East Bay Municipal Utility District

Pursuing Neutral Water Demand In New Developments

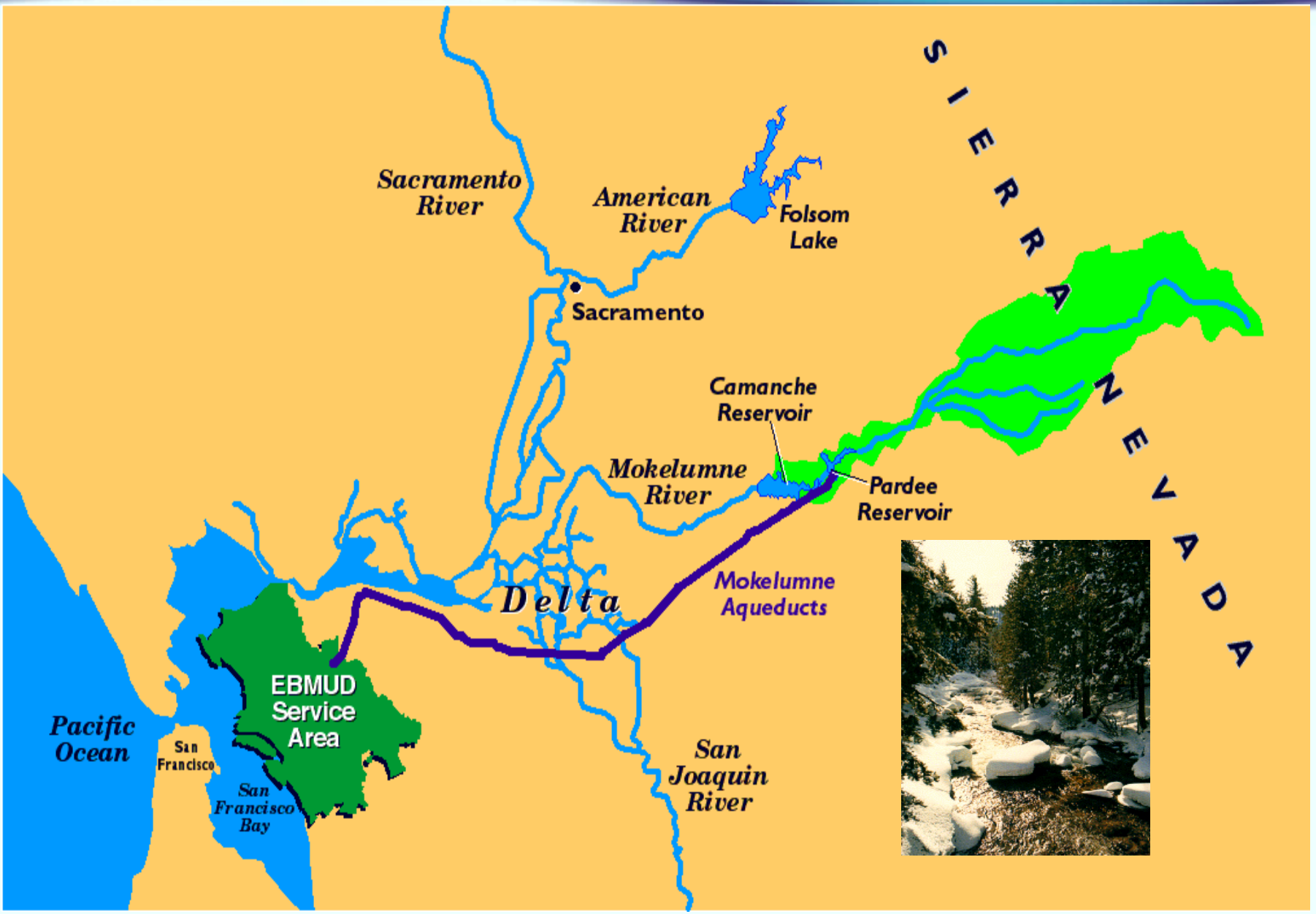


Water 2.0: New Ideas for a Secure Water Future

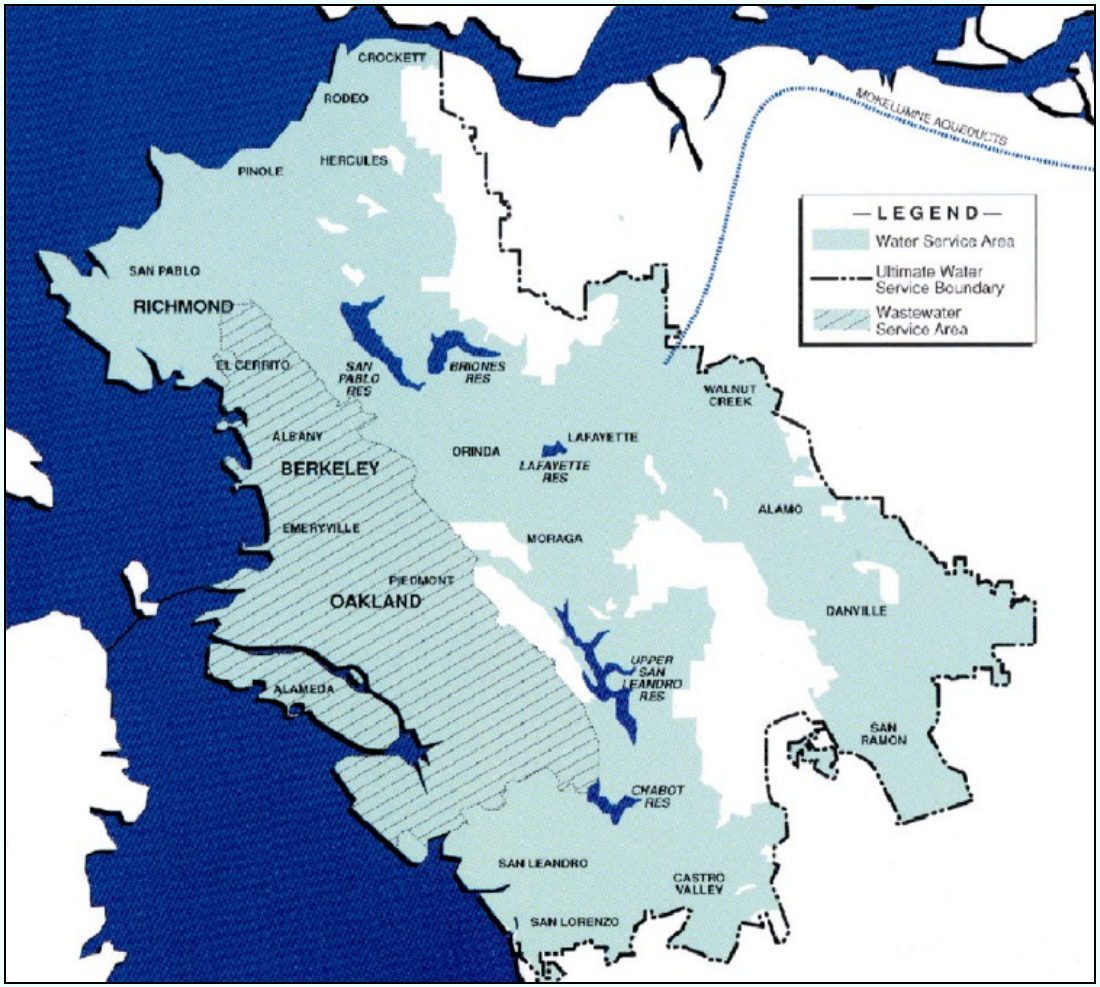
April 17, 2009

Overview

- EBMUD Water Conservation Master Plan
- Need for Regulations
- EBMUD Water Service Regulations
  - Part 1 - Water demand offsets
  - Part 2 – New service water efficiency requirements
- Supporting Activities

