Altamont Landfill and Resource Recovery Facility

Altamont Landfill and Resource Recovery Facility is a regional facility that provides safe and convenient disposal services for communities, businesses and industries serving Alameda County and surrounding cities.

Waste Management's approximately 300 disposal facilities employ the latest advances in landfill technology. This facility is engineered with environmental protection systems that meet or exceed rigorous government regulations and are subject to highly regulated monitoring and reporting requirements. Systems include engineered liners and covers, leachate collection and removal, and landfill gas collection and control.

Altamont Landfill and Resource Recovery Facility is recognized for its sustainable practices and leadership in landfill management. This facility hosts an on-site landfill gas to liquefied natural gas (LNG) plant and Liquefied Compressed Natural Gas (LCNG) fueling facility as well as electricity-generating landfill gas-powered turbines and windmills.

Containment Design

The current fill area for the landfill (Fill Area 1) consists of an older Class III waste management unit with a low-permeability soil liner and leachate collection system (Unit 1), and a Class II unit with a composite liner and leachate collection system. Fill Area 2 is a 250-acre unit scheduled for opening in early 2015 and will utilize a composite liner and leachate collection system.

Leachate Collection & Treatment

The leachate management system for Altamont is designed to detect and collect any leachate generated in the landfill. Collected leachate is pumped to an onsite wastewater storage facility for later use as dust control within the newer cell of the landfill.

Groundwater Monitoring

Groundwater is monitored at 10 wells, both upgradient and downgradient of the waste disposal footprint. The groundwater monitoring network is sampled and analyzed semi-annually in accordance with the procedures of the facility's groundwater sampling and analysis plan.

ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY

10840 Altamont Pass Road
Livermore, CA 94550
800 963 4776

HOURS OF OPERATION

Monday – Friday: 6:00am – 4:00pm
Closed Saturday and Sunday

YEAR OPENED

1980

PROJECTED LIFE REMAINING

~50 years

FACILITY ACREAGE

2,170 acres

PERMITTED FOOTPRINT

472 acres

REMAINING PERMITTED CAPACITY

42.4 million tons

TONS PROCESSED ANNUALLY

1,500,000 tons

OWNERSHIP

Waste Management
of Alameda County, Inc.

PERMIT TYPE & PERMIT #

Solid Waste Facilities 01-AA-0009

Waste Discharge Requirements
R5-2009-0055

REGULATORY AGENCIES

Alameda County Environmental Health (LEA), CalRecycle, Central Valley RWQCB, BAAQMD

EMPLOYEES

55

Landfill Gas Management

Altamont has a Landfill Gas (LFG) collection and control system consisting of 127 vertical wells, two horizontal trench collectors, and one leachate cleanout riser (LCRS). Landfill gas is collected and used to generate power for the site as well as about 8,500 homes through sale of power to PG&E.

In addition, Altamont Landfill maintains a gas to liquefied natural gas (LNG) plant which produces bio-fuel for our collection vehicles and commercial fleets and produces approximately13,000 gallons of LNG fuel daily.

Security

Site security is ensured by controlled, limited access to the facility and perimeter fencing. During non-business hours the gate is locked and monitored by electronic surveillance.

Acceptable Material

Asbestos – Friable/Non-Friable

Auto Shredder Residue

Biosolids

Construction & Demolition (C&D) Debris

Sludge

Drum Management – Liquids/Solids

Industrial & Special Waste

Liquids

Municipal Solid Waste (MSW)

Yard Waste

Unacceptable Material

Electronic Waste

Hazardous Waste

Infectious or Biohazard Waste

NRC Regulated Radioactive Waste

Universal Waste

Additional Services Provided

Metals Recovery (Limited amount through DHEC trial program)

Recycling

Solidification

Risk Mitigation

Waste Management provides the highest level of services, backed with state-of-the-art site design and management systems, to minimize risks and reduce liabilities.

Community Partnerships and Involvement

Altamont Landfill and Resource Recovery Facility is proud to be an active supporter of community events and programs that make Alameda County a strong and healthy place to live, work and play.

The landfill's impact on surrounding communities has been carefully analyzed and mitigated. Annually the Altamont Landfill generates millions of dollars in fees to support Alameda County recycling programs along with open space and community arts programs in the Alameda County.

CONTACT

Technical Support
TSC California
800 963 4776
TSCCalifornia@wm.com

COMMUNITY RELATIONS

Karen Stern
510 613 8720
kstern2@wm.com

COMMUNITIES SERVED

San Francisco and Alameda Counties

WASTE MANAGEMENT

THINK GREEN®

BKF
ENGINEERS / SURVEYORS / PLANNERS

255 Shoreline Drive, Suite 200
Redwood City, CA 94065
(650) 482-6300, Fax (650) 482-6399

MEMORANDUM

Date: November 12, 2015 **BKF No.:** 20130002-12

To: Miroo Desai, City of Emeryville

From: Thomas Morse, BKF
Ryan Bernal, BKF

Cc: Ron Metzker, LPAS Architecture & Design
Mike Millett, LPAS Architecture & Design
Brady Smith, LPAS Architecture & Design
Kevin Ma, Lennar Corp.

Subject: Sherwin Williams – Sewer Capacity

Purpose

The purpose of this memorandum is to summarize previously prepared sanitary sewer demand and capacity studies completed for the 2005 project CEQA review and provide updated project sanitary sewer demands for comparison.

Background

The project includes redevelopment at the 10.05 acre site bounded by Sherwin Ave to the south, Horton Street to the east and Temescal Creek to the north and the Union Pacific Railroad to the west.

The 2005 project included tow development scenarios with the residential intensive scenario creating the largest sewer demand at 88,804 gallons per day. This was based on 1154 dwelling units and 70,000 SF of commercial space. The 2005 project included one project sanitary sewer connection to the existing 8" sewer main in Hubbard Street. The Hubbard Street and Park Avenue sewer line capacity was the subject of sanitary sewer capacity calculation prepared June 5, 2005. These studies are attached.

Based on conversations with the City of Emeryville, sewer points of connection have been reconfigured to reduce the sewer flow to Hubbard Street and included additional sewer points of connection to the Horton Street sewer and the sewer main adjacent to Temescal Creek.

We understand that there are currently 4 project options be studied. Each option has similar sewer demands and may differ slightly in distribution of those sewer demands to the adjacent city sewer infrastructure.

Option A, December 1, 2014

Option A includes 94,600 square feet of retail, commercial and office space and 540 residential Units. This development plan represents 85,060 gallons per day Average Day Demand and is a 3,744 gallon per day reduction in flow compared to the 2005 project. The sewer demand is distributed as follows

City Facility	Sewer Demand	
	GPD ADD	GPM ADD
8" Main, Halleck Street	14,840	10.3
8" Main, Hubbard Street	25,700	17.8
8" Main Horton Street	15,380	10.7
18" Main @ Temescal Creek	29,140	20.2

Option B, December 1, 2014

Option B includes 94,600 square feet of retail, commercial and office space and 540 residential Units. This development plan represents 85,060 gallons per day Average Day Demand and is a 3,744 gallon per day reduction in flow compared to the 2005 project. The sewer demand is distributed as follows

City Facility	Sewer Demand	
	GPD ADD	GPM ADD
8" Main, Halleck Street	0	0
8" Main, Hubbard Street	40,840	28.4
8" Main Horton Street	15,380	10.7
18" Main @ Temescal Creek	28,840	20.0

Option 3B, August 10, 2015

Option 3B includes 82,000 square feet of retail, commercial and office space and 532 residential Units. This development plan represents 82,680 gallons per day Average Day Demand and is a 6,124 gallon per day reduction in flow compared to the 2005 project. The sewer demand is distributed as follows

City Facility	Sewer Demand	
	GPD ADD	GPM ADD
8" Main, Halleck Street	0	0
8" Main, Hubbard Street	27,400	19.0
8" Main Horton Street	22,240	15.4
18" Main @ Temescal Creek	33,040	22.9

Option 4, August 10, 2015

Option 4 includes 82,000 square feet of retail, commercial and office space and 532 residential Units. This development plan represents 82,680 gallons per day Average Day Demand and is a 6,124 gallon per day reduction in flow compared to the 2005 project. The sewer demand is distributed asfollows

City Facility	Sewer Demand	
	GPD ADD	GPM ADD
8" Main, Halleck Street	0	0
8" Main, Hubbard Street	24,360	16.9
8" Main Horton Street	22,240	15.4
18" Main @ Temescal Creek	36,080	25.1

Sewer Capacity

<u>8-inch Main in Halleck Street</u>

The City of Emeryville request, where possible, project flow for buildings adjacent to Halleck Street connect to the 8-inch Halleck Street main. Option A includes the maximum discharge to the Halleck Street main. This represents an additional 8.6 gallons per minute Average Day Demand.

<u>8-inch Main in Hubbard Street</u>

Based on the 2005 study, the 8-inch sewer main in Hubbard Street had capacity to serve the project and adjacent tributary uses, and would flow at a depth ratio of between 0.74 and 0.61 during Peak Wet Weather Flow. The current proposal reduces project demands for the Hubbard Street from 88,800 gpd to a maximum of 27,400 gpd for Option 3B. This would decrease the flow depth ratio to between 0.34 and 0.28.

24-inch Main in Park Avenue

The study performed in 2005 included sewer flow monitoring for the 24-inch main in Park Avenue. This study found that the maximum sewer flow observed only represented 10% of the capacity of the 24-inch main and has adequate capacity to serve the project.

8-inch Main in Horton Street

The City of Emeryville requested that the building fronting Horton Street connect to the 8-inch Horton Street Main. Options 3B and 4 include the maximum discharge to the Horton Street main. This represents an additional 15.4 gallons per minute Average Day Demand discharging to Horton Street.

Temescal Creek

The City of Emeryville requested that buildings toward the north end of the site connect to the 18-inch sewer main adjacent to Temescal Creek. Option 4 includes the maximum discharge to the Temescal Creek sewer main. This represents an additional 25.1 gallons per minute Average Day Demand discharging to the Temescal Creek sewer main.

Conclusion

The proposed site redevelopment will reduce the flows connected to the 8-inch sewer main on Hubbard Street and the 24-inch sewer main on Park Avenue that were studied as a part of the 2005 project application. Modifications to the connection points for sewer have significantly reduced the demand the project would connect to these system. Unless either of these system has experienced substantial increases in demand since the previous study, given that the new project proposal reduces flows to these system, there should be adequate capacity to serve the project.

ATTACHMENTS:

1. Sherwin Williams Utility Plan Option A – Proposed Sanitary Sewer Demands, November 3, 2015
2. Sherwin Williams Utility Plan Option B – Proposed Sanitary Sewer Demands, November 3, 2015
3. Sherwin Williams Utility Plan Option 3B – Proposed Sanitary Sewer Demands, November 12, 2015
4. Sherwin Williams Utility Plan Option 4 – Proposed Sanitary Sewer Demands, November 12, 2015
5. Hubbard Street Sewer Capacity

ATTACHMENT 1

Sherwin Williams Utility Plan Option A – Proposed Sanitary Sewer Demands, November 3, 2015

Sherwin Williams Development Plan (Option A)
Proposed Sanitary Sewer Demands

Table 1 - Proposed Demands by Building

PARCEL A						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	74,000	SF	0.10	7,400	5.14	**0.011**
Total Proposed Demands				**7,400**	**5.14**	**0.011**

PARCEL B-1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	12,000	SF	0.10	1,200	0.83	**0.000**
Residential	175	Units	140	24,500	17.01	**0.038**
Total Proposed Demands				**25,700**	**17.85**	**0.038**

PARCEL B-2						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	5,600	SF	0.10	560	0.39	**0.000**
Residential	53	Units	140	7,420	5.15	**0.011**
Total Proposed Demands				**7,980**	**5.54**	**0.011**

PARCEL C-1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Residential	106	Units	140	14,840	10.31	**0.023**
Total Proposed Demands				**14,840**	**10.31**	**0.023**

PARCEL C-2						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	3,000	SF	0.10	300	0.21	**0.000**
Residential - Studio	126	Units	140	17,640	12.25	**0.027**
Total Proposed Demands				**17,940**	**12.46**	**0.027**

PARCEL D						
DESCRIPTION OF USE				**SEWER DEMAND**		
Land Use	**No.**	**Unit**	**Unit Demand (g/unit)**	**Average Daily Demand (gpd)**	**(gpm)**	**(cfs)**
Residential - Studio	80	Units	140	11,200	7.78	**0.017**
Total Proposed Demands				**11,200**	**7.78**	**0.017**

Sherwin Williams Development Plan (Option A)
Proposed Sanitary Sewer Demands

Table 2 - Proposed Demand Summary by Point of Connection

	SEWER DEMAND Average Daily Demand		
	(gpd)	(gpm)	(cfs)
Proposed Demand for Connection Point #1 (Parcel C-1)	14,840	10.31	0.023
Proposed Demand for Connection Point #2 (Parcel B-1)	25,700	17.85	0.040
Proposed Demand for Connection Point #3 (Parcel A)	7,400	5.14	0.011
Proposed Demand for Connection Point #4 (Parcel B-2)	7,980	5.54	0.012
Proposed Demand for Connection Point #5 (Parcels C-2 & D)	29,140	20.24	0.045
Total Proposed Demand	85,060	59.07	0.132

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SHERWIN WILLIAMS - OPTION A
ATTACHMENT A
CONCEPTUAL UTILITY PLAN
CITY OF EMERYVILLE ALAMEDA COUNTY CALIFORNIA

MARIO J & VIRGINIA E PELLEGRINI

EX SSMH RIM 11.1±

HALLECK STREET

8" SS 94 LF S=0.01

6" SS 35 LF S=0.01

SS 95 LF

EX 15" RCP 177 LF S= 0.0013

CONNECTION POINT #1

SS STUB INV 9.4

SSMH RIM 11.4 INV 9.0

CB RIM 13.5 INV 10.8

12" SD 4 LF S=0.005

12" SD 36 LF S=0.005

12" SD STUB INV 10.9

SDMH RIM 13.8 INV 10.5

PARCEL C-1
RESIDENTIAL - STUDIO: 10
RESIDENTIAL - 1 BEDROOM: 28
RESIDENTIAL - 2 BEDROOM: 46
RESIDENTIAL - 3 BEDROOM: 11

SOUTHERN PACIFIC TRANSPORTATION COMPANY

12" SD 144 LF S=0.005

EX CB 196
TG 9.64
INV IN 7.54 (12")
INV OUT 7.54 (18")

18" RCP 340 LF S=0.15%

CB RIM 13.7 INV 11.3

2" IRR

EX CB 10001
TG 10.71
INV IN 7.11 (18")
INV OUT 7.10 (18")

TEMESCAL CREEK

EX 12" RCP 23 LF S=0.0122

JT STUB 6" W 6" FS

FDC

EX CB 181
TG 8.54
INV OUT 6.19

EX HAMILTON SENIOR HOMES LLC

SHERWIN AVENUE

12" SD 257 LF S=0.005

RESIDENTIAL - STUDIO: 8
RESIDENTIAL - 1 BEDROOM: 24
RESIDENTIAL - 2 BEDROOM: 38
RESIDENTIAL - 3 BEDROOM: 10

PARCEL C-2

EX 12" RCP 19 LF S=0.005

EX CB TG 8.95 INV 6.01

EX CB TG 8.40 INV 6.19

EX SSMH RIM 11.73 INV IN 8.63 (6" N) INV OUT 8.63 (8" S) NEW INV IN 8.9 (8" N)

12" SD 171 LF S=0.0013

CONNECTION POINT #2

HUBBARD CIRCLE WEST

6" W 6" FS

JT STUB

6" SS STUB INV 12.6 6" SS 21 LF S=0.01

12" SD STUB INV 10.9

12" SD 35 LF S=0.005

FH

FDC

CB RIM 15.5 INV 9.1

CB RIM 15.4 INV 9.7

CB RIM 15.6 INV 7.5

CB RIM 15.5 INV 8.1

SSMH RIM 16.0 INV 10.7

SDMH RIM 15.6 INV 5.3

SDMH RIM 15.3 INV 4.4

8" SS 390 LF S=0.005

24" SD 182 LF S=0.005

24" SD 158 LF S=0.005

8" W

JT LINE

SDMH RIM 14.4 INV 11.8

SDMH RIM 16.4 INV 9.5

12" SD 25 LF S=0.005

12" SD 70 LF S=0.005

SSMH RIM 16.2 INV 12.5

12" SD 25 LF S=0.005

12" SD 40 LF S=0.005

SDMH RIM 16.5 INV 8.9 SDMH RIM 16.6 INV 8.3

12" SD 82 LF S=0.005

12" SD 25 LF S=0.005

SSMH RIM 16.2 INV 12.3

18" SD 68 LF S=0.005

12" SD 25 LF S=0.005

SDMH RIM 16.5 INV 7.9

18" SD 95 LF S=0.005

18" SD 85 LF S=0.005

12" SD 25 LF S=0.005

24" SD 45 LF S=0.005

SDMH RIM 16.8 INV 6.6

SDMH RIM 16.8 INV 6.3

12" SD 8 LF S=0.005

6" SS 17 LF S=0.01

6" SS STUB INV 11.0

12" SD STUB INV 6.4

PARCEL D
RESIDENTIAL - STUDIO: 16
RESIDENTIAL - 1 BEDROOM: 49
RESIDENTIAL - 2 BEDROOM: 79
RESIDENTIAL - 3 BEDROOM: 20

8" SS 310 LF S=0.005

24" SD 41 LF S=0.005

CONNECT TO CREEK INV 4.2

CONNECTION POINT #5

EX SSMH RIM 9.1

8" SS 233 LF S=0.45%

8" SS 153 LF S=0.02

HUBBARD STREET

15" RCP

6" RCP 47 LF

EX CB 182
TC 11.71
INV IN 10.01 (8" N)
INV OUT 9.96 (15" S)

EX CB 10004
TG 11.90
INV OUT 11.15 (8" S)

JT STUB 8" SS 42 LF S=0.01

FDC

CB TG 12.2 INV 9.7

SSMH RIM 16.1 INV 12.3

6" SS 33 LF S=0.01

6" SS STUB INV 12.7

12" SD 43 LF S=0.005

12" SD STUB INV 10.0

HUBBARD CIRCLE EAST

CB RIM 15.5 INV 9.1

12" SD 81 LF S=0.005

CB RIM 16.0 INV 9.1

12" SD 10 LF S=0.005

12" SD 35 LF S=0.005

12" SD STUB INV 10.9

FDC

FH

JT LINE

CB RIM 15.6 INV 7.5

CB RIM 15.5 INV 8.1

SDMH RIM 16.3 INV 6.8

JT STUB 6" W 6" FS

FH

CB RIM 17.1 INV 6.9

CB RIM 17.1 INV 6.3

SDMH RIM 16.8 INV 6.1

12" SD 110 LF S=0.005

12" SD 136 LF S=0.005

THE CITY OF EMERYVILLE

EX DI

12" SD 25 LF S=0.005

SDMH RIM 14.3 INV 10.3

12" SD 49 LF S=0.005

CB RIM 14.7 INV 10.5

12" SD 25 LF S=0.005

CB RIM 14.7 INV 10.6

12" SD 4 LF S=0.005

12" SD STUB INV 10.7

EX SSMH RIM 16.76 INV IN 8.46 (8" S) INV OUT 8.46 (8" N)

12" SD 159 LF S=0.005

12" SD 118 LF S=0.005

EX P&H ASSOCIATES

EX FH

PARCEL B-1
RESIDENTIAL - STUDIO: 9
RESIDENTIAL - 1 BEDROOM: 25
RESIDENTIAL - 2 BEDROOM: 41
RESIDENTIAL - 3 BEDROOM: 10

6" W 6" FS

4" RW

8" W

JT LINE

PARCEL B-2
RESIDENTIAL - STUDIO: 11
RESIDENTIAL - 1 BEDROOM: 32
RESIDENTIAL - 2 BEDROOM: 51
RESIDENTIAL - 3 BEDROOM: 13

EX CHIRON PROPERTY

TEMESCAL CREEK

EX 18" SS

RETAIL (COMMERCIAL): 74,000 SF

PARCEL A

CB RIM 16.5 INV 11.7

6" SS STUB INV 8.9

JT STUB 6" W 6" FS

6" SS STUB INV 8.7

CB 224
TG 15.92
INV OUT 12.94 (12")

EX SSMH RIM 17.93 INV 6.73 IN (8" S) INV 6.73 OUT (8" N)

EX DI

EX DI

EX SSMH RIM 16.33 INV 5.71 IN (8" S) INV 5.71 IOUT (8" N)

EX SSMH RIM 15.51 INV OUT 12.31 (8" S)

EX GAS

CB RIM 15.6 INV 10.9

CONNECTION POINT #3

6" SS 30 LF S=0.01

12" SD 137 LF S=0.005

12" SD 34 LF S=0.005

CB RIM 16.4 INV 12.0

EX 12" RW

EX 10" W

EX 6" W

8" SS 299 LF S=0.41%

EX 8" RW

6" SS 30 LF S=0.01

8" SS 172 LF S=0.30%

EX GAS

8" SS 475 LF S=0.22%

EX 10" W

2 WM

EX KEY PAD

12" 27 LF

HORTON STREET

CONNECTION POINT #4

CONNECT TO EX 10" W

45TH STREET ARTIST COOPERATIVE INC

45TH STREET

EX SSMH RIM 17.74 INV 7.44 IN (6" W) INV 7.24 IN (8" S) INV 7.24 OUT (8" N)

CB 209
TG 16.12
INV OUT 13.04 (10")

SDMH 228
TG 16.27
INV 8.00

10" CI

CB TG 16.2 INV IN 12.9

GRAPHIC SCALE
40 0 40 80

No.	Revisions

Date 12/04/2014
Scale 1" = 40'
Design RKB
Drawn BPB
Approved TRM
Job No 20130002

Drawing Number:

1 OF 1

DRAWING NAME: J:\Eng13\130002\Conceptual\Option A\C500-SWPRUT.dwg
PLOT DATE: 12-08-14
PLOTTED BY: baye

ATTACHMENT 2

Sherwin Williams Utility Plan Option B – Proposed Sanitary Sewer Demands, November 3, 2015

Sherwin Williams Development Plan (Option B)
Proposed Sanitary Sewer Demands

Table 1 - Proposed Demands By Building

PARCEL A						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	74,000	SF	0.10	7,400	5.14	**0.011**
Total Proposed Demands				**7,400**	**5.14**	**0.011**

PARCEL B-1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	12,000	SF	0.10	1,200	0.83	**0.000**
Residential	175	Units	140	24,500	17.01	**0.038**
Total Proposed Demands				**25,700**	**17.85**	**0.038**

PARCEL B-2						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	5,600	SF	0.10	560	0.39	**0.000**
Residential	53	Units	140	7,420	5.15	**0.011**
Total Proposed Demands				**7,980**	**5.54**	**0.011**

PARCEL C-1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	3,000	SF	0.10	300	0.21	**0.000**
Residential - Studio	106	Units	140	14,840	10.31	**0.023**
Total Proposed Demands				**15,140**	**10.54**	**0.023**

PARCEL C-2						
DESCRIPTION OF USE				**SEWER DEMAND**		
Land Use	**No.**	**Unit**	**Unit Demand (g/unit)**	**Average Daily Demand**		
				(gpd)	**(gpm)**	**(cfs)**
Residential	126	Units	140	17,640	12.25	**0.027**
Total Proposed Demands				**17,640**	**12.25**	**0.027**

PARCEL D						
DESCRIPTION OF USE				**SEWER DEMAND**		
Land Use	**No.**	**Unit**	**Unit Demand (g/unit)**	**Average Daily Demand**		
				(gpd)	**(gpm)**	**(cfs)**
Residential	80	Units	140	11,200	7.78	**0.017**
Total Proposed Demands				**11,200**	**7.78**	**0.017**

Sherwin Williams Development Plan (Option B)
Proposed Sanitary Sewer Demands

Table 2 - Proposed Demand Summary By Point of Connection

	SEWER DEMAND		
	Average Daily Demand		
	(gpd)	(gpm)	(cfs)
Proposed Demand for Connection Point #1 (Parcels C-1 & B-1)	**40,840**	**28.36**	**0.063**
Proposed Demand for Connection Point #2 (Parcel A)	**7,400**	**5.14**	**0.011**
Proposed Demand for Connection Point #3 (Parcel B-2)	**7,980**	**5.54**	**0.012**
Proposed Demand for Connection Point #4 (Parcels C-2 & D)	**28,840**	**20.03**	**0.045**
Total Proposed Demand	85,060	59.07	0.132

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ENGINEERS/SURVEYORS/PLANNERS
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SHERWIN WILLIAMS - OPTION B
ATTACHMENT A
CONCEPTUAL UTILITY PLAN
ALAMEDA COUNTY, CALIFORNIA
CITY OF EMERYVILLE

MARIO J & VIRGINIA E PELLEGRINI

EX SSMH RIM 11.1±

SS 95 LF

HALLECK STREET

EX 15" RCP 177 LF S= 0.0013

SHERWIN AVENUE

EX 12" RCP 23 LF S=0.0122

EX CB 181 TG 8.54 INV OUT 6.19

EX HAMILTON SENIOR HOMES LLC

EX 12" RCP 19 LF S=0.005

EX CB TG 8.95 INV 6.01

EX CB TG 8.40 INV 6.19

EX SSMH RIM 11.73 INV IN 8.63 (6" N) INV OUT 8.63 (8" S) NEW INV IN 8.9 (8" N)

15" SD 171 LF S=0.0013

EX 6" W

8" SS 233 LF S=0.45%

15" RCP

6" RCP 47 LF

HUBBARD STREET

CONNECTION POINT #1

EX CB 182 TC 11.71 INV IN 10.01 (8" N) INV OUT 9.96 (15" S)

EX CB 10004 TC 11.90 INV OUT 11.15 (8" S)

SDMH RIM 11.7 INV IN 9.4

12" SD 159 LF S=0.005

EX P&H ASSOCIATES

SDMH RIM 14.3 INV 10.3

EX SSMH RIM 15.51 INV OUT 12.31 (8" S)

EX GAS

EX 12" RW

EX 10" W

EX 6" W

CB RIM 15.6 INV 10.9

SOUTHERN PACIFIC TRANSPORTATION COMPANY

TEMESCAL CREEK

CB RIM 13.4 INV 10.8

12" SD 30 LF S=0.005

SDMH RIM 13.5 INV 10.6

12" SD 165 LF S=0.005

EX CB 199 TG 9.64 INV IN 7.54 (12") INV OUT 7.54 (18")

18" RCP 340 LF S=0.15%

CB RIM 13.5 INV 11.5

12" SD 107 LF S=0.005

2" IRR

12" SD 98 LF S=0.005

RESIDENTIAL - STUDIO: 10
RESIDENTIAL - 1 BEDROOM: 28
RESIDENTIAL - 2 BEDROOM: 46
RESIDENTIAL - 3 BEDROOM: 11

CB RIM 12.9 INV 10.6

12" SD 5 LF S=0.005

12" SD STUB INV 10.7

PARCEL C-1

SDMH RIM 13.9 INV 10.0

RESIDENTIAL - STUDIO: 8
RESIDENTIAL - 1 BEDROOM: 24
RESIDENTIAL - 2 BEDROOM: 38
RESIDENTIAL - 3 BEDROOM: 10

PARCEL C-2

4" RW

6" SS STUB INV 12.6

6" W
6" FS
JT STUB

6" SS 67 LF S=0.01

HUBBARD CIRCLE WEST

FDC

8" W

JT LINE

SSMH RIM 14.4 INV 11.8

SDMH RIM 16.4 INV 9.5

SSMH RIM 16.2 INV 12.5

CB RIM 15.4 INV 9.7

CB RIM 15.4 INV 9.7

12" SD 25 LF S=0.005

12" SD 52 LF S=0.005

12" SD 25 LF S=0.005

8" SS 153 LF S=0.02

JT STUB

8" SS 42 LF S=0.01

6" SS 33 LF S=0.01

SSMH RIM 16.1 INV 12.3

CB TG 12.2 INV 9.7

6" SS STUB INV 12.7

12" SD 43 LF S=0.005

12" SD STUB INV 10.0

EX FH

PARCEL B-1

RESIDENTIAL - STUDIO: 9
RESIDENTIAL - 1 BEDROOM: 25
RESIDENTIAL - 2 BEDROOM: 41
RESIDENTIAL - 3 BEDROOM: 10

12" SD 49 LF S=0.005

CB RIM 14.7 INV 10.5

12" SD 25 LF S=0.005

CB RIM 14.7 INV 10.6

12" SD 4 LF S=0.005

12" SD STUB INV 10.7

EX SSMH RIM 16.76 INV IN 8.46 (8" S) INV OUT 8.46 (8" N)

RETAIL (COMMERCIAL): 74,000 SF

PARCEL A

CB RIM 16.5 INV 11.7

6" SS STUB INV 8.9

12" SD 137 LF S=0.005

6" SS 30 LF S=0.01

CB RIM 16.4 INV 12.0

12" SD 34 LF S=0.005

CONNECTION POINT #2

CONNECT TO EX 10" W

45TH STREET ARTIST COOPERATIVE INC

45TH STREET

GRAPHIC SCALE
40 0 40 80

8" SS 299 LF S=0.41%

8" SS 172 LF S=0.30%

HORTON STREET

8" SS 51 LF S=0.01

6" SS STUB INV 12.6

6" SS 21 LF S=0.01

12" SD STUB INV 10.9

12" SD 35 LF S=0.005

CB RIM 15.5 INV 9.1

CB RIM 15.5 INV 8.1

CB RIM 15.6 INV 7.5

FH

FDC

SSMH RIM 16.2 INV 12.3

SDMH RIM 16.5 INV 7.9

SDMH RIM 16.6 INV 7.3

18" SD 69 LF S=0.005

18" SD 95 LF S=0.005

18" SD 85 LF S=0.005

12" SD 25 LF S=0.005

12" SD 38 LF S=0.005

12" SD 81 LF S=0.005

HUBBARD CIRCLE EAST

12" SD 10 LF S=0.005

CB RIM 16.0 INV 9.1

SDMH RIM 16.0 INV 8.9

6" W
6" FS

JT LINE

8" W

4" RW

PARCEL B-2

RESIDENTIAL - STUDIO: 11
RESIDENTIAL - 1 BEDROOM: 32
RESIDENTIAL - 2 BEDROOM: 51
RESIDENTIAL - 3 BEDROOM: 13

EX CHIRON PROPERTY

EX SSMH RIM 17.74 INV 7.44 IN (6" W) INV 7.24 IN (8" S) INV 7.24 OUT (8" N)

EX CB 10001 TG 10.71 INV IN 7.11 (18") INV OUT 7.10 (18")

CB RIM 14.5 INV 6.8

18" RCP 363 LF S=0.23%

EX CB 10027 TG 11.21 INV IN 6.16 (18" S) INV OUT 6.06 (18" E)

SSMH RIM 16.0 INV 10.7

12" SD 81 LF S=0.005

SDMH RIM 15.6 INV 5.3

8" SS 390 LF S=0.005

24" SD 182 LF S=0.005

24" SD 158 LF S=0.005

SDMH RIM 15.3 INV 4.4

24" SD 45 LF S=0.005

24" SD 41 LF S=0.005

CONNECT TO CREEK INV 4.2

8" SS 310 LF S=0.005

6" SS 17 LF S=0.01

6" SS STUB INV 11.0

RESIDENTIAL - STUDIO: 16
RESIDENTIAL - 1 BEDROOM: 49
RESIDENTIAL - 2 BEDROOM: 79
RESIDENTIAL - 3 BEDROOM: 20

PARCEL D

SDMH RIM 16.8 INV 6.6

SDMH RIM 16.8 INV 6.3

12" SD 8 LF S=0.005

12" SD STUB INV 6.4

CB RIM 17.1 INV 6.9

CB RIM 17.1 INV 6.3

SDMH RIM 16.3 INV 6.8

FDC

JT STUB

6" W
6" FS

JT LINE

12" SD 136 LF S=0.005

SDMH RIM 16.8 INV 6.1

12" SD 110 LF S=0.005

12" SD 25 LF S=0.005

EX DI

CONNECTION POINT #4

EX SSMH RIM 9.1

THE CITY OF EMERYVILLE

EX 18" SS

EX 27 LF

CB 224 TG 15.92 INV OUT 12.94 (12")

EX SSMH RIM 16.33 INV 5.71 IN (8" S) INV 5.71 IOUT (8" N)

EX SSMH RIM 17.93 INV 6.73 IN (8" S) INV 6.73 OUT (8" N)

EX DI

EX DI

2 WM

EX KEY NAD

EX GAS

8" SS 475 LF S=0.22%

EX 10" W

CB 209 TG 16.12 INV OUT 13.04 (10")

SDMH 226 TG 16.27 INV 8.00

CONNECTION POINT #3

EX SSMH RIM 17.93 INV 6.73 IN (8" S) INV 6.73 OUT (8" N)

Revisions	No.

Date	12/04/2014
Scale	1" = 40'
Design	RKB
Drawn	BPB
Approved	TRM
Job No	20130002

Drawing Number:

1 OF 1

DRAWING NAME: J:\Eng13\130002\Conceptual\Option B\C500-SWPRUT.dwg
PLOTTED BY: baye
PLOT DATE: 12-08-14

ATTACHMENT 3

Sherwin Williams Utility Plan Option 3B – Proposed Sanitary Sewer Demands, November 12, 2015

Sherwin Williams Development Plan (Option 3B)
Proposed Sanitary Sewer Demands

Table 1 - Proposed Demands by Building

BUILDING A						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	74,000	SF	0.10	7,400	5.14	**0.011**
Total Proposed Demands				**7,400**	**5.14**	**0.011**

BUILDING B1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retail (Commercial)	6,000	SF	0.10	600	0.42	**0.001**
Residential	81	Units	140	11,340	7.88	**0.018**
Total Proposed Demands				**11,940**	**8.29**	**0.018**

BUILDING B2						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Residential	106	Units	140	14,840	10.31	**0.023**
Total Proposed Demands				**14,840**	**10.31**	**0.023**

BUILDING C1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Retain (Commercial)	2,000	SF	0.10	200	0.14	**0.000**
Residential	109	Units	140	15,260	10.60	**0.024**
Total Proposed Demands				**15,460**	**10.74**	**0.024**

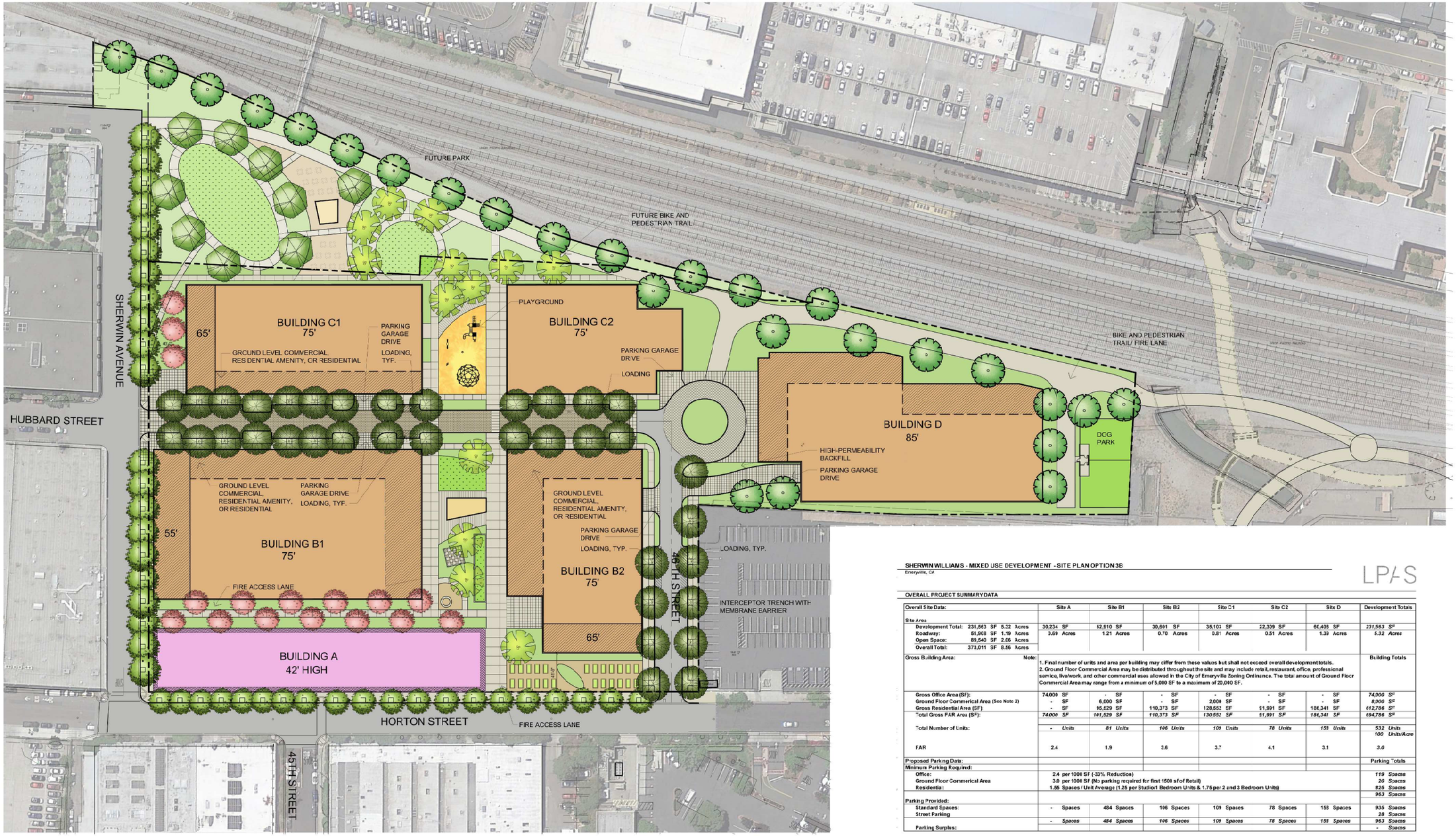
BUILDING C2						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Residential	78	Units	140	10,920	7.58	**0.017**
Total Proposed Demands				**10,920**	**7.58**	**0.017**

BUILDING D						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	(gpm)	(cfs)
Residential	158	Units	140	22,120	15.36	**0.034**
Total Proposed Demands				**22,120**	**15.36**	**0.034**

Sherwin Williams Development Plan (Option 3B)
Proposed Sanitary Sewer Demands

Table 2 - Proposed Demand Summary by Point of Connection

	SEWER DEMAND Average Daily Demand		
	(gpd)	(gpm)	(cfs)
Proposed Demand for Connection Point #1 (Building B1 & C1)	27,400	19.03	0.042
Proposed Demand for Connection Point #2 (Building A)	7,400	5.14	0.011
Proposed Demand for Connection Point #3 (Building B2)	14,840	10.31	0.023
Proposed Demand for Connection Point #4 (Building C2 & D)	33,040	22.94	0.051
Total Proposed Demand	82,680	57.42	0.127



SHERWIN WILLIAMS - MIXED USE DEVELOPMENT - SITE PLAN OPTION 3B
Emeryville, CA

LPAS

OVERALL PROJECT SUMMARY DATA

Overall Site Data:	Site A	Site B1	Site B2	Site C1	Site C2	Site D	Development Totals
Site Area							
Development Total: 231,563 SF 5.32 Acres	30,234 SF	52,610 SF	30,691 SF	35,101 SF	22,339 SF	60,405 SF	231,563 SF
Roadway: 51,963 SF 1.19 Acres	3.69 Acres	1.21 Acres	0.70 Acres	0.81 Acres	0.51 Acres	1.39 Acres	5.32 Acres
Open Space: 89,540 SF 2.05 Acres							
Overall Total: 373,011 SF 8.56 Acres							
Gross Building Area: Note:	1. Final number of units and area per building may differ from these values but shall not exceed overall development totals. 2. Ground Floor Commercial Area may be distributed throughout the site and may include retail, restaurant, office, professional service, live/work, and other commercial uses allowed in the City of Emeryville Zoning Ordinance. The total amount of Ground Floor Commercial Area may range from a minimum of 5,000 SF to a maximum of 20,000 SF.						Building Totals
Gross Office Area (SF):	74,000 SF	- SF	- SF	- SF	- SF	- SF	74,000 SF
Ground Floor Commerical Area (See Note 2)	- SF	6,000 SF	- SF	2,000 SF	- SF	- SF	8,000 SF
Gross Residential Area (SF)	- SF	95,529 SF	110,373 SF	128,552 SF	51,991 SF	186,341 SF	612,786 SF
Total Gross FAR Area (SF):	74,000 SF	101,529 SF	110,373 SF	130,552 SF	51,991 SF	186,341 SF	694,786 SF
Total Number of Units:	- Units	81 Units	106 Units	109 Units	78 Units	153 Units	532 Units
							100 Units/Acre
FAR	2.4	1.9	3.6	3.7	4.1	3.1	3.0
Proposed Parking Data:							Parking Totals
Minimum Parking Required:							
Office:	2.4 per 1000 SF (-33% Reduction)						119 Spaces
Ground Floor Commerical Area	3.0 per 1000 SF (No parking required for first 1500 sf of Retail)						20 Spaces
Residential:	1.55 Spaces / Unit Average (1.25 per Studio/1 Bedroom Units & 1.75 per 2 and 3 Bedroom Units)						825 Spaces
							963 Spaces
Parking Provided:							
Standard Spaces:	- Spaces	484 Spaces	106 Spaces	109 Spaces	78 Spaces	153 Spaces	935 Spaces
Street Parking							28 Spaces
	- Spaces	484 Spaces	106 Spaces	109 Spaces	78 Spaces	153 Spaces	963 Spaces
Parking Surplus:							- Spaces

0 40 80 120 160 200
SCALE: 1" = 40'-0" FT

SHERWIN-WILLIAMS EMERYVILLE

EMERYVILLE, CA

SITE PLAN OPTION '3B'

DATE: 2015-08-10
PROJECT NO: 1132-0007
SCALE:
SHEET:

LENNAR®

LPAS
2434 Natomas Park Drive Suite 100 Sacramento CA 95833
916 443 8335 lpasdesign.com Architecture + Design

ATTACHMENT 4

Sherwin Williams Utility Plan Option 4 – Proposed Sanitary Sewer Demands, November 12, 2015

Sherwin Williams Development Plan (Option 4)
Proposed Sanitary Sewer Demands

Table 1 - Proposed Demands By Building

BUILDING A						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily (gpd)	(gpm)	(cfs)
Retail (Commercial)	74,000	SF	0.10	7,400	5.14	**0.011**
Total Proposed Demands				**7,400**	**5.14**	**0.011**

BUILDING B1						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily (gpd)	(gpm)	(cfs)
Retail (Commercial)	6,000	SF	0.10	600	0.42	**0.001**
Residential	92	Units	140	12,880	8.94	**0.020**
Total Proposed Demands				**13,480**	**9.36**	**0.021**

BUILDING B2						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily (gpd)	(gpm)	(cfs)
Residential	106	Units	140	14,840	10.31	**0.023**
Total Proposed Demands				**14,840**	**10.31**	**0.023**

BUILDING C (Half to Hubbard Street Line)						
DESCRIPTION OF USE				SEWER DEMAND		
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily (gpd)	(gpm)	(cfs)
Retail	1,000	SF	0.10	100	0.07	**0.000**
Residential	77	Units	140	10,780	7.49	**0.017**
Total Proposed Demands				**10,880**	**7.56**	**0.017**

BUILDING C (Half to Temescal Creek Line)						
DESCRIPTION OF USE				**SEWER DEMAND**		
Land Use	**No.**	**Unit**	**Unit Demand (g/unit)**	**Average Daily**		
				(gpd)	**(gpm)**	**(cfs)**
Retail	1,000	SF	0.10	100	0.07	**0.000**
Residential	77	Units	140	10,780	7.49	**0.017**
Total Proposed Demands				**10,880**	**7.56**	**0.017**

PARCEL D						
DESCRIPTION OF USE				**SEWER DEMAND**		
Land Use	**No.**	**Unit**	**Unit Demand (g/unit)**	**Average Daily**		
				(gpd)	**(gpm)**	**(cfs)**
Residential	180	Units	140	25,200	17.50	**0.039**
Total Proposed Demands				**25,200**	**17.50**	**0.039**

Sherwin Williams Development Plan (Option 4)
Proposed Sanitary Sewer Demands

Table 2 - Proposed Demand Summary By Point of Connection

	SEWER DEMAND Average Daily Demand		
	(gpd)	(gpm)	(cfs)
Proposed Demand for Connection Point #1 (Building C (Half to Hubbard St Line) & Building B1)	24,360	16.92	0.038
Proposed Demand for Connection Point #2 (Building A)	7,400	5.14	0.011
Proposed Demand for Connection Point #3 (Building B-2)	14,840	10.31	0.023
Proposed Demand for Connection Point #4 (Building C (Half to Temescal Creek Line) & D)	36,080	25.06	0.056
Total Proposed Demand	82,680	57.42	0.127

SHERWIN WILLIAMS - MIXED USE DEVELOPMENT - SITE PLAN OPTION 4
Emeryville, CA

LPAS

OVERALL PROJECT SUMMARY DATA

Overall Site Data:		Site A	Site B1	Site B2	Site C	Site D	Development Totals
Site Area							
Development Total:	231,644 SF 5.32 Acres	30,711 SF	64,768 SF	34,624 SF	42,485 SF	59,056 SF	231,644 SF
Roadway:	51,734 SF 1.19 Acres	0.71 Acres	1.49 Acres	0.79 Acres	0.98 Acres	1.36 Acres	5.32 Acres
Open Space:	89,611 SF 2.06 Acres						
Overall Total:	372,989 SF 8.56 Acres						
Gross Building Area:	Note:	1. Final number of units and area per building may differ from these values but shall not exceed overall development totals. 2. Ground Floor Commercial Area may be distributed throughout the site and may include retail, restaurant, office, professional service, live/work, and other commercial uses allowed in the City of Emeryville Zoning Ordinance. The total amount of Ground Floor Commercial Area may range from a minimum of 6,000 SF to a maximum of 29,000 SF.					Building Totals
Gross Office Area (SF):		74,000 SF	- SF	- SF	- SF	- SF	74,000 SF
Ground Floor Commercial Area (See Note 2)		- SF	6,000 SF	- SF	2,900 SF	- SF	8,900 SF
Gross Residential Area (SF):		- SF	108,603 SF	110,373 SF	131,424 SF	212,288 SF	612,736 SF
Total Gross FAR Area (SF):		74,900 SF	114,503 SF	110,373 SF	133,424 SF	212,288 SF	694,736 SF
Total Number of Units:		- Units	92 Units	106 Units	154 Units	190 Units	532 Units
							100 Units/Acre
FAR		2.4	1.8	3.2	4.3	3.6	3.0
Proposed Parking Data:							Parking Totals
Minimum Parking Required							
Office:		2.4 per 1000 SF (-33% Reduction)					119 Spaces
Ground Floor Comercial Area		3.8 per 1000 SF (No parking required for first 1500 sf of Retail)					10 Spaces
Residential:		1.55 Spaces / Unit Average (1.25 per Studio/1 Bedroom Units & 1.75 per 2 and 3 Bedroom Units)					825 Spaces
							953 Spaces
Parking Provided:							
Standard Spaces		- Spaces	491 Spaces	106 Spaces	154 Spaces	180 Spaces	931 Spaces
Street Parking							32 Spaces
		- Spaces	491 Spaces	106 Spaces	154 Spaces	190 Spaces	963 Spaces
Parking Surplus:							- Spaces

0 40 80 120 160 200
SCALE: 1" = 40'-0" FT

SHERWIN-WILLIAMS EMERYVILLE

EMERYVILLE, CA

SITE PLAN OPTION '4'

DATE: 2015-08-10
PROJECT NO: 1132-0007
SCALE:
SHEET:

LENNAR

LPAS
2484 Natomas Park Drive Suite 100 Sacramento CA 95833
916 443 0335 lpasdesign.com Architecture + Design

ATTACHMENT 5
Hubbard Street Sewer Capacity

BKF
ENGINEERS / SURVEYORS / PLANNERS
☐ Redwood City • 650-482-6300
☐ San Jose • 408-467-9100
☐ Pleasanton • 925-396-7700
☐ Walnut Creek • 925-940-2200

Job No. 20020210 Sheet 1 of 2
Project Name SHERWIN-WILLIAMS
Prepared By TRM Date 6/5/05
Reviewed By Date
Revised By Date

HUBBARD STREET SEWER CAPACITY

DETERMINE EXISTING SEWER FLOW TRIBUTARY TO HUBBARD STREET BETWEEN SHERWIN AVENUE AND PARK AVENUE

BASED ON THE ASSESSOR'S PARCEL INFORMATION THE BLOCK WEST OF HUBBARD STREET IS A WAREHOUSE @ 103,000 ± SF AND THE BLOCK WEST OF HUBBARD STREET IS SENIOR RESIDENTIAL CONDOMINIUMS. WE HAVE CONSERVATIVELY ASSUMED THAT ALL OF THE WAREHOUSE AND 119 OF THE SENIOR RESIDENTIAL CONDOMINIUMS DISCHARGE SEWER TO HUBBARD STREET

EXISTING SEWER DEMANDS (AVERAGE DAY)

103,000 SF WAREHOUSE @ 0.10 GPD/SF	10,300 GPD
119 CONDOS @ (70 GPD/PERSON * 2 PERSON/UNIT	16,700 GPD
	27,000 GPD

DETERMINE PROJECT SEWER FLOWS BASED ON SPREADSHEET PREVIOUSLY PREPARED (COPY ATTACHED)

AVERAGE DAY SEWER DEMAND = 88,800 GPD
(BASED ON RESIDENTIAL INTENSIVE SCENARIO)

TOTAL PROJECTED AVERAGE DAY SEWER DEMAND

$Q_{AVE,TOTAL}$ = 27,000 GPD + 88,800 GPD = 115,800 GPD

PEAK HOUR WET WEATHER FLOW.
BASED ON 3.5 PEAK FACTOR FOR LOCAL COLLECTION SYSTEM

Q_{PHWWF} = 115,800 GPD * 3.5 = 405,300 GPD = 281 GPM

BASED ON RECENT SURVEY DATA THE SEWER MAIN IN HUBBARD STREET IS 8" INSTALLED AT 0.45 % BETWEEN THE FIRST TWO MANHOLES AND 0.77 % BETWEEN THE SECOND MANHOLE AND PARK AVENUE

FULL FLOW PIPE CAPACITY IS:

Q_{FULL} @ 0.45 % = 363 GPM

Q_{FULL} @ 0.77 % = 475 GPM

(SEE ATTACHED CIVIL TOOLS CALC SHEET

BkF
ENGINEERS / SURVEYORS / PLANNERS
☐ Redwood City • 650-482-6300
☐ San Jose • 408-467-9100
☐ Pleasanton • 925-396-7700
☐ Walnut Creek • 925-940-2200

Job No. 20020210 Sheet 2 of 2
Project Name SHERWIN-WILLIAMS
Prepared By TRM Date 6/5/05
Reviewed By _____ Date _____
Revised By _____ Date _____

PERCENT CAPACITY & PARTIAL FLOW DEPTH

$S = 0.45\%$

$q/Q = 281\ GPM / 363\ GPM = 0.77$

BASED ON NOMOGRAPH THIS GIVES $d/D = 0.74$

$d = 8 * 0.74 = 5.9"$

$S = 0.77\%$

$q/Q = 281\ GPM / 475\ GPM = 0.59$

BASED ON NOMOGRAPH THIS GIVES $d/D = 0.61$

$d = 8 * 0.61 = 4.9"$

BASED ON THESE CONSERVATIVE ESTIMATES OF EXISTING FLOWS THERE IS ADEQUATE CAPACITY IN THE HUBBARD STREET SEWER SYSTEM TO SERVE THE PROJECT

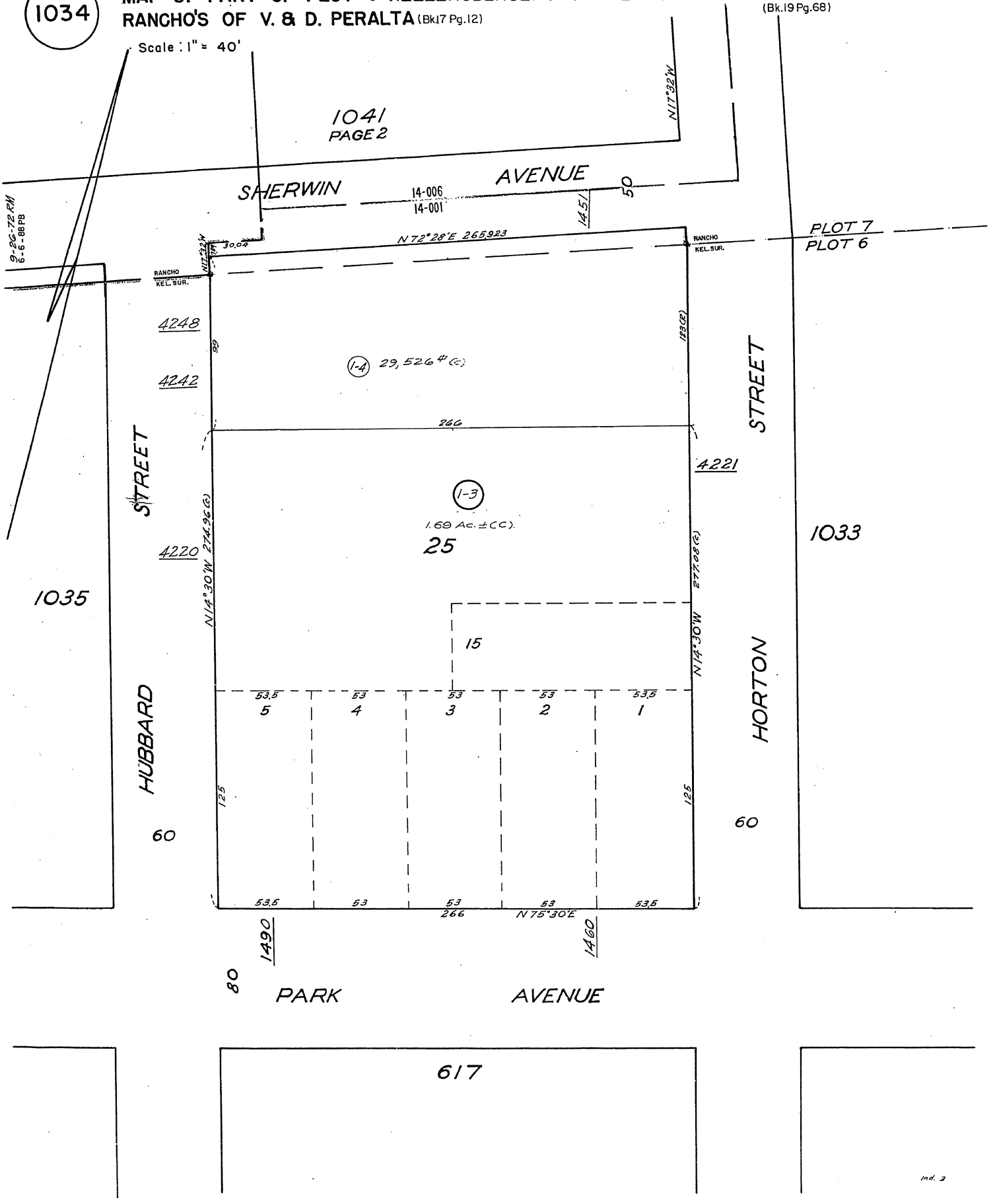
Code Area No. 14-001

ASSESSOR'S MAP 49

1034

MAP OF PART OF PLOT 6 KELLERSBERGER'S SURVEY OF V. & D. PERALTA RANCHO'S
RANCHO'S OF V. & D. PERALTA (Bk.17 Pg.12) (Bk.19 Pg.68)

Scale : 1" = 40'



Ind. 3

Property Detail Report

For Property Located At
4220 HUBBARD ST, EMERYVILLE CA 94608-3516

RealQuest.com

Owner Information:

Owner Name:	**P & H ASSOCIATES**
Mailing Address:	**505 SANSOME ST STE 1400, SAN FRANCISCO CA 94111-3118 C006 C/O MARKS MANAGEMENT CO**
Phone Number:	
Vesting Codes:	/ /

Location Information:

Legal Description:			
County:	**ALAMEDA, CA**	APN:	**049-1034-001-03**
Census Tract/Block:	**4251.00 / 3**	Alternate APN:	
Township-Range-Sect:		Subdivision:	
Legal Book/Page:		Map Reference:	**3-E7 / 629-E7**
Legal Lot:		Tract #:	
Legal Block:		School District:	**EMERY UNIF**
Market Area:		Munic/Township:	**EMERYVILLE INCORP**
Neighbor Code:			

Owner Transfer Information:

Recording/Sale Date:	/	Deed Type:	
Sale Price:		1st Mtg Document #:	
Document #:			

Last Market Sale Information:

Recording/Sale Date:	**06/09/1976 /**	1st Mtg Amount/Type:	/
Sale Price:		1st Mtg Int. Rate/Type:	/
Sale Type:	**FULL**	1st Mtg Document #:	
Document #:	90458	2nd Mtg Amount/Type:	/
Deed Type:	**DEED (REG)**	2nd Mtg Int. Rate/Type:	/
Transfer Document #:		Price Per SqFt:	
New Construction:		Multi/Split Sale:	**MULTIPLE**
Title Company:			
Lender:			
Seller Name:			

Prior Sale Information:

Prior Rec/Sale Date:	/	Prior Lender:	
Prior Sale Price:		Prior 1st Mtg Amt/Type:	/
Prior Document #:		Prior 1st Mtg Rate/Type:	/
Prior Deed Type:			

Property Characteristics:

Gross Area:	**72,618**	Parking Type:		Construct Type:	**MASONRY**
Living Area:	**72,618**	Garage Area:		Heat Type:	
Tot Adj Area:		Garage Capacity:		Exterior wall:	
Above Grade:		Parking Spaces:		Porch Type:	
Total Rooms:		Basement Area:		Patio Type:	
Bedrooms		Finish Bsmnt Area:		Pool:	
Bath(F/H):	/	Basement Type:		Air Cond:	
Year Built / Eff:	**/ 1968**	Roof Type:		Style:	**RECTANGULAR DESIGN**
Fireplace:		Foundation:		Quality:	**AVERAGE**
# of Stories:	**1.00**	Roof Material:		Condition:	
Other Improvements:					

Site Information:

Zoning:		Acres:	**1.69**	County Use:	**WAREHOUSE**
Flood Zone:	**X**	Lot Area:	**73,616**	State Use:	
Flood Panel:	**0600050000**	Lot Width/Depth:	**x**	Site Influence:	
Flood Panel Date:		Res/Comm Units:	**8 / 4**	Sewer Type:	
Land Use:	**WAREHOUSE**			Water Type:	

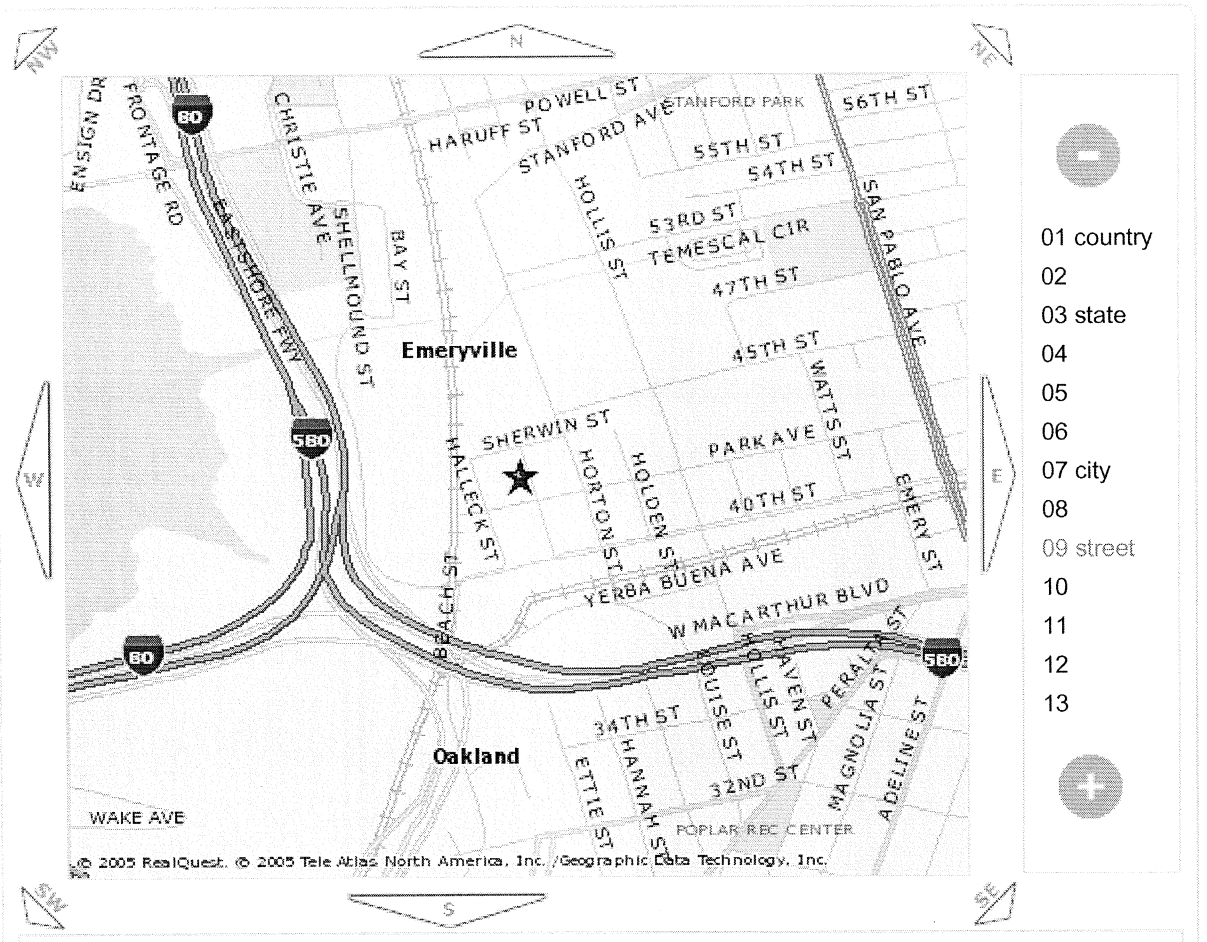
Tax Information:

Assessed Value:	**$1,316,318**	Assessed Year:	**2004**	Property Tax:	**$28,325.80**
Land Value:	**$347,739**	Improve %:	**074%**	Tax Area:	**14001**
Improvement Value:	**$968,579**	Tax Year:	**2004**	Tax Exemption:	
Total Taxable Value:	**$1,316,318**				

Street Map Plus Report

For Property Located At
4220 HUBBARD ST, EMERYVILLE CA 94608-3516

RealQuest.com



Map view : Street Aerial (Free trial has expired. Please call 800-345-7334, option 2 to sign up)

= Exact location of subject may vary by up to 300 feet

Legal & Vesting Report

For Property Located At
4220 HUBBARD ST, EMERYVILLE CA 94608-3516

RealQuest.com

Your username does not have access to this feature. Please contact Customer Service at 800-345-7334 to register or contact your RealQuest Administrator if your account is under the Administrator feature. Thank you.

