

# POLB West Basin & Approach Borrow

## Dredging for Beneficial Reuse & Improved Navigation

### WEDA Pacific Chapter Conference 2015



Port of  
**LONG BEACH**  
*The Green Port*

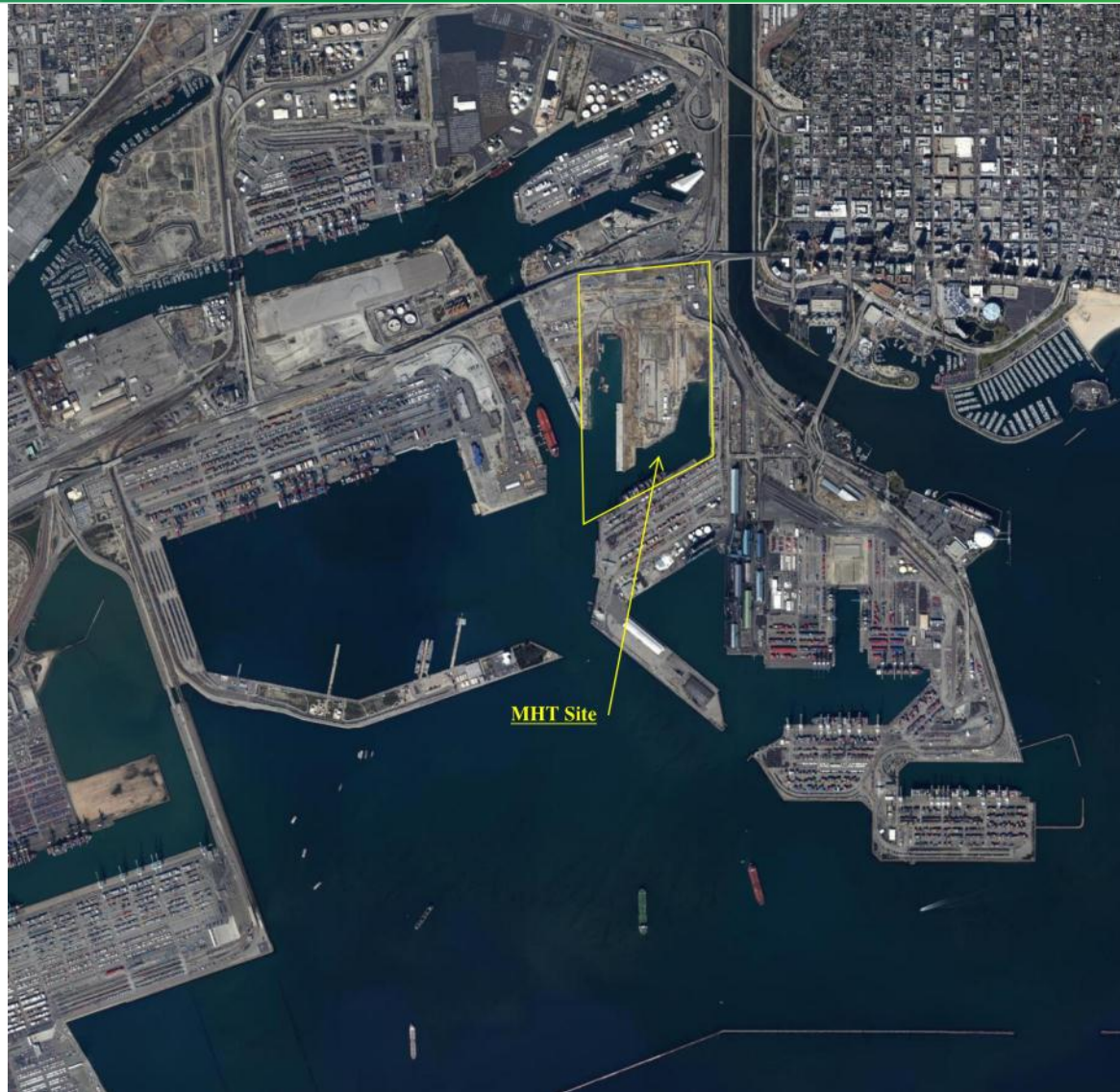
**kpff**  
Engineering  
Opportunities.



