- The Steering Committee makes strategic decisions and controls project “purse strings”
- US Environmental Protection Agency
- National Marine Fisheries Service
- US Army Corps of Engineers
- US Fish and Wildlife Service
- California Department of Fish and Game
- State Lands Commission
- State Resources Agency
- State Coastal Conservancy

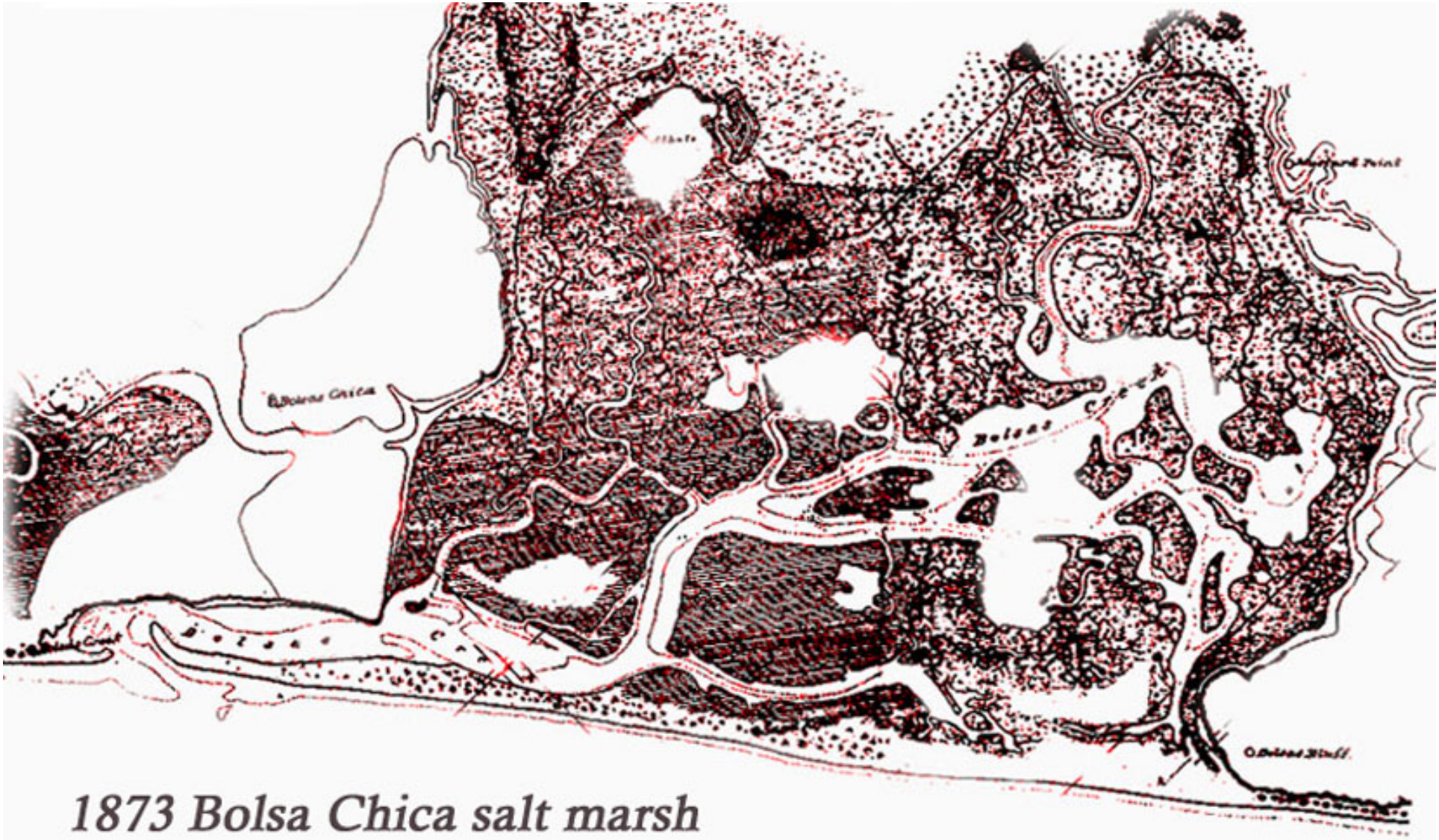
US Army Corps of Engineers

CALIFORNIA STATE LANDS COMMISSION

RESOURCES AGENCY
Office of the Secretary

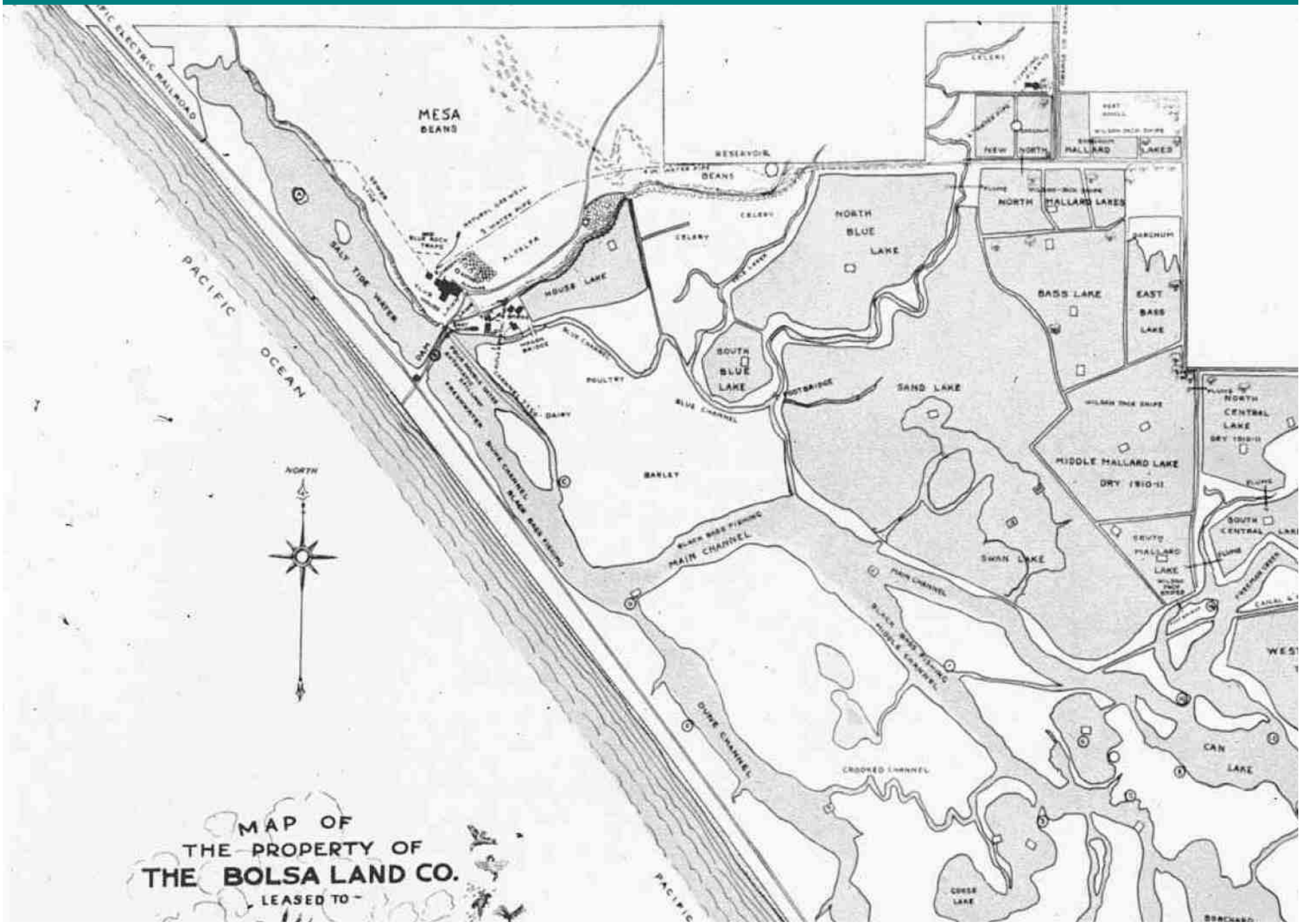
Coastal Conservancy

- California State Lands Commission is the land owner
- Fish and Wildlife Service is lead on construction of the restoration plan
- Caltrans owns and operates Pacific Coast Highway
- Aera Energy LLC operates several oil leases in the project area
- State Parks owns and operates Bolsa Chica State Beach
- Orange County Flood Control has a flood channel easement for the EGGW Flood Channel
- DFG operates the Bolsa Chica Ecological Reserve
- Hearthside Homes owns several adjacent properties
- Gas Company operates a dry gas line owned by Long Beach
- Orange County Water District operates groundwater test wells
- RWQCB oversees contaminant cleanup and WQ permits
- Corps, CCC, AQMD, USCG regulate certain activities

