

Exploring Regional Desalination as a Water Supply Option in the Bay Area

*The Who, What, When, Where, Why and How
of Regional Water Supply Planning*

May 29, 2012

Redwood City Public Workshop

What is “Bay Area Regional Desalination”?

Who are the agencies studying regional desalination in the Bay Area? **Where** would the water flow?

Why are the partners studying desalination?
How could it fit in with other options for the future?

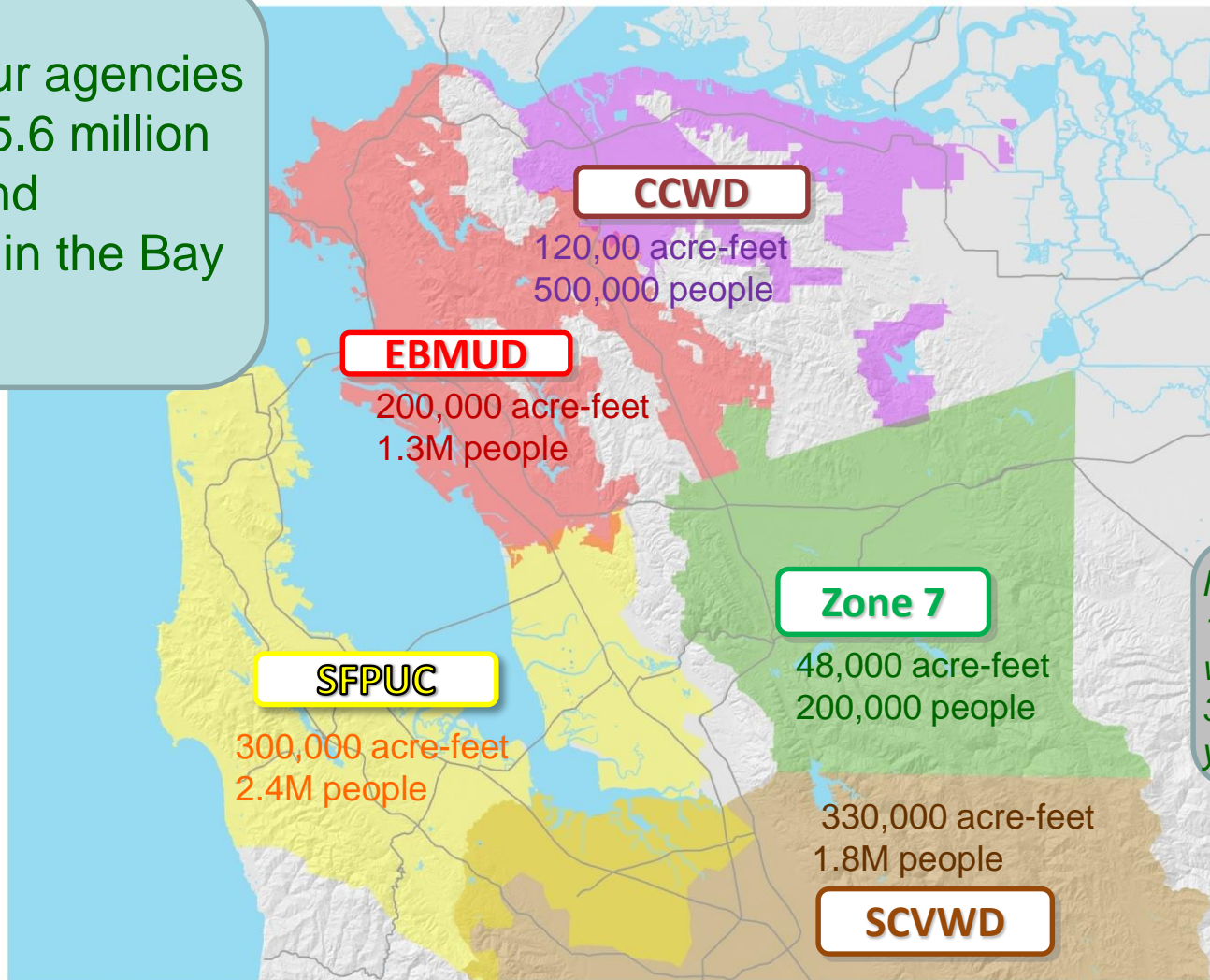
What has been done so far and what remains ahead? (**When**)

What is the Regional Desalination Project?

- A **partnership** between some of the Bay Area's largest water supply agencies.
- A **study** to evaluate how a new water supply can move through our shared region, if and when it is needed.

Partners

Together, our agencies serve over 5.6 million residents and businesses in the Bay Area.



*Note:
1 acre-foot of
water serves 2-
3 families in one
year*

Water Supply Planning



Use Less, Conserve More

- Conservation is a priority:
 - *grants, rebates, and other incentives*
 - *water-wise gardening and turf-conversion programs*
 - *leak and fixture audits*
 - *support of improved plumbing codes*
 - *public education*
- Current annual investments in conservation: **\$20M+**
- Our agencies are also developing automated meter reading, improving leak detection and repair, and tracking down other system losses to manage demand.

Use Less, Conserve More



WaterSmart Center | East Bay Municipal Utility District

This is your resource center for EBMUD services, tips, rebates and information to help you be WaterSmart.

WaterSmart Home Survey Kit
EBMUD's free Home Survey Kit will help you find leaks and save water indoors and out. Return a self-mailing survey form and, as needed, receive free water saving faucet aerators and showerheads to replace inefficient ones.

Water Emergencies
1-866-403-2683

Popular Pages in Conservation and Recycling

- Residential Services and Rebates
- Commercial Services and Rebates
- Irrigation Services and Rebates
- WaterSmart Tips
- Toilet Performance Tests, LNAIR
- News

Free Workshops!
Saturday, March 17, 10 to 11:30 a.m., Western Garden Nursery, 2756 Vineyard Ave., Pleasanton: Learn how you can convert thirsty lawns to water-conserving, environmentally friendly landscapes at this workshop, conducted by Zone7 Water Friendly Gardening and Landscaping Program.

