



WASHINGTON STATE
Department of Ecology



Cleanup and Restoration at Port Gardner

WSU Beach Watchers Training
May 1, 2020

PSI — Port Gardner

by Susannah Edwards, Donna Podger, and Sam Meng

Today's Presentation

2

	Topic
○	Cleanup Authority and Cleanup Process
○	Everett Industrial Past – Legacy Wastes
○	Everett PSI Sites and Cleanup Status
○	Habitat Restoration



Cleanup Regulatory Authority

3

Statute – Adopted in 1989

- ❑ Citizen Initiative 97, passed by the voters in November 1988 general election
- ❑ Cleanup Law codified as **Chapter 70.105D** Revised Code of Washington (RCW)
 - Chapter 70.105D – Hazardous Waste Cleanup – **Model Toxics Control Act (MTCA)**
 - Funded through a tax on hazardous substances

Rules – Adopted in 1991

- ❑ WAC 173-340 (MTCA Cleanup regulation)
- ❑ WAC 173-204 (Sediment Management Standards or SMS)

Model Toxics Control Act Cleanup Regulation Chapter 173-340 WAC

Revised 2013

Washington State Department of Ecology
Toxics Cleanup Program

Publication No. 94-06





Key Principles of Cleanup Law

- ❑ Polluter pays
- ❑ Cleanups should be as permanent as possible
- ❑ Public participation is crucial
- ❑ Processes should demonstrate a bias toward action, permanence, and innovation



Cleanup Process

5

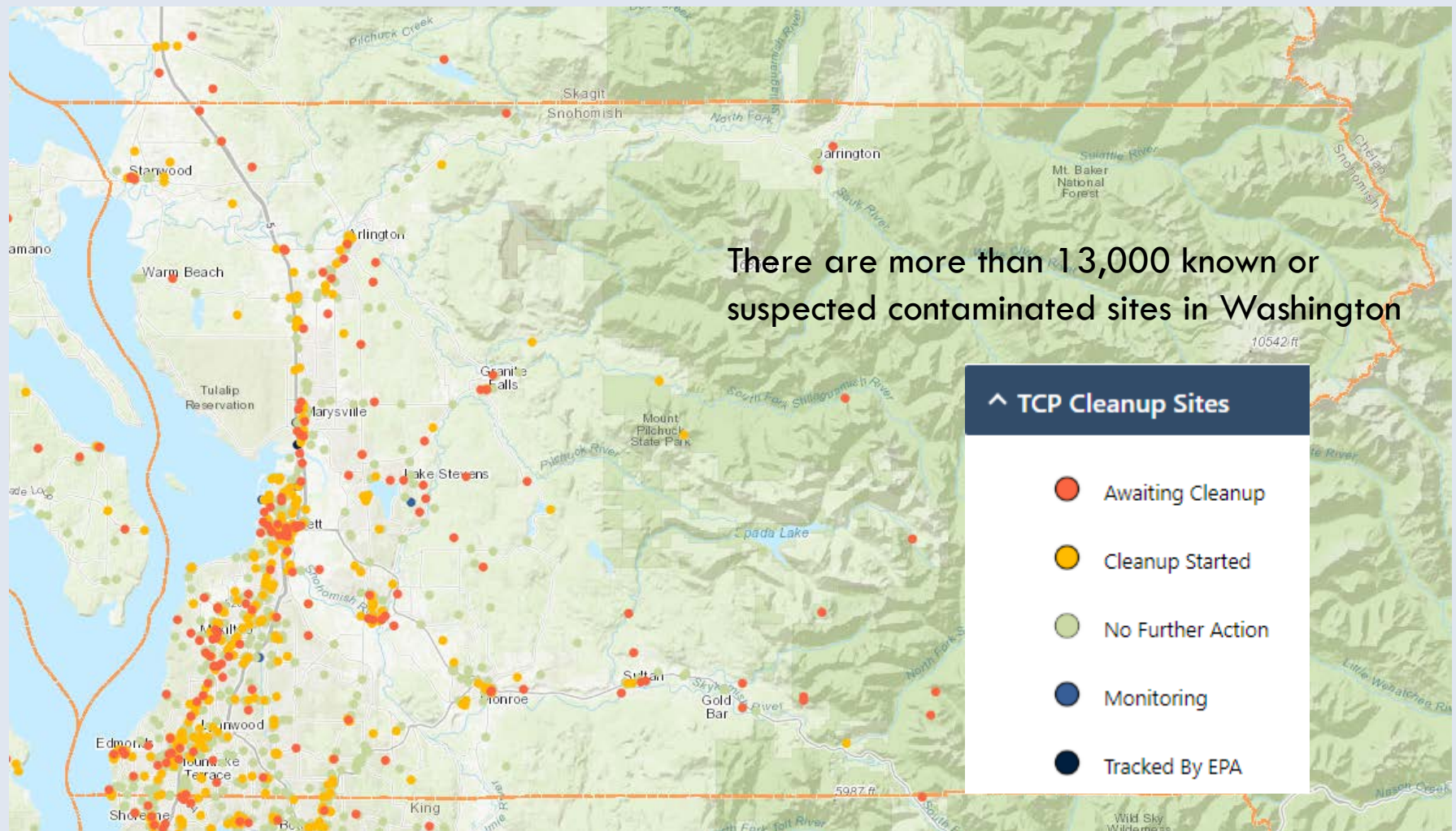
Leadership
from the
state





Toxics Cleanup Sites in Snohomish County

6

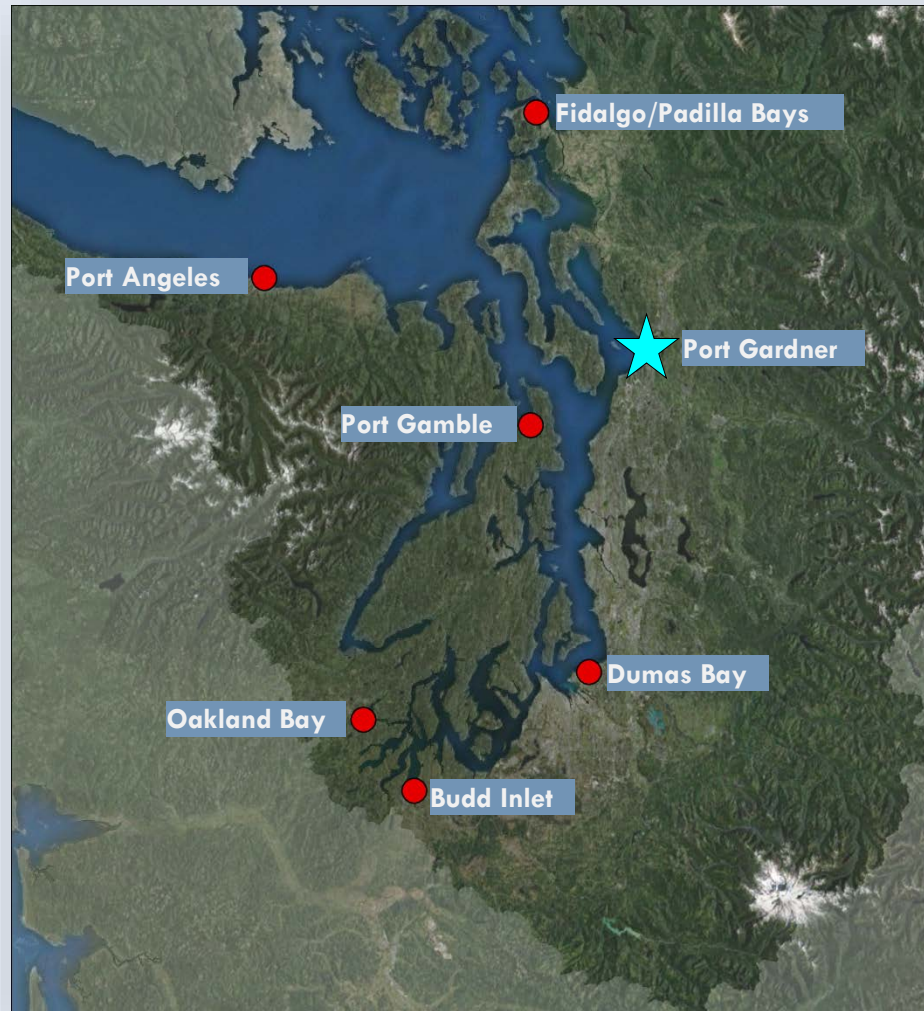




The Puget Sound Initiative (PSI)

