



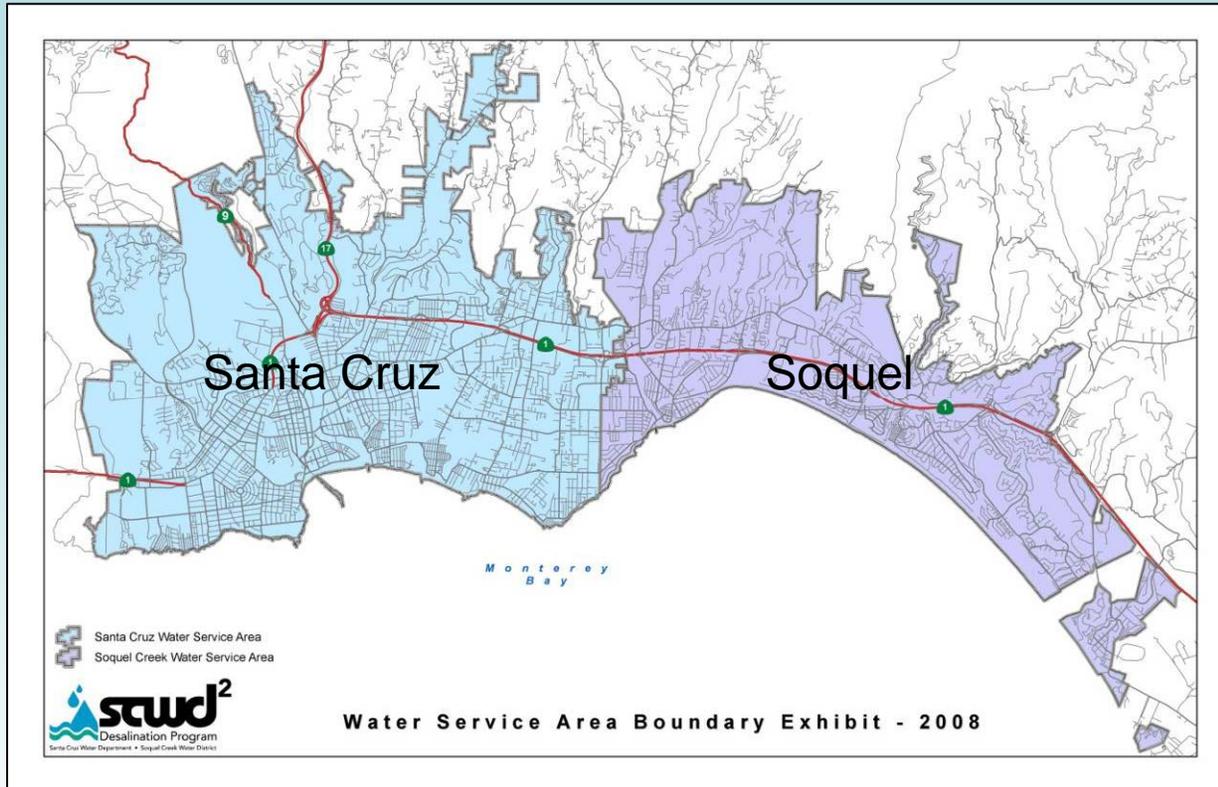
Regional Water Supply Planning and the scwd² Desalination Program

Santa Cruz County
Water Advisory Commission
Commission on the Environment
October 28, 2009

