Update

Ocean Desalination Feasibility Studies

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MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

South Orange County Challenges

- Region is 95% dependent on imported water to meet potable demand
- Single water treatment plant and two pipelines supply imported water to more than 500,000 residents and businesses
- Limited groundwater, surface water
- Emergency outage of the imported water delivery system could cause significant problems for residents, businesses, and the economy

Planned Reliability Improvements

- System Reliability Improvements
  - Lined and covered reservoirs
  - Interconnections
  - Ocean desalination
- Supply Reliability Improvements
  - Water recycling
  - Water use efficiency/conservation
  - Groundwater recovery projects
  - Ocean desalination

Planned Reliability Improvements *(cont'd)*

- Ocean desalination is one part of the solution – and provides two benefits:
  - A reliable local water source
  - Emergency water supply during outages of the imported delivery system

SOUTH ORANGE COUNTY WATER RELIABILITY PROJECTS

Component	Cost $M	Capacity CFS
Orange County Cross Connector	$30	25+
GW Emergency Service	$15	15
Coastal Junction Pump Connection	$2	20
IRWD to JTM	$16	50
IRWD to SCPS	$23	50
Upper & Lower Chiquita Reservoirs	$80	32
Dana Point Ocean Desal	$?	?
Total	$166	135±(1)

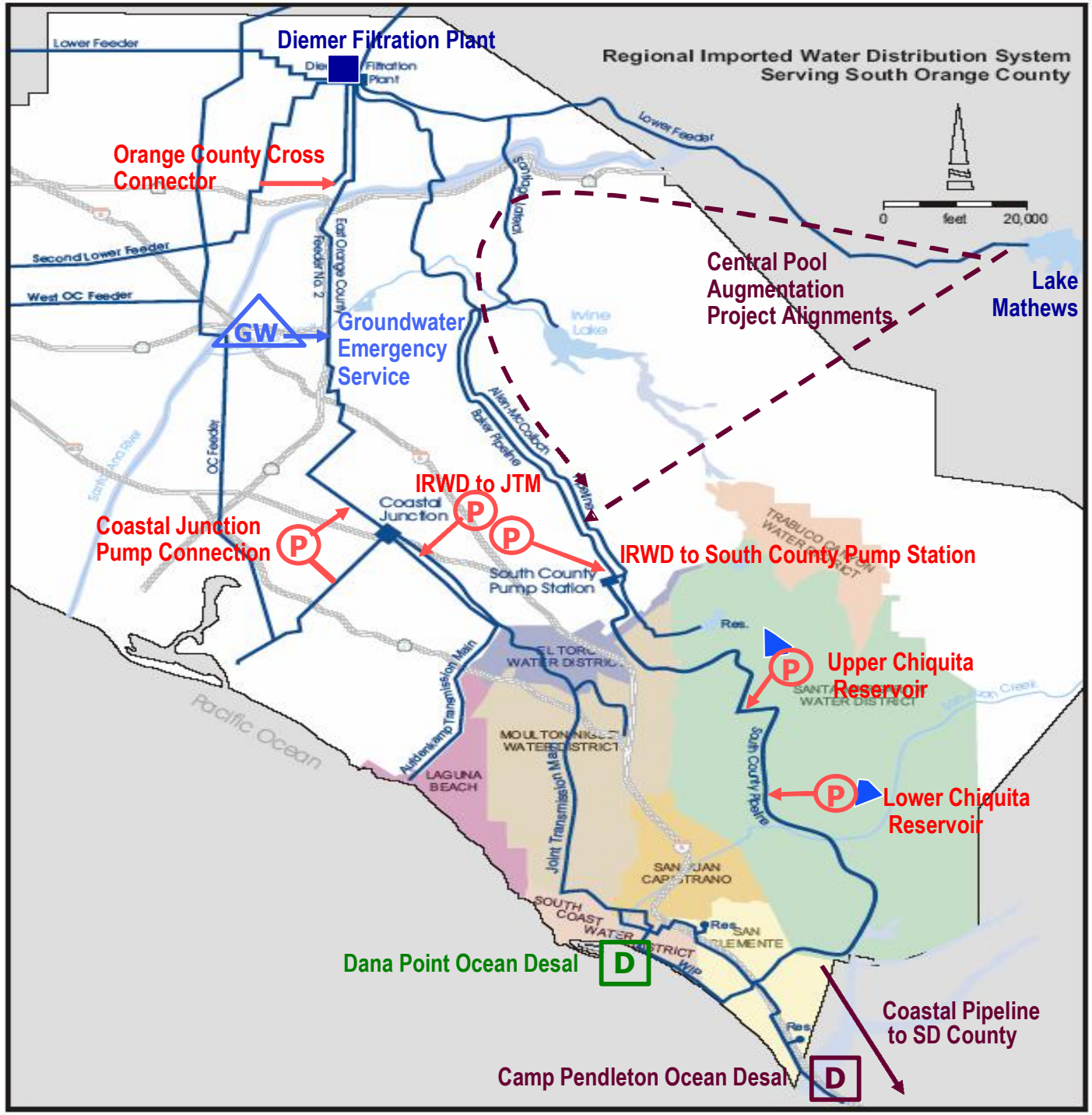
(1) Project Capacities are not all additive