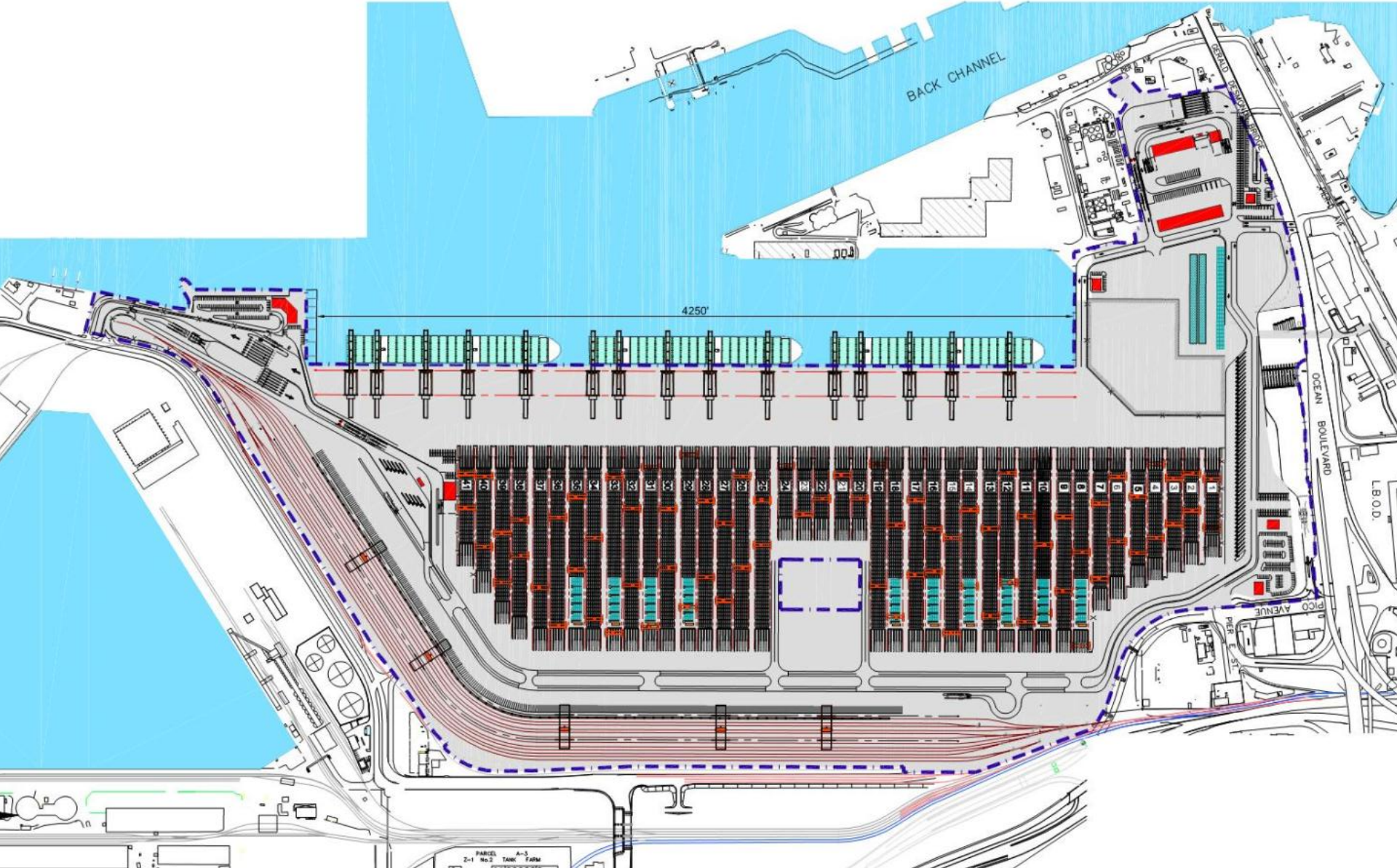
# INTRODUCTION

- 2005 Green Port Policy
  - Mitigate Environmental Impacts
- Current Capitol Plan
  - Develop cleaner, more efficient facilities
- Middle Harbor Terminal (MHT)
  - Technologically advanced
  - Environmentally friendly

# INTRODUCTION



# INTRODUCTION





# PROJECT OBJECTIVES

- Strategic Planning & Permitting
  - West Basin & Approach as Borrow Site
  - Provide majority of MHT Phase 3 Fill
  - Clean up residual contamination
  - Improve Navigational Safety

# WEST BASIN

## Existing Conditions:

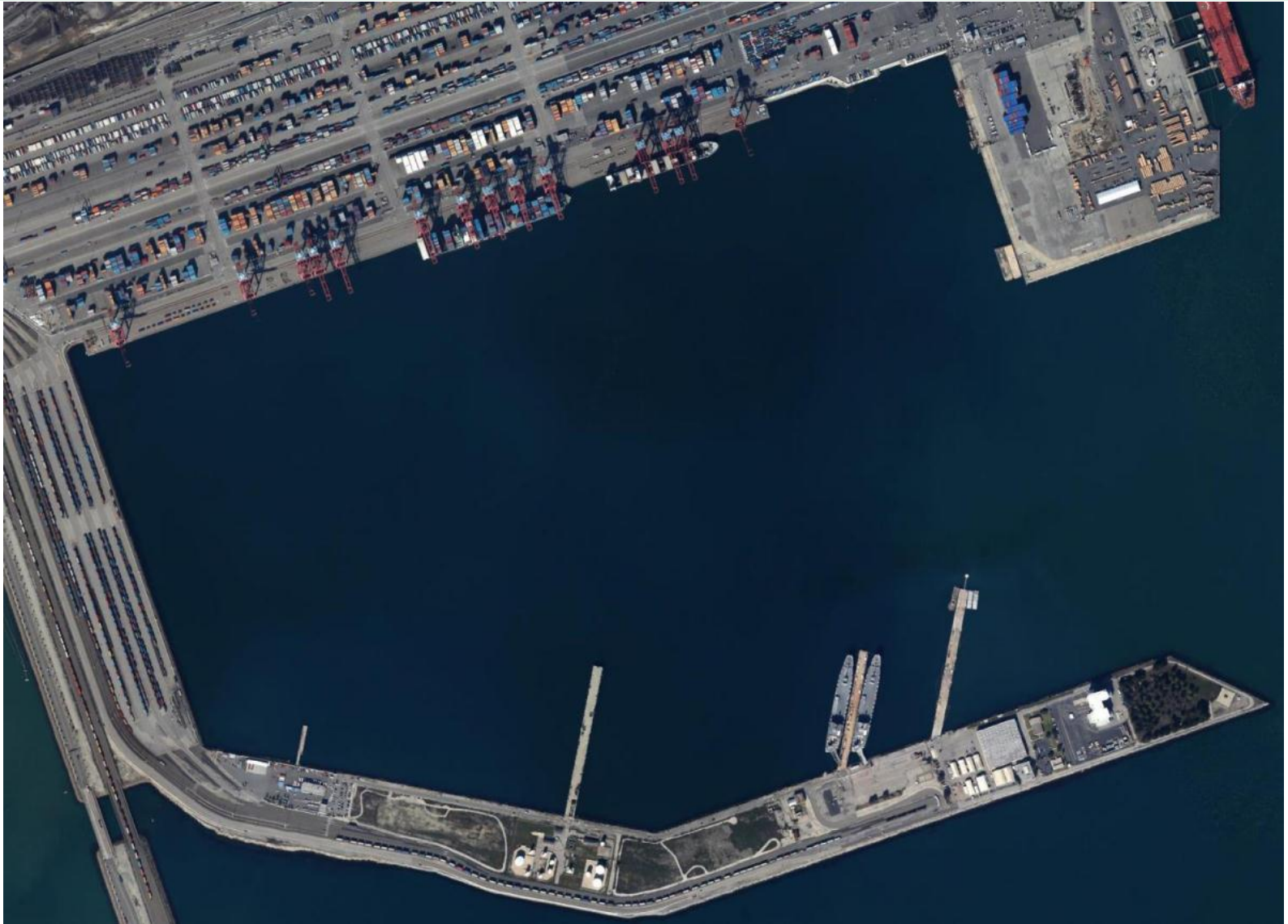
- Approximately 700 acres
- Provides Access to:
  - Pier T Container Terminal
  - MARAD
  - SeaLaunch
  - DOD
- Current minimum depth = -50 Feet MLLW

