



Procurement Strategy for Beneficial Reuse Construction

Restoring Former Marshes in San Francisco Bay

Matt Taylor, Moffatt & Nichol
Costa Mesa, CA

WEDA July 2022

Study Funded by:
California State Coastal Conservancy

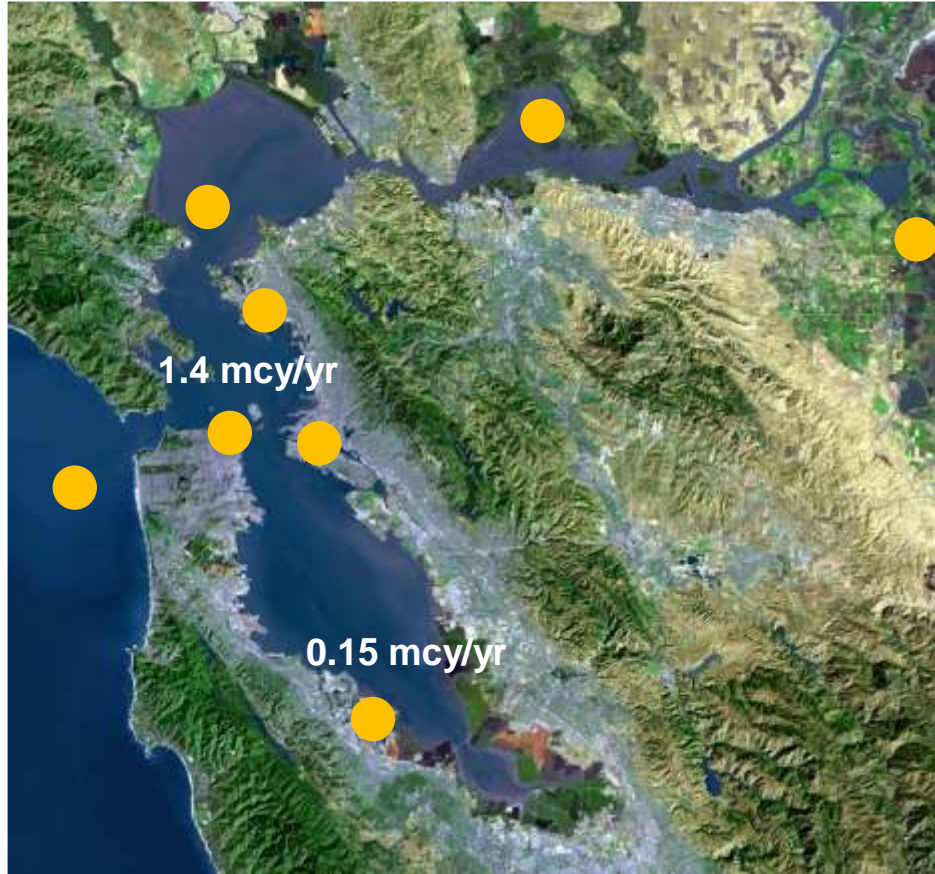
Study Objectives

1. Evaluate beneficial use of dredged material - focus on Eden Landing
2. Develop construction costs
3. Develop contracting options for a procurement strategy
4. Include Redwood City Harbor as first project
5. Compare costs for Beneficial Reuse to Current Practices
6. Assess constraints for beneficial reuse in Bay Area

Summary and Credits

- › Costs for Beneficial Reuse at Eden Landing - **\$22 to \$52 million** over 7 yrs.
- › Concession Model - additional cost of about **\$3 million/yr.** to the region BUT Significant **Upfront Costs**
- › **Competition** with other Reuse sites will remain (Montezuma, Cullinan, Others)
- › **Long-Term Changes** needed for shift from Aquatic to Beneficial Reuse
 - › Partnering with and **Supporting** USACE
 - › **Non-O&M** Program Funding Source(s) at time of bids
 - › Bundling/Streamlining **Multiple** Projects Essential
 - › Explore **Multi-year** Dredging Contracts
 - › Re-evaluate **Hydraulic** Dredging option
 - › Include **In-Bay** Beneficial Reuse within mix

San Francisco Bay Dredging / Beneficial Reuse



- › About 4 mcy/yr. dredged now (>6 mcy/yr. before BRAC)
- › About 1.5 mcy/yr. from Central & South Bay