Water-Wise Gardening in the Tri-Valley

Free Sprinkler Key!!!
To get a free, easy-to-use sprinkler "key" that can adjust and spray onto driveways and sidewalks, send a self-addressed stamped envelope to: Sprinkler Key, Zone 7 Water Agency, 100 North Canyons Parkway, Livermore, CA 94550.

Water Conservation - Santa Clara Valley Water District

Home Services Newsroom Business

- WATER CONSERVATION
 - Rebates
 - Homes
 - Businesses
 - Landscaping
 - Agriculture
 - Free Conservation Items
 - Events And Workshops
- ADOPT A CREEK
- TEACHERS & STUDENTS
- CLEAN SAFE CREEKS PLAN
- FIVE-YEAR CAPITAL IMPROVEMENT PROGRAM (CIP)
- CREEKSIDE PROPERTY PROGRAM
- COMPREHENSIVE WATER RESOURCES MANAGEMENT PLAN

Programs > Water Conservation

Water Conservation

Join Us for our 20th Annual Landscape Workshop

For three Saturdays in March, Santa Clara Valley Water District will host free, efficient Landscape Workshops for home and business. Click here for more information.

It's always a good time to conserve water.

Because we live in a semi-arid region, water is a precious resource. In addition, outside the county and imported supply, and a growing pressure on the state's reliable water supply today and in the future. For more information about our water conservation programs, visit our website.

- Looking for ways on how to save water? The Santa Clara Valley Water District can help through its free, Water-Wise House Call Program. Save resources and money. Rebates are available for qualifying toilets, washers and water, money and energy.
- To view water saving tips and rebates in a new interactive water

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Conservation

Conserving Water and Diversifying Supply

Sources and Supply Planning

- Recycled Water
- Groundwater
- Conservation
- Graywater
- Rainwater Harvesting
- Desalination

At Home
Learn about our water-wise evaluations, conservation tips and water saving devices

For Business
Offering a variety of services aimed at helping your business save water.

Gardens and Landscaping
Learn about harvest and irrigating your water from your water.

Rebates
Save resources and money. Rebates are available for qualifying toilets, washers and solar installations.

Resources & Publications
Additional materials and links provided by our Water Conservation Unit.

Requirements
Stakeholder participation, local ordinance, and achieving goals.

Water Conservation

Water Smart Programs
CCWD offers many different ways to save water at home, in business and industry.

Single-Family Residential

- Home Water Use Survey
- Clothes Washer Rebate Program
- High-Efficiency Toilet Rebate
- Free Water Conservation Devices
- Landscaping Water Saving Tips
- Water Conservation Tips
- Smart Sprinkler Timer Rebates

Multi-Family Residential

- Interior Water Use Survey
- Large Landscape Water Use Survey
- High-Efficiency Toilet Rebate
- Commercial Clothes Washer Rebate
- Irrigation Equipment Rebates
- Smart Sprinkler Timer Rebates

Commercial Properties

- Commercial Water Use Survey
- Large Landscape Water Use Survey
- High-Efficiency Toilet Rebate
- High-Efficiency Toilet Rebate Program
- Commercial Clothes Washer Rebate
- Irrigation Equipment Rebates
- Smart Sprinkler Timer Rebates

Home Water Survey
We'll come to your house & show you how to save water.

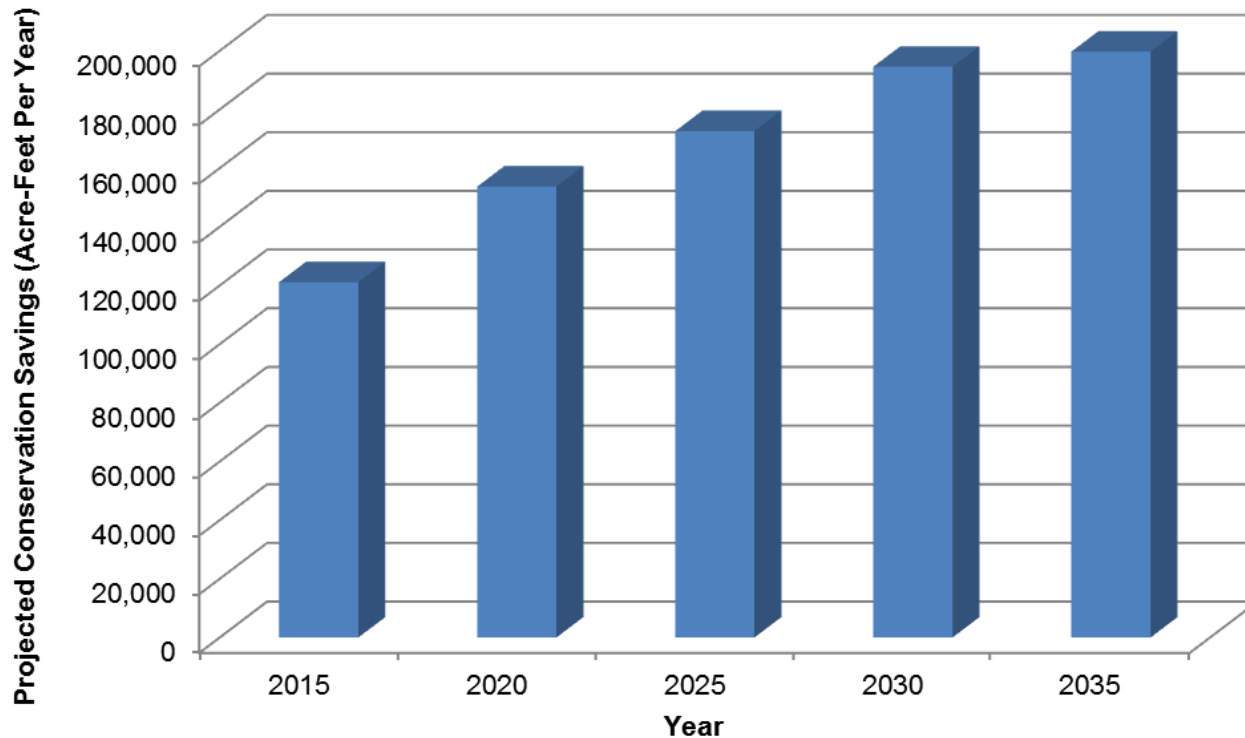
Rebates
Save water & money on clothes washers, toilets & more.