Property Detail Report

For Property Located At
1451 SHERWIN ST, EMERYVILLE CA 94608

RealQuest.com

Owner Information:

Owner Name:	**P & H ASSOCIATES**
Mailing Address:	**505 SANSOME ST STE 1400, SAN FRANCISCO CA 94111-3118 C006 C/O MARKS MANAGEMENT CO**
Phone Number:	
Vesting Codes:	/ /

Location Information:

Legal Description:			
County:	**ALAMEDA, CA**	APN:	**049-1034-001-04**
Census Tract/Block:	**4251.00 / 3**	Alternate APN:	
Township-Range-Sect:		Subdivision:	
Legal Book/Page:		Map Reference:	**3-E7 / 629-E7**
Legal Lot:		Tract #:	
Legal Block:		School District:	**EMERY UNIF**
Market Area:		Munic/Township:	**EMERYVILLE INCORP**
Neighbor Code:			

Owner Transfer Information:

Recording/Sale Date:	/	Deed Type:	
Sale Price:		1st Mtg Document #:	
Document #:			

Last Market Sale Information:

Recording/Sale Date:	**06/09/1976 /**	1st Mtg Amount/Type:	/
Sale Price:		1st Mtg Int. Rate/Type:	/
Sale Type:	**FULL**	1st Mtg Document #:	
Document #:	90458	2nd Mtg Amount/Type:	/
Deed Type:	**DEED (REG)**	2nd Mtg Int. Rate/Type:	/
Transfer Document #:		Price Per SqFt:	
New Construction:		Multi/Split Sale:	**MULTIPLE**
Title Company:			
Lender:			
Seller Name:			

Prior Sale Information:

Prior Rec/Sale Date:	/	Prior Lender:	
Prior Sale Price:		Prior 1st Mtg Amt/Type:	/
Prior Document #:		Prior 1st Mtg Rate/Type:	/
Prior Deed Type:			

Property Characteristics:

Gross Area:		Parking Type:		Construct Type:	
Living Area:		Garage Area:		Heat Type:	
Tot Adj Area:		Garage Capacity:		Exterior wall:	
Above Grade:		Parking Spaces:		Porch Type:	
Total Rooms:		Basement Area:		Patio Type:	
Bedrooms		Finish Bsmnt Area:		Pool:	
Bath(F/H):	/	Basement Type:		Air Cond:	
Year Built / Eff:	/	Roof Type:		Style:	
Fireplace:		Foundation:		Quality:	
# of Stories:		Roof Material:		Condition:	
Other Improvements:					

Site Information:

Zoning:		Acres:	**0.68**	County Use:	**WAREHOUSE**
Flood Zone:	**X**	Lot Area:	**29,526**	State Use:	
Flood Panel:	**0600050000**	Lot Width/Depth:	**x**	Site Influence:	
Flood Panel Date:		Res/Comm Units:	/	Sewer Type:	
Land Use:	**WAREHOUSE**			Water Type:	

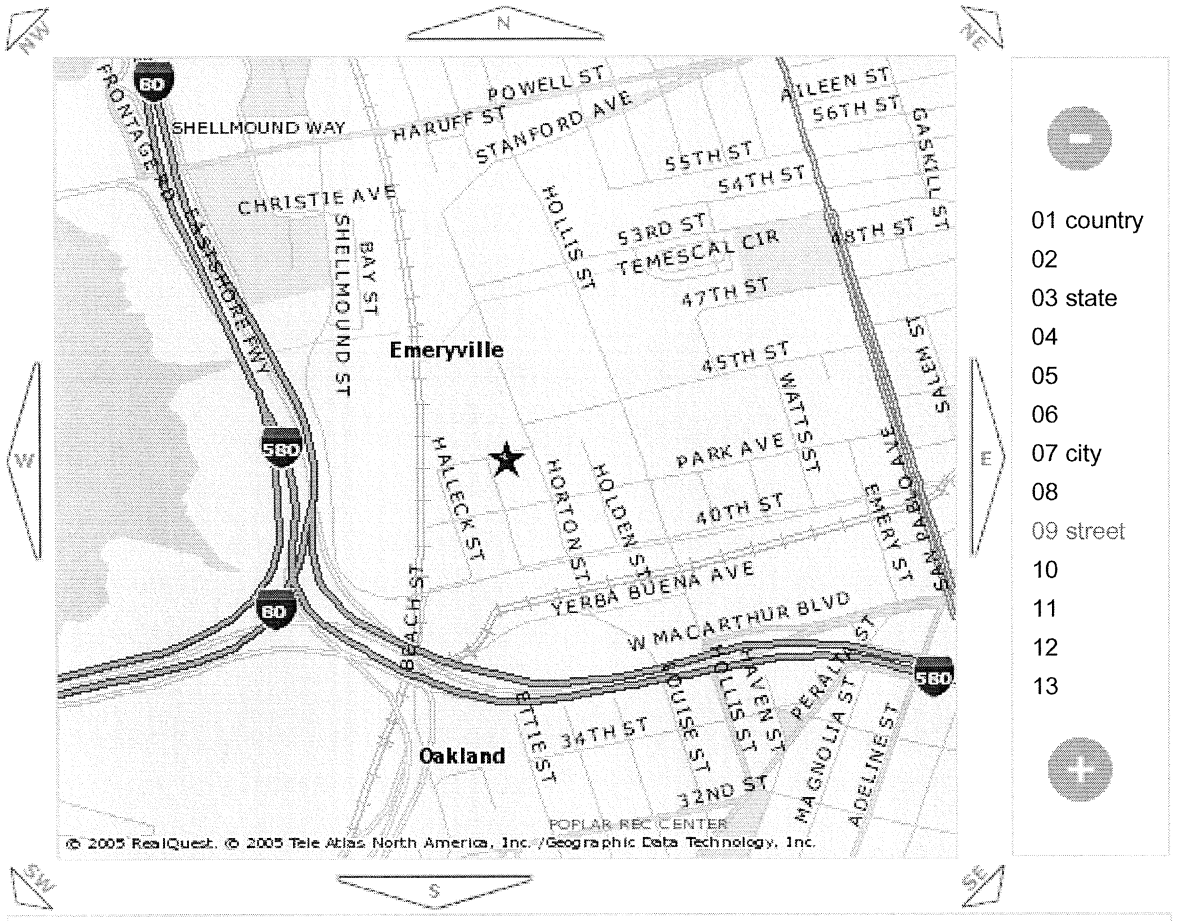
Tax Information:

Assessed Value:	**$520,300**	Assessed Year:	**2004**	Property Tax:	**$5,842.42**
Land Value:	**$133,766**	Improve %:	**074%**	Tax Area:	**14001**
Improvement Value:	**$386,534**	Tax Year:	**2004**	Tax Exemption:	
Total Taxable Value:	**$520,300**				

Street Map Plus Report

For Property Located At
1451 SHERWIN ST, EMERYVILLE CA 94608

RealQuest.com



Map view : Street Aerial (Free trial has expired. Please call 800-345-7334, option 2 to sign up)

★ = Exact location of subject may vary by up to 300 feet

Legal & Vesting Report

For Property Located At
1451 SHERWIN ST, EMERYVILLE CA 94608

RealQuest.com

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ASSESSOR'S MAP 49

Code Area No. 14-006 14-001

1035

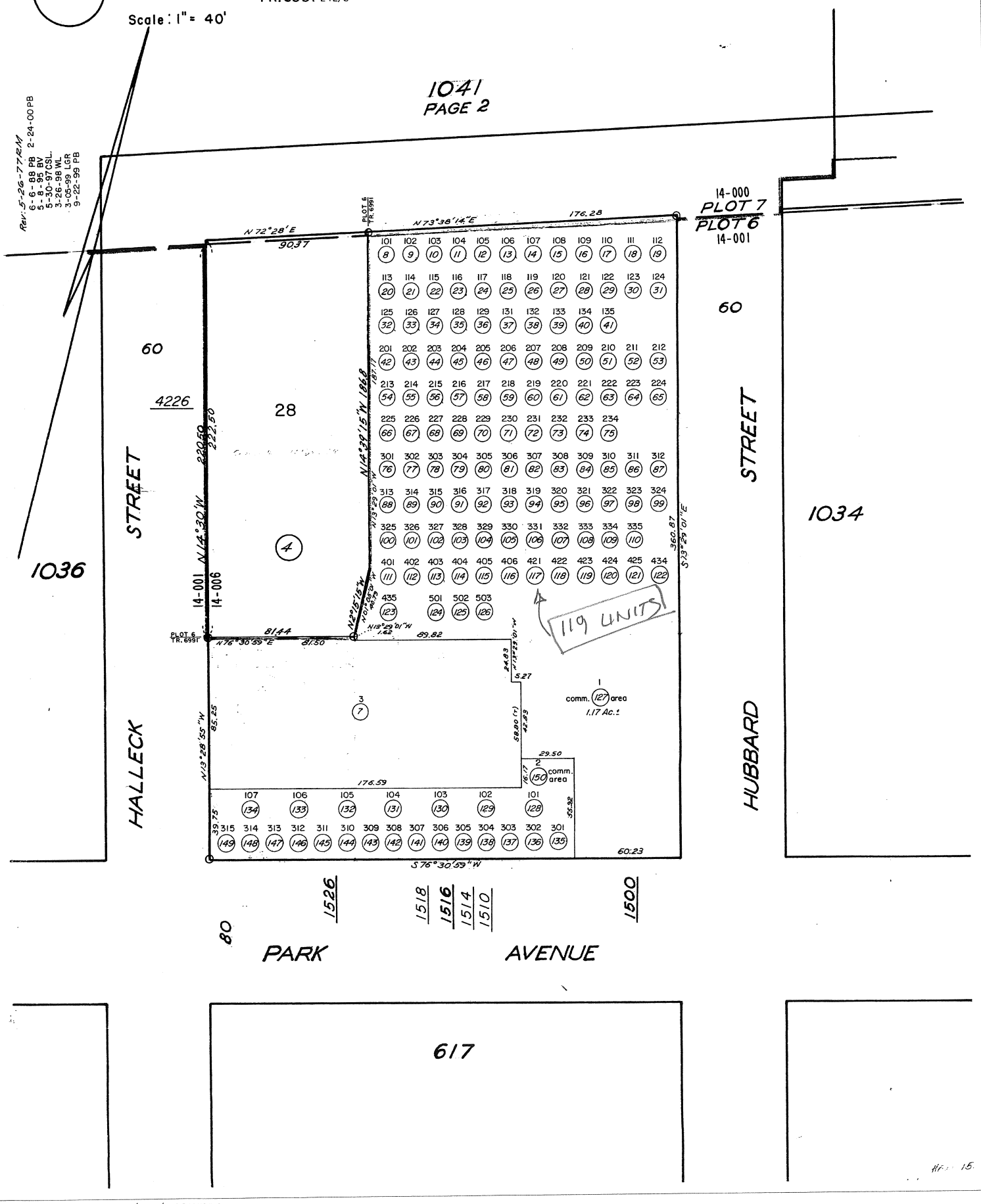
MAP OF PART OF PLOT 6 KELLERSBERGER'S SURVEY OF V. & D. PERALTA RANCHO'S

TR. 6991 242/3

(Bk. 19 Pg. 68)

Scale: 1" = 40'

Rev: 5-26-77 RM
6-6-88 PB 2-24-00 PB
5-8-95 BV
5-30-97 CSL
3-26-98 WL
3-05-99 LGR
9-22-99 PB



Sherwin-Williams

Hubbard Street Sewer Capacity

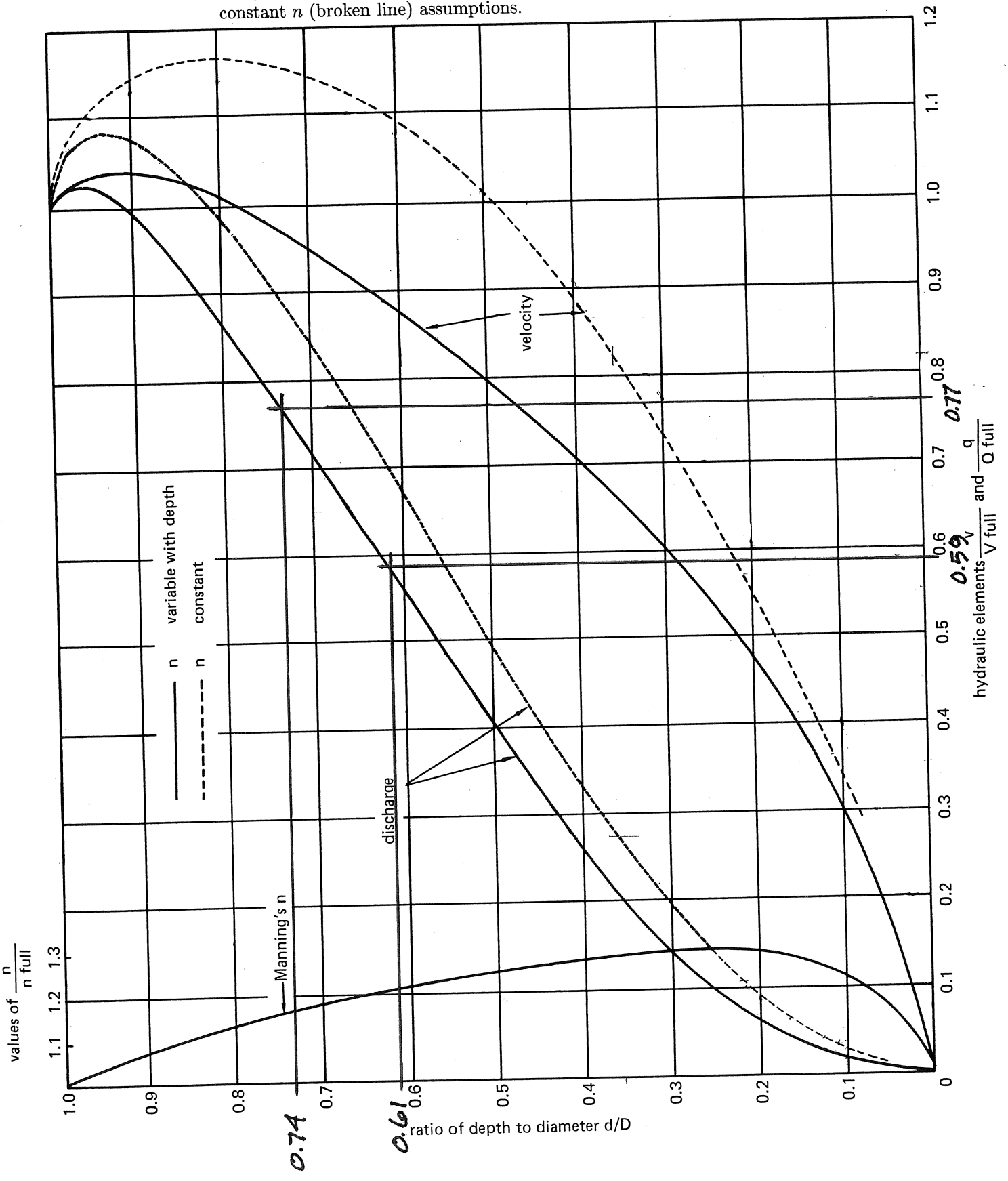
Sewer Pipes -- English Units

Civil Tools for Windows
(06-05-2005, 08:34:04)

Flowrate (cfs)	Diameter (in)	Friction ()	Slope (%)	Velocity (fps)	Q (GPM)
0.81	8.00	0.013	0.45	2.32	363
1.06	8.00	0.013	0.77	3.04	475

Appendix C: Circular Channel Ratios

Experiments have shown that n varies slightly with depth. This figure gives velocity and flow rate ratios for varying n (solid line) and constant n (broken line) assumptions.



SHERWIN WILLIAMS, EMERYVILLE
Illustrative Development Program - Water & Sewer Demand
Based on Preliminary Development Plan dated May 17, 2004
January 13, 2005

	Water Demand		Sewer Demand			
	Daily Water Demand Average Day	Peak Hour[4]	Daily Sewer Demand[1] Average Day		Project PWWF[2]	Basin 23 PWWF[3]
Scenario	gallons per day	gallons per min	gallons per day	(MGD)	(MGD)	(MGD)
1: Residential Intensive	109,385	304	88,804	0.089	0.311	0.178
2: Commercial Intensive	60,260	167	47,048	0.047	0.165	0.094
Exisitng[6]	23,805		3,180			

NOTES
1. Daily Sewer Demand equals 85% of the Daily Water Demand.
2. Local Project Sewer Peak Wet Weather Flow (PWWF) based on 3.5 peaking factor for an approximated population of 2,000 person. This number for analysis of local sewer system.
3. Basin 23 Sewer Peak Wet Weather Flow (PWWF) based on 2.0 peaking factor. See note (b) from Table 5-3 of the 1985 East Bay Infiltration/Inflow Study. This number used to check trunk main capacity.
4. Water Peak Hour flow based on 4.0 peaking factor and 24 hour day.
5. Expected fire water demand not to exceed existing usage.
6. Meter recordings from the billing period of May 23 to July 1, 2003. Demand include an average daily storm drain discharge of 367 gpd.
7. This summary assumes half of the street/open space will need irrigation at a ratio of 2.0 ac-ft/ac

Preliminary Hydrologic Study

Proposed
Tc = 10 min.

Event	Q = C*i*A	Dicharge
10 yr storm	*0.75*2.19*8.59=*	*14.11 cfs*
100 yr storm	*0.75*3.27*8.59=*	*21.07 cfs*

Existing
Tc = 10 min.

Event	Q = C*i*A	Discharge
10 yr storm	*0.85*2.19*8.59=*	*15.99 cfs*
100 yr storm	*0.85*3.27*8.59=*	*23.88 cfs*

Note:
i = rainfall intensity (see "precipitation intensity" tables)

SHERWIN WILLIAMS, EMERYVILLE
Table 1: Illustrative Development Program - Water & Sewer Demand
Based on Preliminary Development Plan dated May 17, 2004
January 13, 2005

SCENARIO 1: RESIDENTIAL INTENSIVE

Parcel	Parcel Area (ac)	Illustrative Program		Ratio	Residential Occupants	Daily Water Demand	Peak Hour[4]	Daily Sewer Demand[2]	PHDWF[3]
A Building 1/31	0.62	• Live-Work or Loft Commercial • Residential	35,000 sf 35 du's	0.10 gpd/sf 70.0 gpd/p	2.5 pers/du	3,500 gpd 6,125 gpd	10 gpm 17 gpm	2,975 gpd	7 gpm
B	1.44	• Residential	75 du's	70.0 gpd/p	2.5 pers/du	13,125 gpd	36 gpm	11,156 gpd	27 gpm
C	1.37	• Residential	125 du's	70.0 gpd/p	2.5 pers/du	21,875 gpd	61 gpm	18,594 gpd	45 gpm
D	0.95	• Residential	117 du's	70.0 gpd/p	2.5 pers/du	20,475 gpd	57 gpm	17,404 gpd	42 gpm
E	1.46	• Residential	225 du's	70.0 gpd/p	2.5 pers/du	39,375 gpd	109 gpm	33,469 gpd	81 gpm
Subtotal	5.84	• Live-Work or Loft Commercial • Residential	35,000 sf 577 du's			104,475 gpd	290 gpm	88,804 gpd	216 gpm
Streets/Open Space	2.75			2.00 ac-ft/ac		4,910 gpd	14 gpm		
Total	8.59					**109,385 gpd**	**304 gpd**		

NOTES
1. Floor Area Ratios do not include parking area. FARs assume an average 1,000 gsf per residential unit.
2. Daily Sewer Demand equals 85% of the Daily Water Demand.
3. Sewer Peak Hour Dry Weather Flow (PHDWF) based on 3.5 peaking factor and 24 hour day for an approximated population of 2,000 person.
4. Water Peak Hour flow based on a 4.0 peaking factor and 24 hour day.
5. This summary assumes half of the street/open space will need irrigation at a ratio of 2.0 ac-ft/ac

SHERWIN WILLIAMS, EMERYVILLE
Table 2: Illustrative Development Program - Water & Sewer Demand
Based on Preliminary Development Plan dated May 17, 2004
January 13, 2005

SCENARIO 2: COMMERCIAL INTENSIVE

Parcel	Parcel Area (ac)	Illustrative Program		Ratio	Residential Occupants	Daily Water Demand	Peak Hour[4]	Daily Sewer Demand[2]	PHDWF[3]
A Building 1/31	0.62	• Commercial/Live-Work Loft	70,000 sf	0.10 gpd/sf		7,000 gpd	19 gpm	5,950 gpd	14 gpm
B	1.44	• Residential	43 du's	70.0 gpd/p	2.5 pers/du	7,525 gpd	21 gpm	6,396 gpd	16 gpm
C	1.37	• Residential	107 du's	70.0 gpd/p	2.5 pers/du	18,725 gpd	52 gpm	15,916 gpd	39 gpm
D	0.95	• Commercial Lofts	56,000 sf	0.10 gpd/sf		5,600 gpd	16 gpm	4,760 gpd	12 gpm
E	1.46	• Commercial Lofts	165,000 sf	0.10 gpd/sf		16,500 gpd	46 gpm	14,025 gpd	34 gpm
Subtotal	5.84	• Commercial or Loft Commercial • Residential	291,000 sf 150 du's			55,350 gpd	154 gpm	47,048 gpd	114 gpm
Streets/Open Space	2.75			2.00 ac-ft/ac		4,910 gpd	14 gpm		
Total	8.59					**60,260 gpd**	**167 gpd**		

NOTES
1. Floor Area Ratios do not include parking area. FARs assume an average 1,000 gsf per residential unit.
2. Daily Sewer Demand equals 85% of the Daily Water Demand.
3. Sewer Peak Hour Dry Weather Flow (PHDWF) based on 3.5 peaking factor and 24 hour day for an approximated population of 2,000 person.
4. Water Peak Hour flow based on a 4.0 peaking factor and 24 hour day.
5. This summary assumes half of the street/open space will need irrigation at a ratio of 2.0 ac-ft/ac

TABLE 5-3

DESIGN FLOWS
EMERYVILLE

Subbasin	Sewered Area (ac)	Isohyetal Factor[a]	Average BWF (mgd)	Design Flows (mgd) 3-Hr Peak BWF[b]	GWI[c]	Peak RDI/I[c]	Total Peak[c]
20-001	39	1.00	0.002	0.46	0.05	0.74	1.25
-002(d)	44	1.00	0.005	0.16	0.06	1.24	1.46
-003(d)	93	1.05	0.120	0.24	0.21	2.75	3.20
-101(d)	20	1.00	0.002	<0.01	0.02	0.36	0.38
-102(d)	91	1.05	0.008	0.02	0.10	1.70	1.82
-111(d)	47	1.05	0.050	0.10	0.03	1.32	1.45
21-001	80	1.00	0.094	0.58	0.15	3.10	3.83
-002(d)	46	1.05	0.129	0.28	0.12	0.61	1.01
-003(d)	25	1.00	0.026	0.06	0.04	0.31	0.41
-004(d)	68	1.05	0.077	0.17	0.10	4.04	4.31
-005(d)	133	1.10	0.152	~~0.33~~ 1.5	0.20	7.53	8.06
-101(d)	15	0.95	0.056	0.20	0.12	0.00	0.32
-102	15	0.95	0.056	0.12	0.12	0.00	0.24
22-001	81	1.00	0.267	1.15	0.51	0.74	1.66
002(d)	46	1.00	0.023	0.07	0.05	0.91	1.03
23-001(d)	67	1.00	0.122	0.37	0.07	1.17	1.61
-002	67	1.00	0.121	0.37	0.07	1.17	1.61

(a) Relative precipitation with respect to Oakland Airport

(b) Calculated as average BWF x flow allowance x peaking factor. Allowance for future increase in BWF varies by location; peaking factor is derived from flow monitoring data and varies by location, but generally ranges from 1.5 to 2.0.

(c) Five-year design storm flow before rehabilitation.

(d) Subbasin partially or entirely located in North Oakland.

TABLE 9-4

DESIGN FLOWS FOR INTERCEPTOR CONNECTION POINTS[a]
EMERYVILLE

Basin	Pipe No.	Location	Pipe Diameter (in)		Design Peak Flow (mgd)[b]			
			Exist	Relief	BWF	GWI	RDI/I	Total
20	2000001	Near vicinity of 64th St & S.P.R.R	30	-	0.98	0.29	4.22	5.49
21	2100001	Near Powell St & Shellmound St	25	21	1.42	0.42	8.90	10.74
	2110001	Near Powell St & Shellmound St	15	-	0.32	0.10	0.02	0.44
22	2200001	Vicinity of S.P.R.R & Halleck St	24	-	1.22	0.27	1.23	2.72
23	2300001	At Intersection of Freeway 80 & 580 near Beach St	21	-	0.74	0.10	1.60	2.44

(a) For major connection points only, i.e., only those trunk sewers modeled for the East Bay I/I Study.

(b) After completion of recommended cost-effective rehabilitation.

EBMUD City Of Emeryville Site 023

Daily Summary

Date	Avg Flow(MGD)	Min Flow(MGD)	Max Flow(MGD)	Max Depth(in.)	Rain(in.)
1/6/05	0.159	0.115	0.284	3.400	0.04
1/7/05	0.243	0.111	0.393	3.924	0.43
1/8/05	0.340	0.206	0.757	5.379	0.84
1/9/05	0.334	0.240	0.400	4.041	0.02
1/10/05	0.315	0.179	0.583	4.594	0.42
1/11/05	0.295	0.234	0.362	3.701	0.12
1/12/05	0.262	0.174	0.344	3.461	0.01
1/13/05	0.233	0.160	0.293	3.278	0.00
1/14/05	0.220	0.136	0.286	3.301	0.00
1/15/05	0.200	0.120	0.270	3.199	0.00
1/16/05	0.190	0.117	0.246	3.169	0.00
1/17/05	0.203	0.141	0.277	3.231	0.00
1/18/05	0.197	0.082	0.269	3.249	0.00
1/19/05	0.204	0.097	0.293	3.157	0.00
1/20/05	0.198	0.091	0.285	3.084	0.00
1/21/05	0.193	0.098	0.271	3.172	0.00
1/22/05	0.164	0.087	0.256	3.004	0.00
1/23/05	0.168	0.104	0.239	3.020	0.00
1/24/05	0.153	0.088	0.214	3.009	0.00
1/25/05	0.161	0.079	0.228	2.997	0.10
1/26/05	0.165	0.086	0.261	3.280	0.26
1/27/05	0.175	0.071	0.255	3.174	0.18
1/28/05	0.204	0.127	0.356	3.720	0.20
1/29/05	0.158	0.106	0.203	2.909	0.00
1/30/05	0.148	0.080	0.206	2.913	0.00
1/31/05	0.167	0.099	0.239	2.921	0.00
2/1/05	0.149	0.080	0.222	2.929	0.00
2/2/05	0.152	0.073	0.208	2.877	0.00
2/3/05	0.168	0.085	0.242	2.888	0.00
2/4/05	0.182	0.093	0.246	3.111	0.00
2/5/05	0.162	0.100	0.242	2.937	0.00
2/6/05	0.151	0.092	0.216	2.910	0.00
2/7/05	0.181	0.077	0.263	3.031	0.11
2/8/05	0.171	0.091	0.271	3.113	0.00
2/9/05	0.158	0.092	0.242	2.950	0.00
2/10/05	0.140	0.067	0.226	2.872	0.00
2/11/05	0.121	0.074	0.209	2.889	0.00
2/12/05	0.114	0.058	0.192	2.739	0.00
2/13/05	0.116	0.064	0.183	2.765	0.00
2/14/05	0.144	0.051	0.235	3.080	0.40
2/15/05	0.270	0.095	0.403	3.659	1.11
2/16/05	0.283	0.161	0.381	3.378	0.02
2/17/05	0.288	0.198	0.339	3.180	0.11
2/18/05	0.319	0.195	0.449	3.936	0.64
2/19/05	0.297	0.239	0.401	3.727	0.39
2/20/05	0.281	0.225	0.344	3.522	0.12
2/21/05	0.305	0.232	0.503	4.145	0.54
2/22/05	0.267	0.228	0.315	3.300	0.00
2/23/05	0.278	0.248	0.330	3.362	0.00
2/24/05	0.268	0.229	0.318	3.294	0.00
2/25/05	0.238	0.172	0.289	3.039	0.00
2/26/05	0.215	0.164	0.252	2.830	0.04

EBMUD City Of Emeryville Site 023

Daily Summary

Date	Avg Flow(MGD)	Min Flow(MGD)	Max Flow(MGD)	Max Depth(in.)	Rain(in.)
2/27/05	0.237	0.158	0.366	3.664	0.52
2/28/05	0.249	0.194	0.299	3.203	0.00
3/1/05	0.238	0.168	0.327	3.484	0.37
3/2/05	0.249	0.213	0.287	3.190	0.06
3/3/05	0.243	0.213	0.287	3.116	0.15
3/4/05	0.279	0.213	0.362	3.455	0.34
3/5/05	0.231	0.186	0.280	3.036	0.00
3/6/05	0.220	0.172	0.296	3.051	0.00
3/7/05	0.234	0.171	0.301	3.276	0.00
3/8/05	0.235	0.174	0.310	3.322	0.00
3/9/05	0.221	0.142	0.266	3.011	0.00
3/10/05	0.243	0.159	0.327	3.164	0.00
3/11/05	0.208	0.148	0.299	3.028	0.00
3/12/05	0.171	0.113	0.217	2.859	0.00
3/13/05	0.201	0.139	0.269	3.020	0.00

	Avg Flow(MGD)	Min Flow(MGD)	Max Flow(MGD)	Max Depth(in.)
Summary	0.214	0.051	0.757	5.379

Sherwin-Williams

Park Avenue Sewer Capacity

Sewer Pipes -- English Units

Civil Tools for Windows
(05-26-2005, 06:12:18)

Flowrate (cfs)	Diameter (in)	Friction ()	Slope (%)	Velocity (fps)	Q (MGD)
10.12	24.00	0.013	0.20	3.22	6.53
12.39	24.00	0.013	0.30	3.94	7.99
14.31	24.00	0.013	0.40	4.55	9.23
16.00	24.00	0.013	0.50	5.09	10.32 ←

PARTIAL FLOW IN PIPE

BASED ON 24" PIPE @ S=0.50%

FULL FLOW Q = 10.32 MGD

USE NOMOGRAPH TO CHECK FLOW VS. DEPTH

FROM 2005 FLOW MONITORING

Q_{MAX} = 757 MGD @ 5.379" DEPTH

d/D = 5.379"/24" = 0.22

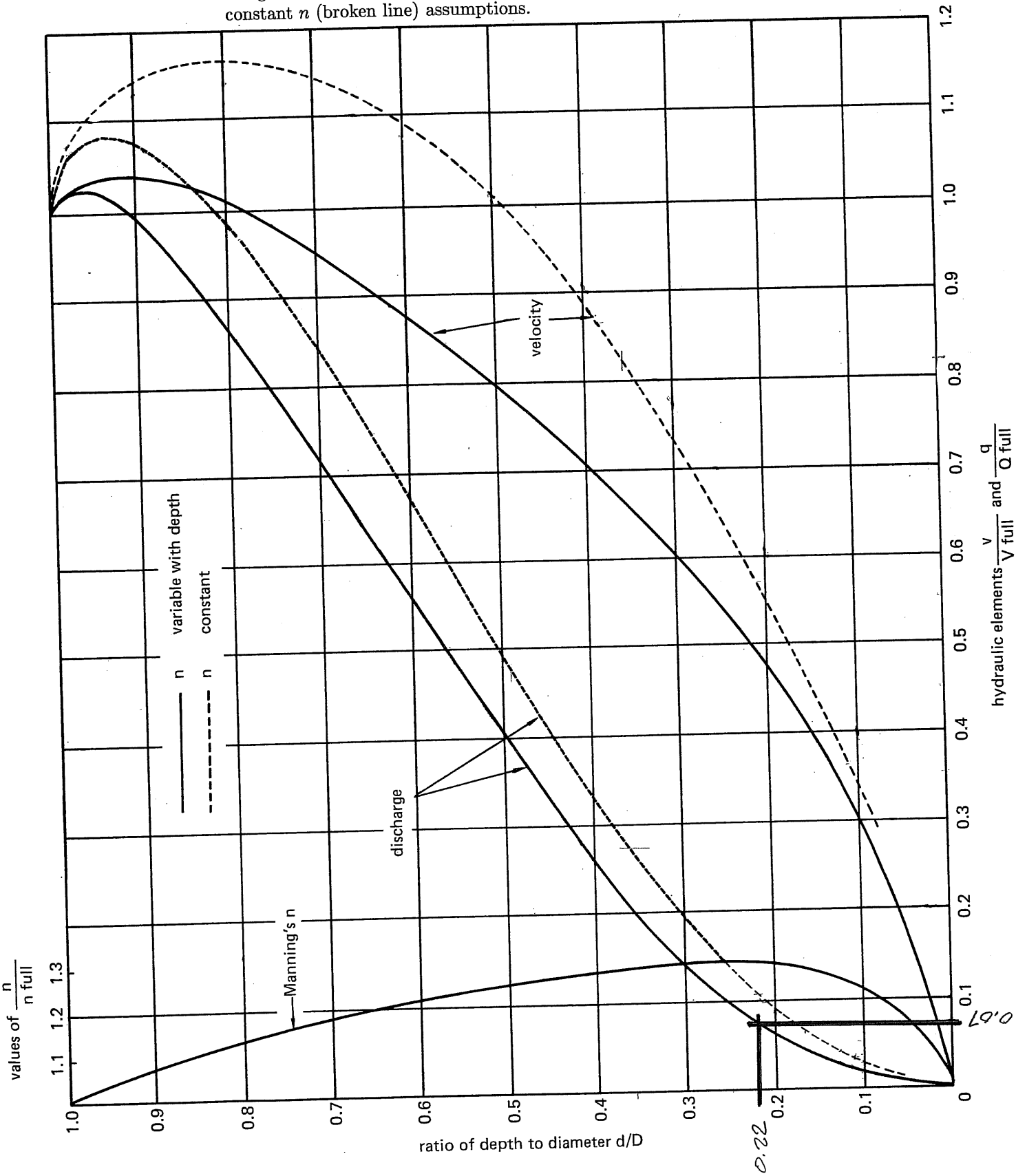
GET q/Q FROM NOMOGRAPH = 0.07

q = 10.32 MGD * 0.07 = 0.72 ≈ 0.757 MEASURED.

∴ 24" SANITARY SEWER MAIN IS FLOWING @ ~10% CAPACITY

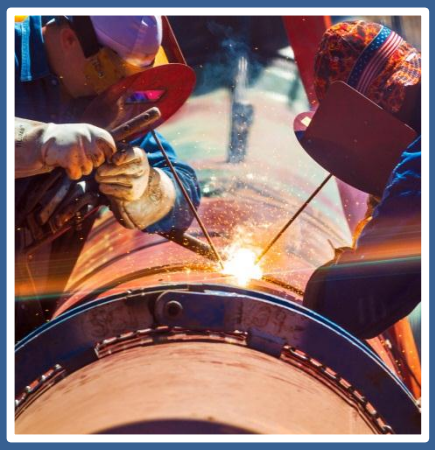
Appendix C: Circular Channel Ratios

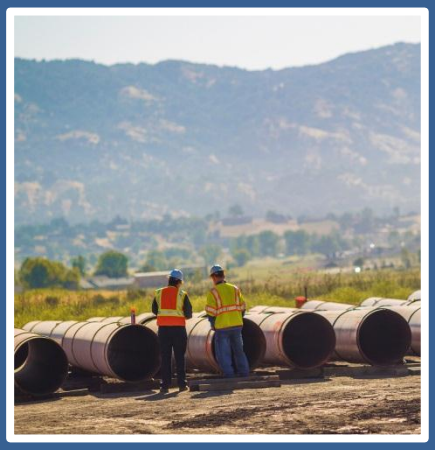
Experiments have shown that n varies slightly with depth. This figure gives velocity and flow rate ratios for varying n (solid line) and constant n (broken line) assumptions.

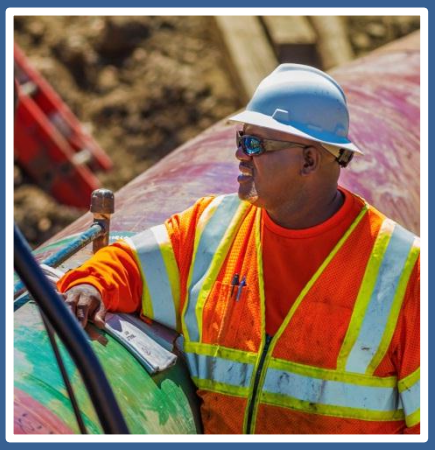


2014 CALIFORNIA GAS REPORT

Prepared by the California Gas and Electric Utilities







2014 CALIFORNIA GAS REPORT

PREPARED BY THE CALIFORNIA GAS AND ELECTRIC UTILITIES

Southern California Gas Company
Pacific Gas and Electric Company
San Diego Gas & Electric Company
Southwest Gas Corporation
City of Long Beach Gas & Oil Department
Southern California Edison Company

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2014 CALIFORNIA GAS REPORT

FOREWORD

FOREWORD

The 2014 California Gas Report presents a comprehensive outlook for natural gas requirements and supplies for California through the year 2035. This report is prepared in even-numbered years, followed by a supplemental report in odd-numbered years, in compliance with California Public Utilities Commission Decision (CPUC) D.95-01-039. The projections in the California Gas Report are for long-term planning and do not necessarily reflect the day-to-day operational plans of the utilities.

The report is organized into three sections: Executive Summary, Northern California, and Southern California. The Executive Summary provides statewide highlights and consolidated tables on supply and demand. The Northern California section provides details on the requirements and supplies of natural gas for Pacific Gas and Electric Company (PG&E), the Sacramento Municipal Utility District (SMUD), Wild Goose Storage, Inc. and Lodi Gas Storage LLC. The Southern California section shows similar detail for Southern California Gas Company (SoCalGas), the City of Long Beach Municipal Oil and Gas Department, Southwest Gas Corporation, and San Diego Gas and Electric Company.

Each participating utility has provided a narrative explaining its assumptions and outlook for natural gas requirements and supplies, including tables showing data on natural gas availability by source, with corresponding tables showing data on natural gas requirements by customer class. Separate sets of tables are presented for average and cold year temperature conditions. Any forecast, however, is subject to considerable uncertainty. Changes in the economy, energy and environmental policies, natural resource availability, and the continually evolving restructuring of the gas and electric industries can significantly affect the reliability of these forecasts. This report should not be used by readers as a substitute for a full, detailed analysis of their own specific energy requirements.

A working committee, comprised of representatives from each utility was responsible for compiling the report. The membership of this committee is listed in the Respondents section at the end of this report.

Workpapers and next year's report are available on request from PG&E and SoCalGas/SDG&E. Write or email us at the address shown in the Reserve Your Subscription section at the end of this report.

2014 CALIFORNIA GAS REPORT

EXECUTIVE SUMMARY

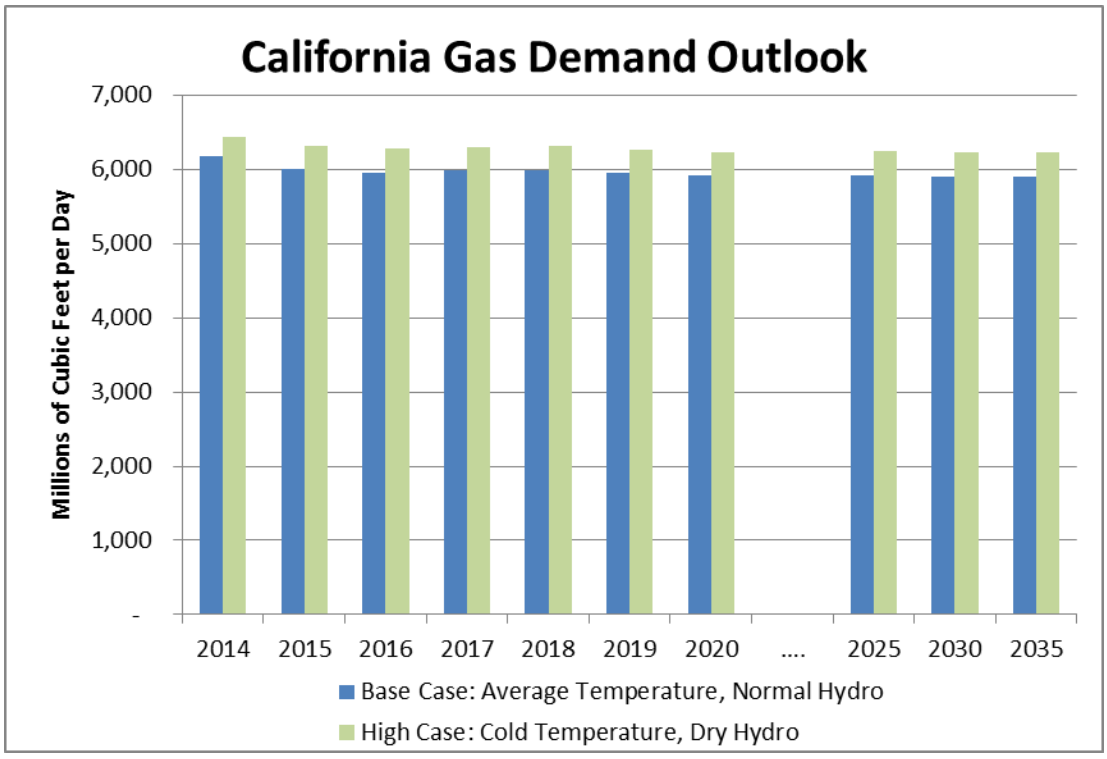
EXECUTIVE SUMMARY

DEMAND OUTLOOK

California natural gas demand, including volumes not served by utility systems, is expected to decrease at a modest rate of 0.2 percent per year from 2014 to 2035. The forecast decline is a combination of moderate growth in the Natural Gas Vehicle (NGV) and Enhanced Oil Recovery (EOR) markets and across-the-board declines in all other market segments: residential; commercial; electric generation; and industrial markets.

Residential gas demand is expected to decrease at an annual average rate of 0.2 percent. Demand in the core commercial and core industrial markets are expected to decline at an annual rate of 0.1 percent; whereas demand in the industrial noncore sector is estimated to decline by 0.25 percent annually as California continues its transition from a manufacturing-based to a service-based economy. Aggressive energy efficiency programs are expected to make a significant impact in managing growth in the residential, commercial, and industrial markets.

For the purpose of load following as well as backstopping intermittent renewable resource generation, gas-fired generation will continue to be the technology of choice to meet the ever growing demand for electric power. However, overall gas demand for electric generation is expected to decline at a modest 0.2 percent per year for the next 20 years due to more efficient power plants, statewide efforts to minimize greenhouse gas (GHG) emissions through aggressive programs pursuing demand side reductions, and the acquisition of preferred resources that produce little or no carbon emissions.



The graph above summarizes statewide demand under base case and high case scenarios. The base case refers to the expected gas demand for an average temperature year and normal hydroelectric power (hydro) year, and the high case refers to expected gas demand for a cold-temperature year and dry hydro conditions. Under an average temperature condition and a normal hydro year, gas demand for the state is projected to average 6,173 MMcf/d in 2014 decreasing to 5,910 MMcf/d by 2035, a decline of 0.2% per year.

In 2014, northern California is projected to require an additional 6% of gas supply to meet demand for the high gas-demand scenario; whereas southern California is projected to require an additional 3.5% of supply to meet the demand under the high scenario condition. This spread between the regions is expected; Northern California is colder and tends to rely more heavily on hydroelectric power than southern California. The weather scenario for each year is an independent event and each event has the same likelihood of occurring. The annual demand forecast for the base case and high case should, therefore, not be viewed as a combined event from year to year.

FOCUS ON EFFICIENCY AND ENVIRONMENTAL QUALITY

California utilities continue to focus on Customer Energy Efficiency (CEE) and other Demand Side Management (DSM) programs in their utility electric and gas resource plans. The 2000-2001 "energy crisis" in California was not limited to electricity. Gas prices at the southern California border reached levels nearly ten times greater than had been experienced in previous years. California utilities are committed to helping their customers make the best possible choices regarding use of this increasingly valuable resource. Gas demand for electric power generation is expected to be moderated by CPUC-mandated goals for electric energy efficiency programs and renewable power. The base case forecasts in this report assume that the state will have 33% of its electric needs met with renewable power by 2020 and beyond.

The state's 2006 Global Warming Solutions Act, also known as Assembly Bill (AB) 32, has set aggressive targets for the state to reduce its overall GHG production. This law creates substantial uncertainty on the amount of natural gas that will be used in the outer years of the forecast. There is a high degree of uncertainty regarding what impact will occur in each sector as a result of the implementation of the measures to meet the GHG reduction goals.

The table on the following page provides estimates of total gas savings based on the impact of renewables in addition to the impact of electric and gas energy efficiency goals on the CPUC-jurisdictional utilities. Gas savings from electric energy efficiency goals are based on a generic assumption of heat rate per megawatt-hour of electricity produced at gas-fired peaking and combined-cycle power plants.

Impact of Renewable Generation and Energy Efficiency Programs on Gas Demand

	2014	2015	2016	2017	2018	2019	2020	2025	2030
California Energy Requirement Forecast [1]									
Electricity Demand (GWh)	257,526	258,543	258,826	259,654	260,610	262,341	264,359	273,606	290,996
33% Renewables by 2020									
Renewable Electric Generation (GWh/Yr) [2]	55,883	60,241	64,707	70,107	75,577	81,326	87,238	90,290	96,029
Increase over 2013 Level (GWh/Yr) [3]	4,728	9,086	13,552	18,952	24,422	30,171	36,083	39,135	44,874
Gas Savings over 2013 Level (Bcf/Yr)	29	55	82	115	148	183	219	237	272
Electric Energy Efficiency Goals [1]									
Electricity Savings over 2013 Level (GWh/Yr)	5,304	10,705	16,465	21,747	26,971	31,490	35,712	57,257	91,912
Gas Savings over 2013 Level (Bcf/Yr) [4]	32	65	100	132	164	191	217	347	558
Energy Efficiency Goal for Natural Gas Programs [1]									
Gas Savings over 2013 Level (Bcf/Yr)	5	11	17	23	29	35	41	74	110
Total Gas Savings (Bcf/Yr) [5]	66	131	199	270	341	409	477	659	940

Note:

(1) Electricity demand forecast and gas and electric efficiency goals sourced from the California Energy Demand 2014-2024 Final Forecast from the California Energy Commission. Mid demand, mid additional achievable energy efficiency scenario. (http://www.energy.ca.gov/2013_energypolicy/documents/index.html#demandforecast) Forecast to 2030 was extended by CEC staff.

(2) Assumes 33% Renewables by 2020.

(3) Increase reflects only impacts of equipment installed after 12/31/2013.

(4) Gas savings are estimated based on the following generic assumptions for California: gas-fired peaking plants are assumed to be the marginal source for 10% of the 8,760 hours in each year (24 * 365), and combined-cycle plants are marginal in another 75% of each year. Each MWh displaced from a peaking plant saves 10 MMBtu (10 Dth, or approx. 10,000 CF) of natural gas. Each MWh displaced from a combined-cycle plant saves 7 MMBtu (7 Dth, or approx. 7000 CF) of natural gas. A conservation program that saves 1 MWh in every hour of a year saves about 55,000 MMBtu of natural gas (8,760 hours * 10% * 10 MMBtu, plus 8,760 hours * 75% * 7 MMBtu). Conservation programs that save MWh primarily during summer peak periods produce greater natural gas savings per MWh. Similar estimates apply to renewable electric generators.

(5) Total gas savings are **annual** savings from equipment installed after 12/31/2013.

Future Gas System Impacts Resulting From Increased Renewable Generation, and Localized or Distributed Generation Resources

Electric system operators must balance electrical demand with supply resources on a real time basis. Historically, system operators have relied on "dispatchable" gas-fired, resources that can respond quickly to changes in demand to keep the system in balance. The substantial increase in renewable resources will present an additional challenge to system operators. They must now deal with real time, unanticipated variations in intermittent renewable resources like wind and solar resources. In addition, these resources greatly increase morning and evening ramps, as both wind and solar resources can come online, as well as, offline very quickly.

California is currently on track to meet a 33% Renewable Portfolio Standard by 2020. It is expected that solar and wind generating units will provide the majority of the new, renewable generation. In addition, the Governor has indicated an interest in significantly increasing the amount of smaller (less than 20 megawatts) generation in the state primarily with renewable or efficient technology. Much of the smaller incremental renewable energy is expected to come from solar Photo Voltaic (PV) installations because solar generation costs have declined rapidly in the past few years and solar has siting advantages especially in the urban areas. All this renewable energy will displace a significant amount of the natural gas currently being used to generate electricity in California. However, the intermittent nature of renewable generation is likely to cause the electric system to rely more heavily on natural gas-fired electric generation for providing the ancillary services (load following, ramping, and quick starts) needed to balance the electric system in the short-term until other technologies like battery or compressed air storage can mature.

The direct result of the addition of significant amounts of renewable generation resources to the California generation resource mix is that the gas system is likely to experience increased gas demand volatility for the gas-fired generators required to provide the additional ancillary service needed. In many months of the year the variability of wind is significant and in months that have significant cloud formation, or overcast conditions, the solar PV units may also have increased generation variability. The uncertainty in day-ahead gas demands will likely cause increased gas system inventory fluctuations. The gas system will, therefore, need to be flexible enough to handle such fluctuations with minimal interruption to gas deliveries to other customers. There will undoubtedly be higher daily fluctuations of gas usage in the future; especially on days when clouds materialize that were not forecast. The gas system will need to be able to accommodate such operations.

The challenge of incorporating intermittent resources into the California electric system is being addressed in several ways. Currently, utility planners are anticipating the use of increased cycling, gas-fired plants, pumped hydroelectric facilities, price responsive demand reducing programs, energy storage products, and distributed generation at load centers to handle much of the variability in electricity demand. Recently, the CPUC Storage Mandate Decision (D).13-10-040 was passed. These energy storage products would use the excess renewables energy to charge the battery or system during the time of low energy demand and would provide energy back into the grid during periods of high energy demand. In addition,

the California Independent System Operator (CAISO) has instituted a number of operational changes that move the forecasting of wind and solar availability closer to real time, which should reduce forecasting errors significantly. More accurate forecasting will help reduce the need for spinning reserves and other ancillary services. Also, the CAISO has broadened its electrical footprint with the creation of an Energy Imbalance Market (EIM). The EIM will allow both the CAISO and non-CAISO members to optimize resource availability that will allow the CAISO to better manage the integration of intermittent renewable resources. Broadening the interconnection to the regional grid will offset some of the intermittent nature of renewable resources and alleviate some of the operational obstacles to renewable integration. In addition, FERC Order 764, mandated intra-hour scheduling (fifteen minutes instead of on hour) between electric control areas. The shorter scheduling time interval will increase the accuracy of schedules, thus reducing the reliance on ancillary services to maintain electric system balance. Even with all of these operational changes to the electric system, there is still a need to have sufficient quick start resources available, most likely gas-fired resources, to balance the grid, as the State integrates more intermittent renewable resources into the California electric grid to achieve its 33% Renewable Portfolio Standard by 2020.

NATURAL GAS PROJECTS: PROPOSALS, COMPLETIONS, AND LIQUEFIED NATURAL GAS

Over the past five years, California natural gas utilities, interstate pipelines, and in-state natural gas storage facilities have increased their delivery and receipt capacity to meet natural gas demand growth. In addition, more projects have been proposed and some are under construction. The California Energy Commission (Energy Commission) posts a list of natural gas projects on its website, which tracks both completed projects and ones that are being developed or in the proposal stage, along with proposed liquefied natural gas (LNG) projects. To review these project lists check the Energy Commission's website at http://www.energyalmanac.ca.gov/naturalgas/index.html.

Supply Outlook/Pipeline Capacity

California's existing gas supply portfolio is regionally diverse and includes supplies from California sources (onshore and offshore), Southwestern U.S. supply sources (the Permian, Anadarko, and San Juan basins), the Rocky Mountains, and Canada. In 2010, the Ruby pipeline came online, bringing up to 1.5 Bcf/d of additional gas to California (via Malin) from the Rocky Mountains. The Energia Costa Azul LNG receiving terminal in Baja California provides yet another source of supply for California, though is unutilized given the current market environment. The map on the following page shows the locations of these supply sources and the natural gas pipelines serving California.

Additional pipeline capacity and open access have contributed to long-term supply availability and gas-on-gas competition for the California market. In addition to Ruby, interstate pipelines currently serving California include El Paso Natural Gas Company, Kern River Transmission Company, Mojave Pipeline Company, Gas Transmission-Northwest, Transwestern Pipeline Company, Questar Southern Trails Pipeline, Tuscarora Pipeline, and the Bajanorte/North Baja Pipeline.

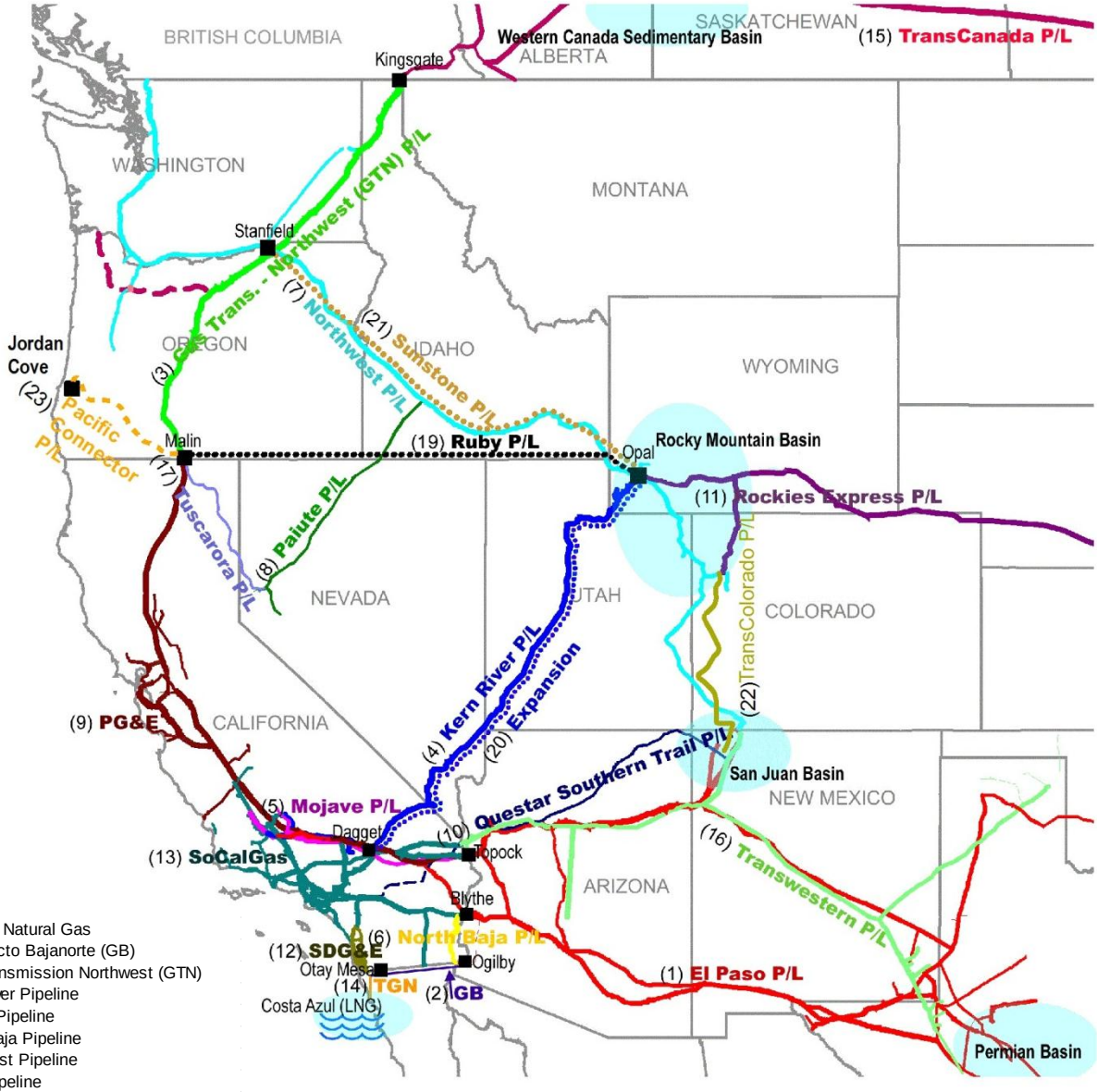
Traditional Southwestern U.S. sources of natural gas, especially from the San Juan Basin, will continue to supply most of Southern California's natural gas demand. This gas is primarily delivered via the El Paso Natural Gas and Transwestern pipelines. The San Juan Basin's gas supplies peaked in 1999 and have been declining at an annual rate of roughly 3%, but at a faster rate in recent years. The Permian Basin's share of supply into Southern California has increased in recent years, although increasing demand in Mexico for natural gas supplies may significantly reduce the volume of Permian Basin supply available to Southern California in the future. In A.13-12-013, SoCalGas and SDG&E have discussed this situation in more detail and have proposed a response to the operational concerns this situation creates for us.

Storage Capacity

Abundant gas storage capacity is available to help meet the supply needs of northern California. Storage services have been provided to the northern California market by PG&E, Lodi Storage, and Wild Goose Storage. In addition, there have been several storage projects that have recently expanded the capacity available to the market. These projects include Gill

Ranch Storage, which came online in 2010, and Central Valley Storage, which came online in 2012. In addition, Wild Goose had a large expansion that became operational in 2012.

Western North American Natural Gas Pipelines



1. El Paso Natural Gas
2. Gasoducto Bajanorte (GB)
3. Gas Transmission Northwest (GTN)
4. Kern River Pipeline
5. Mojave Pipeline
6. North Baja Pipeline
7. Northwest Pipeline
8. Piute Pipeline
9. Pacific Gas & Electric Company
10. Questar Southern Trail Pipeline
11. Rockies Express
12. San Diego Gas & Electric Company
13. Southern California Gas Company
14. Transportadora de Gas Natural (TGN)
15. TransCanada Pipeline
16. Transwestern Pipeline
17. Tuscarora Pipeline
18. Unused
19. Ruby Pipeline
20. Kern River Expansion
21. Sunstone Pipeline
22. Transcolorado Pipeline
23. Pacific Connector Pipeline

Liquefied Natural Gas (LNG)

The abundance of shale gas has changed the paradigm for LNG in the West. Until the latter part of the last decade, LNG was seen as being a potential source of imported gas for California, but that has changed. There are 14 proposed or potential export terminals on the west coast of North America totaling 27 billion cubic feet per day of capacity. Most of these are proposed in British Columbia as shown in the table below. The Costa Azul terminal remains the only import terminal on the west coast; however, it remains unutilized as a source of gas for California. It is uncertain whether all of the proposed and potential export terminals will be built, but their construction and operation could put upward pressure on gas prices in the West.

Potential and Proposed North American West Coast LNG Terminals
As of May 21, 2014[1]

TERMINAL LOCATION	COMPANY OR PROJECT NAME	PRODUCTION CAPACITY (BCF/D)	STATUS
COOS BAY, OR, USA	JORDAN COVE ENERGY PROJECT	0.9	PROPOSED EXPORT
ASTORIA, OR, USA	OREGON LNG	1.3	PROPOSED EXPORT
KITIMAT, BC, CANADA	APACHE CANADA LTD.	1.3	PROPOSED EXPORT
DOUGLAS ISLAND, BC, CANADA	BC LNG EXPORT COOPERATIVE	0.2	PROPOSED EXPORT
KITIMAT, BC, CANADA	LNG CANADA	3.2	PROPOSED EXPORT
PRINCE RUPERT ISLAND, BC, CANADA	BG GROUP	2.9	POTENTIAL EXPORT
PRINCE RUPERT ISLAND, BC, CANADA	PACIFIC NORTHWEST LNG	2.7	POTENTIAL EXPORT
PRINCE RUPERT ISLAND, BC, CANADA	EXXONMOBIL - IMPERIAL	4.0	POTENTIAL EXPORT
SQUAMISH, BC, CANADA	WOODFIBRE LNG EXPORT	0.3	POTENTIAL EXPORT
KITIMAT/PRINCE RUPERT, BC, CANADA	TRITON LNG	0.3	POTENTIAL EXPORT
PRINCE RUPERT ISLAND, BC, CANADA	AURORA LNG	3.1	POTENTIAL EXPORT
KITSAULT, BC, CANADA	KITSAULT ENERGY	2.7	POTENTIAL EXPORT
STEWART, BC, CANADA	CANADA STEWART ENERGY GROUP	4.1	POTENTIAL EXPORT
BAJA CALIFORNIA, MEXICO	SEMPRA - ENERGIA COSTA AZUL	1.5	APPROVED IMPORT

[1] Source: FERC List of Existing, Proposed, and Potential LNG Terminals (http://www.ferc.gov/industries/gas/indus-act/lng.asp, accessed 5/22/2014).

