Remediation of Sediment Sites in Washington and British Columbia – Lessons Learned

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Overview

• Sediment remediation project challenges
  – Site specific, but also common
• Design defines implementation requirements
• How can implementation inform future design?
• Adaptive measures to increase cost and schedule efficiencies
Overview

• Design challenges
• Implementation challenges
• Adaptive management
• Case studies
  – Port Gamble, Washington
  – Esquimalt Harbour, British Columbia
Design Challenges

• How much data is necessary?
• Data accuracy
• Natural site conditions vs. altered use
Design Challenges

• Dredge prism delineation
• Desired level of confidence
• Specificity vs. adaptive management

Engineered Dredge Prism Design

Neatline Dredge Design
Implementation Challenges

- Unforeseen conditions
- Differing site conditions
- Re-design requirements
- Cost negotiations
Implementation Challenges

• Force majeure
• Changed conditions
• Contract document inconsistencies
• Contractor direction for completion of work
• Unknown acceptance of risk
• Others
Adaptive Management

- Build flexibility into design
- Quantify/share risk appropriately
- Maintain contractor relationship
- Understand project limitations
Case Study – Port Gamble

- Washington State Department of Ecology remediation site
- Former industrial mill
- Mill operations altered natural sediment conditions
- Two-season construction project
Case Study – Port Gamble

- Structure demolition
- Wood waste/timber piling removal
- Engineered sediment cap construction
Case Study – Port Gamble

- Significant dataset to inform dredge prism design
- Cores to delineate nearshore wood waste
- Nearshore waste removal objective
Case Study – Port Gamble
Case Study – Esquimalt Harbour

- Vancouver Island, British Columbia
- Canadian Navy and ship repair facilities
- Multiple remediation sites within harbour
- Contaminated sediment removal objective
Case Study – Esquimalt Harbour
Case Study – Esquimalt Harbour

Dredge design developed using significant dataset
Case Study – Esquimalt Harbour
Case Study – Esquimalt Harbour

• Adaptive management for water quality requirements
Lessons Learned

• Understand project complexity and remediation objectives

• Quantify project risk and define risk tolerance

• Consider common construction lessons learned in design

• Utilize adaptive management approach in construction
Questions/Discussion