Lawn & Landscape Watering Schedule
You'll water like the pros.

Alternative ways to save water.
Resources for harvesting rain water & grey water.

Use Less, Conserve More

Projected Conservation Savings: CCWD, EBMUD, SCVWD, SFPUC, and Zone 7



By 2035, conservation savings are projected to be equivalent to the potable water needs of **400,000 households** or **about 1.2 million people.**

Recycle and Reuse

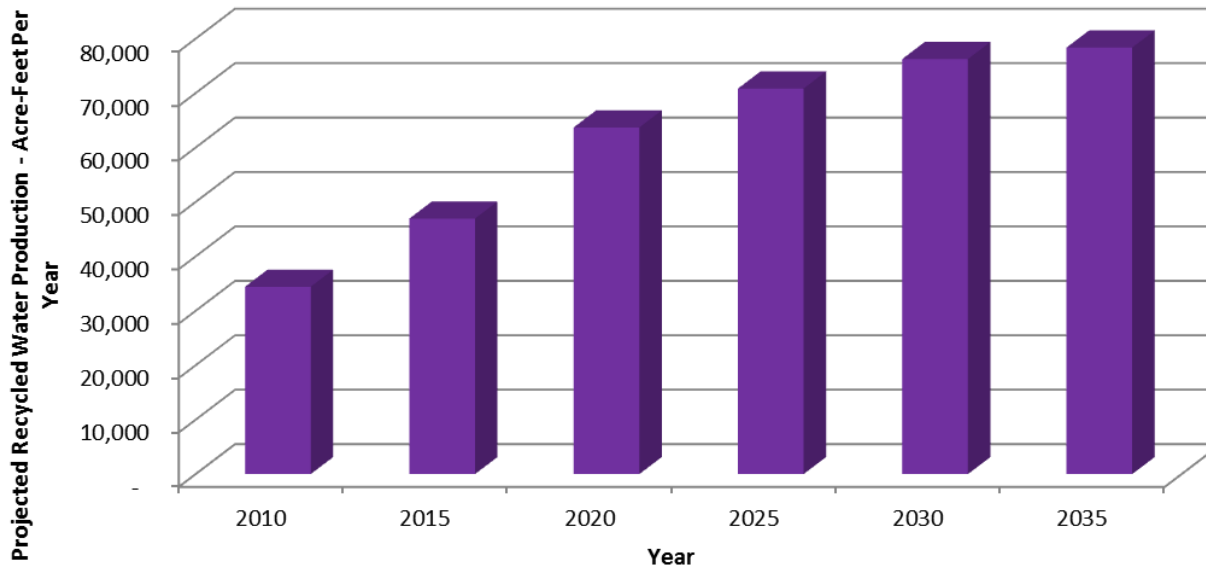


- **EBMUD:** 20 mgd of recycled water by 2040.
- **SCVWD:** Evaluating the feasibility of using advanced treated recycled water for indirect potable reuse, such as groundwater recharge.
- **SFPUC:** Requiring new commercial/mixed-use developments to reuse graywater and treat rainwater on-site.
- **Zone 7:** Evaluating the expansion of recycled water to maximize its use for irrigation.
- **CCWD:** 10% of existing supply is recycled water, evaluating new opportunities.



Recycle and Reuse

Projected Recycled Water Production: CCWD, EBMUD, SCVWD, SFPUC, and Zone 7



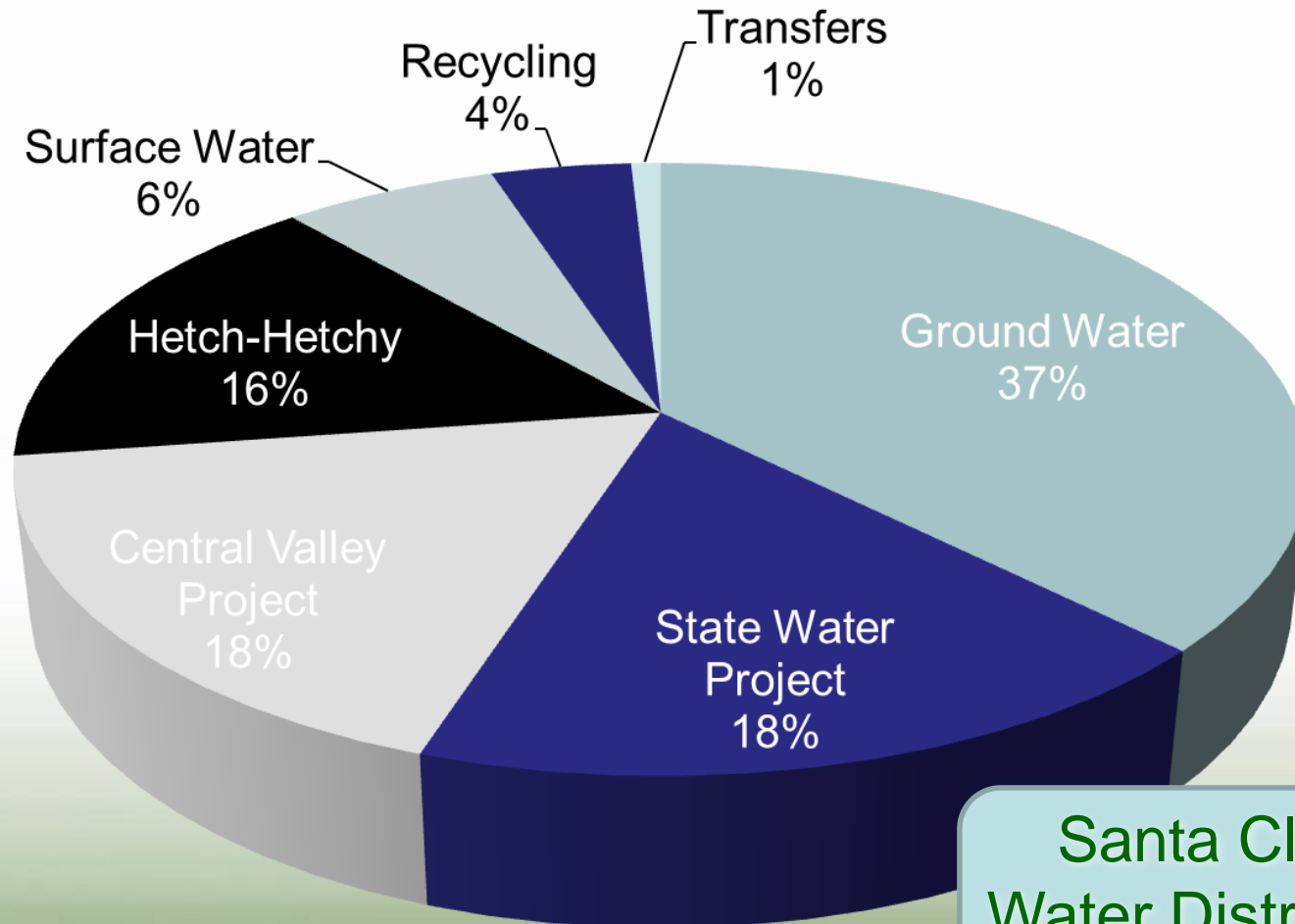
By 2035, use of recycled water is projected to free up drinking water supplies for **160,000 households or nearly half a million people.**