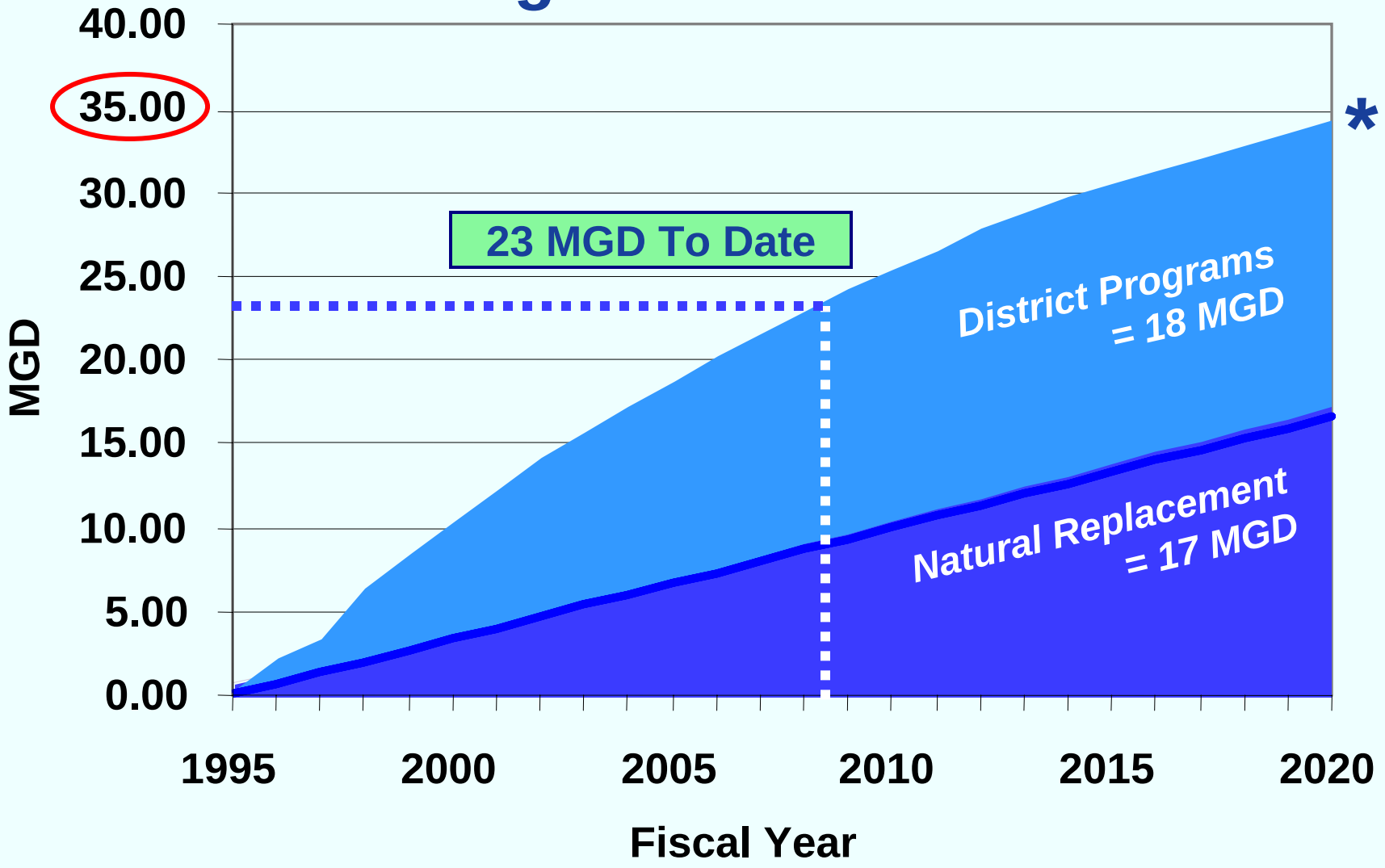

Sacramento River
American River
Folsom Lake
Sacramento
S I E R R A N E V A D A
Camanche Reservoir
Mokelumne River
Pardee Reservoir
Mokelumne Aqueducts
Delta
EBMUD Service Area
Pacific Ocean
San Francisco
San Francisco Bay
San Joaquin River

EBMUD
Water and Wastewater Service Areas



- 1.34 million customers
- 85 % residential
- ~ 212 mgd demand
- 35 communities
- Distinct microclimates
- 330 sq.mi service area
- >4,000 miles of pipe
- 400,000 meters
- 385,000 accounts

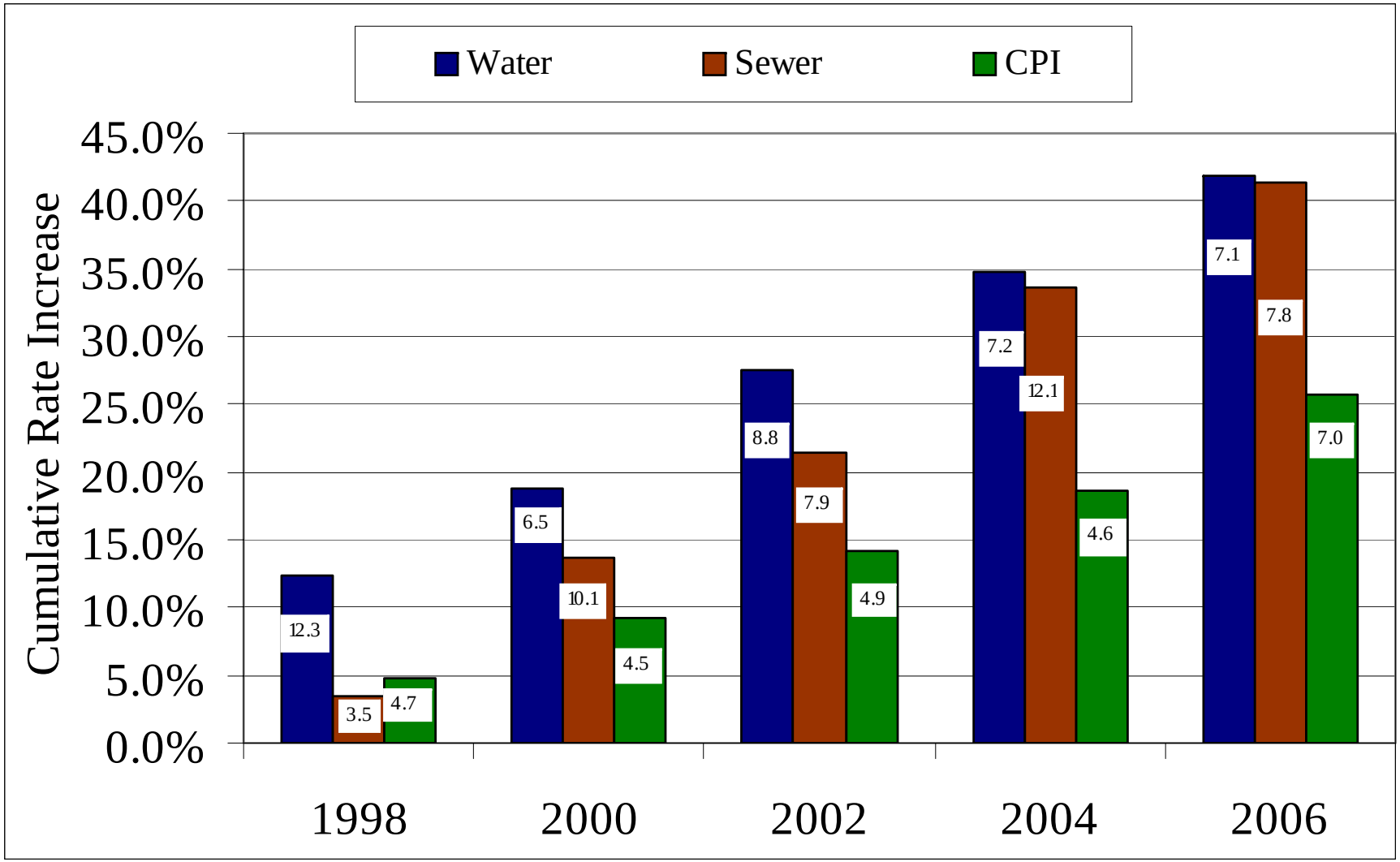
Water Conservation Master Plan
Savings Goal 1995-2020



