Commencement Bay Nearshore/Tideflats
Lessons Learned
SMARM
September 30, 2020
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CBN/T Site Location
CBN/T Site

7 Operable Units

- OU 01: Sediment
- OU 05: Sediment Sources
- OUs 2, 4, 6, 7: Asarco
- OU 3: Tar Pits

Each OU has cleanup plan (ROD)
Objectives of Cleanup

- Reduce fish tissue => Carr Inlet
- Achieve specified sediment concentrations
  - Remedial Action
  - Compensatory Mitigation (CWA 404)
  - ICs & LTMP
- Control sources
- Maintain functional habitat and enhance fisheries
Remedy Components

- Temporary fish advisory
- Source control
- Capping and dredging above remedial action levels (RALs)
- Monitored natural recovery (10 years)
Refinements to Remedy

• 5 Explanation of Significant Differences
• Specify
  – Areas and volumes dredged
  – Disposal locations
  – Capping areas
  – Natural recovery areas
• Added enhanced natural recovery
CERCLA Process

✓ Listing
✓ Remedial Investigation
✓ Feasibility Study
✓ Record of Decision
✓ Remedial Design
  • Remedial Action
  • Deletion
• Long-term Monitoring & Maintenance
  Five-year Reviews
Summary of Cleanup

1983: Site Listing
1984-1989: RI/FS
1988 St. Paul
1989: ROD
1990s: Source Control
1993-2017: Sitcum
1997-2020: Thea
Foss/Wheeler Osgood
1997-present: Hylebos
2000-2018: Middle
When is Remedial Action complete?

**Dredge Only**
- Source control
- Construction
- Confirmation monitoring

**Cap, ENR, NR, in-situ Treatment, Mitigation**
- Control sources
- Construction
- Ensure caps, CADs/CDFs, mitigation functioning
- ENR & NR monitoring
- Need to meet performance standards and cleanup goals
- Need ICs & LTMP where waste left in place
Waterway Status

- **1995:** Partial Deletions Allowed
  - 1996 Blair & St. Paul
  - 2021 Middle, Thea Foss, Wheeler-Osgood
  - 2022 Sitcum and Hylebos?

- **Remedial Action**
  - Construction complete in all Waterways
    - Except Mouth of Hylebos Mitigation -- 2021
  - Sources controlled in all Waterways
    - Hylebos?
  - Complete for Sitcum, Middle and Head Thea Foss
    - Need LTMP for Sitcum and Middle
  - Finalizing Thea Foss/Wheeler-Osgood
    - RA Report submitted
Lesson 1

Don’t forget to measure the fish.
Fish Data are Important to Remedy

- Original action triggered from risk $>10^{-4}$ cancer risk
- Humans consuming fish
- PCBs was only COC
- Goal: Reduce fish concentrations of PCBs to reference (Carr Inlet)
Fish Data

- RI sampling 1984
- Sampling in 2019
  - Reproduced RI sampling
  - WDFW collected English sole
  - 17 trawl lines (had to move some)
  - 5 fish/trawl (where we could)
  - Analyzed for Aroclors
- Results: Site-wide tissue concentrations are no different from background (Carr Inlet)
  - 2-sample test, p=0.05
- Significant reductions
- Non-detects
- Waterway changes
  - Middle
  - St. Paul
  - Milwaukee
Hylebos is statistically greater than Carr Inlet and has greater variability.
Lesson 2

Things change.
Land Use Changes

• Federally authorized navigation projects
  – Blair widening & deepening (Blair & Sitcum)*

• New outfalls
  – Thea Foss
  – Middle Waterway (not in the middle of habitat!)

• Mitigation projects
  – Hylebos (421B)

• Development
  – Park w/Thea Foss outfall
  – City w/Thea Foss docks
  – Expanded berths in Hylebos
  – Redevelopment of St. Paul CDF cap

• Public access
  – Water recreation
  – Boat launch

*Revealed contamination left in Sitcum Waterway
Contamination in Sediments is 3-D

- Many sites only focus on surface sediment
- Fine if no disturbance in future
- Not good in working waterways or areas where land use changes
  - Structure maintenance
  - Maintenance dredging
  - Waterway deepening
  - New outfalls & structures
  - Prop wash
- Need to know where waste left at depth
Lesson 3

Be adaptive.
Adapting to Land Use Changes

- Need good site characterization & records
- Future actions can expose deep contamination
- Need to know where waste is left at site
  - GIS map
  - Contaminants & concentrations
- Need ICs where contamination remains
Lesson 4

Keep track of the important pieces.
Need Comprehensive Map Showing Remedial Actions

• Develop GIS mapping layers
  – Where are the caps located?
  – Which mitigation sites associated with what CERCLA action?
  – Where was dredging done? How deep?
  – Was dredging to clean? Native layer?
  – Where is contamination left above cleanup goals?

• Need long-term management

• Helps with CERCLA Coordination
  – 75 in past 5 years
Mapping Incomplete

Source: Port of Tacoma 2019

Source: EPA 2009
Additional Information Needed

Example: Caps

• Cap as-builts and specifications
• Datums clearly marked
• Hydrographic surveys
  – Accuracy & tolerance
• Cap edges and depths
  – Defined & mapped accurately
  – Thickness
Lesson 5

Wrap up the loose ends.
Make sure ICs are in place

- Environmental Covenants - State
  - CADs/CDFs
  - 404 mitigation sites
  - Nearshore/shoreline caps
  - Waste left under structures or at depth

- Regulated Navigation Area – USCG
  - Caps/CADs in navigable waterways
  - Waste left under structures or at depth

- NPDES Permits
  - Stormwater/wastewater discharges
Compensatory Mitigation Part of RA

- Compensatory mitigation (CWA 404) - ARAR
- Not well-defined/documentated (acres/type)
  - RD: make sure performance measures well-defined
  - RACR: include as-builts
  - OMMP: follow until performance measures met
  - RAR: need to document that ARAR is complete, IC (Environmental Covenant)
  - LTMP: Monitoring and maintenance
Source Control

- Pre-Remedial Action
  - Ecology’s Milestone 5 Reports
- Post-Remedial Action construction
  - Monitor sediment
  - Sediment concentrations stable
Lesson 6

Plan for the long-term.
LTMP for Post-RA

- Replaces OMMP (short-term performance)
- Ensures remedy continues to perform
  - If waste left in place
  - If condition requiring mitigation exists
- Required for 5-year Review
- Consistent frequency & methodology
LTMP Consistency

- Intertidal & subtidal caps
  - 4th year of FYR
  - Hydrographic/survey
  - Visual
  - Cores

- CDFs
  - 4th year of FYR
  - Groundwater
  - Visual
LTMP Consistency (cont.)

• Habitat
  – Annual inspections
  – Debris, invasive species, encampments, spraying
  – Physical stability - erosion/deposition

• Consistent timing
  – Same schedule for all areas of Site
  – Align with 5-year Review

• Consistent report requirements/contents
Homeless Encampments

Middle Waterway
Derelict Dock Sections

OVRA Cap

Head of Hylebos
Debris on Caps
Questions?