Acquire New Supplies

May be needed to replace lost supplies or diversify portfolios.

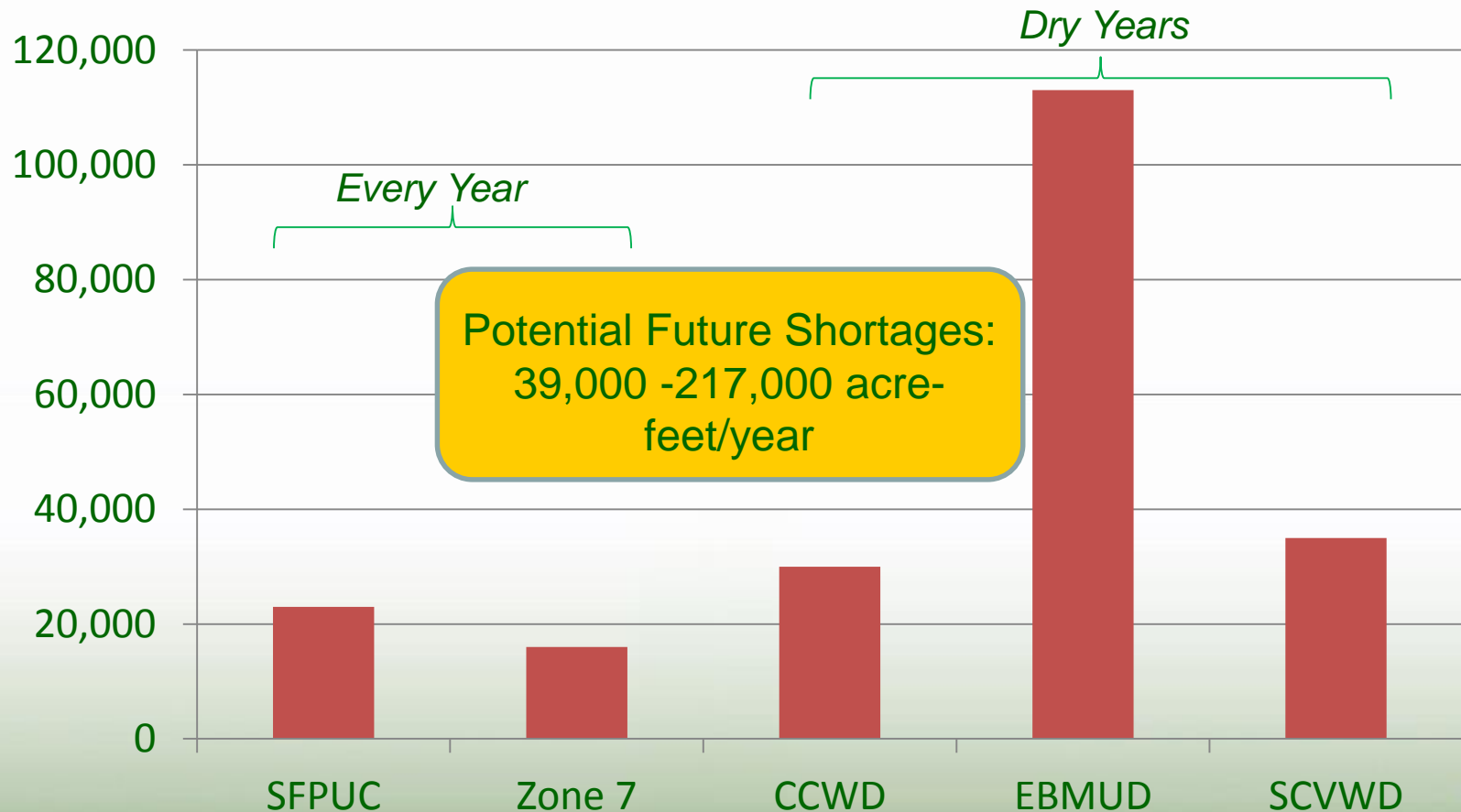
- Purchase imported water from other parties.
 - can be short-term or long-term agreements.
 - water conserved by agriculture is one potential source of water supply for growing urban populations.
- Pump more groundwater.
- Develop groundwater banking or conjunctive use programs.
- Obtain/increase water rights for local streams .
- Desalinate surface water or groundwater normally impaired for potable use.