Heidi R. Luckenbach, P.E.
Desalination Program Coordinator

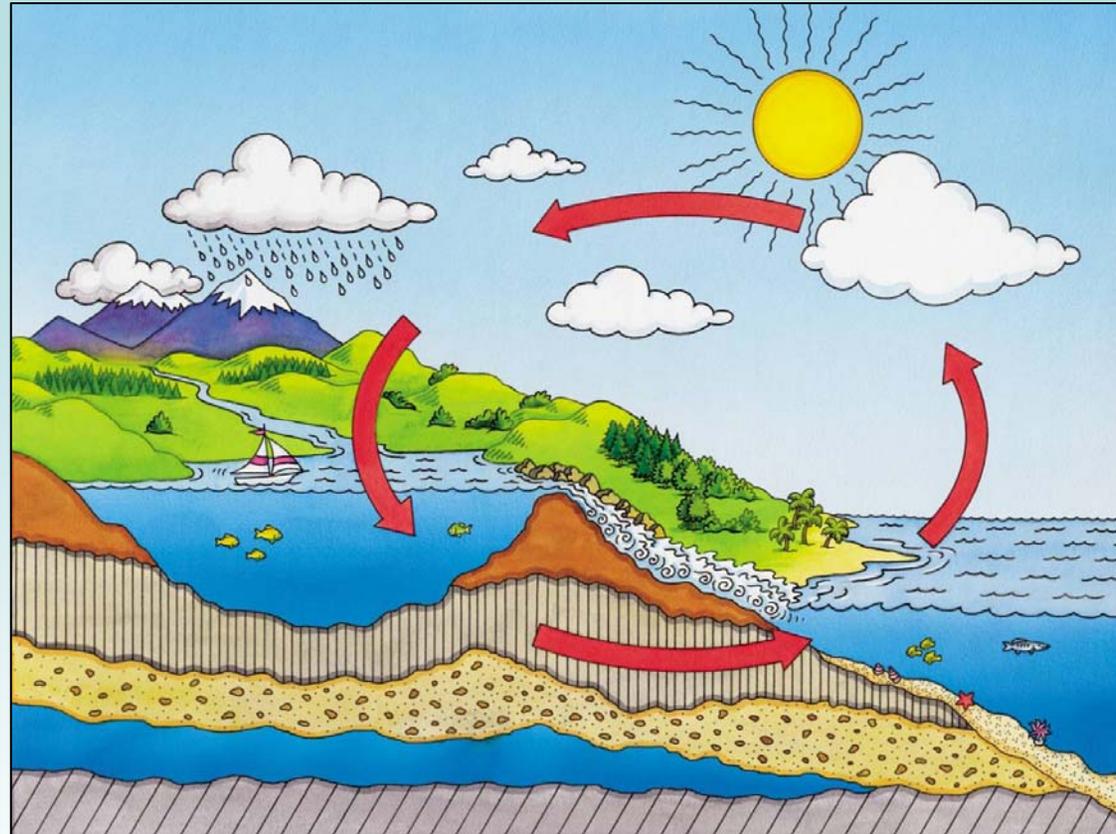


scwd² is a collaboration between the Santa Cruz Water Dept. & Soquel Creek Water Dist.



- ◆ Together we serve over 135,000 people
- ◆ Similar values and objectives
- ◆ Our different needs lead us to a collaborative approach for sustainable water resources

**All of our water comes from rain that falls locally,
on the coast-side of the Santa Cruz Mountains**



**No additional water supply projects
have been built in the last 30 years.**

scwd² Desalination Program Purpose and Need

City of Santa Cruz - Drought

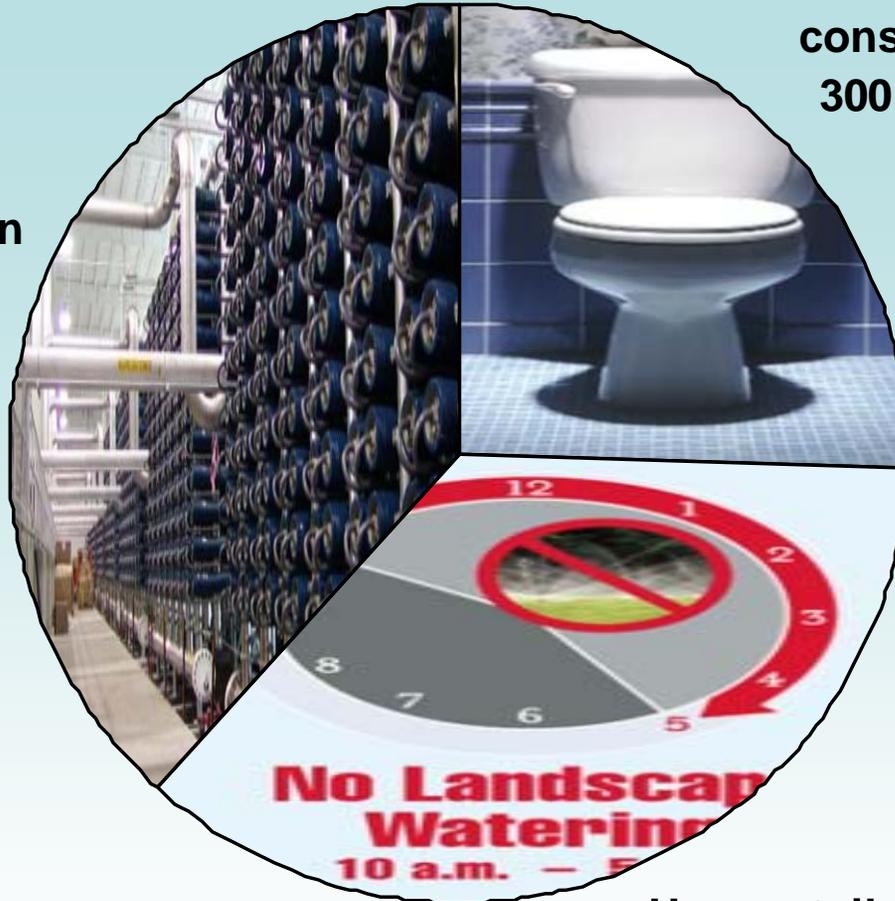
If the City were to experience a drought of a magnitude similar to 1976-77 now, our water shortage could exceed 45%.