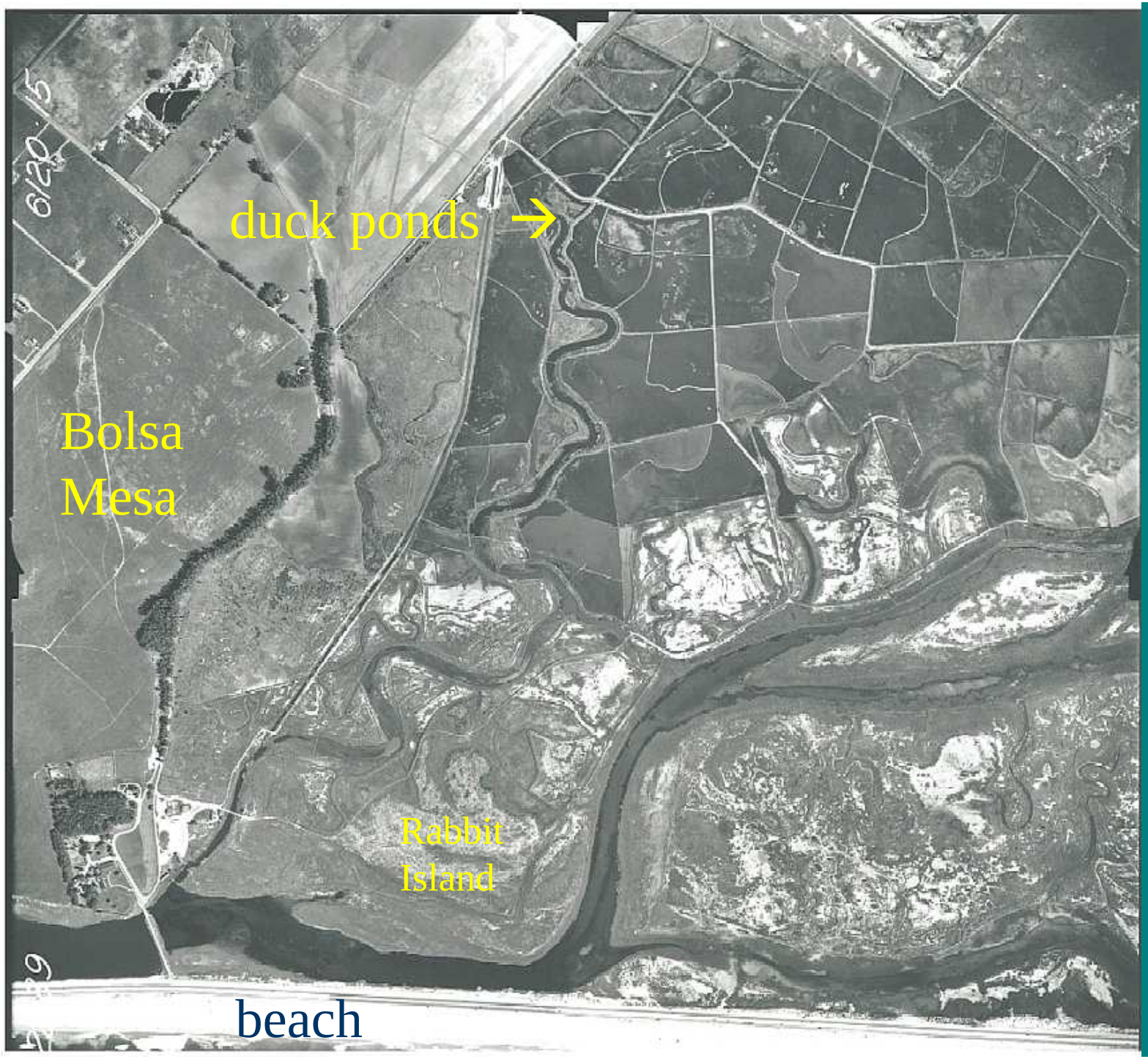


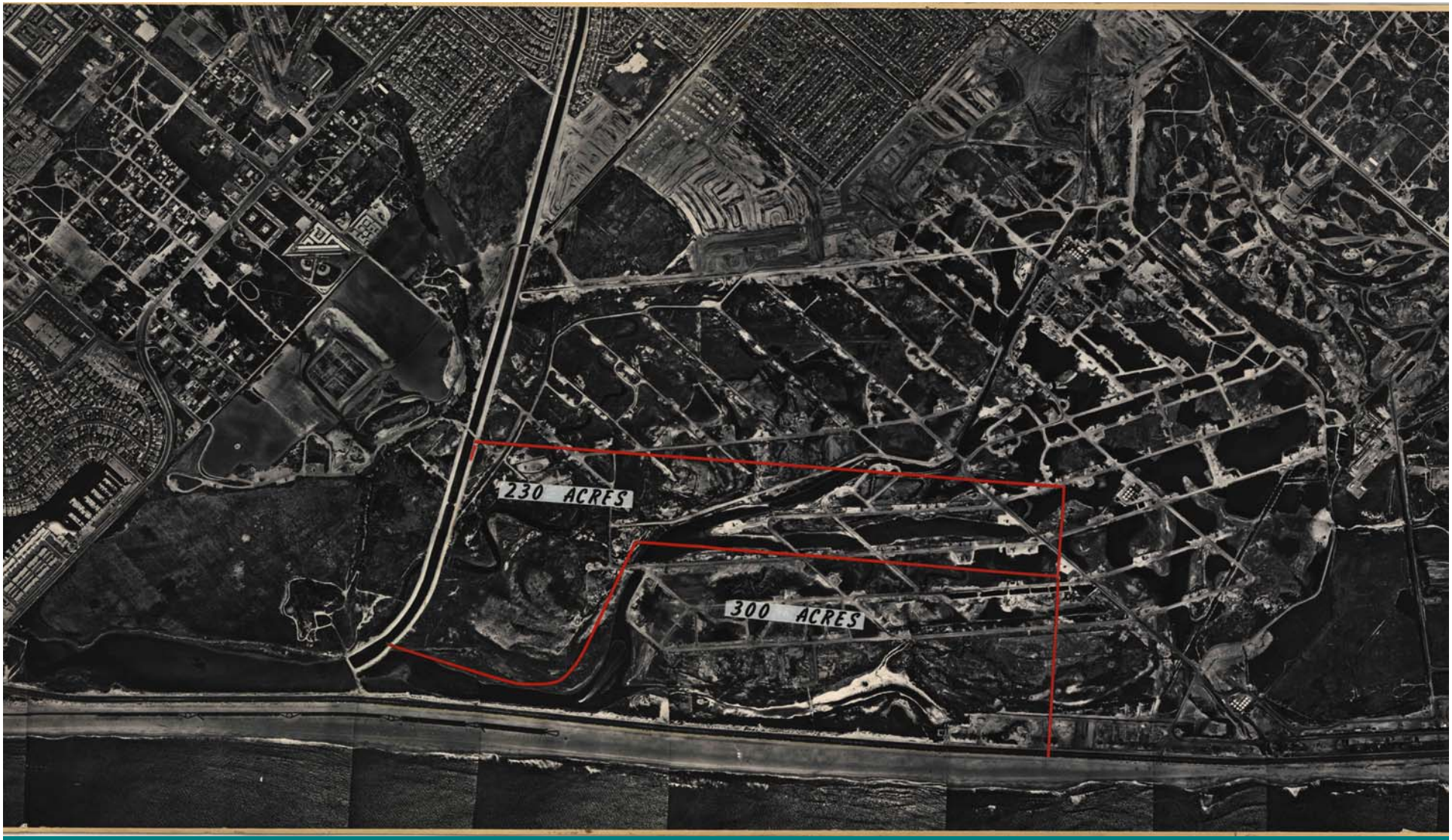
1873 Bolsa Chica salt marsh

- **~ 2,400 acres under full tidal influence with a direct ocean connection**


MESA
BEANS
RESERVOIR
BEANS
CELERY
NEW
NORTH
MALLARD
LAKES
NORTH MALLARD LAKES
NORTH BLUE LAKE
BASS LAKE
EAST BASS LAKE
GERANIUM
HOUSE LAKE
SALT TIDE WATER
PACIFIC OCEAN
SOUTH BLUE LAKE
SAND LAKE
POULTRY
BLUE CHANNEL
DAIRY
BARLEY
MIDDLE MALLARD LAKE
DRY 1910-11
NORTH CENTRAL LAKE
DRY 1910-11
SOUTH CENTRAL
MALLARD LAKE
SWAN LAKE
MAIN CHANNEL
BLACK BASS FISHING
DUNE CHANNEL
CROOKED CHANNEL
CAN
LAKE
CURRIE LAKE
NORTH
MAP OF
THE PROPERTY OF
THE BOLSA LAND CO.
LEASED TO -