Example of a Diversified Portfolio



Santa Clara Valley
Water District's Existing
Supply Mix

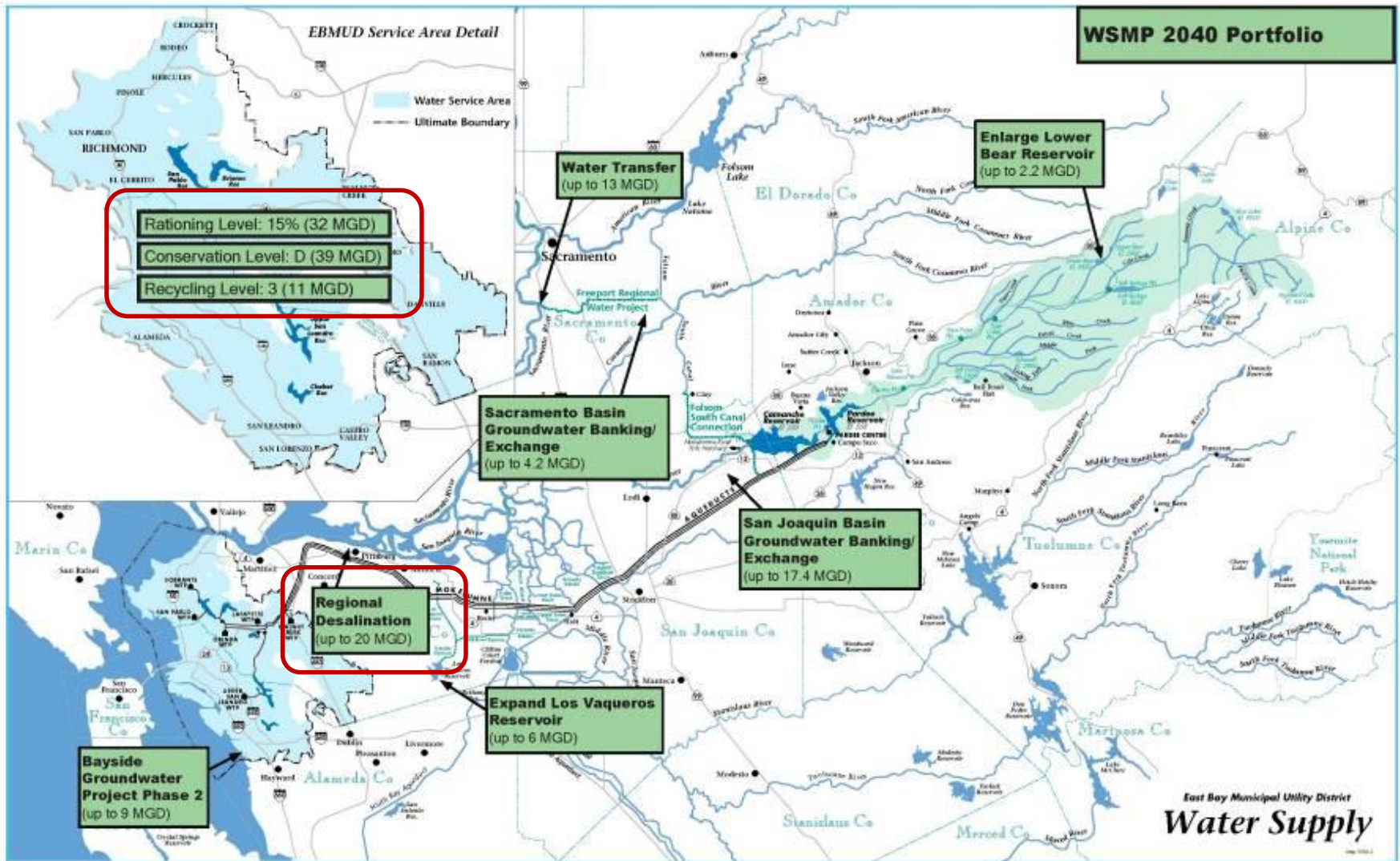
Potential Maximum Future Shortages (2030-2040)



Potential Agency Demands from Desalination

Agency	Demand (Acre-Foot Per Year)	Demand (mgd)	Demand Frequency after 2020
SFPUC	10,000	9	Every year
Zone 7	5,600	5	Every year, or wet/ normal years only
CCWD	Up to 14,400	Up to 13	1 in 10 years (2030+)
SCVWD	Potential Future Shortages: 39,000-217,000	10	1 in 5 years
EBMUD		9+	1 in 5 years
Total	15,600-51,100	14 - 46	

EBMUD's Water Supply Portfolio in 2040



Regional Benefits

- Diversification of Water Supplies
- Reliability of Water Supplies
- Minimization of New Facilities
- Cost-Effectiveness
- Operational Flexibility

Diversification of Water Supplies

- Need different supplies that can handle different challenges.
- Desalination offers unique benefits for responding to some of these challenges.

What factors can affect our ability to reliably provide you with water?

- drought conditions
- earthquakes
- levee failures in the Delta
- major pipeline and facility failures
- environmental restrictions
- climate change
- saltwater intrusion in the Delta
- terrorist acts
- water quality problems

Reliability of Water Supplies

- Desalination provides a reliable source of *drinking* water, unlike other alternative supplies.
- Desalination is not as dependent on hydrologic conditions.

Can supply drinking water even during droughts.

Minimization of New Facilities

- Regional approach minimizes the need for new construction and maximizes use of existing facilities.
 - Sharing of infrastructure leads to minimization of environmental footprint.
 - Environmental disruption due to plant construction would be limited to one site.

Cost-Effectiveness

- Regional approach minimizes overall costs.
- Costs (e.g., planning, design) will be shared among participating agencies.