# WEST BASIN

## Proposed Borrow Project

- 200 acre dredge footprint
- Depth = -55 Feet MLLW
- 1.6M CY
- Eliminate high spots & improved approach
- Improved Navigational Safety

# WEST BASIN





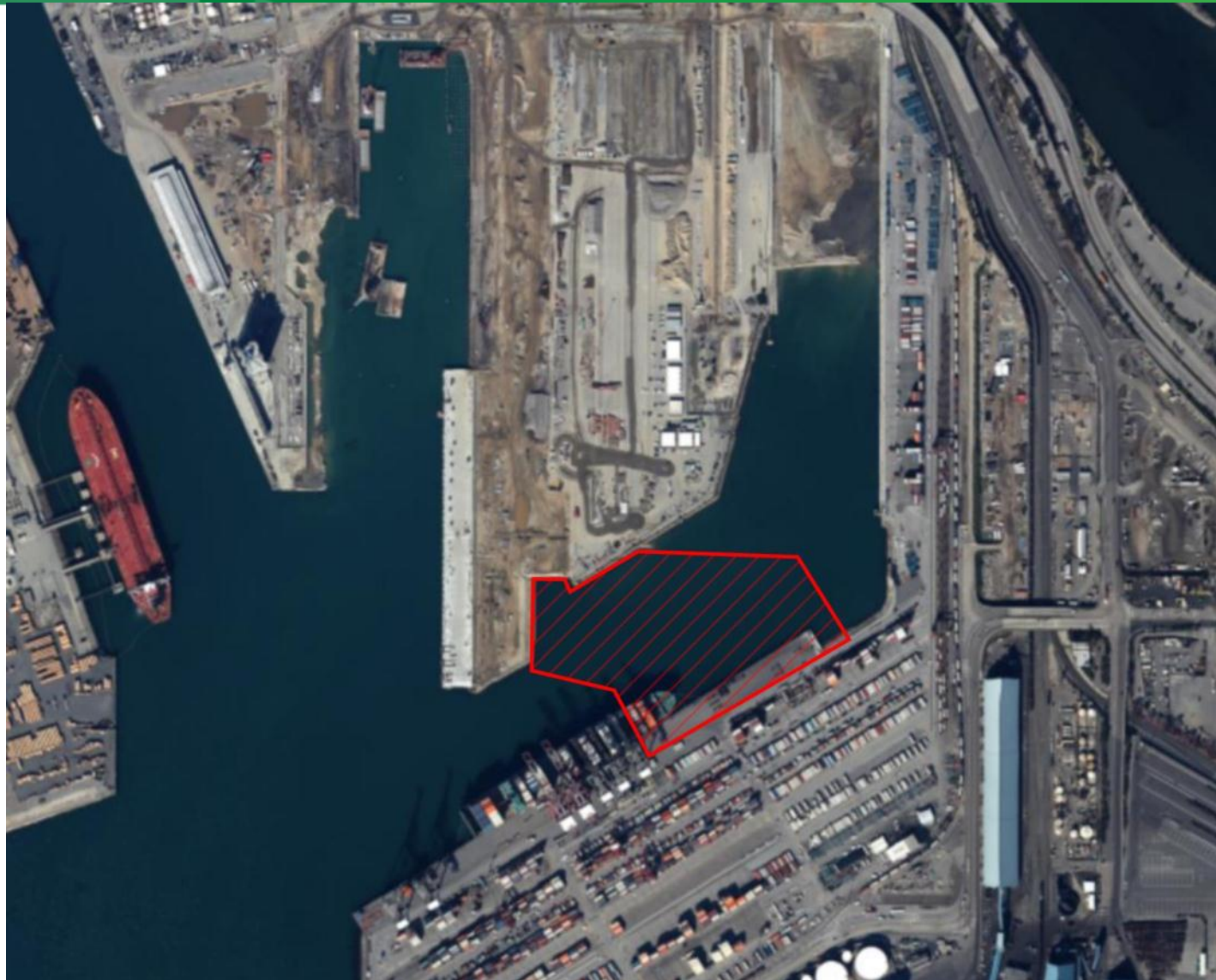
## Design Approach

- Meet MHT fill needs
- Benefit Port pilots
- Strategic dredging footprint
  - Understand approach & berthing paths
  - Develop minimum criteria
  - Refine footprint to achieve goals of Pilots & MHT

