A Unique Partnership for Contaminated Sediment Management: The Port of Hueneme Confined Aquatic Disposal Project

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ANCHOR QEA

Port of Hueneme
Oxnard Harbor District

Overview

- Port and project history
- Confined aquatic disposal (CAD) concept
- Construction sequencing
- Partnership strategy and cost allocations
- Permitting and design
- Post-construction monitoring
- Project benefits

Port of Hueneme

Port of Hueneme History

- Oxnard Harbor District (OHD) formed in 1937 with 322 acres
- Harbor constructed and operations began in 1940
  - Constructed harbor is not on state lands
- USN acquired harbor by paying off bonds in May 1942
- USN agreed to lease 16 acres to OHD in 1947, commercial operations began again

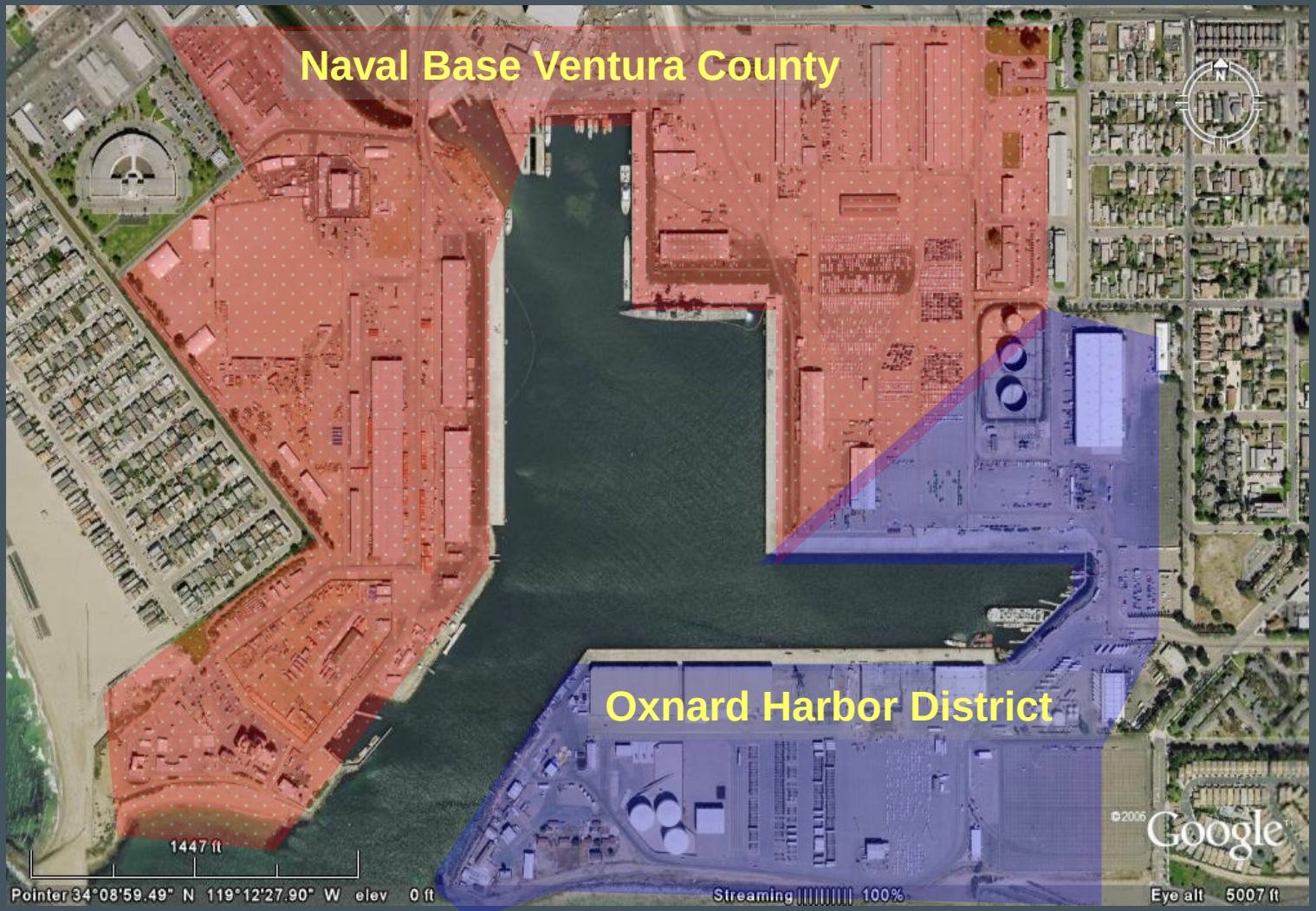
Current Uses

- OHD (Port of Hueneme)
  - Produce import/export
  - Roll-on/roll-off (RO/RO) automobile import/export
  - Liquid bulk fertilizer import
  - Break bulk cargo
  - Offshore oil platform support vessels
- USN (Naval Base Ventura County)
  - Construction Battalion Center
  - Naval Surface Warfare Center
  - Pacific Missile Test Range

