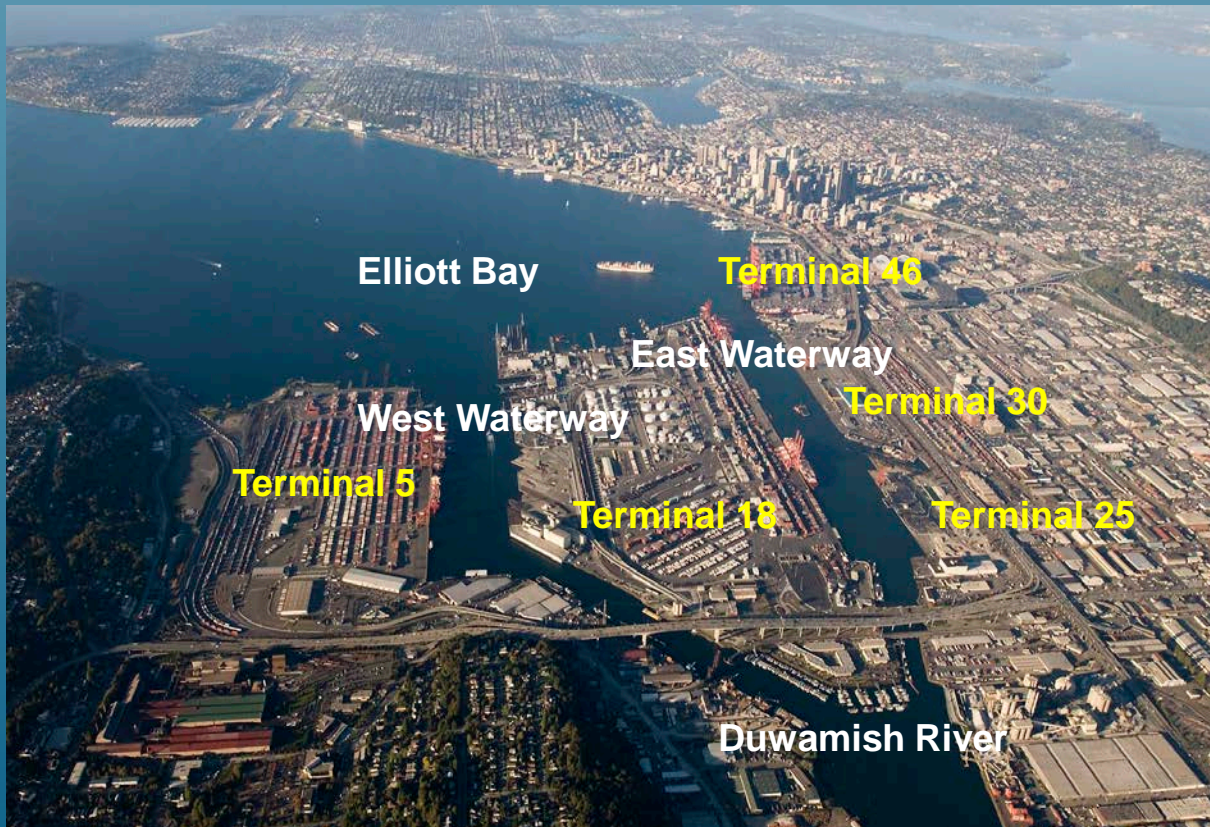


Port of Seattle Maintenance Dredging Program Management

WEDA XXXIII Technical Conference & TAMU 44 Dredging
Seminar

August 25-28, 2013



- Major container port
- Nature deep harbor
- Recent increase in maint. dredging
- \$3M, 3 projects, 3K CY total
- Trying to be more effective and efficient

Why More Dredging Needs Now?

- Container vessel draft steadily increasing
 - 40' in the 1980s
 - 50' in mid-2000s
 - The largest vessels calling the Port draw 48'
- Channel and berth depths at the Port: 50'
- MLLW=0; Extreme low tide -3'
- Short-term: maintenance has to be nimble
- Long-term: need to look at deepening channels and berths

What's causing shoaling?