# WEST BASIN – DREGDE FOOTPRINT



# MIDDLE HARBOR TERMINAL PHASE 3 FILL SITE



# WEST BASIN – PRE POLB DEVELOPMENT





# WEST BASIN – EARLY DESIGN TASK

- Eelgrass & Caulerpa taxifolia surveys
- Sediment Characterization
- Sampling plan – sectioned basin into DUs
  - Combined chemical & geotechnical sampling
  - 72 samples (combination of borings & vibracores)

# WEST BASIN – DREDGE UNITS (DUS)





# WEST BASIN

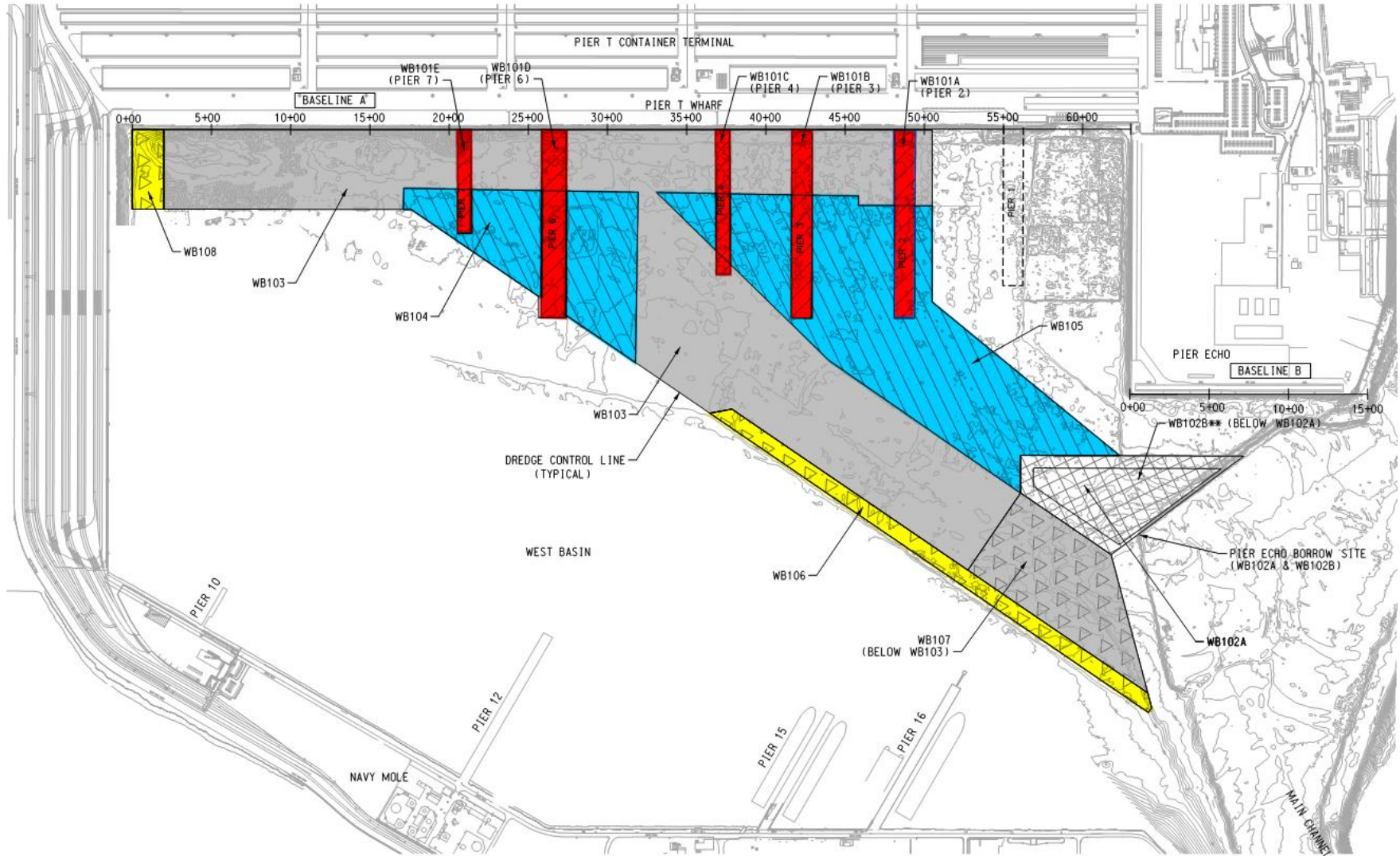
- Sediment Characterization
  - Some DUs not suitable for ocean disposal
  - Place “unsuitable” material below 0 MLLW
- Fill site capacity challenged below 0 MLLW
  - 410,000 CY from West Basin
  - 205,000 CY from other sources