OHD Operations

USN Operations

Port of Hueneme: Joint Use



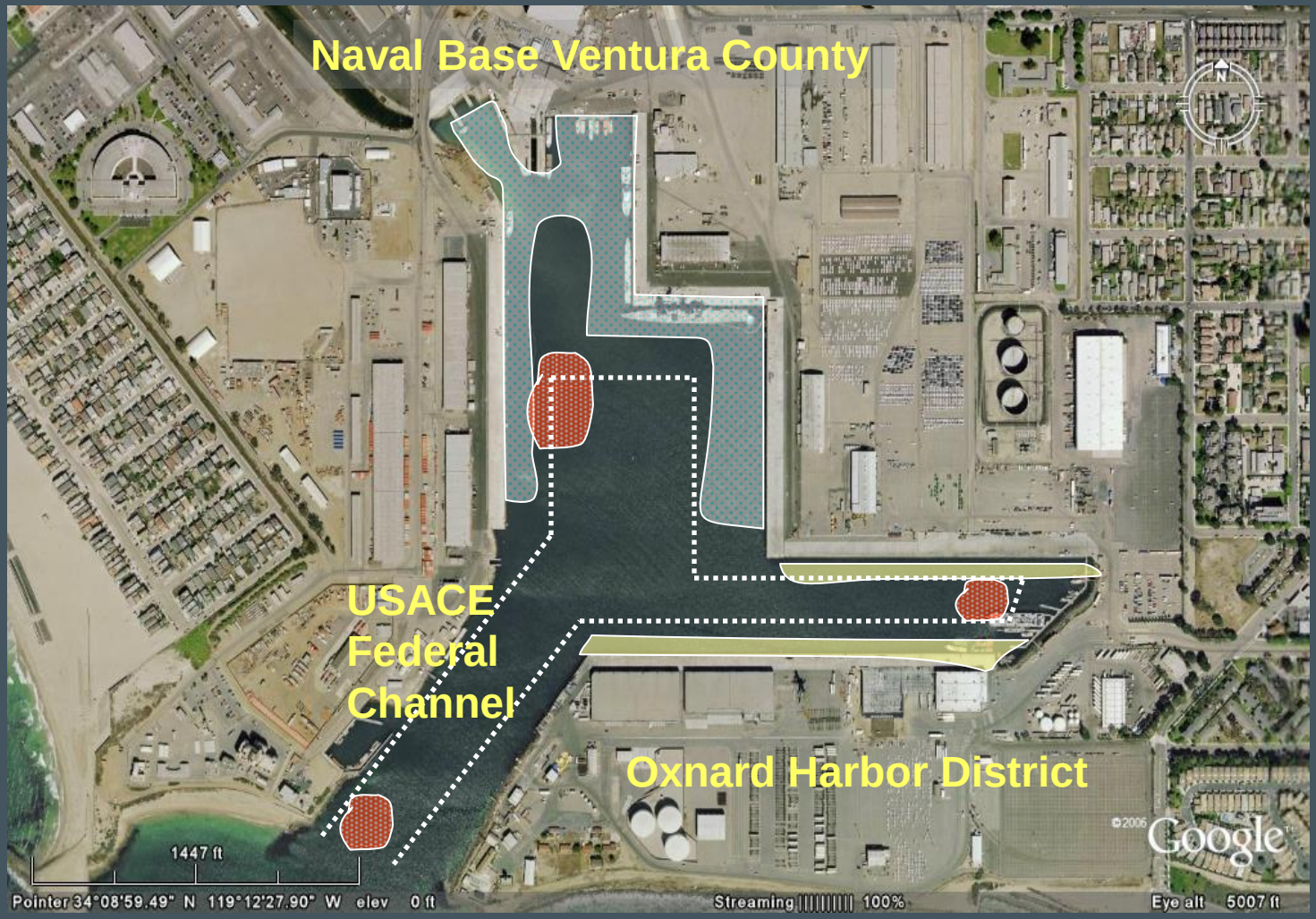
Project Team

- Oxnard Harbor District
- USACE, Los Angeles District
- U.S. Navy (USN)
  - Naval Base Ventura County
  - Naval Facilities Engineering Command (NAVFAC) Southwest Division
- Anchor QEA LLC
  - Everest International Consultants, Inc.
  - iLanco Environmental