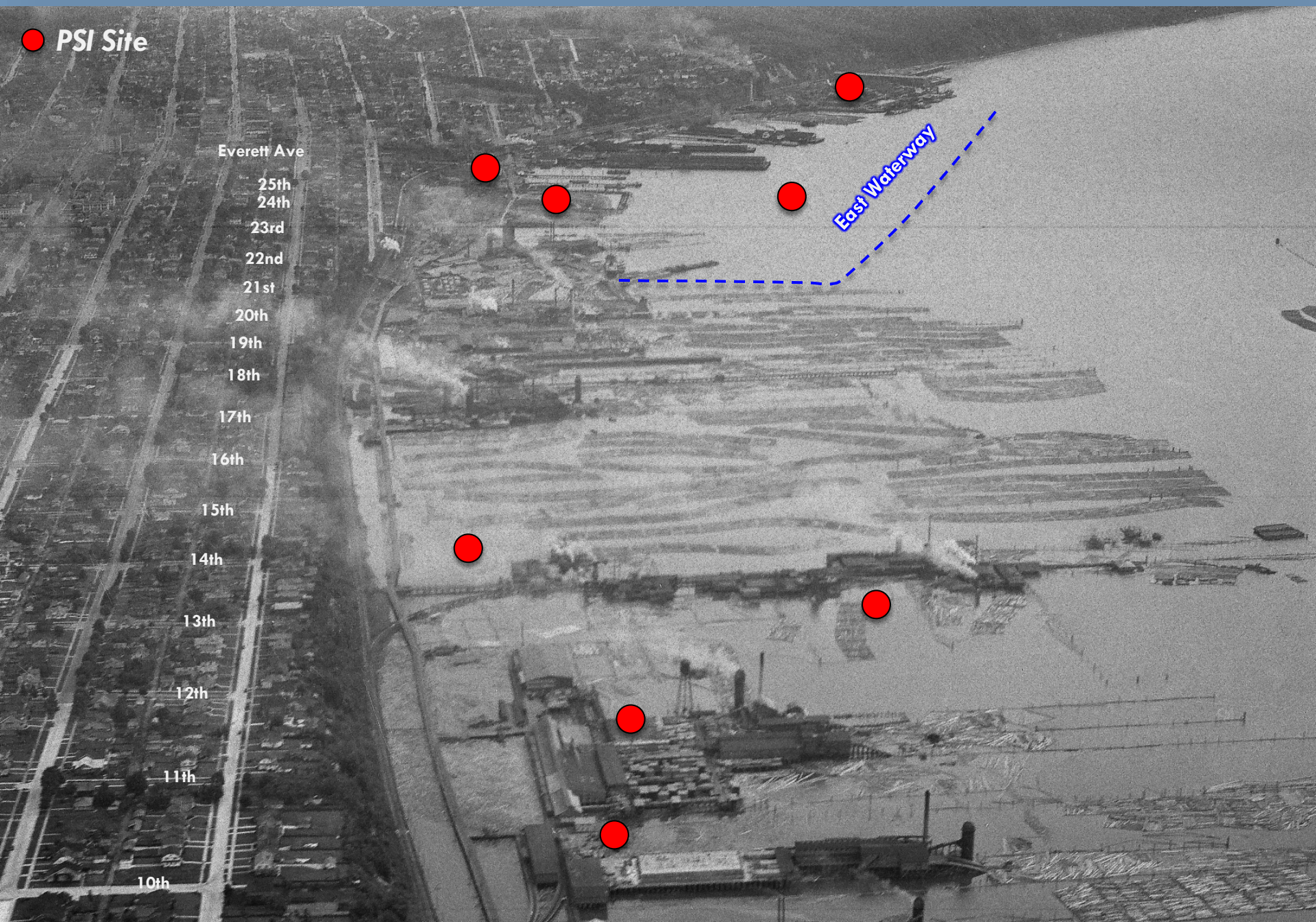
7

- ❑ Began in 2005
- ❑ Includes a lot of people, organizations and governments
- ❑ Intended to restore and preserve the health of Puget Sound
- ❑ Cleanup near shore sites throughout Puget Sound
- ❑ Port Gardner one of 7 priority Bays





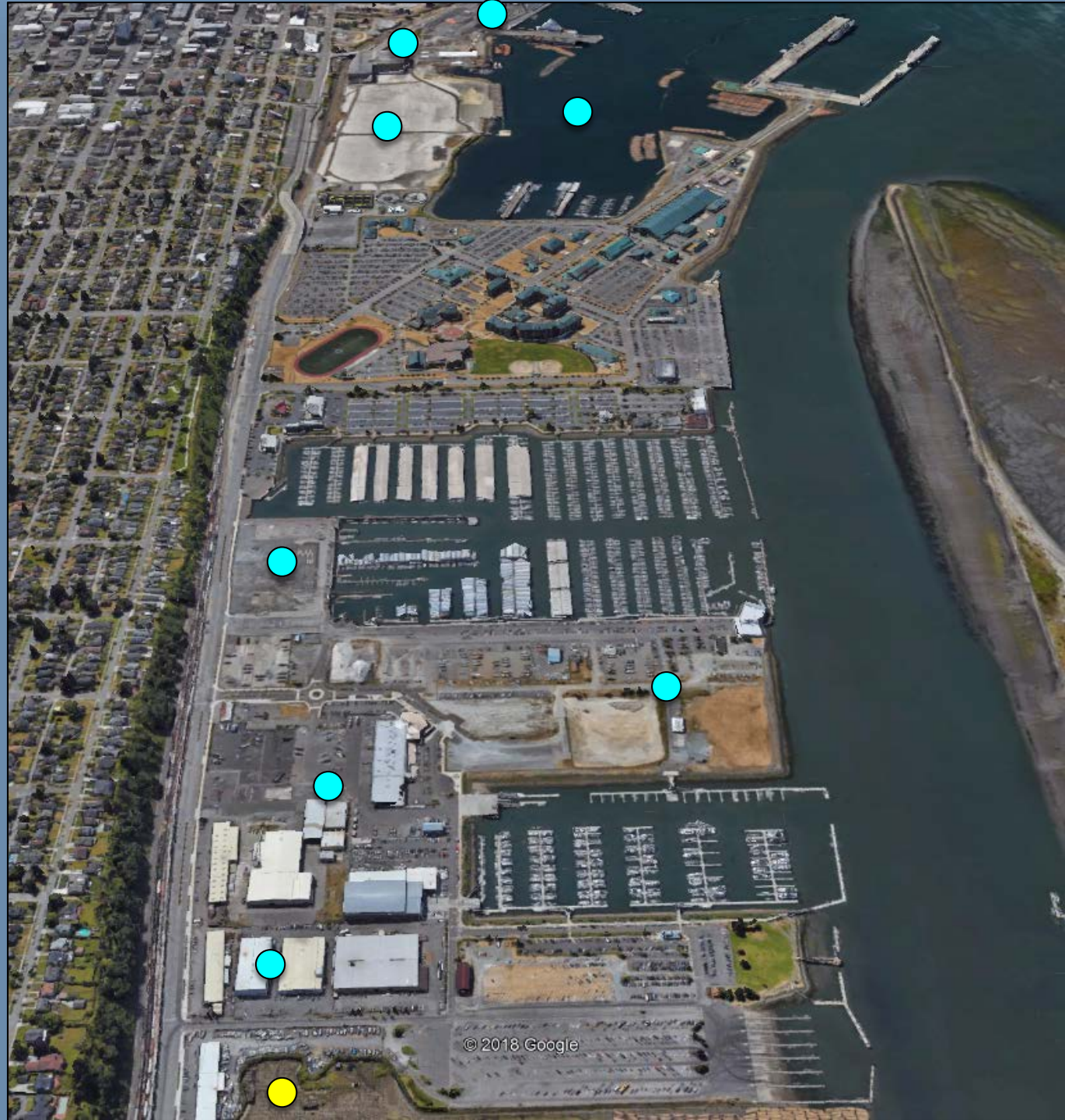
Historical Everett – 1928



2017 Waterfront

 *PSI Site*

 *Potential Site*





Port Gardner Baywide

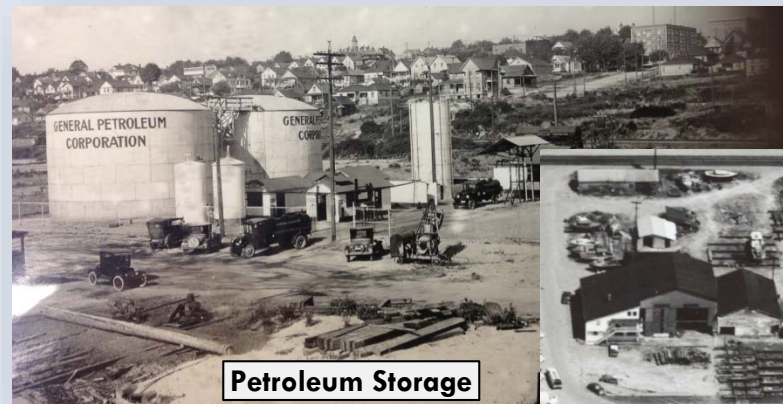
10

General Site Characteristics

❑ Sources

- Discharges to the bay
- Fuel Storage Tanks
- Maritime activities
- Contaminated Fill
- Milling
- Manufacturing
- Pulp and paper
- Metal finishing
- Smelting
- Log rafting and storage
- Pole treating
- Refuse Burners

- ❑ **Site Media** – Soil, groundwater, marine sediment and surface water
- ❑ **Primary Contaminants** – Metals, petroleum, PAHs, PCBs, dioxins/furans