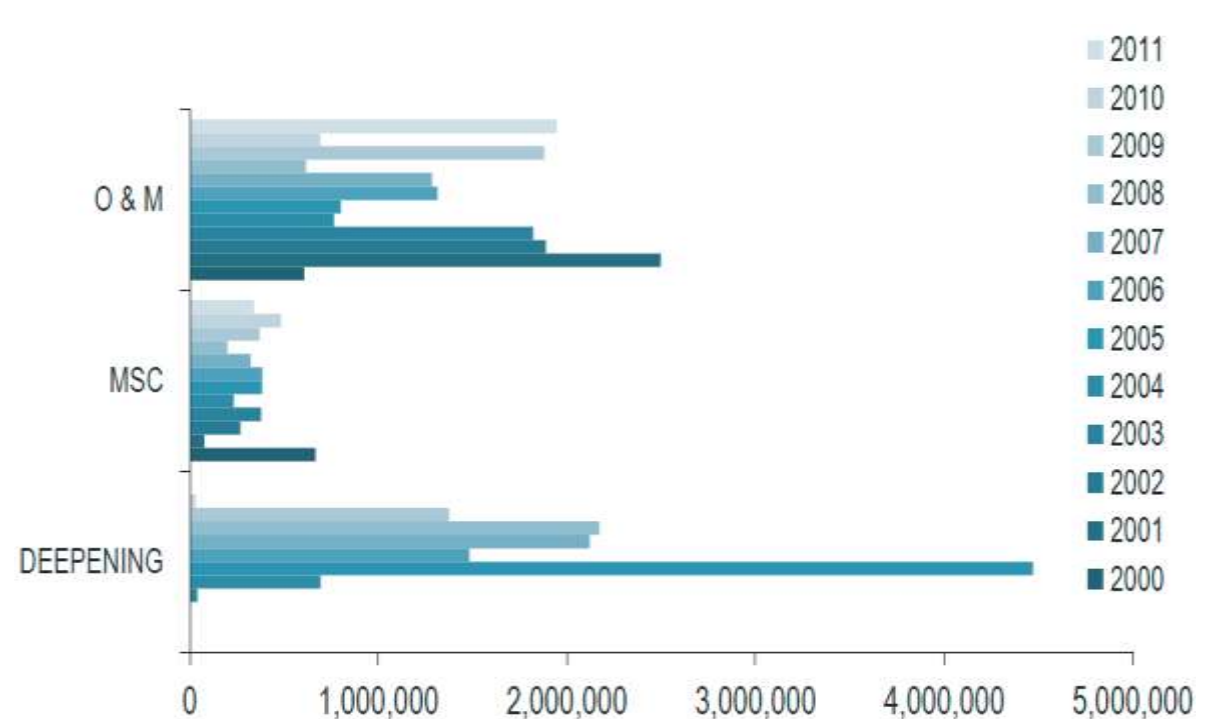
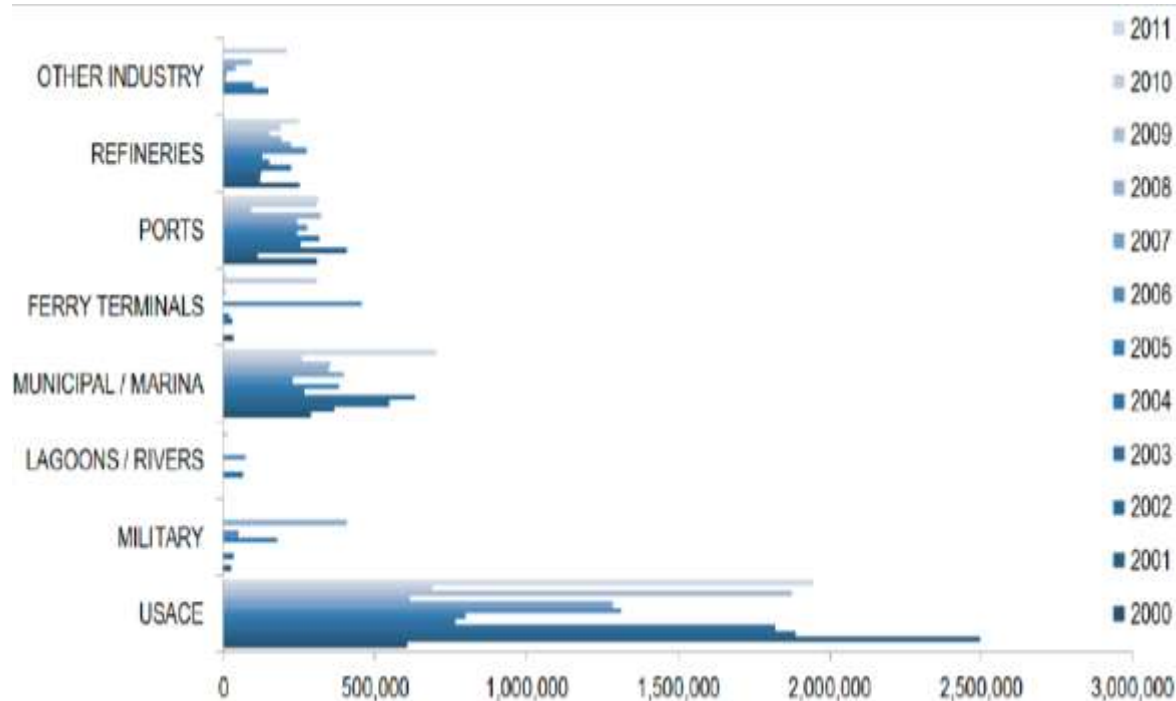


- › >25 yrs. capacity for Beneficial Reuse

(2000 To 2011)