STATEWIDE CONSOLIDATED SUMMARY TABLES

The consolidated summary tables on the following pages show the statewide aggregations of projected gas supplies and gas requirements (demand) from 2014 to 2035 for average-temperature and normal-hydro years and cold temperature and dry hydro years.

Gas sales and transportation volumes are consolidated under the general category of system gas requirement. Details of gas transportation for individual utilities are given in the tabular data for northern California and southern California. The wholesale category includes the City of Long Beach Gas and Oil Department, San Diego Gas & Electric Company, Southwest Gas Corporation, City of Vernon, Alpine Natural Gas, Island Energy, West Coast Gas, Inc., and the municipalities of Coalinga and Palo Alto.

Some columns may not sum precisely because of modeling accuracy and rounding differences, and do not imply curtailments.

STATEWIDE TOTAL SUPPLY SOURCES AND REQUIREMENTS
Average Temperature and Normal Hydro Year
MMcf/Day

	2014	2015	2016	2017	2018
California's Supply Sources					
Utility					
California Sources	392	392	392	392	392
Out-of-State	4,960	4,813	4,790	4,833	4,853
Utility Total	5,352	5,205	5,182	5,225	5,245
Non-Utility Served Load (1)	1,090	1,068	1,050	1,030	1,018
Statewide Supply Sources Total	**6,442**	**6,273**	**6,232**	**6,255**	**6,263**
California's Requirements					
Utility					
Residential	1,218	1,210	1,205	1,202	1,201
Commercial	505	505	505	506	505
Natural Gas Vehicles	43	46	48	50	52
Industrial	934	930	937	940	942
Electric Generation (2)	2,026	1,881	1,853	1,890	1,906
Enhanced Oil Recovery Steaming	44	52	52	52	52
Wholesale/International+Exchange	235	236	237	238	240
Company Use and Unaccounted-for	80	78	78	79	79
Utility Total	5,085	4,938	4,915	4,958	4,978
Non-Utility					
Enhanced Oil Recovery/Industrial	497	502	499	494	496
EOR Cogeneration	128	123	120	118	117
Electric Generation	466	444	431	418	405
Non-Utility Served Load (1)	1,090	1,068	1,050	1,030	1,018
Statewide Requirements Total (3)	**6,175**	**6,006**	**5,964**	**5,988**	**5,995**

Notes:

(1) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.

(2) Includes utility generation, wholesale generation, and cogeneration.

(3) The difference between California supply sources and California requirements is PG&E's forecast of off-system deliveries.

STATEWIDE TOTAL SUPPLY SOURCES AND REQUIREMENTS
Average Temperature and Normal Hydro Year
MMcf/Day

	2019	2020	2025	2030	2035
California's Supply Sources					
Utility					
California Sources	394	394	394	394	394
Out-of-State	4,830	4,832	4,859	4,845	4,850
Utility Total	5,224	5,226	5,253	5,239	5,244
Non-Utility Served Load (1)	999	961	938	938	938
Statewide Supply Sources Total	**6,223**	**6,187**	**6,191**	**6,177**	**6,182**
California's Requirements					
Utility					
Residential	1,196	1,186	1,166	1,160	1,159
Commercial	503	499	488	486	490
Natural Gas Vehicles	54	56	64	70	75
Industrial	940	931	908	895	888
Electric Generation (2)	1,889	1,913	1,979	1,975	1,972
Enhanced Oil Recovery Steaming	52	52	52	52	52
Wholesale/International+Exchange	241	241	247	253	260
Company Use and Unaccounted-for	79	79	80	79	79
Utility Total	4,955	4,957	4,983	4,970	4,974
Non-Utility					
Enhanced Oil Recovery/Industrial	492	489	475	475	475
EOR Cogeneration	117	117	115	115	115
Electric Generation	390	355	348	348	348
Non-Utility Served Load (1)	999	961	938	938	938
Statewide Requirements Total (3)	**5,954**	**5,918**	**5,921**	**5,908**	**5,912**

Notes:
(1) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(2) Includes utility generation, wholesale generation, and cogeneration.
(3) The difference between California supply sources and California requirements is PG&E's forecast of off-system deliveries.

STATEWIDE TOTAL SUPPLY SOURCES-TAKEN
Average Temperature and Normal Hydro Year
MMcf/Day

Utility	2014	2015	2016	2017	2018
Northern California					
California Sources [1]	82	82	82	82	82
Out-of-State	2,468	2,409	2,389	2,446	2,473
Northern California Total	2,550	2,491	2,471	2,528	2,555
Southern California					
California Sources [2]	310	310	310	310	310
Out-of-State	2,492	2,404	2,401	2,387	2,380
Southern California Total	2,802	2,714	2,711	2,697	2,690
Utility Total	5,352	5,205	5,182	5,225	5,245
Non-Utility Served Load [3]	1,090	1,068	1,050	1,030	1,018
Statewide Supply Sources Total	**6,442**	**6,273**	**6,232**	**6,255**	**6,263**

Utility	2019	2020	2025	2030	2035
Northern California					
California Sources [1]	82	82	82	82	82
Out-of-State	2,464	2,494	2,508	2,511	2,512
Northern California Total	2,546	2,576	2,590	2,593	2,594
Southern California					
California Sources [2]	310	310	310	310	310
Out-of-State	2,366	2,338	2,351	2,334	2,337
Southern California Total	2,676	2,648	2,661	2,644	2,647
Utility Total	5,222	5,224	5,251	5,237	5,242
Non-Utility Served Load [3]	999	961	938	938	938
Statewide Supply Sources Total	**6,221**	**6,185**	**6,189**	**6,175**	**6,180**

Notes:
(1) Includes utility purchases and exchange/transport gas.
(2) Includes utility purchases and exchange/transport gas and City of Long Beach "own-source" gas.
(3) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant.
Source: CEC staff-provided forecast results from their own model simulations.

STATEWIDE ANNUAL GAS REQUIREMENTS [1]
Average Temperature and Normal Hydro Year
MMcf/Day

	2014	2015	2016	2017	2018
Utility					
Northern California					
Residential	543	545	547	547	549
Commercial - Core	230	232	233	234	234
Natural Gas Vehicles - Core	7	7	7	8	8
Natural Gas Vehicles - Noncore	1	1	1	1	1
Industrial - Noncore	498	492	498	503	507
Wholesale	0	0	0	0	0
SMUD Electric Generation	122	122	122	122	122
Electric Generation [2]	837	780	751	801	821
Exchange (California)	1	1	1	1	1
Company Use and Unaccounted-for	44	43	43	44	44
Northern California Total [3]	2,283	2,224	2,203	2,261	2,287
Southern California					
Residential	676	664	658	655	652
Commercial - Core	226	227	228	230	230
Commercial - Noncore	48	46	44	43	41
Natural Gas Vehicles - Core	35	38	40	42	43
Industrial - Core	60	59	59	59	58
Industrial - Noncore	376	379	379	379	377
Wholesale	234	235	236	237	239
SDG&E+Vernon Electric Generation	204	190	196	194	186
Electric Generation [4]	863	789	785	773	777
Enhanced Oil Recovery Steaming	44	52	52	52	52
Company Use and Unaccounted-for	36	35	35	35	35
Southern California Total	2,802	2,714	2,711	2,697	2,690
Utility Total	5,085	4,938	4,915	4,958	4,978
Non-Utility Served Load [5]	1,090	1,068	1,050	1,030	1,018
Statewide Gas Requirements Total [6]	**6,175**	**6,006**	**5,964**	**5,988**	**5,995**

Notes:
(1) Includes transportation gas.
(2) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(3) Northern Calfornia Total excludes Off-System Deliveries to Southern California.
(4) Southern California Electric Generation includes commercial and industrial cogeneration, refinery-related cogeneration, EOR-related cogeneration, and non-cogeneration electric generation.
(5) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(6) Does not include off-system deliveries.

STATEWIDE ANNUAL GAS REQUIREMENTS [1]
Average Temperature and Normal Hydro Year
MMcf/Day

	2019	2020	2025	2030	2035
Utility					
Northern California					
Residential	549	548	547	548	548
Commercial - Core	234	234	234	235	235
Natural Gas Vehicles - Core	8	9	9	9	10
Natural Gas Vehicles - Noncore	1	1	1	1	1
Industrial - Noncore	509	508	508	510	511
Wholesale	0	0	0	0	0
SMUD Electric Generation	122	122	122	122	122
Electric Generation [2]	810	841	855	855	855
Exchange (California)	1	1	1	1	1
Company Use and Unaccounted-for	44	45	45	45	45
Northern California Total [3]	2,279	2,309	2,322	2,326	2,327
Southern California					
Residential	647	638	619	612	611
Commercial - Core	230	228	226	228	231
Commercial - Noncore	39	37	28	23	24
Natural Gas Vehicles - Core	45	46	54	59	64
Industrial - Core	57	55	48	43	41
Industrial - Noncore	373	367	351	341	336
Wholesale	240	240	246	252	259
SDG&E+Vernon Electric Generation	183	180	181	179	178
Electric Generation [4]	774	770	821	819	817
Enhanced Oil Recovery Steaming	52	52	52	52	52
Company Use and Unaccounted-for	35	34	35	34	34
Southern California Total	2,676	2,648	2,661	2,644	2,647
Utility Total	4,955	4,957	4,983	4,970	4,974
Non-Utility Served Load [5]	999	961	938	938	938
Statewide Gas Requirements Total [6]	**5,954**	**5,918**	**5,921**	**5,908**	**5,912**

Notes:
(1) Includes transportation gas.
(2) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(3) Northern Calfornia Total excludes Off-System Deliveries to Southern California.
(4) Southern California Electric Generation includes commercial and industrial cogeneration, refinery-related cogeneration, EOR-related cogeneration, and non-cogeneration electric generation.
(5) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(6) Does not include off-system deliveries.

STATEWIDE TOTAL SUPPLY SOURCES AND REQUIREMENTS
Cold Temperature and Dry Hydro Year
MMcf/Day

	2014	2015	2016	2017	2018
California's Supply Sources					
Utility					
California Sources	394	394	394	394	394
Out-of-State	5,198	5,091	5,073	5,114	5,145
Utility Total	5,592	5,485	5,467	5,508	5,539
Non-Utility Served Load (1)	1,110	1,098	1,080	1,058	1,047
Statewide Supply Sources Total	**6,702**	**6,583**	**6,547**	**6,566**	**6,585**
California's Requirements					
Utility					
Residential	1,329	1,320	1,316	1,314	1,313
Commercial	528	529	530	531	530
Natural Gas Vehicles	43	46	48	50	52
Industrial	935	932	938	942	944
Electric Generation (2)	2,111	2,006	1,982	2,015	2,042
Enhanced Oil Recovery Steaming	44	52	52	52	52
Wholesale/International+Exchange	248	249	250	252	253
Company Use and Unaccounted-for	85	83	82	83	84
Utility Total	5,323	5,216	5,198	5,239	5,270
Non-Utility					
Enhanced Oil Recovery/Industrial	497	502	499	494	496
EOR Cogeneration	128	123	120	118	117
Electric Generation	485	473	461	446	434
Non-Utility Served Load (1)	1,110	1,098	1,080	1,058	1,047
Statewide Requirements Total (3)	**6,433**	**6,314**	**6,278**	**6,297**	**6,316**

Notes:
(1) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(2) Includes utility generation, wholesale generation, and cogeneration.
(3) The difference between California supply sources and California requirements is PG&E's forecast of off-system deliveries.

STATEWIDE TOTAL SUPPLY SOURCES AND REQUIREMENTS
Cold Temperature and Dry Hydro Year
MMcf/Day

	2019	2020	2025	2030	2035
California's Supply Sources					
Utility					
California Sources	394	394	394	394	394
Out-of-State	5,119	5,115	5,155	5,144	5,150
Utility Total	5,513	5,509	5,549	5,538	5,544
Non-Utility Served Load (1)	1,026	984	963	963	963
Statewide Supply Sources Total	**6,539**	**6,493**	**6,512**	**6,500**	**6,506**
California's Requirements					
Utility					
Residential	1,308	1,298	1,277	1,271	1,272
Commercial	528	525	514	512	516
Natural Gas Vehicles	54	56	64	70	75
Industrial	941	932	909	895	888
Electric Generation (2)	2,022	2,038	2,119	2,116	2,113
Enhanced Oil Recovery Steaming	52	52	52	52	52
Wholesale/International+Exchange	255	255	261	268	275
Company Use and Unaccounted-for	84	84	85	85	85
Utility Total	5,244	5,240	5,280	5,269	5,275
Non-Utility					
Enhanced Oil Recovery/Industrial	492	489	475	475	475
EOR Cogeneration	117	117	117	117	117
Electric Generation	417	379	372	372	372
Non-Utility Served Load (1)	1,026	984	964	964	964
Statewide Requirements Total (3)	**6,270**	**6,224**	**6,244**	**6,233**	**6,239**

Notes:
(1) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(2) Includes utility generation, wholesale generation, and cogeneration.
(3) The difference between California supply sources and California requirements is PG&E's forecast of off-system deliveries.

STATEWIDE TOTAL SUPPLY SOURCES-TAKEN
Cold Temperature and Dry Hydro Year
MMcf/Day

Utility	2014	2015	2016	2017	2018
Northern California					
California Sources [1]	82	82	82	82	82
Out-of-State	2,609	2,514	2,495	2,557	2,584
Northern California Total	2,691	2,596	2,577	2,639	2,666
Southern California					
California Sources [2]	310	310	310	310	310
Out-of-State	2,589	2,577	2,577	2,557	2,560
Southern California Total	2,899	2,887	2,887	2,867	2,870
Utility Total	5,590	5,483	5,465	5,506	5,537
Non-Utility Served Load [3]	1,110	1,098	1,080	1,058	1,047
Statewide Supply Sources Total	**6,700**	**6,581**	**6,545**	**6,564**	**6,583**

Utility	2019	2020	2025	2030	2035
Northern California					
California Sources [1]	82	82	82	82	82
Out-of-State	2,572	2,599	2,627	2,631	2,634
Northern California Total	2,666	2,654	2,681	2,709	2,713
Southern California					
California Sources [2]	310	310	310	310	310
Out-of-State	2,547	2,515	2,529	2,512	2,516
Southern California Total	2,857	2,825	2,839	2,822	2,826
Utility Total	5,523	5,480	5,520	5,531	5,539
Non-Utility Served Load [3]	1,026	984	963	963	963
Statewide Supply Sources Total	**6,550**	**6,464**	**6,482**	**6,494**	**6,502**

Notes:
(1) Includes utility purchases and exchange/transport gas.
(2) Includes utility purchases and exchange/transport gas and City of Long Beach "own-source" gas.
(3) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant.
Source: CEC staff-provided forecast results from their own model simulations.

STATEWIDE ANNUAL GAS REQUIREMENTS [1]
Cold Temperature and Dry Hydro Year
MMcf/Day

	2014	2015	2016	2017	2018
Utility					
Northern California					
Residential	587	590	593	595	597
Commercial - Core	240	242	244	244	245
Natural Gas Vehicles - Core	7	7	7	8	8
Natural Gas Vehicles - Noncore	1	1	1	1	1
Industrial - Noncore	498	492	498	503	507
Wholesale	0	0	0	0	0
SMUD Electric Generation	122	122	122	122	122
Electric Generation [2]	922	828	799	852	872
Exchange (California)	1	1	1	1	1
Company Use and Unaccounted-for	47	46	45	46	47
Northern California Total [3]	2,424	2,329	2,310	2,372	2,399
Southern California					
Residential	742	730	723	719	716
Commercial - Core	239	240	241	242	243
Commercial - Noncore	49	47	45	44	42
Natural Gas Vehicles - Core	35	38	40	42	43
Industrial - Core	61	61	61	60	59
Industrial - Noncore	376	379	379	379	377
Wholesale	247	248	249	251	252
SDG&E+Vernon Electric Generation	204	199	208	204	200
Electric Generation [4]	863	857	854	838	848
Enhanced Oil Recovery Steaming	44	52	52	52	52
Company Use and Unaccounted-for	38	37	37	37	37
Southern California Total	2,899	2,887	2,887	2,867	2,870
Utility Total	5,323	5,216	5,198	5,239	5,270
Non-Utility Served Load [5]	1,110	1,098	1,080	1,058	1,047
Statewide Gas Requirements Total [6]	**6,433**	**6,314**	**6,278**	**6,297**	**6,316**

Notes:
(1) Includes transportation gas.
(2) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(3) Northern Calfornia Total excludes Off-System Deliveries to Southern California.
(4) Southern California Electric Generation includes commercial and industrial cogeneration, refinery-related cogeneration, EOR-related cogeneration, and non-cogeneration electric generation.
(5) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(6) Does not include off-system deliveries.

STATEWIDE ANNUAL GAS REQUIREMENTS [1]
Cold Temperature and Dry Hydro Year
MMcf/Day

	2019	2020	2025	2030	2035
Utility					
Northern California					
Residential	598	597	598	599	600
Commercial - Core	245	245	246	246	247
Natural Gas Vehicles - Core	8	9	9	9	10
Natural Gas Vehicles - Noncore	1	1	1	1	1
Industrial - Noncore	509	508	508	510	511
Wholesale	0	0	0	0	0
SMUD Electric Generation	122	122	122	122	122
Electric Generation [2]	856	884	909	909	909
Exchange (California)	1	1	1	1	1
Company Use and Unaccounted-for	47	47	48	48	48
Northern California Total [3]	2,387	2,414	2,442	2,446	2,449
Southern California					
Residential	711	701	680	672	672
Commercial - Core	243	241	239	241	244
Commercial - Noncore	41	39	30	24	25
Natural Gas Vehicles - Core	45	46	54	59	64
Industrial - Core	58	56	49	44	42
Industrial - Noncore	373	367	351	341	336
Wholesale	254	254	260	267	274
SDG&E+Vernon Electric Generation	196	192	193	192	191
Electric Generation [4]	848	840	895	893	891
Enhanced Oil Recovery Steaming	52	52	52	52	52
Company Use and Unaccounted-for	37	37	37	37	37
Southern California Total	2,857	2,825	2,839	2,822	2,826
Utility Total	5,244	5,240	5,280	5,269	5,275
Non-Utility Served Load [5]	1,026	984	963	963	963
Statewide Gas Requirements Total [6]	**6,270**	**6,224**	**6,243**	**6,231**	**6,237**

Notes:
(1) Includes transportation gas.
(2) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(3) Northern Calfornia Total excludes Off-System Deliveries to Southern California.
(4) Southern California Electric Generation includes commercial and industrial cogeneration, refinery-related cogeneration, EOR-related cogeneration, and non-cogeneration electric generation.
(5) Consists of California production and deliveries by El Paso, Kern/Mojave and TGN pipelines to industrial, EOR Cogen, EOR steaming and powerplant customers, and gas consumption at Elk Hills powerplant. Source: CEC staff-provided forecast results from their own model simulations.
(6) Does not include off-system deliveries.

STATEWIDE RECORDED SOURCES AND DISPOSITION

The Statewide Sources and Disposition Summary is intended to complement the existing five-year recorded data tables included in the tabular data sections for each utility.

The information displayed in the following tables shows the composition of supplies from both out-of-state sources as well as California sources. The data are based on the utilities' accounting records and on available gas nomination and preliminary gas transaction information obtained daily from customers or their appointed agents and representatives. It should be noted that data on daily gas nominations are frequently subject to reconciling adjustments. In addition, some of the data are based on allocations and assignments that, by necessity, rely on estimated information. These tables have been updated to reflect the most current information.

Some columns may not sum exactly because of factored allocation and rounding differences, and do not imply curtailments.

Recorded 2009 Statewide Sources and Disposition Summary
MMcf/Day

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	Total
Southern California Gas Company								
Core + UAF (2)	98	590	187	20	69	0	19	983
Noncore Commercial/Industrial	35	123	48	31	135	9	5	386
EG (3)	73	259	101	65	284	20	10	811
EOR	3	11	4	3	12	1	0	35
Wholesale/Resale/International (4)	7	191	155	30	17	1	12	412
Total	216	1,174	495	148	518	30	46	2,627
Pacific Gas and Electric Company (5)								
Core	0	219	136	486	0	0	0	842
Noncore Industrial/Wholesale/EG (6)	135	358	175	623	46	0	0	1,337
Total	135	577	311	1,110	46	0	0	2,179
Other Northern California								
Core (7)	0	0	0	0	0	0	13	13
Non-Utilities Served Load (8,9)								
Direct Sales/Bypass	386	27	0	0	909	19	0	1,341
TOTAL SUPPLIER	737	1,778	806	1,258	1,473	49	59	6,160

Notes:

(1) Includes storage activities, volumes delivered on Questar Southern Trails for SoCalGas and PG&E.

(2) Includes NGV volumes

(3) EG includes UEG, COGEN, and EOR Cogen.

(4) Includes transportation to City of Long Beach, Southwest Gas, City of Vernon, DGN, & SDG&E, as shown.

San Diego Gas & Electric Company								
Core	6	45	36	23	14	0	9	133
Noncore Commercial/Industrial	0.058	105	85	0	0	0	0	191
Total	6	150	122	23	14	0	9	324

(5) Kern River supplies include net volume flowing over Kern River High Desert interconnect.

(6) Includes UEG, COGEN, industrial and deliveries to PG&E's wholesale customers.

(7) Includes Southwest Gas Corporation and Tuscarora deliveries in the Lake Tahoe and Susanville areas.

(8) Deliveries to end-users by non-CPUC jurisdictional pipelines.

(9) California production is preliminary.

Recorded 2010 Statewide Sources and Disposition Summary
MMcf/Day

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	Total
Southern California Gas Company								
Core + UAF (2)	181	504	212	30	91	0	-10	1,008
Noncore Commercial/Industrial	5	154	41	28	130	9	14	420
EG (3)	10	323	87	58	273	19	29	768
EOR	0	14	4	3	12	1	1	30
Wholesale/Resale/International (4)	7	191	155	30	17	1	12	412
Total	203	1,186	499	149	524	29	46	2,638
Pacific Gas and Electric Company (5)								
Core	0	219	136	486	0	0	0	842
Noncore Industrial/Wholesale/EG (6)	135	358	175	623	46	0	0	1,337
Total	135	577	311	1,110	46	0	0	2,179
Other Northern California								
Core (7)	0	0	0	0	0	0	13	13
Non-Utilities Served Load (8,9)								
Direct Sales/Bypass	386	27	0	0	909	19	0	1,341
TOTAL SUPPLIER	724	1,790	810	1,259	1,479	48	59	6,171

Notes:

(1) Includes storage activities, volumes delivered on Questar Southern Trails for SoCalGas and PG&E.

(2) Includes NGV volumes

(3) EG includes UEG, COGEN, and EOR Cogen.

(4) Includes transportation to City of Long Beach, Southwest Gas, City of Vernon, DGN, & SDG&E, as shown.

San Diego Gas & Electric Company								
Core	6	45	36	23	14	0	9	133
Noncore Commercial/Industrial	0.058	105	85	0	0	0	0	191
Total	6	150	122	23	14	0	9	324

(5) Kern River supplies include net volume flowing over Kern River High Desert interconnect.

(6) Includes UEG, COGEN, industrial and deliveries to PG&E's wholesale customers.

(7) Includes Southwest Gas Corporation and Tuscarora deliveries in the Lake Tahoe and Susanville areas.

(8) Deliveries to end-users by non-CPUC jurisdictional pipelines.

(9) California production is preliminary.

Recorded 2011 Statewide Sources and Disposition Summary
MMcf/Day

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	RUBY	Total
Southern California Gas Company									
Core + UAF (2)	195	442	257	33	138	0	-25	0	1,040
Noncore Commercial/Industrial	-18	157	24	25	203	14	20	0	423
EG (3)	-31	270	41	44	349	25	34	0	726
EOR	-1	10	2	2	13	1	1	0	27
Wholesale/Resale/International (4)	30	116	97	21	124	0	9	0	407
Total	175	996	420	125	828	40	40	0	2,623
Pacific Gas and Electric Company (5)									
Core	0	166	120	501	6	0	0	37	831
Noncore Industrial/Wholesale/EG (6)	108	132	116	563	118	0	6	281	1,323
Total	108	298	236	1,064	124	0	6	318	2,154
Other Northern California									
Core (7)	24	0	0	0	0	0	13	37	74
Non-Utilities Served Load (8,9)									
Direct Sales/Bypass	391	12	0	0	1,045	23	0	0	1,471
TOTAL SUPPLIER	698	1,306	656	1,189	1,997	63	59	355	6,322

Notes:
(1) Includes storage activities, volumes delivered on Questar Southern Trails for SoCalGas and PG&E.
(2) Includes NGV volumes
(3) EG includes UEG, COGEN, and EOR Cogen.
(4) Includes transportation to City of Long Beach, Southwest Gas, City of Vernon, DGN, & SDG&E, as shown.

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	RUBY	Total
San Diego Gas & Electric Company									
Core	25	59	34	4	19	0	-3	0	138
Noncore Commercial/Industrial	-1	32	42	12	79	0	10	0	174
Total	23	91	76	17	98	0	7	0	312
SouthWest Gas									
Core	24	0	0	0	0	0	13.00	0.000	37.00
Noncore Commercial/Industrial	2	0	0	0	0	0	0.17	0.000	2.17
Total	26	0	0	0	0	0	13.17	0.000	39.17

(5) Kern River supplies include net volume flowing over Kern River High Desert interconnect.
(6) Includes UEG, COGEN, industrial and deliveries to PG&E's wholesale customers.
(7) Includes Southwest Gas Corporation and Tuscarora deliveries in the Lake Tahoe and Susanville areas.
(8) Deliveries to end-users by non-CPUC jurisdictional pipelines.
(9) California production is preliminary.

Recorded 2012 Statewide Sources and Disposition Summary

MMcf/Day

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	Ruby	Total
Southern California Gas Company									
Core + UAF (2)	-10	402	304	59	216	0	10	0	981
Noncore Commercial/Industrial	41	86	80	55	145	13	1	0	425
EG (3)	89	186	174	119	315	28	3	0	922
EOR	3	6	5	4	10	1	0	0	29
Wholesale/Resale/International (4)	25	143	116	47	151	0	6	0	477
Total	148	822	680	283	838	42	21	0	2,834
Pacific Gas and Electric Company (5)									
Core	0	165	90	352	19	0	0	183	809
Noncore Industrial/Wholesale/EG (6)	84	94	95	428	141	318	13	689	1,863
Total	84	259	185	781	161	318	13	872	2,672
Other Northern California									
Core (7)	11	0	0	0	0	0	12	0	23
Non-Utilities Served Load (8,9)									
Direct Sales/Bypass	394	0	0	0	815	36	0	0	1,245
TOTAL SUPPLIER	637	1,081	865	1,064	1,814	396	46	872	6,774

Notes:

(1) Includes storage activities, volumes delivered on Questar Southern Trails for SoCalGas and PG&E.
(2) Includes NGV volumes
(3) EG includes UEG, COGEN, and EOR Cogen.
(4) Includes transportation to City of Long Beach, Southwest Gas, City of Vernon, DGN, & SDG&E, as shown.

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	Ruby	Total
San Diego Gas & Electric Company									
Core	-1.4	55	41	8	30	0	1.4	0	134
Noncore Commercial/Industrial	21	58	50	29	90	0	4	0	251
Total	20	113	91	37	120	0	5	0	385
SouthWest Gas									
Core	22	0	0	0	0	0	11.50	0	33.50
Noncore Commercial/Industrial	2	0	0	0	0	0	0.15	0	2.15
Total	24	0	0	0	0	0	11.65	0	35.65

(5) Kern River supplies include net volume flowing over Kern River High Desert interconnect.
(6) Includes UEG, COGEN, industrial and deliveries to PG&E's wholesale customers.
(7) Includes Southwest Gas Corporation and Tuscarora deliveries in the Lake Tahoe and Susanville areas.
(8) Deliveries to end-users by non-CPUC jurisdictional pipelines.
(9) California production is preliminary.

Recorded 2013 Statewide Sources and Disposition Summary

MMcf/Day

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	Ruby	Total
Southern California Gas Company									
Core + UAF (2)	18	361	265	67	230	0	56	0	997
Noncore Commercial/Industrial	37	163	117	25	77	10	-2	0	426
EG (3)	72	324	231	50	153	19	-4	0	845
EOR	3	13	10	2	6	1	0	0	35
Wholesale/Resale/International (4)	23	141	114	45	144	2	2	0	472
Total	153	1,003	737	189	611	32	51	0	2,775
Pacific Gas and Electric Company (5)									
Core	0	91	116	330	43	0	0	181	760
Noncore Industrial/Wholesale/EG (6)	57	88	92	429	130	0	45	599	1,440
Total	57	178	208	759	173	0	45	779	2,200
Other Northern California									
Core (7)	12	0	0	0	0	0	12	0	24
Non-Utilities Served Load (8,9)									
Direct Sales/Bypass	396	0	0	0	645	129	0	0	1,170
TOTAL SUPPLIER	618	1,181	945	948	1,429	161	109	779	6,169

Notes:

(1) Includes storage activities, volumes delivered on Questar Southern Trails for SoCalGas and PG&E.
(2) Includes NGV volumes
(3) EG includes UEG, COGEN, and EOR Cogen.
(4) Includes transportation to City of Long Beach, Southwest Gas, City of Vernon, DGN, & SDG&E, as shown.

	California Sources	El Paso	Trans western	GTN	Kern River	Mojave (10)	Other (1)	Ruby	Total
San Diego Gas & Electric Company									
Core	-1.4	56.2	42.5	8.2	30.1	1.8	0.0	0	137
Noncore Commercial/Industrial	19.8	55.0	47.6	26.9	83.4	0.0	1.4	0	234
Total	18	111	90	35	114	2	1	0	371
SouthWest Gas									
Core	22	0	0	0	0	0	12	0	33.5
Noncore Commercial/Industrial	2	0	0	0	0	0	0.15	0	2.2
Total	24	0	0	0	0	0	11.65	0	35.7

(5) Kern River supplies include net volume flowing over Kern River High Desert interconnect.
(6) Includes UEG, COGEN, industrial and deliveries to PG&E's wholesale customers.
(7) Includes Southwest Gas Corporation and Tuscarora deliveries in the Lake Tahoe and Susanville areas.
(8) Deliveries to end-users by non-CPUC jurisdictional pipelines.
(9) California production is preliminary.

STATEWIDE RECORDED HIGHEST SENDOUT

The table below summarizes the highest sendout days by the state in the summer and winter periods from the last five years. Daily sendout from SoCalGas, PG&E, and from customers not served by these utilities were used to construct the following tables. Please note that PG&E's values for sendout in year 2012 published in previous reports have been corrected.

Estimated California Highest Summer Sendout (MMcf/d[5])

Year	Date	PG&E[1]	SoCal Gas[2]	Utility Total[4]	Non-Utility[3]	State Total
2009	09/02/2009	2,592	3,235	5,827	1,369	7,196
2010	08/25/2010	2,700	3,504	6,204	1,153	7,357
2011	04/08/2011	2,164	3,313	5,477	1,322	6,799
2012	08/13/2012	2,685	3,483	6,168	1,633	7,801
2013	07/01/2013	2,558	3,393	5,951	1,437	7,388

Estimated California Highest Winter Sendout (MMcf/d[5])

Year	Date	PG&E[1]	SoCal Gas[2]	Utility Total[4]	Non-Utility[3]	State Total
2009	12/08/2009	4,157	4,505	8,662	1,327	9,989
2010	11/29/2010	3,426	4,356	7,782	1,151	8,932
2011	12/12/2011	2,842	4,152	6,994	1,501	8,495
2012	12/19/2012	3,628	4,294	7,922	1,501	9,423
2013	12/09/2013	4,850	4,881	9,731	1,426	11,157

Notes:
(1) PG&E Piperanger.
(2) SoCalGas Envoy.
(3) Source: DOGGR, Monthly Oil and Gas Production and Injection Report, Lipmann Monthly Pipeline Reports. Nonutility Demand equals Kern/Mojave and California monthly average total flows less PG&E and SoCal Gas peak day supply from Kern/Mojave and California Production. Provided by the CEC.
(4) PG&E and SoCalGas sendouts are reported for the day on which the Utility Total sendout is maximum for the respective season each year. Winter season months are Jan, Feb, Mar, Nov and Dec; while Summer season months are Apr, May, Jun, Jul, Aug, Sep, and Oct.
(5) For 2009-2010, PG&E and SoCalGas data were originally in energy units (MDth) and were converted to volumetric units (MMcf) by 1.0150 Dth/Mcf for PG&E and, 1.0235 Dth/Mcf for SoCalGas. For 2011-2013, PG&E's data were reported in volumetric units; SoCalGas' data were converted from energy units using 1.0209, 1.0210, and 1.0266 Dth/Mcf, respectively.

2014 CALIFORNIA GAS REPORT

NORTHERN CALIFORNIA

INTRODUCTION

Pacific Gas and Electric Company provides natural gas procurement, transportation, and storage services to 4.2 million residential customers and over 225,000 businesses in northern and central California. In addition to serving residential, commercial, and industrial markets, PG&E provides gas transportation and storage services to a variety of gas-fired electric generation plants in its service area. Other wholesale distribution systems, which receive gas transportation service from PG&E, serve a small portion of the gas customers in the region. PG&E's customers are located in 37 counties from south of Bakersfield to north of Redding, with high concentrations in the San Francisco Bay Area and the Sacramento and San Joaquin valleys. In addition, some customers also utilize the PG&E system to meet their gas needs in southern California.

The northern California section of the report begins with an overview of the gas demand forecast followed by a discussion of the forecast methodology, economic conditions, and other factors affecting demand in various markets, including the regulatory environment. Following the gas demand forecast are discussions of gas supply and pipeline capacity. Abnormal peak day demands and supply resources, as well as gas balances, are discussed at the end of this section.

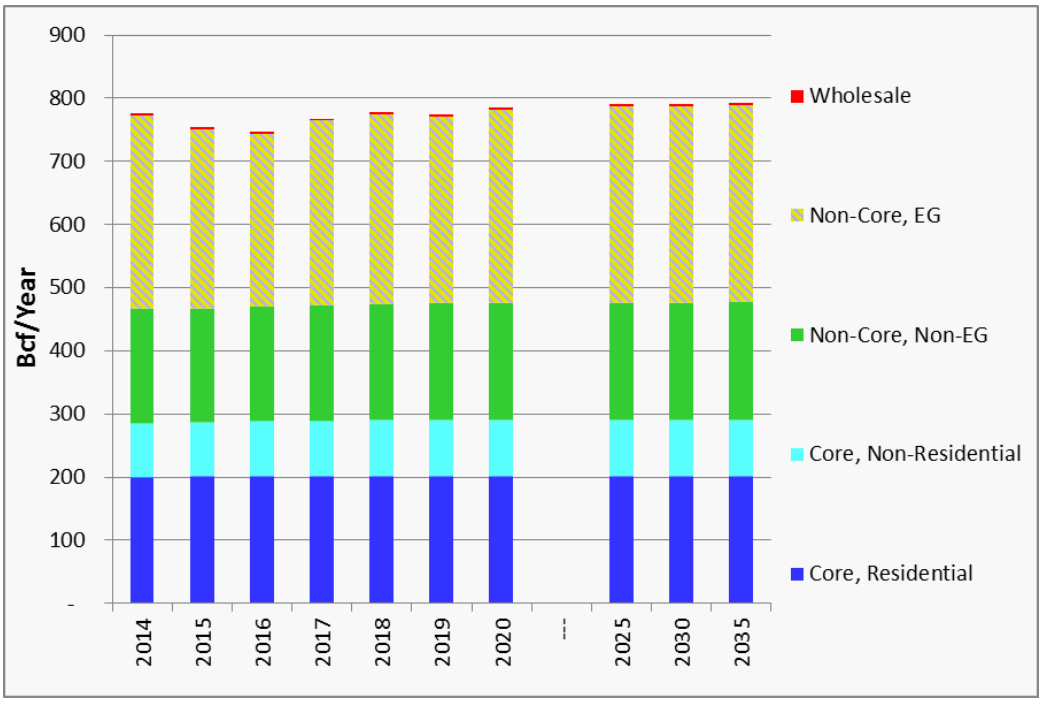
The forecast in this report covers the years 2014 through 2035. However, as a matter of convenience, the tabular data at the end of the section show only the years 2014 through 2020, and the years 2025, 2030, and 2035.

GAS DEMAND

OVERVIEW

PG&E's *2014 California Gas Report (CGR)* average-year demand forecast projects total on-system demand to grow at annual average rate of 0.1 percent between 2014 and 2035. This is due to the combination of a 0.1 percent annual growth in the core market and an annual growth of 0.1 percent in the noncore market. By comparison, the 2012 CGR estimated an annual average decline rate of 0.2 percent per year, based on a 0.1 percent annual decline in the core market and a 0.3 percent annual decline in the noncore market.

Composition of PG&E Requirements (Bcf)
Average-Year Demand



The projected rate of growth of the core market has increased from the *2012 California Gas Report* primarily due to an improving economy, though, this growth is slowed due to increasing emphasis on energy efficiency, and the incorporation of climate change where a warmer climate is assumed in the forecast horizon, thereby reducing winter gas demand in the core market.

The forecast rate of growth of the noncore market has increased due to a decrease in assumed renewable energy generation additions in northern California after several years of rapid growth, a decrease in assumed net retirements of gas-fired power plants in northern California because some have already retired, and decreases in the assumed cost of greenhouse gas allowances and the rate of growth of those costs. In this CGR, total gas demand by electric generators and cogenerators in northern California for average hydrological conditions is estimated to increase at a rate of about 0.5 percent per year from 2015 through 2035 (the forecast

for 2014 includes actual demand for the first quarter, which was affected by drought conditions in California). This total gas demand excludes gas delivered by nonutility pipelines to electric generators and cogenerators in PG&E's service area, such as deliveries by the Kern/Mojave pipelines to the La Paloma and Sunrise plants in central California. In addition, increasing quantities of renewable energy generation are expected to increase the need for load following and ancillary services such as regulation. These ancillary services are likely to be provided by gas-fired power plants, thus, affecting gas demand to some extent. PG&E's 2014 CGR forecast, however, does not capture this impact.

FORECAST METHOD

PG&E's gas demand forecasts for the residential, commercial, and industrial sectors are developed using econometric models. Forecasts for other sectors (NGV, wholesale) are developed based on market information. Forecasts of gas demand by power plants are developed based on modeling of the electricity market in the Western Electricity Coordinating Council using the MarketBuilder model. While variation in short-term gas use depends mainly on prevailing weather conditions, longer-term trends in gas demand are driven primarily by changes in customer usage patterns influenced by underlying economic, demographic, and technological changes, such as growth in population and employment, changes in prevailing prices, growth in electricity demand and in electric generation by renewables, changes in the efficiency profiles of residential and commercial buildings and the appliances within them, and the response to climate change.

FORECAST SCENARIOS

The average-year gas demand forecast presented here is a reasonable projection for an uncertain future. However, a point forecast cannot capture the uncertainty in the major determinants of gas demand (e.g., weather, economic activity, appliance saturation, and efficiencies). To give some flavor of the possible variation in gas demand, PG&E has developed an alternative forecast of gas demand under assumed high-demand conditions.

For the high-demand scenario, PG&E relied on a weather vintage approach by considering a year with cold temperatures and dry hydro conditions. Assuming the demographic conditions and infrastructure likely to exist in each forecast year, PG&E forecasts total gas demand with the weather conditions set to match the conditions that have an approximately 1-in-10 likelihood of occurrence. PG&E used the weather conditions from November 1988 through October 1989, as the winter of 1988-1989 was colder than normal, and this time period was dry in both northern California and the Pacific Northwest.

Temperature Assumptions

Because space heating accounts for a high percentage of use, gas requirements for PG&E's residential and commercial customers are sensitive to prevailing temperature conditions. In previous CGRs, PG&E's average-year demand forecast assumed that temperatures in the forecast period would be equivalent to the average of observed temperatures during the past twenty years. PG&E is now building into its forecast an assumption of climate change. The climate change scenario is developed from work done at the

National Center for Atmospheric Research (Boulder, Colorado), downscaled to the PG&E service area. Although the near-term temperatures of this scenario differ little from long-term averages, the years beyond 2015 begin to show the effects of a warming climate. For example, in 2020, total December/January heating degree days are only 2 percent below the 20-year average. By 2035, however, the impact is more significant, with the difference at 7 percent.

Of course, actual temperatures in the forecast period will be higher or lower than those assumed in the climate-change scenario and gas use will vary accordingly. PG&E's high-demand forecast assumes that winter temperatures in the forecast horizon will be the same as those that prevailed during November 1988-October 1989.

Seasonal variations in temperature have relatively little effect on power plant gas demand and, consequently, PG&E's forecasts of power plant gas demand for average and high demand are both based on average temperatures. (Each summer typically contains a few heat waves with temperatures 10^{o} or 15^{o} Fahrenheit above normal, which lead to peak electricity demands and drive up power plant gas demand; however, on a seasonal basis, temperatures seldom deviate more than 2^{o} Fahrenheit from average.)

Hydro Conditions

In contrast to temperature deviations, annual water runoff for hydroelectric plants has varied by 50% above and below the long-term annual average. The impact of dry conditions was demonstrated during the drought and electricity crisis in 2001 (October 2000 through September 2001). For the 2014 CGR's high-demand scenario, as noted above, PG&E used the 1988-1989 conditions.

Gas Price and Rate Assumptions

Inputs for gas prices and rate assumptions are very important for forecasting gas demand; this is especially true for market sectors that are particularly price sensitive, such as industrial or electric generation. PG&E utilized the gas commodity price forecast described in detail in the Southern California section on page 87. PG&E currently has two rate cases outstanding that will significantly affect gas transmission and distribution rates, the 2014 General Rate Case and the 2015 Gas Transmission and Storage Rate Case. Because of the uncertainty in the outcome of these cases, PG&E has elected to hold transmission and distribution rates constant at their 2014 levels.

MARKET SECTORS

Residential

Households in the PG&E service area are forecast to grow 0.8 percent annually from 2015 to 2035. However, gas use per household has been dropping in recent years due to improvements in appliance and building-shell efficiencies. This decline accelerated sharply in 2001 when gas prices spiked, causing temperature-adjusted residential gas demand to plunge by more than 8 percent. After recovering somewhat in 2002 and 2003, temperature-adjusted gas use per household reverted to its long-term trend and, despite slight upticks in 2009 and 2011 due to cold winters, has fallen on average 2 percent per year since 2004. Total residential

demand is expected to remain flat despite household growth due to continuing upgrades in appliance and building efficiencies, as well as warming temperatures.

Commercial

The number of commercial customers in the PG&E service area is projected to grow on average by 0.5 percent per year from 2015 to 2035. The 2000-2001 noncore-to-core migration wave has caused this class to be less temperature sensitive than it had previously been, and has also tended to stunt overall growth in both customer base and gas use per customer. Gas use per commercial customer is projected to decline slightly over the forecast horizon due to continuing energy efficiency efforts as well as warmer temperatures. Over the next 20 years commercial sales are expected to grow at 0.1 percent per year.

Industrial

Gas requirements for PG&E's industrial sector are affected by the level and type of industrial activity in the service area and changes in industrial processes. Gas demand from this sector plummeted by close to 20 percent in 2001 due to a combination of increasing gas prices, noncore-to-core migration, and a manufacturing sector mired in a severe downturn. After a slight recovery in 2002, demand from this sector fell another 6 percent in 2003 but has seen slow growth in the recent past due to very low natural gas prices and increased capacity at local refineries, though these effects have been tempered by the continuing structural change in California's manufacturing sector. PG&E observed historically high demand from the industrial sector in 2012 and 2013 due in part to refinery demand. While the industrial sector has the potential for high year-to-year variability, over the long term, industrial gas consumption is expected to grow slowly at 0.2 percent annually over the next 20 years.

Electric Generation

This sector includes cogeneration and power plants. Forecasts for this sector are subject to greater uncertainty due to the retirement of existing power plants with once-through cooling; the timing, location, and type of new generation, particularly renewable-energy facilities; construction of new electric transmission lines; and the impact of greenhouse gas policies and regulations on both generation and load. Because of these uncertainties, the forecast is held constant at 2025 levels for 2030 and 2035.

PG&E forecasts gas demand for most cogenerators by assuming a continuation of past usage, with modifications for expected expansions or closures. In this CGR, PG&E has assumed no additions of new onsite and export (demand- and supply-side) combined heat-and-power plants. Operations at most cogeneration plants are not strongly affected by prices in the wholesale electricity market, because electricity is generated with some other product, usually steam, for an industrial process.

PG&E forecasts gas demand by power plants and market-sensitive cogenerators using the MarketBuilder model. MarketBuilder is an economic-equilibrium model that has been applied to various markets with geographically distributed supplies and demands, such as the North American natural gas market. PG&E uses MarketBuilder to model the electricity market

in the Western Electricity Coordinating Council, which encompasses the electric systems from Denver to the Pacific coast and from northern Mexico to British Columbia and Alberta.

PG&E's forecast for 2014-2035 uses the mid-case electricity demand forecast from the California Energy Commission's 2013 *Integrated Energy Policy Report.* The forecast assumes that renewable energy generation will provide 25% of the state's retail sales by 2016 and 33% by 2020. PG&E assumed that gas-fired plants that employ once-through cooling will retire by the compliance date set by the State Water Resources Control Board (with some exceptions where the plant owner has proposed a different date), generally replaced by new gas-fired plants with comparable capacities.

SMUD Electric Generation

The Sacramento Municipal Utility District (SMUD) is the sixth largest community owned municipal utility in the United States, and provides electric service to over 575,000 customers within the greater Sacramento area. SMUD operates three cogeneration plants, a gas-fired combined-cycle plant, and a peaking turbine with a total capacity of approximately 1,000 MW. The peak gas load of these units is approximately 158 MMcf/day, and the average load is about 122 MMcf/day.

SMUD owns and operates a pipeline connecting the Cosumnes combined-cycle plant and the three cogeneration plants to PG&E's backbone system near Winters, California. SMUD owns an equity interest of approximately 3.6 percent in PG&E's Line 300 and approximately 4.2 percent in Line 401 representing about 87 MMcf/day of capacity.

GREENHOUSE GAS LEGISLATION/AB32

During the forecast horizon covered by this CGR, there are many uncertainties that may significantly impact the future trajectory of natural gas demand. It is unclear at this time what the ultimate effect on natural gas demand will be from California's landmark California Global Warming Solutions Act of 2006 (Assembly Bill 32, or AB32). On the one hand, more aggressive energy efficiency programs and/or increased targets for renewable electricity supplies could significantly reduce the use of natural gas by residential and commercial customers and power plants. On the other hand, increased penetration of electric and natural gas vehicles could reduce gasoline use and overall greenhouse gas (GHG) emissions, but increase consumption of natural gas.

PG&E will continue to minimize GHG emissions by aggressively pursuing both demand side reductions and acquisition of preferred resources, which produce little or no carbon emissions.

RENEWABLE ELECTRIC GENERATION

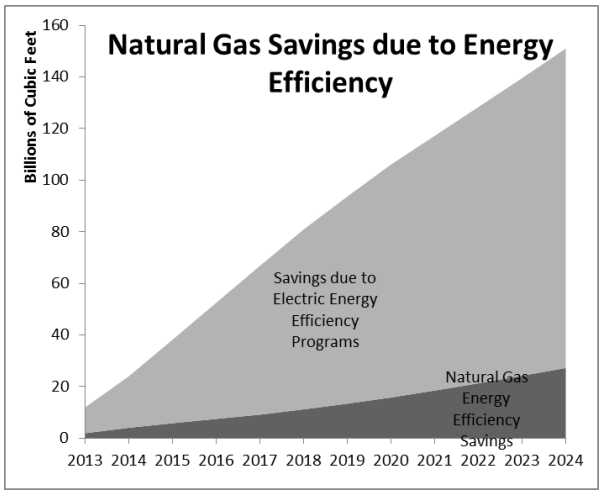
PG&E expects the growth of renewable electric generation will result in higher daily and hourly deviations between forecast and actual generation from natural gas-fueled electric resources. In addition, the intermittent nature of some renewable generation (e.g., wind or solar power) is likely to cause the electric system to rely more heavily on natural gas-fired electric generation to cover forecast deviations and intra-day and intra-hour variability of intermittent

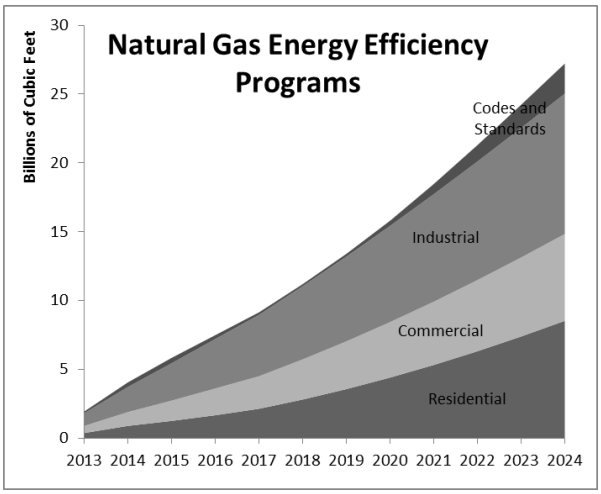
generation. This variability will, in turn, result in higher daily forecast errors for gas and increased fluctuations in gas-system inventory.

ENERGY EFFICIENCY PROGRAMS

PG&E engages in a number of energy efficiency and conservation programs designed to help customers identify and implement ways to benefit environmentally and financially from energy efficiency investments. PG&E administers many energy efficiency programs, including services that help customers evaluate their energy efficiency options and adopt recommended solutions, as well as simple equipment retrofit improvements, such as rebates for new hot water heaters.

Forecast of cumulative natural gas savings due to energy efficiency is provided in the figures below. Savings for these efforts are based on the report *2013 California Energy Efficiency Potential and Goals Study*, which was conducted by Navigant Consulting and published February 14, 2014.





Conservation and energy efficiency savings are measured at the meter and include any interactive effects that may result from efficiency improvements of electric end uses; for instance, increased natural gas heating load that could result from efficiency improvements in lighting and appliances. These figures also include any reductions in natural gas demand for electric generation that may occur due to lower electric demand; see "Savings due to Electric Energy Efficiency Programs" in the graph on the left above.

Details of PG&E's 2013-14 Energy Efficiency Portfolio can be found in CPUC Decision 12-11-015.

GAS SUPPLY, CAPACITY, AND STORAGE

OVERVIEW

Competition for gas supply, market share, and transportation access has increased significantly since the late 1990s. Implementation of PG&E's Gas Accord in March 1998 and the addition of interstate pipeline capacity and storage capacity have provided all customers with direct access to gas supplies, intra- and inter-state transportation, and related services.

Almost all of PG&E's noncore customers buy all or most of their gas supply needs directly from the market. They use PG&E's transportation and storage services to meet their gas supply needs.

Overall, most of the gas supplies that serve PG&E customers are sourced from out of state with only a small portion originating in California. This is due to the increasing gas demand in California over the years and the limited amount of native California supply available.

GAS SUPPLY

California-Sourced Gas

Northern California-sourced gas supplies come primarily from gas fields in the Sacramento Valley. In 2013, PG&E's customers obtained on average 57 MMcf/day of California-sourced gas.

U.S. Southwest Gas

PG&E's customers have access to three major U.S. Southwest gas producing basins—Permian, San Juan, and Anadarko—via the El Paso, Southern Trails, and Transwestern pipeline systems.

PG&E's customers can purchase gas in the producing basins and transport it to California via interstate pipelines. They can also purchase gas at the California-Arizona border or at the PG&E Citygate from marketers who hold inter- or intra-state pipeline capacity.

Canadian Gas

PG&E's customers can purchase gas from various suppliers in western Canada (British Columbia and Alberta) and transport it to California primarily through the Gas Transmission Northwest Pipeline. Likewise, they can also purchase these supplies at the California-Oregon border or at the PG&E Citygate from marketers who hold inter- or intra-state pipeline capacity.

Rocky Mountain Gas

PG&E's customers have access to gas supplies from the Rocky Mountain area via the Kern River Pipeline, the Ruby Pipeline and via the Gas Transmission Northwest Pipeline interconnect at Stanfield, Oregon. The Ruby Pipeline came online in July 2011 and brings up to 1.5 Bcf/day of Rocky Mountain gas to Malin, Oregon. With Ruby pipeline, the share of Canadian gas to PG&E's system has been reduced somewhat while the Redwood path from Malin to PG&E Citygate has run at a higher utilization rate.

Storage

In addition to storage services offered by PG&E, there are four other storage providers in northern California—Wild Goose Storage, Inc., Gill Ranch Storage, LLC; Central Valley Gas Storage, LLC; and Lodi Gas Storage, LLC. As of 2013, these facilities had total working gas capacity of roughly 240 billion cubic feet and peak withdrawal capacity of 4.8 billion cubic feet per day.

INTERSTATE PIPELINE CAPACITY

As a result of pipeline expansion and new projects, California utilities and end-users benefit from improved access to supply basins and enhanced gas-on-gas and pipeline-to-pipeline competition. Interstate pipelines serving northern and central California include the El Paso, Mojave, Transwestern, Gas Transmission Northwest, Paiute Pipeline Company, Ruby, Southern Trails, and Kern River pipelines. These pipelines provide northern and central California with access to gas producing regions in the U.S. Southwest and Rocky Mountain areas, and in western Canada.

U.S. Southwest and Rocky Mountains

PG&E's Baja Path (Line 300) is connected to U.S. Southwest and Rocky Mountain pipeline systems (Transwestern, El Paso, Southern Trails, and Kern River) at and west of Topock, Arizona. The Baja Path has a firm capacity of 1,010 MMcf/day.

Canada and Rocky Mountains

PG&E's Redwood Path (Lines 400/401) is connected to Gas Transmission Northwest and Ruby at Malin, Oregon. The Redwood Path has a firm capacity of 2,038 MMcf/day.

GAS SUPPLIES AND INFRASTRUCTURE PROJECTS

PG&E anticipates that sufficient supplies will be available from a variety of sources at market-competitive prices to meet existing and projected market demands in its service area. The new supplies could be delivered through a variety of sources, including new interstate pipeline facilities and expansion of PG&E's existing transmission facilities, or PG&E's or others' storage facilities.

The growth of gas production in the Midcontinent and eastern shale plays (e.g., Barnett in northeast Texas, Marcellus in Pennsylvania) have had the effect of pushing larger volumes of Canadian, Rockies, San Juan, and Permian supplies to California, as those supplies are crowded out of markets to the east.

LNG Imports/Exports

U.S. imports of liquefied natural gas (LNG) have been declining since 2008. Continued success in developing low-cost domestic shale gas supplies has largely eliminated the need for LNG imports and positioned the United States as a net exporter of LNG Exports of LNG from the contiguous U.S. are projected to start in 2016.

There are numerous proposed projects to export LNG to world markets. Many of the projects are "brownfield", using existing U.S. import terminals to export LNG, but some are "greenfield". The "greenfield" LNG export projects targeting the Asian gas market are mostly in the U.S. West Coast and western Canada. More than 30 Bcf/day of LNG project applications are in line for approval by the U.S. federal government.

The U.S. Department of Energy (DOE) evaluates the impact of LNG projects proposing to export LNG to countries without a Free Trade Agreement (FTA) with the U.S. and grants approval only if the project is deemed in the "public interest." As of May 2014, the DOE had approved seven non-FTA LNG export applications with a total export capacity of 9.3 Bcf/day.

The U.S. Federal Energy Regulatory Commission (FERC), on the other hand, is focused on evaluating the environmental impacts of proposed LNG projects, and is responsible for authorizing the siting and construction of LNG facilities. FERC has approved for construction 5.3 Bcf/day of LNG export capacity. Of approved projects, only the Sabine Pass Liquefaction, LLC, is currently under construction.

The DOE granted authorization to the Jordan Cove project in Oregon with non-FTA LNG export capacity of 0.8 Bcf/day on March 24, 2014. It could soon approve the Oregon LNG project with 1.25 Bcf/day export capacity. However, much more work lies ahead to resolve complex issues of commercial contracts, FERC and local approvals, financing, and new pipelines, before plans can succeed.

The LNG export projects in Oregon, the first on the U.S. West Coast are positioned to source gas from Canada and the U.S. Rockies; thus, they could directly compete for gas supplies available to northern California.

Rocky Mountains

In July 2011, El Paso Natural Gas Corp (since purchased by Kinder Morgan, Inc.) completed the 1.5 Bcf/day Ruby Pipeline project, which connects the Rocky Mountain supply basin at Opal with Malin, Oregon. This project provides a source of supply that competes at Malin with supply from the Western Canadian Sedimentary Basin in Canada.

North American Supply Development

The most promising development in the North American gas supply picture in the past several years has been the rapid development of various shale gas resources through horizontal drilling combined with hydraulic fracturing. While the initial developments were concentrated in the U.S. midcontinent, the large Marcellus and Utica plays in the eastern U.S. have been ramping up, resulting in record U.S. gas production in 2013. While some of the traditional supply basins have shown modest declines in production, the Marcellus and Utica plays have grown from roughly 10 percent of U.S. production in 2012 to 20 percent in 2014, with further strong growth expected in the next few years. Most industry forecasts now expect supply can increase to meet the most aggressive demand scenario in the future.

GAS STORAGE

Northern California is served by several gas storage facilities in addition to the long-standing PG&E fields at McDonald Island, Pleasant Creek, and Los Medanos. Other storage providers include Gill Ranch Storage, LLC (the 20 Bcf facility was co-developed with PG&E, which owns 25% of the capacity), Wild Goose Storage, Inc., Lodi Gas Storage, LLC, and Central Valley Storage, LLC. Of note are the recent addition of 11 Bcf of working gas capacity at Central Valley Storage and the recent series of expansions at Wild Goose Storage that increased its working gas capacity from 29 Bcf to 75 Bcf.

The abundant storage capacity in the northern California market has had the effect of creating additional liquidity in the market both in northern California and in other parts of the West. The extent to which northern California storage helped supply the larger western market could be seen during much of the winter of 2013-2014; increased storage withdrawals allowed pipeline supplies to meet demand outside of California.

REGULATORY ENVIRONMENT

STATE REGULATORY MATTERS

Gas Quality

Gas quality has received much less attention since 2010 due to the abundance of domestic gas supply, which has diminished interest in LNG imports, as described in the previous chapter. Hence, the challenges associated with integrating LNG and traditional North American sources, each typically with different quality characteristics, do not require immediate resolution.

PG&E has historically used the heating value of gas as an indicator of gas interchangeability (the ability to substitute gas of one chemical composition for gas of another different chemical composition). However, based on recent testing, the Wobbe Number is a better indicator of gas quality. The Wobbe Number reflects not only the heating value but the specific gravity of the gas as well. Specific gravity is an indicator of the relative proportion of heavier versus lighter hydrocarbons. In its testing, PG&E tentatively concluded that it could accept gas supplies with a Wobbe Number as high as 1,385.

Pipeline Safety

Since 2011, the CPUC and the state legislature have adopted a series of regulations and bills that reinforce the setting of public and employee safety as the top priority for the state's gas utilities. In particular, Senate Bill 705 mandated for the first time that gas operators develop and implement safety plans that are consistent with the best practices in the gas industry.

PG&E filed with the CPUC its Pipeline Safety Enhancement Plan (PSEP) in August 2011 and a PSEP Update in October 2013. That filing presented the first phase of a comprehensive plan to strength-test or replace all natural gas transmission lines currently in service that have not previously been strength-tested.

In December 2013, PG&E filed its 2015 Gas Transmission and Storage (GT&S) Rate Case, which proposes increased funding for 2015 through 2017 to continue the implementation of best-practice safety improvements using an investment plan based on risk mitigation. This filing proposes a substantial increase in revenue requirement from currently authorized 2014 levels that were adopted in the 2011 GT&S Rate Case and the PSEP proceeding.

Core Gas Aggregation Program

As of early 2014, Core Transport Agents (CTAs) serve approximately 19 percent of PG&E's core gas demand. PG&E recently began implementing the CTA Settlement Agreement, part of the Gas Accord V Settlement Agreement. The CTA Settlement Agreement modifies the practice by which PG&E offers a share of its pipeline and storage capacity holdings to CTAs to serve core customers. Implementation has resulted in numerous revisions to PG&E's Gas Schedule G-CT (Core Gas Aggregation Service) and to PG&E's CTA Service Agreement.

FEDERAL REGULATORY MATTERS

PG&E actively participates in FERC ratemaking proceedings for interstate pipelines connected to PG&E's system, because these cases can impact the cost of gas delivered to PG&E's gas customers and the services provided. PG&E also participates in FERC proceedings of general interest to the extent they affect PG&E's operations and policies or natural gas market policies generally.

Ruby Pipeline, L.L.C. (Ruby)

Ruby Pipeline filed an application with the Federal Energy Regulatory Commission (FERC) on January 27, 2009, authorizing the construction and operation of the Ruby Pipeline Project. On April 5, 2010, the FERC approved the application. Construction began on July 31, 2010, and the pipeline was placed in service on July 28, 2011. Ruby is capable of transporting approximately 1.5 Bcf/day to bring Rocky Mountain natural gas supplies the Northwest, and to California.