2008 Baywide Study

- ❑ Wide Coverage
- ❑ Four Focus Areas



**Aquatic
Impact
Analysis**



Aerial photo 2006

SAIC
From Science to Solutions

L. Delwiche, SAIC 2008



**Figure 1–4. Port Gardner Sediment
Characterization Study Focus Areas**

0 0.5 1 1.5 2
Miles

Scale: 1:47,000

WA State
Plane North
NAD83



W440_gis_Active/Ecology/PortGardnerGIS/projects

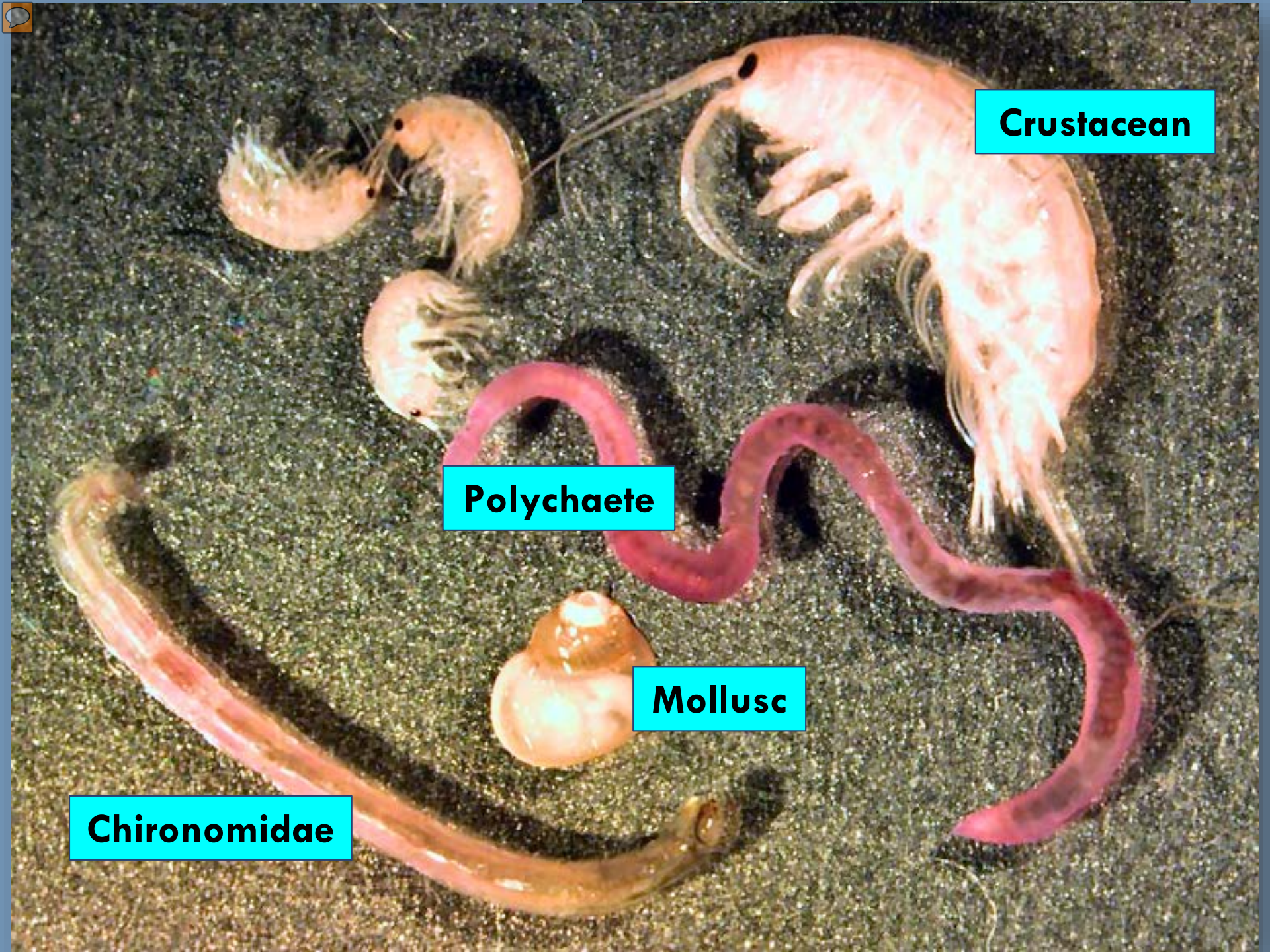


Crustacean

Polychaete

Mollusc

Chironomidae



2008 Baywide Study

- Identify concentrations of chemicals in tissue (fish, shellfish, plant)





Polychaete
(marine segmented worm)



Ghost Shrimp





Public Participation in Cleanup Decisions

16

Results

- ❑ **East Waterway sediments are the most impacted**
 - Biological toxicity and chemical exceedances
 - Higher levels of Dioxins/Furans and PCBs
 - Highest wood debris accumulations
- ❑ **Tissue**
 - **Dioxin/Furans** – Detected in the tissue meat; high concentrations in the fatty material
 - **Polychlorinated biphenyls (PCBs)** – Non-detect in the tissue meat; detected in the fatty material
 - **Metals** – Low levels detected





Historical Everett — 1930s

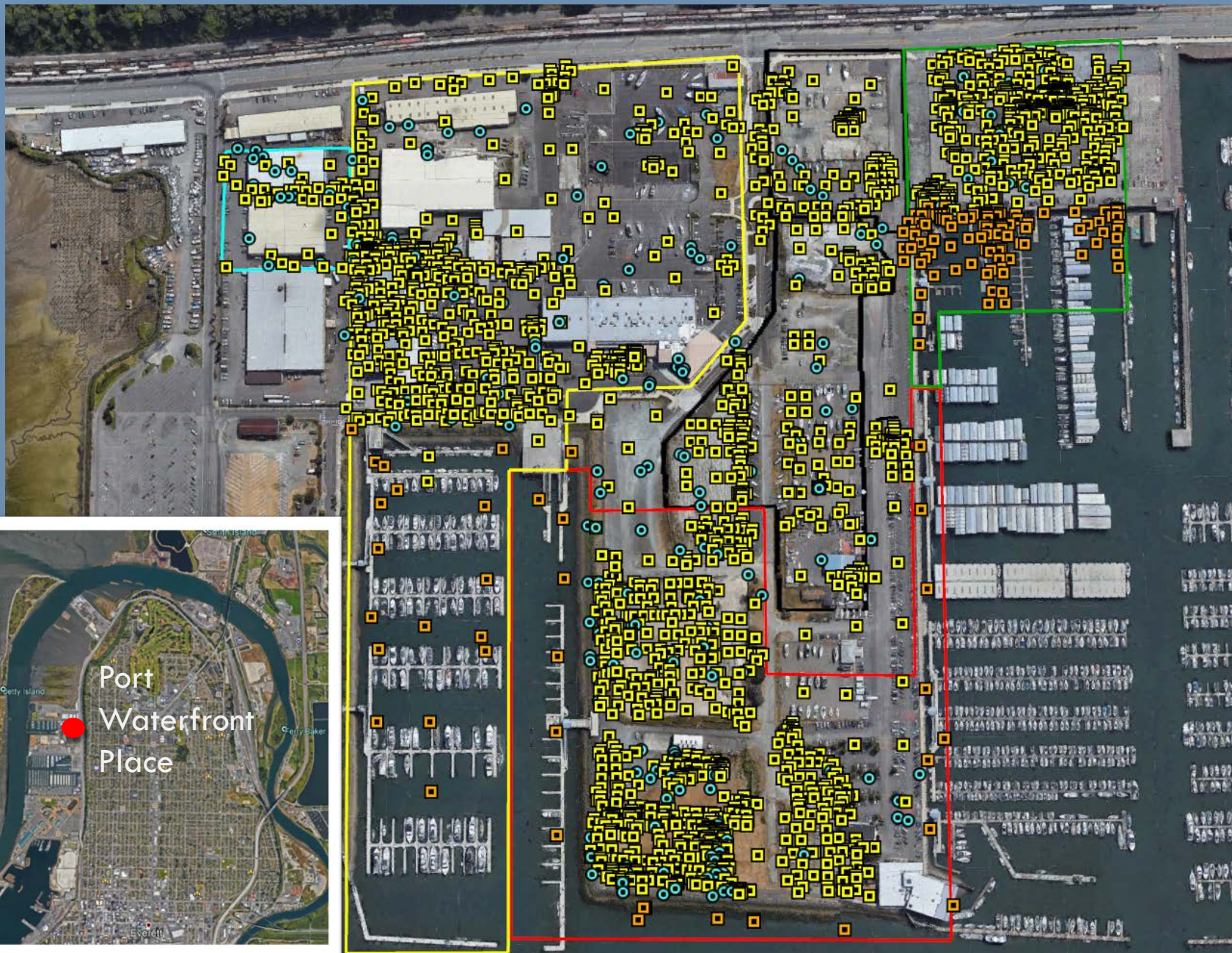




Historical Everett — 1940s



Sampling data at Port Waterfront Place – 65 acres



Cleanup at Port Waterfront Place – 65 acres

**>80,000 cubic yards
(5,000 dump trucks)**





Everett Shipyard Site

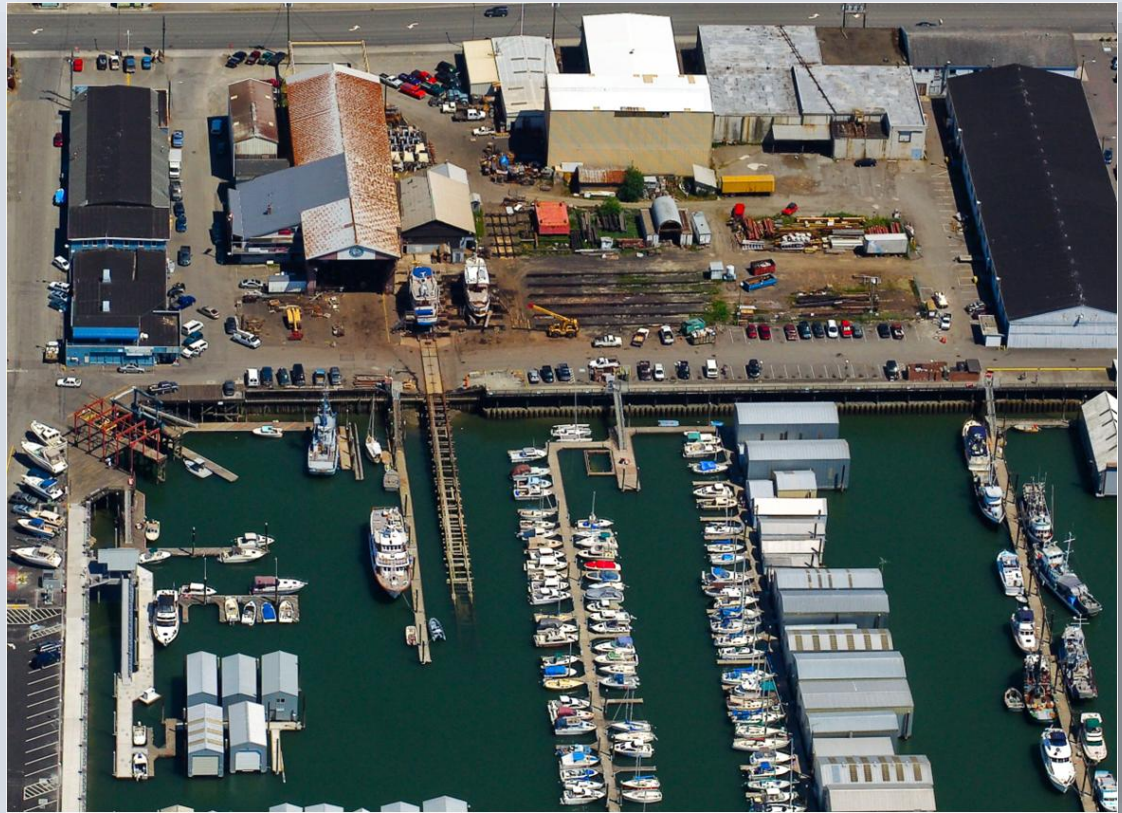
21

❑ Site Use

- Boat building, maintenance, repair
- Machine Shop

❑ Primary Sources

- Sand Blast Grit/Paint Chips
- Fuel Oil Tanks
- Boat Washing & Maintenance
- General Chemical Use
 - Paints/Solvents
 - Oils
 - Creosote
- Discharges to Puget Sound



 **Complete**
Cleanup

Agreed Order

RI/FS

DCAP/CD



Contaminants and Risk

22

Chemical	Soil	GW	SED
Metals	●□	●□	●□
PAH	●□		●□
TPH	●□	●□	
PCB	●□		●□
Tributyltin			●□

□ Upland soil contaminants:

- Are a risk to people through direct contact and inhalation (e.g., windblown dust)
- May be transported to Puget Sound via stormwater runoff and as windblown dust

□ Groundwater contaminants:

- Arsenic and petroleum contamination may flow to the adjacent Puget Sound posing a risk to marine life
- Exposure to contaminants in shallow groundwater during construction activities may be a concern
- Groundwater at the Site is not potable

□ Sediment contaminants:

- Are at concentrations that pose risk to marine life

Everett Shipyard Site

23

□ Upland Cleanup - 2013

- Excavation – 15,000 cu yds
- Cleanout Stormwater System
- Monitor Groundwater



Everett Shipyard Site

24

❑ In-Water Cleanup - 2014

- Sediment Dredge – 9,000 cu yds
- Remove marine railway and travel lift
- Replace portions of the bulkhead

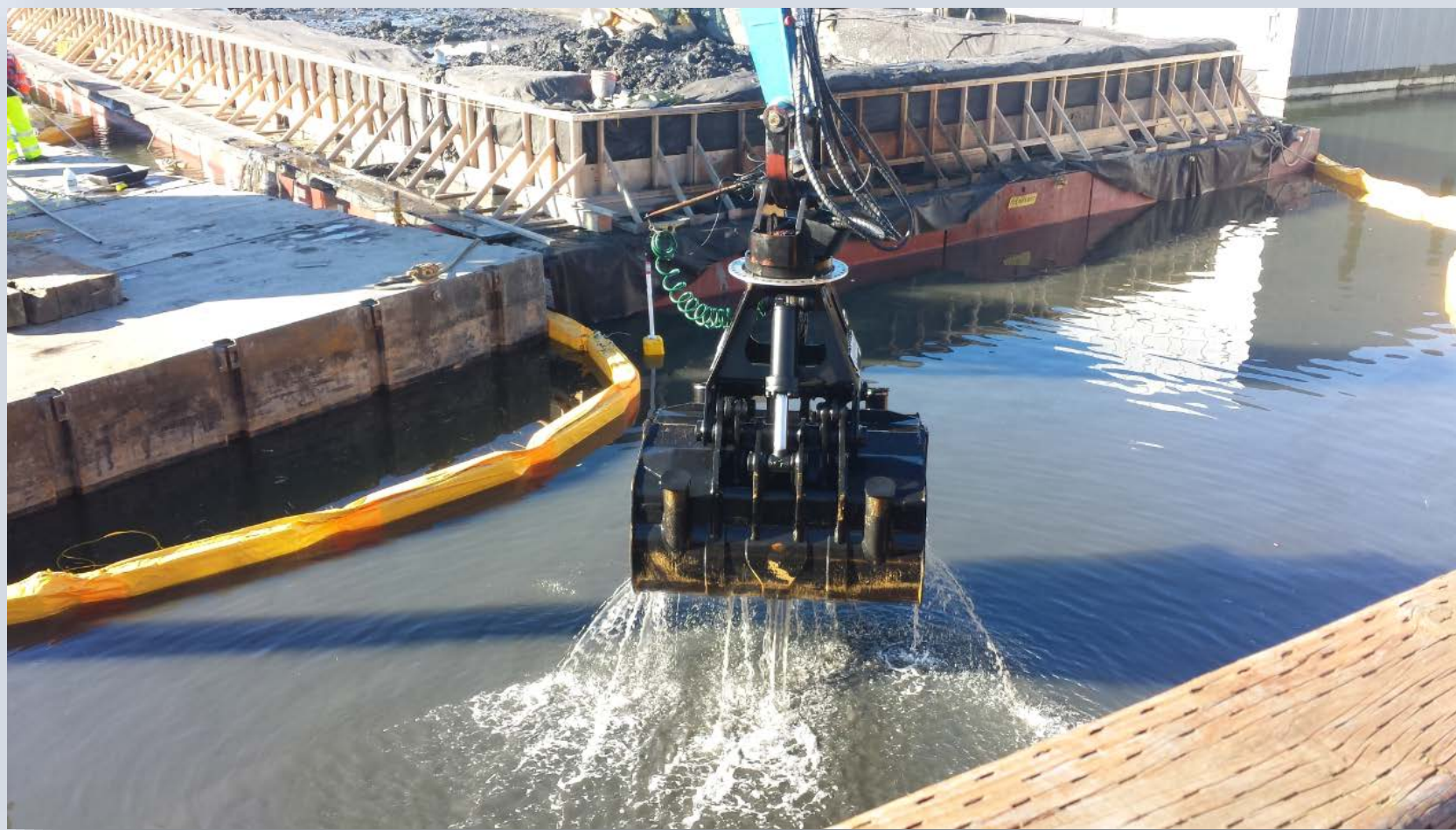




Everett Shipyard Site

25

In-Water Cleanup – November 2014



Everett Shipyard Site

26

Former Creosote Bulkhead and Pilings



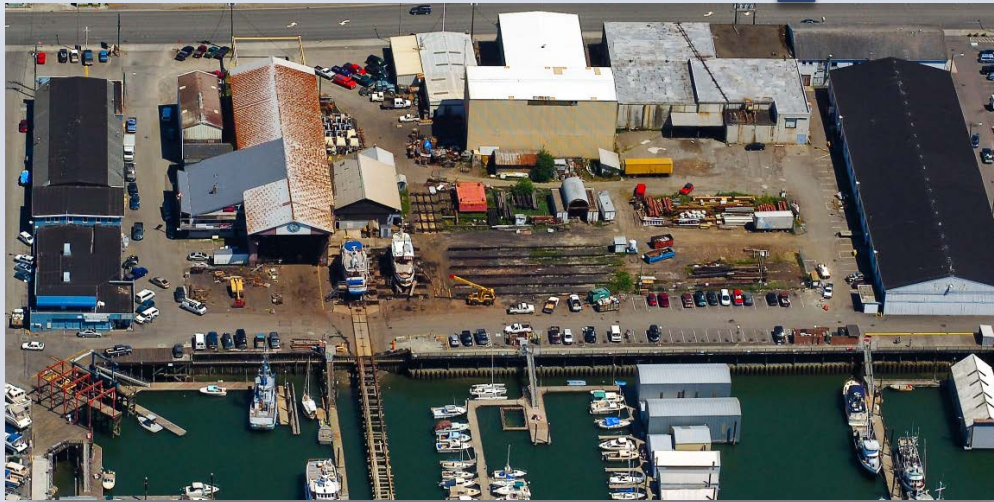
Contaminated
Sediment Within
the Bulkhead

New Steel Sheet Pile Bulkhead

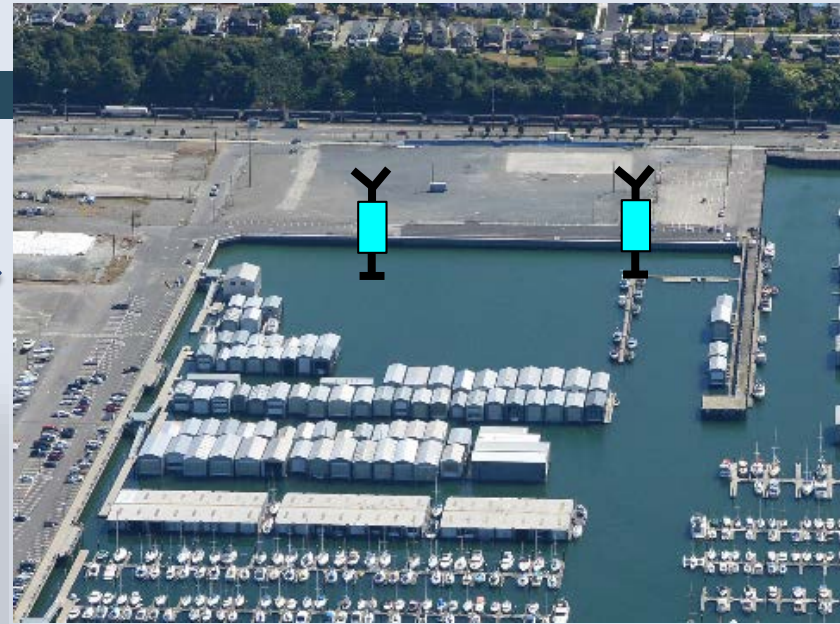


Everett Shipyard Site

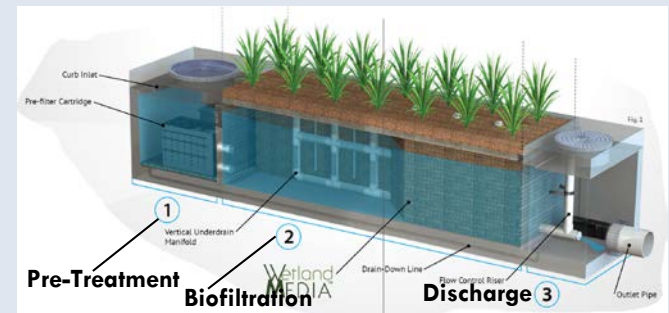
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Everett Shipyard – before cleanup



Everett Shipyard – after cleanup



 Installed - 2017

Modular Wetlands (Stormwater Biofiltration)