EBMUD Camanche Reservoir

January 2009

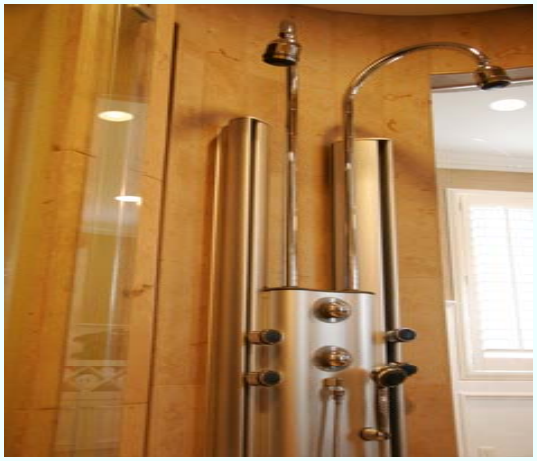
U.S. Water and Sewer Rate Increases



Source: AWWA/Raftelis Financial Consultants, Inc.

The Problem…

- Little water use efficiency review in new construction
- Aging water and sewer infrastructure
- Need more coordination among utilities and planners
- Inconsistent regulations and their implementation
- Water waste at first operation
- Higher retrofit costs later



Inefficient Landscape Designs






EBMUD Regulation-Setting Authority

California Water Code 375-377	authorizes District to require water conserving devices and enforce a water conservation program upon appropriate findings of necessity
Water Code 1009	authorizes District to prepare water conservation plans that can require retrofit conservation devices be installed as a condition of service
Water Code 350-359	water shortage emergency conditions authorizing District to restrict consumption to conserve

Key Water-Efficiency Legislation, Regulations

- Federal Energy Policy Act (toilets, showerheads, pre-rinse)
- California Laws:
  - Water Code – meter stds., reuse, *"waste and unreasonable use"*
  - Administrative Code, Title 20 – appliance stds.
  - Assembly Bill 325, 1881, 2717 – Model Landscape Ordinance
  - Senate Bills 910, 610, 221 – CEQA, Water Supply Assessments
  - Title 24, Administrative Code – hot water use protections
  - California Energy Commission - clotheswasher stds.

Origin of EBMUD Conservation Offsets

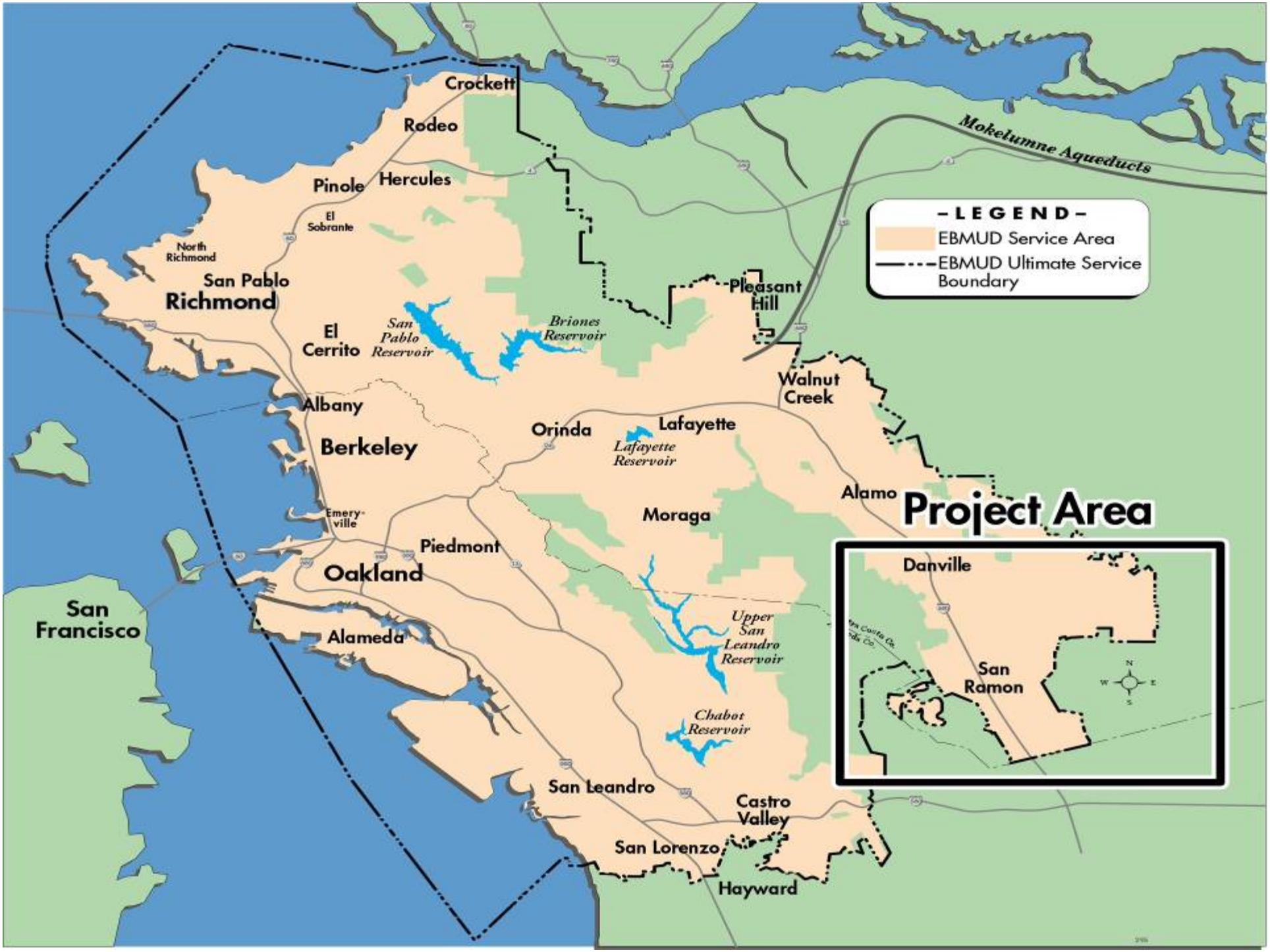
- **Supply limitations** constrained EBMUD's ability to serve new developments outside its service area
- New annexations conditioned on **offsets and funding** of conservation measures
- 1998-2006 four development projects subject to offsets
  - Wendt Ranch
  - Weidemann Ranch
  - The Meadows
  - Camino Tassajara