Soquel Creek Water District – Saltwater Intrusion

Groundwater Basin Overdraft/Potential for Saltwater Intrusion.

City IWP/District IRP

**Desalination
2.5 mgd**



**Long-term
conservation
300 mil gal**

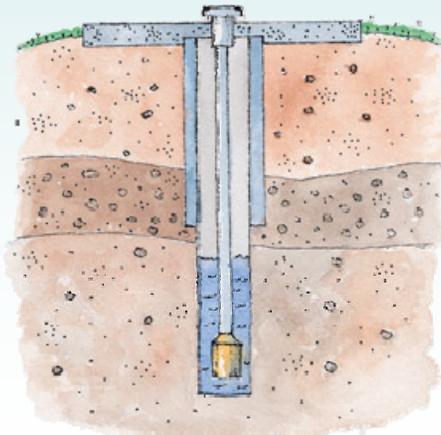
District = ~230MGY

**Use curtailment
15%**

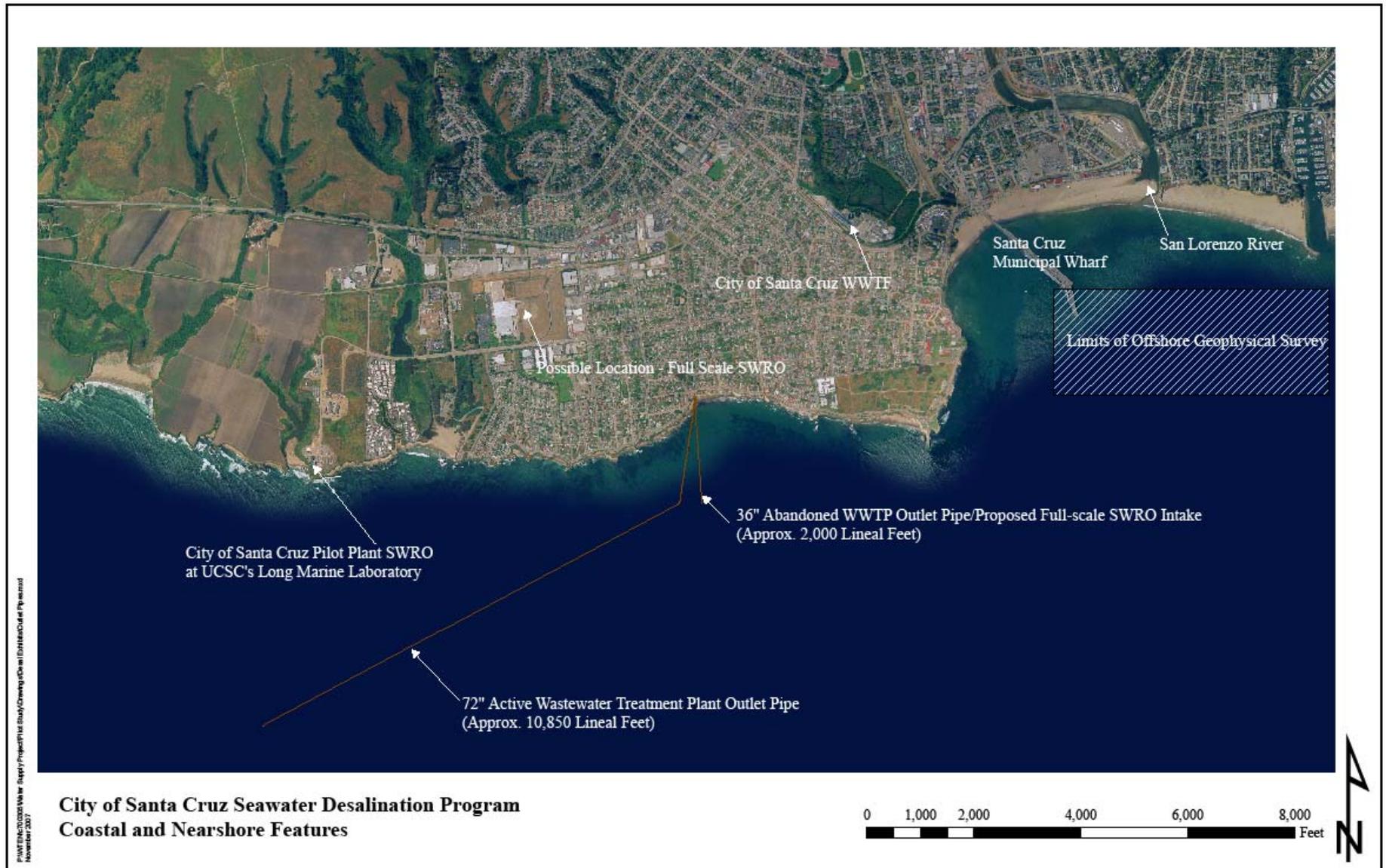
Sharing Desalinated Water



- Up to 2.5 million gallons per day
- Priority User: May - Oct



- Would use at variable rates to augment groundwater supplies & “bank” water
- Priority User: Nov - Apr



Full-Scale Plant – In Concept

scwd² Task Force is conducting numerous studies to evaluate Desalination

Concern

Study to Address

Water Quality

Pilot testing of technology

Intake

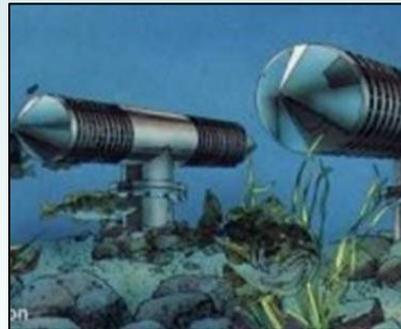
Evaluating screens and beach wells

Energy

Evaluating carbon neutral facility

Brine Discharge

Blend with wastewater plant



Our evaluation process will be careful and thorough.