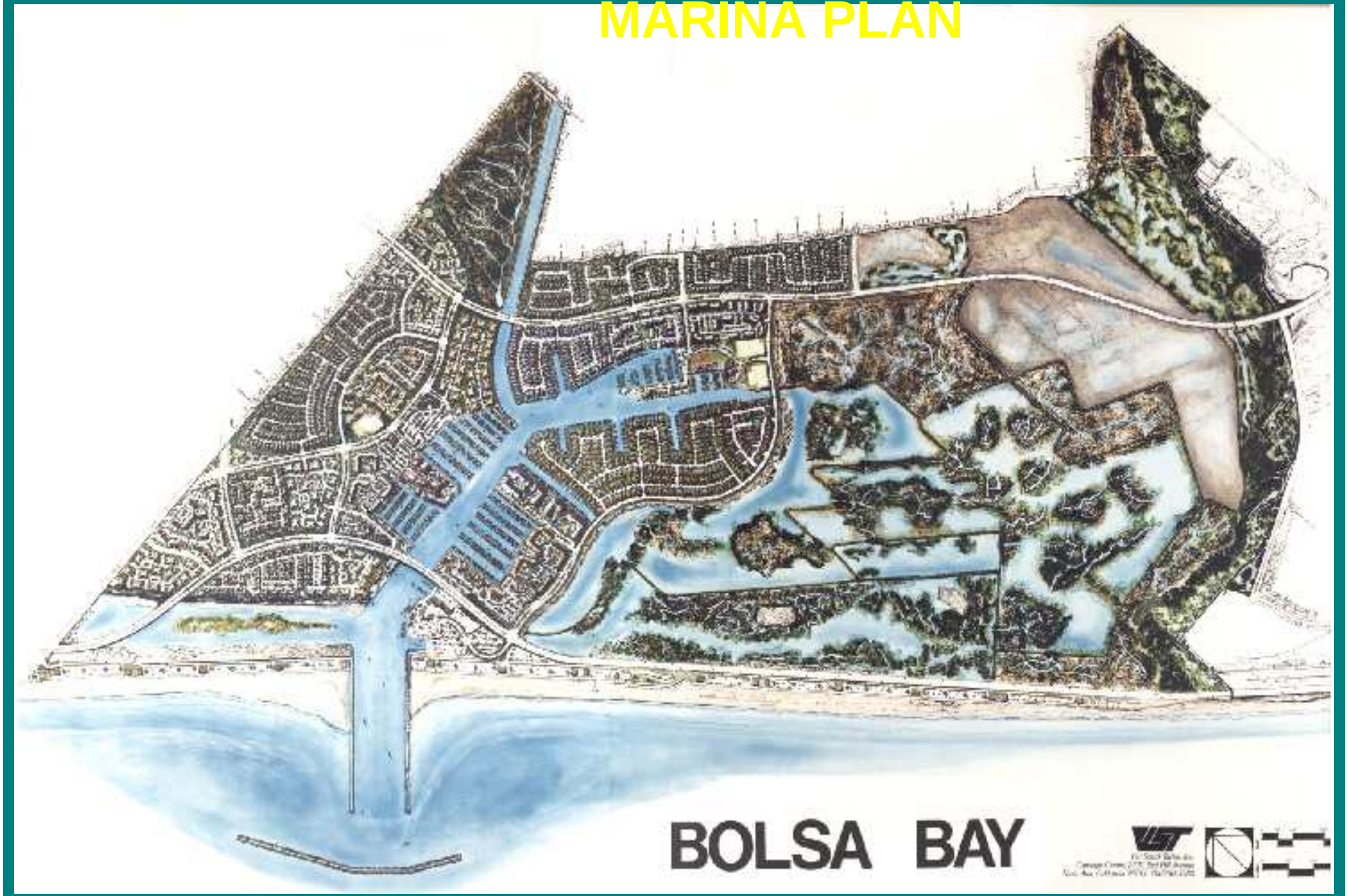
1939

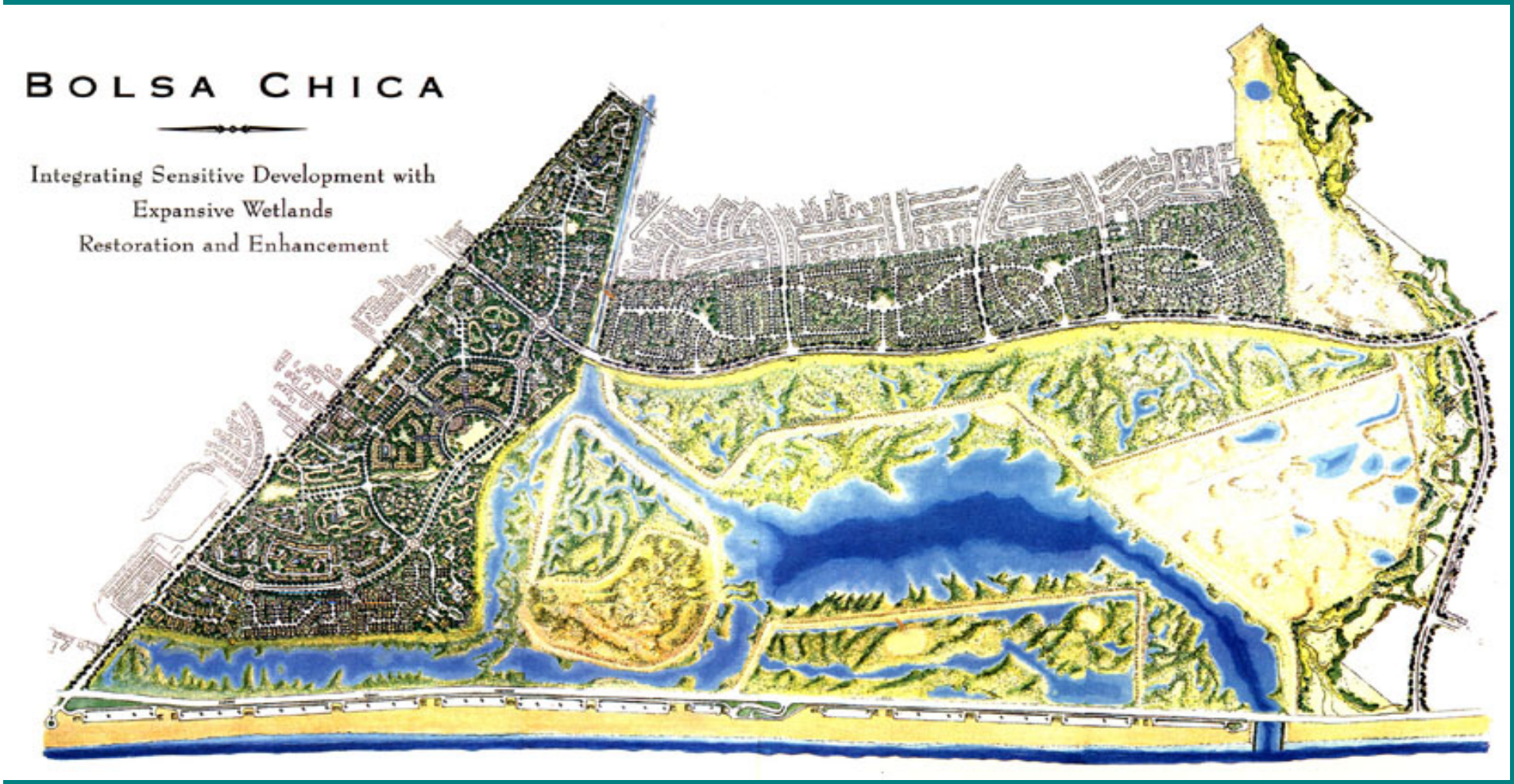




1973 AGREEMENT

MARINA PLAN





COALITION PLAN

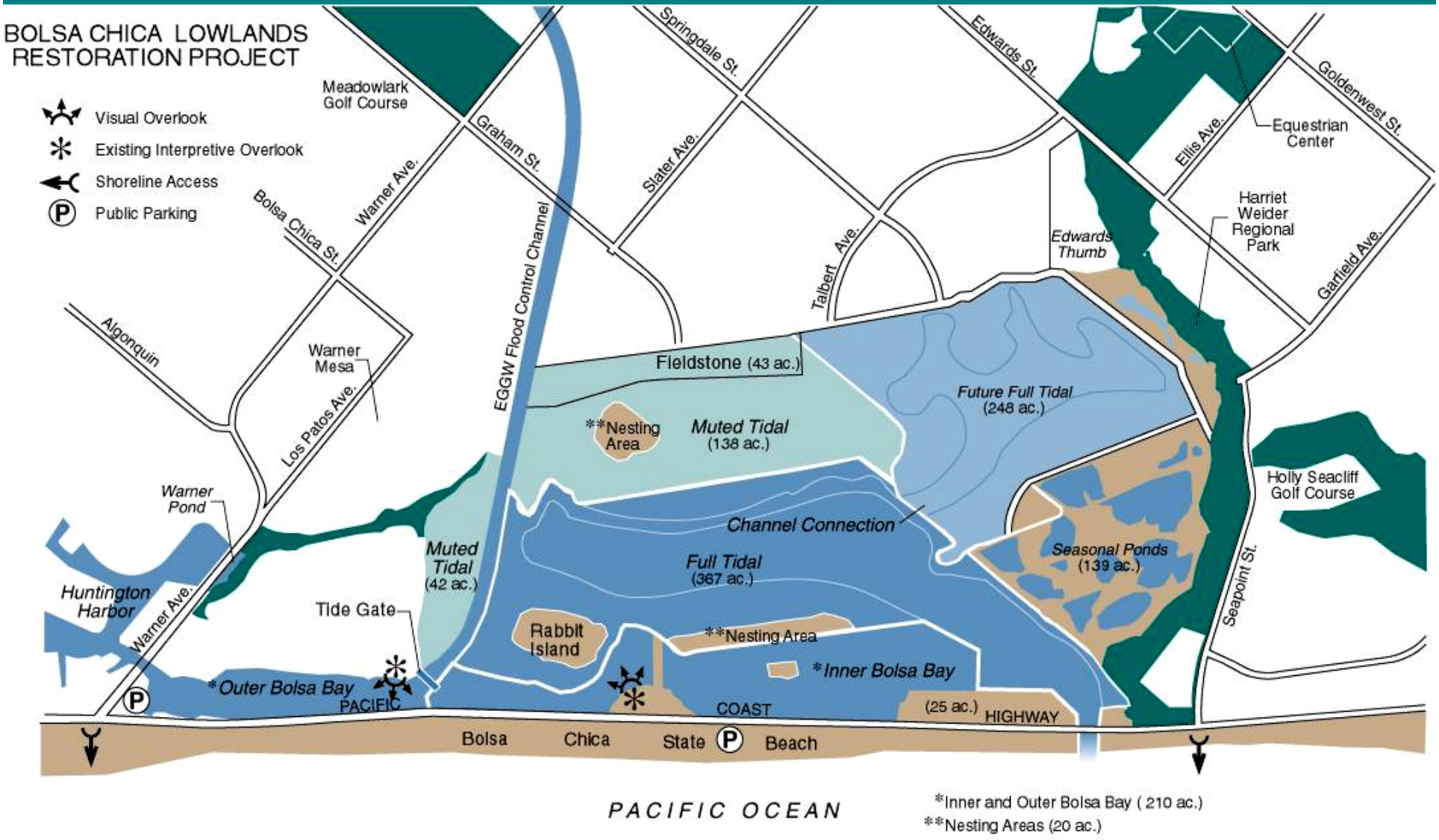

PERENNIAL PONDS
SEASONAL PONDS
MUTED TIDAL
MUTED TIDAL
FULL TIDAL
RABBIT ISLAND
MUTED TIDAL
FULL TIDAL
TIDAL INLET
PROPOSED PLAN

KOLL PLAN

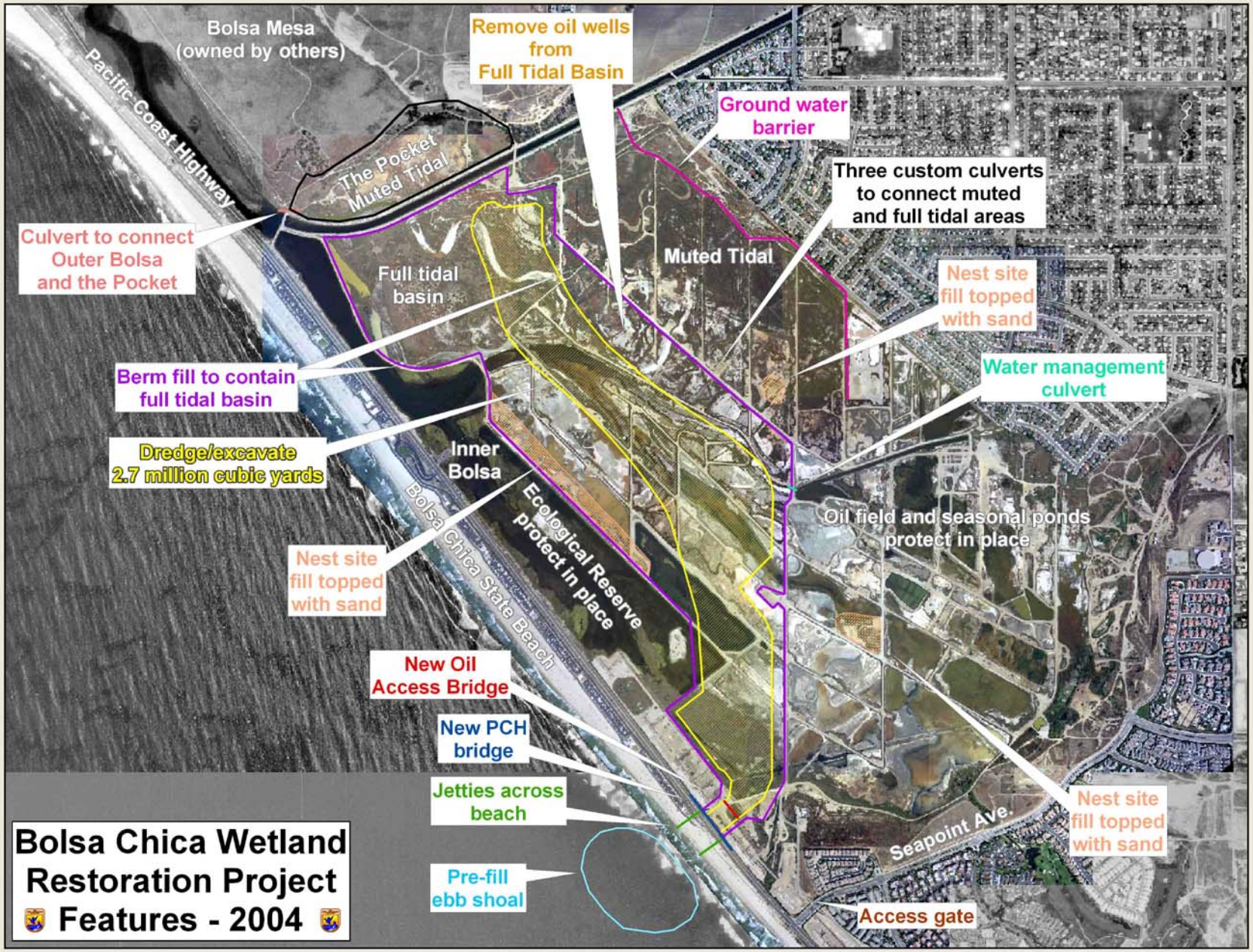
- after 100 years of dike, roads, and houses

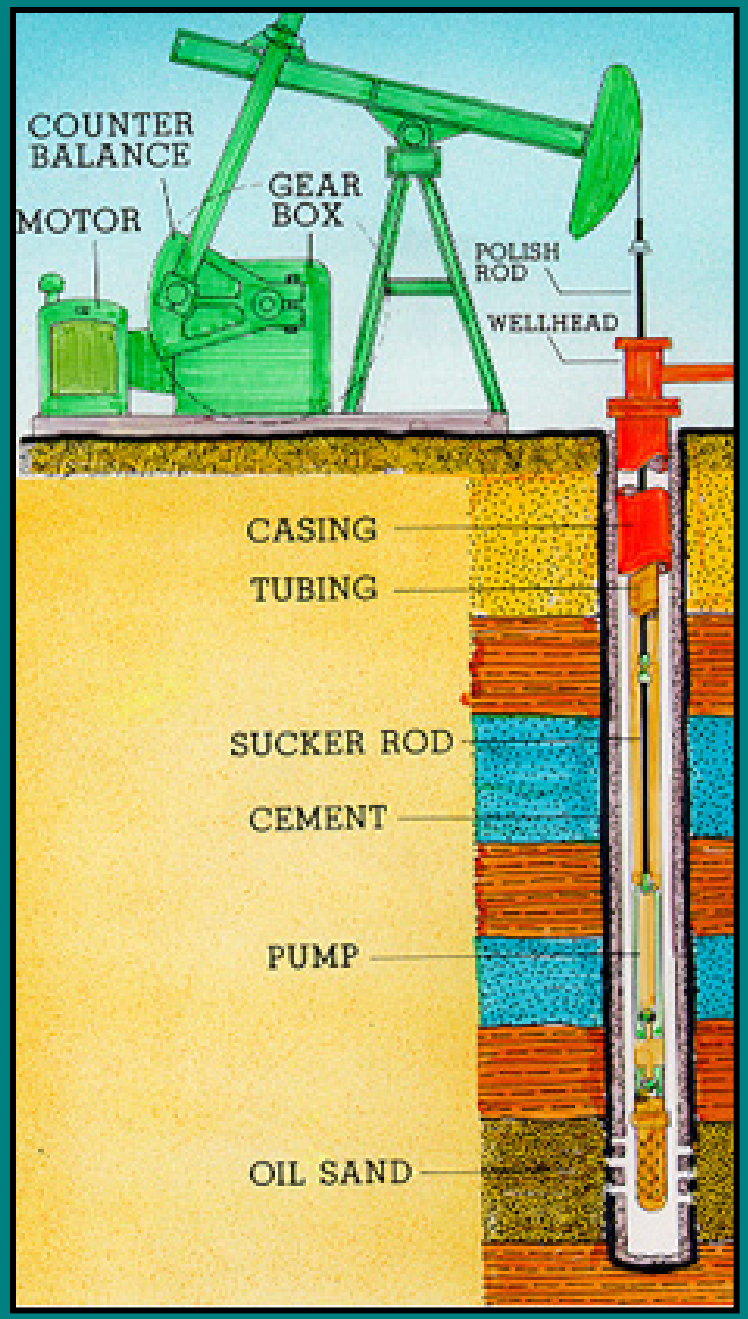
- ~1,300 acres of degraded wetlands and an oil field in a very urban setting

• The Bolsa Chica restoration project



- A **full tidal basin** (367 acres), **managed tidal areas** (178 ac), new nesting areas (20 ac), dune plant rehab (19 ac)
- **down coast inlet location and two bridges**
- **no change** to Inner or Outer Bolsa Chica Ecological Reserve, seasonal ponds and future restoration area (387 ac), whipstock oil area (25 ac), or flood channel
- total of ~ 2.7 million cubic yards (cy) of dredging
  - ~ 1.3 million cy of clean sand goes to the ebb shoal
  - ~ 1.4 million cy to build the tidal basin containment berms and nesting areas
- groundwater interception feature between managed tidal wetland and houses
- hopes to acquire Fieldstone, remove PCB's, and restore


Bolsa Mesa
(owned by others)
Pacific Coast Highway
The Pocket
Muted Tidal
Remove oil wells
from
Full Tidal Basin
Ground water
barrier
Three custom culverts
to connect muted
and full tidal areas
Culvert to connect
Outer Bolsa
and the Pocket
Full tidal
basin
Muted Tidal
Nest site
fill topped
with sand
Berm fill to contain
full tidal basin
Water management
culvert
Dredge/excavate
2.7 million cubic yards
Inner
Bolsa
Ecological Reserve
protect in place
Bolsa Chica State Beach
Oil field and seasonal ponds
protect in place
Nest site
fill topped
with sand
New Oil
Access Bridge
New PCH
bridge
Jetties across
beach
Seapoint Ave.
Nest site
fill topped
with sand
Pre-fill
ebb shoal
Access gate
Bolsa Chica Wetland
Restoration Project
Features - 2004