EBMUD's New Account Programs

- Water Demand Offset for Annexations
  - Camino Tassajarra offset water need on 2:1 basis
  - Wendt Ranch, Weidemann Ranch, The Meadows had a 1:1 offset
- Water Efficiency Within the Service Area
  - Adopted EBMUD regulations for new development July '07
  - These require state of the art efficiency measures in new development consistent with best available technology and practice

Goals and Objectives

- Avoid/reduce the environmental and economic impacts of new demand
- Minimize water waste in new housing
- Minimize the need for future property retrofits (at higher costs) to get water savings later
- Optimize recycled water supply/deliveries


Crockett
Rodeo
Pinole
Hercules
El Sobrante
North Richmond
San Pablo
Richmond
El Cerrito
San Pablo Reservoir
Briones Reservoir
Pleasant Hill
Mokelumne Aqueducts
– L E G E N D –
EBMUD Service Area
EBMUD Ultimate Service Boundary
Walnut Creek
Albany
Berkeley
Orinda
Lafayette
Lafayette Reservoir
Alamo
Project Area
Moraga
Emeryville
Piedmont
Oakland
San Francisco
Alameda
Upper San Leandro Reservoir
Chabot Reservoir
Danville
San Ramon
San Leandro
Castro Valley
San Lorenzo
Hayward


WENDT RANCH
In cooperation with East Bay Municipal Utility District, Shapell is pleased to participate in an educational program to promote and encourage water-efficient living both inside and outside your Wendt Ranch home.

Camino Tassajarra Integrated Project

- 1,400 (phased) homes
- 4 developers –
  - Shapell, KB, Ponderosa, Lennar
- Largest project – Alamo Creek
  - Meter sizing 5/8- to 2-inch
  - Lots = 4,000 - 15,000 sq. ft.
- Each of the four developments has its own water budget

Camino Tassajara Annexation Process

Developer began acquiring 5 land parcels	Jan.1997
County General Plan, FEIR and Tract Map	Jul. 2002
Local Agency Formation Commission annexation	Oct. 2002
EBMUD Miscellaneous Work Agreement	Oct. 2002
EBMUD Water Service Regulation 3D	Jan. 2003
Legal challenges against County EIR completed	Jun. 2004
First water meter installed	Jul. 2006

Camino Tassajarra Project
Scope of Work Agreement

- Refine project baseline demands
- Define on-site demand reduction measures
- Identify off-site water conservation measures to achieve 2:1 total offset
- Establish Water Demand Mitigation Fee to pay for off-site measures
- Establish Project water demand
- Ensure compliance through CC&Rs

Camino Tassajarra
Water Demand (MGD)

Baseline Demand	On-Site Conservation Demand Reduction	On-Site Recycled Water Demand Reduction	Project Water Budget	Off-Site Demand Mitigation (2:1)
0.626	0.035	0.139	0.452	0.904

On-Site Conservation Measures for Camino Tassajarra

- ULFT and HET toilets in every home
- Front-loading clothes washers
- Hot water on-demand systems for 90 largest single-family homes
- Submetering for common area irrigation & multi-family/sr. housing
- Xeriscaping and drip irrigation
- Install (evapotranspiration) self-adjusting irrigation controllers in all landscaped areas

Camino Tassajarra
On-Site Recycled Water

- Homeowner association common areas and parks
- School play fields
- Landscape around artificial turf soccer fields
- Source: San Ramon Valley Water Recycling Project