# WEST BASIN – UNSUITABLE DREDGE UNITS (DUS)



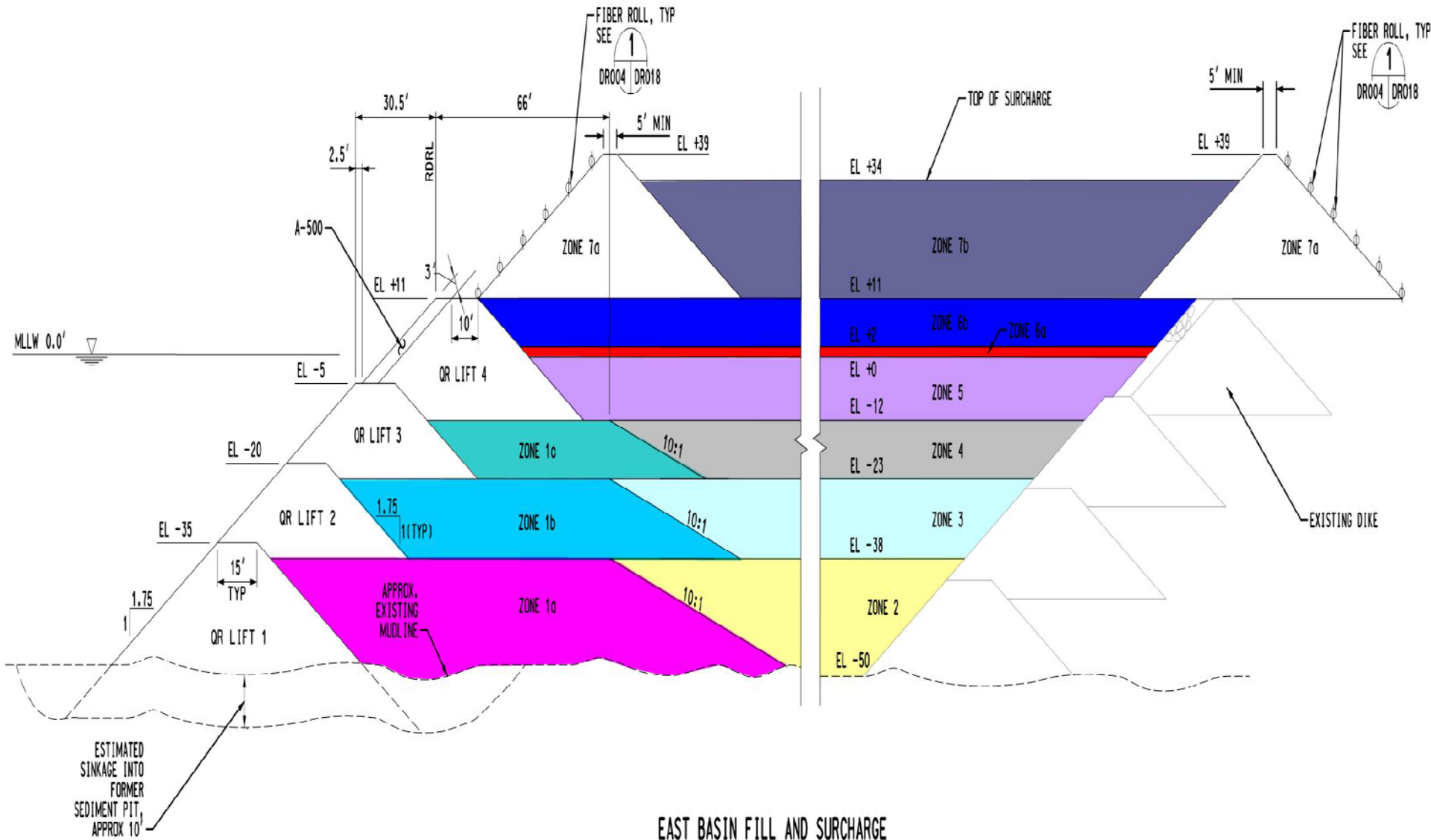


# West Basin – Dredge Areas



**WEST BASIN BORROW SITE DREDGE AREA DESIGNATION AND FILL PLACEMENT