Oil Well Abandonment Steps

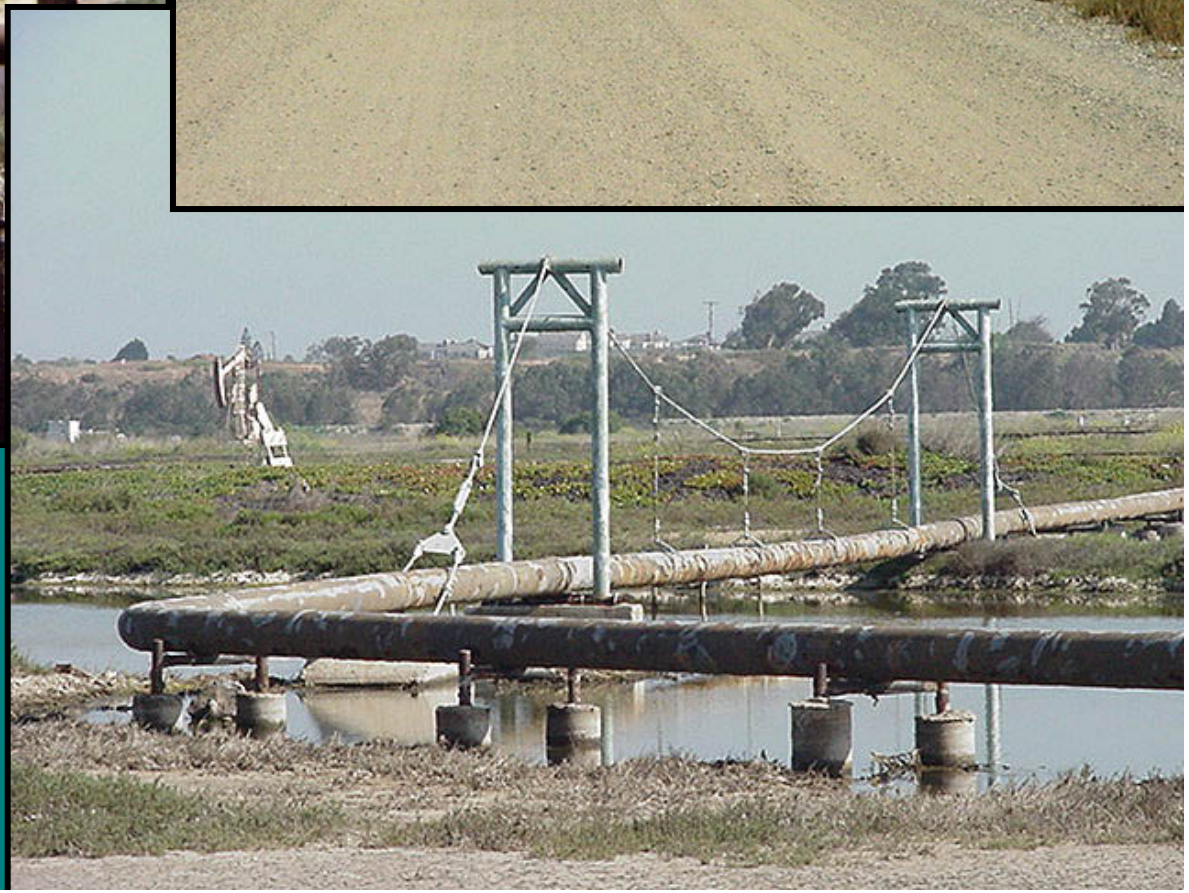
•equipment and pipes in the well casing are removed, casing left in place.

• Well casing is extensively plugged with concrete far below the surface

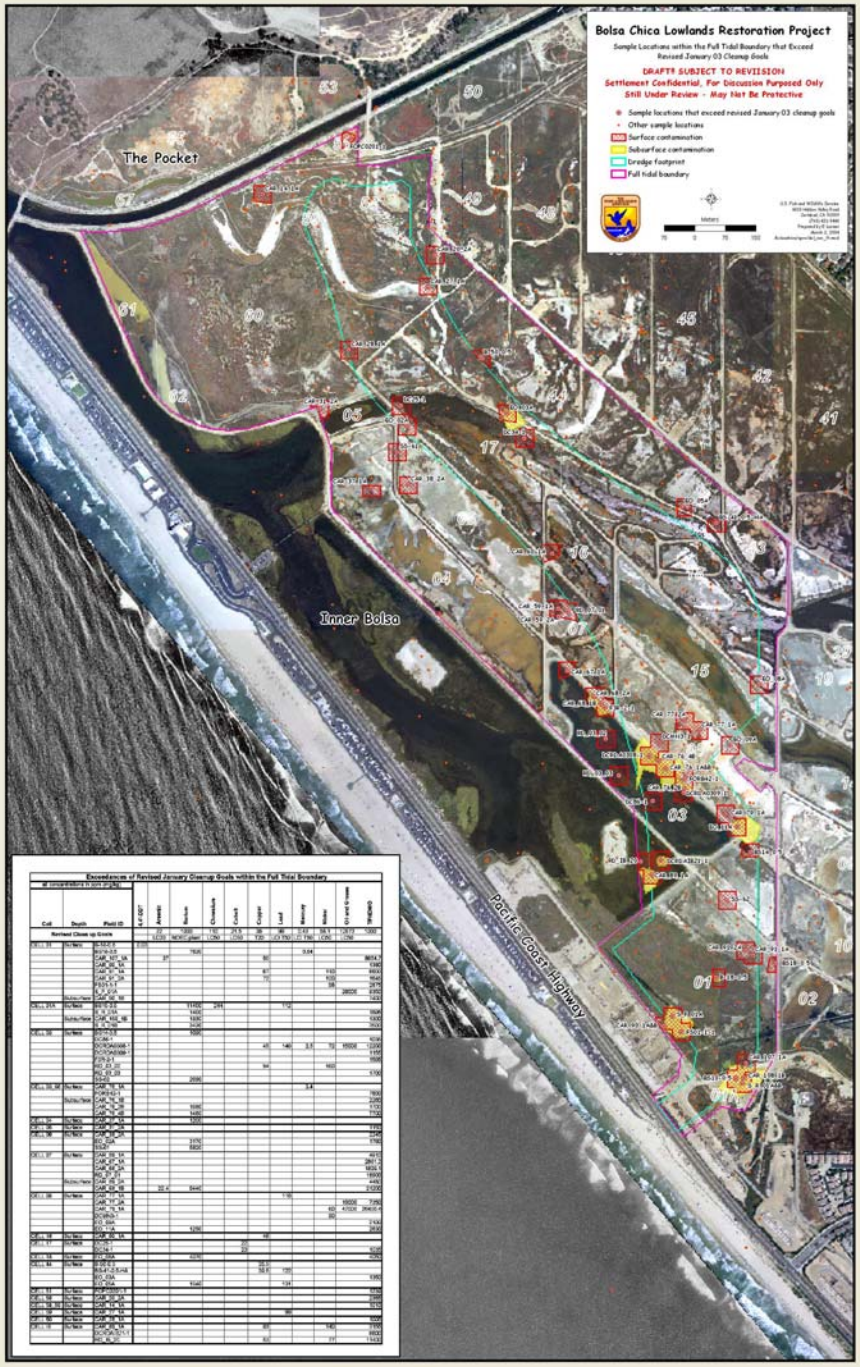
• Surface pump and related equipment are removed

• Well casing is cut off below ground and below any proposed excavation depths

• Well cellar is broken up and removed, surface returned to grade



To be removed from the full tidal basin, oil wells and pipelines, gas line, and roads

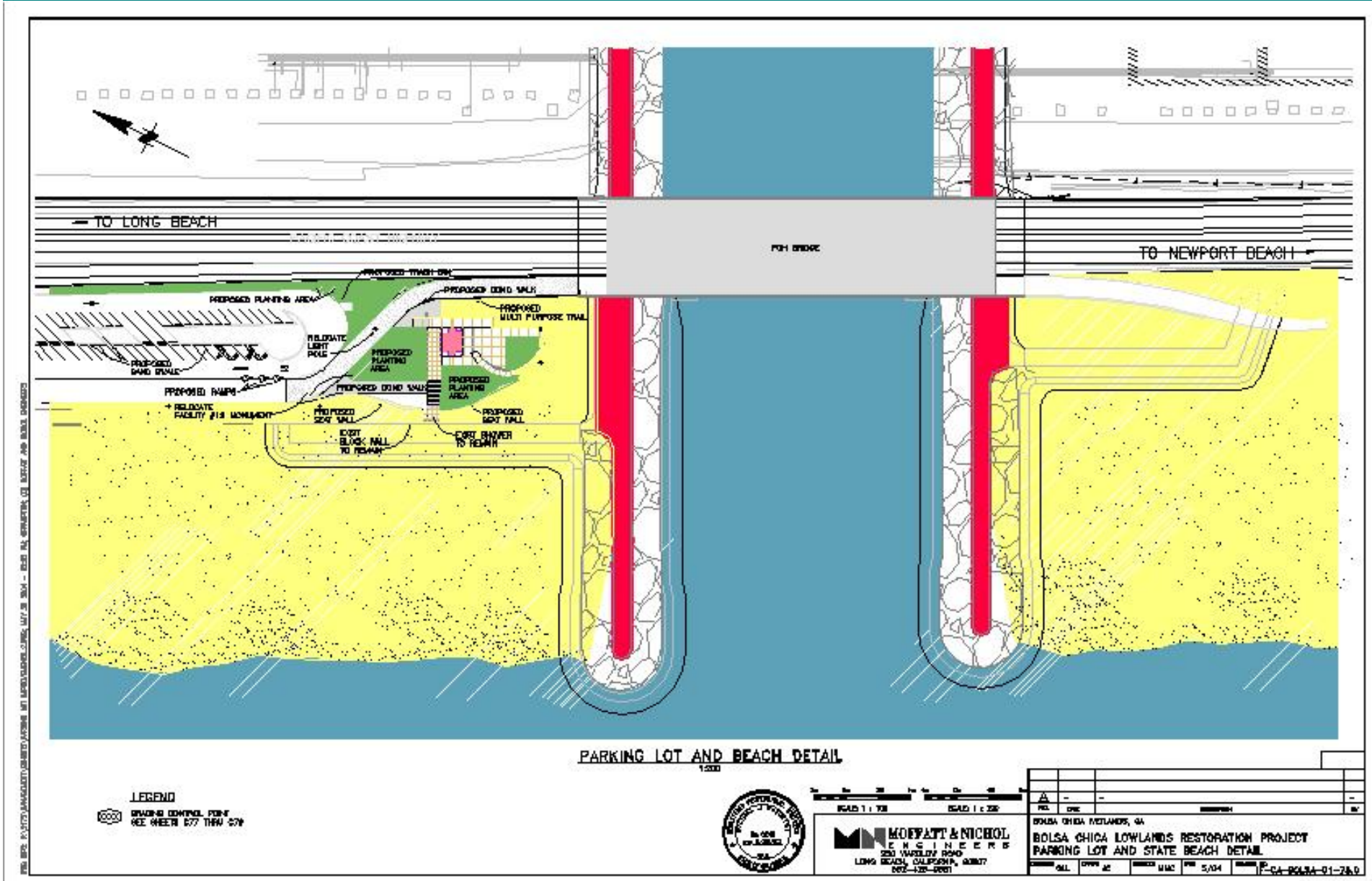


- Contamination in the full tidal basin will be cleaned up during the restoration grading

-Areas of contamination have been mapped and cleanup goals established

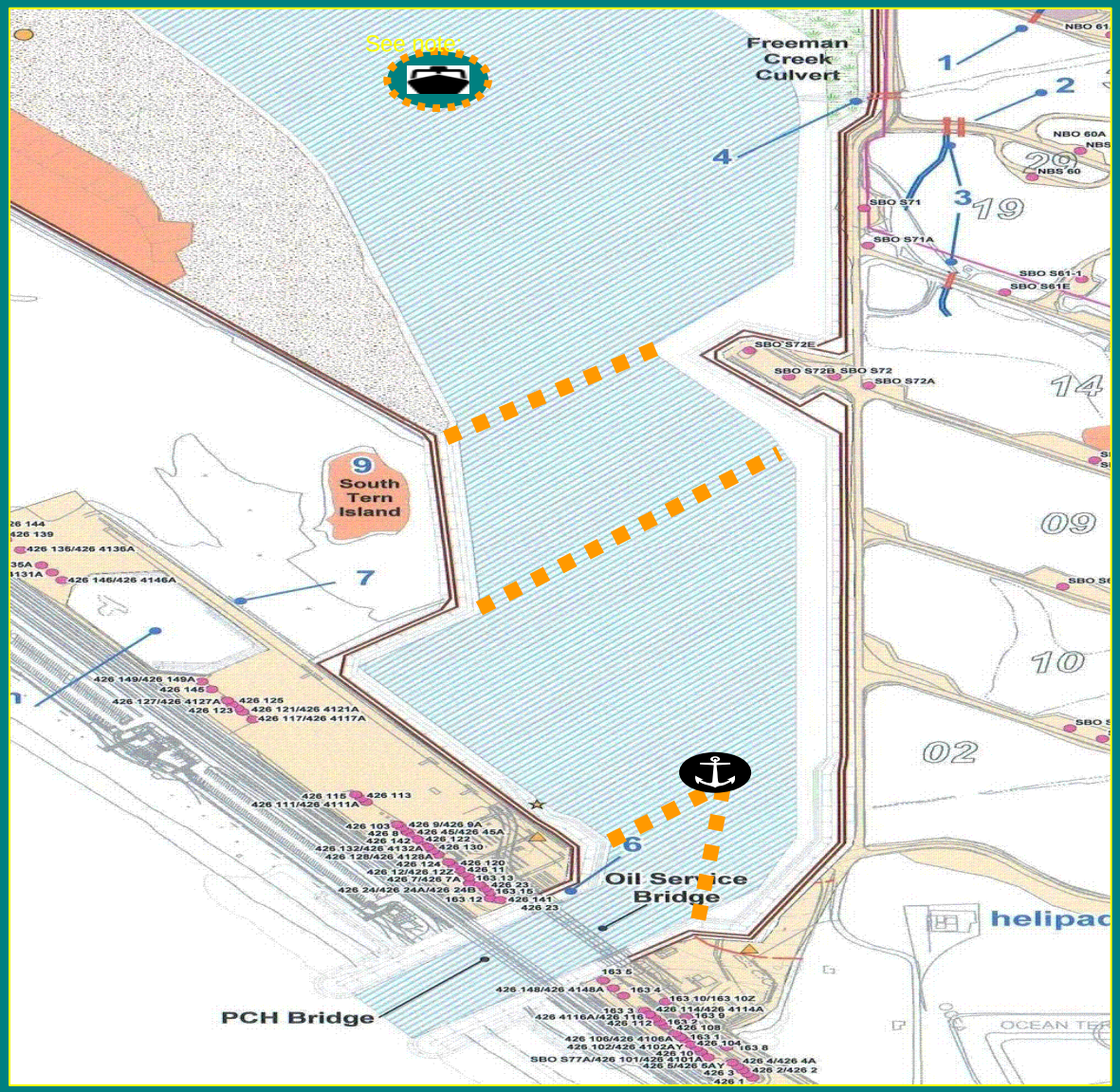
-All the contamination will be hauled off site or sequestered in the core of nest sites or levees