Multiple Sediment Issues in Harbor

- Federal Channel had accumulated approximately 200,000 cubic meters of mostly clean maintenance material
- USACE had authority to deepen Federal Channel by approximately 1.5 meters
- OHD wharves or USN berths had not been dredged in decades, resulting in operational constraints
- Contaminated sediments existed within much of Port of Hueneme Harbor

Contaminated Sediment



Sediment Contamination

- Approximately 220,000 cubic meters to be dredged
  - 60% from OHD wharves and USN berths
  - 40% from Federal Channel
- Chemicals of concern included PAHs, PCBs, DDT, and TBT
- Sediments composed mostly of fine sands, silts, and clays with low organic carbon

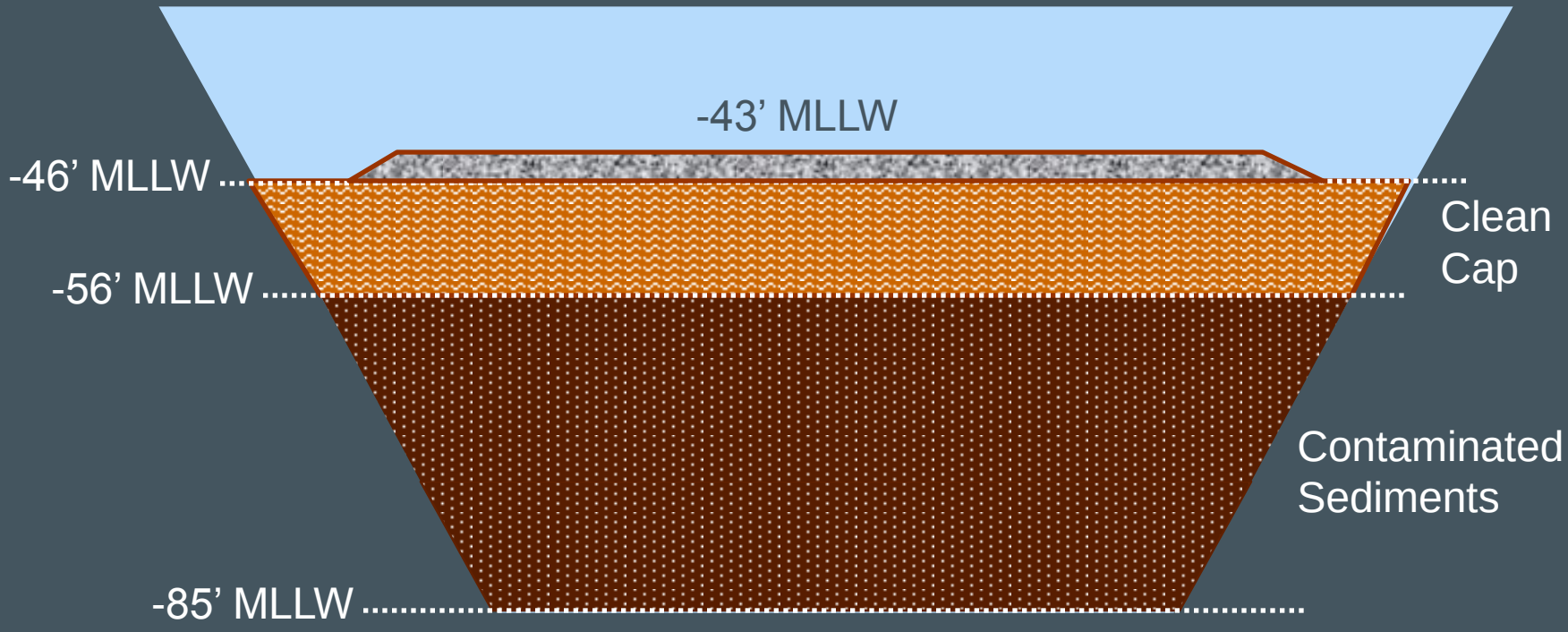
Sediment Management Alternatives

- Landfill disposal
- Beneficial reuse
- On-site nearshore confined disposal facility (CDF)
- Port fill site at Port of Los Angeles or Port of Long Beach
- On-site CAD