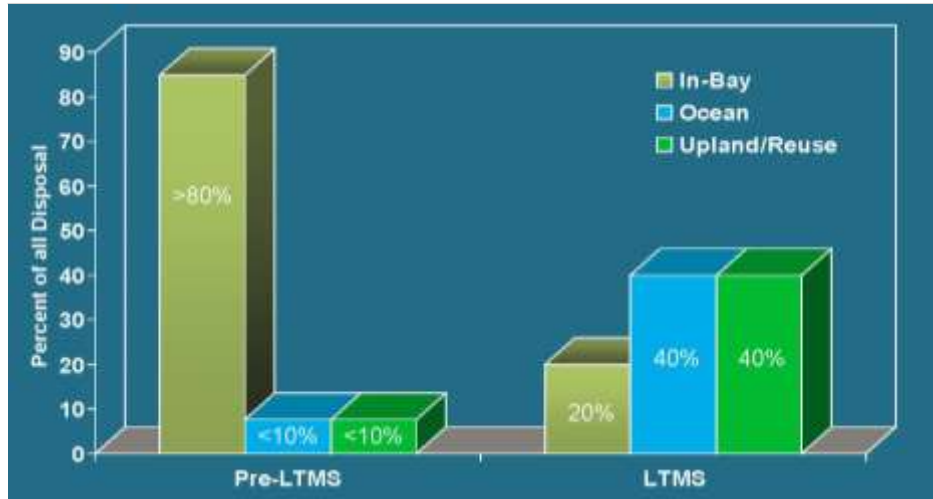
Dredging Volumes By Sector & Activity

- › Fed O&M is largest proportion
- › 51% of CA's O&M \$\$ intended for SF Bay (\$95 million requested by CMANC)
- › Half of it (~\$45 million) for Oakland, Redwood, Richmond, Pinole

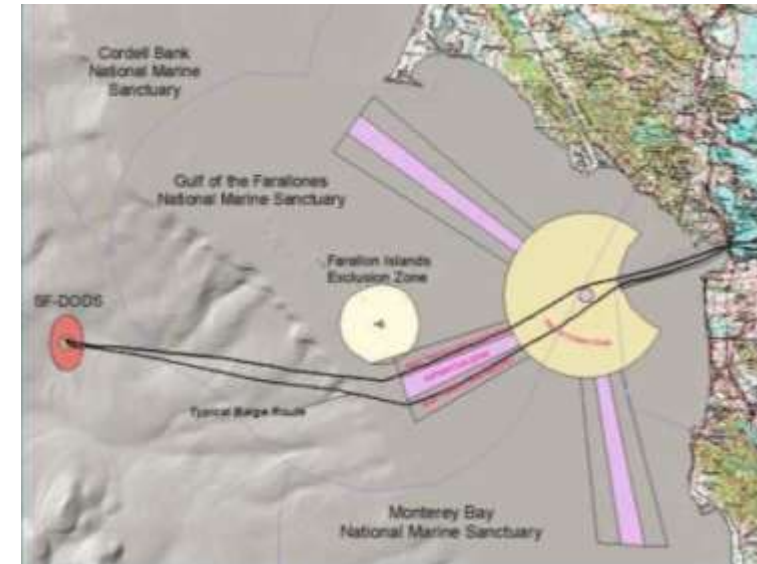


(Since 1999)

Foundation of LTMS Goals



- › LTMS EIS/EIR Finalized (1999)
- › Established goals
- › Transition over 12-year period
- › Emphasis on beneficial reuse
- › Creation of “safety valve” (60 miles offshore in >5000’)



Good Early Project Implementations



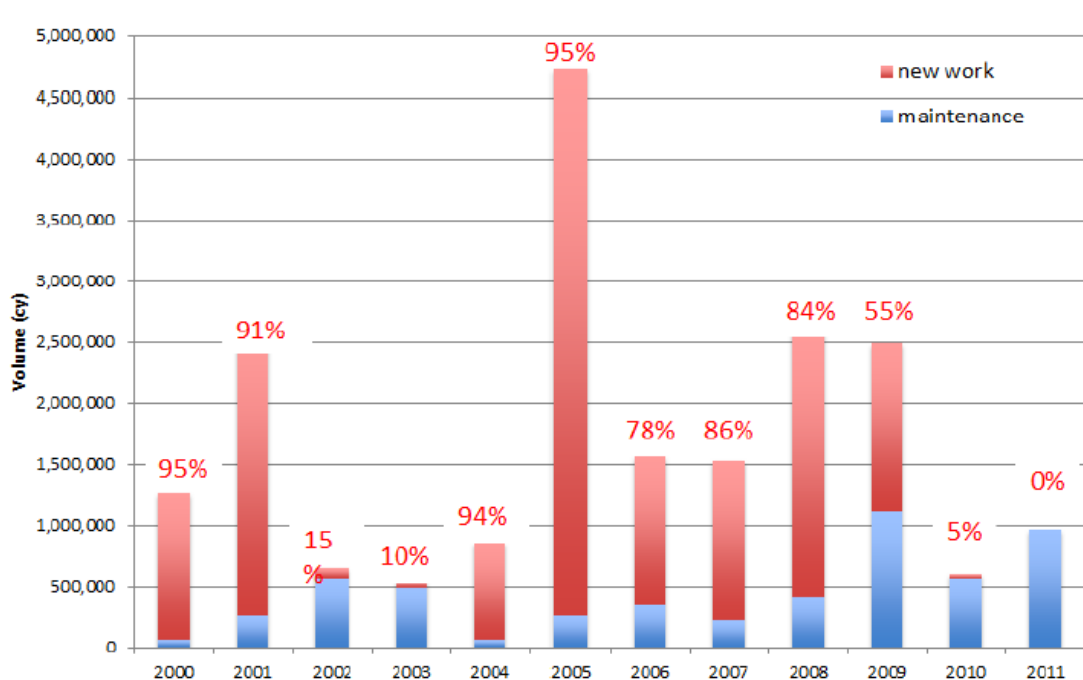
Montezuma Wetlands (2000 ac ongoing) Oakland 50' deepening, now maintenance (private, tipping fee based)