Parking Lot Improvements



BOLSA CHICA WETLANDS

BOLSA CHICA WETLANDS



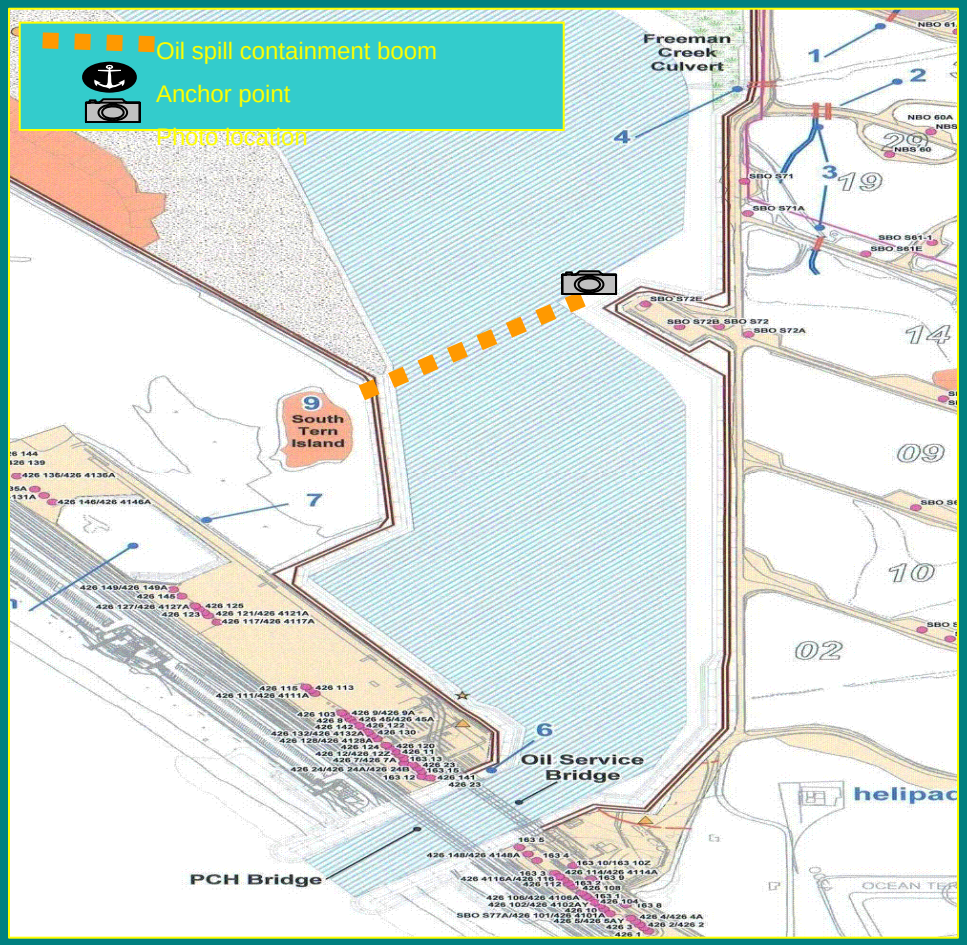
Oil spill containment boom (solid filled floatation 10-24" overall)

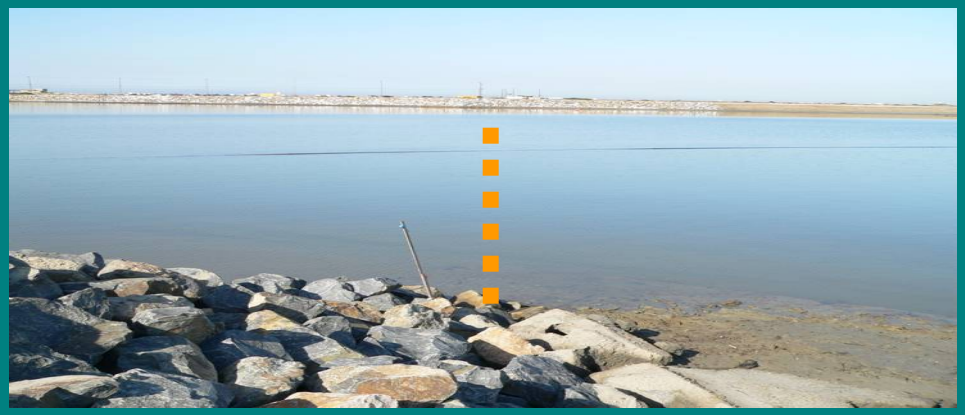
Anchor point (40-60 lb. Danforth anchor or similar)

Bolsa Chica Booming Strategy detail

The following scenarios include deployment or staging of specific booming configurations. Each of these configuration includes pre-established anchor points along the Full Tidal Basin (FTB) levee structure. Priority of these three tactics will vary on the source of the spill and the tidal conditions at the time.

Note: In addition to the protection strategies, conditions in the inner basin may be favorable for open water containment and recovery by deployment of vessel based skimming and storage resources.





Bolsa Chica Booming Strategy detail

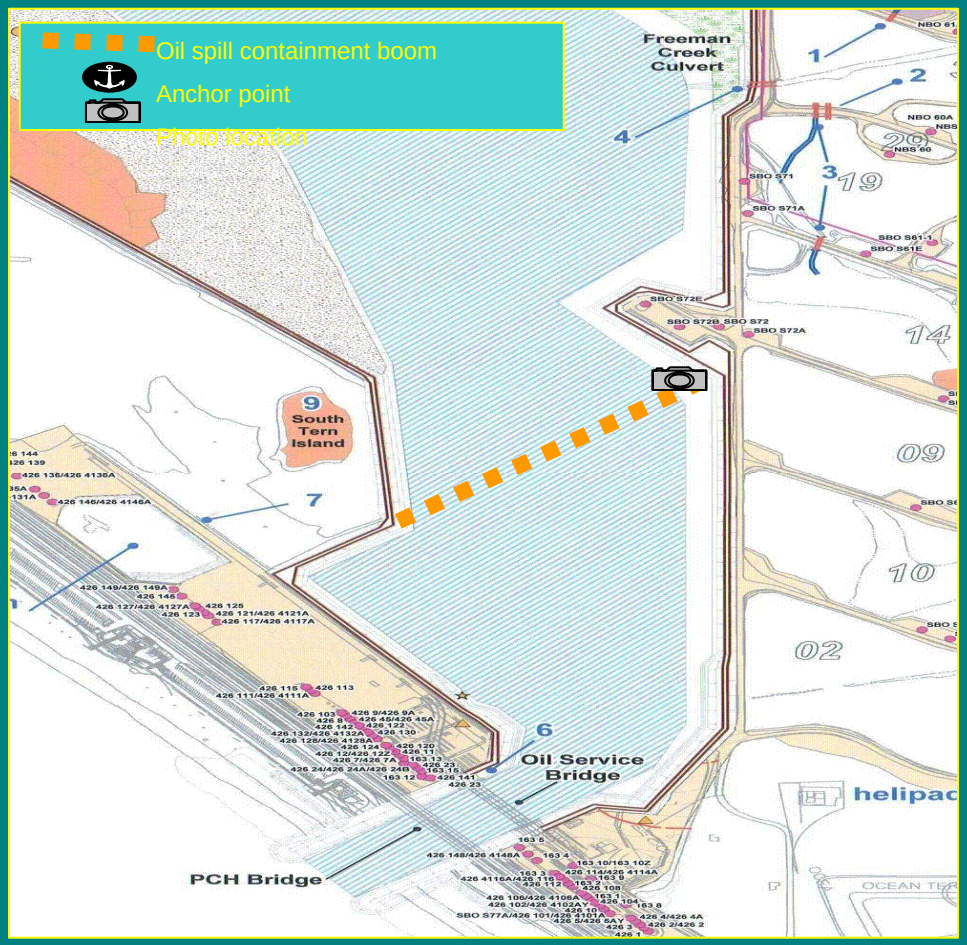
North Thumb Deployment

Deployment of approximately 800 feet of containment boom from the “thumb” levee across to the nearest point on the west side of the FTB.

This boom will used to contain and recover floating oil. Collection points at either shoreline allow access to shore based recovery and storage equipment. Boom angle relative to currents may need to be adjusted for extreme tidal conditions to prevent entrainment. Boom should be angled to move collected oil toward shallower, lower current areas.

This deployment will be facilitated by placement of permanent boom anchors on the levee structure (pictured below)

Photo of anchor point detail



Bolsa Chica Booming Strategy detail

Central Thumb Deployment

Deployment of approximately 1200 feet of containment boom from the “thumb” levee across to the point on the west side of the FTB levee.

This boom will be used to contain and recover floating oil. Collection points at either shoreline allow access to shore based recovery and storage equipment. Boom angle relative to currents may need to be adjusted for extreme tidal conditions to prevent entrainment. Boom should be angled to move collected oil toward shallower, lower current areas.

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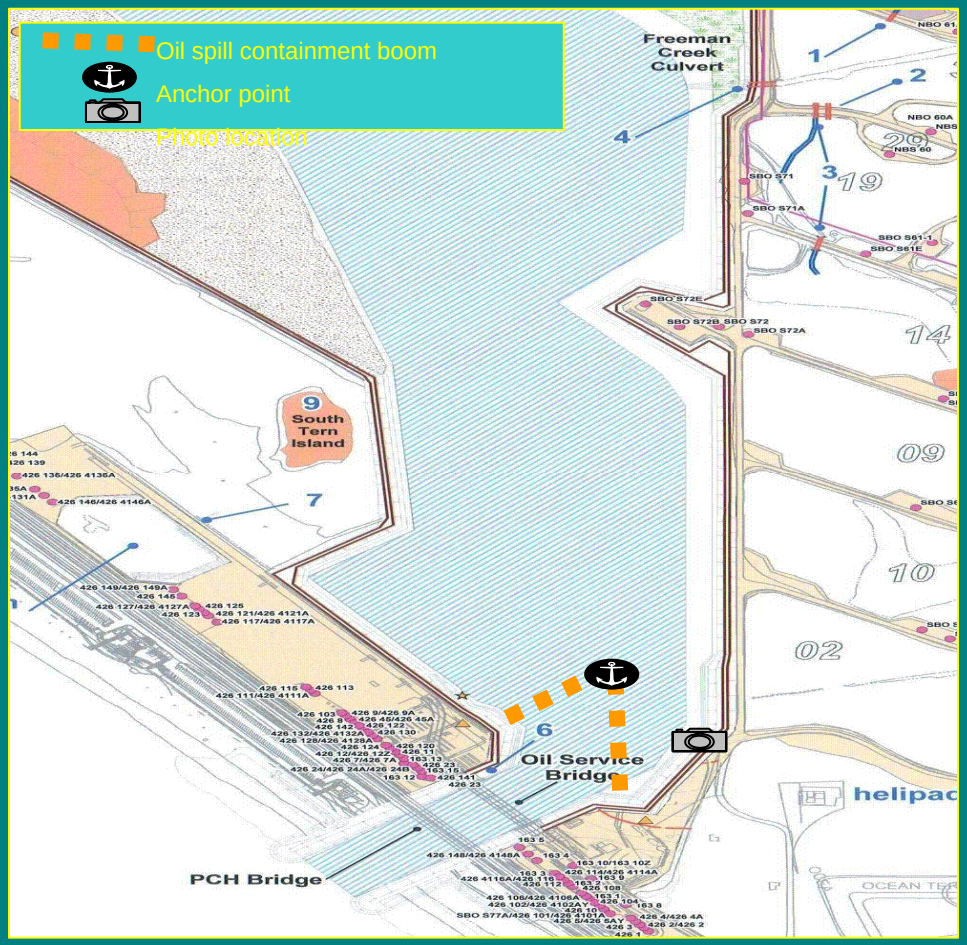

Bolsa Chica Booming Strategy detail

Tidal Mouth Deployment

Deployment of approximately 1200 feet of containment boom from the southern corner of the FTB to an anchor point approximately 600 feet on a direct line from the north shore of the opening. The boom then angles back to shore at the eastern most point near the boat ramp

This boom will be used to contain and recover floating oil. Collection points at either shoreline allow access to shore based recovery and storage equipment. Boom angle relative to currents may need to be adjusted for extreme tidal conditions to prevent entrainment. Boom should be angled to move collected oil toward shallower, lower current areas.