Pilot SWRO Study & Watershed Sanitary Survey



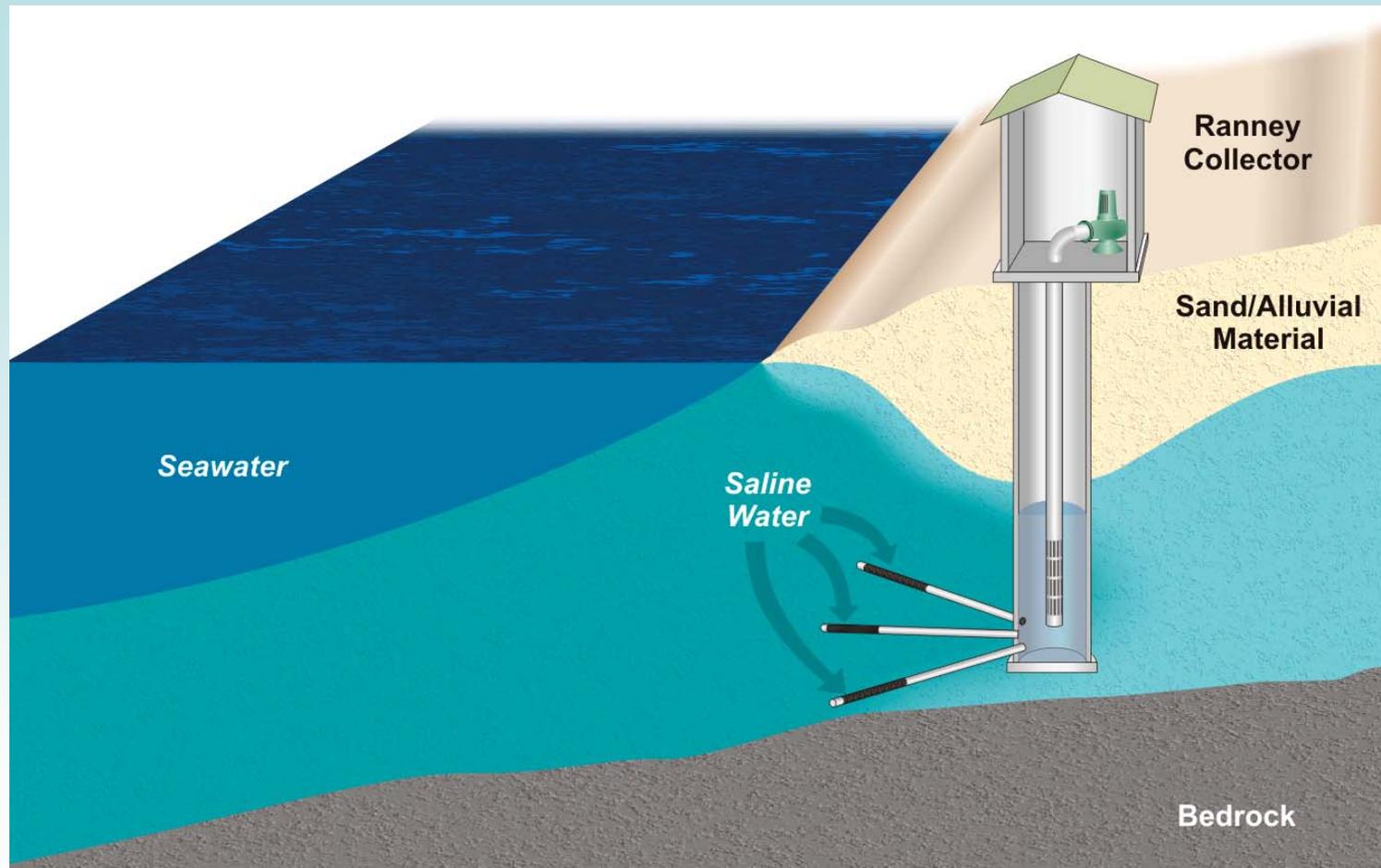
Intake Studies

For Santa Cruz, Hopkins 2001 Report concluded that the local geology does not support subsurface intakes



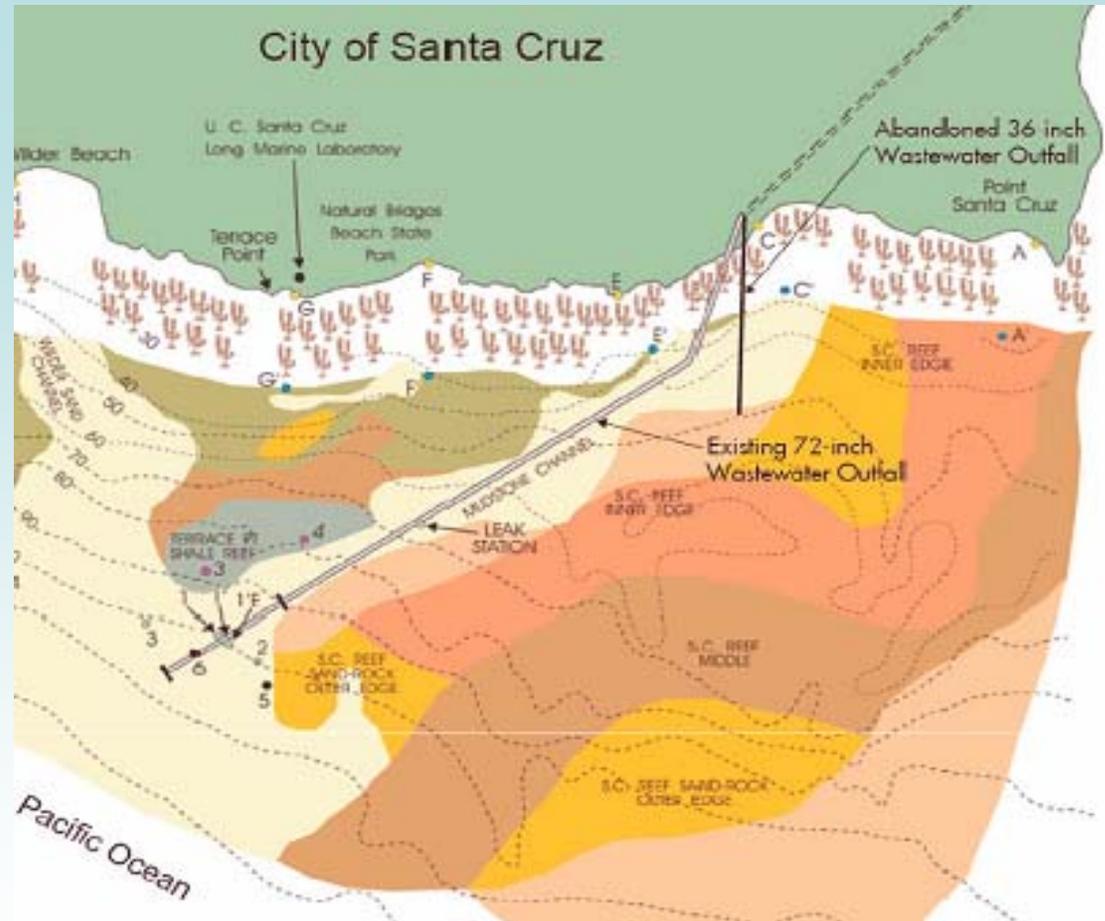
Beaches along Santa Cruz coastline

Vertical or Horizontal Beach wells require deep beaches with large-grain sands and good hydraulics



Initial scwd² intake approach was to convert an abandoned outfall into a screened open intake