CONSTRAINTS PLAN**

# Fill Placement

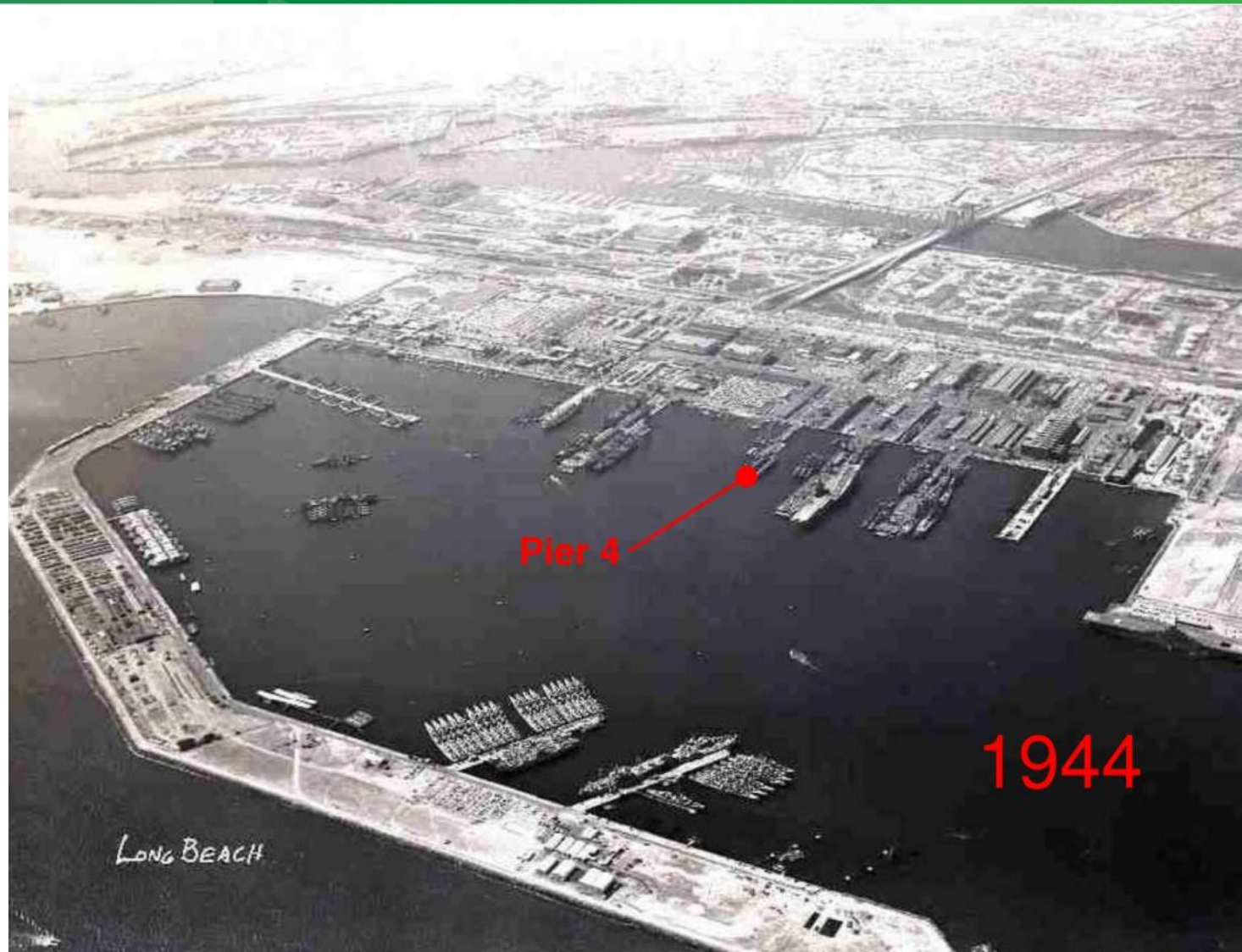


EAST BASIN FILL AND SURCHARGE

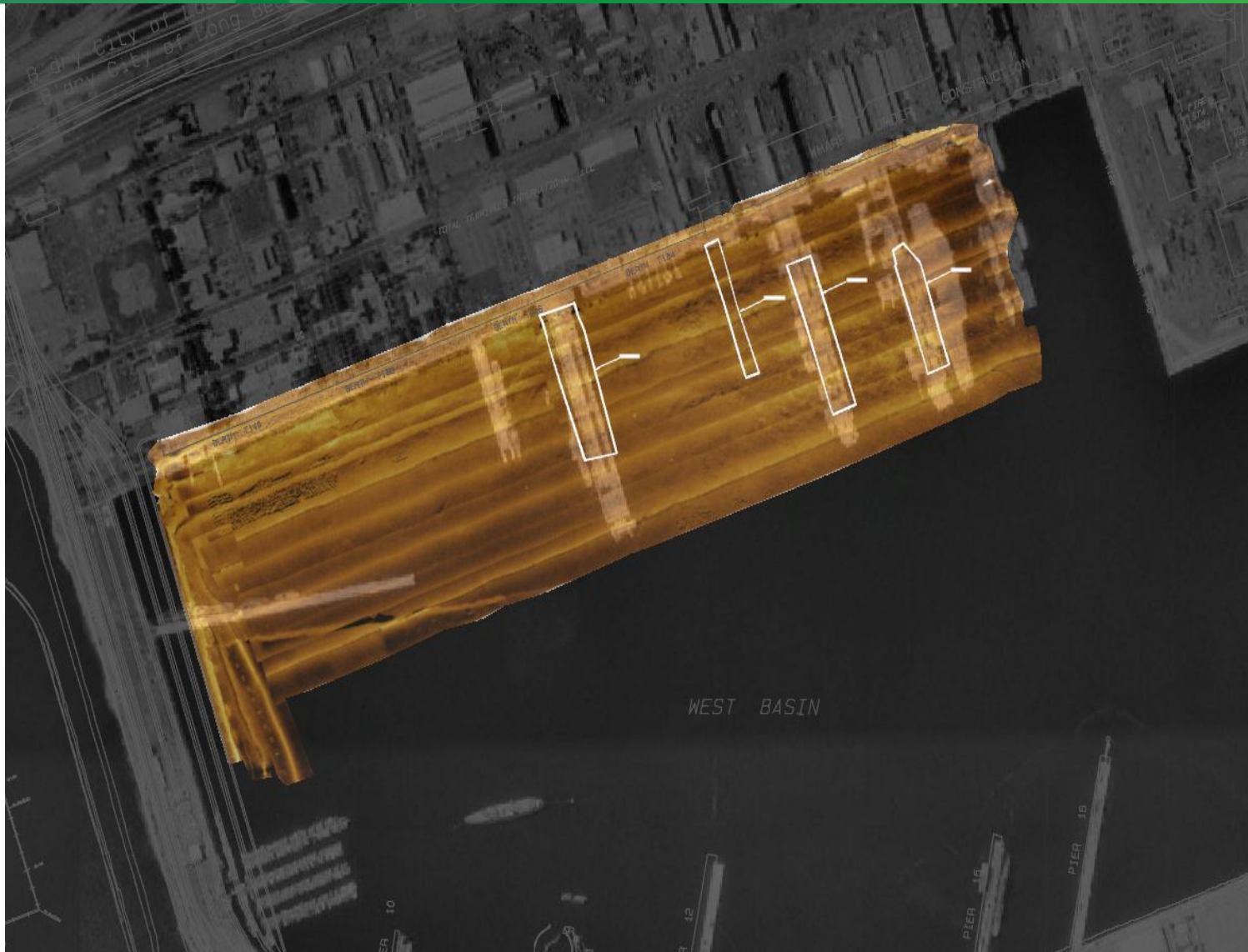
# West Basin – Piles Remnants at Former Piers

