

# Appendix

- I. Open House Exhibit Boards
- II. Open House Notification Materials
- III. Open House Photos

Appendix I:

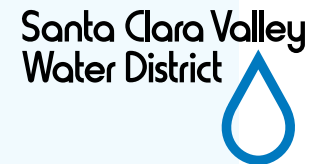
Open House Exhibit Boards



# BAY AREA REGIONAL Desalination Project

Welcome

A partnership between:



# How to Participate

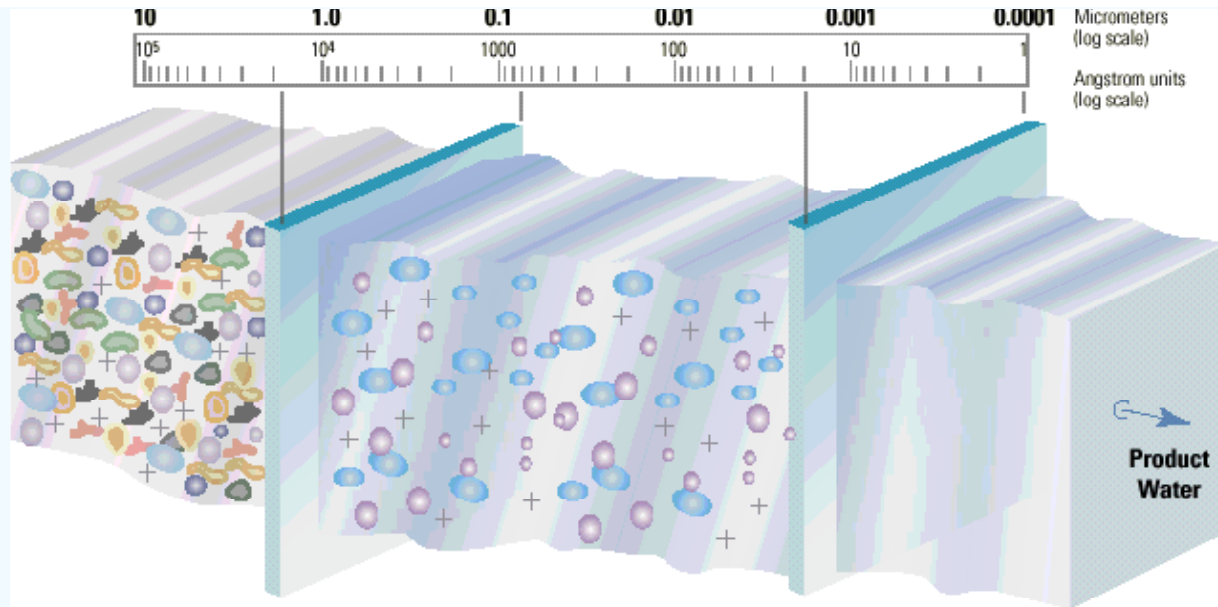
- ◆ **Talk to Staff**
- ◆ **Write Down Your Comments**
- ◆ **Visit Our Website:** [www.RegionalDesal.com](http://www.RegionalDesal.com)
- ◆ **Email Us:** [info@RegionalDesal.com](mailto:info@RegionalDesal.com)



# What is Desalination?

## Some Facts:

- Removes salts from the ocean or brackish water to produce fresh water through distillation or filtration
- NOT a new technology!
- 1,500 plants in the USA
- Over 15,000 plants worldwide
- 60% are seawater desalination plants



**Pre-Treatment via Microfiltration or Pressure Filtration**

**Reverse Osmosis**



# How Does Reverse Osmosis Work?

Reverse osmosis (RO) is a water treatment process in which seawater or brackish water is forced through a semi-permeable membrane that has very small holes.

The membrane blocks impurities, including salts, that are too big to pass, thereby creating freshwater.

Brine, the concentrated salt water that is left behind, is diluted and discharged.