- ◆ Uses existing infrastructure
- ◆ Reduces capital costs
- ◆ Minimizes construction impacts to ocean floor
- ◆ Cylindrical wedgewire screens to minimize entrainment



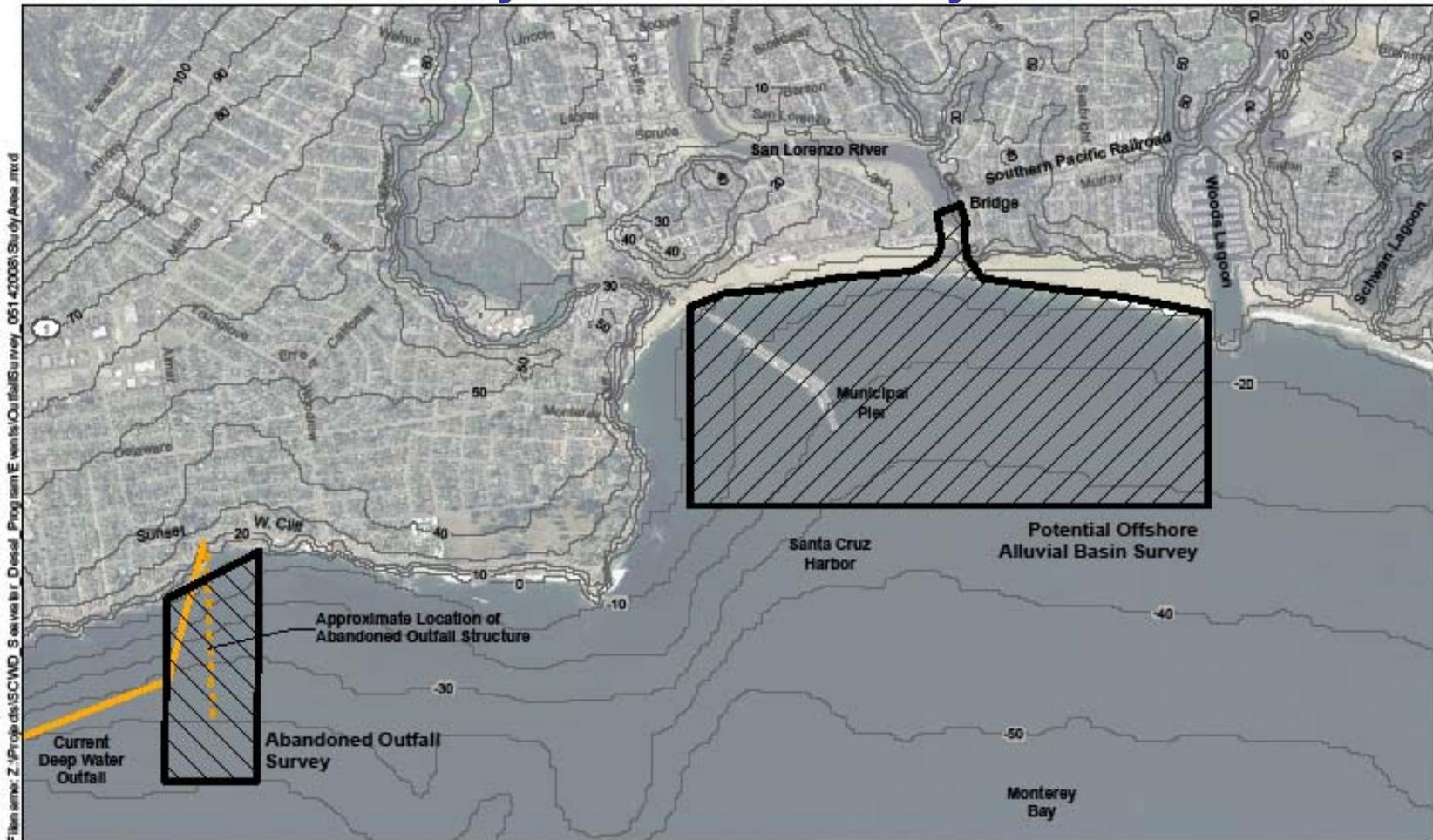


Full-Scale Intake – In Concept

Entrainment Study Area and Sampling Locations (Tenera Environmental)



Intake Study - Offshore Study Areas

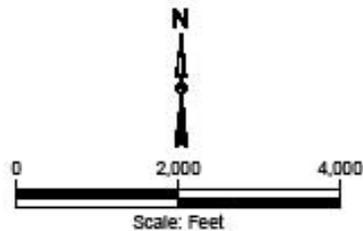


File name: Z:\Proj\ds\SCWD Seawater Desal Program Events\OutfallSurvey_05142008\StudyArea.mxd

Legend

- - - Approximate Location of Abandoned Outfall
- Topographic/Bathymetric Contour (10-foot interval)

Note: Bathymetric and Topographic data source: Monterey Bay Aquarium Research Institute (MBARI), publication date 11/1/2000.



