



Coastal Facilities Decommissioning Challenges A Review of Recent Decommissioning Projects



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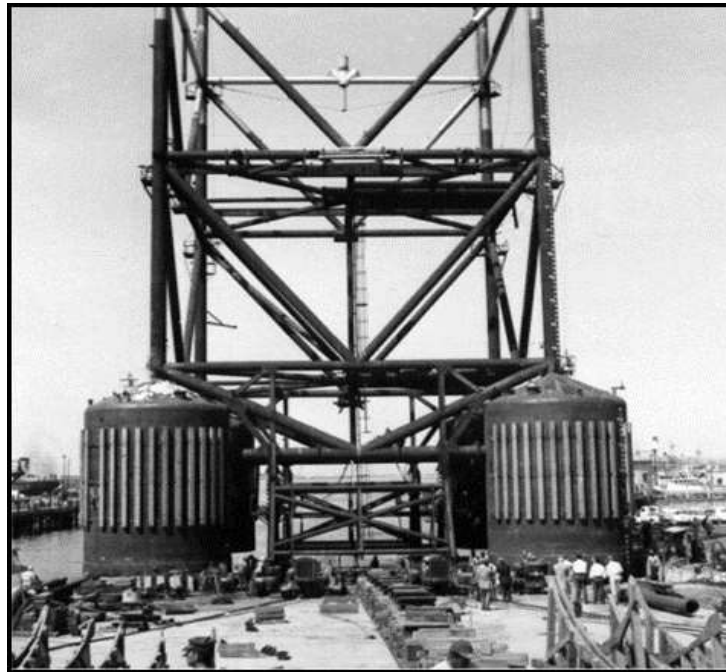


Past Decommissioning Projects

- CSLC Summerland Beach Legacy Well P&A's
- Unocal Ventura Tanker
- Chevron 4H Platforms
- Exxon Belmont Island
- PG&E Line 182
- PG&E SF-Oakland Bay Bridge 10" DRM Reroute
- El Paso Hercules San Pablo Bay MOT
- Exxon OST Facility (OCS)
- SWARS Subsea Well Abandonment Program
- Gaviota Marine Terminal
- Unocal Cojo Marine Terminal
- Mobil Seacliff Pier Complex
- Texaco Hollister Ranch Pipeline and Onshore Processing Facilities
- ARCO Bird Island
- SCE SONGS 1 OTC
- SCE Mandalay MOT
- CSLC Coastal Hazards Removal Program
- PG&E Line 114, Line 114-1 and Line SP4Z San Joaquin River