# Water Quality

Desalination produces high quality drinking water

- Intake screening protects fish and removes large particles
- Pretreatment filtration removes sediments, bacteria and viruses
- Solids are sent to a landfill
- Reverse osmosis (RO) desalination removes salts and other dissolved contaminants
  - First pass RO removes 99.6%
  - Second pass RO removes 99.9%
- Post treatment adds minerals to match the taste of existing water
- Approximately 100 compounds require monitoring per State and Federal regulations
- Tests show desalinated water exceeds State and Federal water quality requirements



# Project Description

- **The Bay Area's four largest water agencies** — the Contra Costa Water District, the East Bay Municipal Utility District, the San Francisco Public Utilities Commission, and the Santa Clara Valley Water District — are jointly exploring a regional desalination project that would provide an additional water source, diversify the area's water supply, and foster long-term regional sustainability
- **The Bay Area Regional Desalination project** could consist of one or more desalination facilities, with an ultimate total capacity of up to 65 million gallons per day
- **The four partner agencies** are focusing on optimizing technologies that minimize power requirements and environmental effects





# Goals and Benefits

- ◆ **Provide additional sources of water** during emergencies such as earthquakes or levee failures
- ◆ **Provide a supplemental water supply** source during extended droughts
- ◆ **Allow other major facilities**, such as treatment plants, water pipelines, and pump stations, to be taken out of service for maintenance or repairs
- ◆ **Reduce costs and minimize environmental impacts** by leveraging existing water infrastructure as a regional partnership



# Potential Issues

## 💧 **Water Rights**

- Challenges and cost to establish new or modify existing rights
- Complexities in facilitating partner exchanges and transfers

## 💧 **CEQA/Permitting Issues**

- Wide range of studies and permits, potentially high mitigation costs

## 💧 **Power Costs**

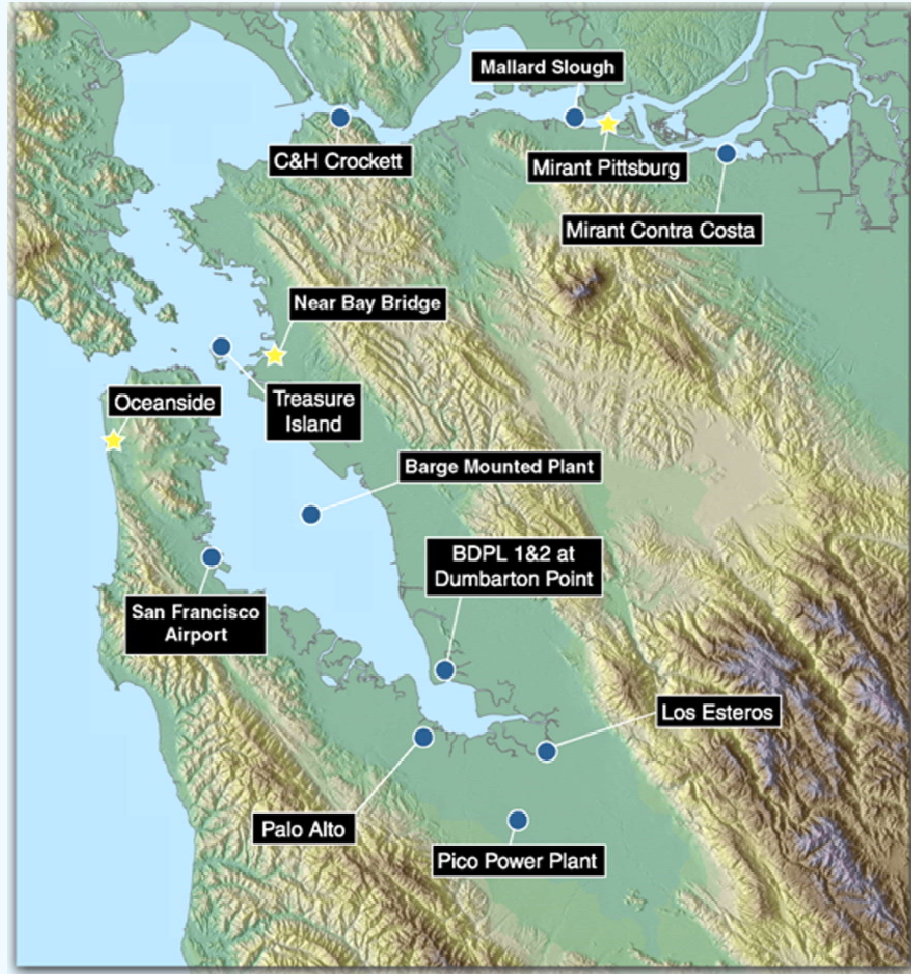
- Rising energy costs could reduce desalination appeal