Kennedy/Jenks Consultants

City of Santa Cruz and Soquel Creek Water District
Seawater Desal Program
Santa Cruz, Santa Cruz County, California

Off-Shore Survey Locations

Project Number 0868005
29 May 2008

Figure 1

There is an alluvial channel offshore of Santa Cruz that may support a subsurface intake

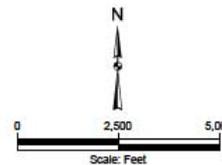


Legend

- Mud and Fine Sand - Quaternary
- Coarse Sands and Gravel - Quaternary
- Purisima Formation - late Miocene
- Santa Cruz Mudstone - Pliocene and Miocene
- pipeline

Source:

Eltreim, Stephen L., Anima, Roberto J., Stevenson, Andrew J., and Wong, Florence L., 2000/01/15, Polygon coverage MDSGEOLSE for Seafloor rocks and sediments of the continental shelf from Monterey Bay to Fort Sur, California. USGS Miscellaneous Field Studies Map MF-2345, U.S. Geological Survey, Menlo Park, CA, Text



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Santa Cruz, Santa Cruz County, California

Seafloor Geology

0868005
5 December 2008

Figure X

Energy Management

- ◆ Assess the feasibility of a carbon neutral 2.5 million gallon per day (mgd) seawater desalination facility.
 - Establish a preliminary energy baseline for operation by each agency.
 - Apportion energy and GHG impacts to SCWD & SqCWD.
 - Study the options to feasibly avoid, reduce, and sequester the net GHG emissions (direct & indirect) produced by the desal facility.

Offsetting Energy Demand

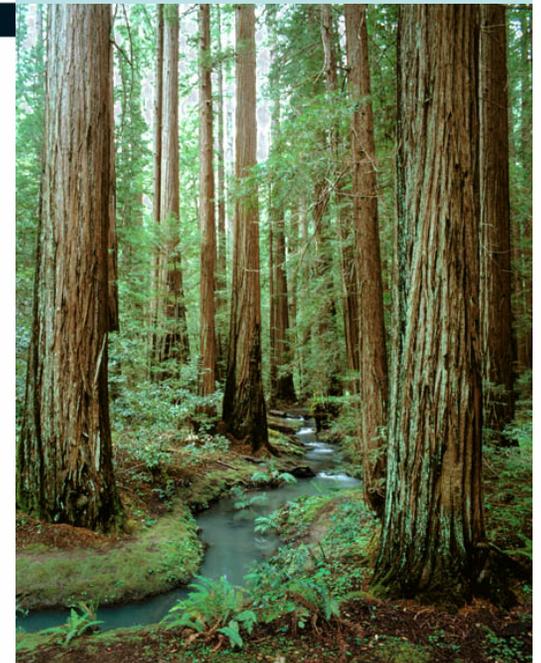
Existing Energy/Carbon Offset Projects:

- ◆ SCWD Graham Hill Treatment Plant PV solar roof and future hydroelectric units
- ◆ Advanced energy efficiency components in the SCWD's new Locust Street Office Higher-efficiency lighting and office equipment at the SqCWD offices
- ◆ SqCWD pump and motor replacement with higher-efficiency equipment
- ◆ Off-peak pumping: TOU pumping
- ◆ Energy savings through water efficiency, conservation measures & programs, and drought-related curtailment

Offsetting Energy Demand

Potential Energy/Carbon Offset Projects:

- ◆ Home/business solar PV rebate
- ◆ Wetland restorations
- ◆ Foodwaste-to-energy through anaerobic digestion
- ◆ Alternative WWTP biosolids end-uses
- ◆ Fleet conversions
- ◆ RECs: Renewable Energy Credits (RECs) can be used to offset Scope 2 emissions in some voluntary programs, but cannot be used to offset Scope 1 emissions



Key Project Considerations and Drivers

Question: Is there a regulatory requirement for the desalination facility to be carbon neutral?

- ◆ California State Law
 - AB32
- ◆ California Coastal Commission (CCC)
- ◆ California Environmental Quality Act (CEQA) requirements for Greenhouse Gas (GHG) emissions
- ◆ Local environmental interest.

