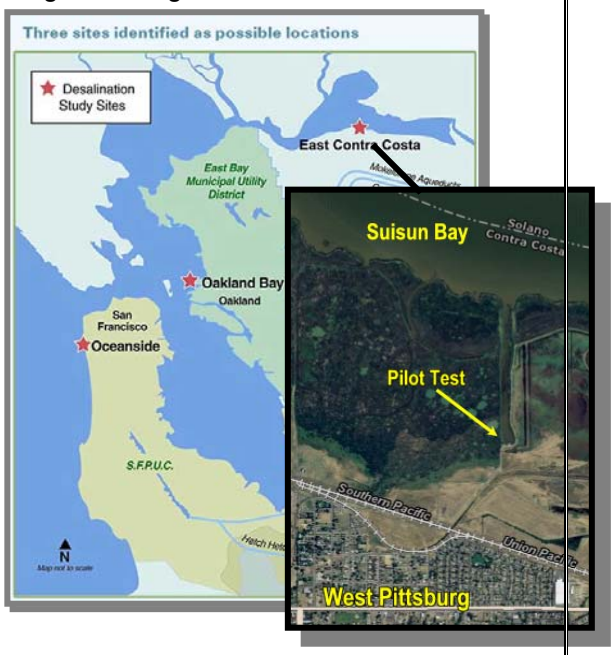
BAY AREA REGIONAL DESALINATION PROJECT

PILOT TEST FACT SHEET

PURPOSE: The Bay Area's four largest water agencies, the Contra Costa Water District (CCWD), the East Bay Municipal Utility District (EBMUD), the San Francisco Public Utilities Commission (SFPUC), and the Santa Clara Valley Water District (SCVWD), are jointly exploring the development of a regional desalination facility or facilities that could provide up to 71 million gallons a day (MGD) during droughts and emergencies. The Feasibility Study, completed in June 2007, concluded that there are three Bay Area locations suitable for siting such a regional desalination facility (Figure 1).

Figure 1: Regional Desalination Sites



PILOT GOALS AND SITE SELECTION: The Feasibility Study recommended conducting a pilot test at CCWD's Mallard Slough Pump Station site in the eastern part of Contra Costa County. The goals of the pilot test are to collect data on technical feasibility (pretreatment options, membrane performance, design parameters) and to assess the potential environmental impacts (brine disposal, marine life). The pilot test is partially funded under the Proposition 50 Chapter 6a program. The East Contra Costa site was selected for piloting to fill in the data gap that currently exists regarding desalination piloting in an estuarine environment since other agencies have recently conducted pilot tests in the San Francisco Bay (Marin Municipal Water District) and the Pacific Ocean (Santa Cruz). The estuarine environment presents a unique challenge of dealing with water quality parameters that vary of several orders of magnitude.

PILOT STATUS: The pilot test was started in October 2008 and continued through April 2009. Approximately 50 gallons per minute (gpm) were drawn from CCWD's intake. The piloting schematic (Figure 2) shows the system layout. Performance data were collected for treatment by two types of micro-filtration pre-treatment membranes, two types of reverse osmosis membranes, and one nano-filtration membrane.