Hamilton Army Airfield (700 ac) Oakland 50' deepening (\$240 million)

But...Limited to Capital Projects

- › Deepening projects constituted almost all of the beneficial reuse since LTMS
- › However, almost all of the deepening projects completed in Bay
- › Maintenance dredging going to DODS (supposed to be safety valve)

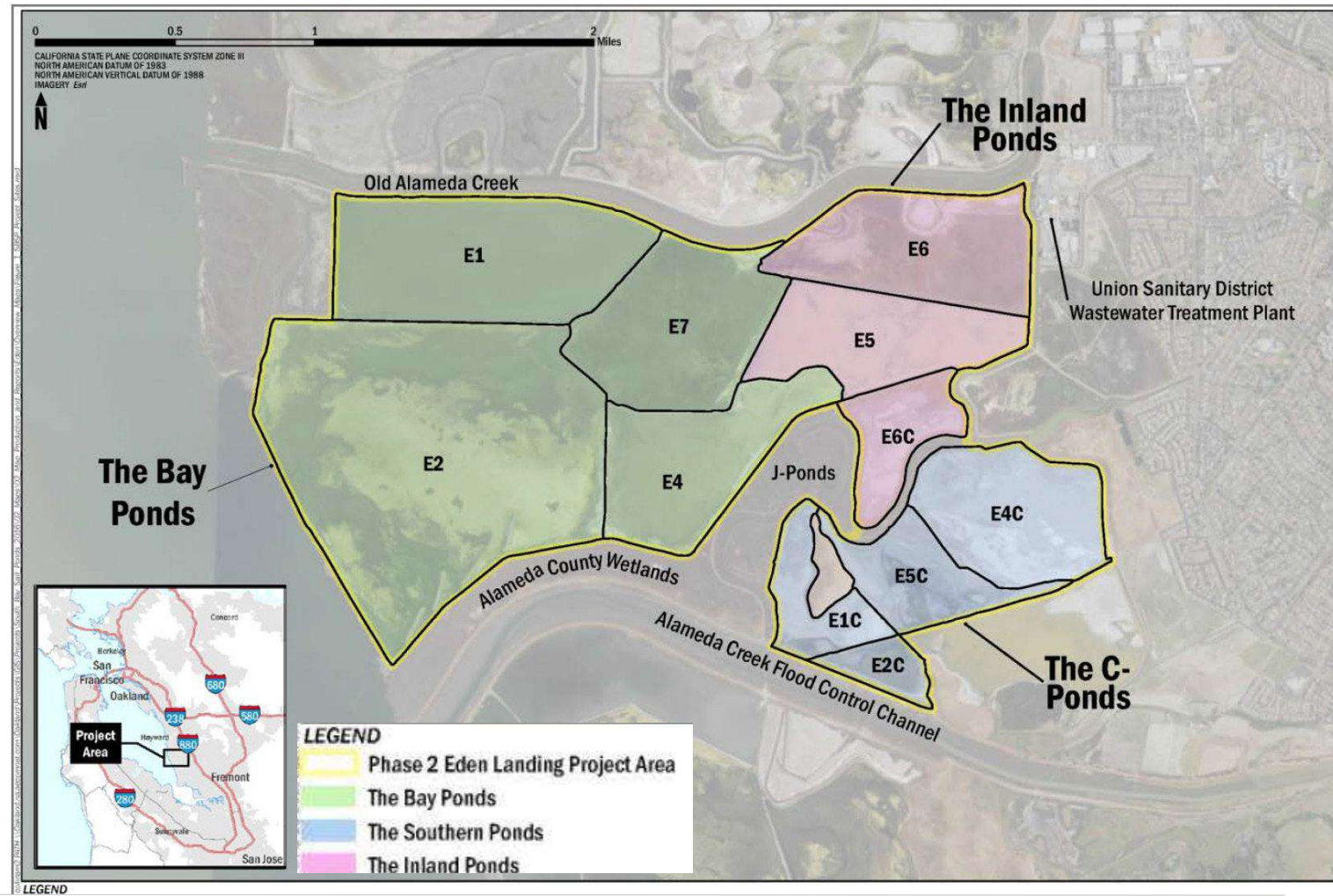


South Bay Salt Pond Restoration Concept

Pond	Area (Acres)	Placement Volume (CY)
E1	297	1,052,000
E2	692	2,449,000
E4	202	501,000
E7	217	723,000
Total	1408	4,725,000

Assumptions:

- › Raise pond bottoms to average elevation of +6 ft NAVD88
- › Repair internal levees
- › Discharge weir to Bay or Old Alameda Creek