Chevron 4H Platforms

- Permitting – Know the Issues
- Technical – Know the Facility



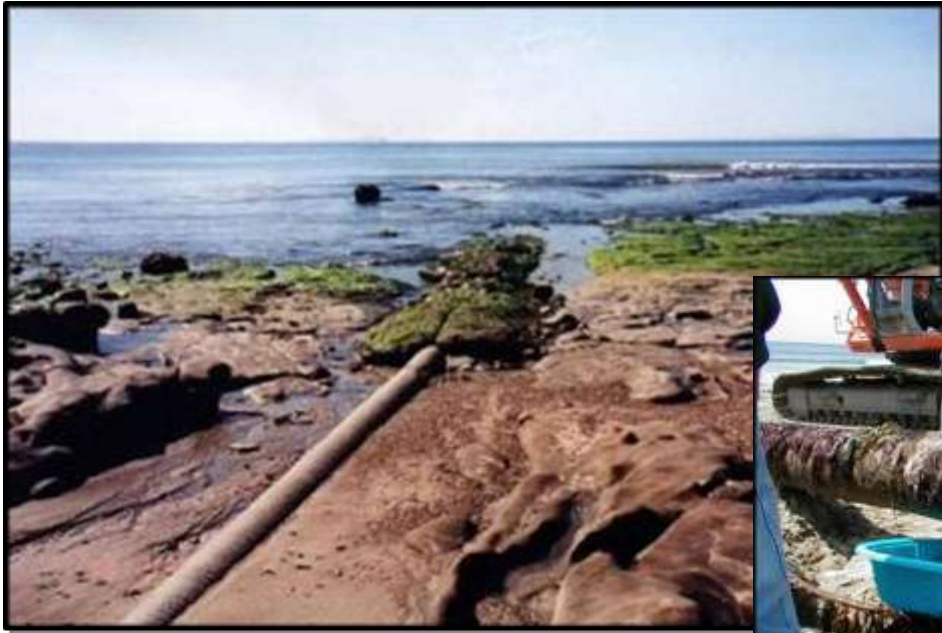
Exxon Belmont Island

- Permitting – Artificial Reefing
- Technical – Know the Facility



Unocal Cojo Marine Terminal

- Permitting – T&E Issues
- Technical – Site Conditions Impact Methods



Mobil Seacliff Pier Complex and ARCO Bird Island

- Permitting – The Art of Explosives
- Technical – Improvements in Cutting Tech



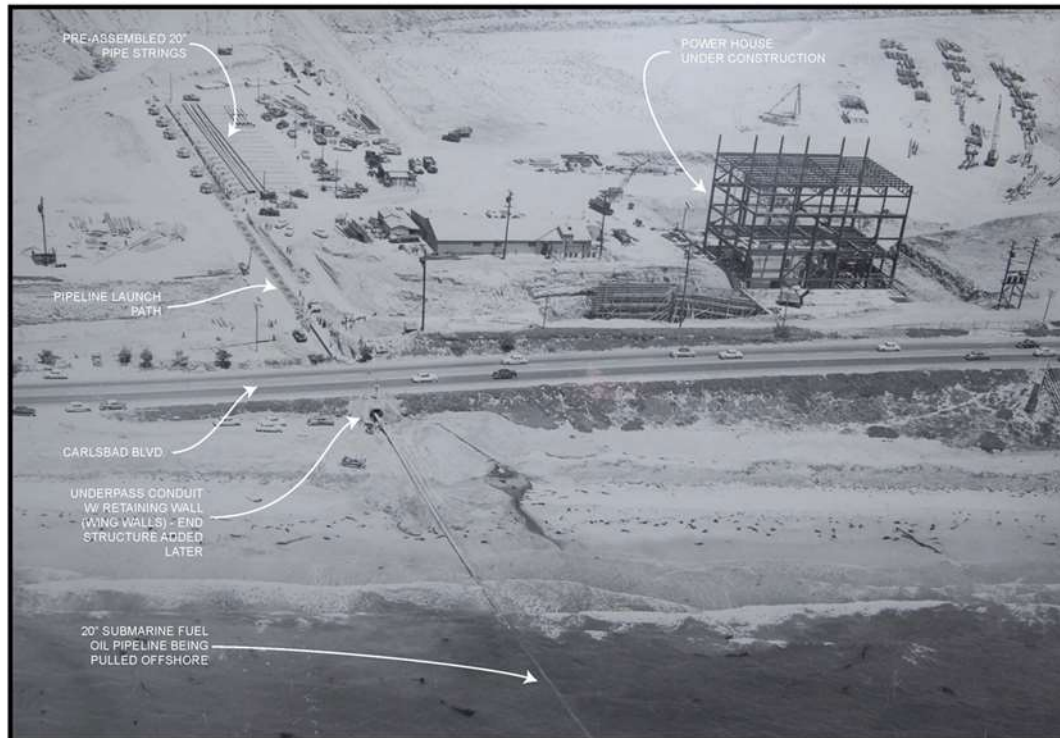
SCE Mandalay Marine Oil Terminal

- Permitting – Don't Underestimate Surf Zones and Their Surprises
- Technical – Pig, Pig, Pig



Current Decommissioning Project Overview

- Encina Marine Oil Terminal Decommissioning Project

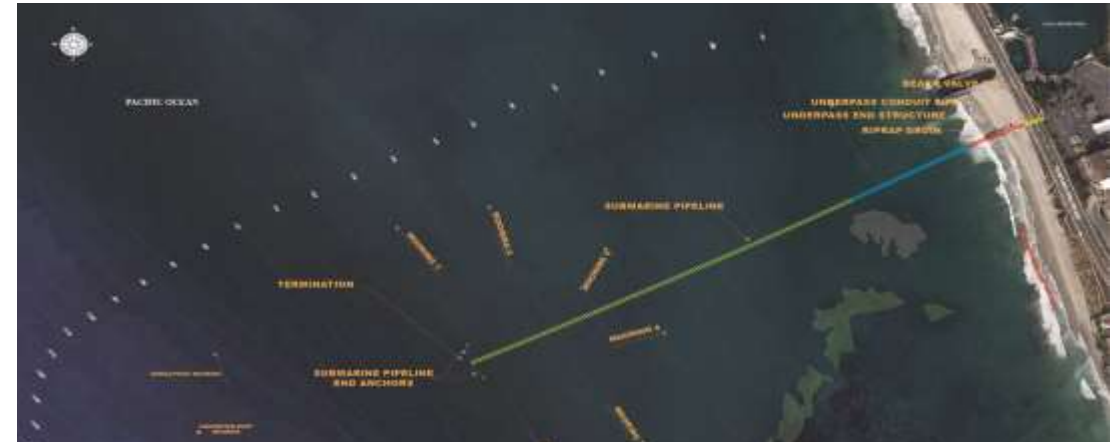


- Morro Bay Marine Oil Terminal Decommissioning Project



Encina Marine Oil Terminal Decommissioning Project

- Cabrillo Power LLC
- Encina Power Station, City of Carlsbad.
- Installation in 1953.
- Project Components
 - 3,855 feet of submarine pipeline
 - Mooring anchors
 - Beach rip-rap
 - Underpass
 - Beach valve pit