Projects Further Out in Time:

Camp Pendleton Ocean Desal

Central Pool Augmentation Project

Coastal Pipeline to SD County



Dana Point Ocean Desalination

Subsurface Intake System

- No entrainment/impingement impacts
- Reduces ocean construction impacts
- Improved chance for permitting approval
- Pretreatment – natural sand and gravel filtration could eliminate need for costly pre-filtration step

Questions to be Answered:

- Capacity of intake system
- Which technology to use for well intake
- Power source for treatment plant
- Use of existing outfall system for brine discharge

Working with Federal, State and Local Agencies

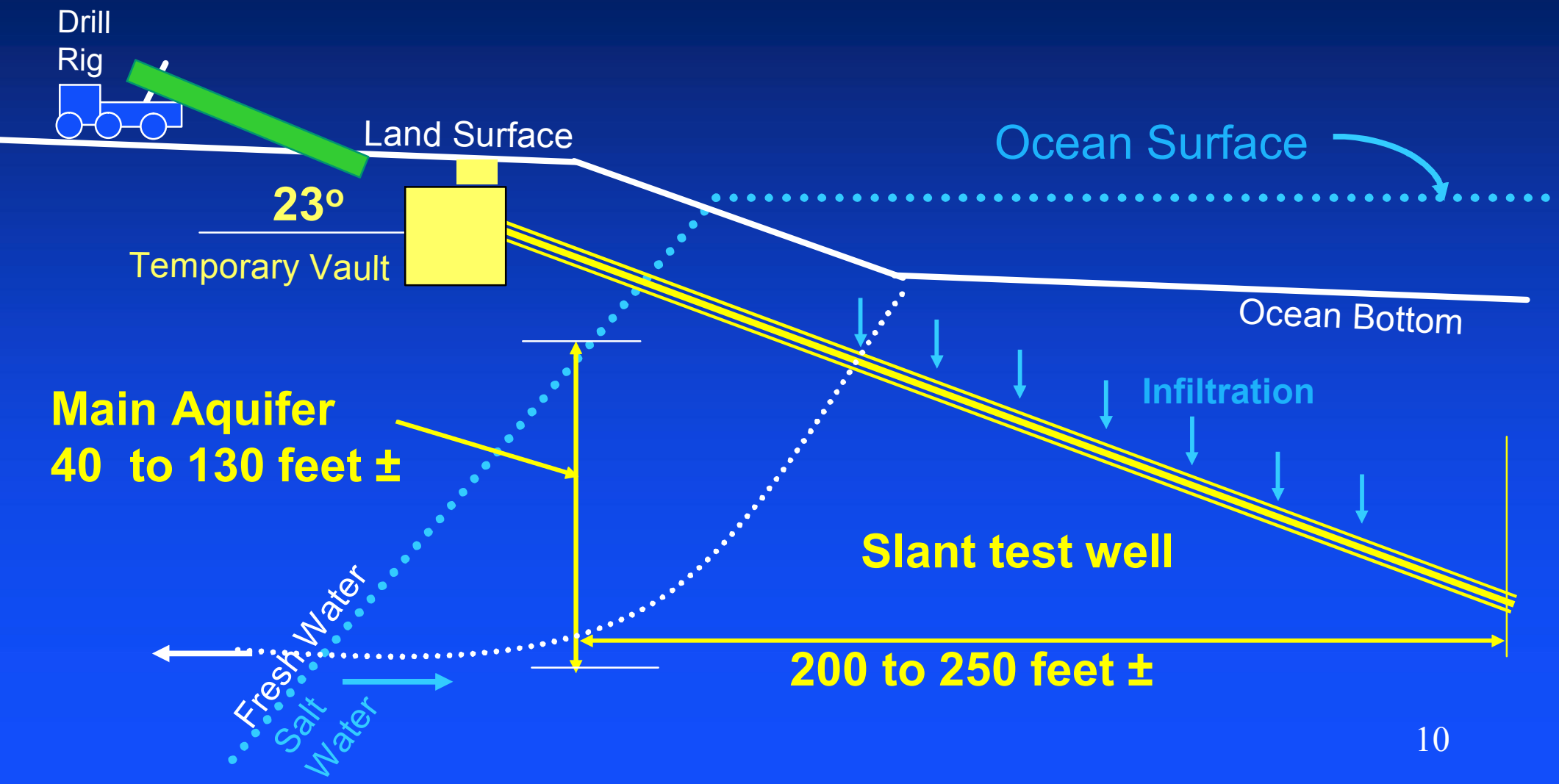
- U.S. EPA
- U.S. Bureau of Reclamation
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- California Department of Water Resources
- California State Lands Commission
- California Department of Parks and Recreation
- California Department of Fish and Game
- California Coastal Commission
- San Diego Regional Water Quality Control Board
- County of Orange
- City of Dana Point
- South Coast Water District
- Metropolitan Water District of Southern California