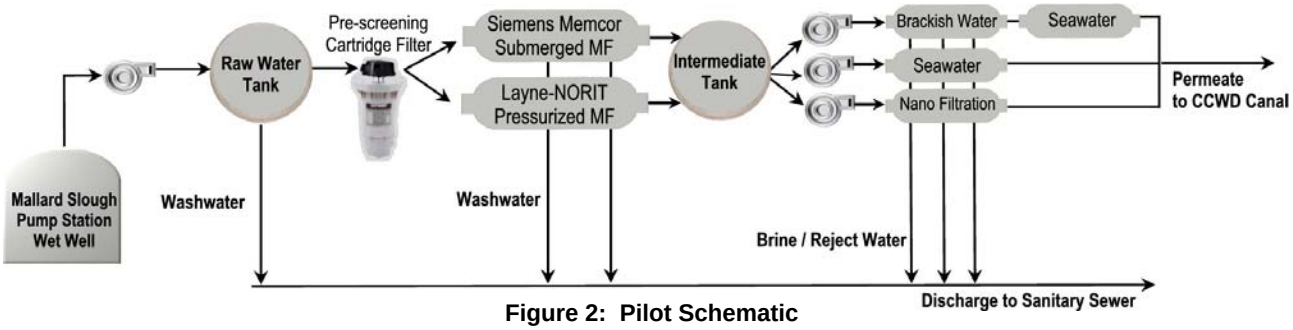


Figure 2: Pilot Schematic

Water samples were collected for biological assessment from the intake (behind the existing fish screens) and from the Mallard Slough source water. Brine samples were collected during the wet and dry season (low and high salinity periods) and bioassay tests were conducted for 6 dilution rates of brine (2.5%, 5%, 10%, 25%, 50% and 100% brine). Bioassay tests included toxicity analysis of algal growth rate, crustacean survival and growth, and fish larvae survival and growth.

Residuals analysis and water compatibility analysis for mixing the desalinated water with EBMUD aqueduct waters or CCWD canal and treated water were performed.

PILOT RESULTS: The following summarizes the pilot test results.

Pretreatment System: Both types of micro-filtration pre-treatment membranes produced acceptable water quality.

Membrane System	Influent Conditions	Treated Water Quality
Layne-Norit. Pressurized (inside-out)	Feed turbidity 5-30 NTU Flux 40- 55 gfd	Reduced turbidity to <0.1 NTU, SDI <3.0
Siemens-Memcor. Submerged (outside in)	Feed turbidity 5-30 NTU Flux 32-41 gfd	Reduced turbidity to <0.1 NTU, SDI <3.0

RO Treatment System: All treatment systems produced water of acceptable quality.

Membrane System	Influent Conditions	Treated Water Quality
RO 1 (2-stage brackish-seawater)	Feed TDS 300 – 11,000 mg/L Feed flux 12 gfd Pressure 120 – 320 psi	Recovery 70- 82% Permeate TDS 65 -100 mg/L Salt Passage 0.5 – 3.0%
RO 2 (1-stage seawater)	Feed TDS 300 – 11,000 mg/L Feed flux 12.7 – 14.1 gfd Pressure 175 – 320 psi	Recovery 50- 62% Permeate TDS 15 -18 mg/L Salt Passage 0.4 – 1.5%
RO/NF 3 (1-stage Nano Filtration)	Feed TDS 300 – 11,000 mg/L Feed flux 12.9 - 13.2 gfd Pressure 60 – 190 psi	Recovery 50- 60% Permeate TDS 170 -190 mg/L Salt Passage 3.0 – 6.0%

Biological Assessment: Listed species were found during the winter sampling events (November through March). Additional water sampling will occur in July and October.

Species	Date and Location of Sampling						
	11/5/2008		11/7/2008	12/16/2008		02/29/09	3/6/2009
	Mallard Slough	Behind Screens	Behind Screens	Mallard Slough	Behind Screens	Behind Screens	Behind Screens
Pacific herring	-	-	-	P	-	-	-
Prickly sculpin	-	-	-	P	-	P	P
Osmeridae	-	-	-	-	-	P	P
Longfin smelt	-	-	-	-	-	-	P
Note: - =Absent, P=Present, Osmeridae includes longfin and delta smelt listed species.							

Bioassay Test: No significant reduction was noticed in algal growth, invertebrate growth/survival, or fish growth/survival. The results indicated no toxic effects of desalination brine on native biota.

Water Compatibility Tests: Water compatibility tests indicate that the treated water can be safely stabilized and matched to existing waters served by the public water supply agencies.

Full-Scale Costs and Residuals Analysis: Order of magnitude capital, operating and maintenance cost estimates and residuals analysis have not yet been completed.

Schedule: The final pilot test report is scheduled to be released in December 2009.

Additional Information: www.regionaldesal.com