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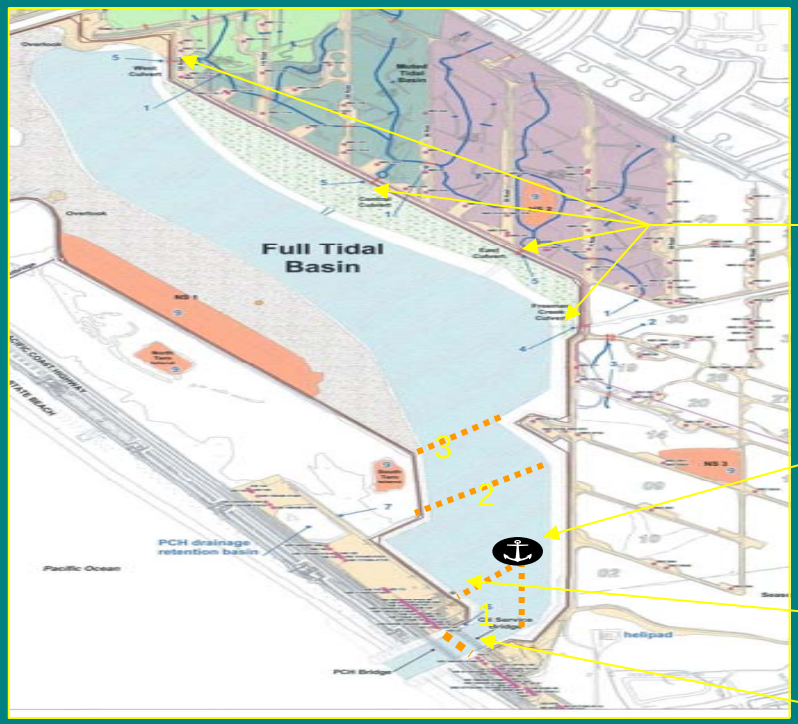


Scenario: Spill to FTB from State Lease

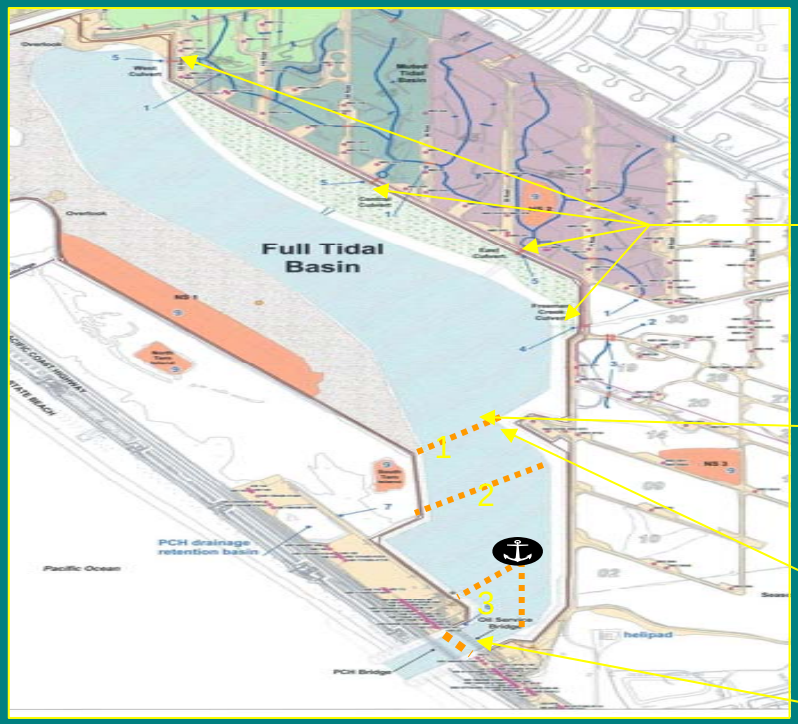
Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions falling or slack before fall

Tactics:

1. Isolate FTB by closing water control structures
   - a) Use mechanical means to isolate MTB by closing control valves on Freeman Creek or FTB structures
   - b) Close all four structures unless positive containment is verified
2. Deploy protection/containment strategies in FTB to contain release
   - a) Deploy on-site and contracted containment boom
     - i. Deploy boom ahead of leading edge. If at night or low visibility (fog) farthest boom first to ensure containment
3. Recover floating oil
   - a) Deploy shoreside recovery equipment at collection points
   - b) Deploy sorbents or passive recovery if oil is not heavy enough for skimming operations
   - c) Deploy oil snare as appropriate in high current areas
4. Cleanup shorelines with approved countermeasures
   - a) Use approved cleanup tactics to remove oil from shorelines



Scenario: Spill to FTB from State Lease

Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions rising or slack before rise

Tactics:

1. Isolate FTB by closing water control structures
   - a) Use mechanical means to isolate MTB by closing control valves on Freeman Creek or MTB structures
   - b) Close all four structures unless positive containment is verified
2. Deploy protection/containment strategies in FTB to contain release
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     - i. Deploy boom ahead of leading edge. If at night or low visibility (fog) farthest boom first to ensure containment
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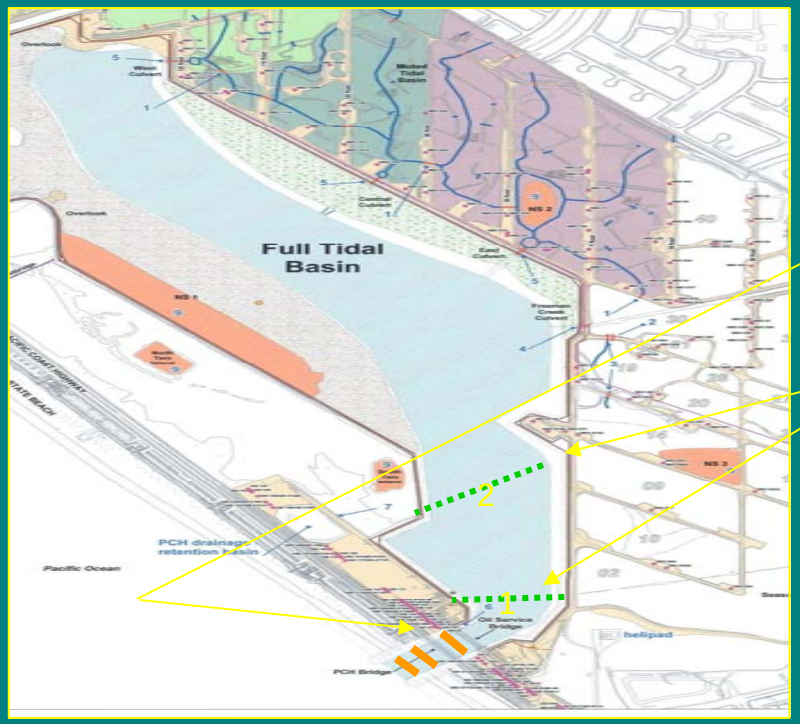
   - c) Deploy oil snare as appropriate in high current areas
4. Cleanup shorelines with approved countermeasures
   - a) Use approved cleanup tactics to remove oil from shorelines



Scenario: Oil Service Bridge Spill

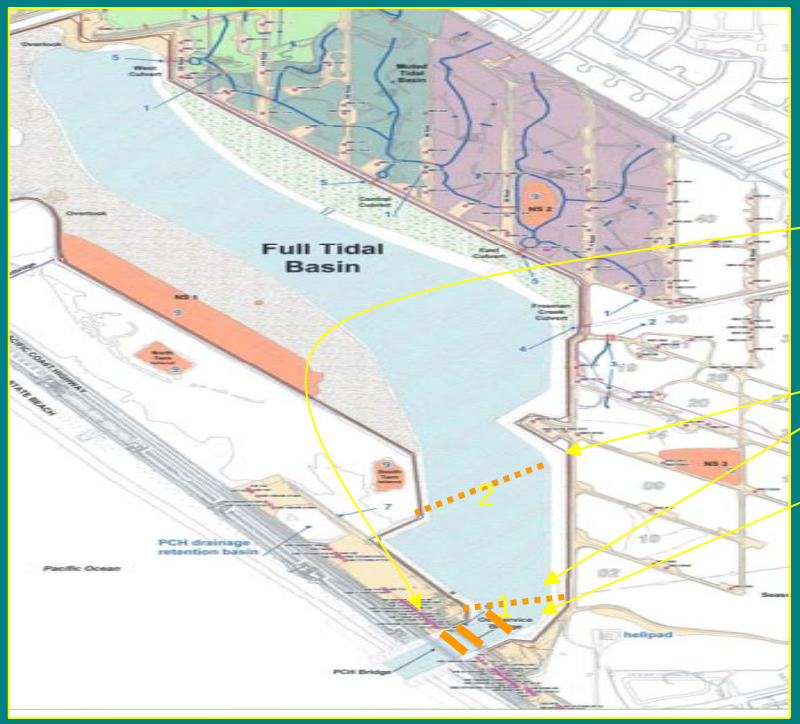
Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions falling or slack before fall

Tactics:

1. Deploy oil snare lines from bridge to contain and recover oil in high current areas
2. Isolate Tidal areas by closing water control structure
   a) Use mechanical means to isolate MTB and Freeman Creek Culverts
3. Stage protection/containment strategies in FTB to contain release
4. Recover floating oil offshore if possible
   a) Stage shoreside recovery equipment at collection points
   b) Stage sorbents or passive recovery if oil is not heavy enough for skimming operations
5. Cleanup shorelines with approved countermeasures
   a) Mobilize for possible beach cleanup
   b) Use approved cleanup tactics to remove oil from shorelines



Scenario: Oil Service Bridge Spill

Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions rising or slack before rise

Tactics:

1. Deploy oil snare lines from bridge to contain and recover oil in high current areas
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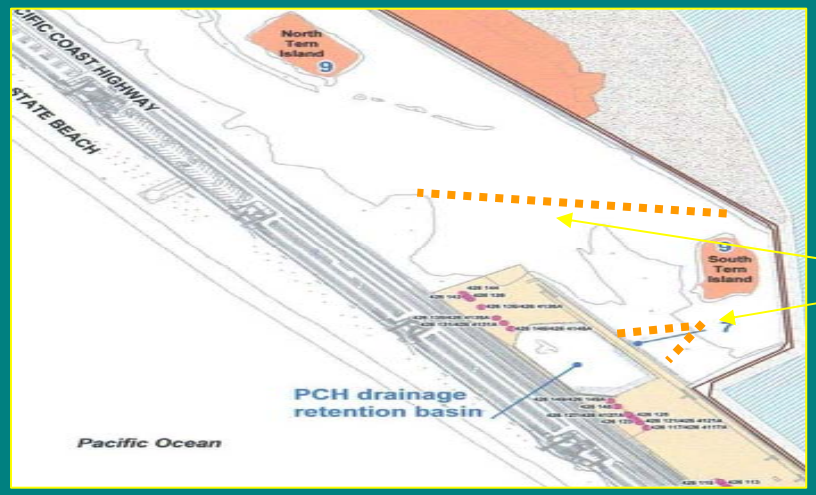
5. Cleanup shorelines with approved countermeasures
   a) Mobilize for possible shoreline cleanup
   b) Use approved cleanup tactics to remove oil from shorelines