Phase 1 Exploratory Test Boring Sites
Future Desalination Site
B4/M2
B3
B2/M1
Bore Hole//Monitoring Well
Bore Hole
SOCWA Outfall
B1

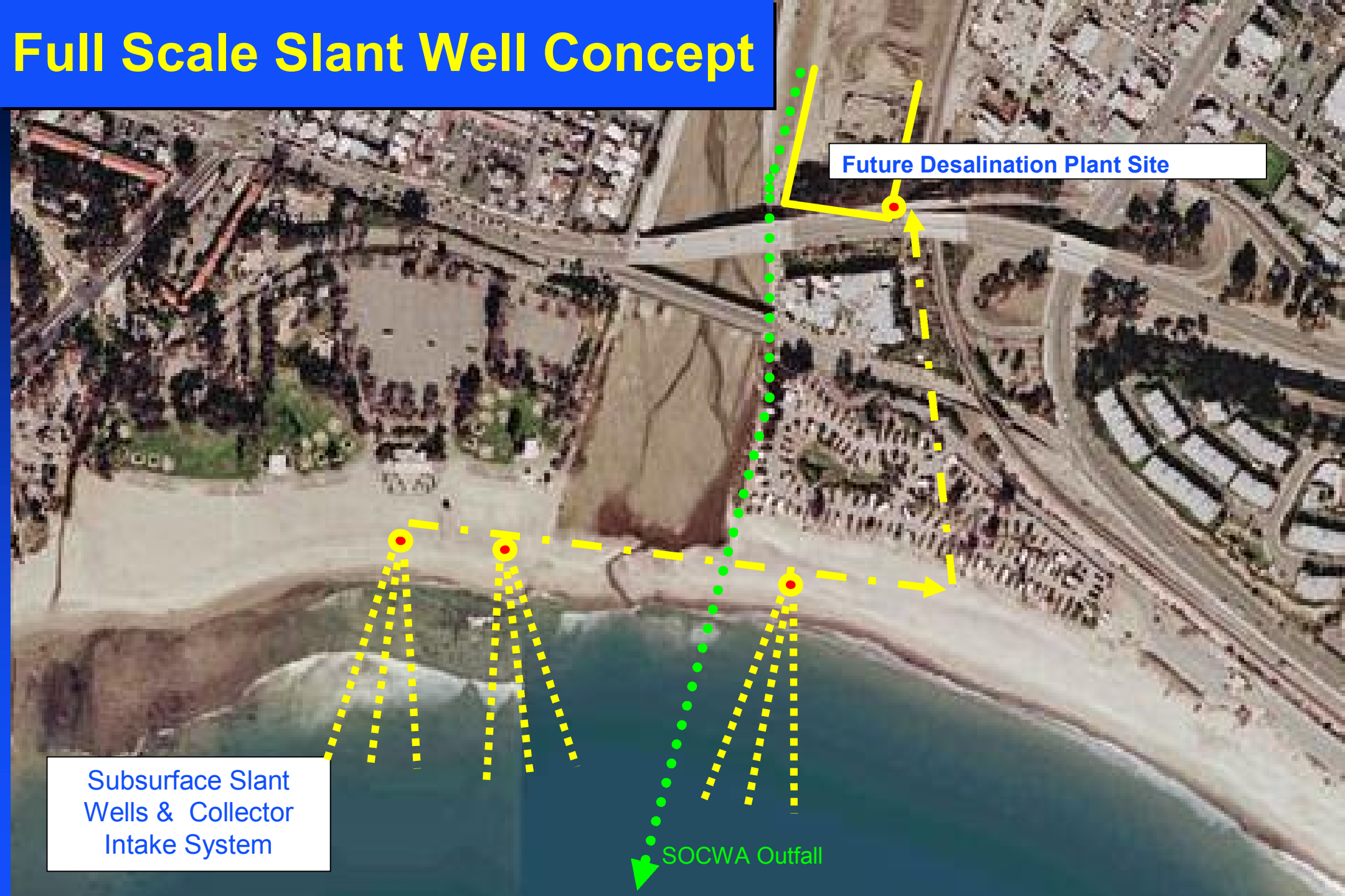
Dana Point Phase 1 Hydrogeology Conclusions