- Low natural sedimentation
- Increased vessel size=increased bow thruster power
- Prop wash has been a main cause of localized high spots at the berths
- Combined with increased vessel draft, small-volume dredging has become a regular need

Regulatory Environment

- By and large, regulators determine how we dredge, how much it will cost, how long it takes
- Permitting is the longest lead activity (6-9 mos)
 - JARPA (Joint Aquatic Resources Permit Application)
 - DMMP (Dredged Material Management Program)
 - Native American Tribes
 - City of Seattle
- Construction is limited by a “fish window” from Dec 1st to Feb 15
- Open-water disposal vs Upland disposal

Chasing the “liquid mud”



- Closed bucket
- Typically in two passes

Dewatering



Upland Disposal



Compare Recent Projects

	T-18	T-5 Berth 2	T-5 Berth 1	T-5 Berth 3 Estimated
Year of Dredging	2008	2010	2012	2013
Type of Permit	Project Specific	New Programmatic	Existing Programmatic	Existing Programmatic
Type of Dredging	Clamshell	Clamshell	Clamshell	Clamshell
Total Volume	500 CY	1,500 CY	2,000 CY	10,000 CY
Construction Cost	\$265,000	\$600,000	\$537,000	\$2,000,000
Unit Cost (construction only)	\$530/CY	\$400/CY	\$269/CY	\$200/CY
Total Project Cost	\$840,000	\$1,500,000	\$700,000	\$2,300,000
Unit Cost (total project)	\$1,680/CY	\$1,000/CY	\$350/CY	\$230/CY