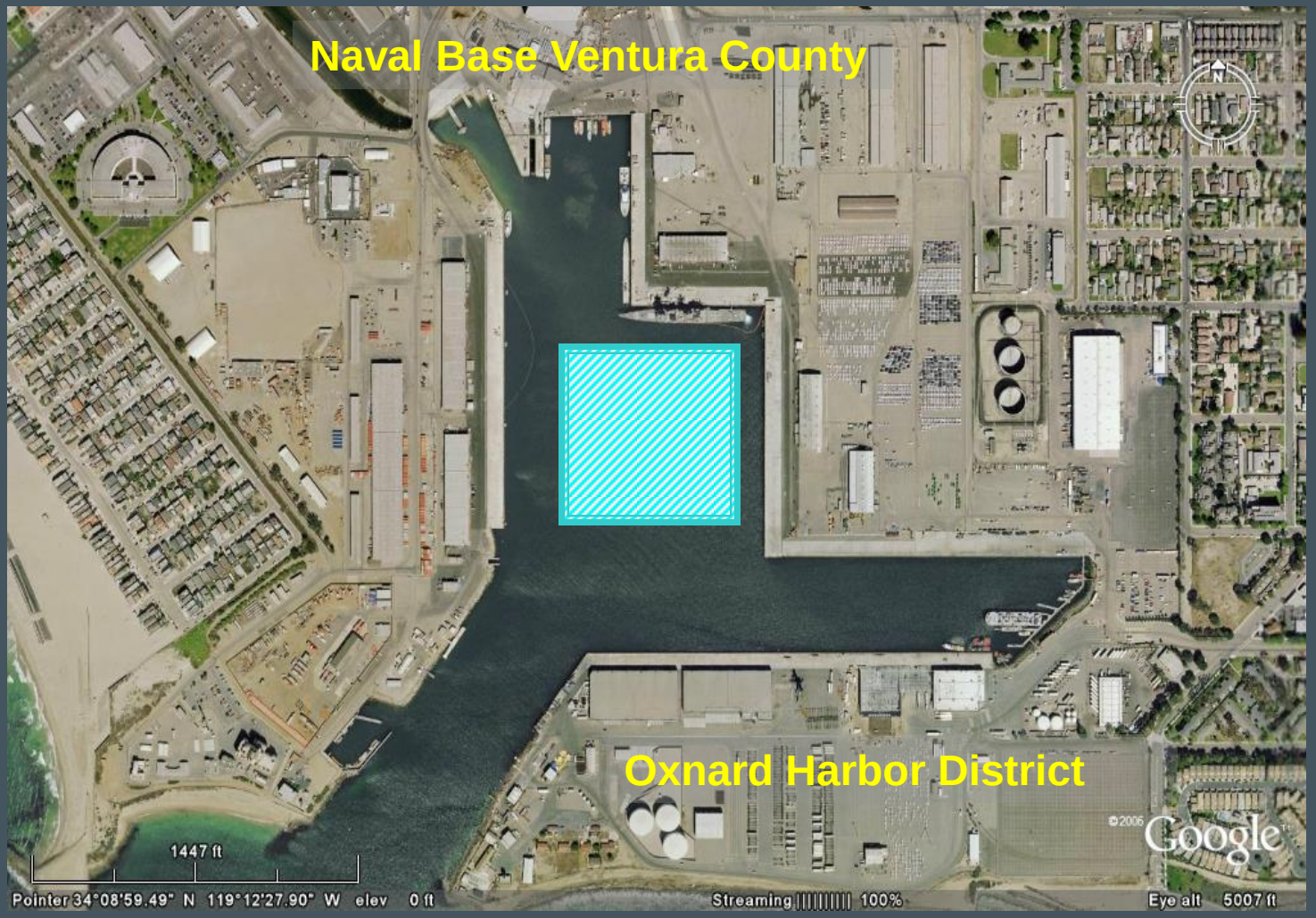
Rationale for CAD Approach

- Provided an on-site solution
- Not tied to other development or funding
- Provided environmental protection
- Provided local beach nourishment
- Allowed for future Port of Hueneme Harbor deepening to advance
- Restored 100% use of OHD wharves and USN berths
- Provided *complete* solution for all three parties
- Shared resources allowed cost effectiveness