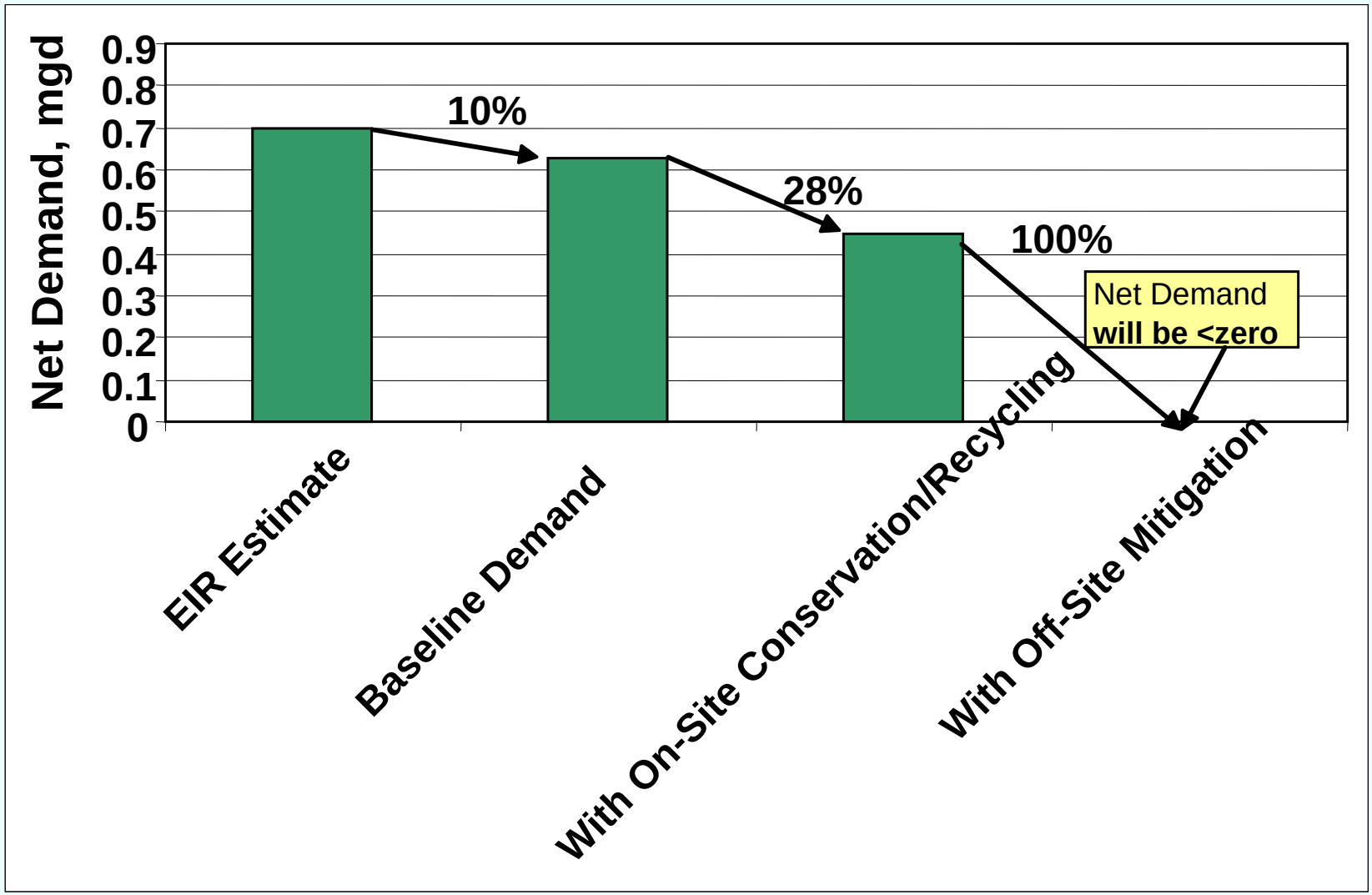
Off-Site Demand Mitigation

- Residential/Commercial Conservation
- Food Service & Hospitality Programs
- Health Care/Medical Sector Programs





Camino Tassajarra Project
Water Demand Estimates



Camino Tassajara Project Features

Camino Tassajara Project Features

Camino Tassajara Project Features

- Balance the amount of hardscape and softscape

Model Complex Design Objectives

Camino Tassajara Project Features

- Demonstrate to the public that sustainable or drought-tolerant landscapes are not GREY or WEEDY looking

Model Complex Design Objectives

Future Compliance

- Staff have already conducted on-site inspections for compliance
- CC&Rs are critical to put buyers on notice
- Review water budgets annually with HOAs
- Future noncompliance will result in “Additional Water Demand Mitigation Fee” assessed to the homeowner or HOA
- No future changes without EBMUD approval
- Recorded with the Department of Real Estate

Camino Tassajara Example Water Budget

- Total water budget of 0.3 million gal/day
- Meter sizing 5/8- to 2-inch
  - Based on size of lot (4,000 sf. – 15,000 sf.
  - Fixture counts (bathrooms, appliances, faucets, etc.)
  - Outdoor irrigation (ET controllers, drip, bubbler, spray)

Housing Area	No. of Units	Individual Water Budget	
		Million gal/day	Million gal/yr
Alamo Creek Single Family	679	0.25	90.8
Alamo Creek Senior Care	120	0.02	6.1
Alamo Creek Town homes	127	0.03	11.3
Master Water Budget	**926**	**0.30**	**108**

Water Demand Offset Mitigation Fees

SCHEDULE OF RATES AND CHARGES TO CUSTOMERS OF THE EAST BAY MUNICIPAL UTILITY DISTRICT

PAGE NUMBER 14-A

EFFECTIVE 08/11/08

SCHEDULE N

WATER DEMAND MITIGATION FEES

The Water Demand Mitigation Fee funds District conservation programs that are intended to achieve water savings that offset water demand from development within the territory or development where the fees are collected. The Water Demand Mitigation Fee is payable at the time application for service is made or prior to release of the distribution system pipelines and related appurtenances when the installation of water main extensions are required.

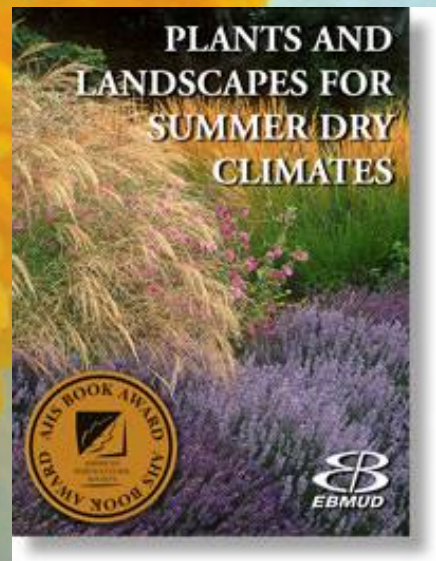
Shapell Water Conservation Model Home

- Est. 2,000 visitors per week
- Plant book on video screen
- Floor to ceiling wall images
- Gardening computer kiosk
- Interactive floor model
- Air-conditioning, lighting
- Installation in August
- Grand opening Sept. 2006?
- Other Developers interested

EBMUD

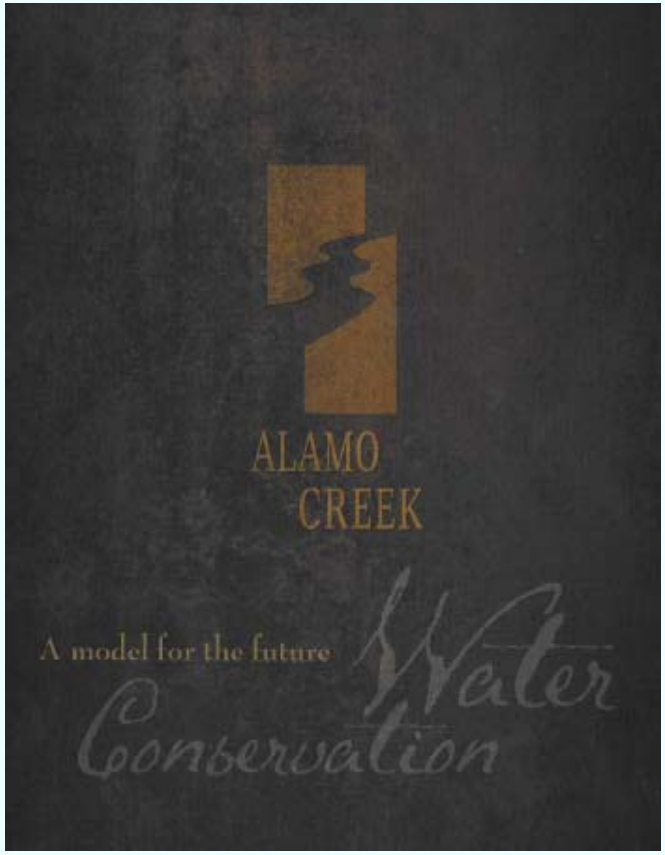
- Garden Tours
- Garden Gallery
- Plants
- Garden Resources
- My List
- Watering Tips
- About Us

WaterSmart Gardening for Alamo Creek



Camino Tassajara Lessons Learned

- **Communicate early** with land use agencies and developers to review all water efficiency options
- **Emphasize proven technologies** to achieve expected water savings and performance
- **Interact with applicants** and educate them about options
  - Pre-approved fixtures (HET's, clothes washers)
  - Landscaping (plant lists)



Water Supply Assessments

- 50 Water Supply Assessments completed by EBMUD since 2000 (all under CWC 10910-10915)
  - 4 completed under SB 901 (2000, CEQA)
  - 46 completed under SB 610 (2002)
- Project types
  - 6 Infill projects
  - 44 Redevelopment projects
- Lead Agency
  - City – 44 WSA's
  - County – 2 WSA's
  - Other – 4 WSA's

Water Supply Assessments (cont.)