Application Process and Key Dates

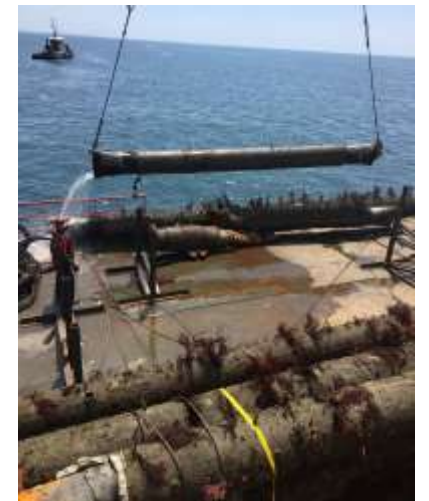
- Formal Decommissioning Application Filed in July 2014
- CSLC MND completed December 2015
- Remaining permits acquired:
 - CCC CDP – November 8, 2016
 - ACOE 404 – February 15, 2017
 - State Parks – March 1, 2017
 - RWQCB 401 – April 26, 2017
 - Archaeological Permit – February 9, 2018
- Work started January 2, 2018
- Work suspended May 31, 2018



Encina Marine Oil Terminal Decommissioning Project

Technical

- Contract Based on a Comprehensive Set of Plans and Specifications
- Contractors Typically Aren't Prepared for the Level of Administrative and Technical Support Required by Marine Decom Projects



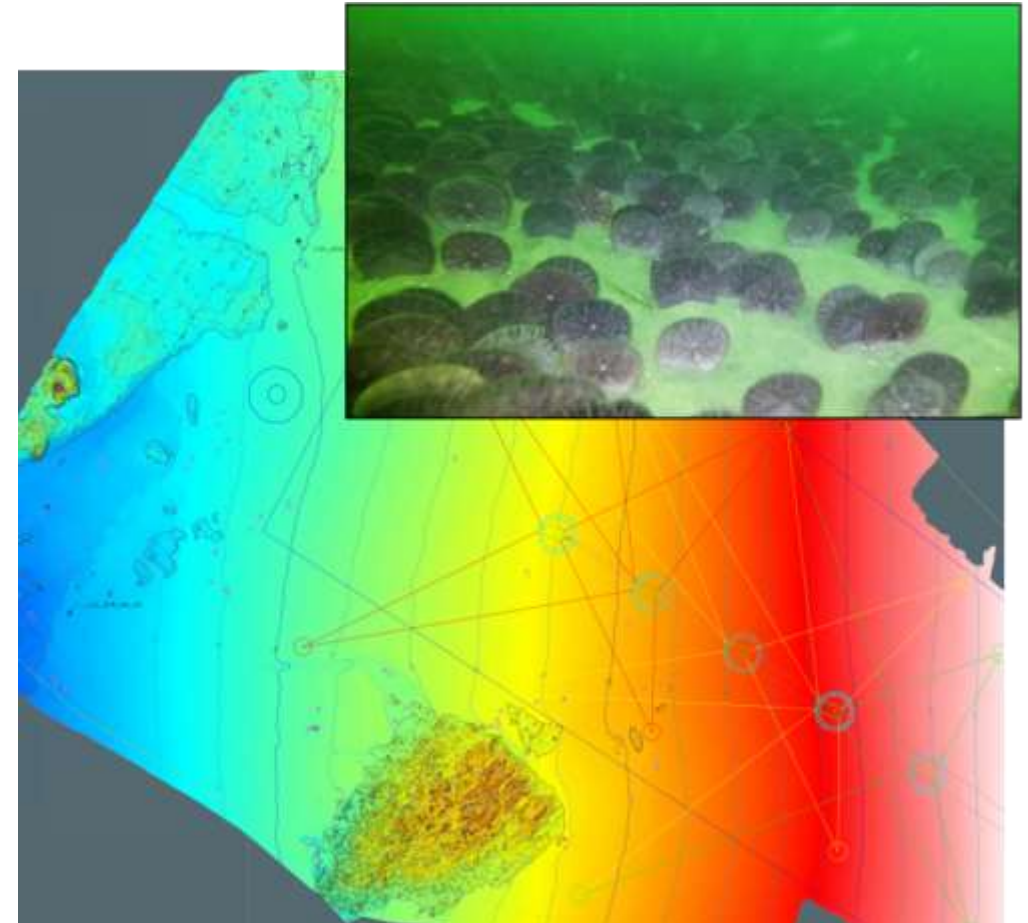
Morro Bay Marine Oil Terminal Decommissioning