El Paso Natural Gas Company, L.L.C. (El Paso)

El Paso filed a rate case application in the Federal Energy Regulatory Commission (FERC) Docket No. RP10 -1398, for revised rates and terms and conditions effective April 1, 2011. At issue in the rate case are commitments made in a 1996 Settlement, which established rate protections for certain El Paso shippers, and which remain in effect. FERC is conducting a supplemental proceeding to determine the appropriate level of costs reflected in protected contracts, and to adjust proposed rates accordingly.

Kern River Gas Transmission (Kern River)

On February 15, 1992, Kern River went into service, providing Rocky Mountain supplies to the San Joaquin Valley near Bakersfield, Calif. Major expansions occurred in 2002 and 2003, and 2010. Kern River currently has a design capacity of approximately 2.17 billion cubic feet per day.

Transwestern Pipeline Company, L.L.C. (Transwestern)

Transwestern and its customers agreed to a rate pre-settlement on September 21, 2011 in FERC Docket No. RP11-2576. Pursuant to Article VI of the FERC-approved settlement, Transwestern is required to file a Natural Gas Act (NGA) Section 4 general rate case on October 1, 2014.

Gas Transmission Northwest, L.L.C.

Gas Transmission Northwest and its customers agreed to rate settlement, effective January 1, 2012, covering a 4 year period. The FERC-approved settlement requires GTN to file a Section 4 general rate case for new rates effective January 1, 2016.

FERC Notice of Inquiry Regarding Integration of Variable Energy Resources (Docket RM10-11)

FERC sought comments in April 2010 as to how to more effectively integrate renewable generation resources into the electric grid. While providing numerous comments from an electric perspective, PG&E also emphasized that electric system planners need to work closely with gas system planners to confirm that gas systems are sized appropriately and offer the necessary services to allow gas-fired electric generation projects to respond to sudden changes in renewable project output. FERC has not taken any specific action in response to the comments.

FERC Gas-Electric Coordination Actions (AD12-12 & EL14-22)

Since 2012, FERC commissioners have raised questions about whether there is sufficient coordination and harmonization between gas and electric systems regarding reliability. Concerns have arisen for several reasons: extreme weather events that can affect both the gas and electric grids; expectations of significant increases in gas-fired electric generation nationwide (less so in PG&E's service territory since a significant number of gas-fired generators already exist); and the expanding prevalence of renewable generation portfolio requirements and the resulting need for non-renewable fuel sources, like natural gas, to support the grid when renewable generation is unavailable or reduced.

In spring 2012, FERC held multiple technical conferences and requested comments from gas and electric industry stakeholders regarding any impediments to closer coordination/communication. After multiple meetings and comment periods, on March 20, 2014, FERC issued a Notice of Proposed Rulemaking (NOPR) proposing to move the start of the gas day from the current 9 a.m. to 4 a.m. Central Time and change the natural gas intraday scheduling practice. The NOPR provided the gas and electricity industry the opportunity to work through the North American Energy Standards Board (NAESB) to reach consensus on modification of the proposed gas day and nomination schedule by September 29, 2014, and requested comments on the NOPR by November 28, 2014.

PG&E is actively participating in the NAESB process to create a consensus proposal. PG&E's position is that gas-electric coordination may be viewed on a regional basis due to the numerous differences in infrastructure and electric markets across the country. PG&E believes that a high degree of coordination already exists in California between gas system operators and the (electric) California Independent System Operator.

Also on March 20, 2014, FERC requested that ISO/RTOs investigate electric scheduling practices. FERC did not dictate any specific language changes; instead it required each ISO/RTO, to make a filing 90 days after the gas-day revised final order is published. The filing will contain (1) proposed tariff changes to adjust the electric scheduling; or (2) show why such changes are not necessary.

OTHER REGULATORY MATTERS

Hydraulic Fracturing

Hydraulic fracturing is not a new technology (see www.fracfocus.org). It is the combination of hydraulic fracturing with horizontal drilling that has unlocked vast shale gas resources across North America. Given the rapid growth in shale drilling and the number of "fracked" wells, federal, state, and local governments are focusing on better understanding the water and air quality impacts.

In 2009, the US Congress requested that the Environmental Protection Agency (EPA) conduct a study on the relationship between hydraulic fracturing and drinking water, which the EPA expects to complete by 2016. In April 2012, the EPA issued its first federal regulation for natural gas wells that are hydraulically fractured to reduce volatile organic compounds and methane emissions. Also in 2012, the Department of Energy, the Department of the Interior (DOI), and the EPA announced that they will jointly develop a multi-agency program to study the key challenges associated with unconventional oil and gas production. The program takes into consideration the recommendations of the Secretary of Energy Advisory Board Subcommittee 2011 report on shale gas production.[2] The outcomes of these studies will support policy decisions at both the federal and state levels. Since 2012, the Bureau of Land Management, within the DOI, has been developing rules to strengthening existing well-integrity standards, requiring measures for management of wastewater and chemical disclosure for hydraulic fracturing wells on federal lands. In February 2014, the EPA released final rules restricting the use of diesel fuels in the hydraulic fracturing process; however, the effects on production will be minimal as "diesel fuels appeared in fewer than two percent of the wells" according to a 2012 report by FRACFocus.

In November 2013, California passed Senate Bill 4 to strengthen California's hydraulic fracturing regulations by requiring permits, notifications, disclosures and impact studies. California regulators, environmentalists, and the gas and oil industry are continuing the discussion to modify the bill.

Gas Exports

The record rise of natural gas production in the United States over the last five years reverses the U.S. position in the international gas trade.

With low domestic natural gas prices compared to world markets, the United States is positioned to become a net exporter of natural gas by 2020. Mexico is projected to be a major importer of U.S. gas. The U.S. natural gas exports to Mexico have grown in recent years from 1.0 Bcf/day in 2008 to approximately 2.0 Bcf/day in 2013. They are projected to reach 5.0 Bcf/day by 2030, due to declining gas production and increasing gas demand for power generation and industrial use in Mexico. Several gas pipeline capacity-expansion projects on both sides of the U.S.-Mexico border are under way to help meet Mexico's growing demand for U.S. gas. These projects are projected to be in service by 2015. When completed, they will significantly increase the total U.S.-to-Mexico pipeline-export capacity. As noted earlier, the U.S. is expected to become a net exporter of LNG beginning in 2016. While project developers

[2] http://www.shalegas.energy.gov/resources/111811_final_report.pdf.

seek to arbitrage North American gas prices and international oil-linked prices, the U.S. federal government is assessing the impact of more than 30 Bcf/day of proposed LNG export projects. The U.S. DOE has approved 9.3 Bcf/day of non-FTA LNG exports, and FERC has authorized the construction of 5.3 Bcf/day of LNG export capacity. Only one of approved projects, Sabine Pass Liquefaction, LLC, is currently under construction in the U.S.

The U.S. LNG exports are projected to grow to 4-6 Bcf/day by 2020. Two of the LNG export projects, the Jordan Cove LNG recently approved by DOE and the Oregon LNG expected to be approved, are on the U.S. West Coast.

Greenhouse Gas (GHG) Reporting and Cap-and-Trade Obligations

In 2014, PG&E Gas Operations reported to the EPA GHG emissions in accordance with 40 CFR Part 98 in three primary categories: GHG emissions in 2013 resulting from combustion at seven compressor stations where the annual emissions exceed 25,000 metric tons of CO_2 equivalent; the GHG emissions resulting from combustion of all customers except customers consuming more than 460 MMcf; and certain vented and fugitive emissions from the seven compressor stations and the distribution system.

In 2014, PG&E Gas Operations reported to the California Air Resources Board (CARB) GHG emissions in the amount of 40.5 million metric tons of CO_2 equivalent in three primary categories: GHG emissions resulting from combustion at seven compressor stations and one underground gas storage station where the annual emissions exceed 25,000 metric tons of CO_2 equivalent; the GHG emissions resulting from combustion of delivered gas to all customers; and vented and fugitive emissions from seven compressor stations, one underground gas storage station and the distribution system.

In 2014, PG&E expects that a total of seven compressor stations and one underground gas storage station will emit more than 25,000 metric tons of CO_2 equivalent and, so, is included in CARB's cap-and-trade program. The scope of CARB's cap-and-trade program expands in 2015 to include natural gas suppliers, who will have a compliance obligation for GHG emissions associated with the natural gas use of their small customers (i.e., those customers who are not covered directly under CARB's cap-and-trade program). In 2012, CARB determined that PG&E's GHG emissions as a natural gas supplier were approximately 18.9 million metric tons of CO_2 equivalent.

ABNORMAL PEAK DAY DEMAND AND SUPPLY

APD DEMAND FORECAST

The Abnormal Peak Day (APD) forecast is a projection of demand under extremely adverse conditions. PG&E uses a 1-in-90 year cold-temperature event as the design criterion. This criterion corresponds to a 27 degree Fahrenheit system-weighted mean temperature across the PG&E gas system. The PG&E core demand forecast corresponding to a 27 degree Fahrenheit temperature is estimated to be approximately 3.2 Bcf/day. The PG&E load forecast shown here excludes all noncore demand and, in particular, excludes all electric generation (EG) demand. PG&E estimates that total noncore demand during an APD event would be approximately 2.5 Bcf/day, with EG demand comprising between one-half to two-thirds of the total noncore demand.

The APD core forecast is developed using the observed relationship between historical daily weather and core usage data. This relationship is then used to forecast the core load under APD conditions.

APD SUPPLY REQUIREMENT FORECAST

For APD planning purposes, supplies will flow under Core Procurement's firm capacity, any as-available capacity, and capacity made available pursuant to supply-diversion arrangements. Supplies could also be purchased from noncore suppliers. Flowing supplies may come from Canada, the U.S. Southwest, the Rocky Mountain region, SoCalGas, and California. Also, a significant part of the APD demand will be met by storage withdrawals from PG&E's and independent storage providers' underground storage facilities located within northern and central California.

PG&E's Core Gas Supply Department is responsible for procuring adequate flowing supplies to serve approximately 81 percent of PG&E's core gas usage. Core aggregators provide procurement services for the balance of PG&E's core customers and have the same obligation as PG&E Core Gas Supply to make and pay for all necessary arrangements to deliver gas to PG&E to match the use of their customers.

In previous extreme-cold weather events, PG&E has observed a drop in flowing pipeline supplies. Supply from Canada is affected as the cold weather front drops down from Canada with a two-to-three-day lag before hitting PG&E's service territory. There is also impact on supply from the Southwest. While prices can influence the availability of supply to our system, cold weather can affect producing wells in the basins, which in turn can affect the total supply to our system and others.

If core supplies are insufficient to meet core demand, PG&E can divert gas from noncore customers, including EG customers, to meet it. PG&E's tariffs contain diversion and Emergency Flow Order (EFO) noncompliance charges that are designed to cause the noncore market to either reduce or cease its use of gas, if required. Since little, if any, alternate fuel-burn capability exists today, supply diversions from the noncore would necessitate those noncore customers to curtail operations. The implication for the future is that under supply-shortfall

conditions such as an APD, a significant portion of EG customers could be shut down with the impact on electric system reliability left as an uncertainty.

As mentioned above, PG&E projects that in the near term, noncore demand, including gas-fired EG, on an APD would be approximately 2.5 Bcf/day. With the additions of the Wild Goose, Lodi, Gill Ranch, and Central Valley Gas storage facilities, more noncore demand will be satisfied in the event of an APD. The availability of supply for any given high-demand event, such as an APD, is dependent on a wide range of factors, including the availability of interstate flowing supplies and on-system storage inventories.

Forecast of Core Gas Demand and Supply on an APD
MMcf/day

	2014-15	2015-16	2016-17
APD Core Demand(1)	3,168	3,228	3,234
Firm Storage Withdrawal(2)	1,071	1,071	1,071
Required Flowing Supply(3)	2,097	2,157	2,163
Total APD Resources	3,168	3,228	3,234

Notes:

(1) Includes PG&E's Gas Procurement Department's and other Core Aggregator's core customer demands. APD core demand forecast is calculated for 27 degrees Fahrenheit system-composite temperature, corresponding to 1-in-90-year cold-temperature event. PG&E uses a system-composite temperature based on six weather sites.

(2) Core Firm Storage Withdrawal capacity includes 98 MMcf/day contracted with an on-system independent storage provider.

(3) Includes supplies flowing under firm and as-available capacity, and capacity made available pursuant to supply-diversion arrangements.

The tables below provide peak day demand projections on PG&E's system for both winter month (December) and summer month (August) periods under PG&E's high-demand scenario.

Winter Peak Day Demand
(MMcf/day)

Year	Core[1]	Noncore Non-EG[2]	EG, including SMUD[3]	Total Demand
2014	2,587	476	1,085	4,148
2015	2,636	484	982	4,102
2016	2,640	489	990	4,119
2017	2,649	493	1,052	4,194
2018	2,641	497	1,070	4,208
2019	2,634	498	1,076	4,208

Notes:
(1) Core demand calculated for 34-degrees-Fahrenheit system-composite temperature, corresponding to 1-in-10-year cold-temperature event.
(2) Average daily winter (December) demand.
(3) Average daily winter (December) demand under 1-in-10 cold-and-dry conditions.

Summer Peak Day Demand
(MMcf/day)

Year	Core[4]	Noncore Non-EG[4]	EG, including SMUD[5]	Total Demand
2014	419	619	1,293	2,331
2015	421	627	1,183	2,231
2016	423	633	1,173	2,229
2017	425	639	1,245	2,309
2018	426	644	1,245	2,315
2019	427	647	1,191	2,265

Notes:
(4) Average daily summer (August) demand.
(5) Average daily summer (August) demand under 1-in-10 cold-and-dry conditions.

2014 CALIFORNIA GAS REPORT

NORTHERN CALIFORNIA
TABULAR DATA

ANNUAL GAS SUPPLY AND REQUIREMENTS
RECORDED YEARS 2009-2013
MMCF/DAY

LINE		2009	2010	2011	2012	2013	LINE
GAS SUPPLY TAKEN							
	CALIFORNIA SOURCE GAS						
1	Core Purchases	0	0	0	0	0	1
2	Customer Gas Transport & Exchange	135	135	120	84	57	2
3	Total California Source Gas	135	135	120	84	57	3
	OUT-OF-STATE GAS						
	Core Net Purchases						
6	Rocky Mountain Gas	1	0	2	203	223	6
7	U.S. Southwest Gas	356	352	293	255	207	7
8	Canadian Gas	502	486	536	353	330	8
	Customer Gas Transport						
10	Rocky Mountain Gas	65	94	125	846	774	10
11	U.S. Southwest Gas	564	535	428	190	180	11
12	Canadian Gas	623	623	674	483	432	12
13	Total Out-of-State Gas	2,111	2,091	2,057	2,330	2,146	13
14	STORAGE WITHDRAWAL [2]	290	256	310	259	395	14
15	Total Gas Supply Taken	2,535	2,483	2,487	2,673	2,598	15
GAS SENDOUT							
	CORE						
19	Residential	541	547	553	537	538	19
20	Commercial	237	217	220	229	229	20
21	NGV	5	5	5	6	6	21
22	Total Throughput-Core	783	769	779	771	774	22
	NONCORE						
24	Industrial	477	461	480	518	519	24
25	Electric Generation [1]	861	853	795	939	987	25
26	NGV	1	1	1	1	1	26
27	Total Throughput-Noncore	1,339	1,315	1,276	1,458	1,507	27
28	WHOLESALE	10	10	10	10	10	28
29	Total Throughput	2,132	2,094	2,064	2,240	2,292	29
30	CALIFORNIA EXCHANGE GAS	2	2	2	2	2	30
31	STORAGE INJECTION [2]	329	312	363	344	267	31
32	SHRINKAGE Company Use / Unaccounted for	51	35	43	46	37	32
33	Total Gas Send Out [3]	2,514	2,442	2,487	2,632	2,598	33
	TRANSPORTATION & EXCHANGE						
37	CORE ALL END USES	69	87	101	130	152	37
38	NONCORE INDUSTRIAL	477	461	480	518	519	38
39	ELECTRIC GENERATION	861	853	795	939	987	39
40	SUBTOTAL/RETAIL	1,407	1,402	1,376	1,587	1,658	40
42	WHOLESALE/INTERNATIONAL	10	10	10	9	10	42
44	TOTAL TRANSPORTATION AND EXCHANGE	1,417	1,412	1,385	1,596	1,668	44
	CURTAILMENT/ALTERNATIVE FUEL BURNS						
47	Residential, Commercial, Industrial	0	0	0	0	0	47
48	Utility Electric Generation	0	0	0	0	0	48
49	TOTAL CURTAILMENT	0	0	0	0	0	49

NOTES:

(1) Electric generation includes SMUD, cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by other pipelines.
(2) Includes both PG&E and third party storage
(3) Total gas send-out excludes off-system transportation; off-system deliveries are subtracted from supply total.
(4) UEG curtailments include voluntary oil burns due to economic, operational, and inventory reduction reasons as well as involuntary curtailments due to supply shortages and capacity constraints.

ANNUAL GAS SUPPLY FORECAST
MMCF/DAY

AVERAGE DEMAND YEAR

LINE		2014	2015	2016	2017	2018	LINE
	FIRM CAPACITY AVAILABLE						
1	**California Source Gas**	82	82	82	82	82	1
	Out of State Gas						
2	Baja Path[1]	1,010	1,010	1,010	1,010	1,010	2
3	Redwood Path[2]	2,038	2,038	2,038	2,038	2,038	3
3.a	SW Gas Corp. from Paiute Pipeline Comp.	41	41	41	41	41	3.a
4	**Supplemental[3]**	0	0	0	0	0	4
5	**Total Supplies Available**	3,171	3,171	3,171	3,171	3,171	5
	GAS SUPPLY TAKEN						
6	**California Source Gas**	82	82	82	82	82	6
7	**Out of State Gas (via existing facilities)**	2,480	2,421	2,400	2,458	2,484	7
8	**Supplemental**	0	0	0	0	0	8
9	**Total Supply Taken**	2,562	2,503	2,482	2,540	2,566	9
10	**Net Underground Storage Withdrawal**	0	0	0	0	0	10
11	**Total Throughput**	2,562	2,503	2,482	2,540	2,566	11
	REQUIREMENTS FORECAST BY END USE						
	Core						
12	Residential[4]	543	545	547	547	549	12
13	Commercial	230	232	233	234	234	13
14	NGV	7	7	7	8	8	14
15	**Total Core**	780	784	787	789	791	15
	Noncore						
16	Industrial	498	492	498	503	507	16
17	SMUD Electric Generation[5]	122	122	122	122	122	17
18	PG&E Electric Generation[6]	837	780	751	801	821	18
19	NGV	1	1	1	1	1	19
20	Wholesale	10	10	10	10	10	20
21	California Exchange Gas	1	1	1	1	1	21
22	**Total Noncore**	1,469	1,406	1,383	1,438	1,462	22
23	**Off-System Deliveries[7]**	269	269	269	269	269	23
	Shrinkage						
24	Company use and Unaccounted for	44	43	43	44	45	24
25	**TOTAL END USE**	2,562	2,503	2,482	2,540	2,566	25
	TRANSPORTATION & EXCHANGE						
26	CORE ALL END USES	171	170	168	169	169	26
27	NONCORE COMMERCIAL/INDUSTRIAL	498	492	498	503	507	27
28	ELECTRIC GENERATION	959	902	873	923	943	28
29	SUBTOTAL/RETAIL	1,628	1,564	1,540	1,595	1,620	29
30	WHOLESALE/INTERNATIONAL	10	10	10	10	10	30
31	TOTAL TRANSPORTATION AND EXCHANGE	1,638	1,574	1,549	1,605	1,629	31
32	System Curtailment	0	0	0	0	0	32

NOTES:

(1) PG&E's Baja Path receives gas from U. S. Southwest and Rocky Mountain producing regions via Kern River, Transwestern, El Paso and Southern Trails pipelines.
(2) PG&E's Redwood Path receives gas from Canadian and Rocky Mountain producing regions via TransCanada Gas Transmission Northwest pipeline and Ruby pipeline.
(3) May include interruptible supplies transported over existing facilities, displacement agreements, or modifications that expand existing facilities.
(4) Includes Southwest Gas direct service to its northern California service area.
(5) Forecast by SMUD.
(6) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(7) Deliveries to southern California.

ANNUAL GAS SUPPLY FORECAST
MMCF/DAY

AVERAGE DEMAND YEAR

LINE		2019	2020	2025	2030	2035	LINE
	FIRM CAPACITY AVAILABLE						
1	**California Source Gas**	82	82	82	82	82	1
	Out of State Gas						
2	Baja Path[1]	1,010	1,010	1,010	1,010	1,010	2
3	Redwood Path[2]	2,038	2,038	2,038	2,038	2,038	3
3.a	SW Gas Corp. from Paiute Pipeline Comp.	41	41	41	41	41	3.a
4	**Supplemental[3]**	0	0	0	0	0	4
5	**Total Supplies Available**	3,171	3,171	3,171	3,171	3,171	5
	GAS SUPPLY TAKEN						
6	**California Source Gas**	82	82	82	82	82	6
7	**Out of State Gas (via existing facilities)**	2,476	2,506	2,519	2,523	2,524	7
8	**Supplemental**	0	0	0	0	0	8
9	**Total Supply Taken**	2,558	2,588	2,601	2,605	2,606	9
10	**Net Underground Storage Withdrawal**	0	0	0	0	1	10
11	**Total Throughput**	2,558	2,588	2,601	2,605	2,607	11
	REQUIREMENTS FORECAST BY END USE						
	Core						
12	Residential[4]	549	548	547	548	548	12
13	Commercial	234	234	234	235	235	13
14	NGV	8	9	9	9	10	14
15	**Total Core**	791	790	790	792	793	15
	Noncore						
16	Industrial	509	508	508	510	511	16
17	SMUD Electric Generation[5]	122	122	122	122	122	17
18	PG&E Electric Generation[6]	810	841	855	855	855	18
19	NGV	1	1	1	1	1	19
20	Wholesale	10	10	10	10	10	20
21	California Exchange Gas	1	1	1	1	1	21
22	**Total Noncore**	1,453	1,483	1,497	1,499	1,499	22
23	**Off-System Deliveries[7]**	269	269	269	269	269	23
	Shrinkage						
24	Company use and Unaccounted for	45	45	45	45	45	24
25	**TOTAL END USE**	2,558	2,588	2,601	2,605	2,606	25
	TRANSPORTATION & EXCHANGE						
26	CORE ALL END USES	169	169	170	171	172	26
27	NONCORE COMMERCIAL/INDUSTRIAL	509	508	508	510	511	27
28	ELECTRIC GENERATION	932	963	977	977	977	28
29	SUBTOTAL/RETAIL	1,611	1,641	1,656	1,658	1,660	29
30	WHOLESALE/INTERNATIONAL	10	10	10	10	10	30
31	TOTAL TRANSPORTATION AND EXCHANGE	1,620	1,651	1,665	1,668	1,669	31
32	System Curtailment	0	0	0	0	0	32

NOTES:

(1) PG&E's Baja Path receives gas from U. S. Southwest and Rocky Mountain producing regions via Kern River, Transwestern, El Paso and Southern Trails pipelines.

(2) PG&E's Redwood Path receives gas from Canadian and Rocky Mountain producing regions via TransCanada Gas Transmission Northwest pipeline and Ruby pipeline.

(3) May include interruptible supplies transported over existing facilities, displacement agreements, or modifications that expand existing facilities.

(4) Includes Southwest Gas direct service to its northern California service area.

(5) Forecast by SMUD.

(6) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.

(7) Deliveries to southern California.

ANNUAL GAS SUPPLY FORECAST
MMCF/DAY

HIGH DEMAND YEAR

LINE		2014	2015	2016	2017	2018	LINE
FIRM CAPACITY AVAILABLE							
1	**California Source Gas**	82	82	82	82	82	1
	Out of State Gas						
2	Baja Path[1]	1,010	1,010	1,010	1,010	1,010	2
3	Redwood Path[2]	2,038	2,038	2,038	2,038	2,038	3
3.a	SW Gas Corp. from Paiute Pipeline Comp.	41	41	41	41	41	3.a
4	**Supplemental[3]**	0	0	0	0	0	4
5	**Total Supplies Available**	3,171	3,171	3,171	3,171	3,171	5
GAS SUPPLY TAKEN							
6	**California Source Gas**	82	82	82	82	82	6
7	**Out of State Gas (via existing facilities)**	2,621	2,526	2,507	2,568	2,596	7
8	**Supplemental**	0	0	0	0	0	8
9	**Total Supply Taken**	2,703	2,608	2,589	2,650	2,678	9
10	**Net Underground Storage Withdrawal**	0	0	0	0	0	10
11	**Total Throughput**	2,703	2,608	2,589	2,650	2,678	11
REQUIREMENTS FORECAST BY END USE							
	Core						
12	Residential[4]	587	590	593	595	597	12
13	Commercial	240	242	244	244	245	13
14	NGV	7	7	7	8	8	14
15	**Total Core**	833	840	844	847	849	15
	Noncore						
16	Industrial	498	492	498	503	507	16
17	SMUD Electric Generation[5]	122	122	122	122	122	17
18	PG&E Electric Generation[6]	922	828	799	852	872	18
19	NGV	1	1	1	1	1	19
20	Wholesale	10	10	10	10	10	20
21	California Exchange Gas	1	1	1	1	1	21
22	**Total Noncore**	1,554	1,453	1,431	1,488	1,513	22
23	**Off-System Deliveries[7]**	269	269	269	269	269	23
	Shrinkage						
24	Company use and Unaccounted for	47	46	45	47	47	24
25	**TOTAL END USE**	2,703	2,608	2,589	2,650	2,678	25
	TRANSPORTATION & EXCHANGE						
26	CORE ALL END USES	175	179	180	180	181	26
27	NONCORE COMMERCIAL/INDUSTRIAL	498	492	498	503	507	27
28	ELECTRIC GENERATION	1,044	950	921	974	994	28
29	SUBTOTAL/RETAIL	1,718	1,621	1,600	1,657	1,682	29
30	WHOLESALE/INTERNATIONAL	10	10	10	10	10	30
31	TOTAL TRANSPORTATION AND EXCHANGE	1,727	1,630	1,609	1,666	1,691	31
32	System Curtailment	0	0	0	0	0	32

NOTES:

(1) PG&E's Baja Path receives gas from U. S. Southwest and Rocky Mountain producing regions via Kern River, Transwestern, El Paso and Southern Trails pipelines.
(2) PG&E's Redwood Path receives gas from Canadian and Rocky Mountain producing regions via TransCanada Gas Transmission Northwest pipeline and Ruby pipeline.
(3) May include interruptible supplies transported over existing facilities, displacement agreements, or modifications that expand existing facilities.
(4) Includes Southwest Gas direct service to its northern California service area.
(5) Forecast by SMUD.
(6) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(7) Deliveries to southern California.

ANNUAL GAS SUPPLY FORECAST
MMCF/DAY

HIGH DEMAND YEAR

LINE		2019	2020	2025	2030	2035	LINE
	FIRM CAPACITY AVAILABLE						
1	**California Source Gas**	82	82	82	82	82	1
	Out of State Gas						
2	Baja Path[1]	1,010	1,010	1,010	1,010	1,010	2
3	Redwood Path[2]	2,038	2,038	2,038	2,038	2,038	3
3.a	SW Gas Corp. from Paiute Pipeline Comp.	41	41	41	41	41	3.a
4	**Supplemental[3]**	0	0	0	0	0	4
5	**Total Supplies Available**	3,171	3,171	3,171	3,171	3,171	5
	GAS SUPPLY TAKEN						
6	**California Source Gas**	82	82	82	82	82	6
7	**Out of State Gas (via existing facilities)**	2,584	2,611	2,638	2,643	2,646	7
8	**Supplemental**	0	0	0	0	0	8
9	**Total Supply Taken**	2,666	2,693	2,720	2,725	2,728	9
10	**Net Underground Storage Withdrawal**	0	0	0	0	0	10
11	**Total Throughput**	2,666	2,693	2,720	2,725	2,728	11
	REQUIREMENTS FORECAST BY END USE						
	Core						
12	Residential[4]	598	597	598	599	600	12
13	Commercial	245	245	246	246	247	13
14	NGV	8	9	9	9	10	14
15	**Total Core**	851	851	852	855	857	15
	Noncore						
16	Industrial	509	508	508	510	511	16
17	SMUD Electric Generation[5]	122	122	122	122	122	17
18	PG&E Electric Generation[6]	856	884	909	909	909	18
19	NGV	1	1	1	1	1	19
20	Wholesale	10	10	10	10	10	20
21	California Exchange Gas	1	1	1	1	1	21
22	**Total Noncore**	1,499	1,526	1,551	1,553	1,554	22
23	**Off-System Deliveries[7]**	269	269	269	269	269	23
	Shrinkage						
24	Company use and Unaccounted for	47	47	48	48	48	24
25	**TOTAL END USE**	2,666	2,693	2,720	2,725	2,728	25
	TRANSPORTATION & EXCHANGE						
26	CORE ALL END USES	180	180	179	179	180	26
27	NONCORE COMMERCIAL/INDUSTRIAL	509	508	508	510	511	27
28	ELECTRIC GENERATION	978	1,006	1,031	1,031	1,031	28
29	SUBTOTAL/RETAIL	1,667	1,694	1,719	1,720	1,723	29
30	WHOLESALE/INTERNATIONAL	10	10	10	10	10	30
31	TOTAL TRANSPORTATION AND EXCHANGE	1,677	1,703	1,729	1,730	1,732	31
32	System Curtailment	0	0	0	0	0	33

NOTES:

(1) PG&E's Baja Path receives gas from U. S. Southwest and Rocky Mountain producing regions via Kern River, Transwestern, El Paso and Southern Trails pipelines.
(2) PG&E's Redwood Path receives gas from Canadian and Rocky Mountain producing regions via TransCanada Gas Transmission Northwest pipeline and Ruby pipeline.
(3) May include interruptible supplies transported over existing facilities, displacement agreements, or modifications that expand existing facilities.
(4) Includes Southwest Gas direct service to its northern California service area.
(5) Forecast by SMUD.
(6) Electric generation includes cogeneration, PG&E-owned electric generation, and deliveries to power plants connected to the PG&E system. It excludes deliveries by the Kern Mojave and other pipelines.
(7) Deliveries to southern California.

2014 CALIFORNIA GAS REPORT

SOUTHERN CALIFORNIA GAS COMPANY

INTRODUCTION

Southern California Gas Company (SoCalGas) is the principal distributor of natural gas in Southern California, providing retail and wholesale customers with transportation, exchange and storage services and also procurement services to most retail core customers. SoCalGas is a gas-only utility and, in addition to serving the residential, commercial, and industrial markets, provides gas for enhanced oil recovery (EOR) and electric generation (EG) customers in Southern California. San Diego Gas & Electric Company (SDG&E), Southwest Gas Corporation, the City of Long Beach Municipal Oil and Gas Department, and the City of Vernon are SoCalGas' four wholesale utility customers. SoCalGas also provides gas transportation service across its system to a border crossing point at the California-Mexico border at Mexicali to ECOGAS Mexico S. de R.L. de C.V which is a wholesale international customer located in Mexico.

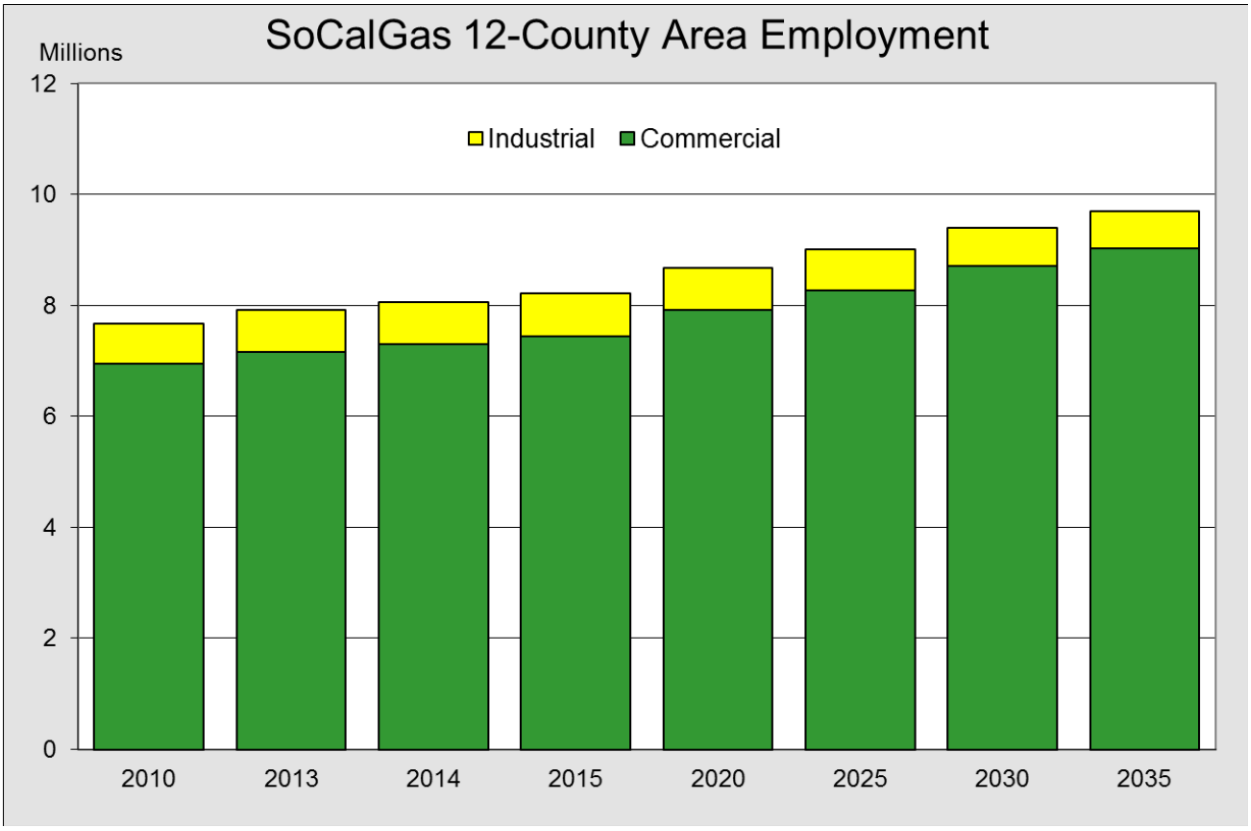
This report covers a 22-year demand and forecast period, from 2014 through 2035; only the consecutive years 2014 through 2020 and the point years 2025, 2030, and 2035 are shown in the tabular data in the next sections. These single point forecasts are subject to uncertainty, but represent best estimates for the future, based upon the most current information available.

The Southern California section of the *2014 California Gas Report* (CGR) begins with a discussion of the economic conditions and regulatory issues facing the utilities, followed by a discussion of the factors affecting natural gas demand in various market sectors. The outlook on natural gas supply availability, which continues to be favorable, is also presented. The natural gas price forecast methodology used to develop the gas demand forecast is discussed followed by a review of the peak day demand forecast. Summary tables and figures underlying the forecast are also provided.

THE SOUTHERN CALIFORNIA ENVIRONMENT

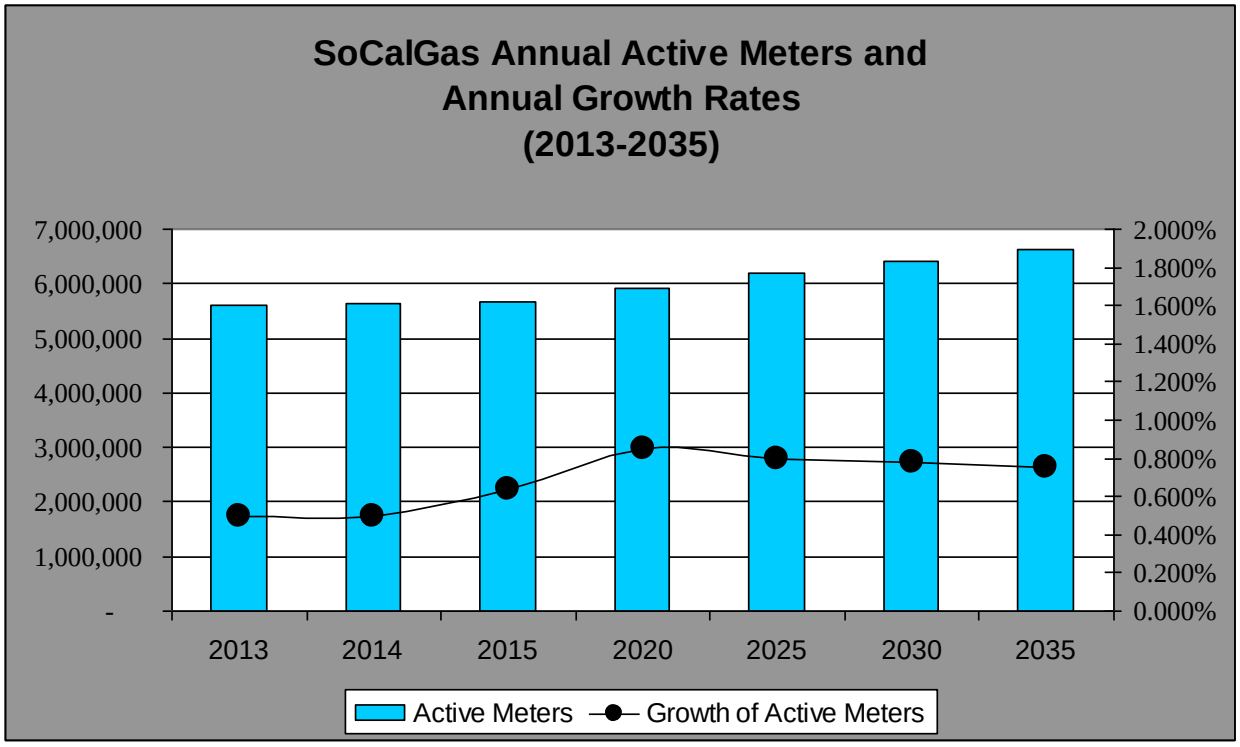
ECONOMICS AND DEMOGRAPHICS

The gas demand projections are in large part determined by the long-term economic outlook for the SoCalGas service territory. As of mid-2014, southern California's economy is gradually recovering from a severe multi-year slump. After peaking in 2007, SoCalGas' service area employment dropped until 2010 and has been growing gradually since then. Overall area jobs are expected to average 1.4% annual growth from 2013 through 2020. Local industrial employment (manufacturing and mining) is expected to grow a more modest 0.6% per year from 2013 to 2020. Commercial jobs should grow by 1.5% per year during the same period. Construction employment should make a strong comeback--albeit from a low current level, averaging 6% annual growth from 2013 through 2020. Other job sectors with expected strong growth in the same period include professional and business services (growing 2.7% per year) and wholesale trade (1.9% per year).



In the longer term, SoCalGas' service area employment will likely see slower growth, as the area population's average age gradually increases--part of a national demographic trend of aging and retiring "baby boomers". From 2013 through 2035, total area job growth should average 0.9% per year. Area industrial jobs are forecasted to shrink an average of 0.3% per year through 2035; we expect the industrial share of total employment to fall from 9.1% in 2013 to 7.1% by 2035. Commercial jobs are expected to grow an average of 1.0% annually from 2013 through 2035.

SoCalGas' service area suffered a serious housing slump in 2007, when the last recession began. As a result, new gas meter hookups dropped drastically from a peak year of nearly 85,000 in 2006 to a low of under 19,000 in 2011. Since 2011, home building and meter hookups have increased modestly, with SoCalGas adding almost 27,000 new meters in 2013. In coming years, new housing and meter growth should continue to recover. SoCalGas expects its active meters to grow an average of 0.8% annually from 2013 through 2035.



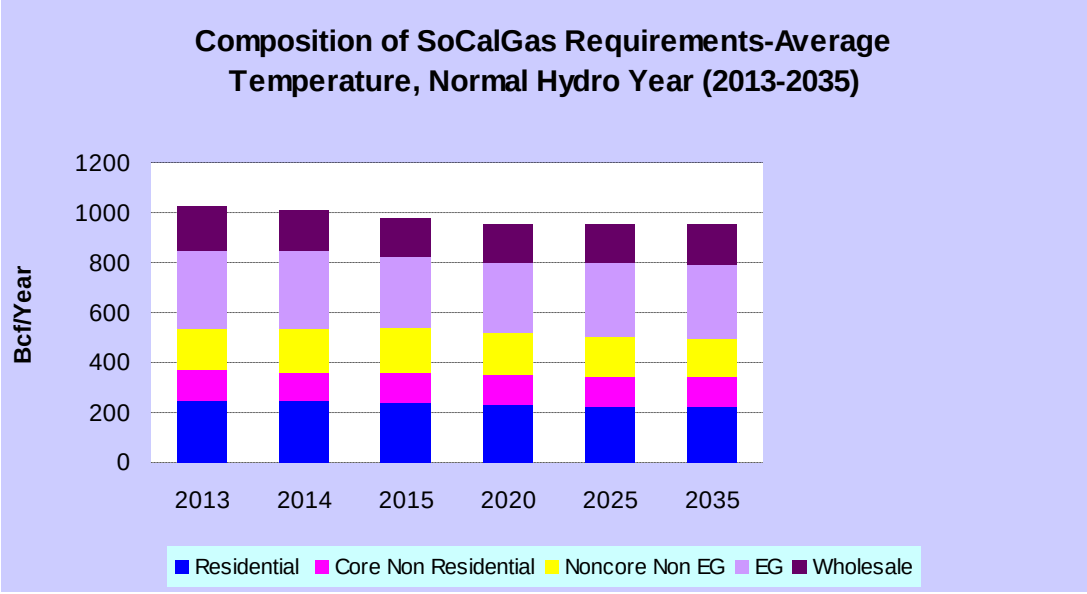
Since 2011, SoCalGas' service area housing market has been in a slow recovery period. Inactive meters in homes vacant due to foreclosures have been gradually re-activating as those homes are re-occupied. SoCalGas' active meter annual growth rate hit a low of 0.24% in 2009. It has since recovered modestly to 0.5% in 2013 and is expected to remain at about 0.5% in 2014. In the longer term, SoCalGas expects its active meters to increase by an annual average of just over 0.8% from the period 2013 through 2035.

GAS DEMAND (REQUIREMENTS)

OVERVIEW

SoCalGas projects total gas demand to decline at an annual rate of 0.33% from 2013 to 2035. The decline in throughput demand is due to modest economic growth, CPUC-mandated energy efficiency (EE) standards and programs, renewable electricity goals, the decline in commercial and industrial demand, and conservation savings linked to Advanced Metering Infrastructure (AMI). By comparison, the 2012 CGR projected an annual decline in gas demand at a rate of 0.13% from 2012 to 2030. The difference between the two forecasts is caused primarily by a higher gas rates outlook, and modest meter and employment growth in the 2014 report.

The following chart shows the composition of SoCalGas' throughput for the recorded year 2013 (with weather-sensitive market segments adjusted to average year heating degree day assumptions) and for the 2014 to 2035 forecast period.



Notes:
(1) Core non-residential includes core commercial, core industrial, gas air-conditioning, gas engine, natural gas vehicles.
(2) Noncore non-EG includes noncore commercial, noncore industrial, industrial refinery, and EOR-steaming
(3) Retail electric generation includes industrial and commercial cogeneration, refinery-related cogeneration, EOR-related cogeneration, and non-cogeneration electric generation.
(4) Wholesale includes sales to the City of Long Beach, City of Vernon, SDG&E, Southwest Gas and Ecogas in Mexico.

From 2014 to 2035, residential demand is expected to decline from 247 Bcf to 223 Bcf. The decline is due to declining use per meter offsetting new meter growth. The core, non-residential markets are expected to grow from 118 Bcf in 2014 to 122 Bcf by 2035. The change

reflects an annual growth rate of 0.15% over the forecast period. The noncore, non-EG markets are expected to decline from 169 Bcf in 2013 to 150 Bcf by 2035. The annual rate of decline is approximately 0.5% due to very aggressive energy efficiency goals and associated programs. On the other hand, utility gas demand for EOR steaming operations, which had declined since the FERC-regulated Kern/Mojave interstate pipeline began offering direct service to California customers in 1992, has shown some growth in recent years because of continuing high oil prices and is expected to show further growth in the early years of the forecast period. EOR demand is forecast to level off in 2016 and remain relatively flat through 2035 as gains are offset by the depletion of older oil fields. Total electric generation load, including cogeneration and non-cogeneration EG for a normal hydro year, is expected to decline from 311 Bcf in 2014 to 298 Bcf in 2035, a decrease of 0.12% per year.

Market Sensitivity

Temperature

Core demand forecasts are prepared for two design temperature conditions – average and cold – to quantify changes in space heating demand due to weather. Temperature variations can cause significant changes in winter gas demand due to space heating in the residential and core commercial and industrial markets. The largest demand variations due to temperature occur in the month of December. Heating Degree Day (HDD) differences between the two conditions are developed from a six-zone temperature monitoring procedure within SoCalGas' service territory. One HDD is recorded when the average temperature for the day drops 1 degree below 65° Fahrenheit. The cold design temperature conditions are based on a statistical likelihood of occurrence of 1-in-35 on an annual basis, with a typical recurrence period of 35 years.

In our 2014 CGR, average year and cold year HDD totals are 1,385 and 1,677 respectively, on a calendar year basis for SoCalGas. For SDG&E, these values are 1,342 and 1,654 HDDs, respectively. The average year values were computed as the simple average of annual HDD's for the years 1994 through 2013.

Hydro Condition

The non-cogen EG forecasts are prepared for two hydro conditions – average and dry. The dry hydro case refers to gas demand in a 1-in-10 dry hydro year.

MARKET SECTORS

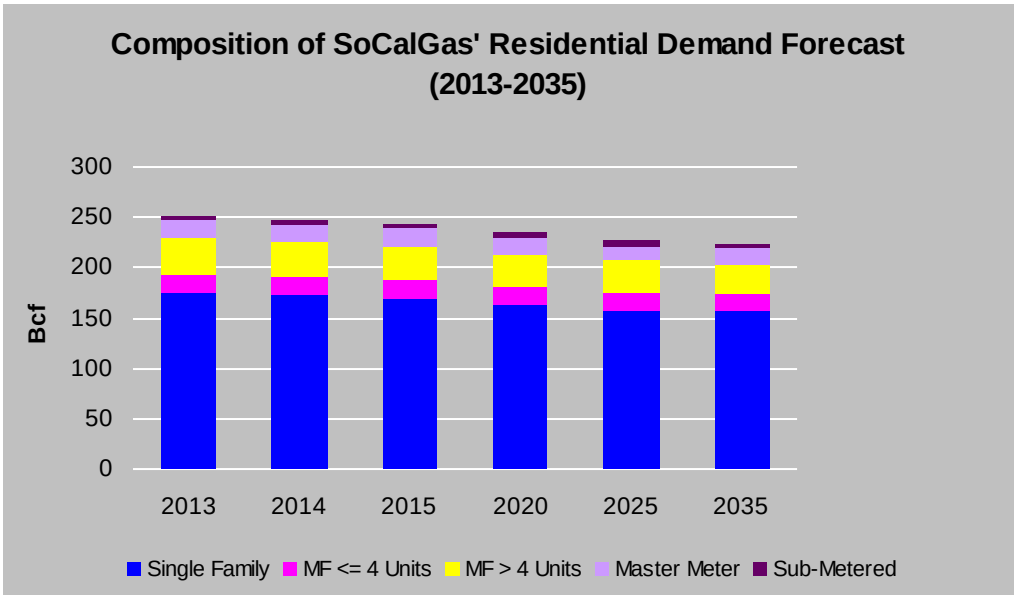
Residential

Residential demand adjusted for temperature totaled 251 Bcf in 2013 which is 8 Bcf higher than 2012 weather adjusted deliveries. The residential load is expected to decline by 0.5% per year from 251 Bcf in 2013 to 223 Bcf in 2035. The decrease in gas demand results from a combination of continued decline in the residential use per meter, increases in the marginal gas rates, the impact of savings from SoCalGas' Advanced Meter Infrastructure (AMI) project deployment which began in 2013 and CPUC authorized energy efficiency program savings in this market.

The total residential customer count for SoCalGas consists of five residential segment types: single family, small and large multi-family customers, master meter and sub-metered customers. The active meters for all residential customer classes were 5.4 million at the end of 2013. This amount reflects a 29,308 active meter increase between 2012 at year end and 2013 at year end. The overall observed 2012-2013 residential meter growth was 0.55%. Just six years before, the observed meter growth had been 53,326 new meters between 2006 and 2007, which amounts to an annual growth rate of 1.03%. The decrease in active meter growth reflects the overall state of the Southern California economy.

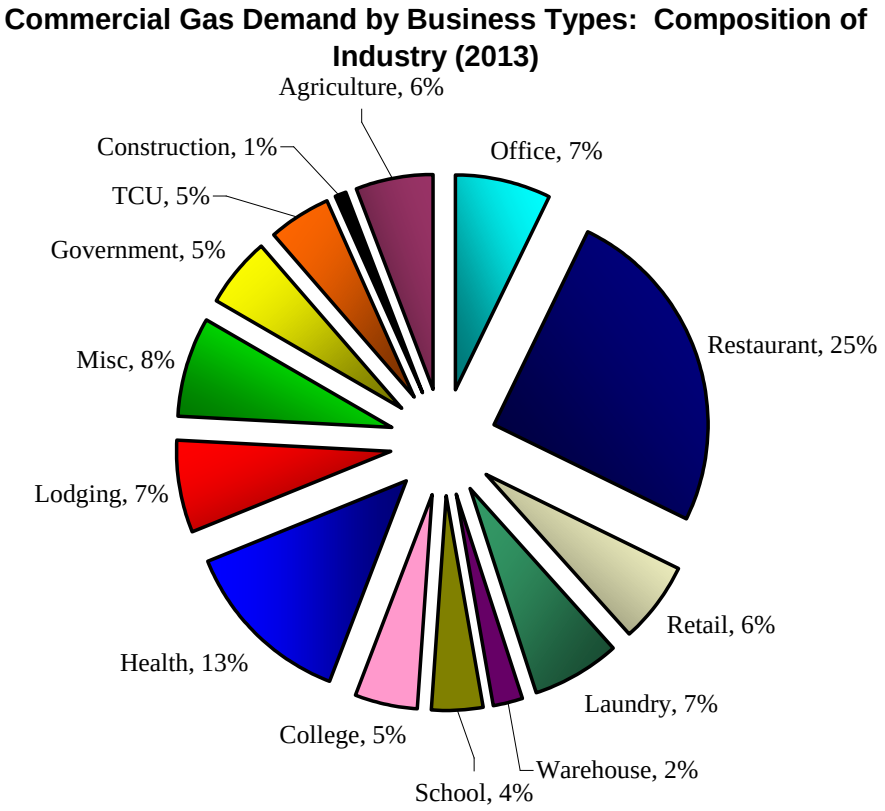
The 2014 CGR shows that in 2013, single family and multi family average annual use per meter was 493 therms and 323 therms, respectively. Over the forecast period, the demand per customer is expected to decline at an annual rate of 1.3%. The decline in use per meter for residential customers is explained by conservation and the energy savings resulting from tightened building and appliance standards and energy efficiency programs and demand reductions anticipated as a result of the deployment of AMI in the Southern California area. With AMI, customers will have more timely information available about their daily and hourly gas use and thereby are expected to use gas more efficiently. Mass deployment of SoCalGas' AMI modules began in 2013 and is expected to be completed by 2017. The deployment of SoCalGas' AMI will not only provide operating efficiencies but will also generate long term conservation benefits.

In summary, the projected residential natural gas demand will be influenced primarily by residential meter growth, moderated by the forecasted declining use per customer, and the gradual conversion of some sub-meter and master meter customers to individual meter use. The residential load trend over the forecast period is illustrated in the graph below.



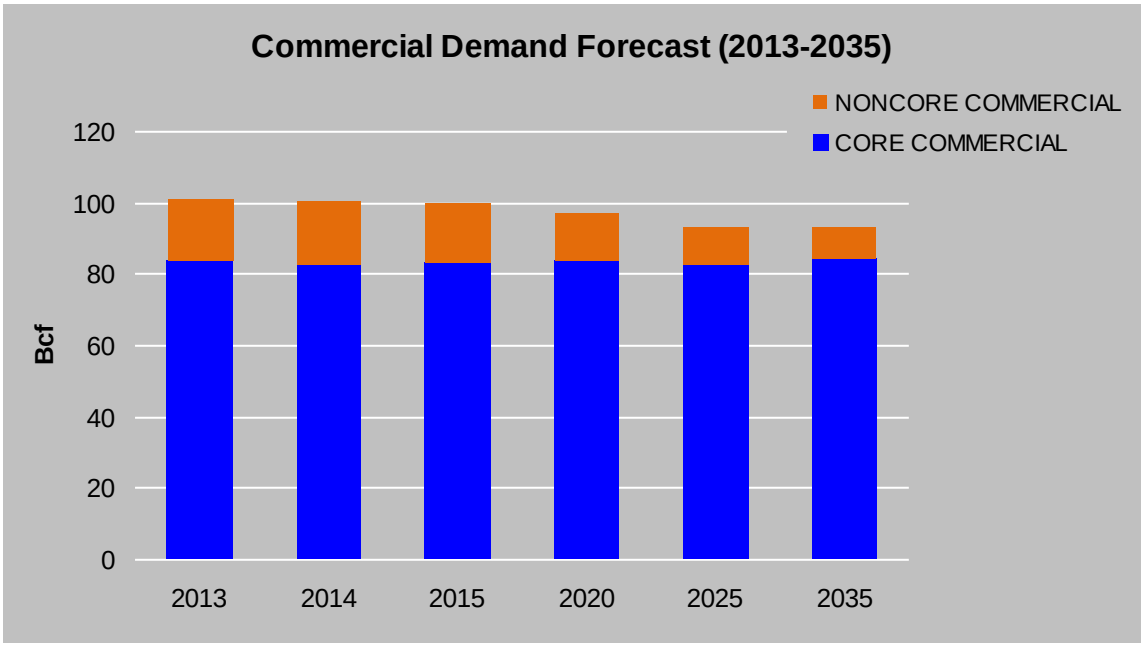
Commercial

The commercial market consists of 14 business types identified by the customer's North American Industry Classification System (NAICS) codes. The restaurant business dominates this market with 25% of the usage in 2013. The health industry is next largest with a share of 13% of the overall market based on 2013 natural gas consumption.



The core commercial market demand is expected to remain relatively flat over the forecast period. On a temperature-adjusted basis, the core commercial market demand in 2013 totaled 83 Bcf. By the year 2035, the load is anticipated to be approximately 84 Bcf. The average annual rate of growth from 2013 to 2035 is forecasted at 0.04% percent. The slow growth in gas usage is mainly the result of the impact of CPUC-authorized energy efficiency programs in this market.

Noncore commercial demand in 2013 was 17.7 Bcf. From 2014 through 2035, this market is expected to decline approximately 3.3% annually to 8.6 Bcf. Aggressive CPUC-authorized energy efficiency programs targeted at this market along with high costs of compliance with environmental regulations are expected to decrease demand in this market.



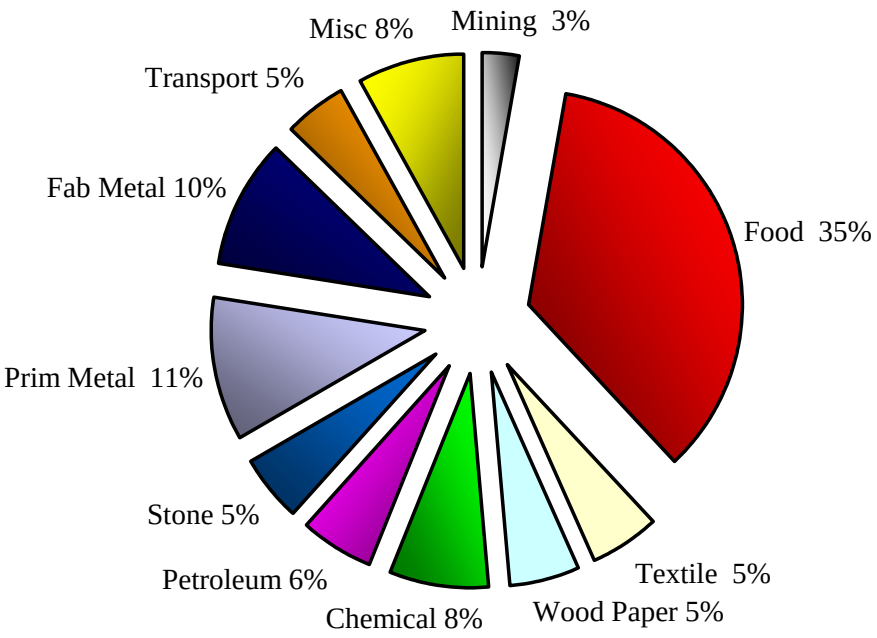
Industrial

Non-Refinery Industrial Demand

In 2013, temperature-adjusted core industrial demand was 22.9 Bcf, which is higher than the 2012 deliveries by 0.8 Bcf. Core industrial market demand is projected to decrease by 1.9% per year from 22.9 Bcf in 2013 to 15.0 Bcf in 2035. This decrease in gas demand results from a combination of factors: minor increases in marginal gas rates, the municipalization of the City of Vernon, and CPUC authorized energy efficiency programs.

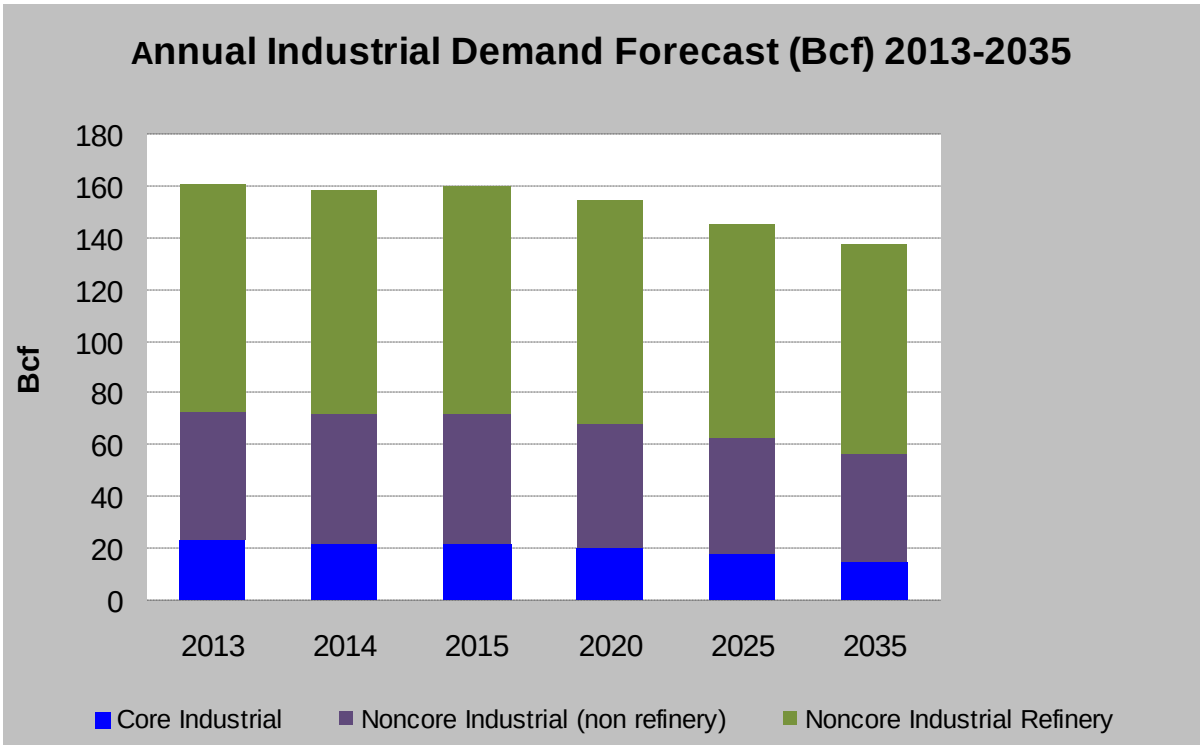
The 2013 industrial gas demand served by SoCalGas is shown below. Food processing, with 35% of the total share, dominates this market.

Non-Refinery Industrial Gas Demand by Business Types
Composition of Industrial Activity (2013)



Overall, the retail noncore industrial (non-refinery) gas demand has shown persistent signs of weakness since 2006 due to competitive economic pressure to relocate out-of-state or to exit the line of business altogether. After 2007, the economic downturn has led to further reductions in gas demand from this market segment with industrial demand dropping annually by 5% in 2007, 13.5% in 2008, and 14.3% in 2009. Since 2009, this market has recovered somewhat with annual growth of 10% in 2010 and 5% in 2011. Additional data suggest that the recovery peaked in 2011 at 50.4. Gas consumption in 2012 and 2013 was 49.8 and 49.6 Bcf, respectively.