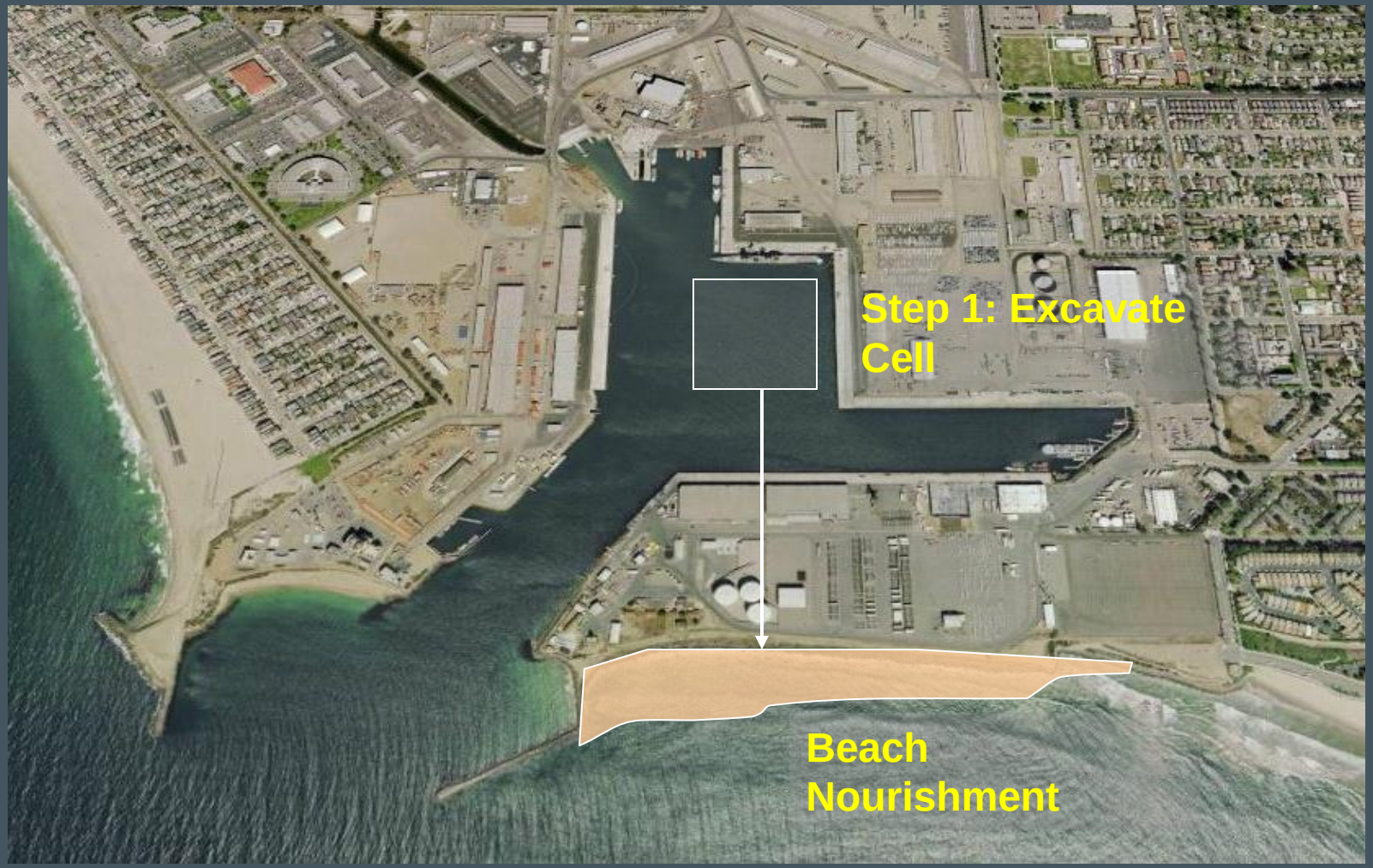
Port Hueneme CAD Cross Section



Construction Sequence



CAD Excavation

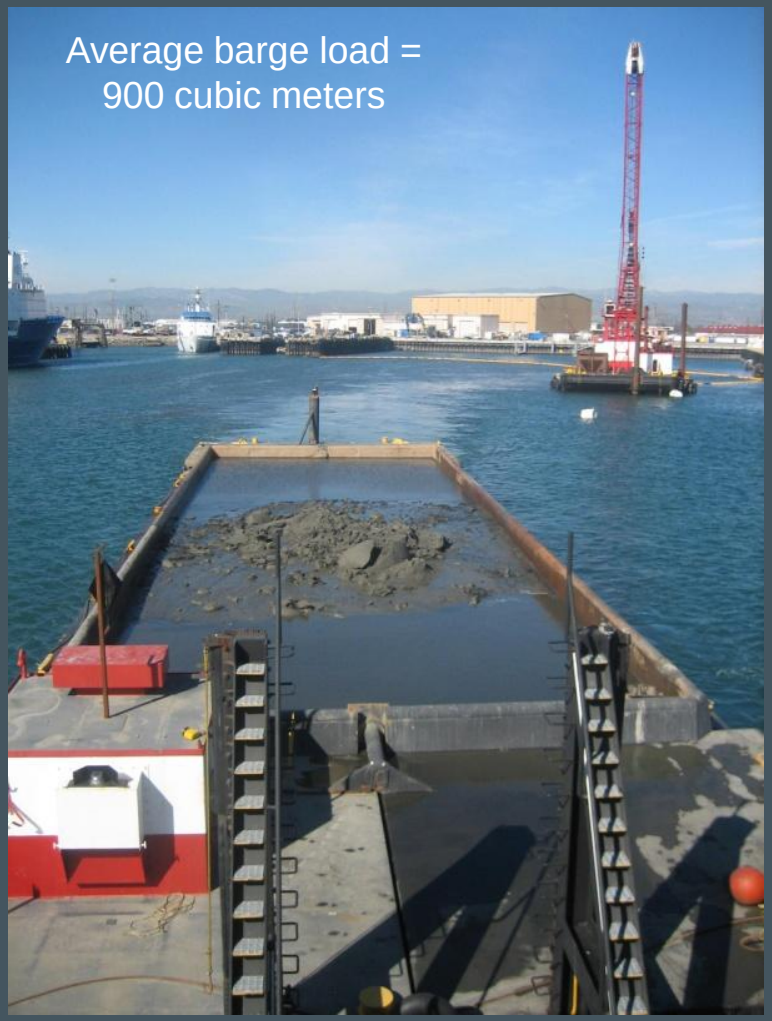


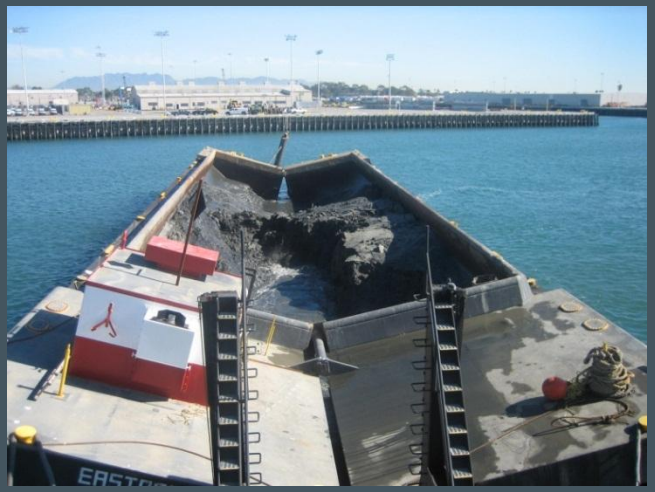