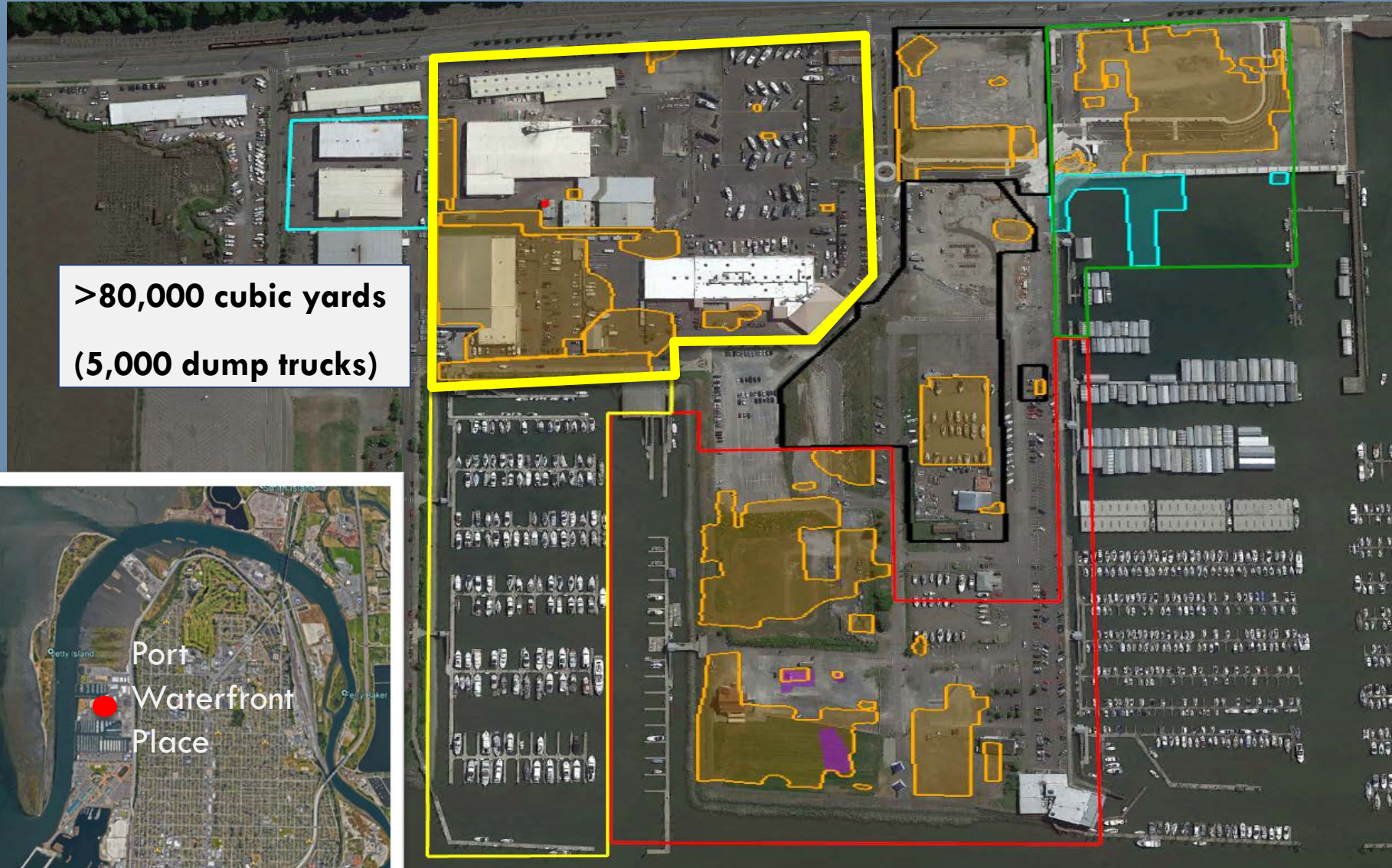
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Cleanup at Port Waterfront Place – 65 acres



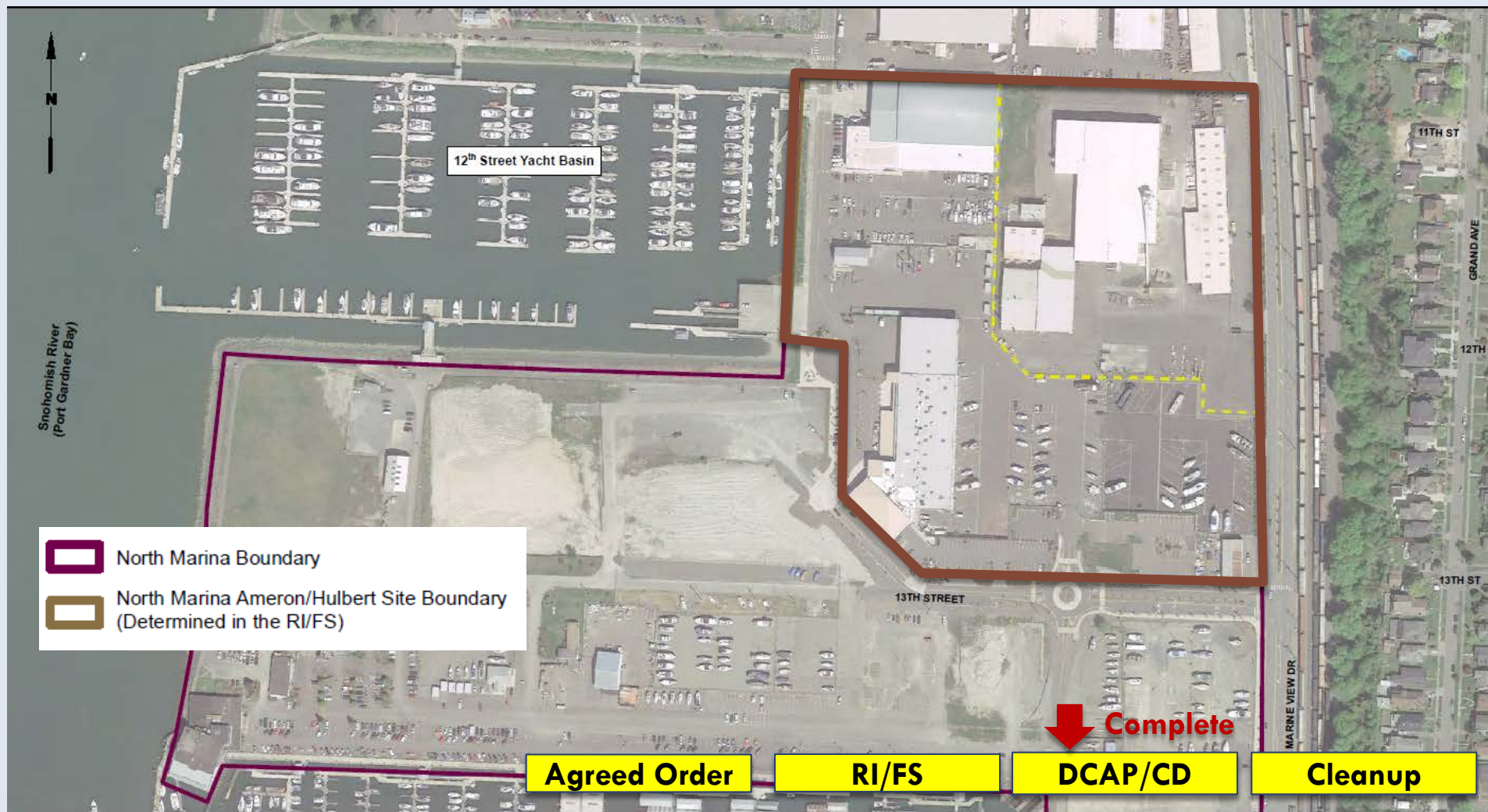
**>80,000 cubic yards
(5,000 dump trucks)**





North Marina Ameron/Hulbert Site

29



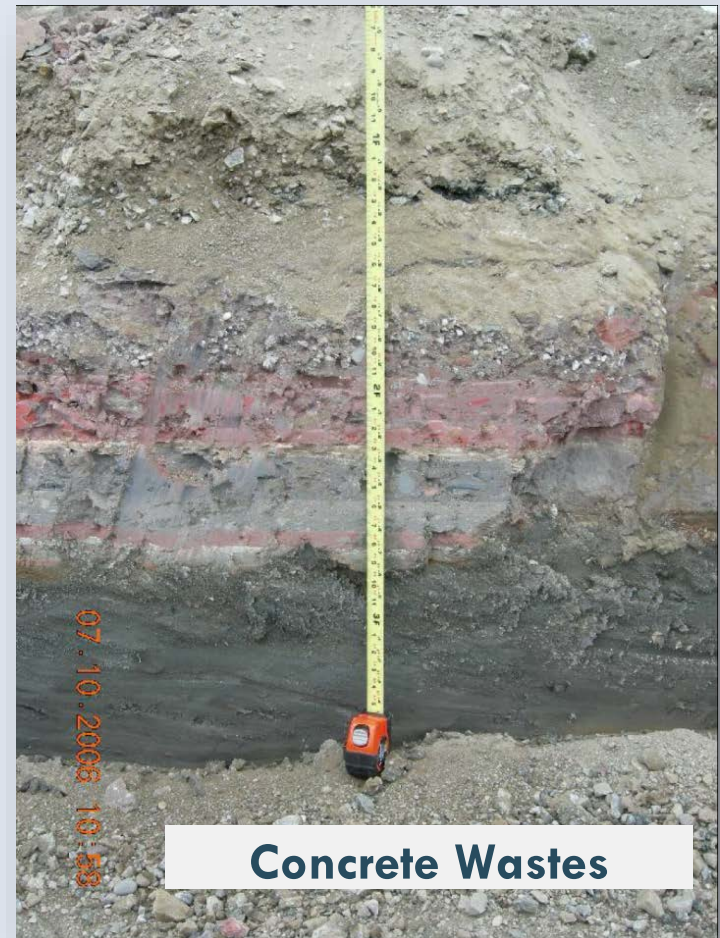


North Marina Ameron/Hulbert Site

30

Historical Cleanups (Pre-CAP 2014)

- ❑ Interim actions
- ❑ Emergency removal



Ameron/Hulbert Site

31



**Removal of Storm
Drain Pipe**

Ameron/Hulbert Site

32



**Sandblast Grit
Encountered in Former
Storm Drain Pipe**



Ameron/Hulbert Site

Recent Cleanups

- Trunk line Replacement (Partial CAP 2018)