Lessons Learned

- Survey
- Design
- Permitting
- Contracting
- Construction

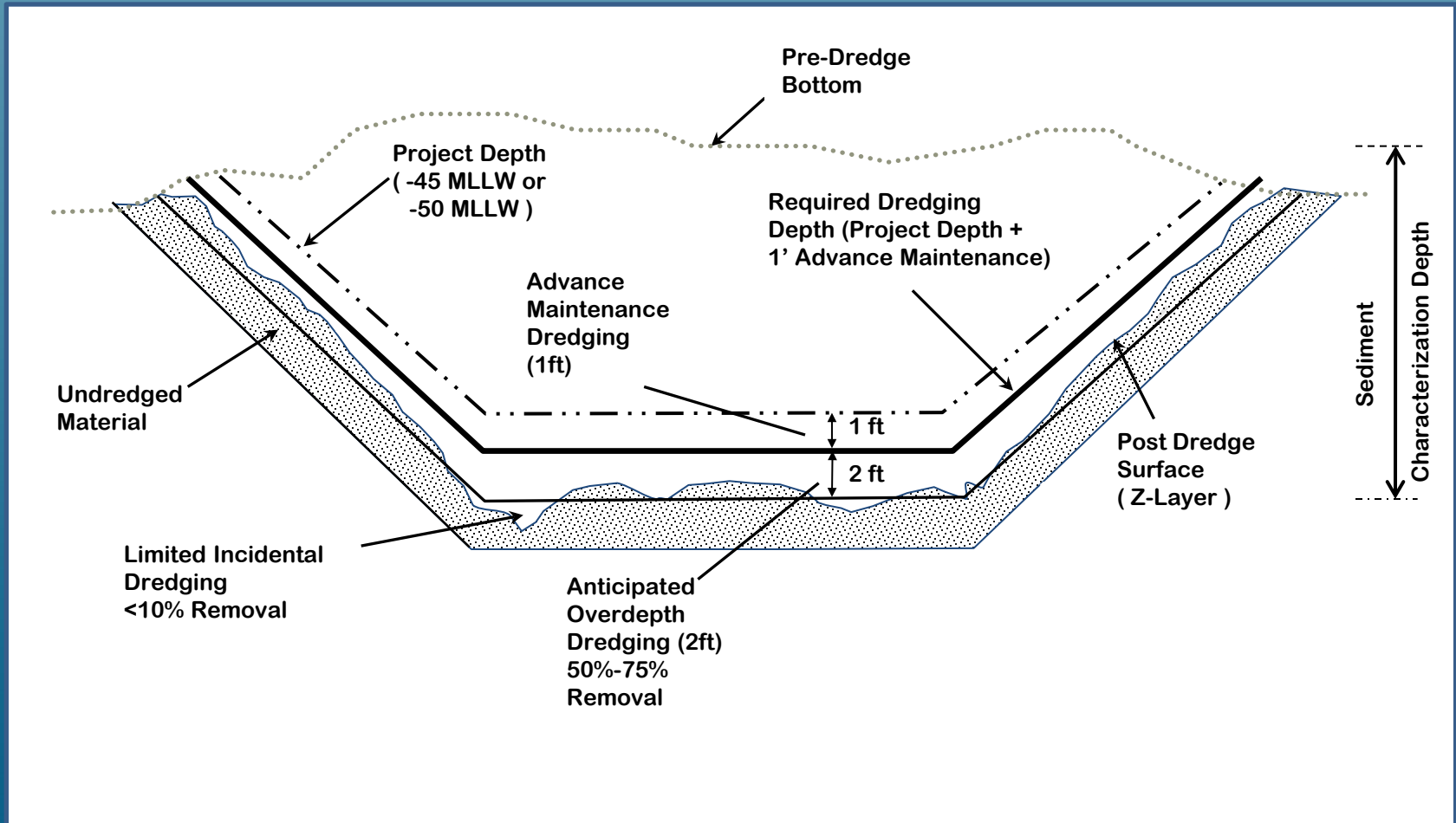
Survey



- Be proactive
- Annual lead line survey along face of dock
- Full berth multi-beam survey every 4 years
- Allows the Port to plan for future maint. Dredging projects
- Eliminates surprises

Advanced Maintenance Dredging and Over-Dredging Allowance

- Reduce frequency of dredging
- Achieve economy of scale
- Allow for survey and construction equipment tolerance



Permitting

- Pursue Programmatic Permit
 - Streamlines regulatory process
 - Eliminates perception of ‘piecemeal’ approach
 - Reduces permitting time and cost
 - Provides predictability for future projects
- Plan for “Antidegradation” to eliminate post-dredging surprises
 - Take z-samples during design
 - Negotiate antidegradation measures before dredging
 - Antidegradation measures often include sand cover

Contracting

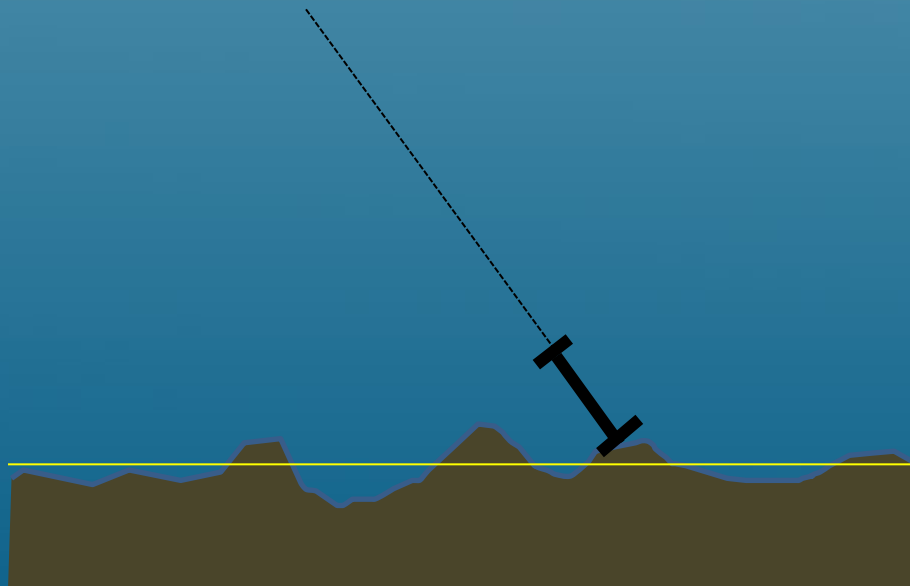
- Establish Professional Services IDIQ Contracts
 - Typical contract selection process takes 3-6 mos
 - Using an IDIQ contract reduces contracting time to 1 mo for scope and fee negotiations
- Review Pros and Cons for Construction IDIQ
 - A future possibility

Upland Disposal Options



- Increasing dredging activities in the region
- Limited dredging window during Dec, Jan, and Feb
- Congestion at transloading sites and regional landfill facilities
- Need to study alternatives

Underwater Grading



- Low natural sedimentation
- High spots caused by prop wash
- Low volume
- Studies have shown UWG effectiveness:
 - Lower cost
 - Less environmental impact
- Port is trying for a programmatic permit in the East Waterway that includes UWG
- High spots discovered at T-91 may allow the Port to test UWG this year due to FUDS issues

Credits

- Dalton Olmsted and Fuglevand
- Anchor Environmental
- Dredging contractors
- Port of Portland

Thank You