CAD Excavation (Dec 15 to Jan 23)

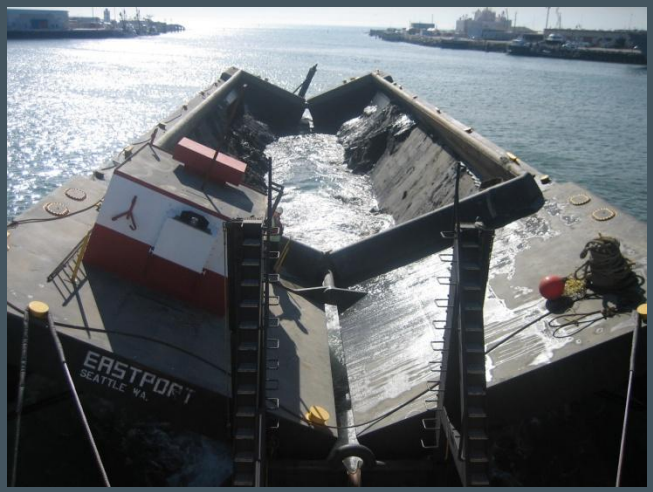
Contaminated Sediment Dredging

Contaminated Sediment Dredging (Feb 4 to May 4)

Contaminated Sediment Placement (Feb 4 to May 4)