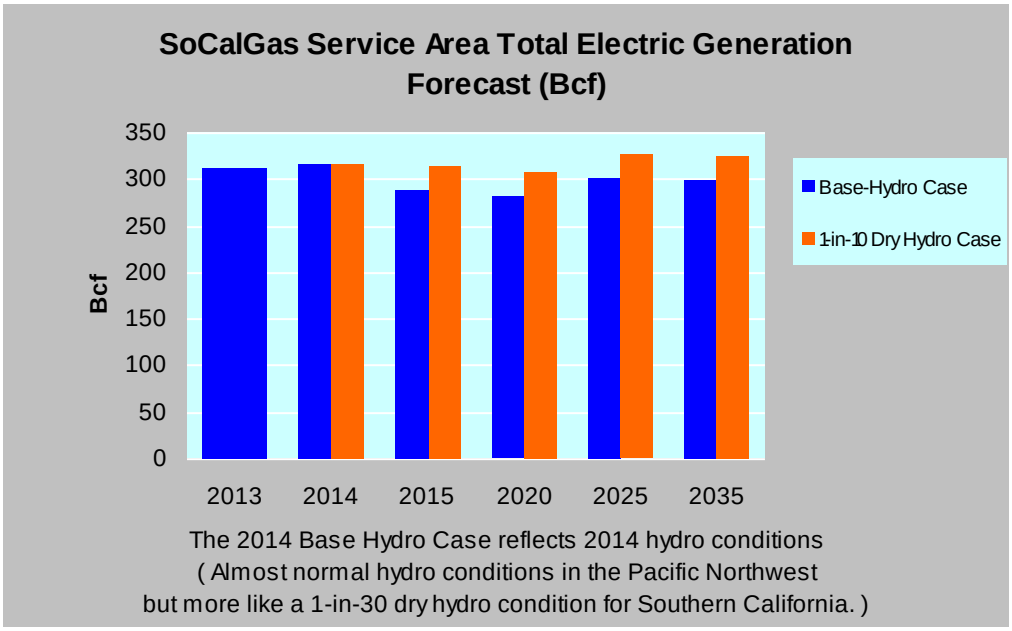
Gas demand for the retail noncore industrial market as a whole is expected to decline at a rate of 0.9% from 49.6 Bcf in 2013 to under 41.5 Bcf by 2035. The reduced demand is primarily due to the departure of customers within the City of Vernon to wholesale service by the City of Vernon, the CPUC-authorized energy efficiency programs designed to reduce gas demand and the expected implementation of regulations to aggressively reduce CO_2 emissions by effectively increasing the gas commodity price for many large industrial customers.



Refinery Industrial Demand

Refinery industrial demand is comprised of gas consumption by petroleum refining customers, hydrogen producers and petroleum refined product transporters. Gas demand in 2011 was 84.5 Bcf and posted gains in 2012 and 2013 to 85.1 and 87.8 Bcf, respectively. Refinery industrial gas demand is forecast to decline about 0.4% per year over the 2014-2035 forecast period, from 87.0 Bcf in 2014 to 81 Bcf in 2035. The decrease over the forecast period is primarily due to the estimated savings from CPUC-authorized energy efficiency programs. Also, the implementation of regulations to aggressively reduce CO_2 emissions effectively increases the commodity prices for both natural gas and butane for large industrial customers; the expected price advantage of natural gas versus butane over the forecast period only lessens the decline in gas consumption that would occur from energy efficiency impacts alone at refineries.

Electric Generation



This sector includes the following markets: all commercial/industrial cogeneration; EOR-related cogeneration; and, non-cogeneration electric generation. It should be noted that the forecast of electric generation (EG) load is subject to a higher degree of uncertainty than the other sectors. This uncertainty is due to the ambiguity inherent in the underlying key assumptions. The assumptions include, but are not limited to, the following: the continued operation of existing generation facilities and the potential shutdown of units from the state's new once-through-cooling (OTC) regulation; the timing and location of new gas-fired generation facilities in the rest of California and the western United States; the regulatory and market decisions that impact the operation of existing cogeneration facilities; the location, timing and construction of new renewable resources; the continued electric transmission line upgrades throughout the system; the Cap and Trade greenhouse gas (GHG) program; and the timing and construction of new energy storage resources. The forecast uses a power market simulation for the period of 2014 to 2025. The simulation reflects the anticipated dispatch of all EG resources in the SoCalGas service territory using a base electricity demand scenario under both average and low hydroelectric availability market conditions. The base case assumes that 33% of the state's energy needs are met with renewable power by 2020, and additional renewable power is added after 2020 to maintain the 33% level. The base case also assumes the IOUs will meet D.13-10-040, or the energy storage procurement framework and design program. However, there is substantial uncertainty as to how this will be implemented, and its impact on gas throughput is unknown.

Due to the large uncertainty in the timing and type of generating plants that could be added after 2025, the EG forecast is held constant at 2025 levels for 2030 and 2035. During that time period, there is the potential for the development and construction of new, non-gas fired resources. These new generation resources may be in sufficient quantity to create downward pressure on the demand for natural gas after 2025; however, increased electrification in other

sectors, such as transportation, could create counteracting upward pressure on electricity demand and associated gas demand.

For electricity demand within California, SoCalGas relies on the California Energy Commission's (CEC) California Energy Demand 2014- 2024 Final Forecast, dated December 2013. SoCalGas selected the Mid Energy Demand scenario with Mid Additional Achievable Energy Efficiency (AAEE) scenario. SoCalGas relies on Ventyx's electric demand forecast for the remainder of the Western Electricity Coordinating Council (WECC) area.

Industrial/Commercial/Cogeneration <20MW

The commercial/industrial cogeneration market segment is generally comprised of customers with generating capacity of less than 20 megawatts (MW) of electric power. Most of the cogeneration units in this segment are installed primarily to generate electricity for internal customer consumption rather than for the sale of power to electric utilities. Customers in this market segment install their own electric generation equipment for both economic reasons (gas-powered systems produce electricity cheaper than purchasing it from a local electric utility) and reliability reasons (lower purchased power prices are realized only for interruptible service). In 2008, recorded gas deliveries to this market were 18.7 Bcf. By 2011, the small cogeneration load totaled 20.9 Bcf, which represents an 11.8% increase over the 2008 level. Consumption continued to increase in 2012 and 2013 to 23.1 and 24.5 Bcf, respectively. Overall, small cogeneration demand is projected to decline modestly from 21.9 Bcf in 2014 to 19.7 Bcf by the year 2035. From 2014 through 2035, small cogeneration load is anticipated to decline at an annual average rate of 0.50%. A key factor in stimulating this gas decline is the expected implementation of regulations to aggressively reduce CO_2 emissions which will effectively increase the gas commodity price for many of the larger small cogeneration customers

Industrial/Commercial Cogeneration >20 MW

For commercial/industrial cogeneration customers greater than 20 MW, gas demand is forecast to remain constant at 51 Bcf from 2014 through 2025. Although there is uncertainty in this sector with respect to contract renewals, this forecast assumes that the existing facilities will continue to be cost–effective and thus will continue to operate at historical levels. Changes to this assumption in the future could have a significant impact on the forecast.

Refinery-Related Cogeneration

Refinery cogeneration units are installed primarily to generate electricity for internal use. This cogeneration segment consumed 20.7 Bcf in 2012 and rose to 22.6 Bcf in 2013. This market is forecast to decline modestly at just over 0.61% per year, from 22.2 Bcf in 2014 to 21.7 Bcf in 2035. The slight decline is mainly due to higher gas costs stemming from California's GHG carbon fees.

Enhanced Oil Recovery-Related Cogeneration

In 2013, recorded gas deliveries to the EOR-related cogeneration market were 8.5 Bcf, a 9% increase from 2012. This increase in load was due to changes in operations for some of the existing EOR-related cogeneration customers. EOR-related cogeneration demand is forecast to remain at 8.5 Bcf throughout the forecast period.

Non-Cogeneration Electric Generation

For the non-cogeneration EG market, two gas demand forecast scenarios were developed underlying: (i) a base hydro condition and (ii) a 1-in-10 dry hydro condition. For the base case, gas demand is forecasted to decrease from 211 Bcf in 2014 to 197 Bcf in 2025. It is important to note that in the base case scenario, the first year of the forecast, 2014, is a dry hydro year. Consequently, the forecasted non-cogeneration EG demand for 2014 is higher than it would be under normal hydro conditions. The forecast for the remaining years, 2015-2025, is based on normal hydro conditions. Demand is forecasted to slightly increase from 183 Bcf in 2015 to 197 Bcf in 2025. This small gain is mostly due to new gas-fired resources beyond 2020. Due to the large uncertainty in the timing and type of generating plants that could be added after 2025, SoCalGas holds the EG forecast constant at the 2025 level for 2030 and 2035.

SoCalGas' forecast includes the addition of approximately 1,950 MW of new gas-fired combined cycle and peaking generating resources in its service area by 2025. However, the forecast also assumes 6,900 MW of older plants are retired as a result of the state's once-through-cooling regulation. Throughout the entire forecast period, SoCalGas assumes that market participants will construct additional generation resources to meet a minimum planning reserve margin of 15%.

Starting in 2014, the forecast ramps up renewable electricity generation to meet 33% of the state's total electric energy consumption by 2020. The forecast estimates renewable-sourced energy generation in 2020 by taking 33% of CEC's forecasted electricity sales load. The forecast shows that close to 80% of the incremental renewable power needed to meet the state's 33% target will be physically located in Southern California.

In this forecast, SoCalGas included energy storage resources in the model as required by D.13-10-040. Installed storage capacity data are based on the mid-scenario from the CPUC's 2014 Long Term Procurement Plan assumptions. Starting in 2017, a state-wide installed capacity of 141 MW is added. Storage capacity increases to 1,125 MW by 2024.

As mentioned above, to account for dry climate conditions, a dry hydro sensitivity gas demand forecast was also created. This dry hydro forecast indicates that, under 1-in-10 dry hydro conditions, gas demand for SoCalGas increases by 25 Bcf, on average, each year over the forecast period.

Enhanced Oil Recovery – Steam

Recorded deliveries to the EOR steaming market in 2013 were 12.8 Bcf, an increase of approximately 15% from 2012. SoCalGas' EOR steaming demand is expected to increase to 15.9 Bcf in 2014, a 24% increase, and to 18.5 Bcf in 2015, a 16% increase, as current EOR customers expand their operations and new customers come on-line. Demand is forecast to level off at 18.5 Bcf from 2016 through the end of the forecast period. These figures include gas delivered to PG&E's EOR customers through inter-utility exchange. In 2013, less than 0.01 Bcf of gas was delivered to PG&E through such arrangements. No change in demand is expected in that market. The EOR-related cogeneration demand is discussed in the Electric Generation section.

Crude oil prices are forecast to remain high over the forecast period which may result in even more expansion of California EOR operations in some fields. However, this expansion is forecast to be offset by declining oil production in other fields as the fields are depleted. For gas supplies, oil producers will continue to rely mainly on interstate pipelines in California to supplant traditional supply sources, such as own source gas and SoCalGas' transportation system.

Wholesale and International

SoCalGas provides wholesale transportation service to SDG&E, the City of Long Beach Gas and Oil Department (Long Beach), Southwest Gas Corporation (SWG), the City of Vernon (Vernon) and Ecogas Mexico, L. de R.L. de C.V. The wholesale load is expected to decrease from 172 Bcf in 2013 to 160 Bcf in 2035.

San Diego Gas & Electric

Under average year temperature and normal hydro conditions, SDG&E gas demand is expected to decrease at an average rate of 0.7% per year from 137 Bcf in 2013 to 119 Bcf in 2035. Additional information regarding SDG&E's gas demand is provided in the SDG&E section of this report.

City of Long Beach

The wholesale load forecast is based on forecast information provided by the City of Long Beach Municipal Gas & Oil Department. Long Beach's gas use is expected to remain fairly constant, increasing from 9.0 Bcf in 2014 to 9.6 Bcf by 2035. Long Beach's locally supplied deliveries are expected to decline from 0.4 Bcf in 2014 to 0.1 Bcf by 2035. SoCalGas' transportation to Long Beach is expected to increase gradually from 8.6 Bcf in 2014 to 9.5 Bcf by 2035. Refer to the City of Long Beach Municipal Gas & Oil Department for more information.

Southwest Gas

The demand forecast for Southwest Gas is based on a long-term demand forecast prepared by Southwest Gas. In 2014, SoCalGas expects to serve approximately 6.4 Bcf directly, with another 2.9 Bcf being served by PG&E under exchange arrangements with SoCalGas. The total load is expected to grow from 9.3 Bcf in 2014 to approximately 12.6 Bcf in 2035.

City of Vernon

The City of Vernon initiated municipal gas service to its electric power plant within the city's jurisdiction in June, 2005. Since 2005, there has also been a gradual increase of Commercial/Industrial gas demand as customers within the city boundaries have left the SoCalGas retail system and interconnected with Vernon's municipal gas system. The forecasted throughput starts at 10.5 Bcf in 2014 and increases to 11 Bcf by 2021, after which the demand remains relatively flat through 2035. Vernon's commercial and industrial load is based on recorded historical usage for commercial and industrial customers already served by Vernon plus the customers that are expected to request retail service from Vernon. The throughput forecast for Vernon's municipal EG customers is based on a power market simulation.

Ecogas Mexico, S. de R.L. de C.V. (Ecogas)

SoCalGas used the forecast prepared by Ecogas for this report. Ecogas' use is expected to gradually increase from approximately 7.3 Bcf/year in 2014 to 7.9 Bcf/year by 2035.

Natural Gas Vehicles (NGV)

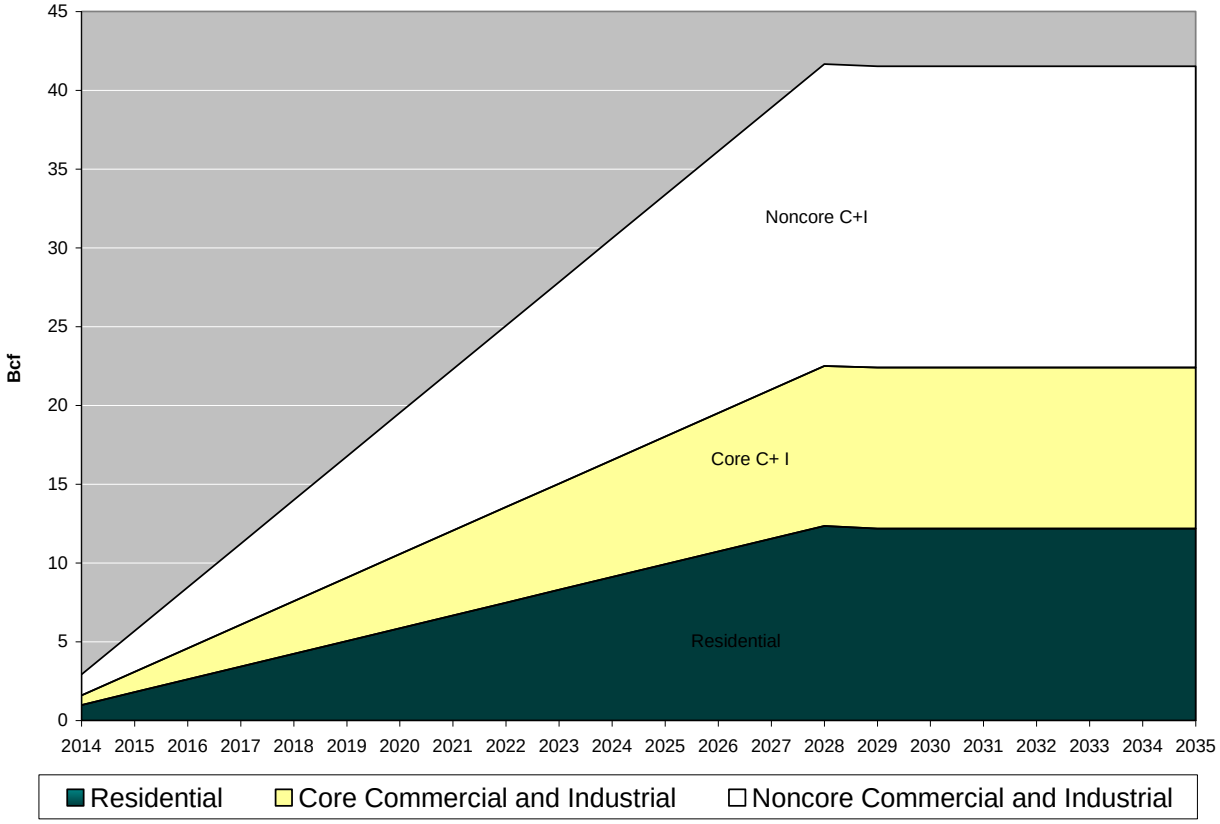
The NGV market is expected to continue to grow due to government (federal, state and local) incentives and regulations related to the purchase and operation of alternate fuel vehicles, growing numbers of natural gas engines and vehicles, and the increasing cost differential between petroleum (gasoline and diesel) and natural gas. At the end of 2013, there were 289 compressed natural gas (CNG) fueling stations delivering 11.4 Bcf of natural gas during the year. The NGV market is expected to grow substantially from 11.4 Bcf in 2013 to 23.3 Bcf in 2035, a growth rate of just over 3.3% per year.

ENERGY EFFICIENCY PROGRAMS

Conservation and energy efficiency activities encourage customers to install energy efficient equipment and weatherization measures and adopt energy saving practices that result in reduced gas usage while still maintaining a comparable level of service. Conservation and energy efficiency load impacts are shown as positive numbers. The "total net load impact" is the natural gas throughput reduction resulting from the Energy Efficiency programs.

The cumulative net Energy Efficiency load impact forecast for selected years is shown in the graph below. The net load impact includes all Energy Efficiency programs that SoCalGas has forecasted to be occurring through year 2035. The 2014 goals for these programs are based on the levels authorized by the CPUC in D.12-05-015. Values for 2015 are based on the proposed program goals currently pending before the Commission in R.13-11-005. For 2015 and beyond, savings goals are based upon the 2013 California Energy Efficiency Potential and Goals Study final report dated February 14, 2014 and performed by Navigant Consulting, Inc. on behalf of the commission. Energy Efficiency goals for the 2025-2035 period are held constant at the 2024 level.

Annual Energy Efficiency Cumulative Savings Goal (Bcf)



Savings reported are for measures installed under SoCalGas' Energy Efficiency programs. Credit is only taken for measures that are installed as a result of SoCalGas' Energy Efficiency programs, and only for the estimated lives of the measures installed. Measures with useful lives less than the forecast planning period fall out of the forecast when their expected life is reached. This means, for example, that a measure installed in 2014 with a lifetime of 10 years is only included in the forecast through 2023.[3] Naturally occurring conservation that is not attributable to SoCalGas' Energy Efficiency activities is not included in the Energy Efficiency forecast.

[3] The assumed average measure life is 15 years.

Details of SoCalGas' Energy Efficiency program portfolio are contained in D.12-05-015 and D.12-15-015. The Energy Efficiency portfolio for program year 2015 and forward is currently being considered in R.13-11-005.

GAS SUPPLY, CAPACITY, AND STORAGE

GAS SUPPLY SOURCES

Southern California Gas Company and San Diego Gas & Electric Company receive gas supplies from several sedimentary basins in the Western United States and Canada including supply basins located in New Mexico (San Juan Basin), West Texas (Permian Basin), the Rocky Mountains, Western Canada, and local California supplies. Recorded 2009 through 2013 receipts from gas supply sources can be found in the Sources and Disposition tables in the Executive Summary.

CALIFORNIA GAS

Gas supply available to SoCalGas from California sources averaged 153 MMcf/day in 2013.

SOUTHWESTERN U.S. GAS

Traditional Southwestern U.S. sources of natural gas, especially from the San Juan Basin, will continue to supply most of Southern California's natural gas demand. This gas is primarily delivered via the El Paso Natural Gas and Transwestern pipelines. The San Juan Basin's gas supplies peaked in 1999 and have been declining at an annual rate of roughly 3%, but at a faster rate in recent years. The Permian Basin's share of supply into Southern California has increased in recent years, although increasing demand in Mexico for natural gas supplies may significantly reduce the volume of Permian Basin supply available to Southern California in the future. In A.13-12-013, SoCalGas and SDG&E have discussed this situation in more detail and have proposed a response to the operational concerns this situation creates for California.

ROCKY MOUNTAIN GAS

Rocky Mountain supply supplements traditional Southwestern U.S. gas sources for Southern California. This gas is delivered to Southern California primarily on the Kern River Gas Transmission Company's pipeline, although there is also access to Rockies gas through pipelines interconnected to the San Juan Basin. Production from the Rocky Mountain region in 2013 has doubled since 2000 due to the successful applications of new technology to drill for coal-bed methane gas. In recent years, Rocky Mountain gas has increasingly flowed to Midwestern and Pacific Northwest markets.

CANADIAN GAS

SoCalGas anticipates that the role of Canadian gas in meeting Southern California's demand during the forecast period will not change significantly. Eventually, LNG exports to Asia may move Canadian gas away from California. Increased gas deliveries to California from the Rockies and Permian Basin are expected to replace these supplies.

BIOGAS

Biogas is a mixture of methane and carbon dioxide produced by the bacterial degradation of organic matter. Biogas is a byproduct produced from processes including, but not limited to, anaerobic digestion, anaerobic decomposition, and thermo-chemical decomposition under sub-stoichiometric conditions. These processes are applied to biodegradable biomass materials, such as livestock manure, wastewater sewage, food waste, and green waste. When biogas is conditioned/upgraded to pipeline quality specifications, commonly referred to as "biomethane," it can be interconnected to a gas utility's pipeline and nominated for a specific end-use customer.[4] Biomethane may also be consumed onsite for a variety of uses, including elected power generation from internal combustion engines, fuel cells, and turbines, or as a fuel source for natural gas vehicles. Currently, there are instances where biogas is being vented naturally or flared to the atmosphere. Venting and flaring wastes this valuable renewable resource and fails to support the state in achieving its emission reduction targets set forth by Assembly Bill ("AB") 32 and the Renewables Portfolio Standard ("RPS") goals, as processed renewable natural gas injected into a common carrier natural gas pipeline system can ultimately count toward satisfying AB 32 and RPS goals.

In February 2013, the CPUC issued an Order Instituting Rulemaking ("Rulemaking") to adopt standards and requirements, open access rules, and related enforcement provisions, pursuant to Assembly Bill 1900 (Gatto), which tasked state agencies to address any constituents of concern specifically found in biomethane, and to identify impediments to interconnecting to utility pipelines.[5] CARB released their report on May 15, 2013 which identifies 17 constituents of concern found in biomethane and provides direction on monitoring, testing, reporting and recordkeeping procedures for utilities and biomethane suppliers. The first phase of the Rulemaking - the identification of constituents of concern – resulted in the utilities filing revised tariff rules governing gas quality specifications in February 2014. The second phase of the Rulemaking began in April 2014 to determine "who should bear the costs of complying with the CPUC-adopted testing, monitoring, reporting, and recordkeeping requirements."

[4] SoCalGas' Tariff Rule 30 (http://socalgas.com/regulatory/tariffs/tm2/pdf/30.pdf) must be met in order to qualify for pipeline injection into SoCalGas' gas pipeline system.
[5] February 13, 2013 Order Instituting Rulemaking to Adopt Biomethane Standards and Requirements, Pipeline Open Access Rules, and Related Enforcement Provisions. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M050/K674/50674934.PDF.

In January 2014 the Commission approved SoCalGas' application to offer a Biogas Conditioning/Upgrading Services Tariff in response to customer inquiries and requests. This service is designed to meet the current and future needs of biogas producers seeking to upgrade their biogas for beneficial uses such as pipeline injection, onsite power generation, or compressed natural gas vehicle refueling stations. There is growing interest regarding biogas production potential in SoCalGas' service territory from the following activities: non-hazardous-waste landfills, landfill diversion of organic waste material, wastewater treatment, concentrated animal feeding operations, and food/green waste processing.

INTERSTATE PIPELINE CAPACITY

Interstate pipeline delivery capability into SoCalGas and SDG&E on any given day theoretically is approximately 6,725 MMcf/day based on the Federal Energy Regulatory Commission (FERC) Certificate Capacity or SoCalGas' estimated physical capacity of upstream pipelines. These pipeline systems provide access to several large supply basins located in: New Mexico (San Juan Basin), West Texas (Permian Basin), the Rocky Mountains, Western Canada, as well as LNG.

Upstream Capacity to Southern California

Pipeline	Upstream Capacity (MMcf/d)(1)
El Paso at Blythe	1,210
El Paso at Topock	540
Transwestern at Needles	1,150
PG&E at Kern River	650(1)
Southern Trails at Needles	80
Kern/Mojave at Wheeler Ridge	885
Kern at Kramer Junction	750
Occidental at Wheeler Ridge	150
California Production	310
TGN at Otay Mesa	400
North Baja at Blythe	600
Total Potential Supplies	6,725

(1) Estimate of physical capacity.

FIRM RECEIPT CAPACITY

SoCalGas/SDG&E currently has firm receipt capacity at the following locations for its customers to access supply from interstate pipelines.

SoCalGas/SDG&E Current Firm Receipt Capacity

Transmission Zone	Total Transmission Zone Firm Access (MMcf/d)	Specific Point of Access[1] (Limitations)[2] (MMcf/d)
Southern	1,210	EPN Ehrenberg (1,010) TGN Otay Mesa (400) NBP Blythe (600)
Northern	1,590	EPN Topock (540) TW North Needles (800) QST North Needles (120) KR Kramer Junction (550)
Wheeler Ridge	765	KR/MP Wheeler Ridge (765) PG&E Kern River Station (520) OEHI Gosford (150)
Line 85	160	California Supply
Coastal	150	California Supply
Other	N/A	California Supply
Total	3,875	

(1) Pipelines
EPN: El Paso Natural Gas Pipeline
TGN: Transportadora de Gas Natural de Baja California
NBP: North Baja Pipeline
TW: Transwestern Pipeline
MP: Mojave Pipeline
QST: Questar Southern Trails Pipeline
KR: Kern River Pipeline
PG&E: Pacific Gas and Electric
OEHI: Occidental of Elk Hills

(2) Transmission Zone Contract Limitations:
Southern Zone:
- In total EPN Ehrenberg and NBP Blythe cannot exceed 1,010 MMcfd.
- In total EPN Ehrenberg, NBP Blythe and TGN Otay Mesa cannot exceed 1,210 MMcfd.

Northern Zone:
- In total TW at Topock and EPN at Topock cannot exceed 540 MMcfd.
- In total TW at North Needles and QST at North Needles cannot exceed 800 MMcfd.
- In total TW at North Needles, TW Topock, EPN Topock, QST North Needles and KR Kramer Junction cannot exceed 1,590 MMcfd.

Wheeler Ridge Zone:
- In total PG&E at Kern River Station and OEHI at Gosford cannot exceed 520 MMcfd.
- In total PG&E Kern River Station, OEHI Gosford, and KR/MP Wheeler Ridge cannot exceed 765 MMcfd.

STORAGE

Underground storage of natural gas plays a vital role in balancing the region's energy supply and demand. SoCalGas owns and operates four underground storage facilities located

at Aliso Canyon, Honor Rancho, Goleta and Playa Del Rey. These facilities play a vital role in balancing the region's energy supply and demand.

Of SoCalGas' total 137.1 Bcf of storage capacity, 83 Bcf is allocated to our core residential, small industrial and commercial customers. About 4.2 Bcf of space is used for system balancing. The remaining capacity is available to other customers.

REGULATORY ENVIRONMENT

State Regulatory Matters

TRIENNIAL COST ALLOCATION PROCEEDING (TCAP)

SoCalGas and SDG&E filed their TCAP, A.11-11-002 in November 2011. The application updated throughput forecasts, cost allocation, and rates by customer class for 2013 through 2015, in addition to addressing issues related to the prior settlement agreements adopted in SoCalGas and SDG&E's previous cost allocation proceeding. A February 2012 Ruling has subsequently bifurcated the TCAP into two phases; Phase I addresses the Pipeline Safety Enhancement Plans (PSEP) originally filed by SoCalGas and SDG&E in Commission Rulemaking R.11-02-019. SoCalGas and SDG&E's PSEP seeks funding for safety enhancement projects for the years 2012 through 2015.

Phase 2 of the TCAP addresses cost allocation including all issues raised by SoCalGas and SDG&E in their original TCAP application (A.11-11-002) to allocate the cost of service to various customer classes to recover the cost of service from the respective rate base. In addition, Phase 2 includes the costs of the PSEP addressed in Phase 1. A proposed decision was issued in April 2014 addressing both Phase 1 and 2 of the TCAP. A final decision is anticipated in 2014.

PIPELINE SAFETY

On February 24, 2011, the CPUC approved an Order Instituting Rulemaking (OIR) to develop and adopt new regulations on pipeline safety. Through the OIR, the Commission will develop and adopt safety regulations that address topics such as construction standards, shut-off valves, maintenance requirements, records management and retention, ratemaking, and penalty provisions.

On June 9, 2011, the CPUC issued a decision requiring that the utilities file a plan to pressure test or replace transmission pipelines that have not been pressure tested. SoCalGas/SDG&E jointly filed their comprehensive Pipeline Safety Enhancement Plan (PSEP) on August 26, 2011. The comprehensive plan covers all of the utilities' approximately 4,000 miles of transmission lines (3,750 miles for SoCalGas and 250 miles for SDG&E) and would be implemented in two phases. Phase 1 focuses on populated areas of SoCalGas' and SDG&E's service territories and, if approved, would be implemented over a 10-year period, from 2012 to 2022. Phase 2 covers unpopulated areas of SoCalGas' and SDG&E's service territories and will be filed with the CPUC at a later date.

The Utilities' Pipeline Safety Enhancement Plan was transferred for consideration from the Pipeline Safety Rulemaking to the Utilities' Triennial Cost Allocation Proceeding. A final decision was issued in May 2014 which adopts the overall plan and a process to recover the associated costs subject to reasonableness reviews.

SOUTHERN GAS SYSTEM RELIABILITY PROJECT

On December 20, 2013, SoCalGas and SDG&E filed an application proposing enhancements to the reliability of its Southern System. The proposal requests authority to collect $628.6 million in customer rates to construct a North-to-South Pipeline from SoCalGas' Adelanto compressor station near Victorville down to the Moreno pressure limiting station in Moreno Valley. The pipeline will be a new source of up to 800 million cubic feet of gas per day to the Southern System and would provide an additional 300 million cubic feet of backbone capacity per day in the northern part of the SoCalGas system. Together, these enhancements will increase reliability to Southern System customers and to the generators supporting the electric grid.

The North-South Project consists of three major components:

Adelanto – Moreno Pipeline	$331.8M
Adelanto Compressor Station	$110.7M
Moreno-Whitewater Pipeline	$186.1M
Total	$628.6M

A Commission decision is expected in 2015. The expected in-service date for the North-South Project, subject to environmental permitting, is late 2018.

FEDERAL REGULATORY MATTERS

SoCalGas and SDG&E participate in FERC proceedings involving interstate natural gas pipelines serving California that can affect the cost of gas delivered to their customers. SoCalGas holds contracts for interstate transportation capacity on the El Paso, Kern River, Transwestern, and GTN pipelines. SoCalGas and SDG&E also participate in FERC proceedings involving the natural gas industry generally as those proceedings may impact their operations and policies.

El Paso

El Paso's rates have been the subject of extensive litigation at FERC in recent years. El Paso filed its third general rate case in five years in September 2010. The 2010 rate case proceeded to a hearing on all issues in 2011, and we are still awaiting a final decision on these matters in 2014.

During 2012-13, El Paso filed applications to abandon certain compression facilities used to transport San Juan Basin gas supplies to interconnects with the SoCalGas and PG&E systems. The FERC approved one application to abandon compression facilities and El Paso withdrew the other application

Also during 2012-13, El Paso filed several applications to build new or expand on existing interconnections at the U.S.-Mexican border to transport natural gas supplies into Mexico. The FERC has approved most of these applications.

Kern River

A final ruling was issued in 2013 in Kern River's 2004 general rate case. The ruling denied many rehearing requests to revisit the issues litigated in this case and accepted a series of orders retaining Kern River's original 1992 levelized rate design, resulting in reduced rates for eligible shippers which extend for periods up to 15 years.

Transwestern

Under the terms of its 2011 rate case settlement, Transwestern agreed to retain its existing tariff rates. Under the settlement, the fuel rate for San Juan Basin gas supplies delivered to California will decrease annually from 2012-2014. The earliest that Transwestern may file for a change in rates is October 1, 2014.

Gas Transmission Northwest (GTN)

In December 2011 FERC approved a rate case settlement between GTN and its customers. Under the settlement, transportation rates for Canadian gas supplies delivered to California are reduced for the four-year term of 2012-2015.

Coordination Between Gas and Electric Markets

In February 2012, FERC opened a proceeding to receive comments concerning potential revisions to coordinate scheduling protocols and emergency response measures between gas and electricity markets. Discussions are underway in 2014 to consider changing the start of the nationwide gas day to better accommodate load nominations between gas and electric energy markets. The nationwide gas day is currently set at 9 am Central Time.

GREENHOUSE GAS ISSUES

National Policy

National greenhouse gas (GHG) policy is currently under development. In general, the programs will all be designed to reduce national GHG emissions, and the electric utility sector will bear much of the reduction requirements.

Restriction on New Conventional Coal Generation

In March 2012, EPA proposed the first Clean Air Act standards for carbon pollution. The proposed standards apply only to new facilities and can be met by a range of power generation facilities burning fossil fuels, including natural gas or coal with technologies to reduce carbon emissions. Since carbon sequestration technology is not yet proven, in the near term, new generation will likely be dependent upon natural gas. Therefore, as California's electricity demand increases, California, as well as the rest of the country, will likely become more dependent upon new natural gas generation to meet the electricity demand that cannot be met through renewable resources.

Motor Vehicle Emissions Reductions

National GHG policy-makers realize that motor vehicles are one of the largest sources of GHG emissions, and one of the potential solutions is the substitution of natural gas and electricity for the current diesel and gasoline energy sources. This transition to cleaner fuels will also increase the demand for both natural gas and natural gas-generated electricity. Under EPA's Mandatory Reporting of Greenhouse Gases rule, all vehicle and engine manufacturers outside of the light-duty sector must report emission rates of carbon dioxide, nitrous oxide, and methane from their products.

California Policy

California is in the process of implementing a broad portfolio of policies and regulations aimed at reducing greenhouse gas (GHG) emissions. This process is a collaborative effort underway at the CPUC, the CEC, and CARB. CARB however is statutorily empowered with developing and implementing the final regulations on GHG regulatory framework and compliance. Approved policies include both programmatic measures and market-based mechanisms to reduce GHG emissions.

Global Warming Solutions Act of 2006

California enacted the Global Warming Solutions Act, also known as AB 32, to help avoid potential climate change-related damage to the economy, public health and the environment. The legislation requires the state to reduce GHG emissions to 1990 levels by 2020 and directs CARB to develop policies and programs to achieve this goal. CARB adopted its final Scoping Plan in 2009, which includes new and existing emissions reduction measures including a low-carbon fuel standard, energy efficiency and conservation measures, RPS for electricity generation and a market-based emissions cap-and-trade program.

Low Carbon Fuel Standard

On January 18, 2007, former Governor Schwarzenegger signed an Executive Order establishing the low carbon fuel standard (LCFS). LCFS requires a 10 percent carbon intensity

reduction by 2020 in the transportation sector. It is recognized that 40 percent of California's GHG emissions are attributable to the transportation sector and 96 percent of the state's transportation needs require petroleum-based fuels. The LCFS requires fuel providers to ensure that the mix of fuel they sell into the California market meets, on average, a declining standard for GHG emissions measured in CO_2 equivalent gram per unit of fuel energy sold. As stated above, the transition to cleaner fuels will increase the demand for both natural gas and natural gas-generated electricity in order to meet the needs of a cleaner state transportation fleet, which will increasingly utilize electricity and natural gas in the future. Further, the CPUC has recently authorized the utilities to sell LCFS credits generated both by their use of low-carbon fuel vehicles and those generated by public refueling stations. The revenue generated by the sale of these credits will be returned to the customers who generated the credits, further enhancing the value of low-carbon fuels.

Cap and Trade Program

The AB 32 Cap and Trade Program was approved by the Office of Administrative Law in December 2011. The Regulation became effective January 1, 2012. The GHG emissions cap drops by about 2% per year in the initial period and then by about 3% a year through 2020. The 2020 cap is about 15% below 2012 levels. Approximately 85% of the GHG emissions in California are covered under the cap. Industrial sources, the electricity sector, and natural gas suppliers start out with free allocations of emissions allowances. The remainder of the allowances will be sold at auctions, which are being held on a quarterly basis beginning in November 2012.

The first compliance period began January 1, 2013 for electricity, including imports, and large industrial facilities with CO_2 emissions equal to or greater than 25,000 metric tons per year. The second compliance period is 2015-2017 and adds distributors of transportation fuels, natural gas, and other fuels. The third compliance period, which includes all covered sectors, is 2018-2020. Currently, several of SoCalGas' and one of SDG&E's compressor stations have a compliance obligation under the Cap and Trade Program. SoCalGas and SDG&E have begun purchasing emissions allowances to cover their GHG emissions related to the compressor stations.

In 2015, SoCalGas' and SDG&E's small and medium-sized customers (fewer than 25,000 tons CO_2/yr or 4.7 million therms/yr) will be part of the AB 32 Cap and Trade Program. CARB allocated free allowances to Electric utilities to help offset the cost of AB 32 programs for customers. CARB will allocate allowances to gas utilities on behalf of their customers beginning in 2015. The allocation decreases in conjunction with the overall GHG cap. A portion of these free allowances must be consigned to auction, with the majority of the revenues generated from these sales returned to ratepayers

The CPUC is currently considering rules that would govern how the natural gas utilities would procure the necessary compliance instruments, the cost recovery and rate design mechanisms, and the method for returning consignment revenues to ratepayers.

Programmatic Emission Reduction Measures

The CEC, CPUC and CARB are considering or have approved a variety of non market-based measures to reduce GHG emissions. Some of these programs include: the California Energy

Efficiency Green Building Standards, the Green State Buildings Executive Order, the CPUC's adopted goal of "zero net energy" for all new residential construction by 2020 and a similar goal for commercial buildings by 2030, potential combined heat and power (CHP) and distributed generation portfolio standards or feed-in tariffs, and increasing the electric renewables portfolio standard to 33%. Energy Efficiency and renewables are considered fundamental to GHG emission reduction in the electric sector. As a result, integration of additional renewables will require quick-start peaking capacity for firming and shaping of intermittent power, which in the foreseeable future will be gas-fired combustion turbines.

GAS PRICE FORECAST

MARKET CONDITION

Current North American production from conventional supplies has been declining, particularly at the Western Canadian Sedimentary Basin and offshore production in the Gulf of Mexico. However, with advanced technology in horizontal drilling, proven reserves from unconventional resources have been soaring due to the unlocking of trapped gas from shale, tight sands and coal bed methane in the Mid-Continent, the Rockies and the Eastern U.S. The new technology is successful at finding trapped gas that was not economical before but is now due to technological breakthroughs that have reduced development costs substantially. The aggressive expansion in the production of shale gas in the Mid-Continent, the Eastern U.S. and Canada and continuing growing production of coal bed methane in the Rockies is expected to moderate some of the price pressure in the next few years although reductions in conventional sources and possible exports of U.S. sourced LNG could offset that price moderation to some degree.

With world-wide LNG prices still higher than the current price at Henry Hub, LNG imports in the short-term are expected to be limited with only a minor impact on domestic supply or price. LNG however is expected to moderate winter gas price increases as LNG will be withdrawn from storage during peak demand periods. LNG deliveries into the Southwest U.S. from the Energia Costa Azul LNG receiving terminal in Baja California, Mexico, have occurred in limited quantities to date. In the long-run, more LNG will be available when the new generation of liquefaction trains are reliably operated; although world-wide demand will most likely dictate the amount of LNG supplies delivered to North America. Although some LNG imports are expected to continue in the forecast period, U.S. sourced LNG exports are also likely and will possibly reduce natural gas supply availability in the U.S.

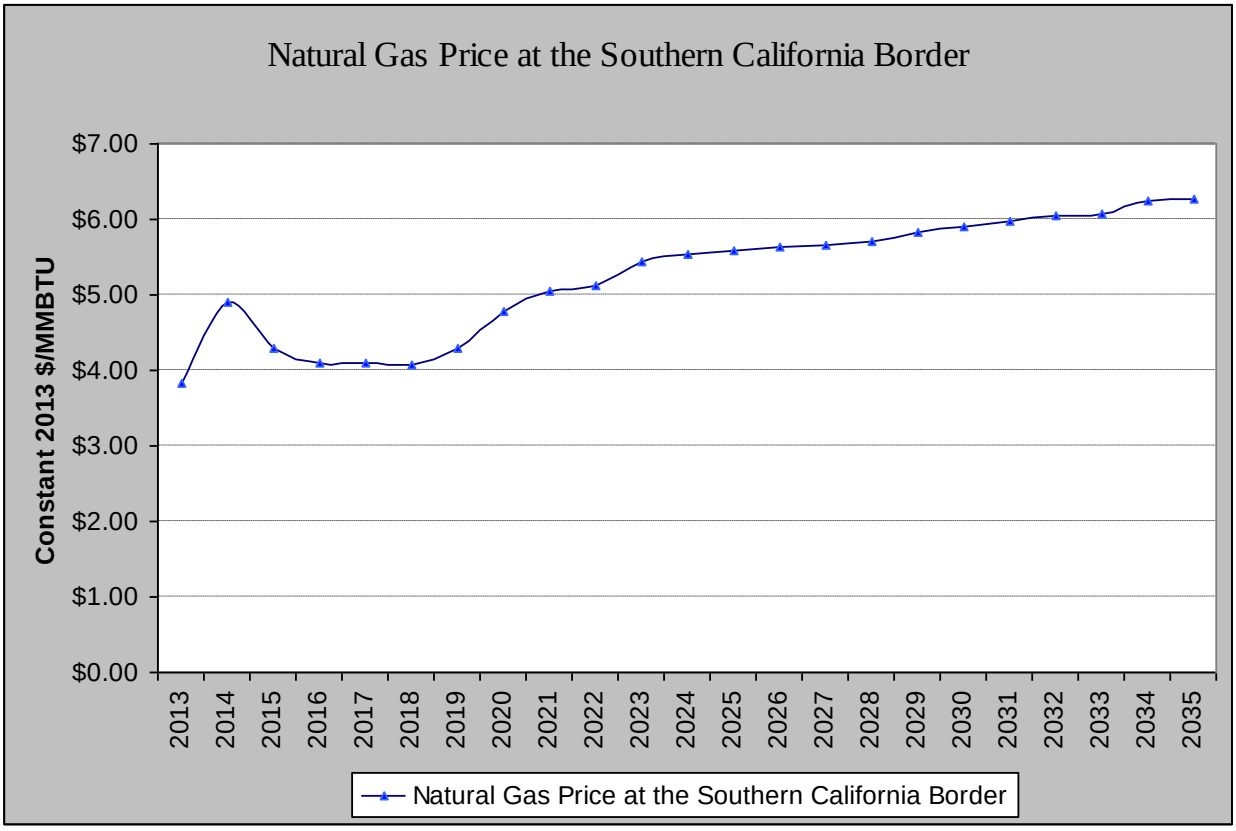
Industry experts now forecast that gas supplies can be expected to be more plentiful and less volatile during the forecast period. Increased shale gas production and increased LNG liquefaction supplies combined with a mild worldwide economic recovery are expected to moderate prices in the medium term. However, increasing demand for clean natural gas for electric power generation, natural gas vehicles fuel, and substitution of gas for coal in electric power production to meet GHG reduction goals will continue to put upward pressure on prices in the longer term.

DEVELOPMENT OF THE FORECAST

In constant 2013 dollars, natural gas prices are expected to average out at $4.91/MMbtu in 2014 and increase by about 1.2 percent per year through 2035.

Consistent with the prior CGR practices, the 2014 CGR gas price forecast was developed using a combination of market prices and fundamental forecasts. NYMEX futures prices were used for the 2014-2018 period. Fundamental price forecasts were used for 2021 and beyond.

The forecasts for 2019 and 2020 reflect a blending of market and fundamental prices, with declining weights for market prices (and corresponding increasing weights for the fundamental price forecast) over the two-year period. The fundamental gas price forecast represents an average of the forecasts developed by the CEC and independent consultants.



It is important to recognize that the natural gas price forecast is inherently uncertain. SoCalGas and the participants of the *2014 CGR* do not warrant the accuracy of the gas price projection. In no event shall SoCalGas or the participants of the *2014 CGR* be liable for the use of or reliance on this natural gas price forecast.

PEAK DAY DEMAND AND DELIVERABILITY

Beginning in April 2008, gas supplies to serve both SoCalGas' and SDG&E's retail core gas demand are procured with a combined portfolio. SoCalGas and SDG&E plan and design their systems to provide continuous service to their core customers under an extreme peak day event. The criteria for extreme peak day design is defined as a 1-in-35 likelihood event for each utility's service area. This criteria correlates to a system average temperature of 40.0° Fahrenheit for SoCalGas' service area and 42.6° Fahrenheit for SDG&E's service area.

Demand on an extreme peak day is met through a combination of withdrawals from underground storage facilities and flowing pipeline supplies. The firm storage withdrawal amount of 2,225 MMCF/day is the value SoCalGas and SDG&E are approved to hold (per CPUC D.08-12-020 on Dec. 4, 2008 at p. 12) to serve the combined core portfolio of SoCalGas' and SDG&E's retail core customers. Storage withdrawal plus pipeline supplies must be sufficient to meet peak day operating requirements. The following table provides an illustration of how storage and flowing supplies can meet forecasted retail core peak day demand.

Retail Core Peak Day Demand and Supply Requirements (MMcf/Day)

Year	SoCalGas Retail Core Demand[(1)]	SDG&E Retail Core Demand[(2)]	Total Demand	Firm Storage Withdrawal[(3)]	Flowing Supply
2014	3,101	389	3,490	2,225	1,265
2015	3,061	388	3,449	2,225	1,224
2016	3,050	390	3,440	2,225	1,215
2017	3,035	390	3,425	2,225	1,200
2018	3,027	391	3,419	2,225	1,194
2019	3,008	393	3,401	2,225	1,176
2020	2,979	393	3,372	2,225	1,147

Notes:
(1) 1-in-35 peak temperature cold day SoCalGas core sales and transportation.
(2) 1-in-35 peak temperature cold day SDG&E core sales and transportation.
(3) This amount was approved by the CPUC for SoCalGas and SDG&E to serve the combined core portfolio of SoCalGas' and SDG&E's retail core customers in CPUC D.08-12-020 on 12/4/2008 at p. 12.

The tables below provide system-wide Winter (December month) peak day demand projections on SoCalGas' system and High Sendout demand during Summer (July, August or September month as designated) periods.

Winter Peak Day Demand
(MMcf/Day)

Year	Core[1]	Noncore NonEG[2]	Electric Generation[3]	Total Demand[4]
2014	3,101	999	936	5,036
2015	3,061	993	986	5,040
2016	3,050	996	1,031	5,077
2017	3,035	996	1,092	5,122
2018	3,027	996	1,128	5,151
2019	3,008	995	1,048	5,051
2020	2,979	990	1,050	5,019

Notes:
(1) 1-in-35 peak temperature cold day for SoCalGas' core.
(2) 1-in-10 peak temperature cold day for Hdd-sensitive load. Includes SoCalGas noncore and wholesale non-EG.
(3) UEG/EWG Base Hydro + all other EG.
(4) SoCalGas is only obligated to design its system to maintain service to retail and wholesale core customers during a 1-in-35 winter peak day temperature event .

Summer High Sendout Day Demand
(MMcf/Day)

Year	High Demand Month[1]	Core[2]	Noncore NonEG[3]	Electric Generation[4]	Total Demand
2014	Sep	665	650	2,012	3,327
2015	Sep	662	658	1,968	3,288
2016	Jul	634	634	1,943	3,211
2017	Jul	634	633	1,808	3,074
2018	Sep	663	653	1,918	3,234
2019	Sep	660	648	1,899	3,208
2020	Sep	655	641	1,910	3,206

Notes:
(1) Month of High Sendout gas demand during summer (July, August or September).
(2) Average daily summer demand SoCalGas core.
(3) Average daily summer demand. Includes SoCalGas retail and wholesale load.
(4) Highest demand on a summer day under 1-in-10 dry hydro conditions.

2014 CALIFORNIA GAS REPORT

SOUTHERN CALIFORNIA GAS COMPANY
TABULAR DATA

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY

RECORDED YEARS 2009 TO 2013

Line	CAPACITY AVAILABLE	2009	2010	2011	2012	2013
1	California Source Gas					
	Out-of-State Gas					
2	California Offshore -POPCO / PIOC					
3	El Paso Natural Gas Co.					
4	Transwestern Pipeline Co.					
5	Kern / Mojave					
6	PGT / PG&E					
7	Other					
8	Total Out-of-State Gas					
9	TOTAL CAPACITY AVAILABLE					
	GAS SUPPLY TAKEN					
10	California Source Gas	216	203	175	148	153
	Out-of-State Gas					
11	Other Out-of-State	2,397	2,445	2,452	2,728	2,514
12	Total Out-of-State Gas	2,397	2,445	2,452	2,728	2,514
13	TOTAL SUPPLY TAKEN	2,613	2,648	2,627	2,876	2,667
14	Net Underground Storage Withdrawal	8	(10)	(4)	(42)	106
15	TOTAL THROUGHPUT (1)(2)	2,621	2,638	2,623	2,834	2,773
	DELIVERIES BY END-USE (3)					
16	Core Residential	645	673	696	644	646
17	Commercial	210	216	217	216	222
18	Industrial	59	61	61	61	62
19	NGV	26	27	28	29	31
20	Subtotal	940	977	1,002	950	961
21	Noncore Commercial	56	59	60	60	60
22	Industrial	324	361	363	365	368
23	EOR Steaming	35	30	27	29	35
24	Electric Generation	811	768	726	922	848
25	Subtotal	1,226	1,218	1,176	1,376	1,311
26	Wholesale/International	412	412	407	477	465
27	Co. Use & LUAF	43	31	38	31	36
28	SYSTEM TOTAL-THROUGHPUT (1)(2)	2,621	2,638	2,623	2,834	2,773
	TRANSPORTATION AND EXCHANGE					
29	Core All End Uses	20	25	29	35	45
30	Noncore Commercial/Industrial	380	420	423	425	428
31	EOR Steaming	35	30	27	29	35
32	Electric Generation	811	768	726	922	848
33	Subtotal-Retail	1,246	1,243	1,205	1,411	1,356
34	Wholesale/International	412	412	407	477	465
35	TOTAL TRANSPORTATION & EXCHANGE	1,658	1,655	1,612	1,888	1,821
	CURTAILMENT (RETAIL & WHOLESALE)					
36	Core					
37	Noncore					
38	TOTAL - Curtailment					
39	REFUSAL					
40	Total BTU Factor (Dth/Mcf)	1.0273	1.0235	1.0209	1.0210	1.0266
	NOTES:					
	(1) Exclude own-source gas supply of procurement by City of Long Beach.	2	2	1	1	2

(2) Deliveries by end-use includes sales, transportation, and exchange volumes.
(3) Data includes effect of prior period adjustments.

TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2014 THRU 2018

AVERAGE TEMPERATURE YEAR

LINE			2014	2015	2016	2017	2018	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN							
8	California Source Gas		310	310	310	310	310	8
9	Out-of-State		2,492	2,404	2,401	2,387	2,380	9
10	TOTAL SUPPLY TAKEN		2,802	2,714	2,711	2,697	2,690	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,802	2,714	2,711	2,697	2,690	12
	REQUIREMENTS FORECAST BY END-USE [5/]							
13	CORE [6/]	Residential	676	664	658	655	652	13
14		Commercial	226	227	228	230	230	14
15		Industrial	60	59	59	59	58	15
16		NGV	35	38	40	42	43	16
17		Subtotal-CORE	997	988	985	985	984	17
18	NONCORE	Commercial	48	46	44	43	41	18
19		Industrial	376	379	379	379	377	19
20		EOR Steaming	44	52	52	52	52	20
21		Electric Generation (EG)	863	789	785	773	777	21
22		Subtotal-NONCORE	1,331	1,266	1,260	1,246	1,247	22
23	WHOLESALE &	Core	190	190	191	192	193	23
24	INTERNATIONAL	Noncore Excl. EG	45	45	45	46	46	24
25		Electric Generation (EG)	204	190	196	194	186	25
26		Subtotal-WHOLESALE & INTL.	438	425	431	432	425	26
27		Co. Use & LUAF	36	35	35	35	35	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,802	2,714	2,711	2,697	2,690	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	47	47	47	48	48	29
30	NONCORE	Commercial/Industrial	424	425	424	421	419	30
31		EOR Steaming	44	52	52	52	52	31
32		Electric Generation (EG)	863	789	785	773	777	32
33		Subtotal-RETAIL	1,378	1,313	1,307	1,294	1,295	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	438	425	431	432	425	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,816	1,738	1,739	1,725	1,720	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1.1	0.9	0.8	0.8	0.8	

5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	975	966	963	962	960

TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2019 THRU 2035

AVERAGE TEMPERATURE YEAR

LINE			2019	2020	2025	2030	2035	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN							
8	California Source Gas		310	310	310	310	310	8
9	Out-of-State		2,366	2,338	2,351	2,334	2,337	9
10	TOTAL SUPPLY TAKEN		2,676	2,648	2,661	2,644	2,647	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,676	2,648	2,661	2,644	2,647	12
	REQUIREMENTS FORECAST BY END-USE [5/]							
13	CORE [6/]	Residential	647	638	619	612	611	13
14		Commercial	230	228	226	228	231	14
15		Industrial	57	55	48	43	41	15
16		NGV	45	46	54	59	64	16
17		Subtotal-CORE	979	968	947	943	947	17
18	NONCORE	Commercial	39	37	28	23	24	18
19		Industrial	373	367	351	341	336	19
20		EOR Steaming	52	52	52	52	52	20
21		Electric Generation (EG)	774	770	821	819	817	21
22		Subtotal-NONCORE	1,239	1,226	1,252	1,235	1,228	22
23	WHOLESALE &	Core	194	194	199	205	211	23
24	INTERNATIONAL	Noncore Excl. EG	46	46	47	47	48	24
25		Electric Generation (EG)	183	180	181	179	178	25
26		Subtotal-WHOLESALE & INTL.	423	420	427	432	437	26
27		Co. Use & LUAF	35	34	35	34	34	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,676	2,648	2,661	2,644	2,647	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	48	48	48	49	50	29
30	NONCORE	Commercial/Industrial	413	405	379	364	359	30
31		EOR Steaming	52	52	52	52	52	31
32		Electric Generation (EG)	774	770	821	819	817	32
33		Subtotal-RETAIL	1,287	1,274	1,301	1,284	1,279	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	423	420	427	432	437	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,710	1,694	1,728	1,716	1,716	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	0.7	0.7	0.5	0.4	0.4

5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	956	944	922	918	921

TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2014 THRU 2018

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2014	2015	2016	2017	2018	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN							
8	California Source Gas		310	160	160	160	160	8
9	Out-of-State		2,589	2,727	2,727	2,707	2,710	9
10	TOTAL SUPPLY TAKEN		2,899	2,887	2,887	2,867	2,870	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,899	2,887	2,887	2,867	2,870	12
	REQUIREMENTS FORECAST BY END-USE [5/]							
13	CORE [6/]	Residential	742	730	723	719	716	13
14		Commercial	239	240	241	242	243	14
15		Industrial	61	61	61	60	59	15
16		NGV	35	38	40	42	43	16
17		Subtotal-CORE	1,078	1,068	1,064	1,063	1,062	17
18	NONCORE	Commercial	49	47	45	44	42	18
19		Industrial	376	379	379	379	377	19
20		EOR Steaming	44	52	52	52	52	20
21		Electric Generation (EG)	863	857	854	838	848	21
22		Subtotal-NONCORE	1,332	1,335	1,330	1,312	1,319	22
23	WHOLESALE &	Core	203	203	204	205	206	23
24	INTERNATIONAL	Noncore Excl. EG	45	45	45	46	46	24
25		Electric Generation (EG)	204	199	208	204	200	25
26		Subtotal-WHOLESALE & INTL.	451	447	457	455	452	26
27		Co. Use & LUAF	38	37	37	37	37	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,899	2,887	2,887	2,867	2,870	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	49	49	50	50	51	29
30	NONCORE	Commercial/Industrial	425	427	425	423	420	30
31		EOR Steaming	44	52	52	52	52	31
32		Electric Generation (EG)	863	857	854	838	848	32
33		Subtotal-RETAIL	1,381	1,384	1,380	1,362	1,370	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	451	447	457	455	452	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,832	1,832	1,836	1,817	1,822	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1.1	0.9	0.8	0.8	0.8	

5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,056	1,046	1,041	1,040	1,039

TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2019 THRU 2035

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2019	2020	2025	2030	2035	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN							
8	California Source Gas		310	310	310	310	310	8
9	Out-of-State		2,547	2,515	2,529	2,512	2,516	9
10	TOTAL SUPPLY TAKEN		2,857	2,825	2,839	2,822	2,826	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,857	2,825	2,839	2,822	2,826	12
	REQUIREMENTS FORECAST BY END-USE [5/]							
13	CORE [6/]	Residential	711	701	680	672	672	13
14		Commercial	243	241	239	241	244	14
15		Industrial	58	56	49	44	42	15
16		NGV	45	46	54	59	64	16
17		Subtotal-CORE	1,057	1,045	1,021	1,017	1,022	17
18	NONCORE	Commercial	41	39	30	24	25	18
19		Industrial	373	367	351	341	336	19
20		EOR Steaming	52	52	52	52	52	20
21		Electric Generation (EG)	848	840	895	893	891	21
22		Subtotal-NONCORE	1,313	1,297	1,327	1,310	1,303	22
23	WHOLESALE &	Core	207	207	213	219	226	23
24	INTERNATIONAL	Noncore Excl. EG	46	46	47	48	48	24
25		Electric Generation (EG)	196	192	193	192	191	25
26		Subtotal-WHOLESALE & INTL.	449	446	453	458	464	26
27		Co. Use & LUAF	37	37	37	37	37	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,857	2,825	2,839	2,822	2,826	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	51	50	51	52	53	29
30	NONCORE	Commercial/Industrial	414	406	381	365	360	30
31		EOR Steaming	52	52	52	52	52	31
32		Electric Generation (EG)	848	840	895	893	891	32
33		Subtotal-RETAIL	1,364	1,348	1,378	1,361	1,356	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	449	446	453	458	464	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,813	1,794	1,831	1,820	1,820	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	0.7	0.7	0.5	0.5	0.5	
5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.						
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,033	1,021	997	991	995	

2014 CALIFORNIA GAS REPORT

LONG BEACH GAS AND OIL DEPARTMENT

CITY OF LONG BEACH MUNICIPAL GAS & OIL DEPARTMENT

The annual gas supply and forecast requirements prepared by the Long Beach Gas & Oil Department (Long Beach) are shown on the following tables for the years 2014 through 2035.

Serving approximately 145,000 customers, Long Beach is the largest California municipal gas utility and the fifth largest municipal gas utility in the United States. Long Beach's service territory includes the cities of Long Beach and Signal Hill, and sections of surrounding communities including Lakewood, Bellflower, Compton, Seal Beach, Paramount, and Los Alamitos. Long Beach's customer load profile is 56 percent residential and 44 percent commercial/industrial.

As a municipal utility, Long Beach's rates and policies are established by the City Council, which acts as the regulatory authority. The City Charter requires the gas utility to establish its rates comparable to the rates charged by surrounding gas utilities for similar types of service.

Long Beach receives a small amount of its gas supply directly into its pipeline system from local production fields that are located within Long Beach's service territory, as well as offshore. Currently, Long Beach receives approximately 5 percent of its gas supply from local production. The majority of Long Beach supplies are purchased at the California border, primarily from the Southwestern United States. Long Beach, as a wholesale customer, receives intrastate transmission service for this gas from SoCalGas.