Total Costs Through 2011	DWR Grant	Partners' Share	Agency Share
\$2,328,254	\$1,199,056	\$845,878	\$283,320

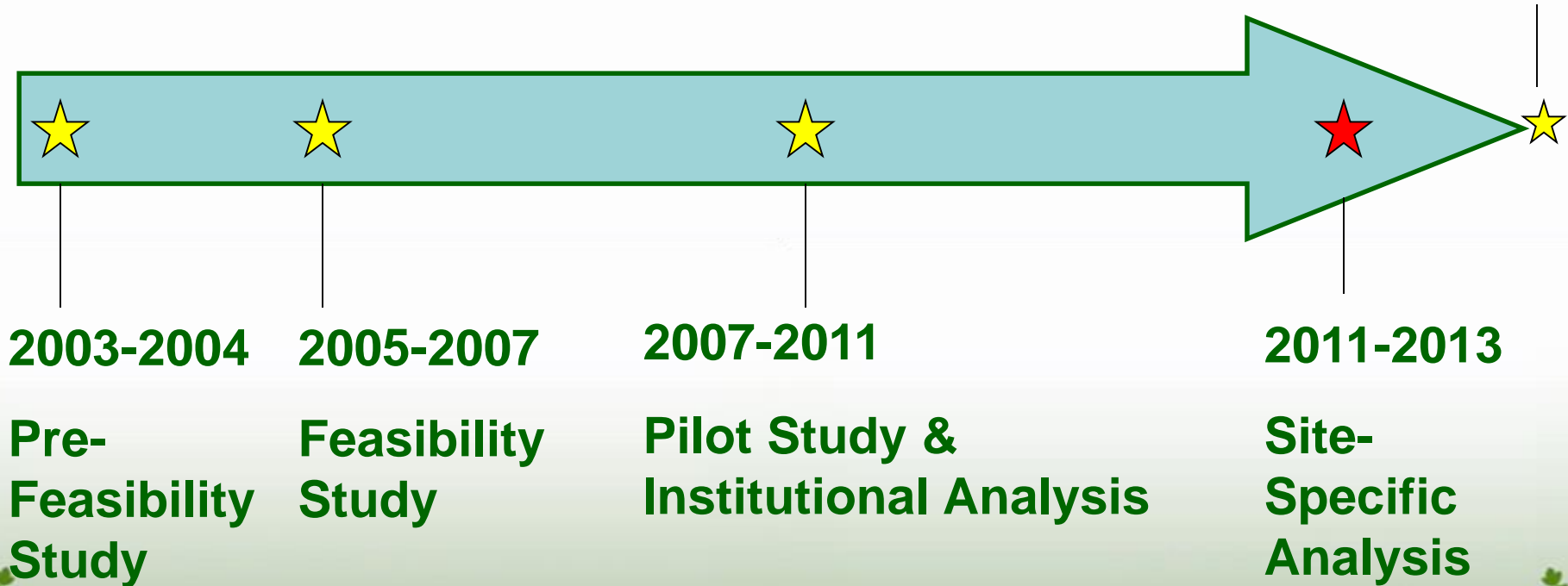
- A regional facility benefits from economies of scale.
- Allows for use of existing excess capacities.

Operational Flexibility

- Optimize regional desalination facility operation and capacity to meet different needs at different times.
- Enhanced agency interconnections and agreements can provide flexibility in wheeling water across the Bay Area.

Timeline

June 2013
Decision on agency participation
and initiation of CEQA process (*pending decision*)



Pre-Feasibility Study (2003-2005)



BAY AREA REGIONAL
DESALINATION PROJECT
PRE-FEASIBILITY STUDY
FINAL REPORT

OCTOBER 2003

Prepared by

URS

URS Corporation
500 12th Street, Suite 200
Oakland, CA 94607

in Association with

Boyle Engineering Corporation

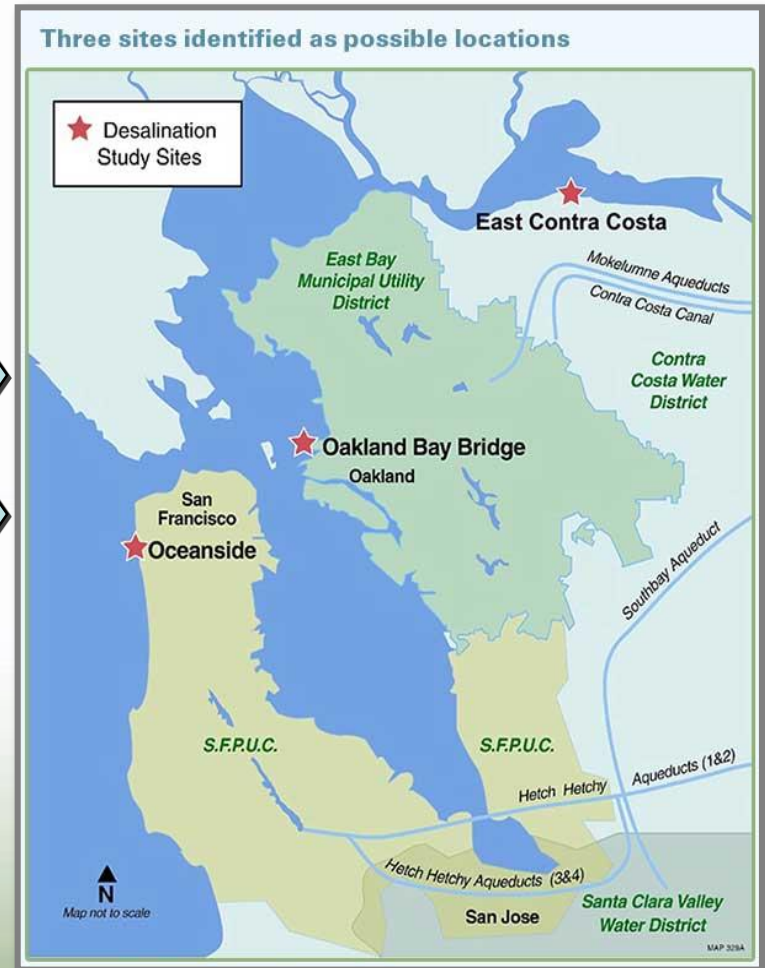
Boyle Engineering Corporation
100 Howe Avenue, Suite 250 North
Sacramento, CA

- Identified project objectives and goals for each agency
- Evaluated future demands based on historical needs, droughts
- Identified and screened 22 sites
=> 13 feasible => top 3

Evaluation of Site Alternatives (2003-2007)