CAD Cell Capping

CAD Cell Capping (May 5 to June 13)

CAD Cell Armor Rock (June 13 to July 15)


GBA
ENGINEERS ★ SURVEYORS
Port Hueneme CAD site - 2009

Funding Strategy

- Challenges
  - Raising funds (total project cost ~ $14 million)
  - Coordinating budget schedules
  - Negotiating and scheduling with contractor
- Opportunities
  - All participants had some funds allocated for smaller individual projects
  - Project partners committed from the top down
  - Significant project momentum

Cost Sharing Approach

- Break project into components (e.g., CAD cell excavation, USN berths, OHD wharves, cap armor placement, long-term monitoring)
- Estimate costs associated with each component
- Assign components to partners based on either ownership or limitations in authority

Cost Sharing Approach (cont.)

- Fine tune cost components to accommodate secondary cost sharing strategies and funding schedules
  - Financial balancing to make project more equitable among all partners
  - Recognize previous agreements between partners
  - Account for contaminated sediment ownership allocation

Cost Sharing Approach Responsibilities

Project Feature	Responsibility		
	USACE	USN	OHD
Project Development			
– CEQA/NEPA Permitting		X	X
– Engineering Design		X	X
Contracting			
– Contract Management	X		
Construction			
- Equipment Mobilization	X		
- CAD Cell Excavation		X	X
- Dredging USN Berths		X	
- Dredging OHD Wharves			X
- Dredging “Hotspots” within O&M Channel	X		
- Capping	X		
- Placing Armor Rock		X	X
- Water Quality Monitoring	X	X	X
- Sediment Confirmational Sampling	X	X	X
- Construction Management	X	X	X
Post-Construction Activities			
- Long-Term Monitoring		X	X

Contracting Approach

- USACE had an existing contract with Manson Construction for O&M dredging in Port of Hueneme and Channel Islands harbors
- Contract modification issued for additional work
- OHD/USACE signed Cost Sharing Agreement
- USACE/USN Cost Sharing Agreement for dredging was already in place

Contracting Approach (cont.)

- OHD/USN signed Cost Sharing Agreement for CAD construction and long-term monitoring/liability
- All funds transferred to USACE for overall contracting and construction management

Permitting Strategy

- Project subject to California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) regulations
  - Joint NEPA/CEQA document to streamline processes
- Also subject to Clean Water Act and other environmental regulations

Permitting Strategy

- Separate regulatory components
  - USACE O&M dredging and disposal (NEPA)
    - Supplemental NEPA document for CAD disposal
  - USN berth dredging and disposal (NEPA and CWA)
  - OHD berth dredging and disposal (CEQA and CWA)
  - CAD cell construction and beach nourishment (NEPA, CEQA, and CWA)
- Joint USN/OHD application for permits to construct the CAD and dredge respective wharves and berths

Initial Design Elements

- Contaminated sediment removal
  - Total of approximately 220,000 cubic meters
  - Mechanically dredged using clamshell
  - Restricted dredging required for some berths
- CAD cell construction and contaminated sediment disposal
  - Hydraulic excavation of CAD cell
  - Clean sand pumped to beach
  - Contaminated sediment placed via bottom-dump scow

Initial Design Elements (cont.)

- CAD cell cap design
  - Chemical isolation modeling to address movement of contaminants within the CAD
  - Hydrodynamic modeling to address scour
  - Geotechnical (i.e., bulking and settling)
  - Bioturbation

Cap Design Critical Elements

- Ship propeller wash scour from USN destroyers
  - Modeled bottom velocities up to 11.4 feet per second
  - Worst-case assumptions capable of producing more than 5 feet of scour
- Chemical flux
  - Some aquifers in region experience artesian conditions
  - Final elevation critical to prevent significant upward flux

Project Timeline

- Conceptual design for project completed in April 2007
- Design and permitting completed in August 2008 (16 months from conception)
- Construction began in December 2008
- Construction completed in July 2009
- Approximately 840,000 cubic meters of dredging

Construction Volumes

- CAD cell construction
  - 540,000 cubic meters
- Contaminated sediment placement
  - 190,000 cubic meters
- CAD cell capping
  - 110,000 cubic meters
- Armor rock
  - 34,000 tons

Monitoring Results

- Three years of monitoring completed
  - Hydrographic surveys, sediment cores, sediment chemistry, sediment porewater samples
- CAD cell performing as designed
  - Sufficient cap thickness
  - Contaminant isolation
  - Scour resistance
- Authorized depths restored to OHD wharves, in USN berths, and to Federal Channel