Approach

- › Identify Material Sources/Volumes
- › Develop Conceptual Improvements
 - › Onsite Improvements
 - › Offsite Improvements
- › Develop Contracting Alternatives
 - › Concession Model (separate entity for offloading)
 - › USACE Model (offloading is part of dredging project)
- › Estimate Construction Costs for Both Alternatives
- › Compare to Current Practices

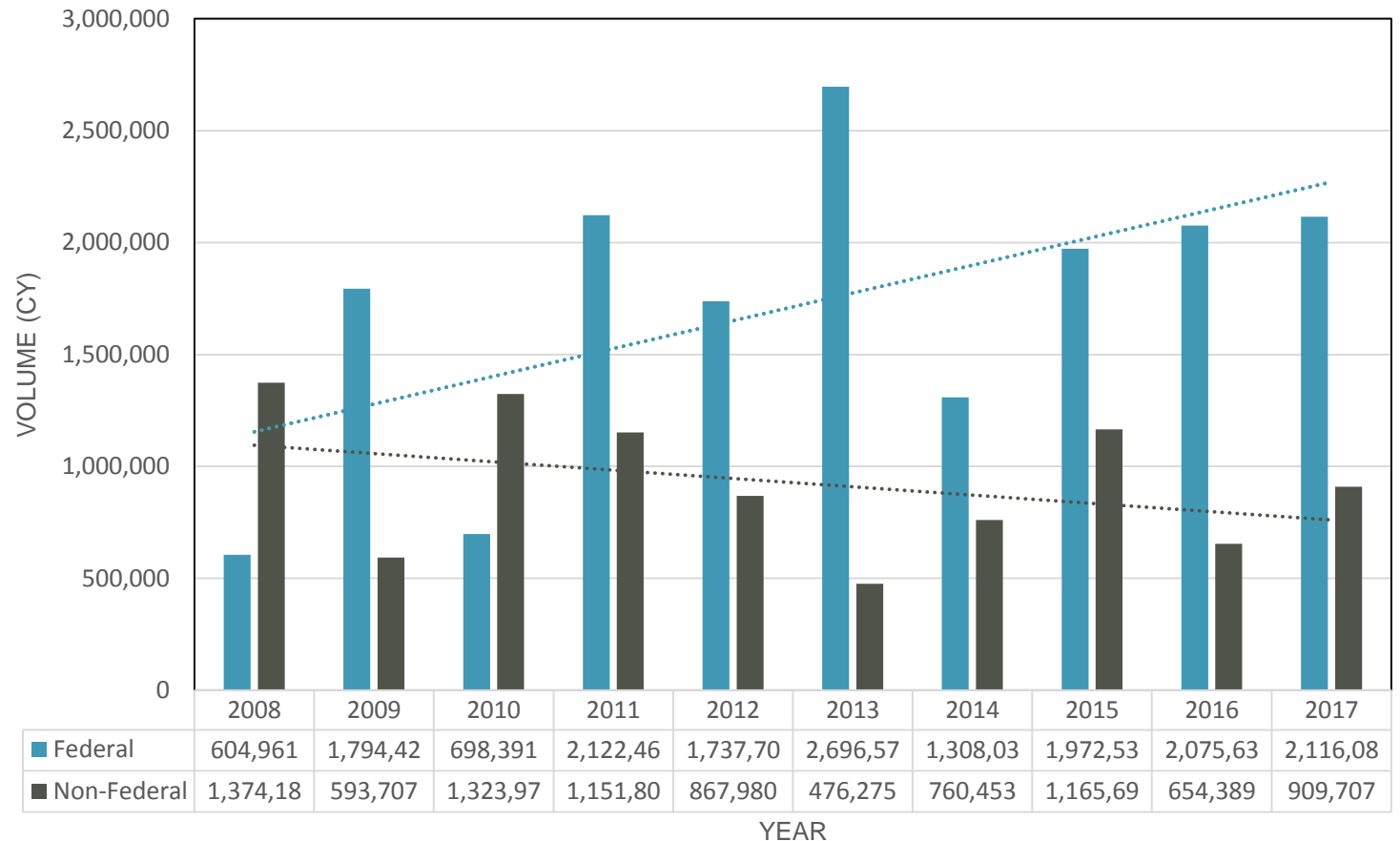
Material Sources

Annual Maintenance Dredging Volumes

Average annual dredging volumes from 2008-2017:

- › Federal – 1.7 MCY/year
- › Non-Federal – 0.9 MCY/year

TOTAL DREDGING VOLUME PER YEAR



Material Sources

Maintenance Projects

Maintenance Projects	Frequency (Years)	Annual Volume (CY)	Historical Disposal Site(s)	Work Windows	Distance to Eden Landing (Miles)
FEDERAL					
Oakland Inner & Outer Harbor	1	429,304	SF-11, Montezuma, Winter Island, Hamilton	Aug. 1 – Nov. 30	23.7
Redwood City Harbor	1.4	231,524	SF-10, SF-11, Hamilton, Bair Island, Montezuma	Jun. 1 – Nov. 30	3.4
Richmond Inner & Outer Harbor	1	286,299	SF-10, SF-11, Hamilton, Cullinan, Montezuma	Jun. 1 – Nov. 30	35.3
	Subtotal	861,266			
MID-SIZED NON-FEDERAL					
Chevron	1	114,400	SF-10, SF-11, Hamilton, Montezuma	Jun. 1 – Nov. 30	32.2
Port of Oakland (Berths)	1	76,288	SF-11, Hamilton, Montezuma	Aug. 1 – Nov. 30	25.4
	Subtotal	190,688			
TOTAL ANNUAL DREDGING		1,051,954			