Scenario: Spill from Retention Pond on State Lease to Inner Bolsa Bay

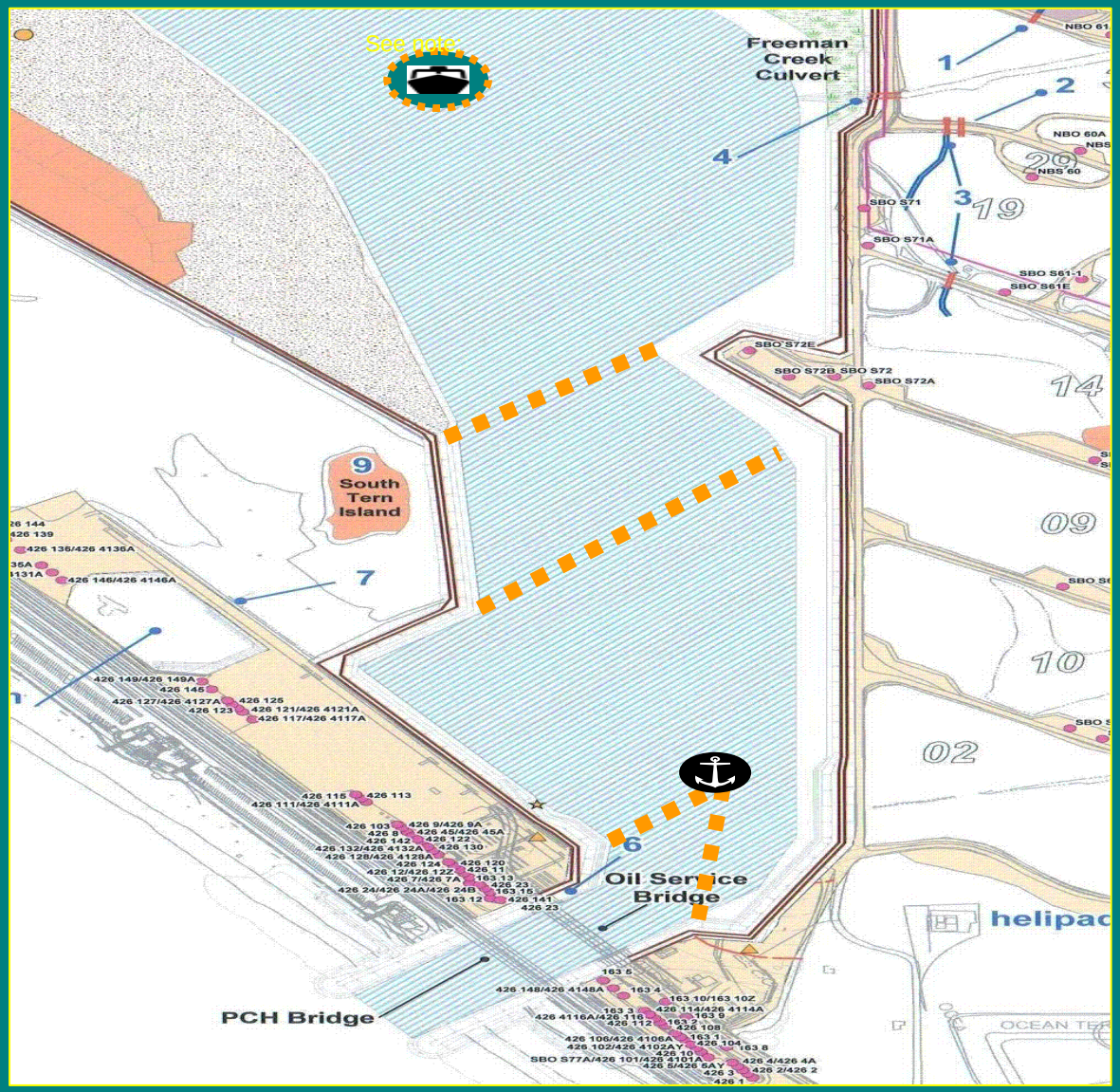
Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions rising or slack before rise

Tactics:

1. Deploy protection/containment strategies in Inner Bolsa Chica Bay to contain release
    1. Deploy containment boom near source if possible
    2. Implement planning strategies
2. Recover floating oil at collection points if possible
    a) Stage shoreside recovery equipment at collection points
    b) Stage sorbents or passive recovery if oil is not heavy enough for skimming operations
3. Cleanup shorelines with approved countermeasures
    a) Mobilize for possible shoreline cleanup
    b) Use approved cleanup tactics to remove oil from shorelines



Oil spill containment boom (solid filled floatation 10-24" overall)

Anchor point (40-60 lb. Danforth anchor or similar)

Bolsa Chica Booming Strategy detail

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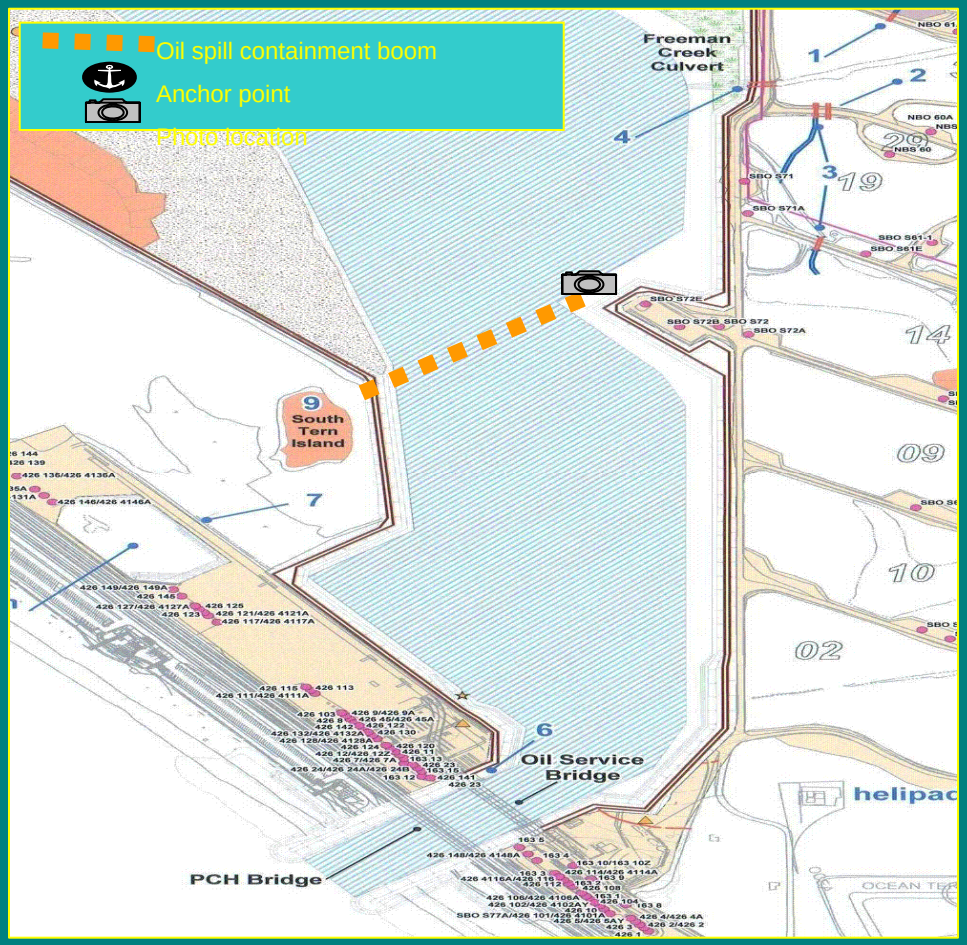

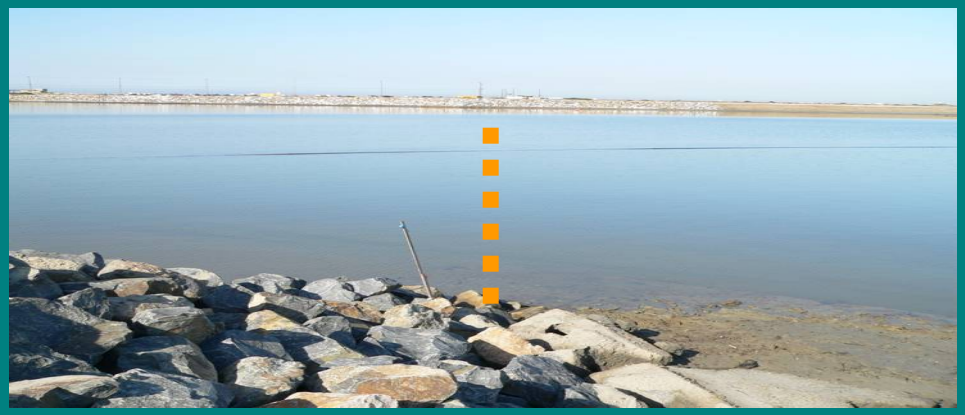

Bolsa Chica Booming Strategy detail

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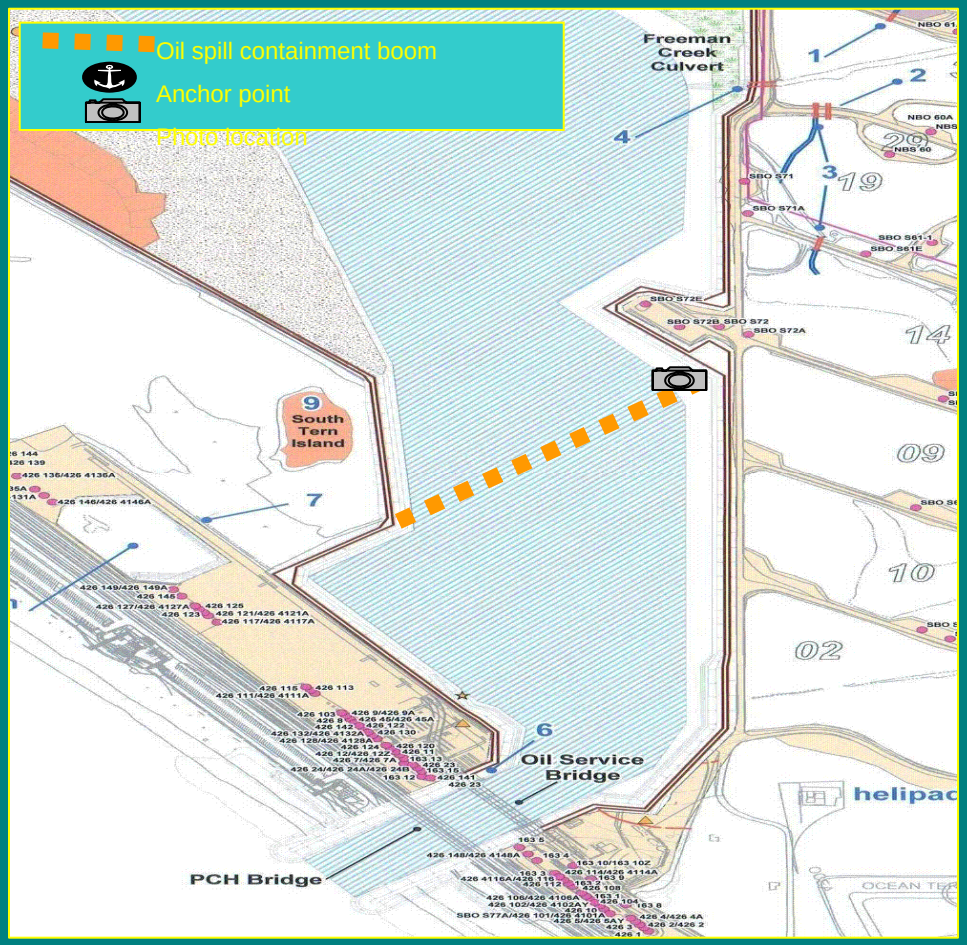
This deployment will be facilitated by placement of permanent boom anchors on the levee structure (pictured below)