- Eelgrass Surveys discovered submerged piles
- Piles were in footprints of former piers
- Estimated ~10,000 piles in original construction
- Extensive research to estimate remaining
  - Historic documents
  - Interviews with demolition personnel
  - Field investigations

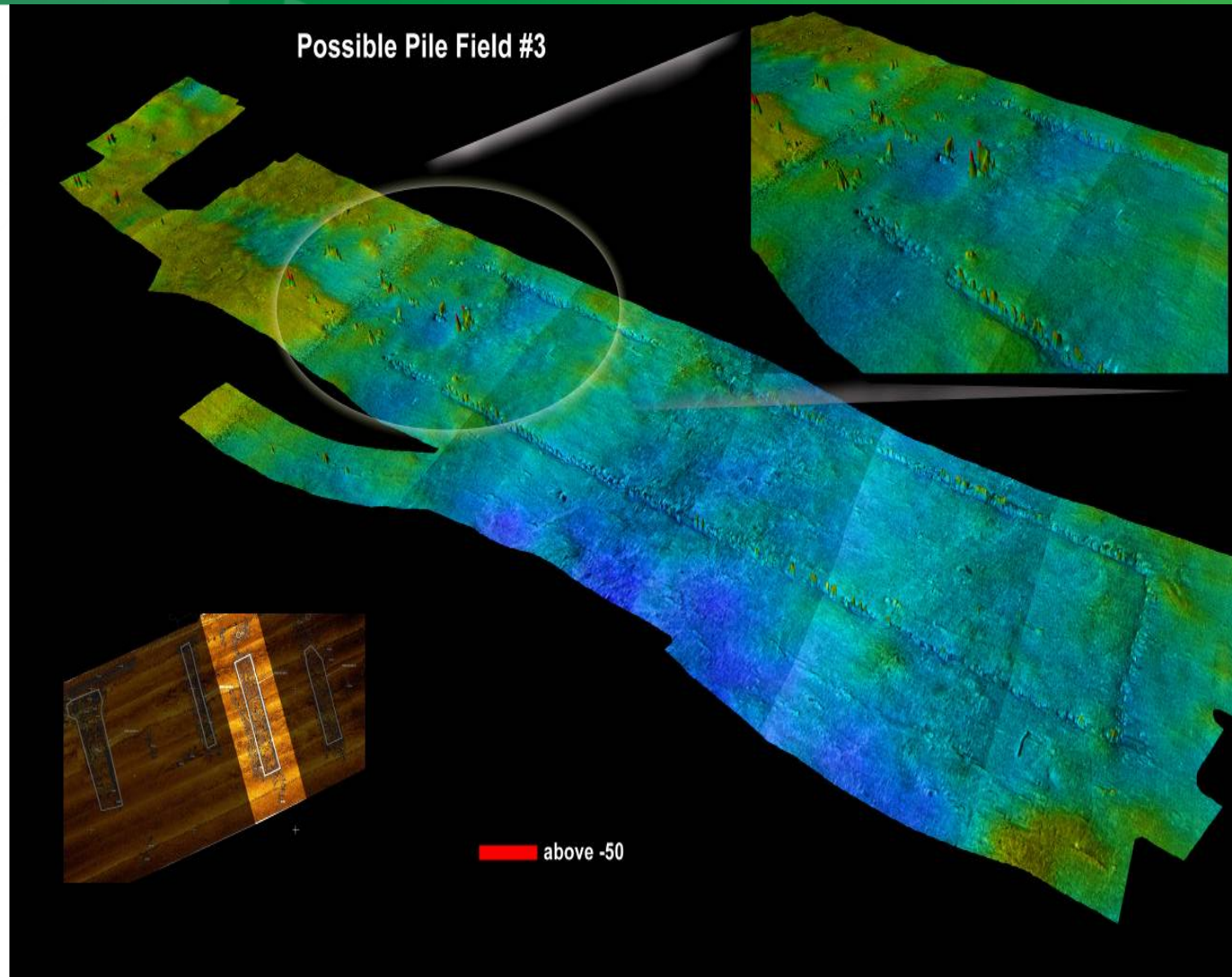
# West Basin – Former Navy Piers



# WEST BASIN – FORMER NAVY PIERS (SIDE SCAN)



# WEST BASIN – FORMER NAVY PIERS (3D Isometric)



# WEST BASIN – PIER T CONTAINER TERMINAL

## EXISTING CONDITONS

- Pier T is largest active terminal at POLB
- 5,000-foot wharf
- Average 10 vessels per week
- Developed 17 wharf segments (WS-areas)
- Specified constraints for WS work
- Goal: Minimize impact to terminal operations