Monitoring Results

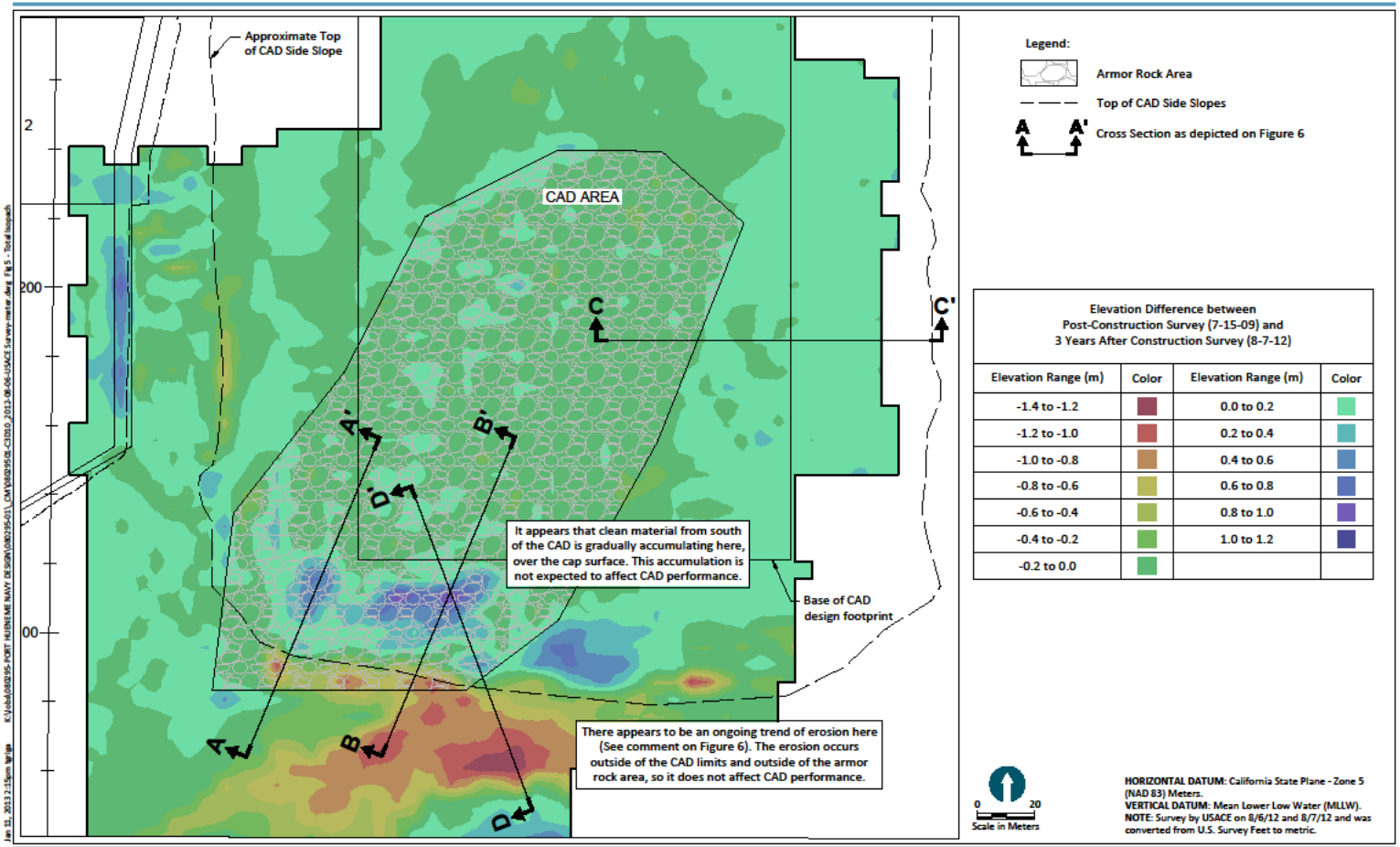


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Figure 5
Bathymetric Isopach Plot Comparing Conditions Post-Construction (7-15-09) to 3 Years After Construction (8-7-12)
Port of Hueneme

Project Benefits

- Recreation: restored Hueneme Beach
- Operations: restored full navigation use to Harbor
- Future Growth: provides clear path for Harbor deepening
- Financial: more than $30 million in benefits achieved for less than $14 million in costs

Biggest Accomplishment: A Model for a Teaming Approach

Questions?


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