Sites evaluated in 2003 feasibility study

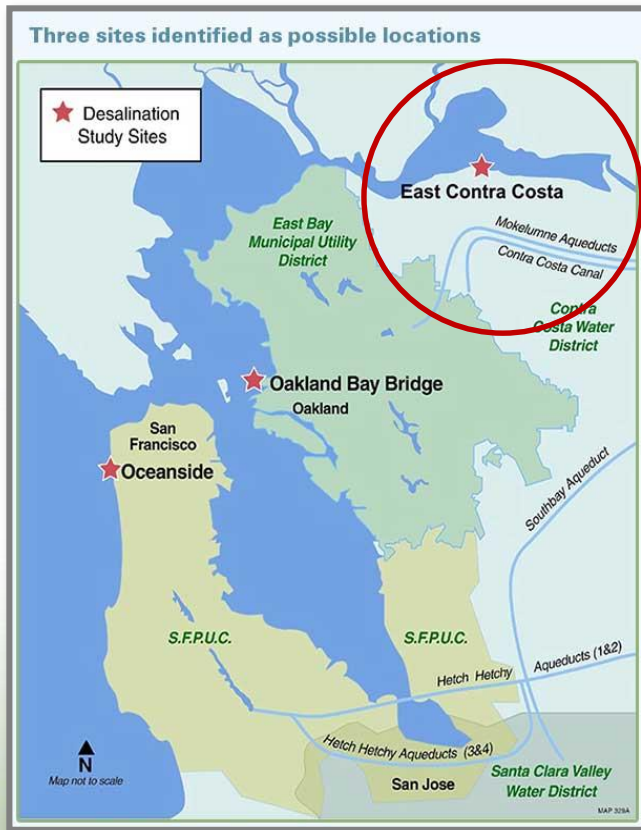


Narrowed down to 3 potential sites

Feasibility Study Findings

- Project size could be optimized to meet most of the demand most of the time
- Conveyance capacity limits the project size
- If operated continuously, water costs could be cut by 50%
- A series of institutional agreements will be required

Site Selection for Pilot Testing



- East Contra Costa selected
- *Benefits:*
 - Opportunity to add to body of research: testing of brackish water desalination
 - Permitted CCWD water intake (Mallard Slough Pump Station)
 - Existing facilities with state-of-the-art fish screen

Concluding Thoughts

- The Bay Area Regional Desalination Project is a **unique partnership** offering **regional benefits**.
- Desalination is **one of many tools** (including recycled water, conservation, groundwater, etc.) to address water shortages.



CONTRA COSTA
WATER DISTRICT



EBMUD



San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Santa Clara Valley
Water District



END



San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Santa Clara Valley
Water District



EXTRA SLIDES

SFPUC Water Supply Project Timeline

		2012	2013	2014	2015	2016	2017	2018	2019	2020
<i>Projects in final planning or environmental review ⁽¹⁾</i>										
2 mgd transfer from MID/TID	W									
Reg. Groundwater Storage/Recovery	W									
San Francisco Groundwater Supply	W									
SF Westside Recycled Water Project	W									
<i>Projects undergoing feasibility analysis</i>										
SF Eastside Recycled Water Project	W									
Daly City Recycled Water Project ⁽²⁾	C									
So. SF Recycled Water Project	C									
Menlo Country Club Recycled Water	C									
Regional Desalination Project										
Additional transfer from MID/TID ⁽²⁾										
Non-potable Supply Program										

⁽¹⁾ The decision to begin environmental review has already been made for the four projects in this category.

⁽²⁾ Schedules for a potential transfer from MID/TID and the proposed Daly City Recycled Water Project are not finalized and depend on funding, Commission and partner approval, and other factors.

Key:

◇ = Approval to commence environmental review, including sufficient design work to complete environmental review

W = Included in WSIP/PEIR

C = Included in the FY2012/13 Water CIP Budget

Feasibility analysis / Preliminary planning

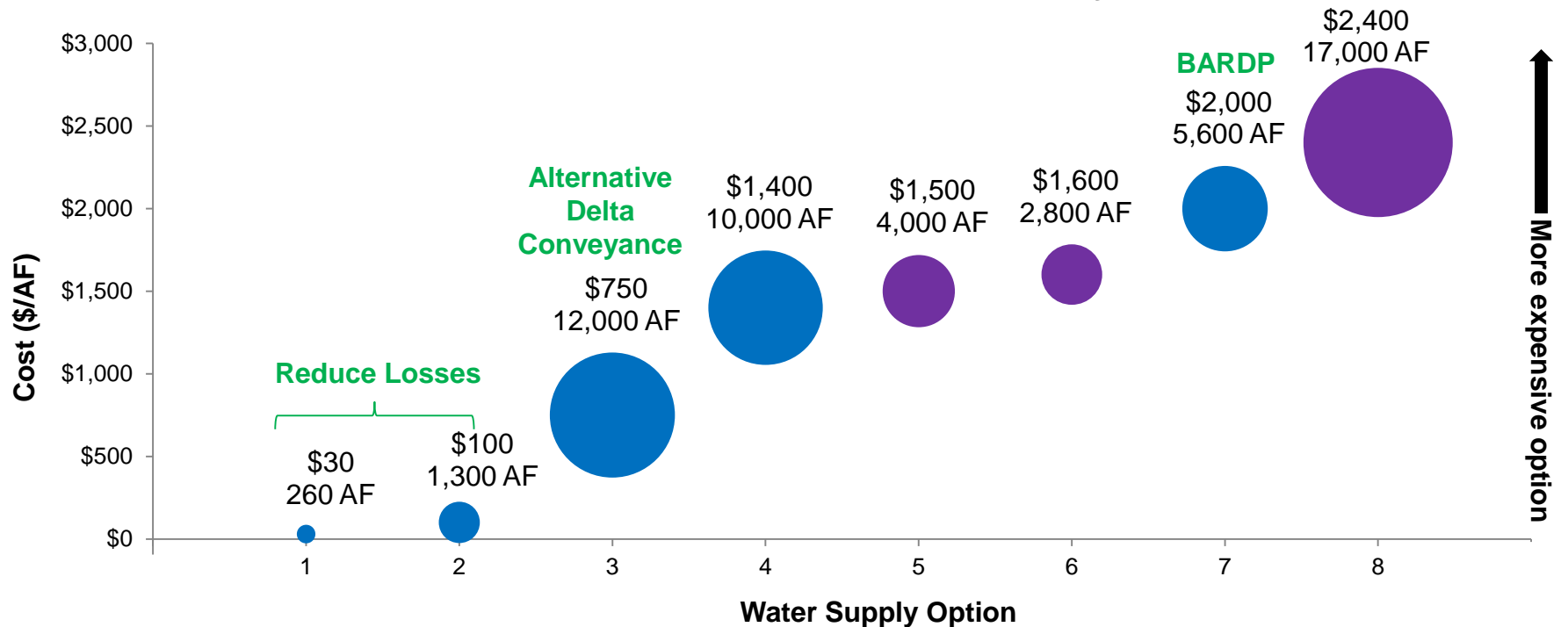
Environmental review

Project approval

Design

Construction

Zone 7 Comparison of Water Supply Options



● Size of circle is related to the potential amount of water available.