## 💧 **Brine Discharge**

- Potential for outfall, permitting and environmental issues



# Locations Identified in Pre-Feasibility Studies



# Possible Sites Evaluated Further

## Oceanside

### Pros:

- Existing outfall structure
- May be easiest to permit

### Cons:

- Source water quality most saline
- Need to construct intake structure
- No near economical energy source

**Cost: \$2700/acre-ft**

## Oakland Bay Bridge

### Pros:

- Large site
- Existing outfall structure
- Close to EBMUD transmission facilities

### Cons:

- Need to construct intake structure
- Not near economical energy source
- Source water quality more saline

**Cost: \$2500/acre-ft**

## East Contra Costa

### Pros:

- Large site
- Existing intake and outfall structures at power plants
- Low salinity source water
- Economical energy source
- Close to CCWD and EBMUD transmission facilities

### Cons:

- Need water rights for consumptive use
- More stringent discharge standards in Delta

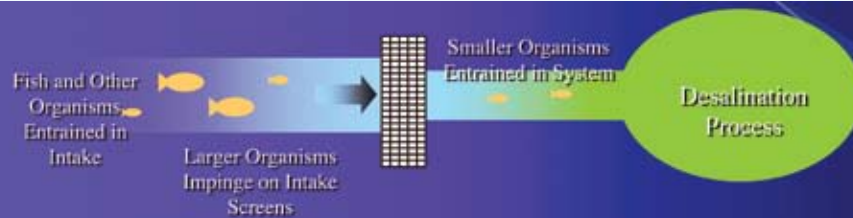
**Cost: \$500–\$1200/acre-ft**



# Environmental Issues

## Source Water Intake Issues

- Intake of water removes small organisms (entrainment)
- Suction at intake can pin fish to the screen (impingement)
- Protective screens installed near intake can minimize these impacts



## Brine Discharge Issues

- Concentrated saltwater called brine is a by-product of desalination
- 40–50% of intake water becomes brine
- Brine is usually discharged back into receiving water through an existing industrial or wastewater outfall, where it is mixed with the existing outfall's water
- This results in water with similar salinity to the receiving water but fewer contaminants such as heavy metals that are removed during pretreatment
- Testing is conducted on the brine mixture to determine what effects, if any, it could have on the quality of the receiving water and on the aquatic life in that water



# Schedule

We are here ⇨

|                           |             |
|---------------------------|-------------|
| ● Pre-Feasibility Studies | 2003 – 2005 |
| ● Feasibility Study       | 2005 – 2006 |
| ● Pilot Testing           | 2007 – 2008 |
| ● Environmental Study     | 2009        |
| ● Design                  | 2010        |
| ● Plant Construction      | 2012        |



# Funding and Costs

- The pre-feasibility studies were funded by the four partner agencies with costs shared equally (split four ways)
- The feasibility study is being funded by a grant administered by the California Department of Water Resources (DWR) through Proposition 50 — the Water Security, Clean Drinking Water, Coastal and Beach Protection Act passed by voters in 2002
- The feasibility study costs \$500,000, and the DWR grant represents 50% of the study estimate. In June 2006, the agencies were awarded an additional grant for close to \$1 million for a pilot study
- The complete pilot study is estimated to cost about \$2 million



# Possible Cost Scenarios

| Plant Configuration  | East Contra Costa Site (ECC) |          |                          |          | Near Bay Bridge Site (NBB) |          | Oceanside Site           |          |
|--|------------------------------|----------|--------------------------|----------|----------------------------|----------|--------------------------|----------|
|  | All Year Operation           |          | Dry-Years Operation Only |          | Dry-Years Operation Only   |          | Dry-Years Operation Only |          |
|  | Wet Year                     | Dry Year | Wet Year                 | Dry Year | Wet Year                   | Dry Year | Wet Year                 | Dry Year |
| 10MGD ECC all years,<br>55 MGD ECC dry years<br>only               | \$486                        | \$586    | \$0                      | \$1,179  |                            |          |                          |          |
| 25MGD ECC dry years<br>only, 40 MGD NBB dry<br>years only          |                              |          | \$0                      | \$1,303  | \$0                        | \$2,527  |                          |          |
| 35MGD ECC dry years<br>only, 30 MGD<br>Oceanside dry years<br>only |                              |          | \$0                      | \$1,266  |                            |          | \$0                      | \$2,694  |