Everett Shipyard Area – Fisherman's Harbor

34

Fisherman's Harbor





ExxonMobil ADC Site

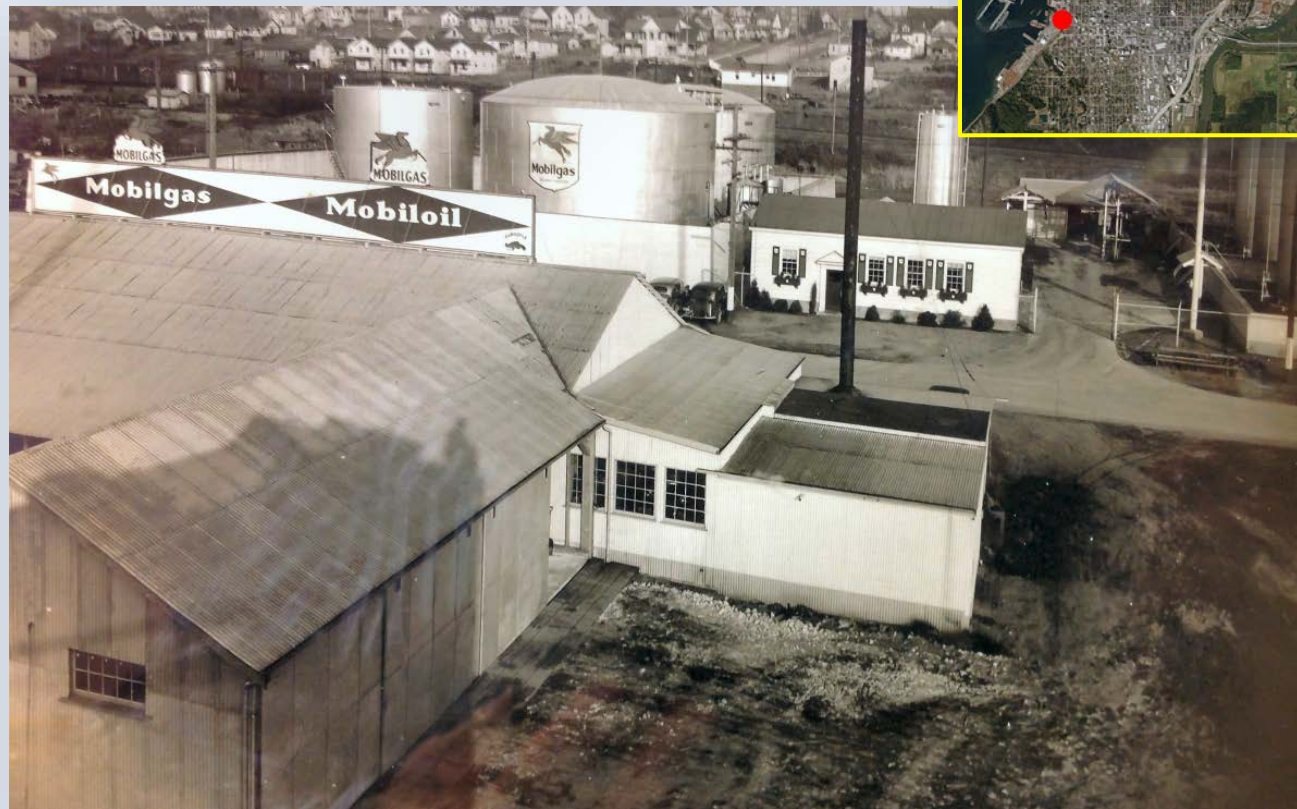
35

❑ Site Use

- Bulk Petroleum Storage and Distributing Facility

❑ Primary Sources

- Leaks and spills
- Fuel Storage Tanks



Agreed Order

RI/FS

DCAP/CD

Cleanup

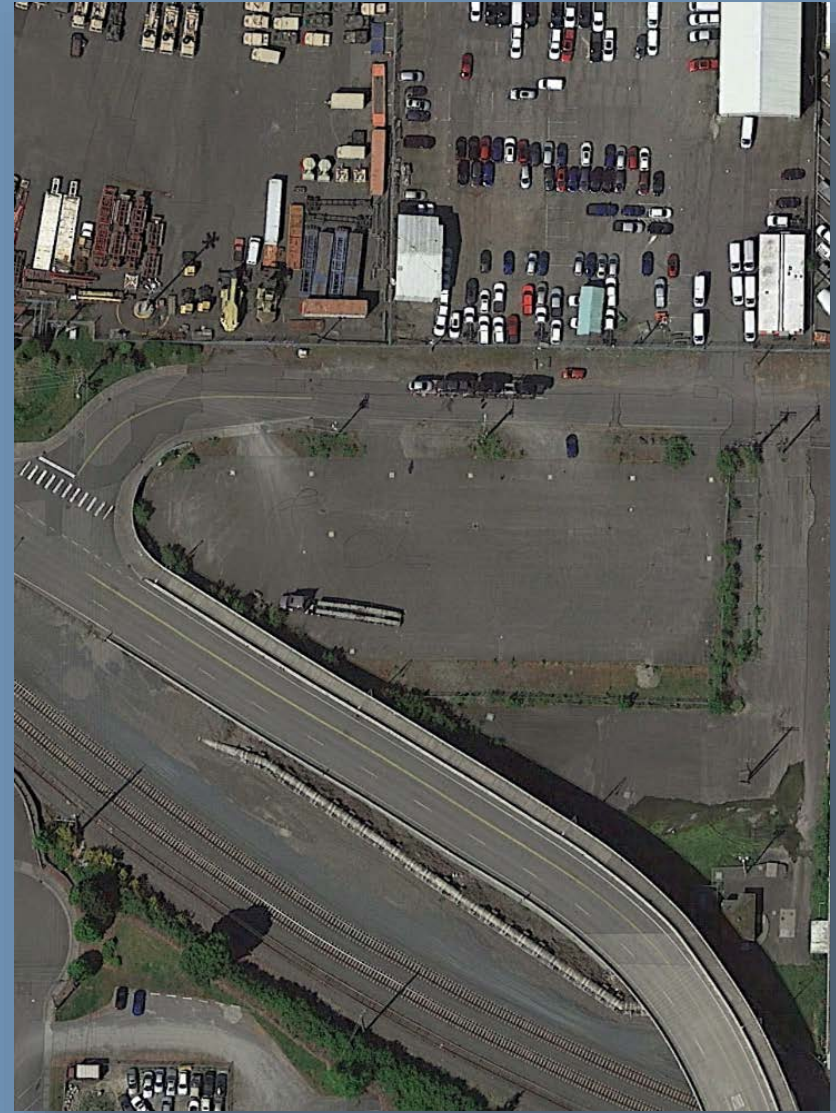




ExxonMobil ADC



1966

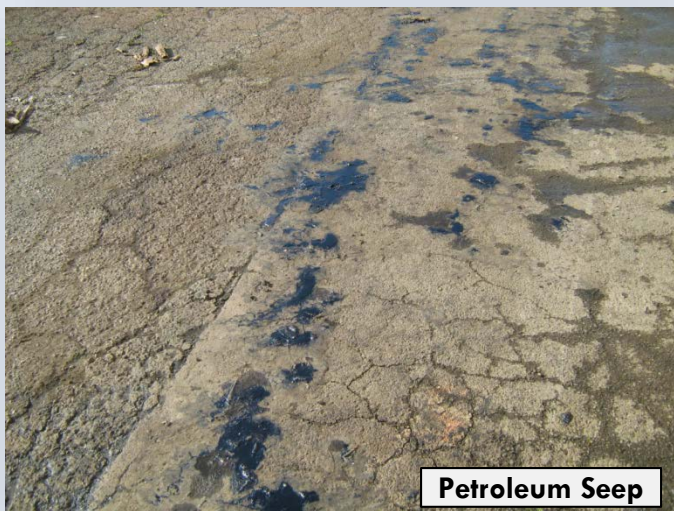


Current



ExxonMobil ADC Site

37





ExxonMobil ADC Site – 2011 Excavation

38



ExxonMobil ADC Site

39

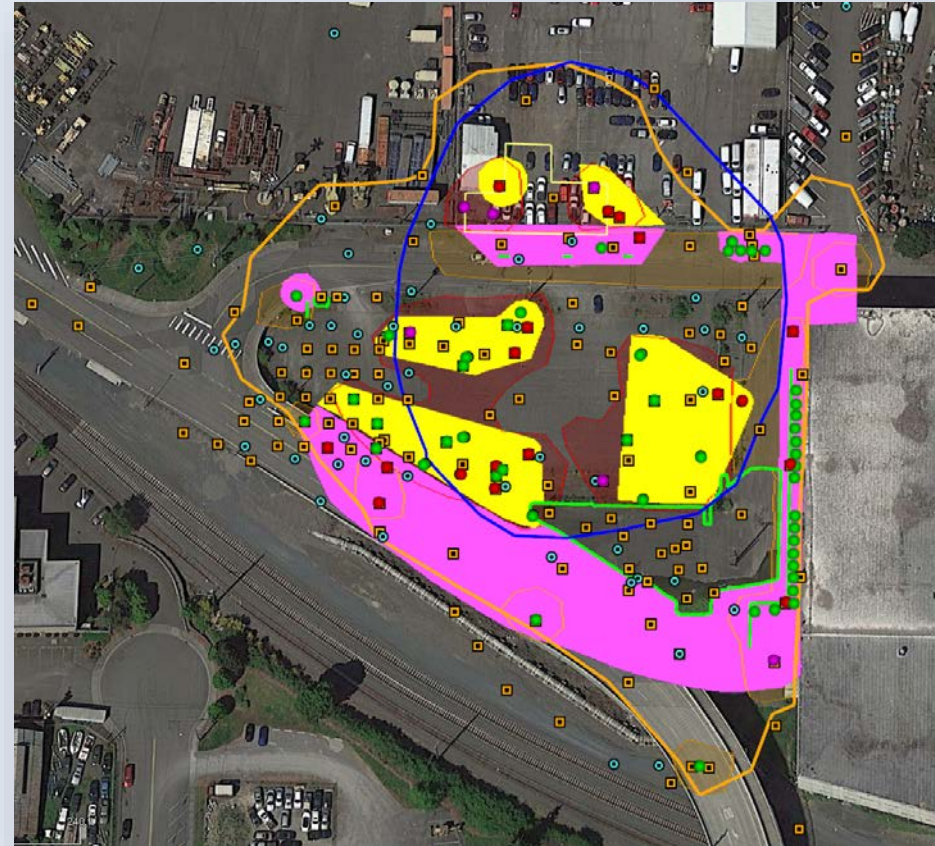


Water Treatment

ExxonMobil ADC Site – Cleanup Options

40

- ❑ Soil and Oil product removal – hot spots and full removals
- ❑ In-situ soil solidification
- ❑ Hydraulic Barriers/Oil Interceptor trench
- ❑ Surface Capping
- ❑ Engineering/Institutional Controls
- ❑ Monitored Natural Attenuation
- ❑ Long-Term Monitoring



Bay Wood Products Site

41

❑ Site Use

- Sawmill
- Log Handling and Storage

❑ Primary Sources

- Fuel Oil Tanks
- Drum storage area
- Electrical Transformers (PCBs)
- Oil Shed
- Dip Tank
- Wood Debris
- Upland Sediment Disposal
- Discharges to Puget Sound