Delivery/Placement Scenarios

DELIVERY SCENARIO	Annual Quantity Dredged (CY)	Annual Quantity Placed (CY)	Annual Duration (Months)*	Project Duration (Years)
EXISTING LEVEES AROUND PONDS (NO IMPROVEMENTS)				
Scenario 1: Oakland + Redwood City Federal	660,800	726,880	1.74	5
Scenario 2: Oakland + Redwood City + Richmond Federal	947,100	1,041,810	2.83	4
Scenario 3: Oakland + Redwood City + Richmond Federal + Chevron + Port of Oakland Berths	1,137,800	1,251,580	3.62	3
IMPROVED LEVEES AROUND PONDS				
Scenario 1: Oakland + Redwood City Federal	660,800	726,880	1.74	7
Scenario 2: Oakland + Redwood City + Richmond Federal	947,000	1,041,810	2.83	5
Scenario 3: Oakland + Redwood City + Richmond Federal + Chevron + Port of Oakland Berths	1,137,800	1,251,580	3.62	4

*Significantly compressed duration compared to current practice

Onsite Improvements

Electric Option:

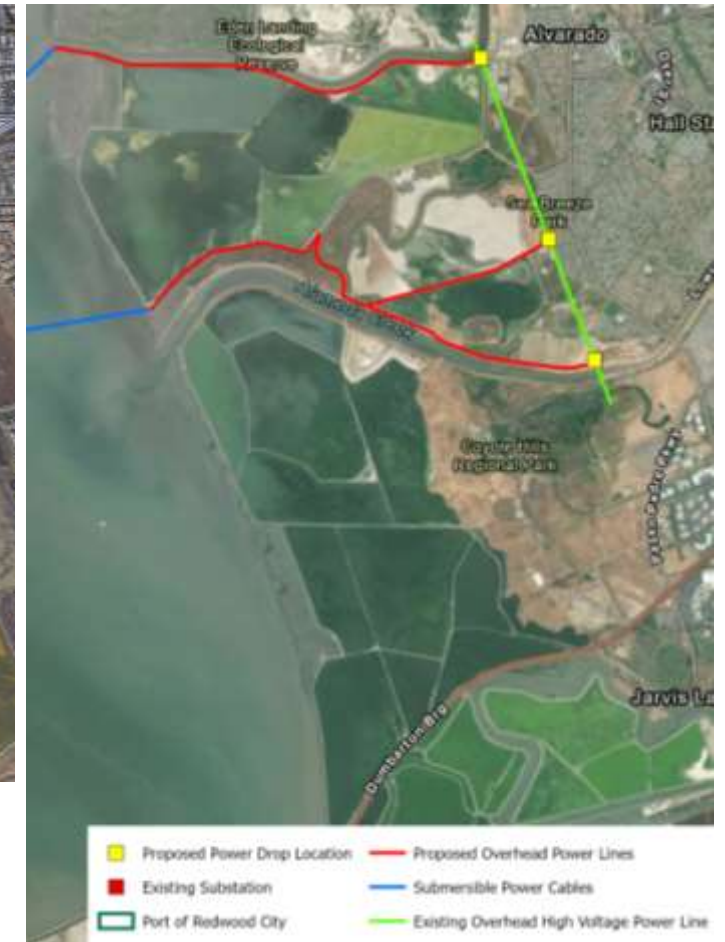
1. Power drop from OH transmission line
2. Temporary pole line to shore

Electric/Diesel Option:

1. Improve Internal Levees
2. Submersible power cable
3. Shore discharge pipeline

Onsite Improvement Costs:

- › Electric Option - \$14.9M
- › Diesel Option - \$6.8M

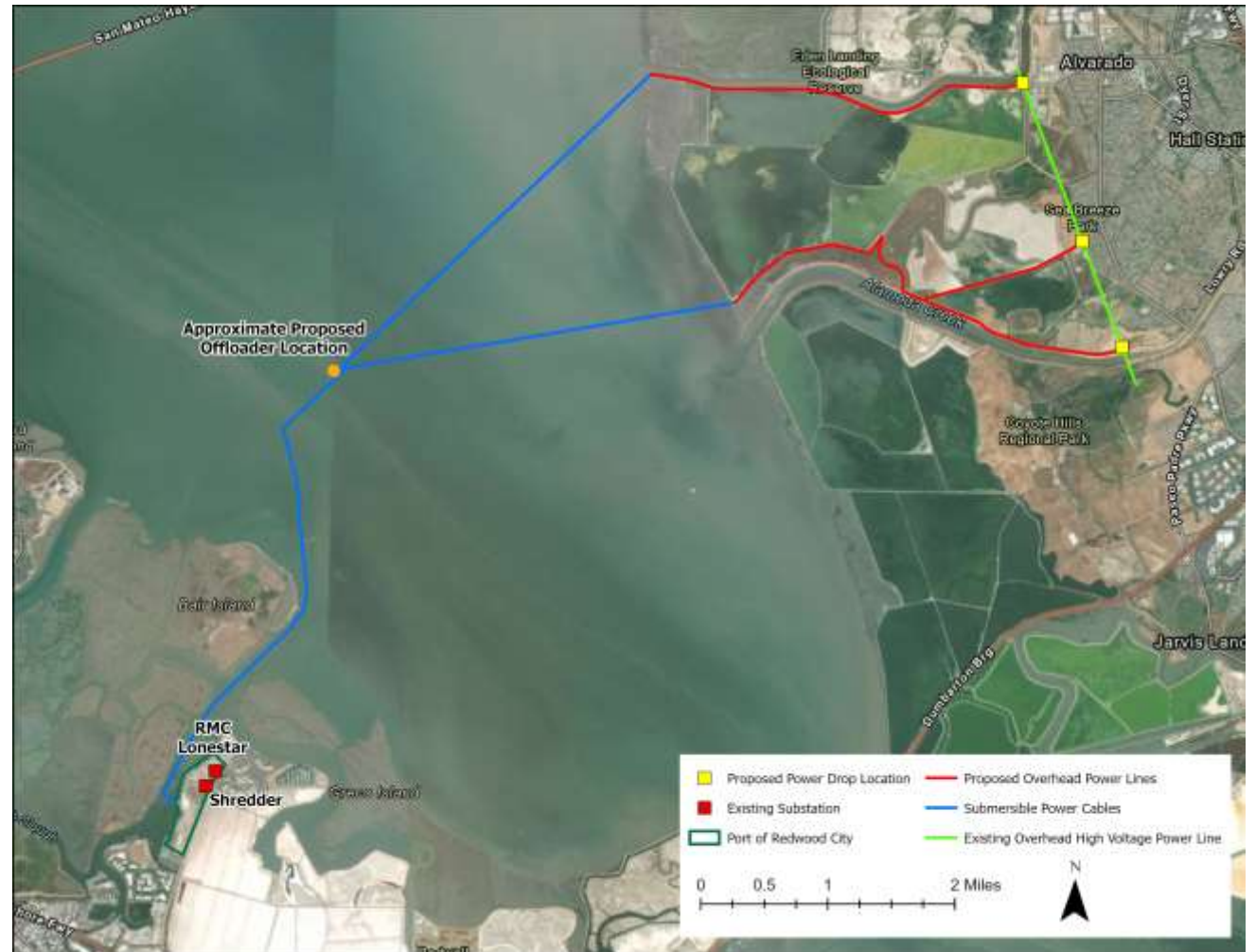


Offsite Improvements

- › Offloader located near ship channel
 - 3 miles from Eden Landing shoreline
 - 20-25 feet depth to allow for fully loaded SCOWS
- › Mooring system – approx. 30 steel pilings
- › Pipeline – 16,500 lf submerged pipeline
- › Booster pump(s)
- › Submersible power cable

Offsite Improvement Costs

- › Electric Option - \$6.4M
- › Diesel Option - \$2.1M



Contracting Options Considered

1. Concession Model (separate entity for offloading)

- › SCC would contract with 3rd party entity to procure and operate an offloader
- › Onsite and Offsite improvements constructed
- › Costs include onsite improvements, offsite improvements, offloader mobilization and operations, shoreside placement, engineering design, CM, contingency, & escalation

2. USACE Model (offloading is part of dredging project)

- › Two or more Federal projects are bundled and bid as one contract
- › Offloading at Eden Landing is bid as Alternate Bid
- › SCC would contract only for minimal onsite improvements
- › All other activities included with dredging contract

Comparison of Costs

ESTIMATE DESCRIPTION	Total Project Cost (\$M)						Total*	Difference
	Site Improvements	Mob/Demob	Dredging & Transport	Offloading	Remaining Dredging	Site Management		
Current Disposal Practice Oakland/Redwood City (over 7-Years)	N/A	\$16.5	\$195.4	N/A	N/A	N/A	\$212.0	-
Concession Model* Oakland/Redwood City (compressed schedule)	\$9.0	\$14.9	\$75.9	\$41.2	\$88.4	\$4.2	\$233.5	+\$21.5
USACE Model Oakland/Redwood City (Bundled)	\$5.1	\$46.0	\$75.9	\$42.5	\$88.4	\$5.9	\$263.7	+ \$51.7

*The SBSP project would have to upfront about \$60 million and recoup a significant portion of this cost via a tipping fee

Summary

1. Additional Costs - \$22 million to \$52 million over 7-years but significant upfront costs
2. Concession Model - additional cost of about \$3 million/year to the region
3. Competition with other Reuse sites will remain (Montezuma, Cullinan, Others)
4. Long-Term Changes needed for beneficial reuse (as opposed to project by project)
 - › Partnering with and Supporting USACE essential (Federal Standard, Total Costs)
 - › Reliable & sustainable funding source(s) needed to augment the O&M program budget
 - › Bundling and/or Streamlining Multiple Projects
 - › Multi-year dredging contracts
 - › Re-evaluate Hydraulic Dredging option
 - › In-Bay Beneficial Reuse at other sites needs to be included in mix