AB32 regulations for the Proposed Project

- ◆ AB32 applies to Scope 1 (direct) emissions
- ◆ Proposed Project will primarily produce Scope 2 (indirect) emissions

AB32 does not directly apply to the proposed project and it does not provide a mandate for scwd² to reduce Scope 2 emissions

California Coastal Commission (CCC)

The CCC requires a plan for projects in their jurisdiction to be consistent with the requirements of Section 30253(4) and other relevant Coastal Act provisions related to:

1. Minimizing energy use
2. Mitigating any adverse effects on coastal resources from greenhouse gas emissions (e.g., sea level rise, erosion, marine life, etc.)

California Environmental Quality Act (CEQA)

Currently there is no CEQA threshold of significance for Project-related GHGs

- ◆ CA Air Resources Board is not taking action on CEQA right now
- ◆ Under CEQA, lead agencies will set GHG thresholds of significance
- ◆ Monterey Unified Air Pollution Control District does not have local thresholds
 - Proposed BAAQMD Operational GHG threshold = 10,000 metric tons of CO₂/year

Local Interest

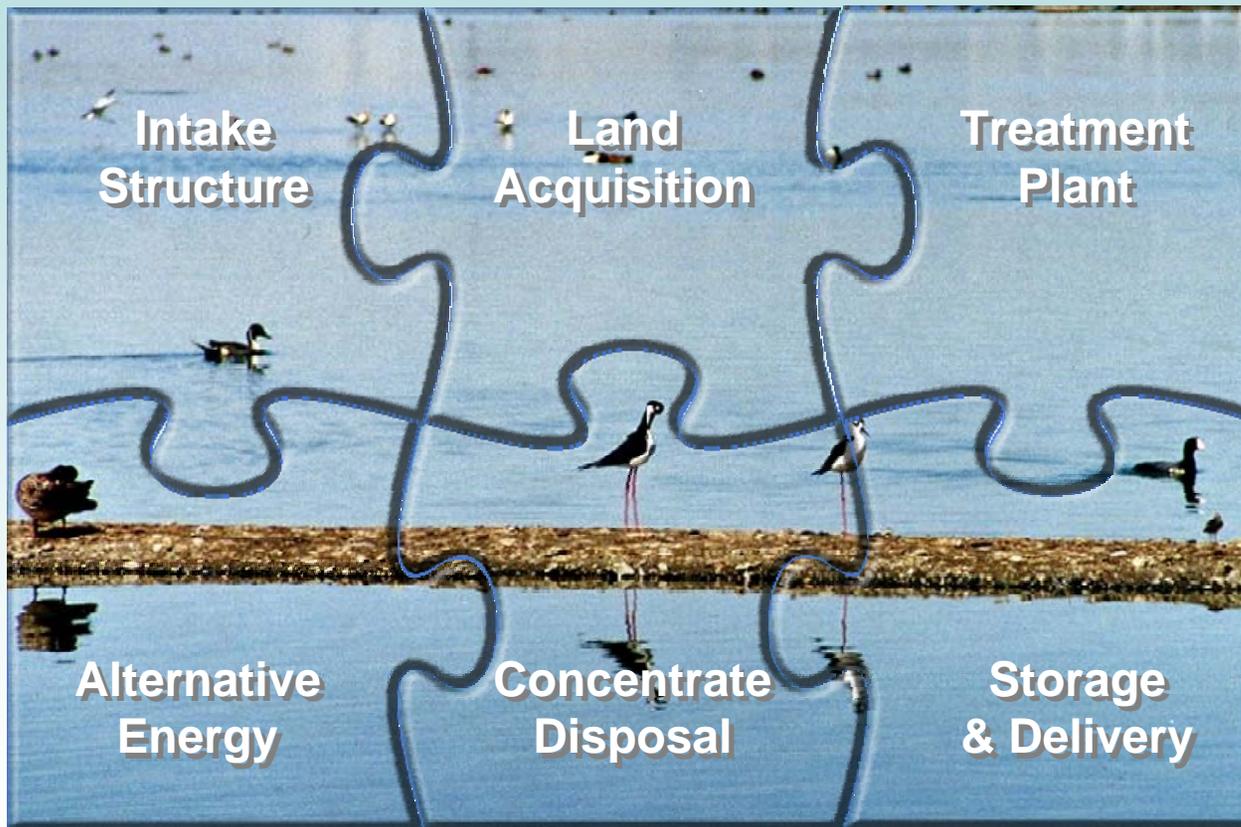
Our Customer Base is requesting Good Stewardship.

Brine Discharge/Dilution Analysis



Project Costs will be Shared Equitably

- ◆ Capital Costs based on proportional share of facility need and use
- ◆ Operating & Maintenance Costs based on percentage of use



Project Schedule and Timeline





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