Ebb and Flow of Dredging
An Overview

Addressing Uncertainty and Managing Risk at Contaminated Sediment Sites

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Discussion’s Purpose

- Provide overview
- Identify factors in success or failure of dredging projects
- Discuss how we maximize chances for success
Outline of our Presentation

• Definition of issues
• Risk reduction
• Residuals concentrations
• Resuspension
• Keys to a successful dredging project
Issues That Make or Break a Project

• Risk reduction – end up better than before
  – Residuals
  – Resuspension
• Time or cost (time is money)
Factors for Success or Failure

- Geotechnical/chemical properties
- Disposal type/location
- Site characteristics
- Cleanup constraints
- Equipment
- Contractor
- Project management
Risk Reduction
How do we Measure?

• Long-term
  – Sediment concentrations (residuals) ★
  – Biota concentrations & effects
  – Water concentrations

• Short-term
  – Sediments (residuals) ★
  – Water (resuspension) ★
  – Air
Residual Concentrations
Key Factors

• Bedrock
• Debris
• Operator experience
• Equipment
• Design
• Other variables
Residual Concentrations
Methods to Predict

- No good way
- Average concentration of material removed
- Comparison to results on similar sites
Residual Concentrations
Ways to Mitigate

- Know when to avoid
- Pre-plan to address if residuals occur
  - Monitoring before further decision
  - Post-dredge cap
  - Engineered cap
  - Additional dredge passes
- Flexibility in achieving cleanup standards
Meeting Cleanup Standard
(one approach)

- All areas less than 1 ppm?
  - Yes → ACHIEVED
  - No
    - 1 ppm footprint removed?
      - Yes
        - 0.25 ppm SWAC for OU?
          - Yes → ACHIEVED
          - No
            - Sand cover
              - Capping contingency
      - No
        - More Dredging

FLEXIBILITY
Residual Concentrations
Implications if Not Properly Addressed

- Continued exposure & risk
- Excessive costs (redredging)
  - Low production rates
  - High water content
Resuspension
Key Factors

- Operator experience
- Equipment
- Design
- Other variables
Resuspension
Methods to Predict

- Laboratory tests/modeling
- Comparison to similar sites

Cutterhead: 0.1-0.5%
Bucket: 0.2-0.9%
Resuspension
Ways to Mitigate

• Monitoring
  – Real time difficult
• Smart designs
• Experienced operators
• Best Management Practices (BMPs)
Resuspension
Implications if Not Properly Addressed

- Exposure & risk
- Excessive costs
Tying it All Together

Conclusions

Characterization, Design & Planning

Successful Dredging Projects

Contractor

Project Management