- Development Type
  - Single Family Residential (500 to 2,100 units)
  - Multi-family Residential (500 to 1,700 units)
  - Commercial (200,000 to 4.7 million square feet)
  - Mixed-Use (Residential/Commercial)

- Average Water Demand of 15,000 to 1,800,000 gallons per day

Written Verification

- No EBMUD projects to date required a Written Verification under SB 221.
  - All projects are within an urbanized area that has been previously developed for urban uses.
  - The projects are located at sites where the immediate contiguous properties surrounding the site are, or have been, developed for urban uses.

2009 Draft Legislation

- Assembly Bill 1408 (Krekorian)
  - Voluntary new development 1:1 water demand offsets
  - Co-Sponsored by Planning Conservation League and EBMUD
  - Alternative to meet Water Supply Assessment
  - Focus on “substantiating water savings”

Lessons Learned

- Local jurisdictions may not be aware of Water Supply Assessment requirement
  - 90-day water company response time allowed
- The Lesson
  - Failure to consult early may result in delay in publishing Draft EIR
  - Water agencies need to prospectively remind local jurisdictions of the requirements

Lessons Learned

- Comprehensive Urban Water Management Plan (UWMP) needed
  - Includes best available demand forecast
  - Critical to understand overall water supply availability including water supply for drought years
  - Updated every five years
- The Lesson
  - Having a comprehensive UWMP is key document to support preparation of all WSAs

Lessons Learned

- Water agency specific response letter
  - Provides for any updates to the UWMP between the five year updates
  - Must be clear on water agencies consumer reduction goals during drought conditions
- The Lesson
  - WSAs present specific opportunities each project has to further water company's water conservation and recycling goals

Lessons Learned

- Land use methods in forecasting water demand
  - If rigorously performed and updated on a regular basis, demand projections are spatially accurate
  - Allows for specific adjustments to account for water conservation and water recycling goals
  - Land use information is provided by local jurisdictions (General and Long Range Plans)
- The Lesson
  - Convert to GIS based land-use forecasting method

Lessons Learned

- Local jurisdiction General Plans and Long Range Planning
  - Shorter time frame than that used by a typical water agency in planning and securing water supply and the life span of the major infrastructure facilities
  - General Plans are started and finished at different time periods unlike the UWMP
- The Lesson
  - It is a challenge to forecast land use changes for all agencies involved and yet water system infrastructure useful life is often expected to be 30 to 50 years or longer

Lessons Learned

- WSA in General Plan Updates
  - Intent of the Legislation – project level analysis
  - General Plans propose land use and zoning changes but do not identify specific projects to be developed under the plan
- The Lesson
  - WSA not required for a General Plan updates
    - This does not absolve the General Plan process and CEQA documentation from dealing with issue of water supply as appropriate

Plan Review Process

Developer

- Submits plans to planning agency
- Tentative Map Plan (TMP) approval
- Environmental assessment/compliance
- Pays for water service connection

Planning Agency

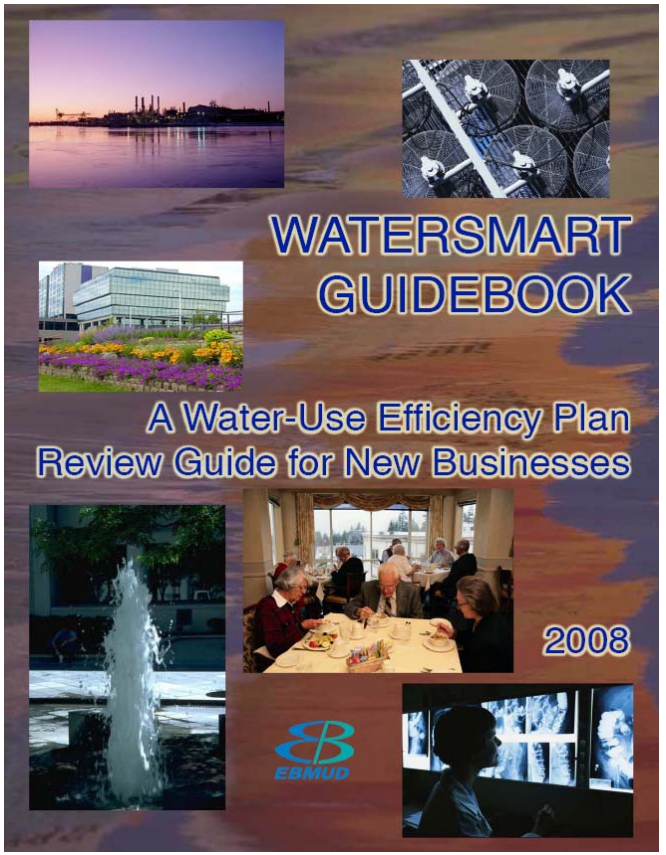
- Routes TMP for comment
- Notifies developer of req’ts
- Routes DEIR for comment
- Issues occupancy permit

Water Agency

- Review and comment on TMP
- Review and comment on DEIR
- Complete water service assessment
- Issue water meter

WaterSmart Development Guidebook

- A reference document on CII water-use efficiency
- Applies 15+ water use technologies
- Covers 20+ different business types
  - Description of end uses
  - Water savings hardware and processes
  - Cost-benefit analyses
  - Hardware and customer profiles
  - Permit process
  - Marketing plan
  - Appendices



Matrix of Operations

Type of Business (20)

- Offices
- Schools
- Restaurants
- Retail
- Hotel/Motel
- Grocery
- Medical facilities
- Laboratories
- Laundries
- Manufacturing
- Vehicle washing
- Bakeries
- Automotive
- Printing

Water Using Technology (15)

- Plumbing fixtures
- Landscaping
- Pools, spas & fountains
- Water treatment
- Alternate water sources
- Thermodynamic processes
- Food service
- Wash down & sanitation
- Laundry
- Submetering
- Process water
- Photo & film processing
- Medical & laboratory
- Vehicle wash

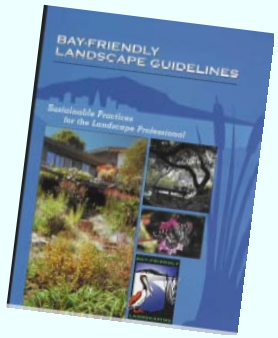
Supporting Initiatives

- Water Efficient Product Rating and Labeling

- EBMUD WaterSmart Certification and Recognition

- WaterSmart Development Guidebook
- LEED, Build it Green, NAHB GBI

- Nursery Partnering/Bay Friendly Landscaping



Supporting Initiatives

"WaterSmart From the Start" Requirements for New Service

- Apply to new water services and meter upsizing
- Require EBMUD-approved plan review for water efficiency
- Require individual metering for MF and commercial units < 4 stories
- Promote non-potable water service