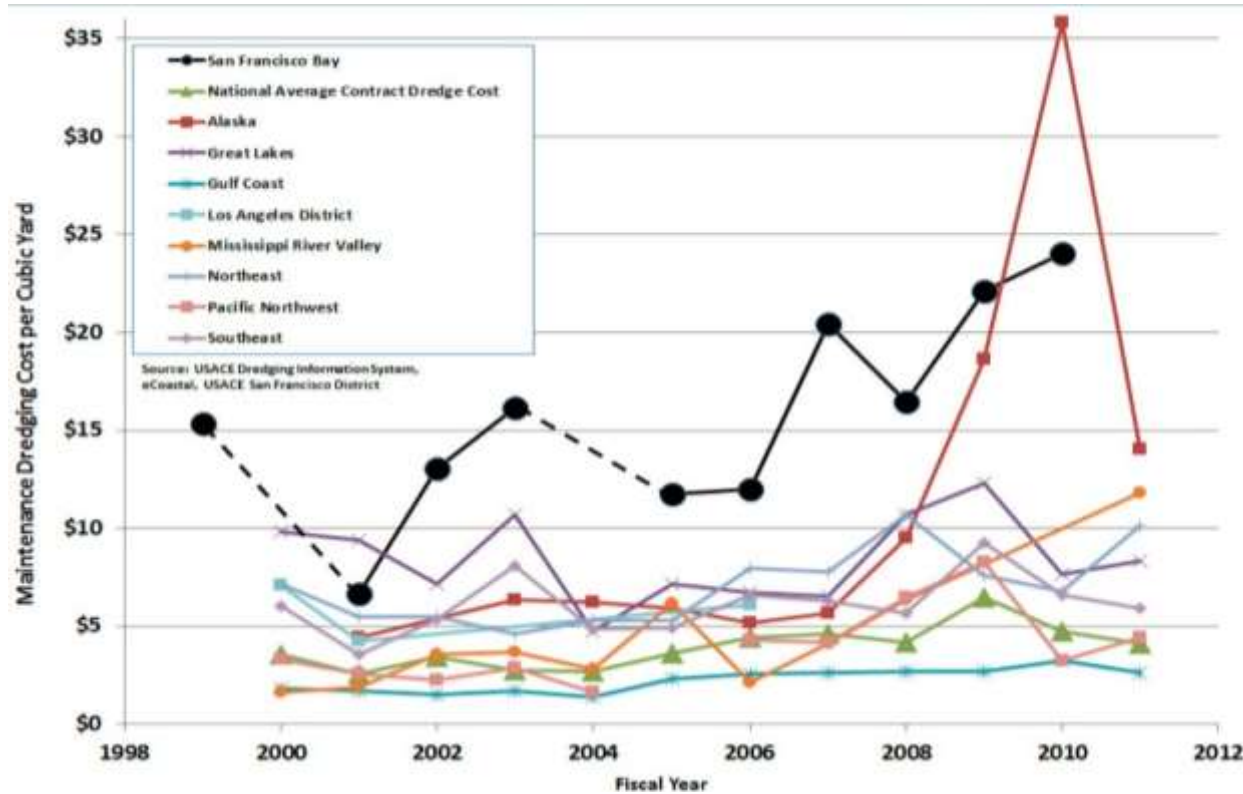


moffatt & nichol

OFFLOADER PROCUREMENT STRATEGY

Questions

Beneficial Reuse Costs Unsustainable...



Component	Cost	Cost/CY
Site Construction		
Design and PED	\$34.9 m	\$6.20
Construction Management	\$3.3 m	\$0.59
LERRDs and Relocation	\$2.6 m	\$0.46
Site Shaping, Culverts, and Nursery	\$26.7 m	\$4.74
Planting, Surveys, and Monitoring	\$2.0 m	\$0.36
Other	\$1.3 m	\$0.23
Off-loading/Placement Increment (HWRP Share)	\$24.9 m	\$4.42
Dredging/Off-loading (Paid by 50-Foot Project and USACE O&M Projects)		
50-Ft Project (3.46 mcy)	\$99.3 m	\$28.70
Oakland Harbor O&M (1.02 mcy)	\$23.2 m	\$22.75
Richmond Harbor O&M (0.75 mcy)	\$12.4 m	\$16.53
Pinole + RWC O&M (0.40 mcy)	\$7.6 m	\$19.00
Total Cost to Construct HWRP	\$238.2 m	\$42.31

Challenges...



Off-loader and scow at the Hamilton Wetlands Restoration Project



Dredging for placement



Booster pumps for hydraulic off-loading of dredged material at the Hamilton Wetland Restoration Project

Clear that we need beneficial reuse of Corps-dredged O&M Material, but

Technical Challenges:

- › Urbanization around ports (no sponsor provided site)
- › Distance to disposal site (clamshell dredging + scows)
- › Mudflats fronting beneficial reuse site (shallow draft scows)
- › Federal Standard (beneficial reuse more expensive)
- › Annual appropriations (multi-year contracts difficult)