Photo of anchor point detail



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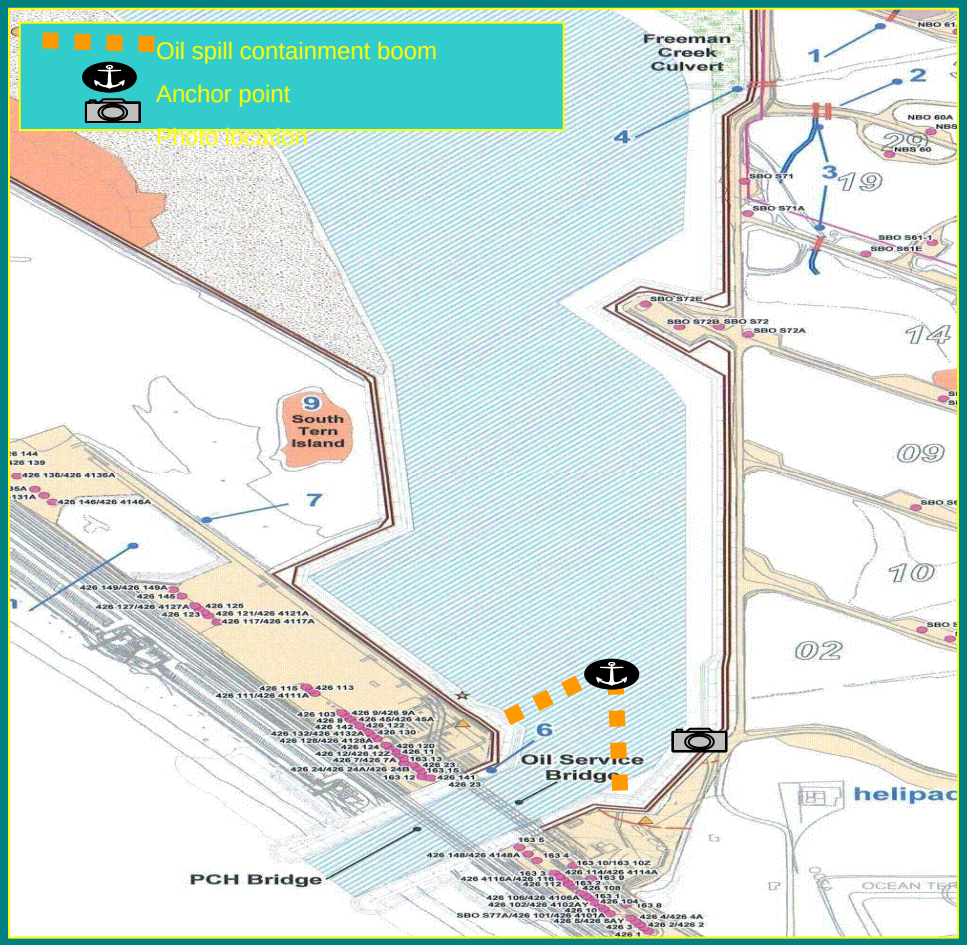

Bolsa Chica Booming Strategy detail

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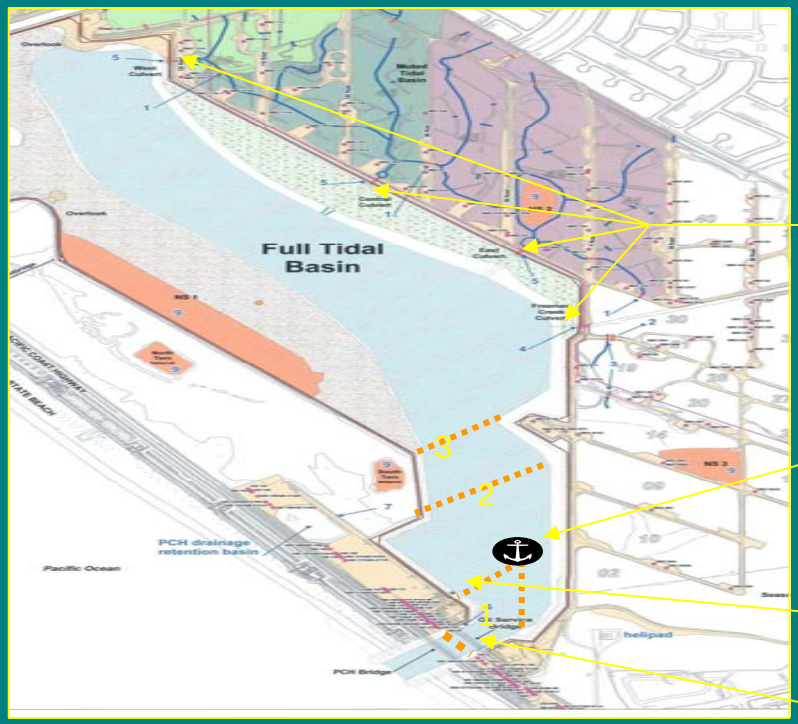

Scenario: Spill to FTB from State Lease

Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions falling or slack before fall

Tactics:

1. Isolate FTB by closing water control structures
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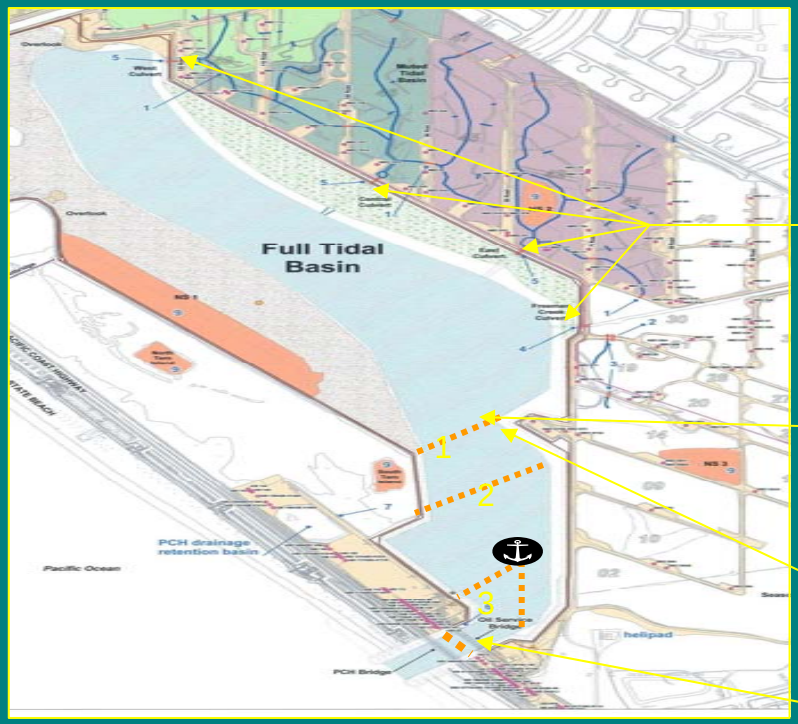
   - c) Deploy oil snare as appropriate in high current areas
4. Cleanup shorelines with approved countermeasures
   - a) Use approved cleanup tactics to remove oil from shorelines



Scenario: Spill to FTB from State Lease

Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions rising or slack before rise

Tactics:

1. Isolate FTB by closing water control structures
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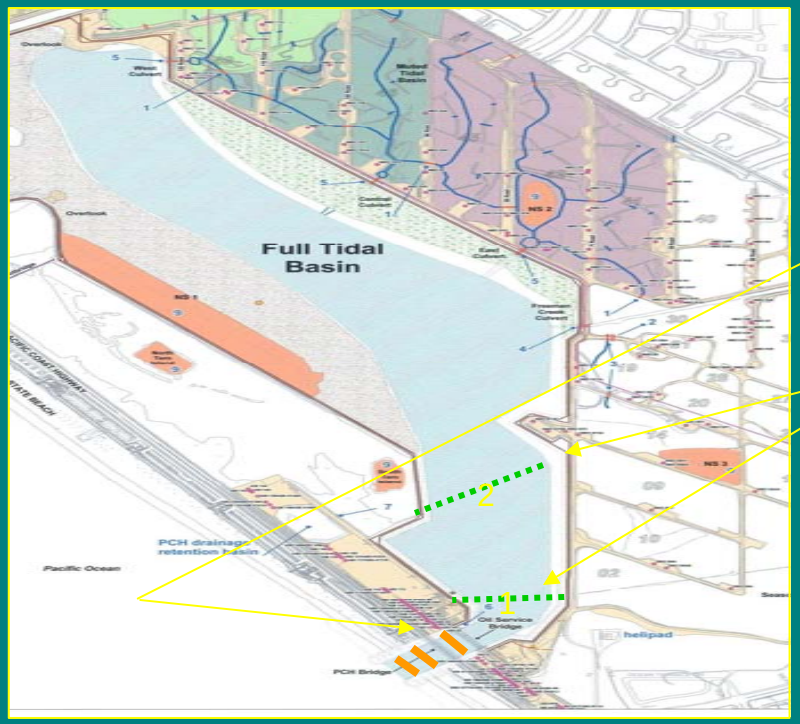


Scenario: Oil Service Bridge Spill

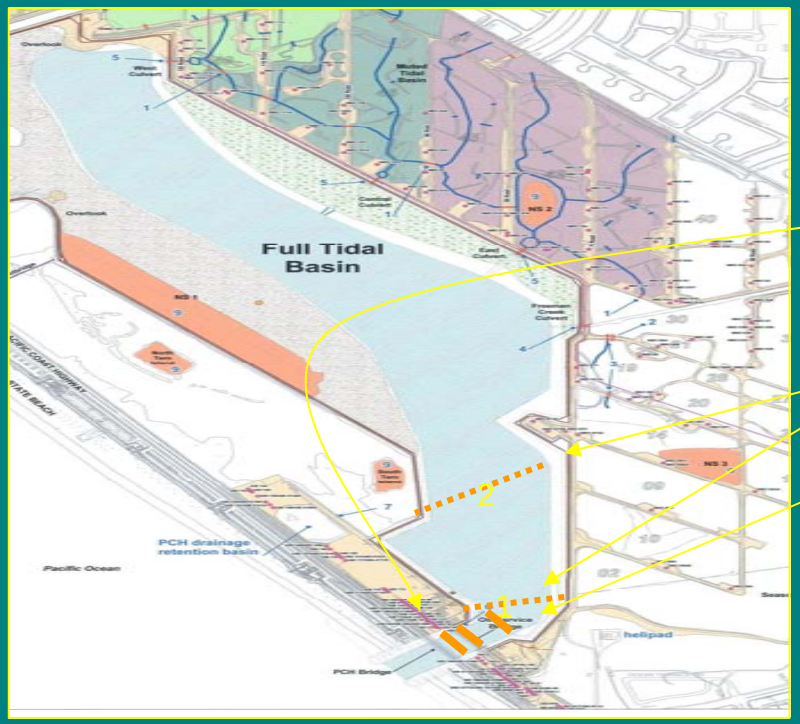
Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions falling or slack before fall

Tactics:

1. Deploy oil snare lines from bridge to contain and recover oil in high current areas
2. Isolate Tidal areas by closing water control structure
   a) Use mechanical means to isolate MTB and Freeman Creek Culverts
3. Stage protection/containment strategies in FTB to contain release
4. Recover floating oil offshore if possible
   a) Stage shoreside recovery equipment at collection points
   b) Stage sorbents or passive recovery if oil is not heavy enough for skimming operations
5. Cleanup shorelines with approved countermeasures
   a) Mobilize for possible beach cleanup
   b) Use approved cleanup tactics to remove oil from shorelines



Scenario: Oil Service Bridge Spill

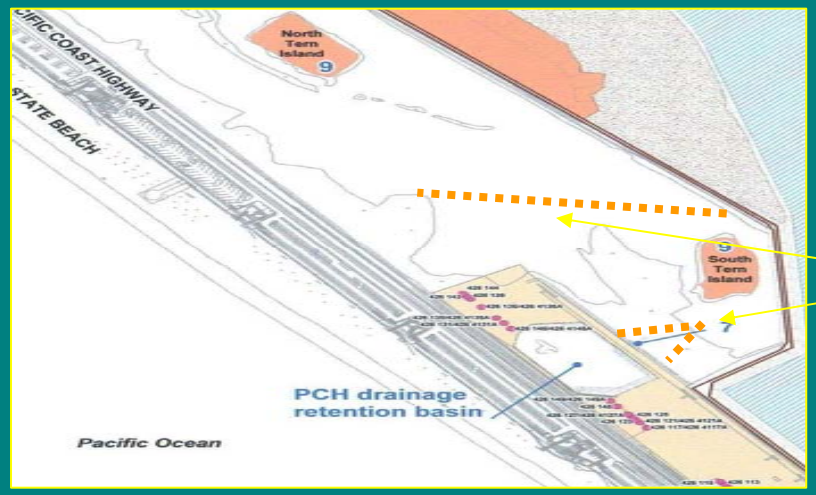
Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions rising or slack before rise

Tactics:

1. Deploy oil snare lines from bridge to contain and recover oil in high current areas
2. Isolate Tidal areas by closing water control structure
   a) Use mechanical means to isolate MTB and Freeman Creek Culverts
3. Deploy protection/containment strategies in FTB to contain release
4. Recover floating oil at collection points if possible
   a) Stage shoreside recovery equipment at collection points
   b) Stage sorbents or passive recovery if oil is not heavy enough for skimming operations
5. Cleanup shorelines with approved countermeasures
   a) Mobilize for possible shoreline cleanup
   b) Use approved cleanup tactics to remove oil from shorelines



Scenario: Spill from Retention Pond on State Lease to Inner Bolsa Bay

Objective: Minimize environmental impact

Strategy: Contain the release

Tidal conditions rising or slack before rise

Tactics:

1. Deploy protection/containment strategies in Inner Bolsa Chica Bay to contain release
    1. Deploy containment boom near source if possible
    2. Implement planning strategies
2. Recover floating oil at collection points if possible
    a) Stage shoreside recovery equipment at collection points
    b) Stage sorbents or passive recovery if oil is not heavy enough for skimming operations
3. Cleanup shorelines with approved countermeasures
    a) Mobilize for possible shoreline cleanup
    b) Use approved cleanup tactics to remove oil from shorelines