2014 CALIFORNIA GAS REPORT

LONG BEACH GAS AND OIL DEPARTMENT
TABULAR DATA

TABLE 1A-LB

CITY OF LONG BEACH - GAS & OIL DEPARTMENT

ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY
RECORDED YEARS 2009 THRU 2013

LINE	ACTUAL DELIVERIES BY END-USE		2009	2010	2011	2012	2013	LINE
1	CORE	Residential	13.4	14.2	14.9	13.7	14.2	1
2	CORE/NONCORE	Commercial	5.1	5.3	5.6	5.4	5.9	2
3	CORE/NONCORE	Industrial	5.1	4.4	3.6	3.4	3.4	3
4		Subtotal	23.6	23.9	24.1	22.5	23.6	4
5	NON CORE	Non-EOR Cogeneration	0.4	0.8	0.8	1.6	1.5	5
6		EOR Cogen. & Steaming	-	-	-	-	-	6
7		Electric Utilities	-	-	-	-	-	7
8		Subtotal	0.4	0.8	0.8	1.6	1.5	8
9	WHOLESALE	Residential	-	-	-	-	-	9
10		Com. & Ind., others	-	-	-	-	-	10
11		Electric Utilities	-	-	-	-	-	11
12		Subtotal-WHOLESALE	-	-	-	-	-	12
13		Co. Use & LUAF	0.5	0.4	0.6	0.2	0.2	13
14		Subtotal-END USE	24.5	25.1	25.5	24.4	25.4	14
15		Storage Injection	-	-	-	-	-	15
16	SYSTEM TOTAL-THROUGHPUT		24.5	25.1	25.5	24.4	25.4	16
	ACTUAL TRANSPORTATION AND EXCHANGE							
17		Residential	N/A	N/A	N/A	N/A	N/A	17
18		Commercial/Industrial	4.2	3.5	2.7	2.7	2.5	18
19		Non-EOR Cogeneration	0.3	0.8	0.8	1.6	1.5	19
20		EOR Cogen. & Steaming	N/A	N/A	N/A	N/A	N/A	20
21		Electric Utilites	N/A	N/A	N/A	N/A	N/A	21
22		Subtotal-RETAIL	4.5	4.2	3.5	4.3	3.9	22
23	WHOLESALE	All End Uses	-	-	-	-	-	23
24	TOTAL TRANSPORTATION & EXCHANGE		4.5	4.2	3.5	4.3	3.9	24
	ACTUAL CURTAILMENT							
25		Residential	-	-	-	-	-	25
26		Commercial/Industrial	-	-	-	-	-	26
27		Non-EOR Cogeneration	-	-	-	-	-	27
28		EOR Cogen. & Steaming	-	-	-	-	-	28
29		Electric Utilites	-	-	-	-	-	29
30		Wholesale	-	-	-	-	-	30
31		TOTAL- Curtailment	-	-	-	-	-	31
32	REFUSAL		-	-	-	-	-	32

TABLE 1-LB

CITY OF LONG BEACH - GAS & OIL DEPARTMENT

ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY
RECORDED YEARS 2009 THRU 2013

LINE	GAS SUPPLY AVAILABLE	2009	2010	2011	2012	2013	LINE
	California Source Gas						
1	Regular Purchases	-	-	-	-	-	1
2	Received for Exchange/Transport	-	-	-	-	-	2
3	Total California Source Gas	-	-	-	-	-	3
4	Purchases from Other Utilities	-	-	-	-	-	4
	Out-of-State Gas						
5	Pacific Interstate Companies	-	-	-	-	-	5
6	Additional Core Supplies	-	-	-	-	-	6
7	Incremental Supplies	-	-	-	-	-	7
8	Out-of-State Transport	-	-	-	-	-	8
9	Total Out-of-State Gas	-	-	-	-	-	9
10	Subtotal	-	-	-	-	-	10
11	Underground Storage Withdrawal	-	-	-	-	-	11
12	GAS SUPPLY AVAILABLE	-	-	-	-	-	12
	GAS SUPPLY TAKEN						
	California Source Gas						
13	Regular Purchases	2.2	1.6	1.1	1.2	1.9	13
14	Received for Exchange/Transport	0	0	0	0	0	14
15	Total California Source Gas	2.2	1.6	1.1	1.2	1.9	15
16	Purchases from Other Utilities	-	-	-	-	-	16
	Out-of-State Gas						
17	Pacific Interstate Companies	-	-	-	-	-	17
18	Additional Core Supplies	-	-	-	-	-	18
19	Incremental Supplies	22.3	23.5	24.3	23.2	23.5	19
20	Out-of-State Transport	-	-	-	-	-	20
21	Total Out-of-State Gas	22.3	23.5	24.3	23.2	23.5	21
22	Subtotal	24.5	25.1	25.5	24.4	25.4	22
23	Underground Storage Withdrawal	-	-	-	-	-	23
24	TOTAL Gas Supply Taken & Transported	24.5	25.1	25.5	24.4	25.4	24

TABLE 2-LB

CITY OF LONG BEACH - GAS & OIL DEPARTMENT

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2014 THRU 2018

AVERAGE TEMPERATURE YEAR

LINE	CAPACITY AVAILABLE		2014	2015	2016	2017	2018	LINE
1	California Source Gas							1
2	Out-of-State Gas							2
3	TOTAL CAPACITY AVAILABLE							3
	GAS SUPPLY TAKEN							
4	California Source Gas		1.1	0.9	0.8	0.8	0.8	4
5	Out-of-State Gas		23.9	24.4	24.4	24.5	24.7	5
6	TOTAL SUPPLY TAKEN		25.0	25.3	25.2	25.3	25.5	6
7	Net Underground Storage Withdrawal		-	-	-	-	-	7
8	TOTAL THROUGHPUT (1)		25.0	25.3	25.2	25.3	25.5	8
	REQUIREMENTS FORECAST BY END-USE (1)							
9	CORE	Residential	14.7	14.7	14.8	14.9	14.9	9
10		Commercial	5.2	5.2	5.2	5.3	5.3	10
11		NGV	0.3	0.3	0.3	0.3	0.3	11
12		Subtotal-CORE	20.2	20.3	20.4	20.4	20.5	12
13	NONCORE	Industrial	3.3	3.3	3.3	3.2	3.3	13
14		Non-EOR Cogeneration	1.2	1.5	1.3	1.4	1.4	14
15		EOR	-	-	-	-	-	15
16		Utility Electric Generation	-	-	-	-	-	16
17		NGV	-	-	-	-	-	17
18		Subtotal-NONCORE	4.5	4.8	4.6	4.6	4.7	18
19		Co. Use & LUAF	0.2	0.2	0.2	0.2	0.2	19
20	SYSTEM TOTAL THROUGHPUT (1)		25.0	25.3	25.2	25.3	25.5	20
21	SYSTEM CURTAILMENT		-	-	-	-	-	21
	TRANSPORTATION							
22	CORE	All End Uses	-	-	-	-	-	22
23	NONCORE	Industrial	2.5	2.5	2.5	2.5	2.5	23
24		Non-EOR Cogeneration	1.2	1.5	1.3	1.3	1.4	24
25		EOR	-	-	-	-	-	25
26		Utility Electric Generation	-	-	-	-	-	26
27		Subtotal NONCORE	3.7	3.9	3.8	3.8	3.9	27
28	TOTAL TRANSPORTATION		3.7	3.9	3.8	3.8	3.9	28

(1) Requirement forecast by end-use includes sales and transportation volumes.

TABLE 3-LB

CITY OF LONG BEACH - GAS & OIL DEPARTMENT

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2019 THRU 2035

AVERAGE TEMPERATURE YEAR

LINE	CAPACITY AVAILABLE		2019	2020	2025	2030	2035	LINE
1	California Source Gas							1
2	Out-of-State Gas							2
3	TOTAL CAPACITY AVAILABLE							3
	GAS SUPPLY TAKEN							
4	California Source Gas		0.7	0.7	0.5	0.4	0.4	4
5	Out-of-State Gas		24.7	24.8	25.3	25.8	26.2	5
6	TOTAL SUPPLY TAKEN		25.4	25.5	25.9	26.2	26.5	6
7	Net Underground Storage Withdrawal		0	0	0	0	0	7
8	TOTAL THROUGHPUT (1)		25.4	25.5	25.9	26.2	26.5	8
	REQUIREMENTS FORECAST BY END-USE (1)							
9	CORE	Residential	15.0	15.0	15.3	15.7	16.0	9
10		Commercial	5.3	5.3	5.3	5.3	5.3	10
11		NGV	0.3	0.3	0.3	0.3	0.3	11
12		Subtotal-CORE	20.6	20.6	21.0	21.3	21.6	12
13	NONCORE	Industrial	3.3	3.3	3.3	3.3	3.3	13
14		Non-EOR Cogeneration	1.4	1.4	1.4	1.4	1.4	14
15		EOR	0	0	0	0	0	15
16		Utility Electric Generation	0	0	0	0	0	16
17		NGV	0	0	0	0	0	17
18		Subtotal-NONCORE	4.6	4.7	4.7	4.7	4.7	18
19		Co. Use & LUAF	0.2	0.2	0.2	0.2	0.2	19
20	SYSTEM TOTAL THROUGHPUT (1)		25.4	25.5	25.9	26.2	26.5	20
21	SYSTEM CURTAILMENT		0	0	0	0	0	21
	TRANSPORTATION							
22	CORE	All End Uses	0	0	0	0	0	22
23	NONCORE	Industrial	2.5	2.5	2.5	2.5	2.5	23
24		Non-EOR Cogeneration	1.3	1.4	1.3	1.3	1.3	24
25		EOR	0	0	0	0	0	25
26		Utility Electric Generation	0	0	0	0	0	26
27		Subtotal NONCORE	3.8	3.8	3.8	3.8	3.8	27
28	TOTAL TRANSPORTATION		3.8	3.8	3.8	3.8	3.8	28

(1) Requirement forecast by end-use includes sales and transportation volumes.

TABLE 6-LB

CITY OF LONG BEACH - GAS & OIL DEPARTMENT

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2014 THRU 2018

1 in 35 TEMPERATURE YEAR

LINE	CAPACITY AVAILABLE		2014	2015	2016	2017	2018	LINE
1	California Source Gas							1
2	Out-of-State Gas							2
3	TOTAL CAPACITY AVAILABLE							3
	GAS SUPPLY TAKEN							
4	California Source Gas		1.1	0.9	0.8	0.8	0.8	4
5	Out-of-State Gas		25.2	25.7	25.7	25.8	26.0	5
6	TOTAL SUPPLY TAKEN		26.3	26.6	26.6	26.6	26.8	6
7	Net Underground Storage Withdrawal		-	-	-	-	-	7
8	TOTAL THROUGHPUT (1)		26.3	26.6	26.6	26.6	26.8	8
	REQUIREMENTS FORECAST BY END-USE (1)							
9	CORE	Residential	15.8	15.9	16.0	16.0	16.0	9
10		Commercial	5.4	5.4	5.4	5.4	5.4	10
11		NGV	0.3	0.3	0.3	0.3	0.3	11
12		Subtotal-CORE	21.5	21.6	21.7	21.7	21.8	12
13	NONCORE	Industrial	3.3	3.3	3.3	3.2	3.3	13
14		Non-EOR Cogeneration	1.2	1.5	1.3	1.4	1.4	14
15		EOR	-	-	-	-	-	15
16		Utility Electric Generation	-	-	-	-	-	16
17		NGV	-	-	-	-	-	17
18		Subtotal-NONCORE	4.5	4.8	4.6	4.6	4.7	18
19		Co. Use & LUAF	0.2	0.3	0.2	0.3	0.3	19
20	SYSTEM TOTAL THROUGHPUT (1)		26.3	26.6	26.6	26.6	26.8	20
21	SYSTEM CURTAILMENT		-	-	-	-	-	21
	TRANSPORTATION							
22	CORE	All End Uses	-	-	-	-	-	22
23	NONCORE	Industrial	2.5	2.5	2.5	2.5	2.5	23
24		Non-EOR Cogeneration	1.2	1.5	1.3	1.3	1.4	24
25		EOR	-	-	-	-	-	25
26		Utility Electric Generation	-	-	-	-	-	26
27		Subtotal NONCORE	3.7	3.9	3.8	3.8	3.9	27
28	TOTAL TRANSPORTATION		3.7	3.9	3.8	3.8	3.9	28

(1) Requirement forecast by end-use includes sales and transportation volumes.

TABLE 7-LB

CITY OF LONG BEACH - GAS & OIL DEPARTMENT

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2019 THRU 2035

1 in 35 TEMPERATURE YEAR

LINE	CAPACITY AVAILABLE		2019	2020	2025	2030	2035	LINE
1	California Source Gas							1
2	Out-of-State Gas							2
3	TOTAL CAPACITY AVAILABLE							3
	GAS SUPPLY TAKEN							
4	California Source Gas		0.7	0.7	0.5	0.5	0.5	4
5	Out-of-State Gas		26.0	26.2	26.7	27.1	27.5	5
6	TOTAL SUPPLY TAKEN		26.7	26.9	27.2	27.6	27.9	6
7	Net Underground Storage Withdrawal		0	0	0	0	0	7
8	TOTAL THROUGHPUT (1)		26.7	26.9	27.2	27.6	27.9	8
	REQUIREMENTS FORECAST BY END-USE (1)							
9	CORE	Residential	16.1	16.2	16.5	16.8	17.2	9
10		Commercial	5.4	5.5	5.5	5.5	5.5	10
11		NGV	0.3	0.3	0.3	0.3	0.3	11
12		Subtotal-CORE	21.9	22.0	22.3	22.7	23.0	12
13	NONCORE	Industrial	3.3	3.3	3.3	3.3	3.3	13
14		Non-EOR Cogeneration	1.4	1.4	1.4	1.4	1.4	14
15		EOR	0	0	0	0	0	15
16		Utility Electric Generation	0	0	0	0	0	16
17		NGV	0	0	0	0	0	17
18		Subtotal-NONCORE	4.6	4.7	4.7	4.7	4.7	18
19		Co. Use & LUAF	0.3	0.3	0.3	0.3	0.3	19
20	SYSTEM TOTAL THROUGHPUT (1)		26.7	26.9	27.2	27.6	27.9	20
21	SYSTEM CURTAILMENT		0	0	0	0	0	21
	TRANSPORTATION							
22	CORE	All End Uses	0	0	0	0	0	22
23	NONCORE	Industrial	2.5	2.5	2.5	2.5	2.5	23
24		Non-EOR Cogeneration	1.3	1.4	1.3	1.3	1.3	24
25		EOR	0	0	0	0	0	25
26		Utility Electric Generation	0	0	0	0	0	26
27		Subtotal NONCORE	3.8	3.8	3.8	3.8	3.8	27
28	TOTAL TRANSPORTATION		3.8	3.8	3.8	3.8	3.8	28

(1) Requirement forecast by end-use includes sales and transportation volumes.

2014 CALIFORNIA GAS REPORT

SAN DIEGO GAS & ELECTRIC COMPANY

INTRODUCTION

San Diego Gas & Electric Company (SDG&E) is a combined gas and electric distribution utility serving more than three million people in San Diego and the southern portions of Orange County. SDG&E delivered natural gas to 861,573 customers in San Diego County in 2013, including power plants and turbines. Total gas sales and transportation through SDG&E's system for 2013 were approximately 135 billion cubic feet (Bcf), which is an average of over 369 million cubic feet per day (MMcf/day).

The Gas Supply, Capacity, and Storage section for SDG&E has been moved to SoCalGas' due to the integration of gas procurement and system integration functions into one combined SDG&E/SoCalGas system per D.07-12-019 (natural gas operations and service offerings) and D.06-12-031 (system integration).

GAS DEMAND

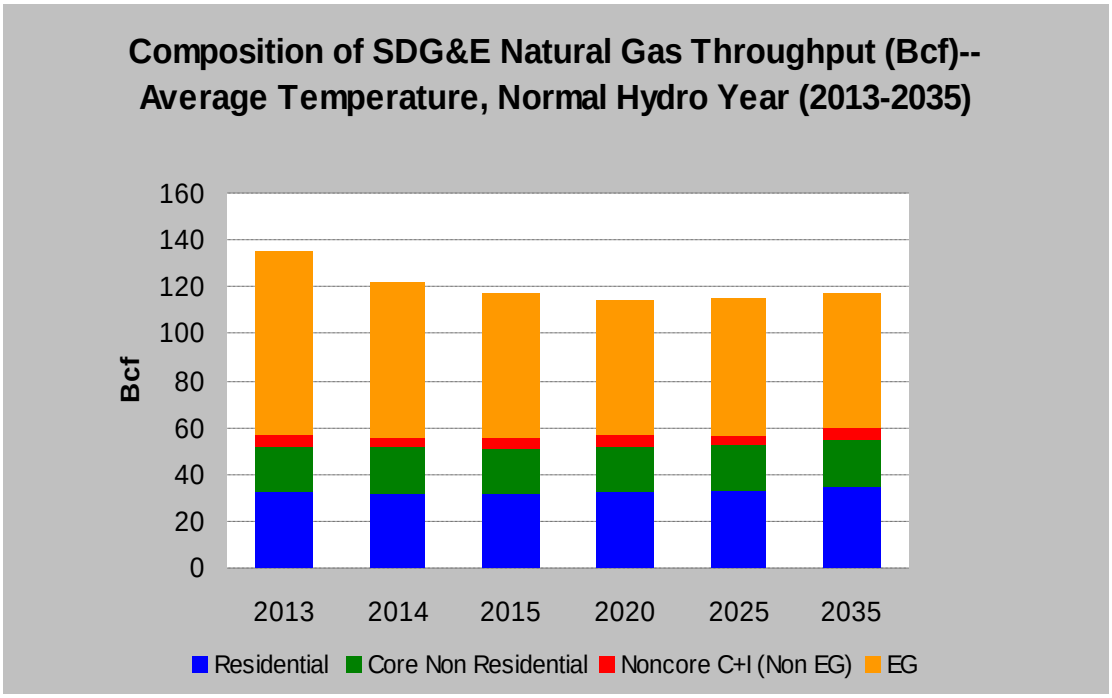
OVERVIEW

SDG&E's gas demand forecast is largely determined by the long-term economic outlook for its San Diego County service area. The county's economic trends are expected to generally parallel those of the larger SoCalGas area as discussed above.

This projection of natural gas requirements, excluding electric generation (EG) demand, is derived from models that integrate demographic assumptions, economic growth, energy prices, energy efficiency programs, customer information programs, building and appliance standards, weather and other factors. Non-EG gas demand is projected to remain virtually flat between 2013 and 2035. The total load, including EG, is expected to decline from a total of 135 Bcf in 2013 to 117 Bcf by 2035. Assumptions for SDG&E's gas transportation requirements for EG are included as part of the wholesale market sector description for SoCalGas.

ECONOMICS AND DEMOGRAPHICS

SDG&E's gas demand forecast is largely determined by the long-term economic outlook for its San Diego County service area. The county's economic trends are expected to generally parallel those of the larger SoCalGas area as discussed above. San Diego County's total employment is forecasted to grow an average of 1.2% annually from 2013 to 2035; the subset of industrial (mining and manufacturing) jobs is projected to remain virtually flat over the same period. From 2013 to 2035, the county's inflation-adjusted Gross Product is expected to average 3.0% annual growth. (Gross Product, the local equivalent of national Gross Domestic Product, is a measure of the total economic output of the area economy.) The number of SDG&E gas meters is expected to increase an average of 1.3% annually from 2013 through 2035.



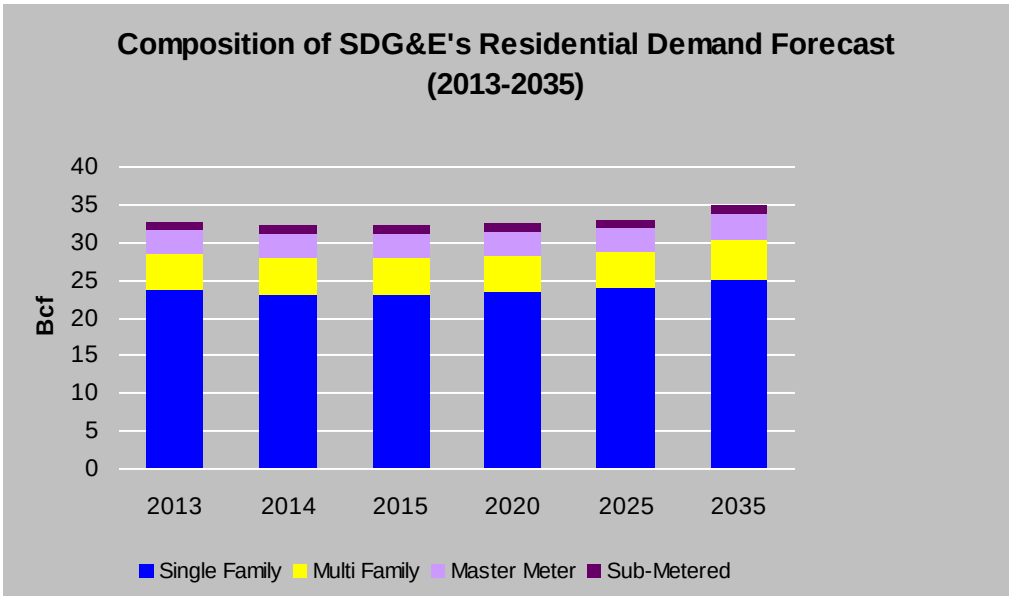
MARKET SECTORS

Residential

The total residential customer count for SDG&E consists of four residential segment types. These are single family and multi-family customers, as well as master meter and sub-metered customers. The active meters for all residential customer classes averaged 831,403 in 2013. This total reflects a 5,206 meter increase relative to the 2012 total. The overall observed 2012-2013 residential meter growth was 0.63%.

Residential demand adjusted for average temperature conditions totaled 33 Bcf in 2013. By the year 2035, residential demand is expected to reach 35 Bcf. The change reflects a 0.29% annual compound growth rate.

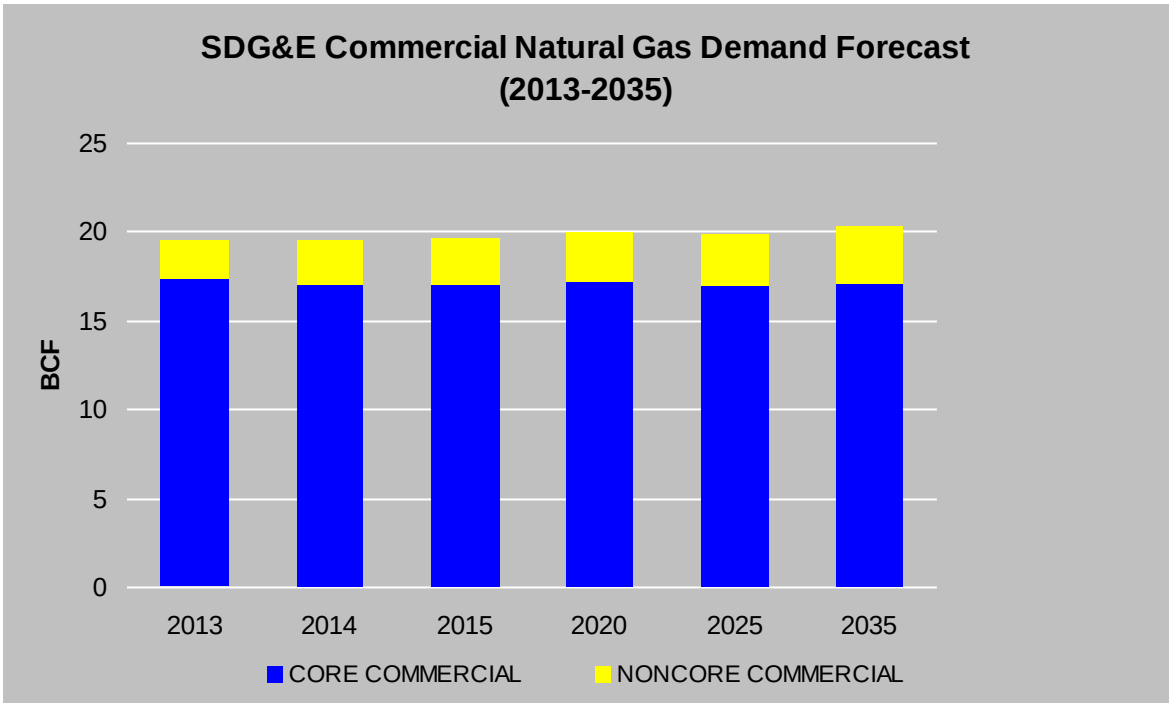
The projected residential natural gas demand will be influenced primarily by residential meter growth moderated by the forecasted declining use per customer due to energy efficiency improvements in the building shell design, appliance efficiency and CPUC-authorized EE programs plus the additional efficiency gains associated with advanced metering.



Commercial

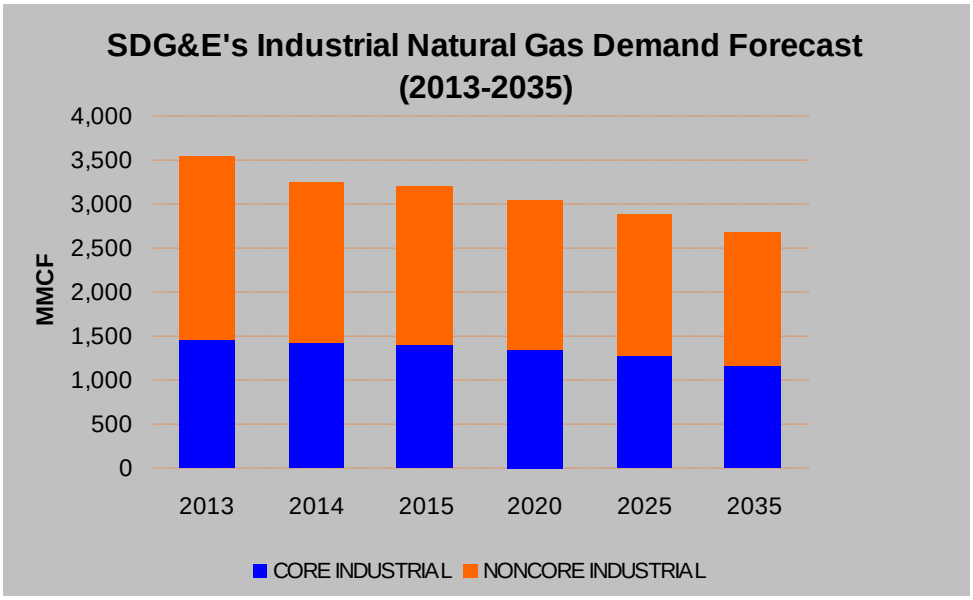
On a temperature-adjusted basis, the core commercial demand in 2013 totaled 17 Bcf. By the year 2035, the SDG&E core commercial load is expected to remain at 17 Bcf.

SDG&E's noncore commercial load in 2013 was 2.2 Bcf. Over the forecast period, gas demand in this market is projected to show moderate growth mostly driven by increased economic activity and employment. Noncore commercial load is projected to grow to 3.3 Bcf by 2035, an average annual increase of 1.9%.



Industrial

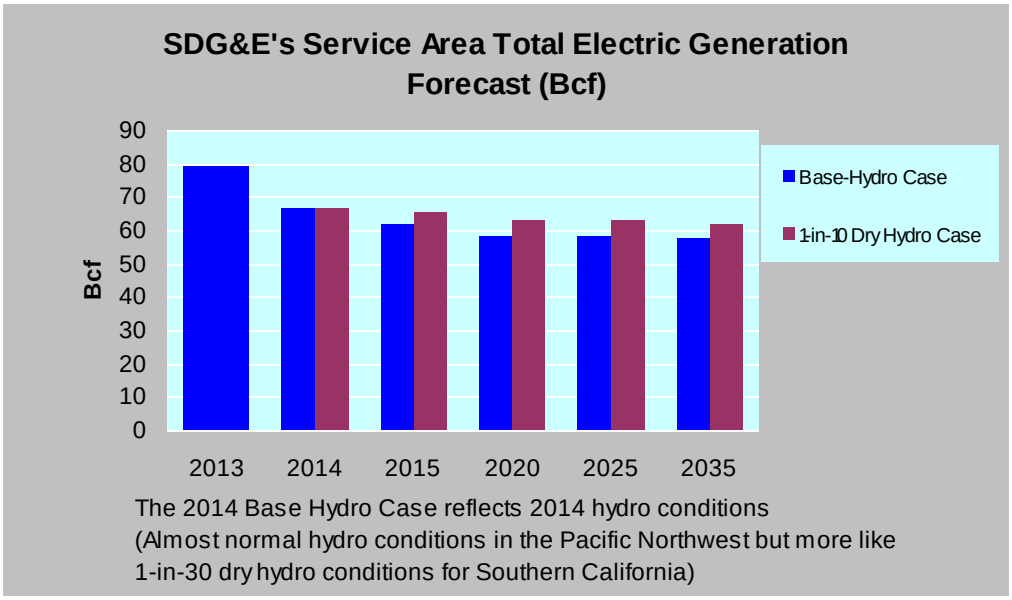
In 2013, temperature-adjusted core industrial demand was 1.4 Bcf. The core industrial market demand is projected to decrease at an average rate of 1% per year from 1.4 Bcf in 2013 to 1.2 Bcf in 2035. This result is due to slightly lower forecasted growth in industrial production and the impact of savings from CPUC-authorized energy-efficiency programs in the industrial sector.



Noncore industrial load in 2013 was 2.2 Bcf and is expected to decline at an average rate of 1.5% per year to 1.6 Bcf by 2035. CPUC-mandated energy efficiency programs more than offset any modest gains from industrial economic growth.

Electric Generation

Total EG, including cogeneration and non-cogeneration EG, is expected to decrease at an annual average rate of 1.4 percent from 79 Bcf in 2013 to 58 Bcf in 2035. The following graph shows total EG forecasts for a normal hydro year and a 1-in-10 dry hydro year.



Cogeneration

Small EG load from self-generation totaled 18.0 Bcf in 2013. By 2035, small EG load is expected to decrease slightly to 17.4 Bcf – declining an average of 0.1% per year, mainly due to the effects of higher costs for mandated carbon emissions reduction.

Non-Cogeneration Electric Generation

The forecast of the large EG loads in SDG&E's service area is based on the power market simulation as noted in SoCalGas' electric generation chapter for "Non-Cogeneration EG" demand. This forecast includes approximately 900 MW of new thermal peaking generating resources in its service area by 2020. However, it also assumes that approximately 1,150 MW of the existing plants are retired during the same time period. EG demand is forecasted to decrease from 49 Bcf in 2014 to 41 Bcf in 2025. It is important to note that the first year of the forecast, 2014, is a dry hydro year and the forecast for the remaining years, 2015-2025, is based on normal hydro conditions. Therefore the EG demand for 2014 is higher than it would have been under normal hydro conditions. From 2015 through 2025, EG gas demand is forecast to decrease from 44 Bcf in 2015 to 41 Bcf in 2025. The EG forecast is held constant at 2025 levels for 2030 and 2035 as previously explained.

A 1-in-10 year dry hydro sensitivity forecast was also developed. A dry hydro year increased SDG&E's EG demand on average for the forecast period by approximately 4 Bcf or 10% per year. For additional information on EG assumptions, such as renewable generation, greenhouse gas adders and sensitivity to electric demand and attainment of renewables' goals, refer to the Non-Cogeneration Electric Generation section of the SoCalGas Electric Generation chapter.

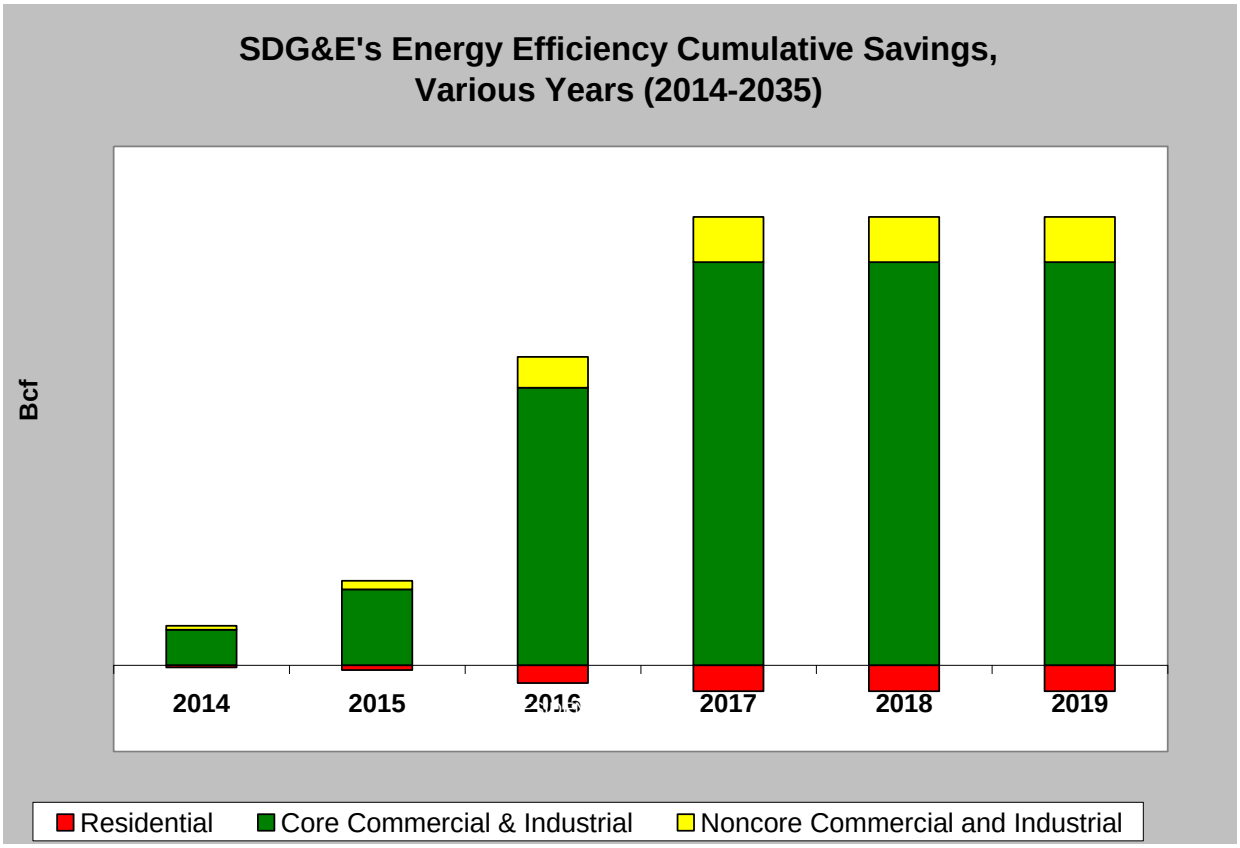
Natural Gas Vehicles (NGV)

The NGV market is expected to continue to grow due to government (federal, state and local) incentives and regulations related to the purchase and operation of alternate fuel vehicles, growing numbers of natural gas engines and vehicles, and the increasing cost differential between petroleum (gasoline and diesel) and natural gas. At the end of 2013, there were 31 compressed natural gas (CNG) fueling stations delivering about 1.4 Bcf of natural gas during the year. The NGV market is forecast to essentially triple in size to 4.6 Bcf in 2035, a growth rate of nearly 5.6% per year.

ENERGY EFFICIENCY PROGRAMS

Conservation and energy efficiency activities encourage customers to install energy efficient equipment and weatherization measures and adopt energy saving practices that result in reduced gas usage while still maintaining a comparable level of service. Conservation and energy efficiency load impacts are shown as positive numbers. The "total net load impact" is the natural gas throughput reduction resulting from the Energy Efficiency programs.

The cumulative net load impact forecast from SDG&E's integrated gas and electric energy efficiency programs for selected years is shown in the graph below. The net load impact includes all Energy Efficiency programs, both gas and electric, that SDG&E has forecasted to be implemented beginning in year 2014 and occurring through the year 2035. Savings and goals for these programs are based on the program goals authorized by the Commission in D.12-05-015 and D.12-15-015.



Savings reported are for measures installed under SDG&E's gas and electric Energy Efficiency programs. Credit is only taken for measures that are installed as a result of SDG&E's Energy Efficiency programs, and only for the measure lives of the measures installed.[6] Measures with useful lives less than the forecast planning period fall out of the forecast when their expected life is reached. This means, for example, that a measure installed in 2014 with a lifetime of 10 years is only included in the forecast through 2023.[7] Naturally occurring conservation that is not attributable to SDG&E's Energy Efficiency activities is not included in the Energy Efficiency forecast.

Notes:
(1) "Hard" impacts include measures requiring a physical equipment modification or replacement.
(2) SDG&E does not include "soft" impacts, e.g., energy management services type measures.
(3) The assumed average measure life is 10 years.

[6] The above chart shows that SDG&E's residential integrated gas and electric energy efficiency program leads to gas consumption actually increasing due to the interactive impacts of gas and electric efficiency measures. For example, high efficiency lights generate less heat and thus, lead to more gas heating during winter months.
[7] The assumed average measure life is 10 years.

GAS SUPPLY

Beginning April 2008, gas supplies to serve both SoCalGas' and SDG&E's retail core gas demand are procured with a combined SoCalGas/SDG&E portfolio per D.07-12-019 December 6, 2007. Refer to the Gas Supply, Capacity and Storage section in the Southern California area for more information.

PEAK DAY DEMAND

Beginning in April 2008, gas supplies to serve both SoCalGas' and SDG&E's retail core gas demand are procured with a combined portfolio with a total firm storage withdrawal capacity designed to serve the utilities' combined retail core peak-day gas demand. Please see the corresponding discussion of "Peak Day Demand and Deliverability" under the SoCalGas portion of this report for an illustration of how storage and flowing supplies can meet the growth in forecasted load for the combined (SoCalGas plus SDG&E) retail core peak day demand.

2014 CALIFORNIA GAS REPORT

SAN DIEGO GAS & ELECTRIC COMPANY
TABULAR DATA

San Diego Gas & Electric Company
Annual Gas Supply and Sendout (MMCF/Day)
Recorded Years 2009-2013

LINE			2009	2010	2011	2012	2013
	Actual Deliveries by End-Use						
1	**CORE**	Residential	82	85	88	83	85
2		Commercial	48	48	50	50	52
3		Industrial	0	0	0	0	0
4	*Subtotal -*	*CORE*	130	133	138	134	137
5	**NONCORE**	Commercial	0	0	0	0	0
6		Industrial	11	12	12	13	12
7		Non-EOR Cogen/EG	115	98	69	100	70
8		Electric Utilities	64	81	87	134	147
9	*Subtotal -*	*NONCORE*	191	191	169	247	229
10	**WHOLESALE**	All End Uses	0	0	0	0	0
11	*Subtotal -*	*Co Use & LUAF*	3	6	5	4	5
12	**SYSTEM TOTAL THROUGHPUT**		324	330	312	384	371
	Actual Transport & Exchange						
13	**CORE**	Residential	0	0	0	0	1
14		Commercial	8	10	10	11	12
15	**NONCORE**	Industrial	11	12	12	13	12
16		Non-EOR Cogen/EG	115	98	69	100	70
17		Electric Utilities	64	81	87	134	147
18	*Subtotal -*	*RETAIL*	199	201	179	258	242
19	**WHOLESALE**	All End Uses	0	0	0	0	0
20	**TOTAL TRANSPORT & EXCHANGE**		199	201	179	258	242
	Storage						
21		*Storage Injection*	0	0	0	0	0
22		*Storage Withdrawal*	0	0	0	0	0
	Actual Curtailment						
23		Residential	0	0	0	0	0
24		Com/Indl & Cogen	0	0	0	0	0
25		Electric Generation	0	0	0	0	0
26	**TOTAL CURTAILMENT**		0	0	0	0	0
27	**REFUSAL**		0	0	0	0	0
	ACTUAL DELIVERIES BY END-USE includes sales and transportation volumes						
		MMbtu/Mcf:	1.020	1.019	1.018	1.017	1.024

NB: This file and MMCFD Supplies are used in the odd year reports (see P 17-18 of CGR)

SAN DIEGO GAS & ELECTRIC COMPANY

ANNUAL GAS SUPPLY TAKEN (MMCF/DAY)
RECORDED YEARS 2009-2013

LINE		2009	2010	2011	2012	2013
	CAPACITY AVAILABLE					
1	**California Sources**					
	Out of State gas					
2	California Offshore (POPCO/PIOC)					
3	El Paso Natural Gas Company					
4	Transwestern Pipeline company					
5	Kern River/Mojave Pipeline Company					
6	TransCanada GTN/PG&E					
7	Other					
8	**TOTAL Output of State**					
9	Underground storage withdrawal					
10	**TOTAL Gas Supply available**					
	Gas Supply Taken	**2009**	**2010**	**2011**	**2012**	**2013**
	California Source Gas					
11	Regular Purchases	0	0	0	0	0
12	Received for Exchange/Transport	0	0	0	0	0
13	**Total California Source Gas**	0	0	0	0	0
14	**Purchases from Other Utilities**	0	0	0	0	0
	Out-of-State Gas					
15	Pacific Interstate Companies	0	0	0	0	0
16	Additional Core Supplies	0	0	0	0	0
17	Supplemental Supplies-Utility	125	130	132	126	129
18	Out-of-State Transport-Others	199	201	179	258	242
19	**Total Out-of-State Gas**	324	330	312	384	371
20	**TOTAL Gas Supply Taken & Transported**	324	330	312	384	371

TABLE 1-SDGE

SAN DIEGO GAS & ELECTRIC COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2014 THRU 2018

AVERAGE TEMPERATURE YEAR

LINE			2014	2015	2016	2017	2018	LINE
	CAPACITY AVAILABLE [1/ & 2/]							
1	California Source Gas		0	0	0	0	0	1
2	Southern Zone of SoCalGas [1/]		607	607	607	607	607	2
3	TOTAL CAPACITY AVAILABLE		607	607	607	607	607	3
	GAS SUPPLY TAKEN							
4	California Source Gas		0	0	0	0	0	4
5	Southern Zone of SoCalGas		341	325	332	330	323	5
6	TOTAL SUPPLY TAKEN		341	325	332	330	323	6
7	Net Underground Storage Withdrawal		0	0	0	0	0	7
8	TOTAL THROUGHPUT		341	325	332	330	323	8
	REQUIREMENTS FORECAST BY END-USE [3/]							
9	CORE [4/]	Residential	88	87	88	88	88	9
10		Commercial	47	47	47	47	47	10
11		Industrial	4	4	4	4	4	11
12		NGV	2	2	2	2	2	12
13		Subtotal-CORE	141	140	141	141	141	13
14	NONCORE	Commercial	7	7	7	7	8	14
15		Industrial	5	5	5	5	5	15
16		Electric Generation (EG)	183	169	175	173	165	16
17		Subtotal-NONCORE	195	181	187	185	178	17
18		Co. Use & LUAF	5	4	4	4	4	18
19	SYSTEM TOTAL THROUGHPUT		341	325	332	330	323	19
	TRANSPORTATION AND EXCHANGE							
20	CORE	All End Uses	11	12	12	12	12	20
21	NONCORE	Commercial/Industrial	12	12	12	12	12	21
22		Electric Generation (EG)	183	169	175	173	165	22
23	TOTAL TRANSPORTATION & EXCHANGE		206	193	199	197	189	23
	CURTAILMENT							
24		Core	0	0	0	0	0	24
25		Noncore	0	0	0	0	0	25
26		TOTAL - Curtailment	0	0	0	0	0	26

NOTES:

1/ Capacity to receive gas from the Southern Zone of SoCalGas is an annual value based on weighting winter and non-winter season values: 607 = (630 winter) x (151/365) + (590 non-winter) x (214/365).

2/ For 2010 and after, assume capacity at same levels.

3/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

4/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 133 131 132 132 132

TABLE 2-SDGE

SAN DIEGO GAS & ELECTRIC COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2019 THRU 2035

AVERAGE TEMPERATURE YEAR

LINE			2019	2020	2025	2030	2035	LINE
	CAPACITY AVAILABLE [1/ & 2/]							
1	California Source Gas		0	0	0	0	0	1
2	Southern Zone of SoCalGas [1/]		607	607	607	607	607	2
3	TOTAL CAPACITY AVAILABLE		607	607	607	607	607	3
	GAS SUPPLY TAKEN							
4	California Source Gas		0	0	0	0	0	4
5	Out-of-State		321	318	318	322	325	5
6	TOTAL SUPPLY TAKEN		321	318	318	322	325	6
7	Net Underground Storage Withdrawal		0	0	0	0	0	7
8	TOTAL THROUGHPUT		321	318	318	322	325	8
	REQUIREMENTS FORECAST BY END-USE [3/]							
9	CORE [4/]	Residential	88	88	90	93	95	9
10		Commercial	47	47	46	46	46	10
11		Industrial	4	4	3	3	3	11
12		NGV	3	3	3	5	6	12
13		Subtotal-CORE	142	142	142	147	150	13
14	NONCORE	Commercial	8	8	8	8	9	14
15		Industrial	5	5	4	4	4	15
16		Electric Generation (EG)	162	159	160	159	158	16
17		Subtotal-NONCORE	175	172	172	171	171	17
18		Co. Use & LUAF	4	4	4	4	4	18
19	SYSTEM TOTAL THROUGHPUT		321	318	318	322	325	19
	TRANSPORTATION AND EXCHANGE							
20	CORE	All End Uses	12	12	13	15	17	20
21	NONCORE	Commercial/Industrial	12	12	12	13	13	21
22		Electric Generation (EG)	162	159	160	159	158	22
23	TOTAL TRANSPORTATION & EXCHANGE		186	183	185	187	188	23
	CURTAILMENT							
24		Core	0	0	0	0	0	24
25		Noncore	0	0	0	0	0	25
26		TOTAL - Curtailment	0	0	0	0	0	26

NOTES:

1/ Capacity to receive gas from the Southern Zone of SoCalGas is an annual value based on weighting winter and non-winter season values: 607 = (630 winter) x (151/365) + (590 non-winter) x (214/365).

2/ For 2010 and after, assume capacity at same levels.

3/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

4/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 133 133 132 135 136

TABLE 3-SDGE

SAN DIEGO GAS & ELECTRIC COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2014 THRU 2018

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2014	2015	2016	2017	2018	LINE
	CAPACITY AVAILABLE [1/ & 2/]							
1	California Source Gas		0	0	0	0	0	1
2	Southern Zone of SoCalGas [1/]		607	607	607	607	607	2
3	TOTAL CAPACITY AVAILABLE		607	607	607	607	607	3
	GAS SUPPLY TAKEN							
4	California Source Gas		0	0	0	0	0	4
5	Out-of-State		350	344	355	351	348	5
6	TOTAL SUPPLY TAKEN		350	344	355	351	348	6
7	Net Underground Storage Withdrawal		0	0	0	0	0	7
8	TOTAL THROUGHPUT		350	344	355	351	348	8
	REQUIREMENTS FORECAST BY END-USE [3/]							
9	CORE [4/]	Residential	96	95	96	96	96	9
10		Commercial	48	48	49	49	49	10
11		Industrial	4	4	4	4	4	11
12		NGV	2	2	2	2	2	12
13		Subtotal-CORE	150	149	151	151	151	13
14	NONCORE	Commercial	7	7	7	7	8	14
15		Industrial	5	5	5	5	5	15
16		Electric Generation (EG)	183	178	187	183	179	16
17		Subtotal-NONCORE	195	190	199	195	192	17
18		Co. Use & LUAF	5	5	5	5	5	18
19	SYSTEM TOTAL THROUGHPUT		350	344	355	351	348	19
	TRANSPORTATION AND EXCHANGE							
20	CORE	All End Uses	12	12	12	12	13	20
21	NONCORE	Commercial/Industrial	12	12	12	12	12	21
22		Electric Generation (EG)	183	178	187	183	179	22
23	TOTAL TRANSPORTATION & EXCHANGE		207	202	211	207	204	23
	CURTAILMENT							
24		Core	0	0	0	0	0	24
25		Noncore	0	0	0	0	0	25
26		TOTAL - Curtailment	0	0	0	0	0	26

NOTES:

1/ Capacity to receive gas from the Southern Zone of SoCalGas is an annual value based on weighting winter and non-winter season values: 607 = (630 winter) x (151/365) + (590 non-winter) x (214/365).

2/ For 2010 and after, assume capacity at same levels.

3/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

4/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 141 140 142 142 141

TABLE 4-SDGE

SAN DIEGO GAS & ELECTRIC COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2019 THRU 2035

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2019	2020	2025	2030	2035	LINE
	CAPACITY AVAILABLE [1/ & 2/]							
1	California Source Gas		0	0	0	0	0	1
2	Southern Zone of SoCalGas [1/]		607	607	607	607	607	2
3	TOTAL CAPACITY AVAILABLE		607	607	607	607	607	3
	GAS SUPPLY TAKEN							
4	California Source Gas		0	0	0	0	0	4
5	Out-of-State		345	342	342	345	348	5
6	TOTAL SUPPLY TAKEN		345	342	342	345	348	6
7	Net Underground Storage Withdrawal		0	0	0	0	0	7
8	TOTAL THROUGHPUT		345	342	342	345	348	8
	REQUIREMENTS FORECAST BY END-USE [3/]							
9	CORE [4/]	Residential	96	96	98	101	103	9
10		Commercial	49	49	48	48	48	10
11		Industrial	4	4	4	3	3	11
12		NGV	3	3	3	5	6	12
13		Subtotal-CORE	152	152	153	157	160	13
14	NONCORE	Commercial	8	8	8	8	9	14
15		Industrial	5	5	4	4	4	15
16		Electric Generation (EG)	175	172	172	171	170	16
17		Subtotal-NONCORE	188	185	184	183	183	17
18		Co. Use & LUAF	5	5	5	5	5	18
19	SYSTEM TOTAL THROUGHPUT		345	342	342	345	348	19
	TRANSPORTATION AND EXCHANGE							
20	CORE	All End Uses	13	13	14	15	17	20
21	NONCORE	Commercial/Industrial	12	12	12	13	13	21
22		Electric Generation (EG)	175	172	172	171	170	22
23	TOTAL TRANSPORTATION & EXCHANGE		200	197	198	199	200	23
	CURTAILMENT							
24		Core	0	0	0	0	0	24
25		Noncore	0	0	0	0	0	25
26		TOTAL - Curtailment	0	0	0	0	0	26

NOTES:

1/ Capacity to receive gas from the Southern Zone of SoCalGas is an annual value based on weighting winter and non-winter season values: 607 = (630 winter) x (151/365) + (590 non-winter) x (214/365).

2/ For 2010 and after, assume capacity at same levels.

3/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

4/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 142 142 142 145 146

2014 CALIFORNIA GAS REPORT

GLOSSARY

GLOSSARY

Average Day (Operational Definition)
Annual gas sales or requirements assuming average temperature year conditions divided by 365 days.

Average Temperature year
Long-term average recorded temperature.

BTU (British Thermal Unit)
Unit of measurement equal to the amount of heat energy required to raise the temperature of one pound of water one degree Fahrenheit. This unit is commonly used to measure the quantity of heat available from complete combustion of natural gas.

California-Source Gas
1. Regular Purchases – All gas received or forecast from California producers, excluding exchange volumes. Also referred to as Local Deliveries.
2. Received for Exchange/Transport – All gas received or forecast from California producers for exchange, payback, or transport.

CEC
California Energy Commission.

CNG (Compressed Natural Gas)
Fuel for natural gas vehicles, typically natural gas compressed to 3000 pounds per square inch.

Cogeneration
Simultaneous production of electricity and thermal energy from the same fuel source. Also used to designate a separate class of gas customers.

Cold Temperature Year
Cold design-temperature conditions based on long-term recorded weather data.

Commercial (SoCalGas & SDG&E)
Category of gas customers whose establishments consist of services, manufacturing nondurable goods, dwellings not classified as residential, and farming (agricultural).

Commercial (PG&E)
Non-residential gas customers not engaged in electric generation, enhanced oil recovery, or gas resale activities with usage less than 20,800 therms per month.

Company Use

Gas used by utilities for operational purposes, such as fuel for line compression and injection into storage.

Conversion Factor (Natural Gas)

- 1 CF (Cubic Feet) = Approx. 1,000 BTUs
- 1 CCF = 100 CF = Approximately 1 Therm
- 1 Therm = 100,000 BTUs = Approximately 100 CF = 0.1 MCF
- 10 Therms = 1 Dth (dekatherm) = Approximately 1 MCF
- 1 MCF = 1,000 CF = Approximately 10 Therms = 1 MMBTU
- 1 MMCF = 1 million cubic feet = Approximately 1 MDth (1 thousand dekatherm)
- 1 BCF = 1 billion CF = Approximately 1 million MMBTU

Conversion Factor (Petroleum Products)

Approximate heat content of petroleum products (Million BTU per Barrel)

- Crude Oil 5.800
- Residual Fuel Oil 6.287
- Distillate Fuel Oil 5.825
- Petroleum Coke 6.024
- Butane 4.360
- Propane 3.836
- Pentane Plus 4.620
- Motor Gasoline 5.253

Conversion Factor (LNG)

Approximate LNG liquid conversion factor for one therm (High-Heat Value)

- Pounds 4.2020
- Gallons 1.1660
- Cubic Feet 0.1570
- Barrels 0.0280
- Cubic Meters 0.0044
- Metric Tonnes 0.0019

Core Aggregator

Individuals or entities arranging natural gas commodity procurement activities on behalf of core customers. Also, sometimes known as an Energy Service Provider (ESP), a Core Transport Agent (CTA), or a Retail Service Provider (RSP).

Core customers (SoCalGas & SDG&E)

All residential customers; all commercial and industrial customers with average usage less than 20,800 therms per month who typically cannot fuel switch. Also, those commercial and industrial customers (whose average usage is more than 20,800 therms per year) who elect to remain a core customer receiving bundled gas service from the LDC.

Core Customer (PG&E)

All customers with average usage less than 20,800 therms per month.

Core Subscription

Noncore customers who elect to use the LDC as a procurement agent to meet their commodity gas requirements.

CPUC

California Public Utilities Commission.

Cubic Foot of Gas

Volume of natural gas, which, at a temperature of 60° F and an absolute pressure of 14.73 pounds per square inch, occupies one cubic foot.

Curtailment

Temporary suspension, partial or complete, of gas deliveries to a customer or customers.

EG

Electric generation (including cogeneration) by a utility, customer, or independent power producer.

Energy Service Provider (ESP)

Individuals or entities engaged in providing retail energy services on behalf of customers. ESP's may provide commodity procurement, but could also provide other services, e.g., metering and billing.

Enhanced Oil Recovery (EOR)

Injection of steam into oil-holding geologic zones to increase ability to extract oil by lowering its viscosity. Also used to designate a special category of gas customers.

Exchange

Delivery of gas by one party to another and the delivery of an equivalent quantity by the second party to the first. Such transactions usually involve different points of delivery and may or may not be concurrent.

Exempt Wholesale Generators (EWG)

A category of customers consuming gas for the purpose of generating electric power.

FERC

Federal Energy Regulatory Commission.

Futures (Gas)

Unit of natural gas futures contract trades in units of 10,000 million British thermal units (MMBtu) at the New York Mercantile Exchange (NYMEX). The price is based on delivery at Henry Hub in Louisiana.

Gas Accord

The Gas Accord is a multi-party settlement agreement, which restructured PG&E's gas transportation and storage services. The settlement was filed with the CPUC in August 1996, approved by the CPUC in August 1997 (D.97-08-055) and implemented by

PG&E in March 1998. In D.03-12-061, the CPUC ordered the Gas Accord structure to continue for 2004 and 2005.

Key features of the Gas Accord structure include the following: unbundling of PG&E's gas transmission service and a portion of its storage service; placing PG&E at risk for transmission service and a portion of its storage service; placing PG&E at risk for transmission and storage costs and revenues; establishing firm, tradable transmission and storage rights; and establishing transmission and storage rates.

Gas Sendout

That portion of the available gas supply that is delivered to gas customers for consumption, plus shrinkage.

GHG

Greenhouse gases are the gases present in the atmosphere which reduce the loss of heat into space and therefore contribute to global temperatures through the greenhouse effect. The most the most abundant greenhouse gases are, in order of relative abundance are water vapor, carbon dioxide, methane, nitrous oxide, ozone and CFCs.

Heating Degree Day (HDD)

A heating degree day is accumulated for every degree Fahrenheit the daily average temperature is below a standard reference temperature (SoCalGas and SDG&E: 65ºF; PG&E 60ºF). A basis for computing how much electricity and gas are needed for space heating purposes. For example, for a 50ºF average temperature day, SoCalGas and SDG&E would accumulate 15 HDD, and PG&E would accumulate 10 HDD.

Heating Value

Number of BTU's liberated by the complete combustion at constant pressure of one cubic foot of natural gas at a base temperature of sixty degrees Fahrenheit (60°F) and a pressure base of fourteen and seventy-three hundredths (14.73) psia, with air at the same temperature and pressure as the natural gas, after the products of combustion are cooled to the initial temperature of natural gas, and after the water vapor of the combustion is condensed to the liquid state. The heating value of the natural gas shall be corrected for the water vapor content of the natural gas being delivered except that, if such content is seven (7) pounds or less per one million cubic feet, the natural gas shall be considered dry.

Industrial (SoCalGas & SDG&E)

Category of gas customers who are engaged in mining and in manufacturing durable goods.

Industrial (PG&E)

Non-residential customers not engaged in electric generation, enhanced oil recovery, or gas resale activities using more than 20,800 therms per month.

LDC

Local electric and/or natural gas distribution company.

LNG (Liquefied Natural Gas)

Natural gas that has been super cooled to -260° F (-162° C) and condensed into a liquid that takes up 600 times less space than in its gaseous state.

Load Following

A utility's practice of adding additional generation to available energy supplies to meet moment-to-moment demand in the distribution system served by the utility, and for keeping generating facilities informed of load requirements to insure that generators are producing neither too little nor too much energy to supply the utilities customers.

MMBTU

Million British Thermal Units. One MMBTU is equals to 10 therms or one dekatherm.

MCF

The volume of natural gas which occupies 1,000 cubic feet when such gas is at a temperature of 60º Fahrenheit and at a standard pressure of approximately 15 pounds per square inch.

MMCF/DAY

Million cubic feet of gas per day.

NGV (Natural Gas Vehicle)

Vehicle that uses CNG or LNG as its source of fuel for its internal combustion engine.

Noncore Customers

Commercial and industrial customers whose average usage exceeds 20,800 therms per month, including qualifying cogeneration and solar electric projects. Noncore customers assume gas procurement responsibilities and receive gas transportation service from the utility under firm or interruptible intrastate transmission arrangements.

Non-Utility Served Load

The volume of gas delivered directly to customers by an interstate or intrastate pipeline or other independent source instead of the local distribution company.

Off-System Sales

Gas sales to customers outside the utility's service area.

Out-Of-State Gas

Gas from sources outside the state of California.

Priority of Service (SoCalGas & SDG&E)

In the event of a curtailment situation, utilities curtail gas usage to customers based on the following end-use priorities:

1. Firm Service – All noncore customers served through firm intrastate transmission service, including core subscription service.
2. Interruptible – All noncore customers served through interruptible intrastate transmission service, including inter-utility deliveries.

Priority of Service (PG&E)

In the event of a curtailment situation, PG&E curtails gas usage to customers based on the following end-use priorities:

1. Core Residential
2. Non-residential Core
3. Noncore using firm backbone service (including UEG)
4. Noncore using as-available backbone service (including UEG)
5. Market Center Services

PSIA

Pounds per square inch absolute. Equal to gauge pressure plus local atmospheric pressure.

PSEP

Pipeline Safety Enhancement Plan.

Purchase from Other Utilities

Gas purchased from other utilities in California.

Requirements

Total potential demand for gas, including that served by transportation, assuming the availability of unlimited supplies at reasonable cost.

Resale

Gas customers who are either another utility or a municipal entity that, in turn, resells gas to end-use customers.

Residential

A category of gas customers whose dwellings are single-family units, multi-family units, mobile homes or other similar living facilities.

Short-Term Supplies

Gas purchased usually involving 30-day, short-term contract or spot gas supplies.

Spot Purchases

Short-term purchases of gas typically not under contract and generally categorized as surplus or best efforts.

Storage Banking

The direct use of local distribution company gas storage facilities by customers or other entities to store self-procured commodity gas supplies.

Storage Injection

Volume of natural gas injected into underground storage facilities.

Storage Withdrawal

Volume of natural gas taken from underground storage facilities.

Supplemental Supplies
A utility's best estimate for additional gas supplies that may be realized, from unspecified sources, during the forecast period.

System Capacity or Normal System Capacity (Operational Definition)
The physical limitation of the system (pipelines and storage) to deliver or flow gas to end-users.

System Utilization or Nominal System Capacity (Operational Definition)
The use of system capacity or nominal system capacity at less then 100 percent utilization.

Take-or-Pay
A term used to describe a contract agreement to pay for a product (natural gas) whether or not the product is delivered.

Tariff
All rate schedules, sample forms, rentals, charges, and rules approved by regulatory agencies for used by the utility.

TCF
Trillion cubic feet of gas.

Therm
A unit of energy measurement, nominally 100,000 BTUs.

Total Gas Supply Available
Total quantity of gas estimated to be available to meet gas requirements.

Total Gas Supply Taken
Total quantity of gas taken from all sources to meet gas requirements.

Total Throughput
Total gas volumes passing through the system including sales, company use, storage, transportation and exchange.

Transportation Gas
Non-utility-owned gas transported for another party under contractual agreement.

UEG
Utility electric generation.

Unaccounted-For
Gas received into the system but unaccounted for due to measurement, temperature, pressure, or accounting discrepancies.

Unbundling

The separation of natural gas utility services into its separate service components such as gas procurement, transportation, and storage with distinct rates for each service.

WACOG

Weighted average cost of gas.

Wholesale

A category of customer, either a utility or municipal entity, that resells gas.

Wobbe

The Wobbe number of a fuel gas is found by dividing the high heating value of the gas in BTU per standard cubic feet (scf) by the square root of a specific gravity with respect to air. The higher a gases' Wobbe number, the greater the heating value of the quality of gas that will flow through a hole of a given size in a given amount of time.

2014 CALIFORNIA GAS REPORT

RESPONDENTS

RESPONDENTS

The following utilities have been designated by the California Public Utilities Commission as respondents in the preparation of the California Gas Report.

- Pacific Gas and Electric Company
- San Diego Gas and Electric Company
- Southern California Gas Company

The following utilities also cooperated in the preparation of the report.

- City of Long Beach Municipal Gas and Oil Department
- Sacramento Municipal Utilities District
- Southern California Edison Company
- Southwest Gas Corporation
- ECOGAS Mexico, S. de R.L. de C.V.

A statewide committee has been formed by the respondents and cooperating utilities to prepare this report. The following individuals served on this committee.