● Involves recycled water.

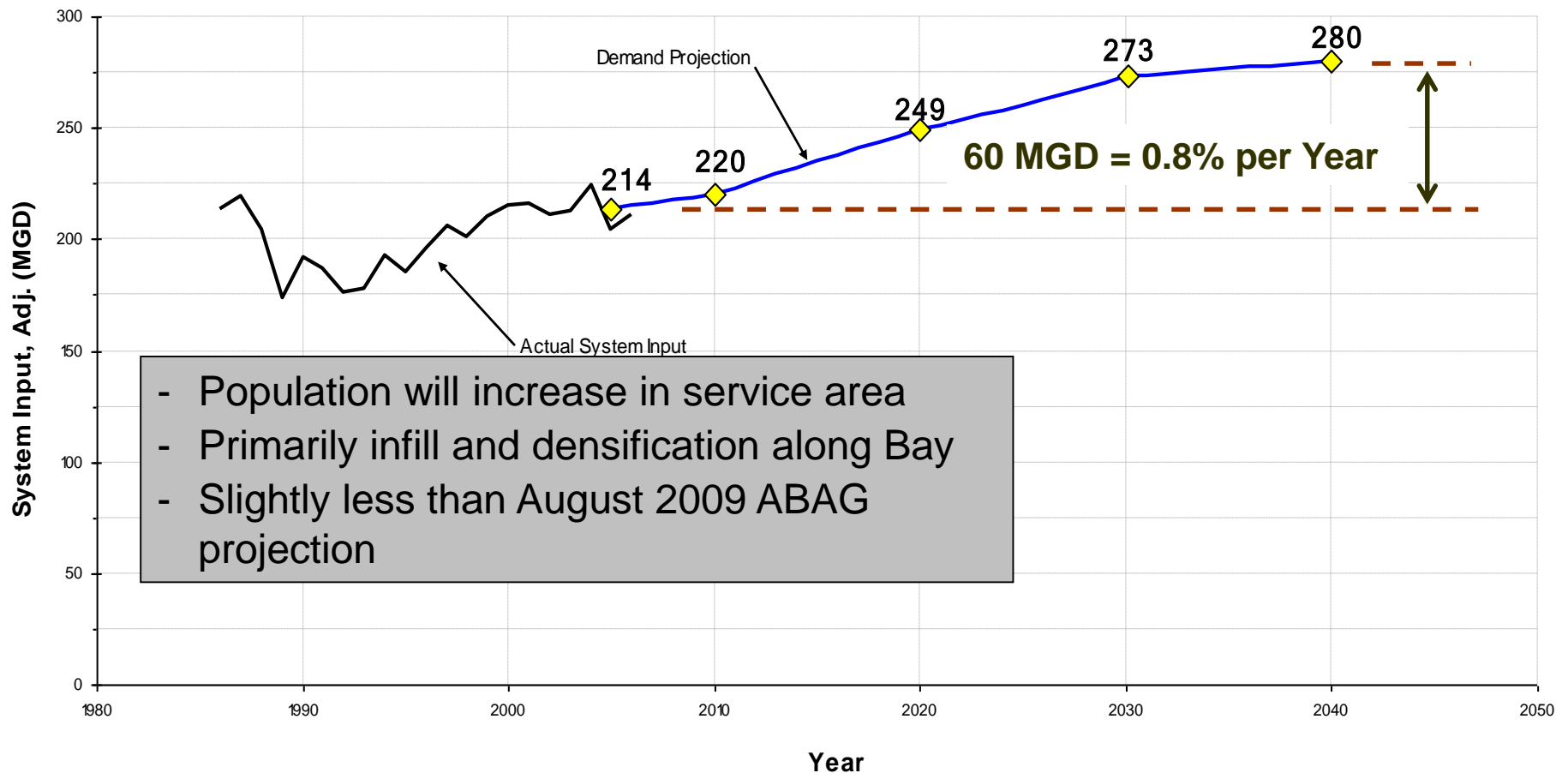
- 1 Reduce Groundwater Demineralization Losses
- 2 Reduce Unaccounted-for-Water Losses
- 3 Alternative Delta Conveyance
- 4 Long-term Water Transfers
- 5 Recycled Water – Direct Use
- 6 Groundwater Injection: Recycled Water
- 7 Regional Desalination Project (BARDP)
- 8 Recycled Water - With Storage

Source: PRELIMINARY ESTIMATES from Zone 7 2011 Water Supply Evaluation

Cost-Sharing (2003-2011)

Work Product	Total Cost	DWR Grant	Partners' Share	Agency Share
<i>Pre-Feasibility (2003-2005)</i>	\$66,617	-	\$49,963	\$16,654
<i>Feasibility Study (2005-2007)</i>	\$502,337	\$249,756	\$188,415	\$64,166
<i>Pilot Study (2007-2010)</i>	\$1,749,300	\$949,300	\$600,000	\$200,000
<i>Institutional Study (2010-2011)</i>	Staff Time			
<i>Support for Independent Research</i>	\$10,000	-	\$7,500	\$2,500
TOTAL	\$2,328,254	\$1,199,056	\$845,878	\$283,320

EBMUD's Projected Shortfall



Projected Demands, Supplies, and Potential Maximum Shortages (2030-2040)