- Dynegy Morro Bay LLS
- Morro Bay Power Plant, City of Morro Bay
- Facilities Constructed circa 1954
 - CSLC Lease PRC 1390.1 Originated 1954. CSLC Lease Revised 1976 and 2004
 - Tanker Berth Mooring System and Cargo Hoses Removed in 1996
 - Tanker Berth Operational Status Changed to USCG “Caretaker” Status in 1997
- Project Components
 - MBPP Facilities
 - Pipeline Segments (16- and 24 inch)
 - Sand Dune Segment (1,180 ft)
 - Beach Segment (810 ft)
 - Surf Zone Segment (1,300 ft)
 - Offshore Segment (2,500 ft)



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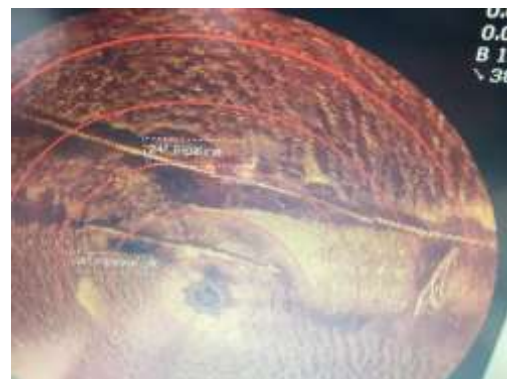
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- Duke Energy submitted CSLC Application for Decommissioning – September 2004 (application withdrawn)
- Dynegy submitted CSLC Application for Decommissioning – February 2016
- CSLC MND completed February 2018
- Final Permits acquired August 2018
- Work started August 2018



Morro Bay Marine Oil Terminal Decommissioning

Challenges

- Old Facilities Come with Surprises
- Pig, Pig, Pig
- Timing is Everything on Coastal Projects
- Things Change – The Lagoon
- West Coast Offshore Contractor Resources Aren't What They Used to Be
- Offshore Successes – Surgical Excavation, Shearing and Grappling



Lessons Learned and Observations for Upcoming West Decommissioning Projects

- State Waters Facilities
 - Platform Holly – Ellwood Field
 - Rincon Island
 - Estero Marine Terminal
 - Morro Bay Marine Oil Terminal
 - Grubb Lease Intake/Outfall
 - Encina Marine Oil Terminal
- OCS Facilities
 - Point Arguello Field
 - Santa Clara Unit
 - Platform Habitat
- Non-Oil and Gas Facilities
 - Diablo Nuclear Power Generation Station
 - San Onofre Nuclear Power Generation Station
 - AT&T Fiber Optic Cables
 - Numerous Intake/Outfall Structures

Future Permitting Challenges

- Federal, State and Local agencies have not permitted a large scale decommissioning project.
 - Regulatory approval timelines and requirement increase complexity in scheduling and implementing a project.
 - Integration of key regulatory processes untested and likely will require extended permitting timeline.
 - Strong entrenched NGO positions will likely complicate and extend the permitting process.
- Alternative/reuse should be examined
- Abandonment in place alternatives may be best alternatives – should be carefully considered:
 - Structural integrity and depth of burial can present environmental and safety challenges
 - Long term liability issues complicate otherwise viable options.
- Aging facilities present many new challenges during the implementation phase and these uncertainties need to be built into the permit approach and final permit conditions.

Future Implementation Challenges

- Installations were not designed with removal in mind.
 - Installation process used gravity and techniques that are often hard to permit today.
- Aging facilities become increasingly more difficult to remove.
- Facility modification over time are often not well documented and can present unexpected challenges during decommissioning
- Sea state present operational and safety challenges.
- West Coast decommissioning equipment and experience is limited.

Key Lessons Learned

- The fact it was successfully installed does not mean it can be taken out – Gravity is not on your side.
- Regulatory agency staff need to be shown the engineering and environmental challenges facing a project.
- Time is not on your side.
 - Start engineering and permitting process as soon as possible.
 - Identify and understand key issues and drivers.
- Work with an integrated team.
- The surf zone is not your friend.