Water Efficiency Requirements

- Applies to all new applicants & meter upsizing
  - By **customer** type (residential, commercial, industrial, etc.)
  - By **use** type (indoor, outdoor)
  - By **technology** (fixtures, appliances, equipment, etc.)
- Application process
  - Varies by number of units
  - Varies by size of landscaping
  - Integrated into existing process

Property Type – Outdoor Water Use	Check List	Detailed Plan *
<5,000 ft² landscaped area (e.g. owner occupied)	💧	
2 or fewer properties/units	💧	
3 or more properties (e.g. developer)		💧
Commercial properties		💧

** District reserves right to inspect and verify efficiency measures*

Trend: Increasing Densities

OAKLAND 10k INITIATIVE

10,000 RESIDENTS DOWNTOWN

Commercial Complex

Submetering Retrofit Pilot Program - District Benefits

- Capture additional water savings
- Improved water shortage response due to direct pricing signal
- Improved communication with end user

Higher residential densities

Compact commercial development

Water Efficiency Criteria

- Products have been **performance rated** (3rd party)
- Achieve **measurable water savings**
- Product and technology **readily available**
- **Reasonable economic cost** to consumer
- **Compliance** at applicants expense

Indoor Water Efficiency Requirements

Item	Residential	Non-Residential
Toilets	1.28 gal dual flush (HET)	1.28 gal dual flush (HET)
Urinals	---	0.5 gal per flush
Showerheads	2.5 gpm; individually plumbed; one head per 2,500 sq. in stall	2.5 gpm; individually plumbed; one head per 2,500 sq. in stall
Faucet Aerators	1.5 gpm bath; 2.2 gpm kitchen	1.5 gpm bath; 2.2 gpm kitchen
Clotheswasher	7.5 gal per cubic foot of laundry	7.5 gal per cubic foot of laundry
Pre-Rinse Spray Valves	---	1.6 gal. per minute
Ice Machines	---	Air cooled or $\leq$ 25 gal/100 lbs
Food Steamers	---	Boiler-less; self contained*
Cooling Towers	---	$\geq$ 5 cycle recirculating

** Where applicable*

Outdoor Water Efficiency Requirements

Item	Water Efficiency Requirement
✓ Landscape Plan	detailed plan review; check List <5,000 ft^2
✓ Turf Areas	< 25% of area; turf and sprinklers/spray heads not allowed in medians <8 ft.
✓ Dedicated Irrigation Meter	> 5,000 sq. ft. of landscape
✓ Irrigation Efficiency	80% of evapotranspiration; no runoff
✓ Irrigation Controller	weather-based self adjusting model
Plants	80% low water use; 20% other
Non-Turf Areas	drip, sub-surface and bubblers; no runoff
Valves and circuits	separately zoned by plants and water use

✓*Exception for: (a) <5,000 ft^2 of irrigated landscaping and (b) < 3 residential properties*

Consequences for Non-Compliance

- Applicant must resubmit application at their expense
- Meter installation refused until plan is approved

Results of New Regulations

- 140 plans received (800 residences)
- Plans are incorporating state-of-the-art conservation
- Builders are accepting HET's
- Ornamental turf is reduced or eliminated
- Multi-family and commercial metering expanded

WaterSense Labeled Products (2006 to 2008)

- Independent Certification
  - To earn the WaterSense label, products must pass **independent, third-party testing**
- High-Efficiency Toilets (HETs)
  - 300+ labeled models
- Faucets
  - 750+ labeled models
- Find Products
  - www.epa.gov/watersense

EPA WaterSense

WaterSense Products
Near-Term Specifications

High-Efficiency Urinals
2009

Irrigation Controllers
2009 - 2010

Pre-rinse Spray
Valves
2010

Showerheads
2009 - 2010

Landscape Irrigation Water Budgets

EBMUD Landscape Water Use Estimate

EBMUD

Customer:	Meridian Place HOA
Project Name:	Common Area Landscape
Project Address:	Sutton Circle
Account #:	5022324-2, 5022331-2, 5022334-2, 5022317-2
City:	Danville
Date:	2/13/2001

		TURF		SHRUBS/ GROUNDCOVER	
Total irrigated landscape: 72765		13,164	Square feet	59,601	Square feet
ET:		48	Inches/Year	48	Inches/Year
Peak ET:		0.24	Inches/Day	0.24	Inches/Day
Percent of ET:	100%	80%		60%	
Annual water use requirement:		314,925	Gallons/Year	1,059,385	Gallons/Year
		420	CCF/Year	1,425	CCF/Year

Target Goal for Site (80%-60% ET) 1,844 **CCF/Year**

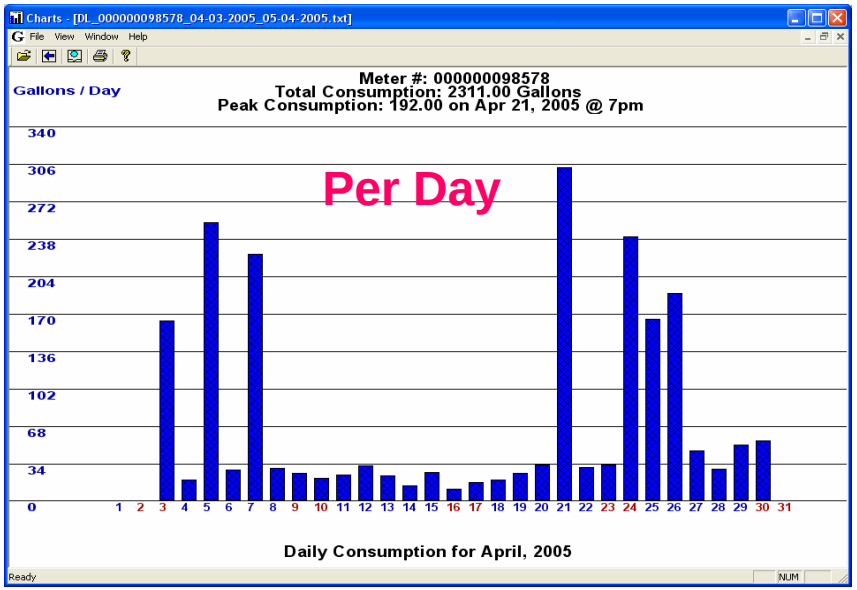
Maximum (Ceiling) Use for Site (100% ET) 2,899 **CCF/Year**

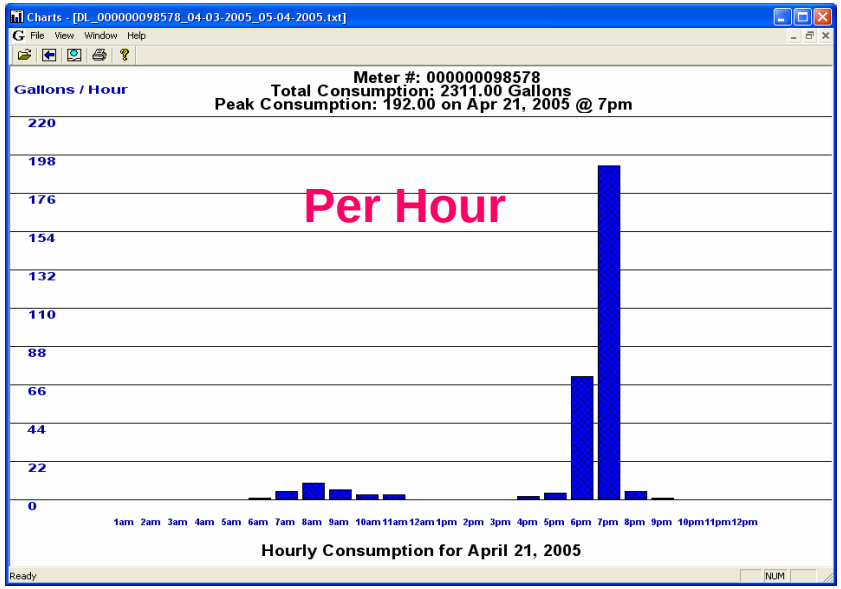
1999 Site Consumption 1,863 **CCF/Year**