1977 Aerial



Agreed Order

RI/FS

DCAP/CD

Cleanup



Bay Wood Products

42





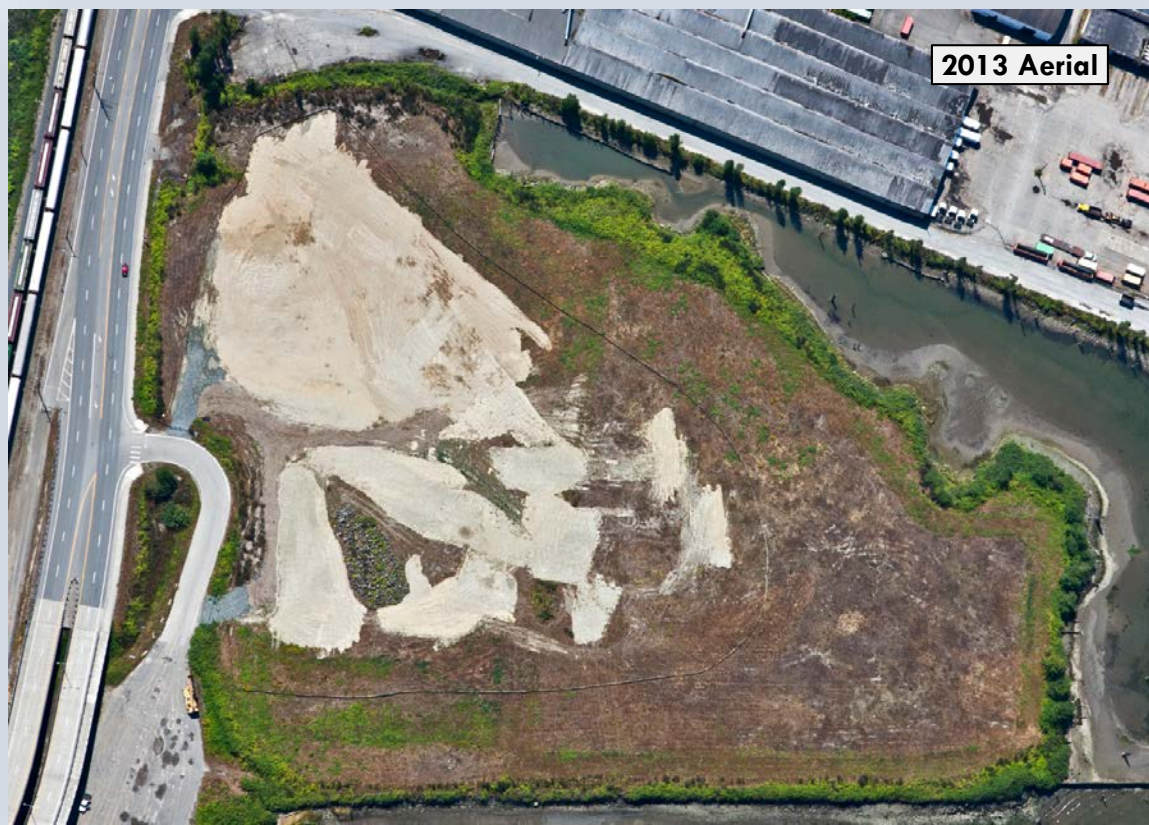
Bay Wood Products Site

43

Contaminated Pile Removal

□ Early Cleanups

- PCB Removal – 10 cu yds
- Wood Waste Removal – 140,000 cu yds





Bay Wood Products Site

44

Interim Action #1: Upland Soil Stockpiles



Bay Wood Products – Interim Action #2

45

- ❑ **Low Area**
 - Unauthorized discharge to the Site

- ❑ **Shoreline Cleanup and Restoration**



Restore Degraded Habitat: 2020/2021



Restore Degraded Habitat: 2020/2021





Jeld-Wen Site

48



❑ Site Use

- Wood Treating
- Sawmill
- Casket Factory
- Former Door Manufacturer

❑ Primary Sources

- Creosote Tanks
- Fuel Oil Tanks
- Woodlife Tank
- Hog Fuel Burner Emissions
- Discharges to Puget Sound