Working Committee

- Jeff Swanson (Chairperson) – PG&E
- Rose-Marie Payan-SoCalGas/SDG&E
- Sharim Chaudhury- SoCalGas/SDG&E
- Jeff Huang – SoCalGas/SDG&E
- Michelle Clay-Ijomah-SDG&E
- Eric Hsu-PG&E
- David Sanchez- City of Long Beach Gas and Oil
- Robert Kennedy- CEC
- Angela Tanghetti – CEC

Observers

- Richard Myers– CPUC Energy Division

RESERVE YOUR SUBSCRIPTION

2015 CALIFORNIA GAS REPORT – SUPPLEMENT

Southern California Gas Company
2015 CGR Reservation Form
Box 3249, Mail Location GT14D6
Los Angeles, CA 90051-1249

or

Fax: (213) 244-4957
Email: Sharim Chaudhury
IChaudhury@semprautilities.com

- ❑ Send me a 2015 CGR Supplement
- ❑ New subscriber
- ❑ Change of address

Company Name: _____

C/O: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: (_____) _____ Fax: (_____) _____

Also, please visit our website at: www.socalgas.com
www.sdge.com

RESERVE YOUR SUBSCRIPTION

2015 CALIFORNIA GAS REPORT – SUPPLEMENT

Pacific Gas and Electric Company
2015 CGR Reservation Form
Attention: Jeff Swanson
Mail Code B10B
P. O. Box 770000
San Francisco, CA 94177

or

Email: Jeff Swanson
JKSR@PGE.COM

- ❑ Send me a 2015 CGR Supplement
- ❑ New subscriber
- ❑ Change of address

Company Name: _____

C/O: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: (_____) _____ Fax: (_____) _____

Digital copies available on our website at:
http://www.pge.com/pipeline/library/regulatory/cgr_index.shtml

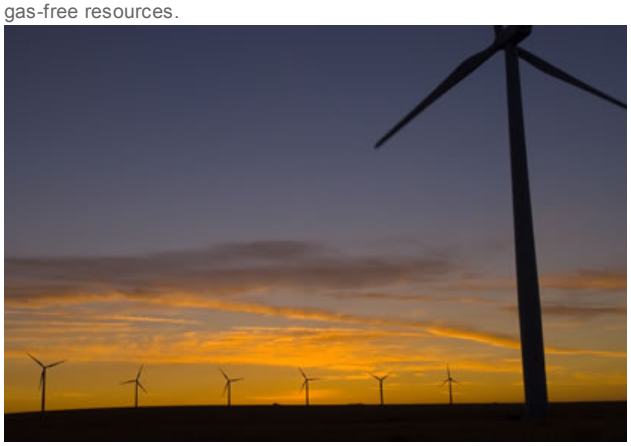

Malin
Oregon
Eureka
Redding
Sacramento
San Francisco
San Jose
Fresno
Bakersfield
Needles
Topock
Arizona
Blythe
Santa Barbara
Los Angeles
San Diego
= Storage Fields

Clean Energy Solutions

PG&E delivers some of the nation's cleanest energy to our customers. And we are planning for the future by exploring new sources of renewable technologies. We are also investing in state-of-the-art, cleaner sources of fossil fuel-based power to meet growing demand.

Delivering Low-Emission Energy

On average, approximately half of the electricity PG&E delivers to its customers comes from a combination of renewable and greenhouse gas-free resources.

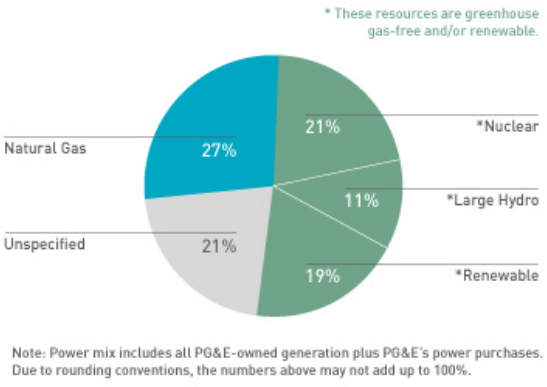


PG&E customers benefit from wind energy generated from an Iberdrola Renewables site in Sherman County, Oregon. Photo courtesy of Iberdrola Renewables.

The power mix* we provided to our customers in 2012 consisted of non-emitting nuclear generation (21 percent), large hydroelectric facilities (11 percent) and eligible renewable resources (19 percent), such as wind, geothermal, biomass, solar and small hydro. The remaining portion came from natural gas/other (27 percent) and unspecified power (21 percent). Unspecified power refers to electricity that is not traceable to specific generation sources by any auditable contract trail.

**Note: Due to rounding conventions, the numbers above may not add up to 100 percent.*

PG&E's 2012 Electric Power Mix



Note: Power mix includes all PG&E-owned generation plus PG&E's power purchases. Due to rounding conventions, the numbers above may not add up to 100%.

Investing in Renewables

We are aggressively adding more renewable energy to our power mix under California's renewable portfolio standard and are well on our way toward 33 percent renewables by the end of 2020. We are investing in a

Additional Info

- Generate Your Own Power
- Solar Energy

Related Links

- Currents
- PG&E Corporation Environmental Policy Framework
- Corporate Responsibility and Sustainability Report

range of clean energy resources such as solar, wind, geothermal, biomass and small hydro.

We are using a variety of approaches to bring more renewable energy to our customers, including using competitive solicitations to procure renewable energy from third-parties and owning renewables projects ourselves.

PG&E can also purchase power from customers who install eligible renewable generation up to 1.5 MW in size. Customers can choose a full "buy/sell" option, which means PG&E will purchase all of the electricity their facility generates, or they can choose to use some of the electricity for their own needs and PG&E will purchase only the excess.

Harnessing the Sun

We have added more than 100 megawatts of new solar photovoltaic generation, owned and operated by PG&E, including three new solar plants dedicated last year in Fresno County.

We also continue to add solar energy to our energy supply through significant contracts with third-party developers.

Sempra Generation delivers energy to PG&E customers from a large photovoltaic solar power plant in Boulder City, Nevada, located about an hour southeast of Las Vegas. Photo courtesy of Sempra Generation.

Benefiting our customers further, PG&E administers the California Solar Initiative, an ambitious program designed to boost the amount of customer-installed solar capacity in California. PG&E paid and reserved $137 million in rebates for 70 MW of both installed and currently active residential and commercial solar installations in 2011. This accounted for nearly half of the total customer applications to reserve funding for residential and commercial solar projects. Learn more about solar energy.

PG&E leads the nation by hooking up more than 60,000 solar-generating customers to the electric grid.

Managing Our Hydro Operations

PG&E owns and operates the nation's largest investor-owned hydroelectric system, providing a safe and reliable source of clean energy for millions of customers.

The system is built along 16 river basins stretching nearly 500 miles—from Redding in the north to Bakersfield in the south. PG&E's 68 powerhouses, including a pumped storage facility, have a total generating capacity of 3,896 MW and rely on nearly 100 reservoirs located primarily in the higher elevations of California's Sierra Nevada and Southern Cascade mountain ranges.

By allowing more water to pass through new streamflow release facilities, we are enhancing 22.5 miles of the Pit River and its associated habitat.

Investing in Cleaner Conventional Sources

Although energy efficiency and renewable energy are playing larger roles in our plans to meet future demand, investment in new conventional generation facilities is also necessary to meet our customers' needs.

PG&E's Gateway Generating Station in Contra Costa County yields dramatically less CO_2 for every megawatt-hour produced compared to older fossil-fueled plants and uses "dry" cooling, which allows the plant to use 97 percent less water than older plants with "once-through" cooling water systems.

We have also brought the Colusa Generating Station, a 657 MW combined cycle natural gas power plant, into service. The facility serves nearly half a million homes using the latest technology and environmental design, including dry cooling technology and the same combustion controls enhancements used at Gateway. Additionally, we have put the 163 MW Humboldt Bay Generating Station into service; it employs technology that produces significantly less SO_2, NOx and CO_2 emissions than the retired facility at the site, while also eliminating the need for "once-through" cooling.

EAST BAYSHORE RECYCLED WATER PROJECT

PROJECT PURPOSE

EBMUD's East Bayshore Recycled Water Project currently supplies recycled water for landscape irrigation and one cooling tower site in areas of Oakland and Emeryville where recycled water pipelines have been installed. EBMUD plans to expand the distribution system into Alameda, Albany and Berkeley. In addition to irrigating landscapes, recycled water uses may include restoring wetlands, flushing toilets in dual-plumbed buildings, and commercial and industrial processes.

RECYCLED WATER BENEFITS

- Stretches our limited drinking water supply, especially in droughts
- Safeguards community and private investments in parks and landscaping
- Makes drinking water supplies more reliable, helping to sustain our economy
- Protects San Francisco Bay

PROJECT STATUS

Recycled water treatment facilities were constructed at EBMUD's wastewater treatment plant, located at the foot of the Bay Bridge. Using microfiltration and extra disinfection, EBMUD produces recycled water that meets or surpasses California Department of Public Health standards for unrestricted use. EBMUD stores the recycled water in a 1.5 million gallon storage tank on the site. A recycled water transmission pipeline along more than 4 miles of the Eastshore Freeway still needs to be completed, and 2 miles of transmission pipeline have been installed in Oakland.

The East Bayshore Recycled Water Project began deliveries to customers in 2008 and currently serves customers at 23 locations. In Fiscal Year 2014 the project delivered recycled water to offset the need for a total of almost 56 million gallons of EBMUD drinking water. EBMUD itself used another 2.4 million gallons a day at the wastewater treatment plant for various industrial processes and for landscape irrigation.

When complete, up to 24 miles of distribution pipelines will be in place and up to 2.5 million gallons per day of recycled water will be available to East Bayshore Recycled Water Project customers. (See map on page 2.)

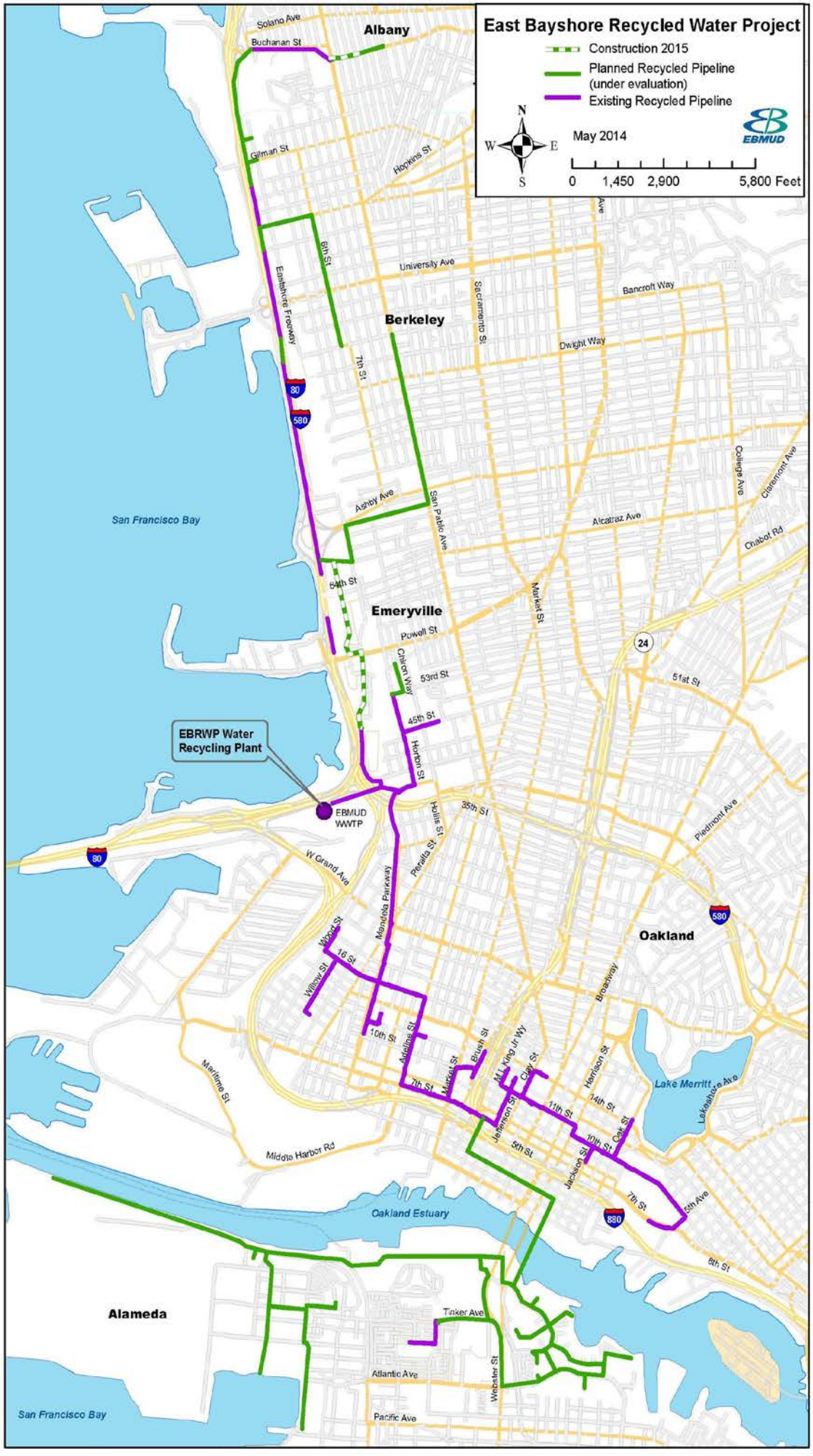
NEXT STEPS

- Retrofit customer sites in areas of Emeryville, Berkeley, Albany, and Alameda
- Complete construction of transmission pipeline from Emeryville to Albany
- Design and construct pipeline to reach customer sites in western and northern Emeryville, Albany, Berkeley, and western Alameda, including pipeline under the Oakland Estuary

CONTACT US

Lori Steere, Community Affairs Representative at 510-287-1631 or lsteere@ebmud.com

October 2014


East Bayshore Recycled Water Project
Construction 2015
Planned Recycled Pipeline (under evaluation)
Existing Recycled Pipeline
May 2014
EBMUD
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Albany
Berkeley
Emeryville
Oakland
Alameda
San Francisco Bay
Oakland Estuary
Lake Merritt
EBRWP Water Recycling Plant
EBMUD WWTP
Solano Ave
Buchanan St
Gilman St
Hopkins St
6th St
Eastshore Freeway
University Ave
Sacramento St
Bancroft Way
Dwight Way
7th St
Ashby Ave
San Pablo Ave
Alcatraz Ave
College Ave
Claremont Ave
Chabot Rd
54th St
Market St
Powell St
Chiron Way
53rd St
45th St
Horton St
51st St
35th St
Hollis St
Peralta St
Piedmont Ave
W Grand Ave
Mandela Parkway
Wood St
16 St
Willow St
10th St
Adeline St
Broadway
Brush St
M.L. King Jr Wy
Clay St
Harrison St
14th St
11th St
Jefferson St
Oak St
10th St
8th St
Jackson St
7th St
5th Ave
Lakeshore Ave
Maritime St
Middle Harbor Rd
8th St
Tinker Ave
Atlantic Ave
Webster St
Pacific Ave
80
580
24
880

Urban Water Management Plan 2010

EBMUD

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Urban Water Management Plan 2010

This document provides an overview of water supply and usage, wastewater, recycled water, conservation and water supply shortage contingency plan at East Bay Municipal Utility District. This information represents East Bay Municipal Utility District's best efforts to promote efficient water use of available supplies consistent with the Urban Water Management Planning Act and the Water Conservation Act of 2009.

EBMUD

■ Water Resources Planning Division ■ East Bay Municipal Utility District ■ June 2011 ■

EAST BAY MUNICIPAL UTILITY DISTRICT

ALEXANDER R. COATE ■ GENERAL MANAGER

RICHARD G. SYKES ■ DIRECTOR OF WATER & NATURAL RESOURCES

LENA L. TAM ■ MANAGER OF WATER RESOURCES PLANNING

PROJECT STAFF

PROJECT MANAGER

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AN BARTLETT ■ ASSOCIATE CIVIL ENGINEER ■ WATER SUPPLY IMPROVEMENTS

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DOUG LINNEY

LESA R. MCINTOSH

FRANK MELLON

WILLIAM B. PATTERSON

COVER PHOTOS LEFT TO RIGHT

■ RECYCLED WATER PIPES
PHOTO BY MIKKI FERRILL

■ DELTA AREA
PHOTO BY JIM KARAGEORGE

■ SUMMER-DRY CLIMATE LANDSCAPING
PHOTO BY SAXON HOLT

■ FREEPORT
PHOTO BY CHIP ALLEN

■ UPPER MOKULUMNE RIVER, PARDEE RESERVOIR AREA
PHOTO BY RICH TURNER

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FOR INFORMATION CONTACT EBMUD ON THE WEB AT WWW.EBMUD.COM OR CALL 1-866-403-2683

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CHAPTER 1. GENERAL INFORMATION

East Bay Municipal Utility District (EBMUD) supplies water and treats wastewater for significant parts of Alameda and Contra Costa counties. Every five years, EBMUD updates its Urban Water Management Plan (UWMP) by evaluating water supply and demand, water recycling projects, and demand management activities as required by the California Water Code Division 6, Part 2.6 (Urban Water Management Planning Act).

URBAN WATER MANAGEMENT PLANNING ACT

EBMUD sponsored the Urban Water Management Planning Act (Act) that became part of the California Water Code with the passage of Assembly Bill 797 in 1983. As stated in the Act, water is a limited and renewable resource subject to ever-increasing demands. Section 10610.4 of the Act specifies that "urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies." It is the State's policy to achieve conservation and efficient use of urban water supplies to protect both the people of the State and their water resources. The Act provides water utilities with an approach to assess their water resource needs and supplies by requiring that each urban water supplier providing more than 3,000 acre-feet of municipal water or supplying water directly or indirectly to more than 3,000 customers annually, shall prepare, update, and adopt an UWMP at least once every five years. Since 1983, the Act has been amended by various Assembly and Senate bills (see Table 1-1) which expanded the issues that are to be addressed in the UWMP. Amendments to the Act since 2005 include:

- SB 1087, Florez, 2005 (Water use projections and lower income households),
- AB 1420, Laird, 2007 (Water demand management measures),
- SBx7-7, Steinberg, 2009 (Water conservation), and
- AB 2409, Nestande, 2010 (Water shortage contingency analysis).

Appendix A contains the text of the act and its amendments.

EBMUD'S URBAN WATER MANAGEMENT PLAN

On November 26, 1985, after a period of public review and a public hearing, EBMUD adopted its first UWMP. Since 1985, the plan has been updated and adopted by EBMUD's Board of Directors every five years. This UWMP 2010, an update of the UWMP 2005, is designed to satisfy the requirements of the Urban Water Management Planning Act, and to provide the public with a report on EBMUD's progress in implementing conservation, water recycling programs, and securing supplemental water supply sources. In adopting its UWMP, the District commits to achieve conservation and efficient use of its water supplies to protect both its customers and its water resources by making every effort to ensure the appropriate level of water service reliability sufficient to meet various demands during normal, dry, and multiple dry years.

PUBLIC PARTICIPATION AND ADOPTION OF PLAN

EBMUD has actively encouraged the involvement of a diverse sector of the population in its urban water management planning efforts throughout the update process. EBMUD also made its UWMP available for public review and held a public hearing prior to adopting the UWMP 2010.

To encourage public involvement, EBMUD sent a notice of intent to update its UWMP to all cities and counties within its service area, local and neighboring water districts and agencies, and other relevant groups and organizations on January 14, 2011, more than 60 days prior to the public hearing. EBMUD also posted the notice of the intent to update on its website.

EBMUD's Draft UWMP 2010 was first distributed for review and comment beginning on April 12, 2011. As a result of the de-certification of the Water Supply Management Plan 2040 EIR, EBMUD updated the draft plan and released a revised Draft UWMP 2010 on May 6, 2011 and extended the comment period to end on May 20, 2011. In response to a request from the public, the comment period was extended for a second time to end on May 31, 2011.

Notice of the public hearing and the public comment period and intent to adopt was posted in relevant newspapers between April 12 and May 22, 2011. Copies of the public notices and a list of newspapers with dates on which the notices were published are included in Appendix B. A notice of the hearing and the public

comment period was also mailed to all parties included in EBMUD's UWMP 2010 mailing list on May 6, 2011, and was posted on EBMUD's website. In addition to the public hearing EBMUD held a public comment meeting on the Draft UWMP 2010 on April 21, 2011 to further encourage public involvement.

The UWMP 2010 was modified, where appropriate, to incorporate comments received from the public, interested organizations, and other agencies. Appendix C contains a summary of the comments received and EBMUD's responses to those comments.

At its meeting on June 28, 2011, the EBMUD Board of Directors adopted the UWMP 2010 and the 2010 Water Shortage Contingency Plan. A copy of the adoption resolution is included in Appendix D. By July 27, copies of the adopted UWMP 2010 were sent to the California Department of Water Resources (DWR), the California State Library, and cities and counties within EBMUD's service area and posted on EBMUD's website.

EAST BAY MUNICIPAL UTILITY DISTRICT

FORMATION

East Bay Municipal Utility District, a public utility, was formed under the Municipal Utility District (MUD) Act, passed by the California Legislature in 1921. The MUD Act permits formation of multi-purpose government agencies to provide public services on a regional basis. In accordance with the MUD Act's provisions, voters in the San Francisco East Bay Area created EBMUD in 1923 to provide water service. In 1929, EBMUD first began water deliveries from the Sierra Nevada Mountains to the East Bay when construction of Pardee Dam and the first Mokelumne Aqueducts was completed.

The MUD Act was amended in 1941 to enable formation of special districts. In 1944, voters in six East Bay cities elected to form EBMUD's Special District No. 1 to treat wastewater from their jurisdictions prior to it being released into the San Francisco Bay. Wastewater treatment for those cities began in 1951 and later expanded to annex the Stege Sanitary District, which includes Kensington, El Cerrito, and parts of Richmond.

TABLE 1-1 URBAN WATER MANAGEMENT PLANNING ACT AND AMENDMENTS

BILL	INTRODUCED BY	CHAPTERED
AB 2661	KLEHS	1990
AB 11X	FILANTE	1991
AB 1869	SPEIER	1991
AB 892	FRAZEE	1993
SB 1017	MCCORQUODALE	1994
AB 2853	CORTESE	1994
AB 1845	CORTESE	1995
SB 1011	POLANCO	1995
AB 2552	BATES	2000
SB 553	KELLEY	2000
SB 610	COSTA	2001
AB 901	DAUCHER	2001
SB 672	MACHADO	2001
SB 1348	BRULTE	2002
SB 1384	COSTA	2002
SB 1518	TORLAKSON	2002
AB 105	WIGGINS	2004
SB 318	ALPERT	2004
SB 1087	**FLOREZ**	**2005**
AB 1420	**LAIRD**	**2007**
SBx7-7	**STEINBERG**	**2009**
AB 2409	**NESTANDE**	**2010**

BOARD OF DIRECTORS

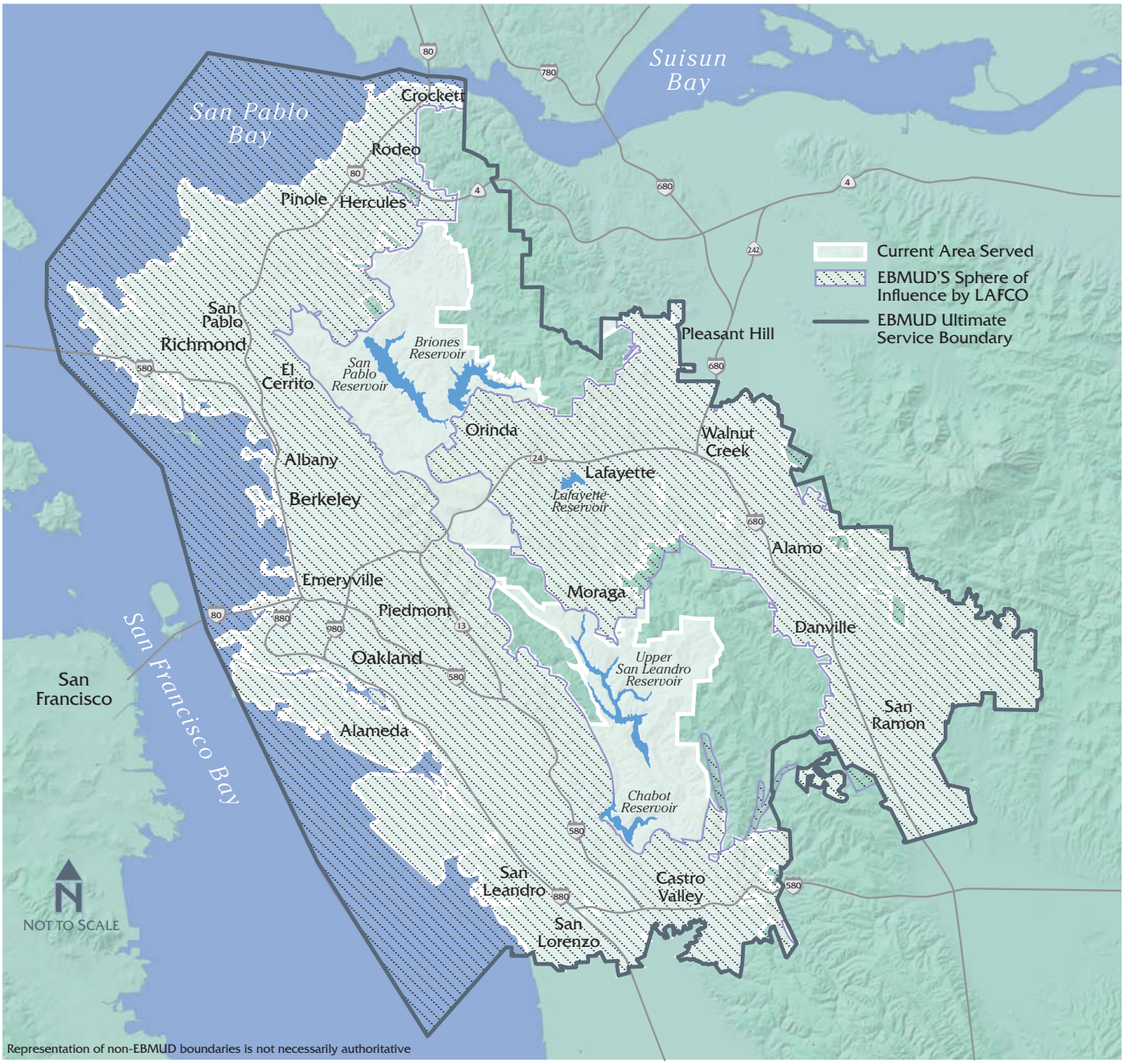
EBMUD is governed by a seven-member Board of Directors, publicly elected to four-year terms from wards within EBMUD's service area. The Board determines overall policies, which are implemented under the direction of the General Manager. Activities of EBMUD are guided by the following Mission Statement:

To manage the natural resources with which the District is entrusted; to provide reliable, high quality water and wastewater services at fair and reasonable rates for the people of the East Bay; and to preserve and protect the environment for future generations.

SERVICE AREA

EBMUD supplies water and provides wastewater treatment for significant parts of Alameda and Contra Costa counties. Based on 2010 census data, approximately 1.34 million people are served by EBMUD's water system in a 332-square-mile area extending from Crockett on the north, southward to San Lorenzo (encompassing the major cities of Oakland and Berkeley), eastward from San Francisco Bay to Walnut Creek, and south through the San Ramon Valley. The wastewater system serves approximately 650,000 people in an 88-square-mile area of Alameda and Contra Costa counties along the Bay's east shore, extending from Richmond on the north, southward to San Leandro. EBMUD customers include residential, industrial, commercial, institutional and irrigation water users.

FIGURE 1-1 EBMUD SERVICE BOUNDARY



Boundary

The EBMUD service area encompasses incorporated and unincorporated areas within Alameda and Contra Costa counties. The current service area, illustrated in Figure 1-1, is the area that was established during EBMUD's formation, as modified by annexation, detachment, or other change of organization thereafter. The Ultimate Service Boundary (USB) is a boundary established by EBMUD to define its limit of future annexation for extension of water service.

The Local Agency Formation Commissions (LAFCOs) of Alameda and Contra Costa counties have established a Sphere of Influence (SOI) for EBMUD. The SOI, illustrated in Figure 1-1, defines the area that can be served by EBMUD, as defined by LAFCO.

Climate and Topography

Within the EBMUD service area there are significant differences in geography, climate, and land use. These characteristics are important as they influence how water

TABLE 1-2 EBMUD SERVICE AREA CLIMATE STATISTICS

	WEST OF HILLS				EAST OF HILLS			
MONTH	RAINFALL (IN)	MAXIMUM TEMPERATURE (°F)	MINIMUM TEMPERATURE (°F)	AVERAGE TEMPERATURE (°F)	RAINFALL (IN)	MAXIMUM TEMPERATURE (°F)	MINIMUM TEMPERATURE (°F)	AVERAGE TEMPERATURE (°F)
JAN	5.0	59	47	53	5.9	56	39	47
FEB	4.3	61	48	55	5.2	59	41	50
MAR	3.6	66	50	58	4.0	65	43	54
APR	1.9	66	51	59	2.0	66	44	55
MAY	0.7	71	55	63	0.8	73	49	61
JUN	0.2	74	58	66	0.1	79	53	66
JUL	0.0	76	60	68	0.0	82	56	69
AUG	0.1	76	60	68	0.1	82	56	69
SEP	0.3	76	59	68	0.3	82	54	68
OCT	1.5	74	56	65	1.4	74	50	62
NOV	3.3	66	52	59	3.4	64	44	54
DEC	4.6	59	47	53	5.2	56	40	48
ANNUAL	**25.5**	**69**	**54**	**61**	**28.4**	**70**	**47**	**59**

NOTE:
West-of-Hills climate data based on measurements from USL Water Treatment Plant station, and East-of-Hills climate data based on measurements from Lafayette Reservoir station. Rainfall is based on data from 1953-2009, and temperature is based on data from 2000-2009.

is used in various portions of the service area. These characteristics also are factors considered in future water demand projections.

Geographically, the EBMUD service area is divided by the Oakland/ Berkeley Hills that rise to about 1,900 feet above sea level. The area west of the Oakland/ Berkeley Hills (West-of-Hills) is characterized by a plain that extends from Richmond to Hayward and from the shore of the Bay inland. The terrain east of the Oakland/Berkeley Hills (East-of-Hills) is characterized by rolling hills as the land descends to about 100 feet above sea level near Walnut Creek. West of Hills areas border San Francisco Bay and experience a moderate climate that is tempered by ocean and Bay waters. In contrast, East-of-Hills areas, such as Lafayette, Walnut Creek, and the San Ramon Valley, experience greater extremes in climate. These areas are cooler in the winter and hotter in the summer. Average historical climate characteristics for East-of-Hills and West-of-Hills portions of the EBMUD service area are illustrated in Table 1-2.

Land Uses

Urban land uses in the EBMUD service area include residential (ranging from very low-density single-family lots to high density multi-family residences), commercial, industrial including petroleum refining and public facilities, such as parks and schools. A majority of the high-density urban growth within EBMUD has occurred along the Bay plain and includes residential, commercial, institutional, and industrial developments. Other urban development areas include Pleasant Hill, the San Ramon Valley, and Walnut Creek. Over the next 25 years, the increased water demand as projected would come mainly from increased densities in existing developed urban areas, as formerly lower consumption land uses are replaced with more intensive mixed use and other development. See Chapter 4 for more discussion on projected demands.

EBMUD owns and manages approximately 28,000 acres of land and water surface areas in the East Bay, comprising portions of the watershed lands of EBMUD's local reservoirs. While these protected watershed lands are located within EBMUD's USB, a large part is not located within EBMUD's service area. There are a number of land uses on EBMUD-owned lands. The predominant agricultural land use is livestock grazing which serves to reduce the danger of wildfires in the watershed and in areas near the wildland/urban interfaces. EBMUD also leases its watershed lands for other agricultural uses such as Christmas tree and hay farming. EBMUD is also in the early stages of evaluating the potential feasibility of establishing a mitigation/conservation bank on EBMUD-owned lands in the Pinole Valley watershed (3,000 acres of land not tributary to any EBMUD reservoirs) to protect and enhance habitat for endangered species.

TABLE 1-3 POPULATION PROJECTIONS

REGION	2015	2020	2025	2030	2035
BAY AREA	7,678,000	8,018,000	8,365,000	8,719,000	9,074,000
ALAMEDA COUNTY	1,626,000	1,706,000	1,787,000	1,875,000	1,966,000
CONTRA COSTA COUNTY	1,131,000	1,177,000	1,226,000	1,274,000	1,323,000
EBMUD SERVICE AREA	1,474,000	1,538,000	1,607,000	1,677,000	1,751,000
SERVICE AREA WITHIN ALAMEDA CO.	935,000	975,000	1,019,000	1,066,000	1,117,000
SERVICE AREA WITHIN CONTRA COSTA CO.	539,000	563,000	588,000	611,000	634,000

NOTES:

1. Source: ABAG Projections 2009.

2. Population estimates for EBMUD service area include the following areas: ALAMEDA COUNTY – incorporated cites of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and San Leandro; and subregional study areas of Hayward, Castro Valley, Cherryland-Fairview, Ashland, and San Lorenzo; CONTRA COSTA COUNTY- city sphere of influence areas of Danville, El Cerrito, Hercules, Lafayette, Moraga, Orinda, Pinole, Pleasant Hill, Richmond, San Pablo and Walnut Creek; and subregional study areas of San Ramon, Crockett-Rodeo and Blackhawk-Alamo.

3. Populations for Hayward, Pleasant Hill and Walnut Creek were weighted according to the percent of total area within the service area: Hayward (2.6%), Pleasant Hill (21.1%) and Walnut Creek (63.6%).

TABLE 1-4 MOKELUMNE BASIN RUNOFF AND CLIMATE STATISTICS

MONTH	AVERAGE RUNOFF[1] (FT^3/SEC)	AVERAGE PRECIPITATION[2] (IN.)	AVERAGE SNOW DEPTH [3] (IN.)	AVERAGE TEMPERATURE (°F)
JAN	889	8.9	49	27
FEB	1,090	7.9	69	27
MAR	1,360	7.1	77	30
APR	2,110	4.1	60	35
MAY	3,150	2.2	27	42
JUN	2,010	0.8	2	50
JUL	456	0.2	0	57
AUG	87	0.3	0	57
SEP	60	0.8	0	51
OCT	96	2.5	1	43
NOV	322	5.5	8	34
DEC	629	8.0	24	29
ANNUAL	**1,020**	**48.3**	**—**	**40**

[1] Average True Natural Flow at Mokelumne Hill Gaging Station, 1930-2009.
[2] EBMUD 4-station average, 1930-2009.
[3] Snow depth and temperature from NOAA Twin Lakes station (#49105), 1919-2000. Western Regional Climate Center (http://wrcc.dri.edu).

EBMUD's East Bay watershed provides extensive recreational opportunities. Three terminal reservoirs, Lafayette, San Pablo and Chabot, are open for recreation. Body contact recreational activities are prohibited to protect public health and safety. In EBMUD's undeveloped East Bay watershed, there is a 60-mile system of trails open for hiking and horseback riding (permit required).

Population Projections

By 2035, the Bay Area's population is forecasted to grow by nearly 25 percent, or by 1.7 million residents, for a total of 9 million people. Nearly 75 percent of this growth is projected to occur in three Bay Area counties including Alameda and Contra Costa, significant parts of which make up the EBMUD service area. Alameda and Contra Costa counties, along with Santa Clara County, will remain among the top three most populous in the region over the next several decades.

According to the Association of Bay Area Governments' (ABAG) Projections 2009, Alameda County alone is projected to grow by 416,500 people, for a total of nearly 2 million people by 2035. It is forecasted that 327,000 jobs also will be added during this period. Almost all jurisdictions in Alameda County are expected to see significant changes in population and especially employment, although most growth will occur in the communities closest to the San Francisco Bay. Some of the biggest population changes will occur in Emeryville and Oakland. The City of Oakland is forecasted to continue to have over 25 percent of the county's residents and jobs. Nearly 70 percent of the population growth in Western Alameda County is projected to occur in infill neighborhoods, where there is access to public transit.

By 2035, Contra Costa County's population is forecasted to be over 1.3 million, an increase of approximately 233,000. Nearly 180,000 jobs will be added county wide during this time period, for a total of over 555,000. Several jurisdictions, including Hercules will see their jobs more than double by 2035. Among the communities expected to see the most population change are San Ramon and Hercules; each will grow by more than one-third.

Table 1-3 depicts population projections for the Bay Area and the EBMUD service area over the next 25 years. The population projections are based on ABAG's Projections 2009.

MOKELUMNE WATERSHED AND HYDROLOGY

Based on historical average, about 90 percent of the water delivered to EBMUD's customers originates from the Mokelumne River watershed, and 10 percent originates as runoff from the protected watershed lands in the East Bay Area. The Mokelumne River watershed upstream of Camanche Dam is relatively narrow and steep and is located northeast of the Sacramento-San Joaquin River Delta on the western slope of the Sierra Nevada. Above Camanche Dam, the Mokelumne River drains over 600 square miles of mountains and foothills. The elevation in the watershed ranges from 235 feet at the dam to 10,000 feet in the headwater region.

Runoff Characteristics

Annual precipitation and stream flow in the Mokelumne River watershed upstream of Camanche Dam are extremely variable from month to month and from year to year. Most precipitation normally falls between November and May and very little falls between late spring and late fall (see Table 1-4). Peak flows in the Mokelumne River normally occur during winter storms or during the spring snow melt season from March through June. These flows decrease to a minimum in late summer or fall.

Snow melt from parts of Alpine, Amador, and Calaveras counties contribute to the Mokelumne River runoff. The primary tributaries are the North, Middle and South Forks of the Mokelumne River, with the North Fork tributary draining over 80 percent of the Mokelumne watershed. Smaller tributaries include Summit Creek, Bear Creek, Cole Creek, Moore Creek, Blue Creek, Tiger Creek, Panther Creek, Forest Creek and Licking Fork. The Mokelumne River watershed runoff is modified by various diversions and regulated by reservoir storage operations including a network of facilities operated by Pacific Gas and Electric Company. EBMUD collects the Mokelumne stream flow in Pardee Reservoir. A portion of the water stored in Pardee Reservoir is conveyed to the EBMUD service area via the Mokelumne Aqueducts, and to the Jackson Valley Irrigation District via the Jackson Creek Spillway outlet. The remainder of the water is released from Pardee Reservoir into Camanche Reservoir.

Land Uses

Most of the Mokelumne River watershed upstream of Camanche Dam is protected and undeveloped, consisting of open space and forest land with small concentrations of residential/commercial development along the major highways, and large tracts of designated wilderness. Forest land, located chiefly within the El Dorado and Stanislaus National Forests, accounts for about 75 percent of the watershed land. There are small agriculture areas, mainly orchards and vineyards, and several areas of recreational developments (including winter sports facilities). There are minor industrial and commercial uses in the watershed, and logging is the major land use activity.

Various forms of recreation such as camping and water-related activities are allowed at Pardee Reservoir (only non-body-contact activities allowed) and Camanche Reservoir (body-contact activities allowed). There also is an extensive system of Mokelumne area trails in the Sierra foothills such as the Coast-to-Crest trail across EBMUD land.

REPORT FORMAT

The UWMP 2010 brings together important information and updates on EBMUD's water supply planning projects and studies, and recycled water and conservation program activities undertaken since 2005.

This report consists of the following chapters that satisfy the provisions of the Urban Water Management Planning Act:

CHAPTER 1 – GENERAL INFORMATION.
The chapter contains a discussion on the Urban Water Management Planning Act, as well as an overview of EBMUD;

CHAPTER 2 – WATER SUPPLY AND WATER SUPPLY PLANNING.
The chapter contains an overview of EBMUD's water supply system, reliability of the water supply, and future water supply planning;

CHAPTER 3 – WATER SHORTAGE CONTINGENCY PLAN.
The chapter contains specifics on EBMUD's Drought Management Program and its elements;

CHAPTER 4 – WATER USAGE.
The chapter contains a discussion on past, current and projected demand as well as an assessment of supply and demand for various scenarios as specified in the Act;

CHAPTER 5 – WASTEWATER AND RECYCLED WATER.
The chapter contains an overview of the wastewater system, current and planned recycled water projects, methods of encouraging recycled water use, and other existing non-potable water projects; and

CHAPTER 6 – WATER CONSERVATION.
The chapter contains an overview of EBMUD's demand-side and supply-side conservation programs, existing and future conservation projects, Best Management Practices, and EBMUD compliance with California's "20 percent by 2020" reduction in per capita urban water use requirement.

APPENDICES

APPENDIX A contains the UWMP Act and its amendments;

APPENDIX B contains the newspaper public notice that announced the public review period, time and place of a comment meeting and hearing, and a listing of those newspapers in which the notice was published with the dates of publication;

APPENDIX C contains the comments received during the public review period, the public comment meeting and public hearing and responses to those comments;

APPENDIX D contains the Board Resolution adopting the UWMP 2010 and the Water Shortage Contingency Plan;

APPENDIX E contains the South East Bay Plain Groundwater Basin Description;

APPENDIX F contains referenced governing EBMUD regulations, and the rate structures for water and wastewater services;

APPENDIX G contains the 2010 Water Shortage Contingency Plan Supplement;

APPENDIX H contains SBx7-7 Detailed Analyses;

APPENDIX I contains the 2009 and 2010 Annual Report of Best Management Practices submitted to the California Urban Water Conservation Council, and EBMUD Conservation Research Projects; and

APPENDIX J contains a glossary of terms used in the UWMP 2010.

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CHAPTER 2. WATER SUPPLY SYSTEM AND WATER RESOURCES PLANNING

EBMUD's water supply system extends from the Mokelumne River watershed on the western slope of the Sierra Nevada Mountains to the East Bay. The Mokelumne River water supply, in concert with aggressive conservation and recycled water programs, is sufficient during normal and wet years to meet the needs of EBMUD's customers; however, several factors affect the reliability of the water supply. EBMUD is investigating opportunities to improve the reliability of its water supply and close the gap between water supplies and water needs during multi-year drought periods.

WATER SUPPLY SYSTEM

The EBMUD water supply system collects, transmits, treats, and distributes high-quality water from its primary water source, the Mokelumne River, to its customers in the San Francisco East Bay Area (see Figure 2-1). The Mokelumne Aqueducts convey the Mokelumne River supply from Pardee Reservoir across the Sacramento-San Joaquin River Delta (Delta) to local storage and treatment facilities. After treatment, water is distributed to 20 incorporated cities and 15 unincorporated communities in Alameda and Contra Costa Counties. The cities are Alameda, Albany, Berkeley, Danville, El Cerrito, Emeryville, parts of Hayward, Hercules, Lafayette, Moraga, Oakland, Orinda, Piedmont, Pinole, parts of Pleasant Hill, Richmond, San Leandro, San Pablo, San Ramon, and parts of Walnut Creek. The unincorporated communities include Alamo, Ashland, Blackhawk, Castro Valley, Cherryland, Crockett, Diablo, El Sobrante, Fairview, Kensington, North Richmond, Oleum, Rodeo, San Lorenzo, and Selby.

EXISTING WATER SUPPLY SOURCES

Since the late 1920s, EBMUD's primary source of water has been the Mokelumne River. For details on dry-year supplemental supply sources and infrastructure refer to the "Existing Supplemental Water Supply Sources" section in this chapter.

Mokelumne River

The Mokelumne River serves a variety of uses, including agriculture, fisheries, hydropower, recreation, and municipal and industrial use. Approximately 90 percent of the water used by EBMUD comes from the Mokelumne River watershed. EBMUD has water rights that allow for delivery of up to a maximum of 325 million gallons per day (MGD) from the Mokelumne River, subject to the availability of Mokelumne River runoff and to the senior water rights of other users, downstream fishery flow requirements, and other Mokelumne River water uses.

Figure 2-2 (see page 2-5) displays EBMUD's Mokelumne River flow commitments which are determined by hydrology; a variety of agreements between EBMUD and other Mokelumne River users; water rights priorities; agreements with State and Federal regulatory agencies; State Board orders and decisions; federal directives; court decrees; and numerous agreements both upstream and downstream of EBMUD's Mokelumne River facilities.

Amongst these factors, EBMUD's Mokelumne River flow commitments are generally tied to the variability in the Mokelumne River watershed rainfall and runoff patterns which govern the release requirements for the year. Figure 2-2 provides information regarding EBMUD's flow commitments during normal and 'dry' years. For comparison, the figure also provides information on the average runoff for various periods of historical records, EBMUD's maximum water rights appropriations, and other pertinent information that illustrate the complex nature of agreements and uses on the Mokelumne River.

As depicted in Figure 2-2, EBMUD continues to meet its commitment to protect the lower Mokelumne River by providing instream flow releases from EBMUD's Camanche Dam to improve fishery conditions, per the requirements of the 1998 Joint Settlement Agreement (JSA) among EBMUD, US Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG).

In the long-term, during drought periods, the Mokelumne River cannot meet EBMUD's projected customer demands, even with an "up to 15 percent" rationing imposed under EBMUD's Board Policy 9.03 (see Appendix F) and use of existing dry-year supplemental supplies. Furthermore, EBMUD's Mokelumne River supply is expected to be reduced as demands on the Mokelumne River increase from the growing needs from users in Amador, Calaveras, and San Joaquin counties with water rights senior to those of EBMUD's.

Local Runoff

EBMUD's secondary water supply source is local runoff from the East Bay area watersheds that is stored in the terminal reservoirs located within the service area boundaries. The availability of water from local runoff is dependent on two factors: hydrologic conditions and terminal reservoir storage availability. Hydrologic conditions determine the amount of runoff in the local watershed. In dry-years, evaporation can exceed runoff, resulting in no net local supply. In addition, the amount of storage available for capturing local runoff is limited. Maintaining lower water levels in the terminal reservoirs would provide space for storing additional to supplement EBMUD's existing dry-year supplies. The collaborative effort has already resulted in a $25 million grant, and up to $12 million was allocated for the construction of the Freeport Regional Water Facility. local runoff. However, because these reservoirs also regulate EBMUD's Mokelumne River supply and provide emergency standby storage, limited space can be held for the variable local runoff. Average local supply that is used in the East Bay is 15 to 25 MGD during normal hydrologic years and is near zero during drought conditions.

EXISTING WATER SUPPLY INFRASTRUCTURE

EBMUD's water supply system consists of a network of reservoirs, aqueducts (pipelines), water treatment plants (WTP), pumping plants, and other distribution facilities that convey Mokelumne River from Pardee Reservoir to EBMUD customers.

Pardee Dam and Reservoir

Pardee Dam and Reservoir are located approximately 38 miles northeast of Stockton near the town of Valley Springs, downstream from Pacific Gas and Electric Company's Mokelumne River Hydroelectric Project. Pardee Dam, constructed in 1929, is a concrete gravity arch structure rising 345 feet above the river bed. The reservoir has 37 miles of shoreline, a surface area of 2,222 acres, and a current capacity of 197,950[1] acre-feet (AF) at spillway crest elevation. A 27.8-megawatt (MW) Pardee Powerhouse, located at the base of the dam, was placed in service in 1930. It generates 140 million kilowatt hours (kWh) during a median runoff year.

Pardee Reservoir is used principally for EBMUD's municipal water supply, power generation, and as a supply source for Jackson Valley Irrigation District. Pardee Reservoir also is operated to provide recreational facilities to the public and to protect and enhance the fishery resources and ecosystem of the lower Mokelumne River.

[1] Licensed quantity to store in Pardee Reservoir is 209,950 AFY.
[2] Camanche Reservoir was originally constructed with a capacity of 431,500 AF

Camanche Dam and Reservoir

Camanche Dam is located on the Mokelumne River approximately 10 miles downstream from Pardee Dam. Camanche Dam, constructed in 1964, is a zoned earthen structure. Camanche Reservoir has 63 miles of shoreline, a surface area of 7,470 acres, and a current capacity of 417,120AF[2] at spillway crest elevation. An 11.25-MW Camanche Powerhouse, located at the base of the dam, was placed in service in 1983. It generates 45 million kWh during a median runoff year.

Camanche Reservoir is operated jointly with Pardee Reservoir to provide water supply benefits while maintaining numerous downstream obligations, including stream-flow regulation, water for fisheries and riparian habitat, flood control, and obligations to downstream diverters. It also provides power generation and recreation opportunities.

Mokelumne Aqueduct System

Raw water from Pardee Reservoir is transported approximately 91 miles to EBMUD WTPs and terminal reservoirs through the Pardee Tunnel, the Mokelumne Aqueducts, and the Lafayette Aqueducts. Water flowing by gravity from Pardee Reservoir takes 30 to 45 hours to reach the East Bay.

The Pardee Tunnel is a 2.2 mile, 8 foot high horseshoe structure constructed in 1929. The Mokelumne Aqueducts (see Table 2-1 for pipeline characteristics) are comprised of three 82 mile long pipelines that transport water from the end of Pardee Tunnel in Campo Seco to Walnut Creek at the east end of the two Lafayette Aqueducts. The Mokelumne Aqueducts have a total capacity of 200 MGD by gravity flow and up to 325 MGD with pumping at the Walnut Creek pumping plants.

TABLE 2-1 MOKELUMNE AQUEDUCT SYSTEM CHARACTERISTICS

PIPELINE	CONSTRUCTED	DIAMETER (INCHES)	MATERIAL
MOKELUMNE AQUEDUCT NO. 1	1929	65	STEEL
MOKELUMNE AQUEDUCT NO. 2	1949	67	STEEL
MOKELUMNE AQUEDUCT NO. 3	1963	87	STEEL

EBMUD Water Treatment Infrastructure

Water from Pardee Reservoir is transported to the EBMUD service area in the Mokelumne Aqueducts, which terminate in Walnut Creek. From Walnut Creek, the water is sent directly to EBMUD's three in-line filtration WTPs or to one or more of the EBMUD terminal reservoirs (see Figure 2-1).

FIGURE 2-1

EBMUD WATER SUPPLY SYSTEM

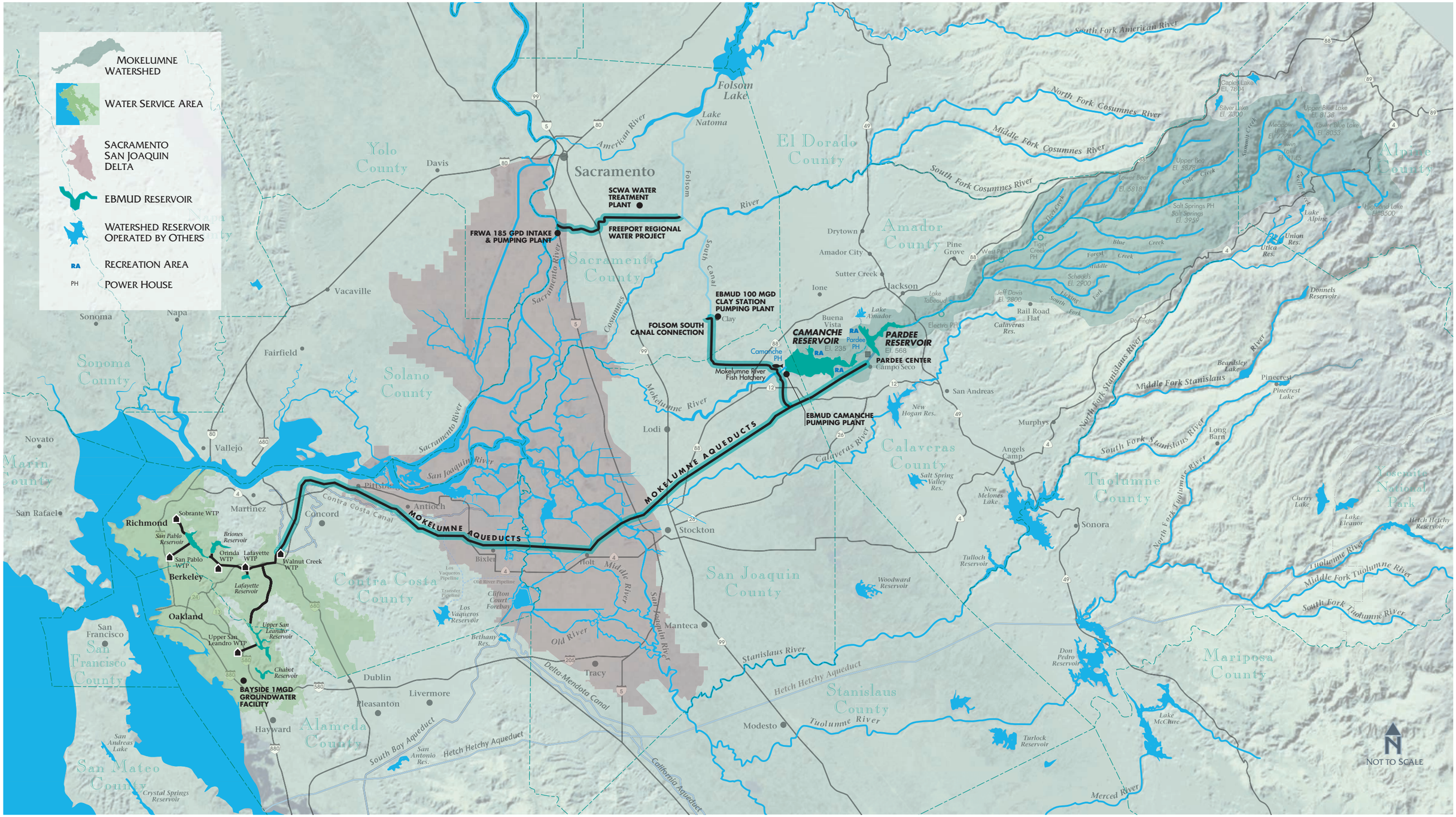

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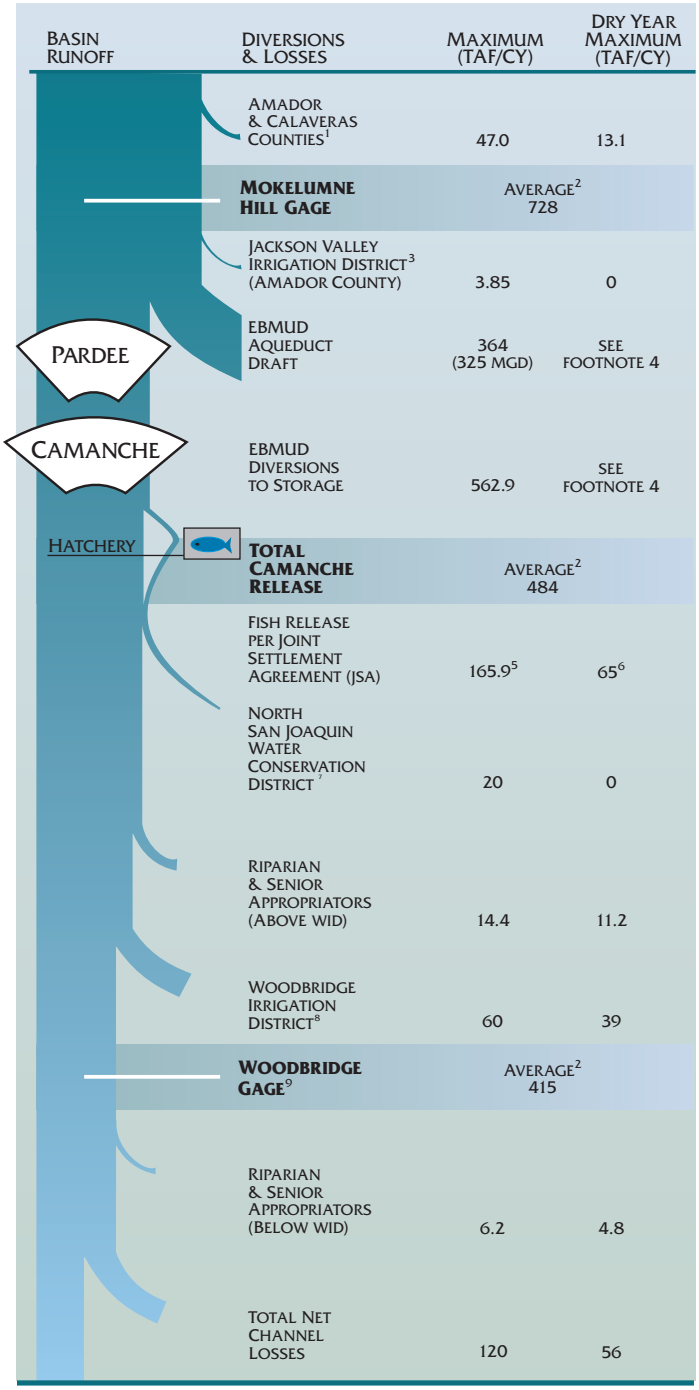
FIGURE 2-2 EBMUD FLOW COMMITMENTS



1. Amador County has 15 TAF of pre-14 rights, which could be exercised in dry years if there is sufficient runoff.
2. Average data provided for the various periods of historical record.
3. May be "0" if no water is available under JVID priority or Pardee elevation is below 550 ft.
4. Varies with runoff and storage conditions.
5. Water releases committed by EBMUD to protect fishery per "Normal and Above" water year type under JSA criteria.
6. Water releases committed by EBMUD to protect fishery per "Dry" water year type under JSA criteria. In critically dry years, the minimum releases could be as low as 22.5 TAF.
7. May be "0" if no water is available surplus to EBMUD needs.
8. EBMUD's obligation to release water to the Woodbridge Irrigation District is governed by a series of water rights settlement agreements to a maximum of 60 TAF/yr when inflow to Pardee is greater than 375 TAF.
9. Includes local runoff between Camanche and WID.

The in-line filtration plants that receive water directly from Pardee Reservoir are Walnut Creek WTP, Lafayette WTP, and Orinda WTP. Walnut Creek WTP and Lafayette WTP serve the area east of Oakland-Berkeley Hills and Orinda WTP serves primarily the central parts of the area west of the Oakland-Berkeley Hills. Three other plants, Upper San Leandro WTP, San Pablo WTP, and Sobrante WTP provide full conventional treatment and receive water from EBMUD's terminal reservoirs. These plants serve the northern and southern parts of the EBMUD distribution system west of the Oakland-Berkeley Hills.

EBMUD Terminal Reservoirs

Water that is not immediately put through the WTPs and distributed is stored in five EBMUD terminal reservoirs: Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro reservoirs. The total maximum capacity of these reservoirs is 151,670 AF. The terminal reservoirs serve multiple functions that include:

- regulating EBMUD's Mokelumne River supply in winter and spring;
- augmenting EBMUD's Mokelumne water supply with local runoff;
- providing emergency sources of supply during extended drought or in the event of interruption of delivery of the Mokelumne supply;
- providing environmental and recreational benefits to East Bay communities; and
- minimizing flooding.

Upper San Leandro, San Pablo and Briones reservoirs can supply water to EBMUD throughout the year, where as Lafayette Reservoir and Lake Chabot provide emergency standby supply. Lake Chabot also provides untreated water supply to several golf courses These two reservoirs are not used for regular domestic supplies and are used for public recreation (e.g. fishing, sailing, canoeing, hiking, jogging, bicycling, picnicking, walking, and nature observations). San Pablo Reservoir is also used for public recreation. Table 2-2 provides the capacities and water sources of the terminal reservoirs.

EBMUD Distribution Facilities

After the WTPs, water is distributed throughout EBMUD's service area, which is divided into more than 120 pressure zones ranging in elevation from sea level to 1,450 feet. Approximately 50 percent of treated water is distributed to customers by gravity. The water distribution network includes 4,100 miles of pipe, 140 pumping plants and 170

TABLE 2-2 TERMINAL RESERVOIR CHARACTERISTICS

RESERVOIR	CONSTRUCTED	CAPACITY (ACRE-FEET)	WATER SOURCES
BRIONES	1964	60,510	MOKELUMNE RIVER, BEAR CREEK
CHABOT	1875	10,350	MOKELUMNE RIVER, SAN LEANDRO CREEK, UPPER SAN LEANDRO RESERVOIR, MILLER CREEK
LAFAYETTE	1933	4,250	LAFAYETTE CREEK [1]
SAN PABLO	1920	38,600	MOKELUMNE RIVER, SAN PABLO CREEK, BEAR CREEK, BRIONES RESERVOIR
UPPER SAN LEANDRO	1926	37,960	MOKELUMNE RIVER, SAN LEANDRO CREEK AND TRIBUTARIES

[1] The raw water line for the Mokelumne aqueducts was disconnected from the reservoir in 1971.

neighborhood reservoirs (tanks storing treated drinking water) having a total capacity of 830 million gallons.

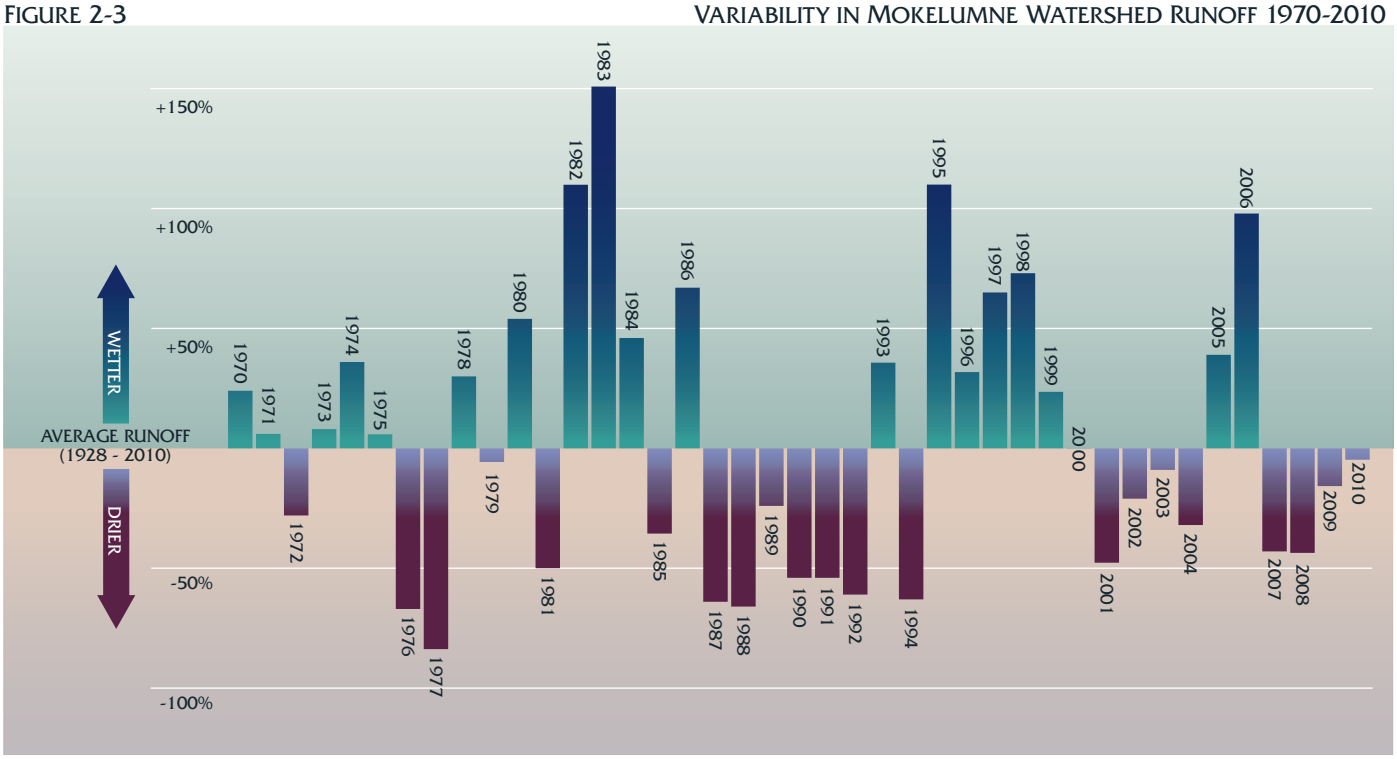
VULNERABILITIES IN WATER SUPPLY AND SYSTEM RELIABILITY

The reliability of EBMUD's water supply sources and transmission system are affected by many factors. Droughts and climatic variations can adversely affect the availability of EBMUD's water supplies. In addition to such gradually-occurring phenomena, sudden catastrophic interruptions also can compromise the availability of water. Despite efforts to upgrade the system, the structural strength of the Mokelumne Aqueducts that cross the Delta region, could be undermined by a levee failure, especially during flooding and earthquakes. Federal authorities have warned the nation's major water suppliers that the integrity of their water supply systems could be compromised by terrorist attacks. Other factors that could affect the availability of water supply include periods of poor water quality from high turbidity, which affects the water treatment system; potential contamination of supplies; maintenance outages at terminal reservoirs; shortfalls in distribution system capacity; widespread power outage; fires; and civil disturbances.