- The permeability of the aquifer formation looks promising
- Need information on the formations under ocean floor
- Further testing needed to:
  - Estimate production capacity of the aquifer
  - Analyze water quality

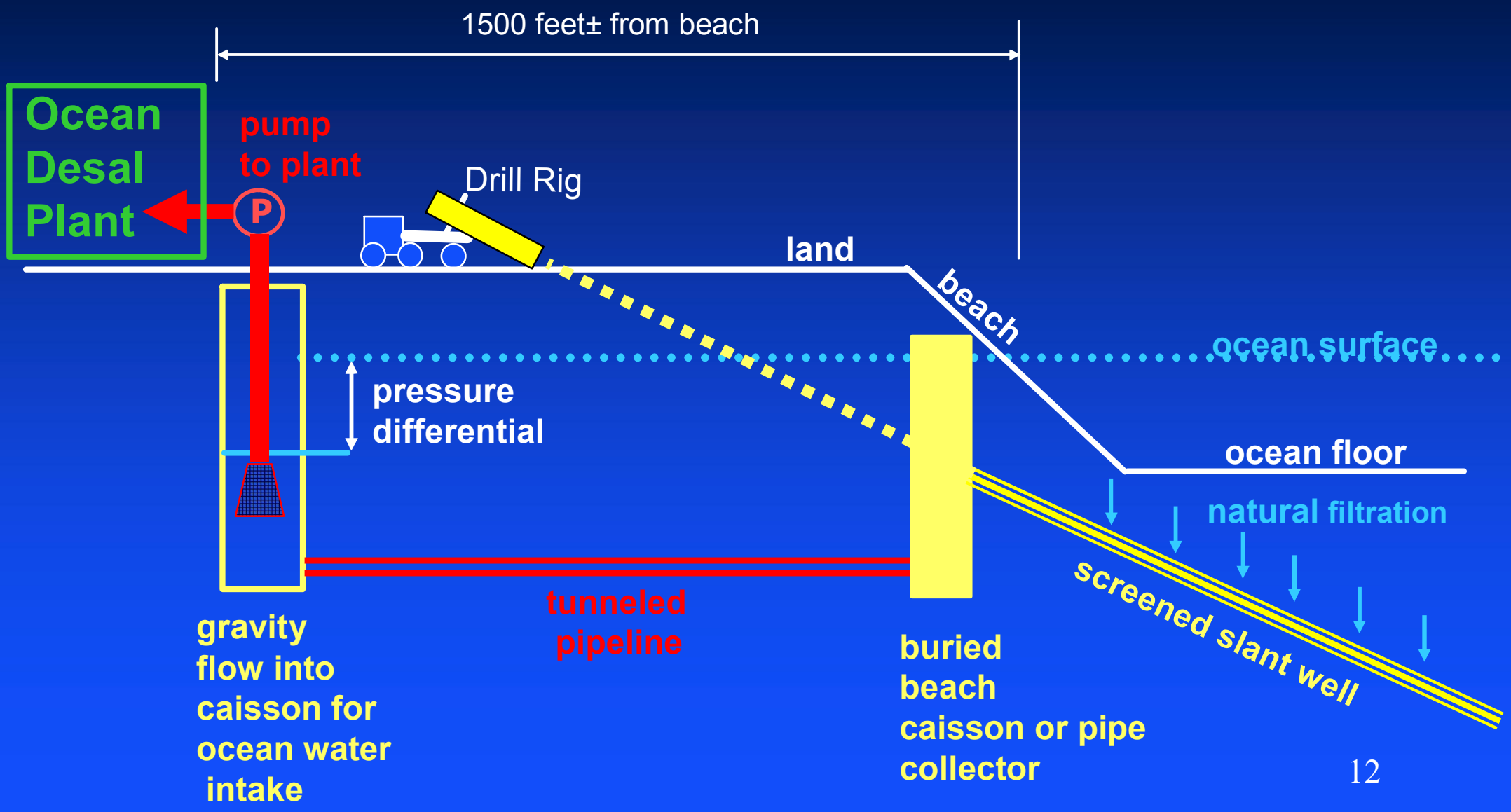
Phase 2 Near Shore Test Drilling Approach



Full Scale Slant Well Concept



Slant Well Intake System Concept



Questions or Comments?

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