Agreed Order

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DCAP/CD

Cleanup



Jeld-Wen Site

49



JELD-WEN Site

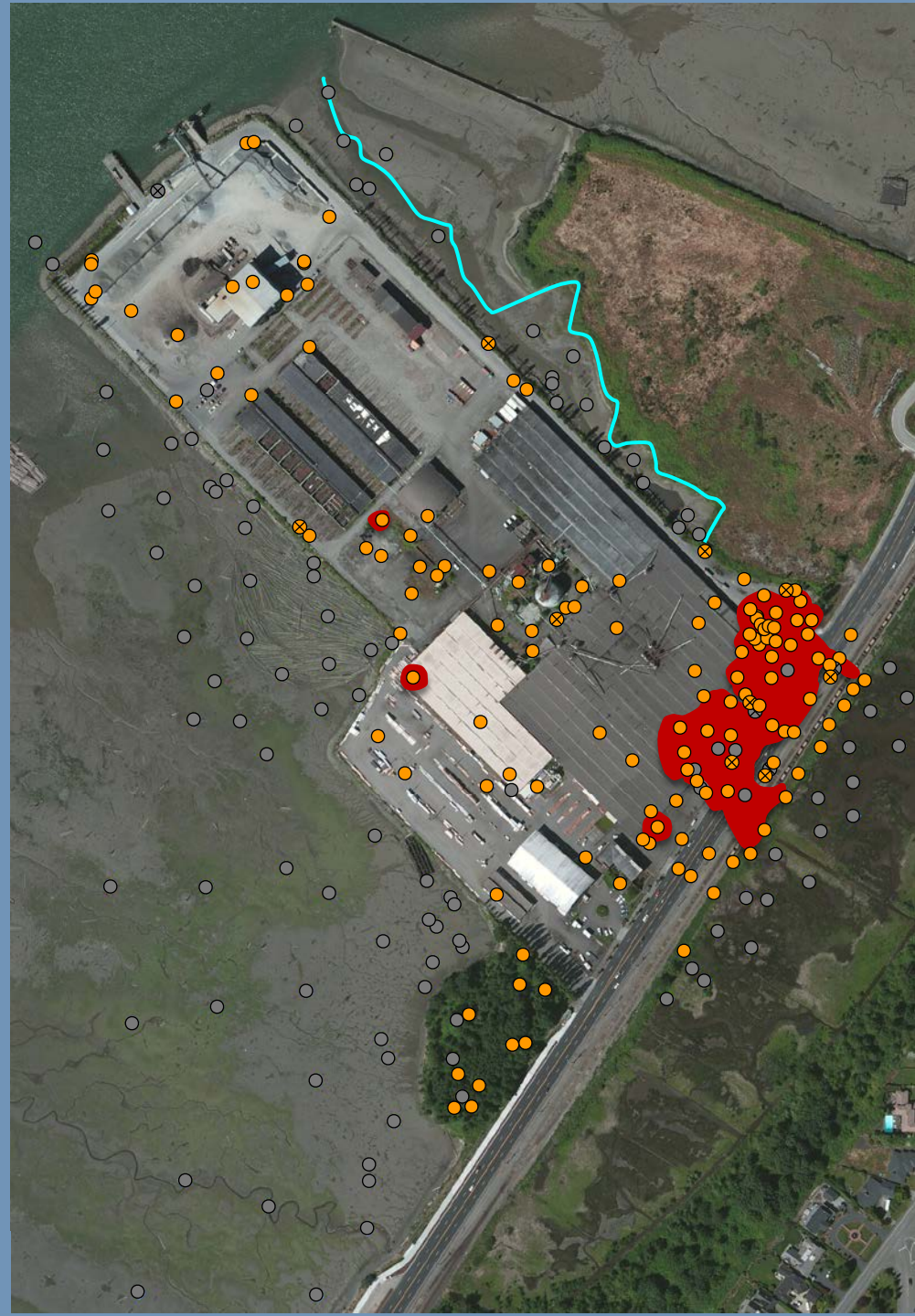
Soil Sampling

● Soil Sample Location

□ Soil Contaminants of Concern

- Petroleum (diesel range)
- Benzene
- Naphthalene
- cPAHs
- Dioxins/Furans

● Impacted Soil



JELD-WEN Site

Groundwater Sampling

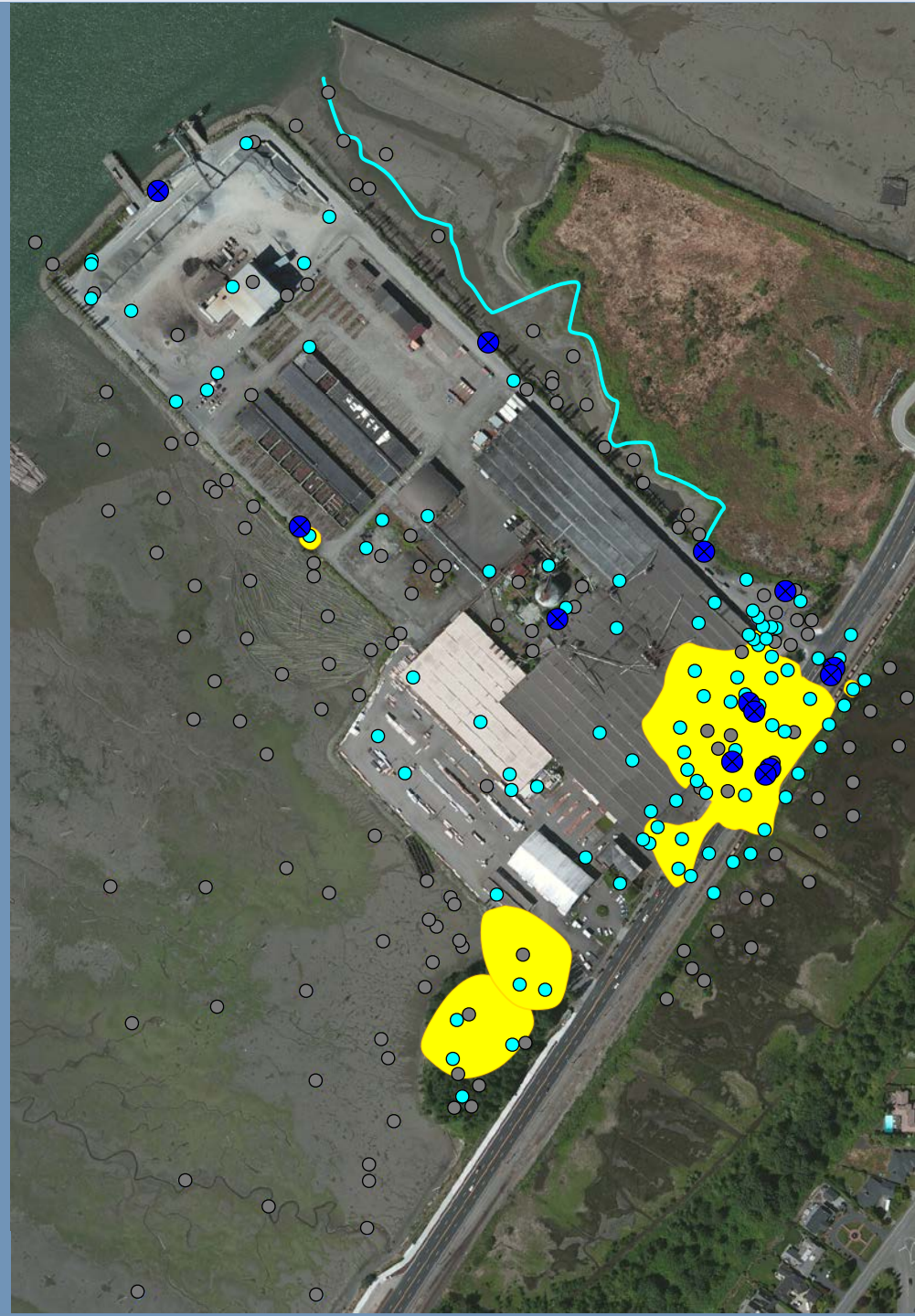
● Groundwater Grab Sample

⊗ Permanent Well Location

□ GW Contaminants of Concern

- Petroleum (diesel range)
- Benzene
- Naphthalene
- cPAHs
- Dioxins/Furans
- PCBs

● Impacted Groundwater
(approximate)



JELD-WEN Site

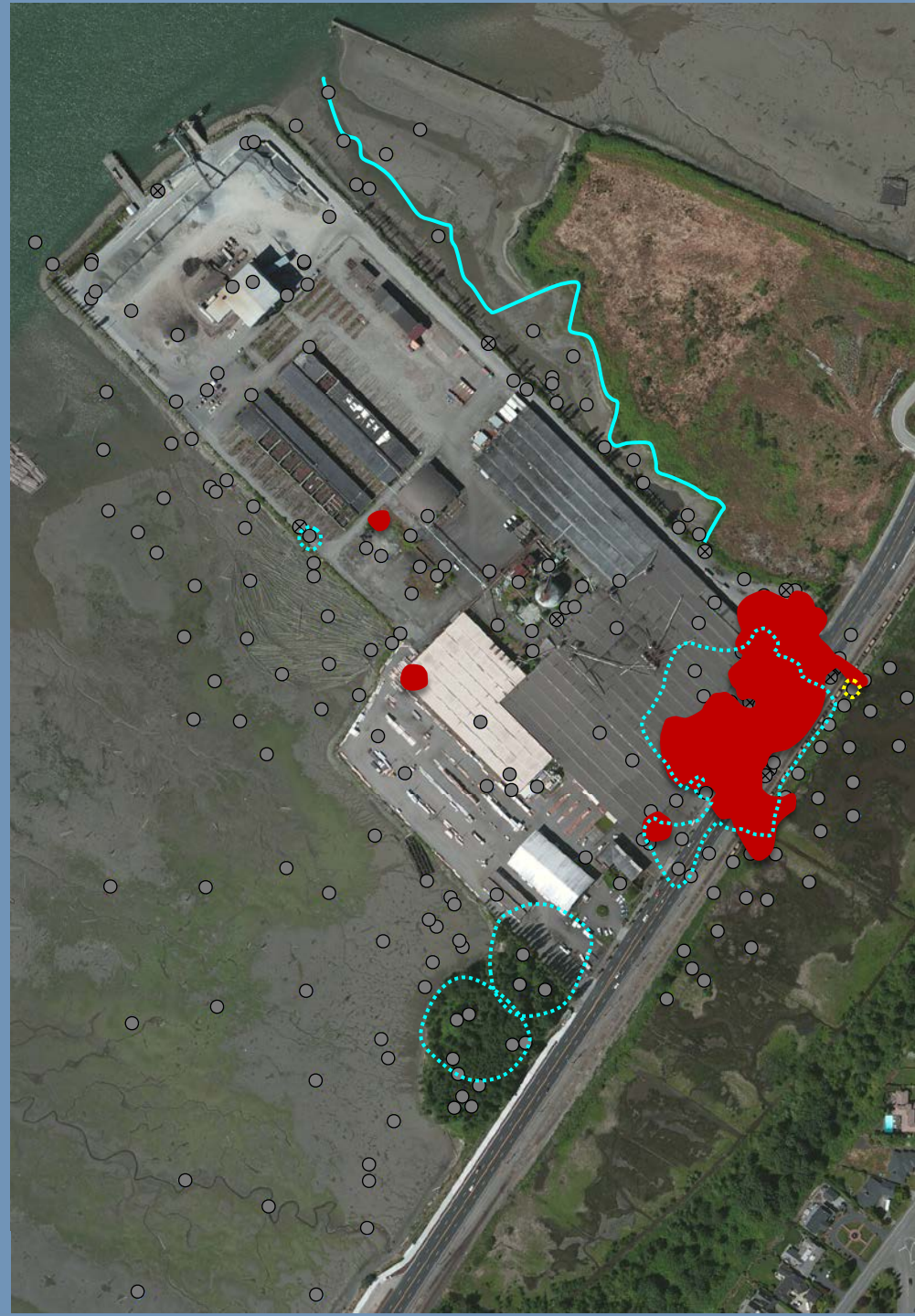
Upland Cleanup Options

- ☐ Soil removal
- ☐ In-situ stabilization
- ☐ Dual phase extraction
- ☐ SVE/Air sparging
- ☐ In-situ treatment
- ☐ Surface Capping
- ☐ Engineering/Institutional Controls
- ☐ Monitored Natural Attenuation
- ☐ Long-Term Monitoring

SVE = Soil Vapor Extraction

 Impacted Soil

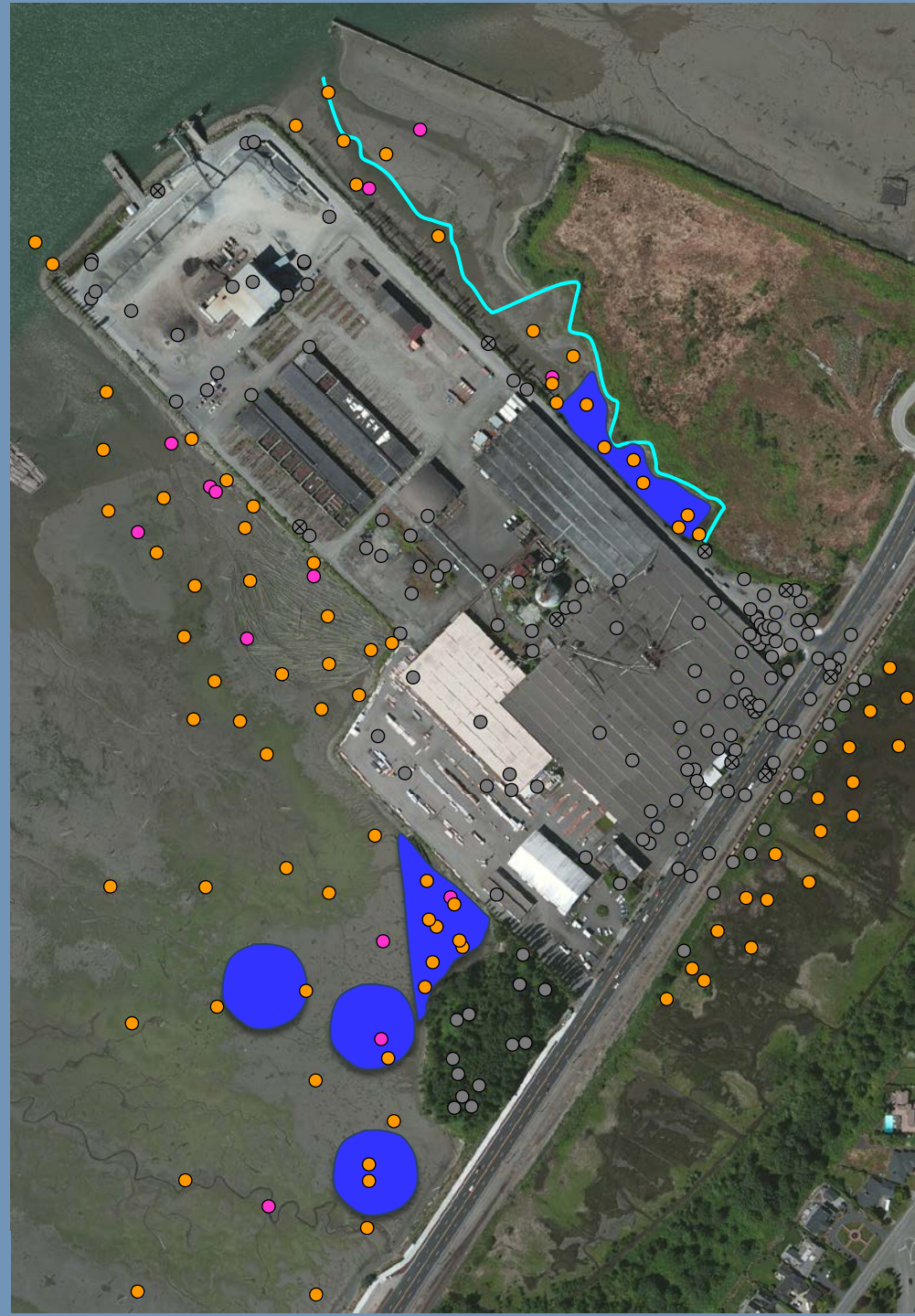
 Impacted Groundwater



JELD-WEN Site

Sediment/Tissue Sampling

- Surface Sediment Sample
- Sediment Core Sample
- Sediment Contaminants of Concern
 - cPAHs
 - Dioxins/Furans
 - PCBs
- Clam Tissue Sampling Areas



JELD-WEN Site

In-Water Cleanup Options

- ☐ Sediment removal
- ☐ Enhanced monitored natural recovery
- ☐ Monitored natural recovery
- ☐ Capping with clean sediment
- ☐ Institutional controls

 Impacted Sediment