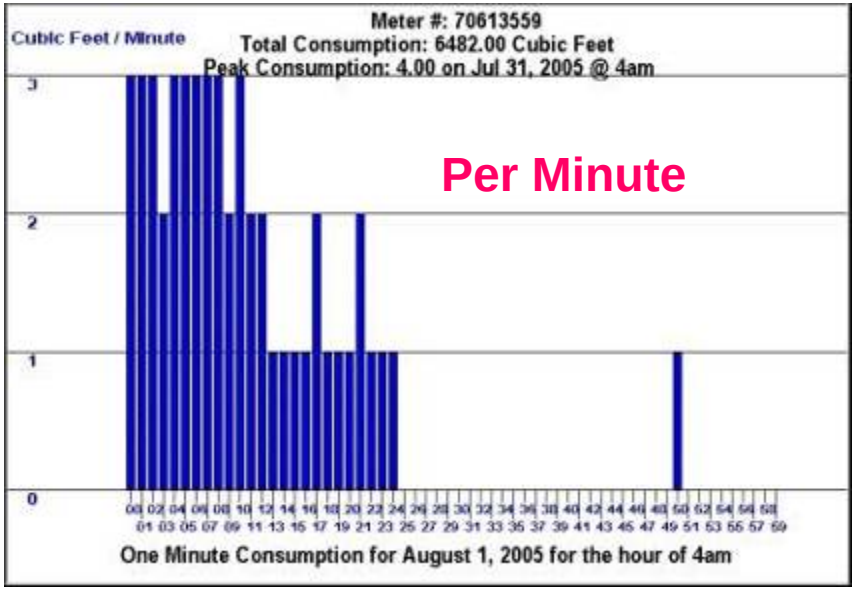
A Meter Reader during World War II

A Meter Reader today

Sample Customer Profiles

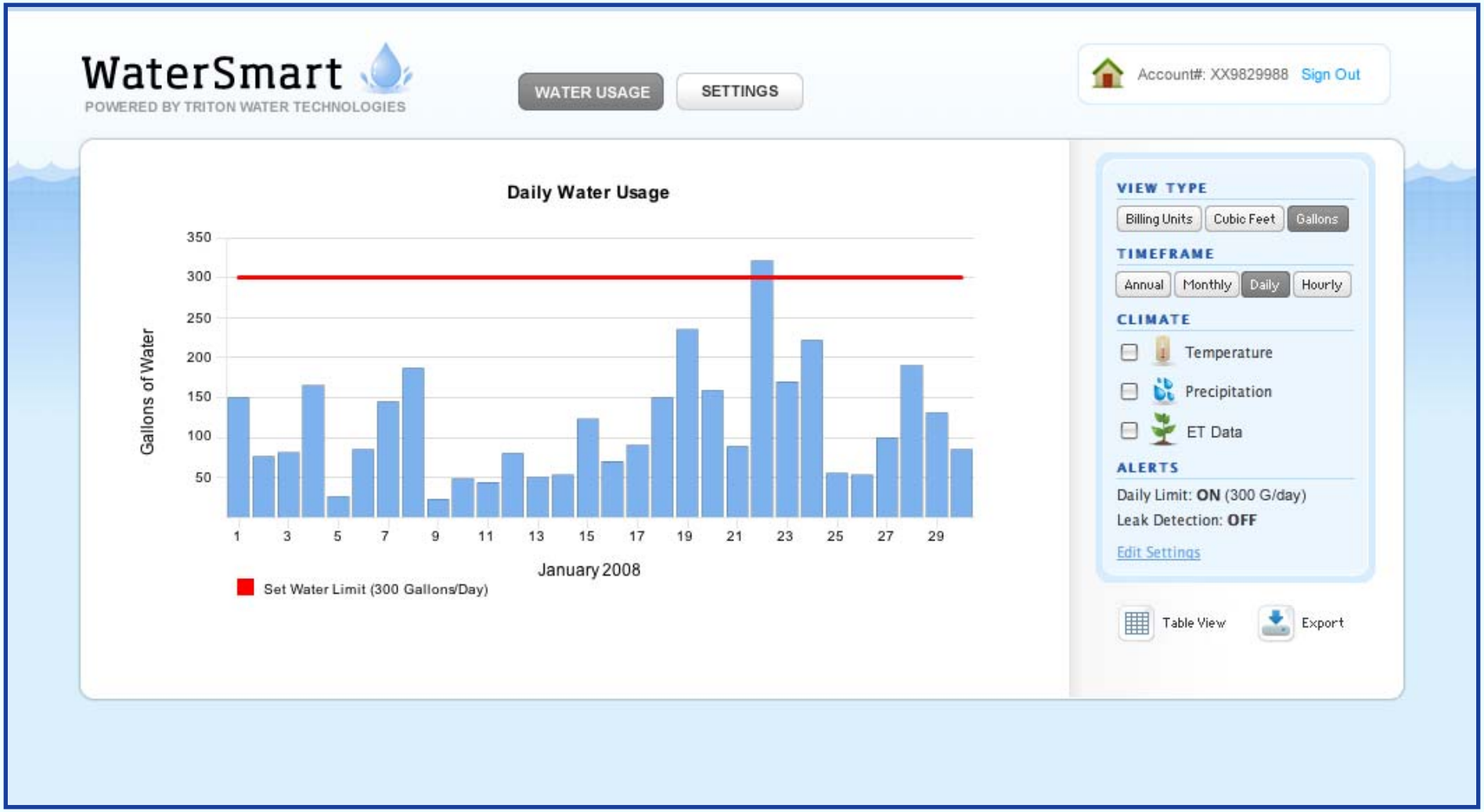






EBMUD Blackhawk Customer Interface

(daily usage showing budget level)



Recommendations

- Water efficient development helps new supply lag time
- New sustainability concepts supplement existing conservation services
- Begin coordination before the Environmental Impact Report (EIR) process
- Reduce on-site water use to reduce off-site measures
- Use conventional technology to more reliably meet goals

Conclusions

- Unique partnership is one of the first in the U.S.
- Demonstrates zero water footprint development
- A model for other water short areas
- Water supply shortages create innovation
- On-site water savings of 20 to 30 percent possible
- Off-site mitigation possible where conservation potential exists within local utility service area

Questions?

Richard W. Harris

Water Conservation Manager

rharris@ebmud . com

(510) 287-1675