Getting Back on Track
Assuring Necessary Maintenance Dredging in Channels and Harbors Impacted by Contaminated Sediments

Philip Spadaro, L.G.
Blasland, Bouck & Lee, Inc.
2300 Eastlake Avenue
Suite 100
Seattle, WA 98102

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Recontamination of Sediments - Can you afford it?

- Continuation of high unit cost of dredging and disposal
- Slower project permitting, development, and execution
- Possible natural resource damage claims
- Possible operational concerns
What is a Source?

- Upstream
- Industrial discharges
- Stormwater outfalls
- Groundwater discharges
- Direct runoff and bank erosion
- Contaminated sediment
- Atmospheric deposition
- Existing and future structures
  - Operations
  - Material handling
  - Spills
  - Vessels
Geochemical Model of Sources

Terminal Upland

Berth Area

Channel Area

- Stormwater
- Oil Seepage
- Groundwater
- Spills

Air

Suspended Sediment and Water

Sedimentation

Resuspension

Bedload

Water

Suspended Sediment and Water

Contaminated Sediment

Underlying Sediment
Recontamination Analysis

Objective is to assess the potential for post-dredging recontamination of sediment

This is done by:

• Determining potential sources
• Collecting data from sources
• Evaluating recontamination potential
Conceptual Model of Recontamination

Total Mass of COCPs Deposited on an Annual Basis

Fraction Deposited on a Unit Area

Concentration of COCPs in Upper One Foot of Sediment

Mixing Rate

New Sediment

Post Removal Action Sediment
Sediment Traps

- **Pyrex sample tubes**: 3-inch diameter, 21-inch long
- **"test tube" bottom**: plastic cap
- **Concrete base with positioning brackets and lifting rings**
- **Plastic turbulence flow baffle to cover top of trap tubes**: (3 layers of ½" grid)
- **Rubber bungee tying trap to base**
- **Holes for lifting harness**
- **Plastic 15-tube magazine**: (1/4” Delran®)
- **Aluminum and stainless frame construction**
- **Plastic trap case**
- **Professional diver for installation**

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Sediment Traps
Resuspension from vessel movements
Sediment Trap Recovery
Stormwater as a Source
Storm Drain Traps
Future Sediment Concentrations

Three steps to modeling exercise:

• Measure the annual mass from each source
• Estimate the mass flux from each source to sediment
• Calculate the predicted future surface sediment concentration
Relative Annual Mass Loading

- **Total PAHs**
- **Total PCBs**
- **ΣDDT**
- **Bis(2-ethylhexyl)phthalate**
Estimated Post-Dredging Concentrations

130,000 sf

44,000 sf

26,000 sf

13,000 sf
Stormwater Source Control Measures
Recontamination of Sediments – Can it be Avoided?

- To begin, lead by example - control your own sources
- Question funding priorities that do not address source control
- Set a goal for cleaner sediment – don’t accept contamination as the new norm
- Take an active role in basin-wide source control
- Demand a “clean upstream” for your port
- Take an active role in evaluating private cleanups in or near your port
- Consider delay of cleanups without sufficient demonstration of source control
Happy Dredging!