# WEST BASIN – PIER T CONTAINER TERMINAL

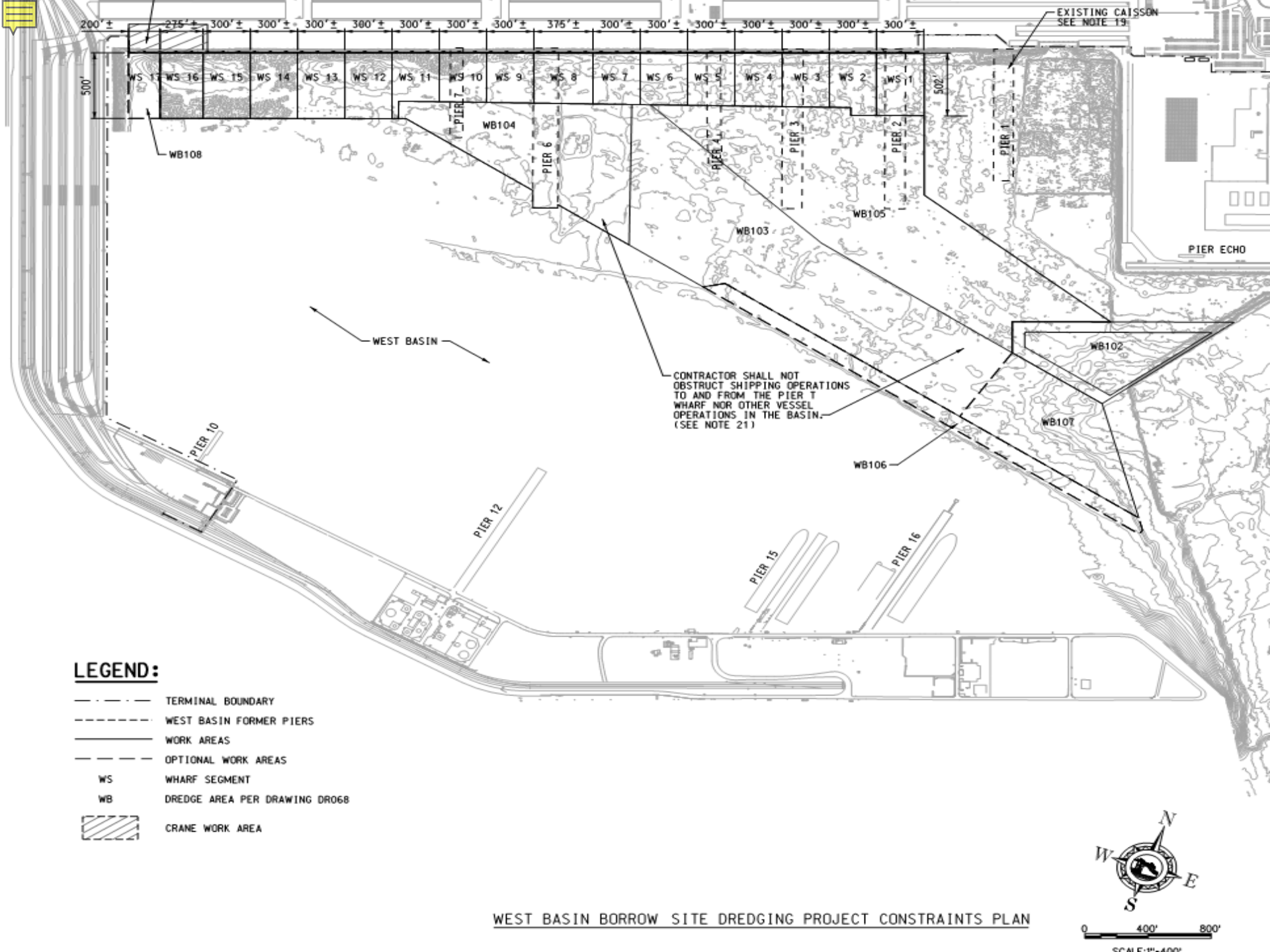
## DESIGN APPROACH

- Goal: Minimize impact to terminal operations
- Developed 17 wharf segments (WS-areas)
- Specified constraints for work within WS-areas



# West Basin – Pier T Container Terminal

- Specified WS-area Constraints
  - Only work in a single WS-area at a time
  - Start work in WS-area 2
  - Complete WS-area before moving to next
  - Minimum 72-hour work windows
  - Daily communication with terminal operator & pilots



EXISTING CAISSON  
SEE NOTE 19

PIER ECHO

WEST BASIN

CONTRACTOR SHALL NOT  
OBSTRUCT SHIPPING OPERATIONS  
TO AND FROM THE PIER T  
WHARF NOR OTHER VESSEL  
OPERATIONS IN THE BASIN.  
(SEE NOTE 21)

**LEGEND:**

- TERMINAL BOUNDARY
- - - WEST BASIN FORMER PIERS
- WORK AREAS
- - - OPTIONAL WORK AREAS
- WS WHARF SEGMENT
- WB DREDGE AREA PER DRAWING DR068
- ▨ CRANE WORK AREA



0 400' 800'  
SCALE: 1"=400'

**WEST BASIN BORROW SITE DREDGING PROJECT CONSTRAINTS PLAN**



# CONCLUSIONS

- Example of Green Port Policy in action
- Beneficial Reuse
- Win – Win



# THANK YOU TO THE PROJECT TEAM

- POLB
  - Program Management
  - Environmental Planning
  - Design
- Anchor QEA
- Moffat Nichol
- KPFF Consulting Engineers