DROUGHTS

Northern California's water resources, including EBMUD's supplies, have been stressed by periodic drought cycles. Historical multi-year droughts have significantly diminished the supplies of water available to EBMUD's customers. The periodic drought cycles, including the most recent 2007-2009 hydrologic drought

FIGURE 2-3 VARIABILITY IN MOKELUMNE WATERSHED RUNOFF 1970-2010



and high variability of runoff in the Mokelumne River watershed are illustrated in Figure 2-3.

During the early stages of a drought and throughout the drought period, EBMUD imposes drought management programs to reduce customer demands, thereby saving water for the following year in case drought conditions continue. Chapter 3 of the UWMP 2010 includes the details of EBMUD's drought management program; Chapter 4 provides an assessment of the reliability of water service for EBMUD customers during normal, single, and multiple dry-years.

Effects of Climate Change

Climate change is a growing threat to water resources. Although the full impact of climate change has not been felt, EBMUD has initiated the planning for climate change to ensure that it can continue to provide reliable, high quality water and wastewater services to its customers.

In 2008, EBMUD incorporated climate change into its Strategic Plan and issued its first Climate Change Monitoring and Response Plan. Both documents were updated in 2010. An interdisciplinary staff committee is reviewing the evolving science of climate change, assessing potential water supply impacts and vulnerabilities, and developing strategies for adaptation and mitigation.

In 2009 EBMUD evaluated the sensitivity of its current water supply system to potential climate change impacts. The results of the analysis are intended to help guide EBMUD in managing water supplies to meet demand with the maximum amount of flexibility and the ability to adapt to unknown future conditions, and show that:

- the water supply is most vulnerable to decreases in annual runoff volumes;
- an increase in air temperature may result in increases in the temperature of water flowing into Pardee Reservoir and in customer demand; and
- the frequency of rationing is sensitive to decreases in annual precipitation volume.

Although EBMUD may experience these changes in its Mokelumne River watershed supply in the future, due to the uncertainty in regional climate change projections, the severity of these impacts is unknown.

EBMUD also participates in external working groups focused on climate change, including the Climate Ready Water Utilities Working Group and the Climate Resilience Evaluation and Assessment Tool (CREAT) Working Group. These working groups are part of the Environmental Protection Agency's Climate Ready Water Utilities Program. The purpose of both groups is to increase utility awareness of climate change impacts, educate and prepare utilities for climate change, and identify and provide tools to assess and understand the impact of climate change.

The Climate Ready Water Utilities Working Group is charged with developing attributes for climate ready utilities; identifying tools, training, and products to address short and long-term needs; and facilitating the adoption of climate change adaptation and mitigation strategies. The CREAT Working Group guided the development of a computer based tool to support utilities with performing traditional risk based and scenario based assessments to evaluate the utilities resilience to climate change. Version 1 of the software was released by the EPA in 2010.

Regulatory Constraints

EBMUD's ability to use its full entitlement of Mokelumne River water is constrained by the limitations incorporated into the state issued licenses and permits that grant EBMUD the right to serve its customers 325 MGD from the Mokelumne River. Although EBMUD's water supply system was designed and constructed to deliver 325 MGD, in dry-years, the extent to which EBMUD's water rights can be exercised is further constrained by other Mokelumne River water users with water entitlements that are senior to those held by EBMUD.

In addition to the requirements set forth in the licenses and permits, EBMUD's water supply system operating goals and objectives must also conform to State Water Resources Control Board Decisions, Court Decisions, Federal Energy Regulatory Commission Orders, and water right settlement agreements. EBMUD is obligated to meet multiple operating objectives, including providing municipal water supply benefits, streamflow regulation, fishery/ public trust interests, flood control, temperature management, and obligations to downstream diverters.

In 2007, the State Water Resources Control Board (SWRCB) commenced a formal proceeding on EBMUD's petition for a time extension of its permit to put Mokelumne River water rights entitlement to full beneficial use. In accordance with the California Environmental Quality Act, EBMUD issued a Notice of Preparation of an Environmental Impact Report (EIR) for the permit extension in November 2008 with the Draft EIR expected to be released for public review at a later date.

WATER SUPPLY QUALITY

EBMUD consistently provides the highest quality water possible. EBMUD's primary water supply from the Mokelumne River requires only limited treatment to meet or surpass health standards, because it comes from a remote, mostly undeveloped watershed and is transported within two days to the EBMUD's service area in large steel pipes. EBMUD has further protected water quality at Pardee Reservoir through the purchase of conservation easements in areas with significant potential for residential development adjacent to Pardee Reservoir. As a result, the Mokelumne River supply is minimally exposed to common sources of contaminants such as pesticides, agricultural or urban runoff, municipal sewage discharges, or industrial toxics.

EBMUD and county health departments have posted health warnings to notify the public about fish consumption and elevated mercury levels. Mercury in the foothills including Pardee and Camanche Reservoirs has been associated with historical gold mining activity. However it is important to note that mercury has never been detected in EBMUD's drinking water supply from Pardee or Camanche Reservoirs at levels above the California Public Health Goal (PHG) of 1.2 ug/L.

On certain occasions, turbidity in Pardee reservoir can exceed the water quality limits that the District water treatment plants can treat adequately and reliably to meet regulatory water quality standards. The degradation in water quality has historically been attributed to extreme weather or unusual watershed emergencies such as landslides. In those situations, the Mokelumne Aqueducts must be shutdown or throttled to low flow until the water quality in Pardee Reservoir sufficiently improves. The District's local reservoir supply is the primary source of supply in these emergency situations. Since 1982 the aqueducts were taken out of service at least three times because of poor raw water quality (i.e. high turbidity) in Pardee Reservoir, caused by winter storm runoff or landslides. The longest recorded shutdown duration was for a period of 65 days in 1997 when a landslide occurred on January 7, on a slope of the Mokelumne River in the Upper Mokelumne River watershed.

As performance regulations for drinking water treatment become more stringent, recovery from poor water quality events is expected to take longer, resulting in longer aqueduct shutdowns or reduced flows.

When the aqueducts are shut down because of severe water quality events, EBMUD implements water management plans, which are already in place. Terminal reservoirs are normally operated to provide 180 days of standby storage at reduced consumption, and EBMUD meets its service area demands by relying on this supply when the Mokelumne River supply is temporarily unavailable. After water quality has returned to acceptable levels, the terminal reservoirs are refilled as soon as practical by the Mokelumne Aqueducts to meet standby storage levels.

EBMUD WTPs that process the water supplied by local terminal reservoirs are designed to handle high turbidity conditions that can be caused by severe local storms. Consequently, water quality variations do not limit the water supply available from terminal reservoirs.

EARTHQUAKES

Potential seismic events pose a significant threat to the delivery of water in the San Francisco Bay Area. Within or near EBMUD's service area, several earthquake faults, including the San Andreas, San Gregorio, Hayward, Calaveras, Concord, Antioch, Greenville, Mt. Diablo Thrust, Midland, and others, as depicted in Figure 2-4, pose varying degrees of risk to the water distribution system and to the Mokelumne Aqueducts in the Delta area. The most significant seismic threat comes from the Hayward Fault that crosses the Claremont Tunnel, which is the most critical conduit of treated water to the East Bay plain. See Table 2-3 for a list of significant earthquakes that have occured in the Bay Area since 1836.

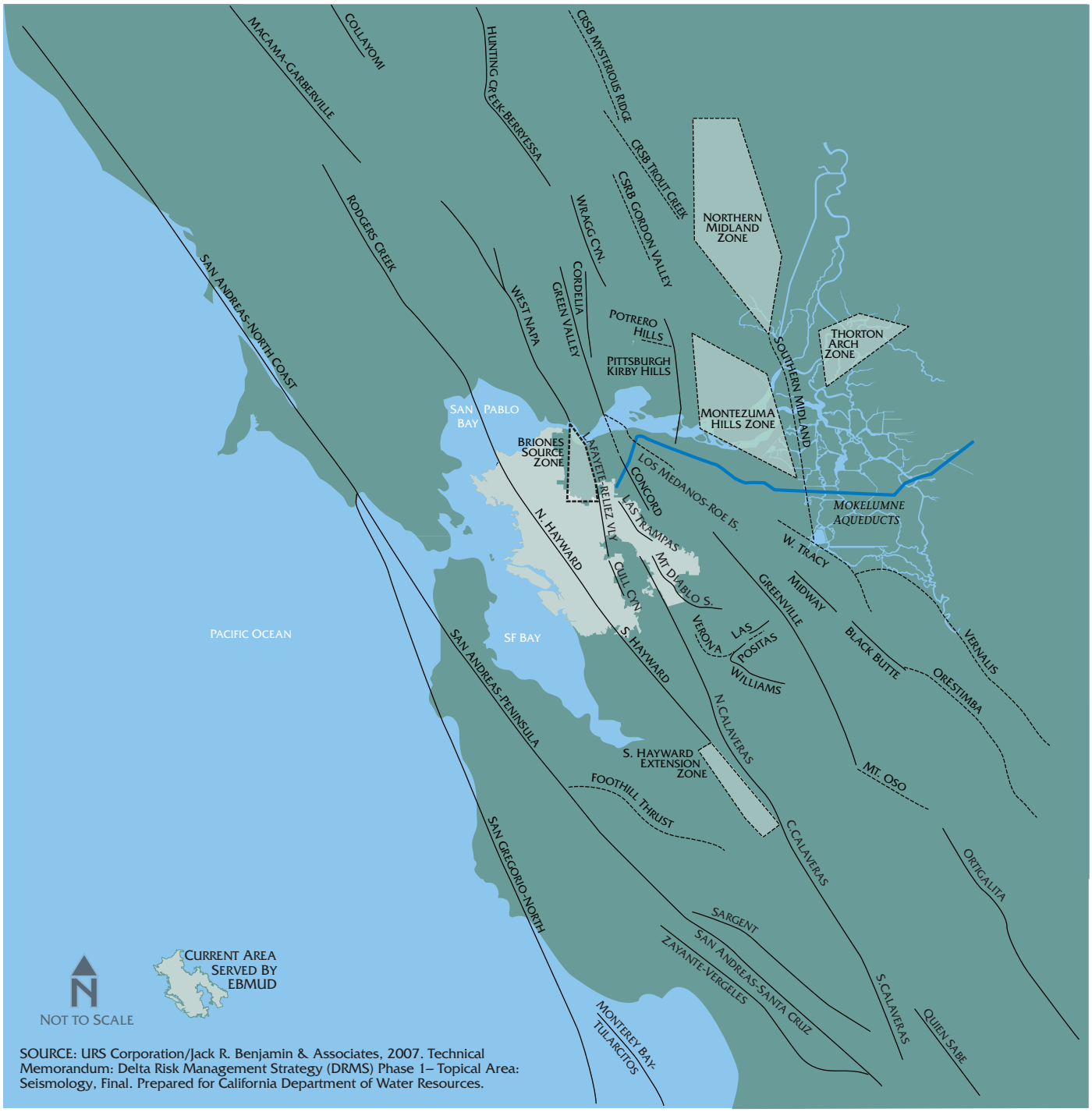
EBMUD's Mokelumne River facilities are also located in a seismically active area. Pardee Dam is located within three miles of the Bear Mountain Fault zone (see Figure 2-5); however, according to analyses completed in 1992, it will not be adversely impacted by a seismic

TABLE 2-3 SIGNIFICANT BAY AREA EARTHQUAKES (M>6.5)

YEAR	FAULT	RICHTER MAGNITUDE
1836	HAYWARD	6.75
1838	SAN ANDREAS	7.0
1865	SAN ANDREAS	6.5
1868	HAYWARD	7.0
1892	UNDETERMINED	6.5
1898	UNDETERMINED	6.5
1906	SAN ANDREAS	8.25
1911	CALAVERAS	6.5
1989	SAN ANDREAS	7.1

Source: http://seismo.berkeley.edu/seismo.baseis.html

FIGURE 2-4 SAN FRANCISCO BAY AREA REGION FAULTS



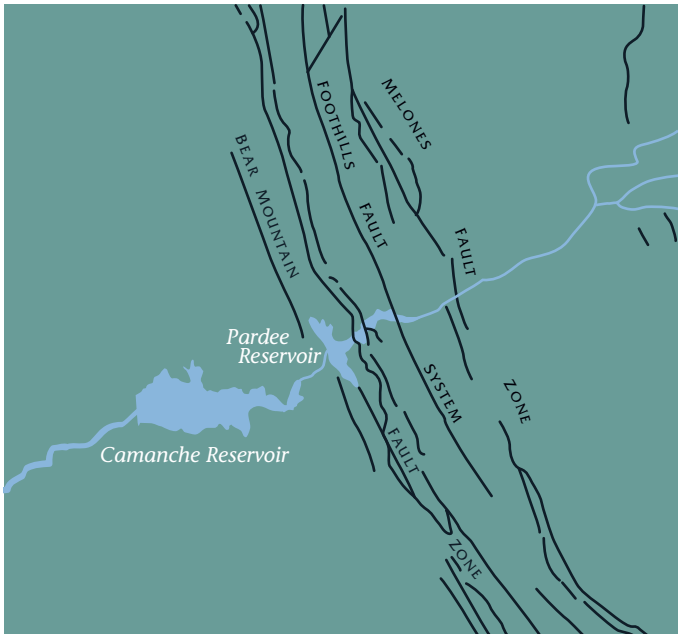
SOURCE: URS Corporation/Jack R. Benjamin & Associates, 2007. Technical Memorandum: Delta Risk Management Strategy (DRMS) Phase 1– Topical Area: Seismology, Final. Prepared for California Department of Water Resources.

event on that fault. A seismic study of Camanche Dam completed in 2010 concluded that a major earthquake on the Bear Mountain Fault zone could cause liquefaction of the tailings materials under the Camanche Main Dam embankment. The resultant deformation would be limited to the downstream toe area and would not affect the overall dam stability nor lead to dam overtopping.

DELTA FLOODS

There is a long history of levee failures in the Delta, including the region where the Mokelumne Aqueducts cross. EBMUD experienced a near-catastrophic event in 1980 when Lower Jones Tract flooded and the railroad embankment adjacent to the aqueducts subsequently failed, allowing floodwater

FIGURE 2-5 UPCOUNTRY AREA FAULTS



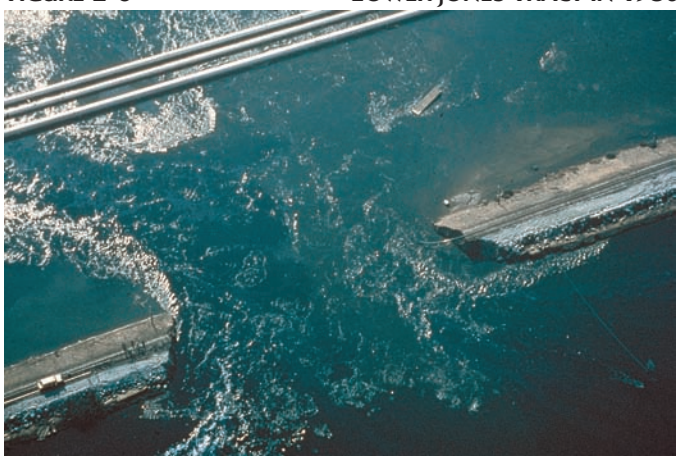
to flow into Upper Jones Tract (see Figure 2-6). This event nearly undermined the aqueduct supports in the area. Necessary repairs were made.

In June 2004, a structural failure in the levee at the Upper Jones Tract 1.5 miles south of the Mokelumne Aqueducts caused a levee breach. The resulting flood submerged about 5.25 miles of the elevated Mokelumne Aqueducts for several months while the island was being drained. Nevertheless, the aqueducts remained in full operation during the entire time. Subsequent investigation of the damage concluded that the aqueducts and their supports were structurally sound, and the maintenance road and drainage systems for the aqueducts sustained damage to their exterior coatings.

IMPROVING WATER SUPPLY AND SYSTEM RELIABILITY

To prepare for conditions that may affect the availability of water, EBMUD implements infrastructure related programs and projects that improve the reliability of its water supply. Among these are supplemental water supply projects that not only reduce the frequency and magnitude of water rationing required of customers during droughts, but also provide EBMUD customers with greater assurance against other possible adverse situations, such as emergency water shortages. In addition to pursuing supplemental water supply sources, EBMUD also maximizes resources through continuous improvements in the delivery and transmission of available water supplies, and investments in ensuring the safety of its existing water supply facilities.

FIGURE 2-6 LEVEE FAILURE ON THE LOWER JONES TRACT IN 1980



INFRASTRUCTURE IMPROVEMENT PROJECTS

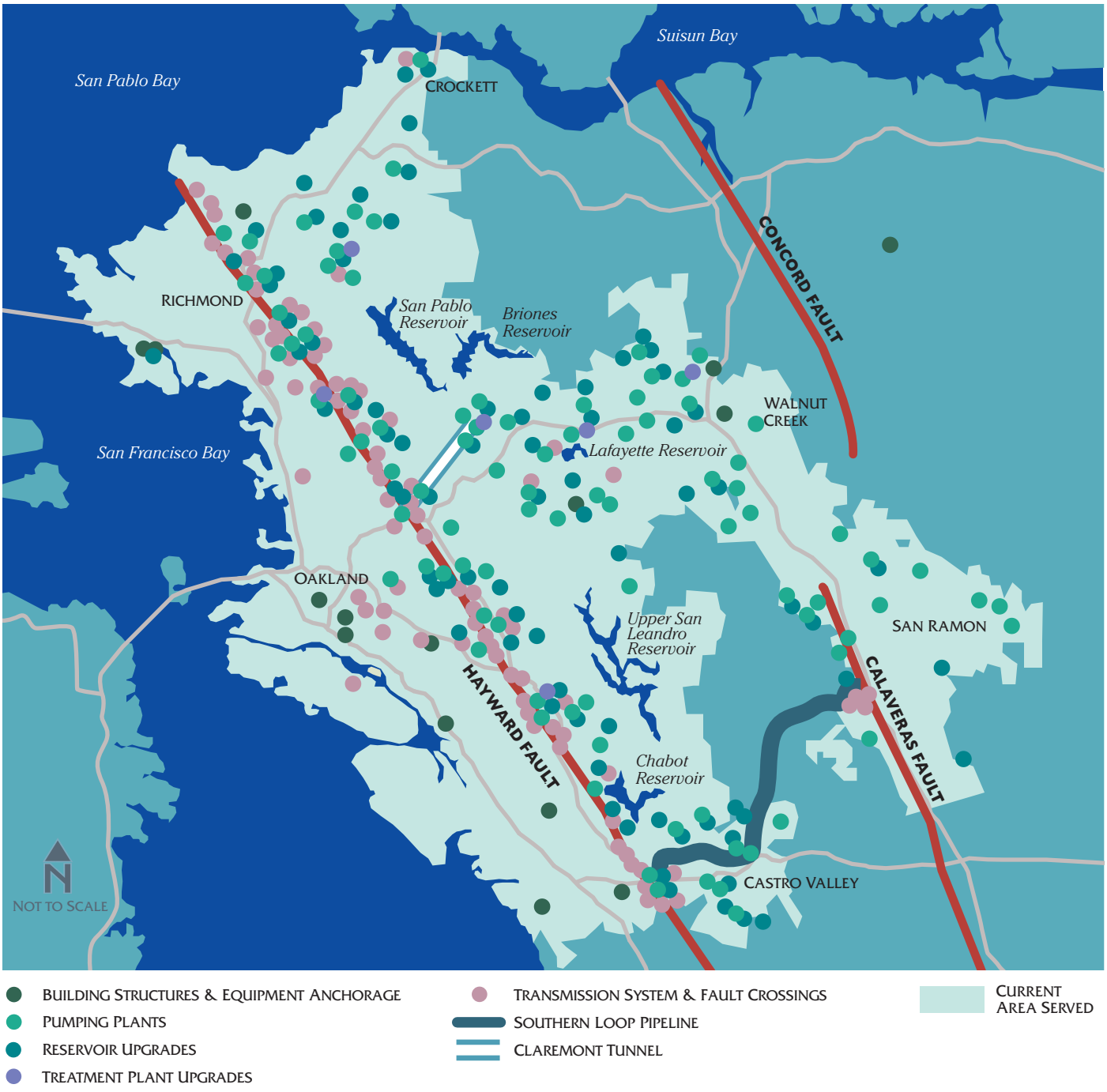
Seismic Improvement Program

EBMUD is internationally recognized for its proactive approach to minimizing seismic risk. A Seismic Improvement Program completed in 2007, made EBMUD the first water agency in the United States to retrofit its facilities on a comprehensive scale. The program was designed and implemented to protect public safety and preserve the regional economy by making improvements that would allow EBMUD to partially restore water service to its customers following a major earthquake within 30 days. The seismic improvements improved the system's operational flexibility and reliability and put in place the necessary tools for rapid response, repairs, and recovery. As illustrated in Figure 2-7, the program included installation of an 11-mile pipeline at the southern end of the service area to create an alternate transmission route, upgrades and retrofits to more than 300 critical facilities, and an innovative bypass tunnel through the Hayward Fault zone for the Claremont Tunnel, a critical facility that brings water through the Oakland-Berkeley hills to approximately 800,000 customers.

Mokelumne Aqueduct Seismic Upgrade

The Mokelumne Aqueducts convey the Mokelumne River supply from Pardee Reservoir across the Delta to EBMUD's service area. The aqueducts are buried for most of their length. At Delta river and slough crossings, they are buried from 10 to 40 feet below the channel bottoms or levee crests. The remaining above-ground sections are supported on timber, reinforced concrete or steel bents for approximately ten miles as the aqueducts cross the islands in the Delta. The

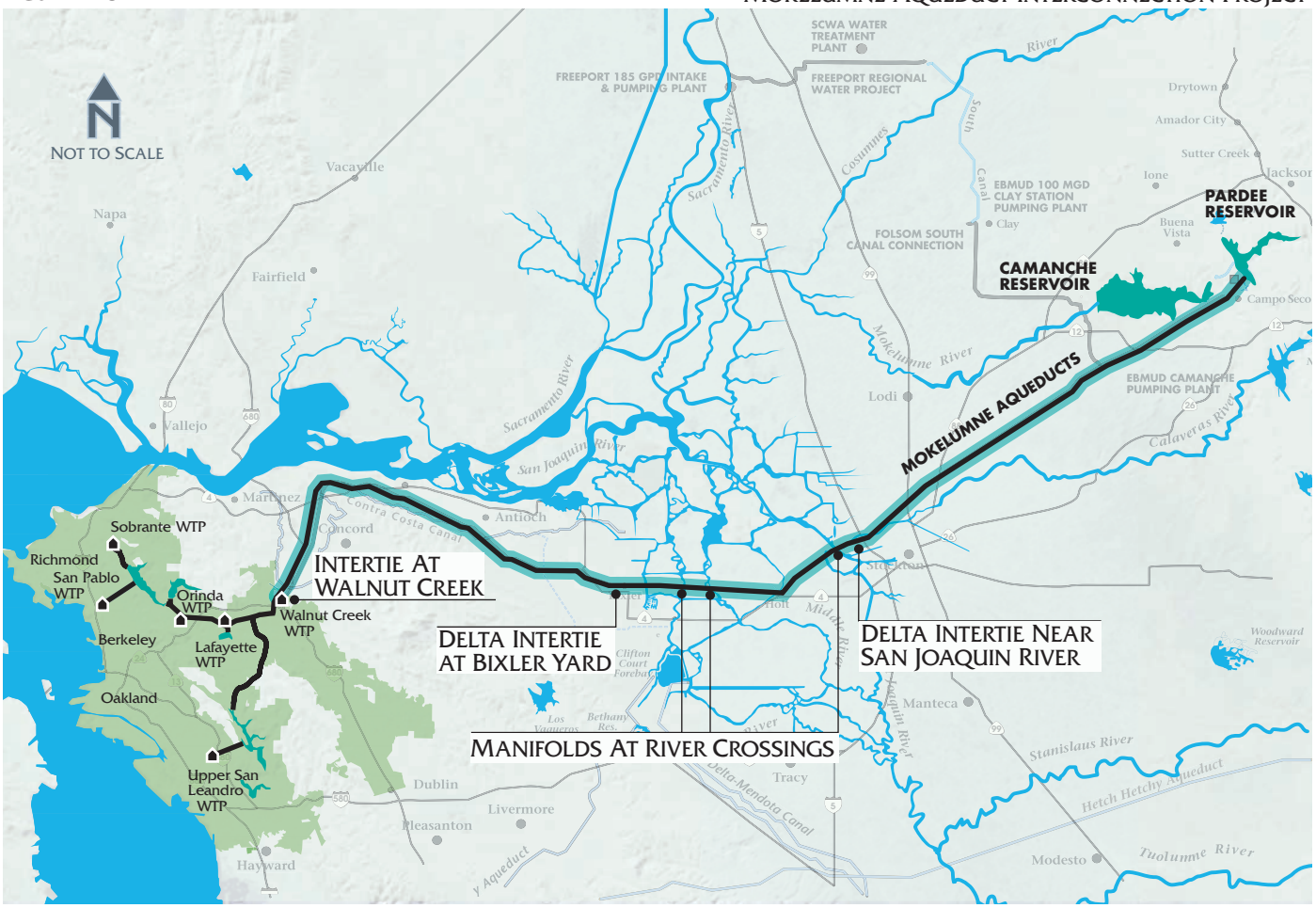
FIGURE 2-7 SEISMIC IMPROVEMENT PROGRAM



aqueducts also cross non-engineered levees constructed in the late 1800s, which provide little support.

In the 1990s, EBMUD began the Mokelumne Aqueduct Seismic Upgrade Project, as part of the comprehensive Mokelumne Aqueduct Security program, to improve the seismic performance of the aqueducts in the Delta and to ensure that raw water deliveries can be partially restored within 180 days after a major earthquake. The project improved the seismic performance of the Mokelumne Aqueduct No. 3, by strengthening of levees at aqueduct crossings and of pipe foundations at river crossings; reinforcing all pipe joints on buried portions of the pipe; and the strengthening of pipe support structures on elevated portions of the aqueduct. The project also included replacement of all low strength

FIGURE 2-8 MOKELUMNE AQUEDUCT INTERCONNECTION PROJECT



bolts with high strength bolts on elevated portions of Mokelumne Aqueduct No. 2 and No. 3. The final phase of this program was completed in 2005.

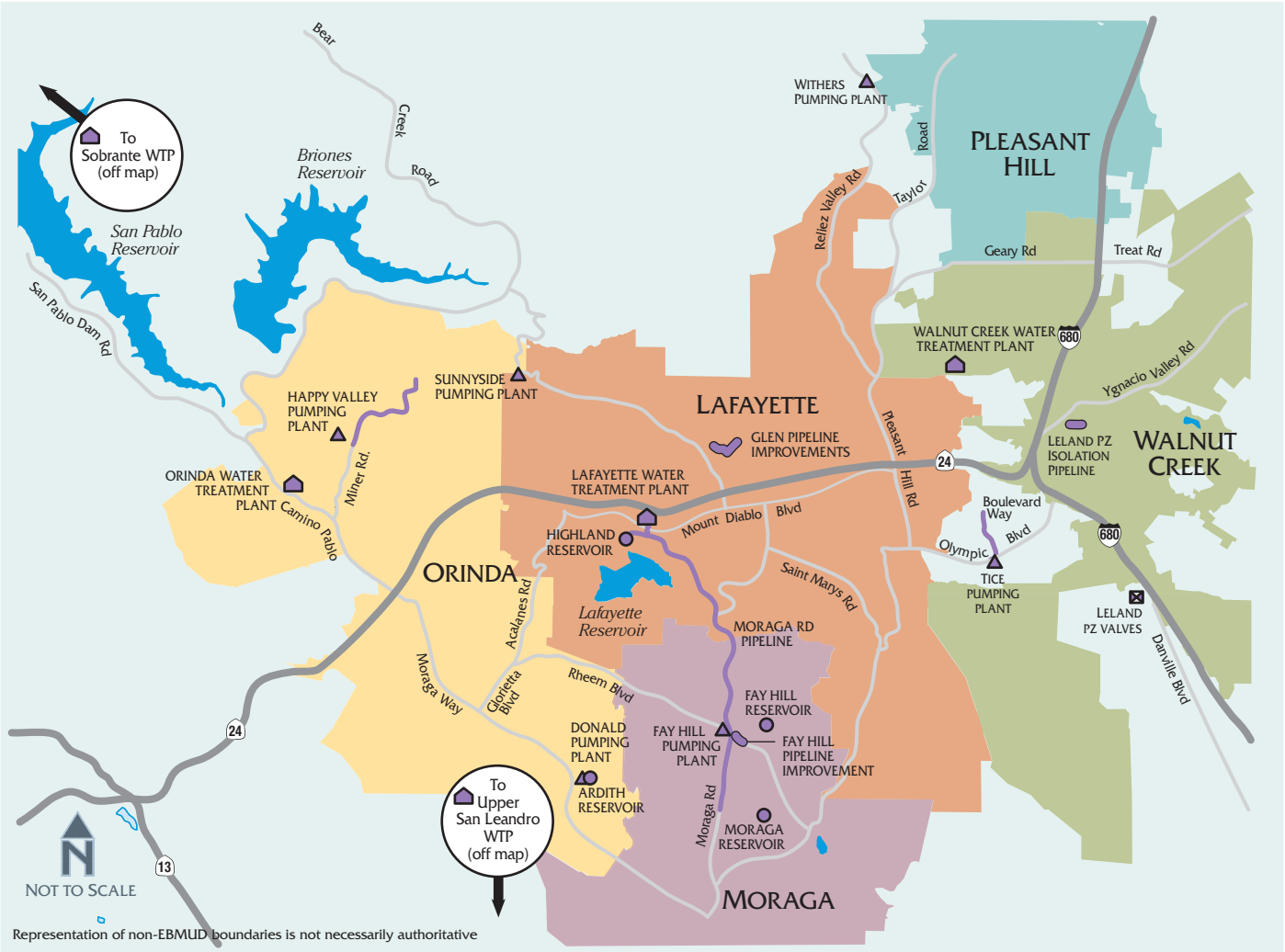
EBMUD prepared an Aqueduct Section Emergency Plan that will be activated in the event of an aqueduct or levee failure. The type and magnitude of the failure will determine whether the EBMUD Emergency Operations Plan should be activated. If the water supply to the service area is impacted, the Water Shortage Contingency Plan (see Chapter 3) will also be activated.

Mokelumne Aqueduct Interconnection Project

EBMUD is currently in the design phase of the Mokelumne Aqueduct Interconnection Project that will further improve the reliability of its water supply delivered through the Mokelumne Aqueducts. The project includes the addition of interconnections between the aqueducts in two locations in the Delta area and near Walnut Creek, and adding emergency piping manifolds to Mokelumne Aqueduct No. 3 at the Delta river crossings (see Figure 2-8). The interconnections in the Delta will allow the District to bypass segments of the Mokelumne Aqueducts that may be damaged following a levee failure or seismic event, and thus, maximize flows through surviving segments of the aqueducts. The interconnection near Walnut Creek will allow for isolation and bypassing at the two tunnels that are at the end of the Mokelumne Aqueducts to improve operational flexibility. Following an emergency event, the piping manifolds on Mokelumne Aqueduct No. 3 at the Delta river crossing will allow water to temporarily bypass these three main river crossings in the Delta, where the Mokelumne Aqueduct No. 3 is more susceptible to damage, until permanent repairs can be made.

The project is funded by a Proposition 84 grant from the California Department of Water Resources (DWR) in the amount of $10 million as part of the State's Integrated Regional Water Management Program (IRWMP).

FIGURE 2-9 WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM



Walnut Creek–San Ramon Valley Improvement Project

The Walnut Creek–San Ramon Valley Improvement Project increased system reliability in the eastern portion of the service area, improving water pressure and water availability during prolonged seasonal hot periods while maintaining adequate reserves for fire flows. This project was completed in the mid-2000s. It included capacity expansion and upgrades to the Walnut Creek WTP, construction of 4.4 miles of large diameter transmission pipeline (including a one-mile tunnel) from Walnut Creek to Alamo, and expansion of the Danville Pumping Plant in Alamo.

Water Treatment and Transmission Improvements Program

The Water Treatment and Transmission Improvements Program (WTTIP) addresses regulatory issues, maintenance needs, and water treatment and transmission capacity needs in Lafayette, Moraga, Orinda, western Walnut Creek, and parts of unincorporated Contra Costa County. The program will allow EBMUD to reliably and efficiently meet current and projected 2030 water demands of the WTTIP area. It includes improvements to the Lafayette, Orinda, Walnut Creek, Sobrante, and Upper San Leandro WTPs, four new or upgraded storage tanks, nine new or upgraded pumping plants, and approximately 5.5 miles of new pipeline, as illustrated in Figure 2-9. The WTTIP EIR and recommended projects was approved by the Board in December 2006.

One of the WTTIP components, the Moraga Road Pipeline, a new three mile 36-inch and 48-inch diameter pipeline, was placed in-service in December 2008. Highland Reservoir, a new 2.7 million gallon reservoir is scheduled to be placed in-service by the end of 2011. The Walnut Creek WTP project completion is expected in 2012, and includes construction of two new filters, a new 34 MGD distribution system pumping plant and backwash water recycling system improvements.

West-of-Hills Master Plan

The West-of-Hills Master Plan was completed in 2010 and addresses regulatory issues, existing maintenance needs, and existing and future water treatment and transmission capacity needs for the western portion of the EBMUD service area. This regional master plan was undertaken to better understand WTP and transmission capacity limitations, integrate long-range plans with the WTTIP, and develop strategies to resolve competing needs from individual pressure zones. The proposed improvements include expansion and upgrades to Orinda, Sobrante, and Upper San Leandro WTPs, five water storage reservoirs, two pumping plants, and 23 miles of new transmission pipeline projects ranging in size from 30-inches to 72-inches in diameter. Some of components of the West-of-Hills Master Plan will be completed as needed, when future development and projected water demand growth materialize.

Dam Safety Program

EBMUD maintains a comprehensive Dam Safety Program. Instrumentation monitoring, monthly visual inspections, and periodic dam safety reviews are conducted to prevent loss of life, personal injury and property damage from dam failures. EBMUD staff utilizes the latest technology in geotechnical, structural and earthquake engineering to conduct monitoring, inspection, and evaluation of the dams. While most EBMUD dams are under the jurisdiction of the California Division of Safety of Dams (DSOD), Pardee and Camanche Dams also are monitored by the Federal Energy Regulatory Commission (FERC) because they produce hydropower. DSOD and FERC conduct their annual dam inspections independently of EBMUD monitoring and inspection.

FERC uses the Potential Failure Mode Analysis (PFMA), a component of its Dam Safety Performance Monitoring Program, to identify, evaluate, and categorize potential failure modes for dams that are under FERC jurisdiction. In 2008, in compliance with FERC's regulatory requirements, an independent consultant and project team conducted the PFMA for Pardee and Camanche Dams. The results of the analysis show that Pardee and Camanche Dams were well designed, constructed, instrumented, monitored, and maintained by EBMUD. Based on results of the analyses, FERC recommended that EBMUD continues to implement its comprehensive Dam Safety Program for both dams.

In 2004 and 2005, EBMUD completed stability evaluations for San Pablo, Chabot, and Lafayette Dams. Based on the results, EBMUD completed seismic upgrades at San Pablo Dam by improving the foundation materials with cement deep soil mixing technology and a larger downstream buttress, and plans to start seismic upgrade work at Chabot Dam in the coming decade. The embankment of Lafayette Dam was found to be seismically adequate; however, its outlet tower may require seismic upgrades. EBMUD is working with DSOD to identify the appropriate measures. The seismic evaluation of Upper San Leandro Dam is currently underway and it is expected to be completed in 2011.

Security

Working with law enforcement and utility industry security experts, EBMUD has established a comprehensive security program to protect its water supply. Acting on the recommendations of the Federal Bureau of Investigation, the American Water Works Association, and the California Emergency Management Agency, EBMUD continually reviews and updates emergency response plans, and guards its water and wastewater systems.

As required by the Federal "Bioterrorism Preparedness and Response Act, Public Law 107-188," EBMUD submitted its Vulnerability Assessment to the Unite States Environmental Protection Agency (EPA) in 2003, and established a Security and Emergency Preparedness Section (SEPS) to coordinate its security efforts. Since 2003, the SEPS has continued to stay abreast of security developments and been prepared to respond to security issues that might arise. EBMUD's SEPS has trained and certified EBMUD staff in compliance with all legal requirements.

EBMUD has continually improved its ability to deter and delay criminal activity; to detect such activity when it does happen; to assess alarm and potential security breach conditions; and to dispatch responders to security incidents promptly. Physical improvements to key EBMUD facilities include, but are not limited to, re-keying locks, fencing, access control systems, lighting, alarms (interior and exterior), motion detectors, cameras, video recorders, monitors, and all related required appurtenances to complete the security systems. Operational improvements

included updating the security response section of EBMUD's Emergency Operations Plan (submitted to the EPA in 2003). In 2009, the SEPS revised the Emergency Operations Plan for full compliance with the National Incident Management System (NIMS). In addition, per EBMUD's FERC license, periodic security inspections are conducted and specific requirements have to be met to ensure the security of the FERC licensed hydropower project. EBMUD also maintains and annually updates its Emergency Action Plan for Pardee and Camanche Reservoirs to comply with current FERC requirements. EBMUD continues to adjust and improve security measures as warranted to protect against potential terrorism and other security concerns experienced by EBMUD.

Ensuring the safety of public water supplies is EBMUD's top priority. EBMUD uses an all-hazard, multi-barrier approach with physical, chemical, and operational controls to safeguard the drinking water provided to consumers. This approach is advocated by national industry and homeland security experts. In response to a threat or situation in which the quality of the water supply is potentially affected or compromised, EBMUD follows a systematic approach to assess the threat or likelihood of potential contamination, to investigate the event, and to respond appropriately to protect the public and the water system. EBMUD has plans in place and is ready to issue all required and appropriate public notices if there is a question or concern regarding the safety of its public water supplies.

EBMUD's Emergency Operations Team (EOT) is ready to respond quickly and appropriately to any emergency with other public safety and first responder agencies. The EOT manages emergency responses, meets, trains, and conducts exercises routinely. EBMUD's EOT utilizes the California Standardized Emergency Management System that incorporates all NIMS requirements, and is very well integrated with other utilities directly, by agreement, and by its active engagement with the California Utilities Emergency Association. See Chapter 3 for details on inter-agency emergency support.

Existing Supplemental Water Supply Sources

EBMUD's long-term water supply goals include improving water supply reliability and diversifying its water supply portfolio. Since the UWMP 2005 update, two critical steps toward realizing those goals were completed when EBMUD finished the construction of the Freeport Regional Water Facility and the Bayside Groundwater Facility. These facilities provide additional water to augment EBMUD's water supply during drought periods.

Freeport Regional Water Facility

The Freeport Regional Water Facility is a result of a regional water supply project undertaken by Freeport Regional Water Authority (FRWA), which was created by exercise of a joint powers agreement between Sacramento County Water Agency (SCWA) and EBMUD. The City of Sacramento is an associate partner. The facility, as shown in Figure 2-1, (see page 2-3) enables delivery of water diverted from the Sacramento River near the town of Freeport to EBMUD customers during dry-years and will provide water in all years for the Sacramento County. It will be used to supplement EBMUD's aggressive water conservation and recycling programs to reduce the potential for severe water rationing and associated economic losses during droughts.

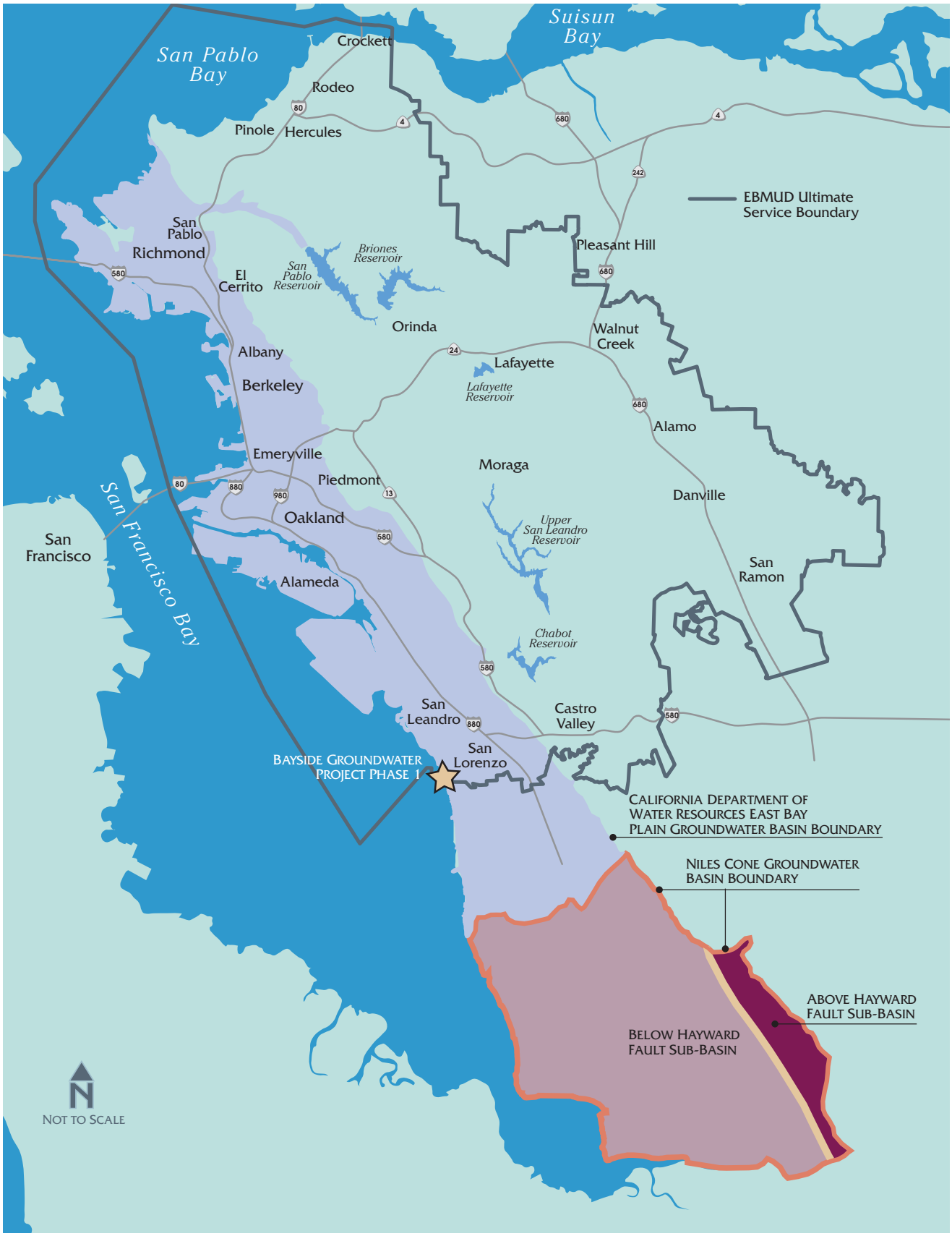
Stemming from its effort to identify additional sources of supply to meet its long-term water demand since the mid-1960s, EBMUD executed a contract in 1970 with the United States Bureau of Reclamation (USBR) for delivery of Central Valley Project (CVP) water from the American River. Years of litigation followed, preventing construction of the infrastructure necessary to deliver this water supply to EBMUD. In 2000, USBR, EBMUD, and Sacramento parties reached an agreement to modify the contract and to develop a joint water supply from the Sacramento River, rather than from the American River. FRWA was created in 2002, to implement the development of the Freeport facility. The facility, as illustrated in Figure 2-1, includes:

Table 2-4 Existing Supplemental Water Supply Quantities (in acre-feet per year)

Sources	Normal Year	Maximum Single Dry Year	Multiple Dry Years		
			Year 1	Year 2	Year 3
Freeport Regional Water Facility	0	Up to 112,000 [1]	165,000 over three years		
Bayside Groundwater Facility	0	1,120	1,120	1,120	1,120

[1] Contractual single-year limit of supply from USBR is 133,000 AF. Continuous operation at 100 MGD, EBMUD's allocation capacity in the FRWP, yields a maximum annual delivery of 112,000 AF. Supply from the FRWP is also limited by the availability of CVP water during dry-years.

FIGURE 2-10 SOUTH EAST BAY PLAIN BASIN



- 185-MGD water intake and pumping plant (with state-of-the-art fish screens) on the Sacramento River near Freeport;
- 72- to 84-inch diameter pipeline to transport water eastward from the Sacramento River to the existing Folsom South Canal and to SCWA's treatment plant, which is presently under construction;
- the aforementioned WTP in central Sacramento County; and
- approximately 20 miles of 72-inch diameter pipeline and two 100 MGD pumping plants to transport water from the southern end of the Folsom South Canal to EBMUD's Mokelumne Aqueducts.

The project became operational in February 2011. EBMUD's ability to take delivery of water through the Freeport facility is based on its Long Term Renewal Contract (LTRC) with the USBR, which provides for up to 133,000 AF in a single dry-year, not to exceed a total of 165,000 AF in three consecutive dry-years. Under the LTRC, the CVP supply is available to EBMUD only in dry-years when EBMUD's total stored water supply is forecast to be below 500 TAF on September 30 of each year (See Chapter 3 and Appendix G for further details). Table 2-4 illustrates the supplemental supply quantities provided to EBMUD by the Freeport facility.

Bayside Groundwater Facility

The Bayside Groundwater Facility was built to enable EBMUD to inject potable drinking water into the deep aquifer of the South East Bay Plain Groundwater Basin (SEBPB) during wet years until its subsequent recovery, treatment and use during times of drought. The facility supplies supplemental water to EBMUD customers only when supplemental water is needed, and overall, the quantity of water injected into the aquifer of the SEBPB will exceed the quantity of water extracted. See Figure 2-10 for basin location.

Groundwater from the SEBPB is available only to a limited extent as part of the implementation of the injection/extraction system associated with the Bayside Groundwater Facility. Because it is possible that some extractions may include native groundwater, which will subsequently be treated, EBMUD has started the process for preparing a groundwater management plan for the SEBPB (see SEBPB Groundwater Management Plan Development section of this Chapter), but EBMUD has not yet adopted a groundwater management plan. The native groundwater of the SEBPB is not available as a significant source of water to EBMUD.

The groundwater facility became operational in 2010. The facility consists of a new water treatment facility and associated pipelines linking the treatment plant to the injection/ extraction well, subsidence monitoring system, and a network of groundwater monitoring wells. The project will supply water to EBMUD customers only when supplemental water is needed because of drought conditions.

The injection/ extraction system uses a 600-foot deep well, located on property leased from the Oro Loma Sanitary District in San Leandro. When operated in injection mode, treated water from EBMUD's distribution system is directed through the project well into the deep aquifers of the SEBPB. The injection mode operation will take place during wet years when surplus water is available for storage. During droughts water will be extracted and treated to meet all federal and state drinking water standards prior to distribution to the customers. A permit from the Department of Public Health, which is pending, is required before the groundwater can be extracted and treated for municipal use.

The project is designed to yield 2 MGD over a 6-month period, resulting in an average annual production capacity of 1 MGD or 1,120 acre-feet per year (AFY). The supplemental supply quantities available to EBMUD as a result of operation of the project are presented in Table 2-4. EBMUD's long-range plan calls for investigating potential expansion of the Bayside Groundwater Facility in the future.

Potential Supplemental Water Supply Sources

Short-Term Potential Supplemental Water Supply Projects

EBMUD will meet future growth in projected customer demand with aggressive conservation and recycled water development, and, as necessary, by implementing additional supplemental supply components. These supply components will lower the customer rationing burden during droughts and thereby decrease direct impacts on EBMUD customers.

EBMUD has established aggressive targets for conservation and recycling, and these two actions will meet a total of 50 MGD of future demand, as described in detail in Chapter 5 and Chapter 6, respectively, of the UWMP 2010. The supplemental supply components that

FIGURE 2-11 POTENTIAL WATER TRANSFER SOURCE AREAS AND CONVEYANCE

EBMUD may pursue in order to enhance its supplies during dry-years include, but are not limited to, water transfers, and groundwater banking/ exchange efforts.

EBMUD will simultaneously pursue supplemental supply projects to meet future water needs consistent with the resources management strategies presented in DWR's 2009 California Water Plan. By considering a broad mix of projects, with inherent scalability and the ability to adjust implementation schedules for a particular component, EBMUD will be able to minimize the risks associated with future uncertainties such as project implementation challenges and global climate change. If EBMUD is able to successfully develop one component, this could result in deferral of other additional supplemental supply components over the planning period. EBMUD is interested in partnering with other agencies and other water rights owners in exploring projects to ensure the water supply for the future. Partnerships offer the best potential solutions that are environmentally sound, cost-effective, and sustainable. Separate project-level environmental documentation will be prepared, as appropriate, for specific components as they are developed in further detail and implemented in accordance with EBMUD's water supply needs.

Because EBMUD's extensive conservation savings have limited the ability to ration in dry and critical dry years without extensive cost to customers, EBMUD has set the rationing goal to up to 15 percent during multi-year droughts. As a practical matter, EBMUD may be unable to reduce rationing to 15 percent until it has developed sufficient dry-year supply to meet the demands during any particular drought. As new supplemental supplies are secured, EBMUD will be able to gradually reduce the amount of rationing it imposes upon its customers.

Northern California Water Transfers

EBMUD is interested in exploring a water transfer program to secure up to 13 MGD of dry-year water supply through voluntary water transfers. The purpose of EBMUD's Water Transfer Program is to develop and implement water transfer and exchange opportunities throughout northern California. EBMUD plans to use the Freeport facilities, illustrated in Figure 2-11, to convey the transfer water to EBMUD's service area.

Due to recent demand reductions resulting from economic downturn and drought and in combination with the District's rationing policy, EBMUD's water supplies are currently sufficient in the near-term. Therefore, EBMUD's primary interest is exploring partnership opportunities with willing parties within the Sacramento River Watershed on long-term or permanent water transfer arrangements. In the future, EBMUD's Water Transfer Program also may pursue short-term transfer arrangements, as needed, to help reliably meet EBMUD's dry-year water supply needs.

Bayside Groundwater Project Expansion

EBMUD plans to examine the potential expansion of the Bayside Groundwater Facility that was completed in 2010. EBMUD plans to utilize information gained from the operation of the facility to help determine whether and how to proceed with the expansion. EBMUD would prepare a project specific EIR for Phase 2 prior to the development of the project.

Phase 2 is envisioned to have an annual capacity ranging between 2 and 9 MGD and to use the South East Bay Plain Groundwater Basin (SEBPB), although details regarding proposed capacity, locations, and configuration of Phase 2 facilities will not be developed until Phase 1 is operated for a period of time. As planning for Phase 2 moves forward, EBMUD will work with the Bayside Community Liaison Group to address community concerns.

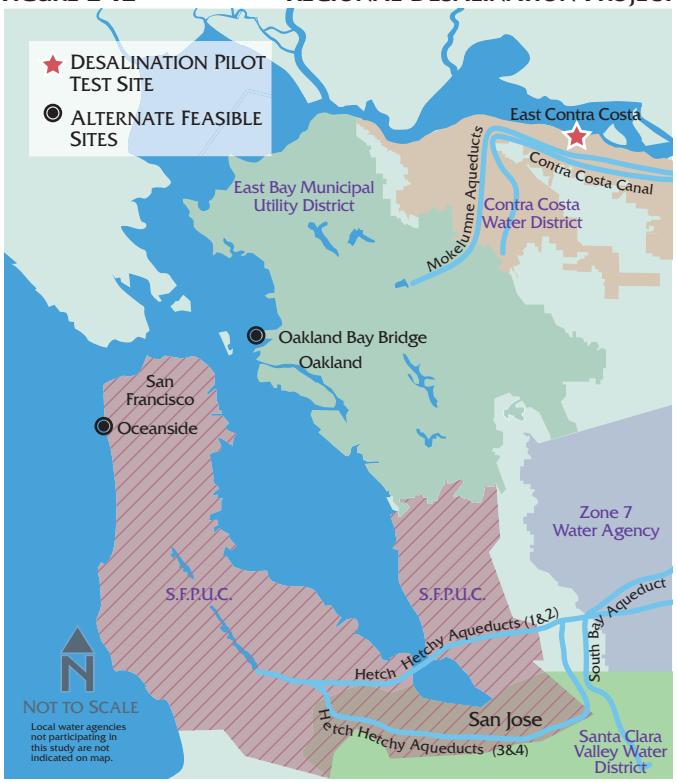
SEBPB Groundwater Management Plan Development

With the completion of the Bayside Groundwater Facility and the potential expansion of the facility, local groundwater resources have become a key component of EBMUD's future supplemental supply strategy. Because the groundwater facility relies on the SEBPB, EBMUD plans to develop a Groundwater Management Plan (GMP) in collaboration with local stakeholders as a tool to manage basin water quality and quantity. In accordance with the Urban Water Management Act, a description of the East Bay Plain Basin is provided in Appendix E of the UWMP 2010.

The SEBPB GMP development is anticipated to include a hydrogeologic review to gain a deeper understanding of basin characteristics, working with stakeholders, and setting basin management objectives. The GMP will be consistent with commitments made in the Bayside Groundwater Project EIR Mitigation Monitoring and Reporting Plan.

The first step in GMP development will be a stakeholder assessment. A collaborative workgroup will be formed and detailed objectives of the GMP will be collectively developed. As per AB 3030, the GMP development process will solicit public involvement and outreach will likely include workshops and public meetings. The GMP work effort will also include updating studies to

FIGURE 2-12 BAY AREA REGIONAL DESALINATION PROJECT



define the basin boundaries and characteristics. Some studies were conducted for the Bayside Phase 1 efforts. Additional technical studies may be used to update basin groundwater modeling, basin yield and storage estimates, and water quality characterizations. The GMP planning effort began in 2010. It is anticipated that the GMP development will take about two years to complete.

Long-Term Conceptual Supplemental Water Supply Projects

Bay Area Regional Desalination Project

The Contra Costa Water District (CCWD), EBMUD, San Francisco Public Utilities Commission (SFPUC), Santa Clara Valley Water District (SCVWD), and the Alameda County Flood Control and Water Conservation District - Zone 7 are jointly exploring the development of regional desalination facilities that would benefit over 5.6 million Bay Area residents and businesses served by these agencies. The Bay Area Regional Desalination Project (BARDP) would consist of one or more facilities, as shown in Figure 2-12, with an estimated capacity range of 10 to 50 MGD. Up to a maximum of 22,400 acre-feet per year of ocean/ bay/ brackish water would be made available to EBMUD for municipal use.

BARDP goals and benefits:

- provide a reliable water supply source that is available even during contract delivery reductions, extended droughts, and emergencies such as earthquakes or levee failures;
- allow other major facilities such as treatment plants, water pipelines, and pump stations, to be taken out of service for maintenance or repairs;
- minimize the potential for adverse environmental impacts; and
- leverage existing and contiguous infrastructure to meet needs and minimize costs.

Three potential sites have been identified where a regional desalination facility could be located: a site in the eastern part of Contra Costa County (East Contra Costa); a site in Oakland near the Bay Bridge (Oakland Bay Bridge); and a site in San Francisco near Oceanside (Oceanside). A feasibility study was completed in 2007 and a six month pilot test was completed in 2009 at the East Contra Costa site (CCWD's Mallard Slough Pump Station site). The project's pilot testing collected data on technical feasibility (pretreatment options, membrane performance, and design parameters) and the environmental impacts (brine disposal and marine life). The pilot testing confirmed:

- membrane pre-treatment and desalination can produce desired water quality;
- sensitive species, such as the Delta and Longfin smelt, may be present during certain times of the year; and
- brine, a salty by-product produced at the desalination plant, did not have a significant negative impact on local species.

Regional Desalination Project would require an assessment of potential environmental impacts and would undergo an extensive and complex regulatory review process. Implementation of the Regional Desalination Project would involve significant public outreach, hearings and negotiations to obtain a number of permits from many different agencies.

Inter-Regional Groundwater Banking/Exchange

EBMUD is investigating long-range options for combined use of groundwater and surface water sources beyond the East Bay service area. Groundwater storage is being explored in Sacramento County and San Joaquin County. Water banked underground would benefit either location, as it would help address the over-

drafted groundwater basins in both regions, while providing a potential dry-year supply for EBMUD.

A Sacramento County groundwater project option would most likely be located adjacent to a stretch of EBMUD's pipeline from the Freeport facility (a pipe which traverses the central and southern portion of Sacramento County) or the Folsom South Canal. A San Joaquin County groundwater storage project option would most likely be located in the proximity of EBMUD's Mokelumne Aqueducts (which traverse the northern portion of San Joaquin County along a west-to-east route). The proximity of the projects to existing EBMUD conveyance facilities would allow efficient transport of stored groundwater to the EBMUD service area.

Entities in both locales have discussed the potential to develop groundwater storage and banking projects in partnership with other water agencies in the IRWMP prepared for the respective regions (i.e., American River Basin IRWMP, the Mokelumne/ Amador/ Calaveras IRWMP and Northeastern San Joaquin Groundwater Banking Authority's IRWMP) .

Inter-Regional Conjunctive Use Project

The Mokelumne River Forum (Forum) is made up primarily of water agencies, local governments, and non-governmental organizations with an interest in the Mokelumne River. In April 2005, the Forum members signed a Memorandum of Understanding with the DWR and committed to seek mutually beneficial and regionally focused solutions that meet water management needs in the Sierra Foothills, San Joaquin County, and the portion of the East Bay served by EBMUD. A result of those discussions is the Mokelumne River Inter-Regional Conjunctive Use Project (IRCUP). The IRCUP envisions conjunctive use on a regional scale, with the potential to provide water supply and environmental benefits to a broad range of Mokelumne River basin stakeholders. Benefits would include:

- storage and supplies for drought protection and to meet the future water needs of the citizens of Amador and Calaveras Counties;
- long-term drought protection for areas of Alameda and Contra Costa Counties served by EBMUD;
- drought protection, replenishment of the groundwater basin, and water to create a hydraulic barrier to prevent further saline intrusion for San Joaquin County citizens; and
- enhanced cold water pool to benefit water temperatures and therefore fish in the Lower Mokelumne.

The IRCUP project elements, as currently envisioned, include the capture of excess surface water during wet years (potentially within expanded existing Mokelumne reservoirs and/ or within new off-stream reservoirs) and the diversion of water to groundwater storage/ recharge facilities that could be located in San Joaquin County and/ or western Calaveras County. During dry-years, previously stored groundwater would be extracted to supplement surface water supplies. Conveyance would be accommodated through use of existing and new systems (pipelines). EBMUD plans to continue participating with other Forum members in further refining the IRCUP concept. There are no plans to move into a project-specific stage of development until the concept is better understood and support is garnered within the region that would benefit from the IRCUP.

Expansion of Surface Water Storage

In the future, EBMUD plans to explore a wide range of options to improve reliability of its supply during droughts and to meet future needs, including examination of participation in the Los Vaqueros Expansion. If Los Vaqueros Expansion becomes feasible as a short-term potential supplemental water supply project, then the 2015 UWMP will incorporate and quantify the project. Enlargement of EBMUD's existing facilities on the Mokelumne River may be pursued in the long-term as part of an interrelated set of upcountry projects with a common set of partners. Enlargement of the Lower Bear Reservoir could also be pursued on a regional basis, and the enlargement would increase the surface water storage capacity within the upper Mokelumne watershed. If regional upcountry actions are pursued in the future, additional negotiations, as well as planning, design and environmental review, will have to be conducted.

Partnerships in Regional Management Plans

EBMUD partners with other water agencies to develop integrated water resources management strategies that would supplement existing water supplies. EBMUD participates in several consensus-based regional water management efforts with stakeholders in the San Francisco Bay Region as well as the Mokelumne and American River Basins to explore regional and statewide water resource issues.

San Francisco Bay Area Regional Partnerships

As a member of the Bay Area Water Agencies Coalition (BAWAC), EBMUD continues to work with local agencies under a Letter of Mutual Understanding to update an IRWMP that was drafted in 2007 for the nine Bay Area counties. The goal is to systematically combine water supply reliability, water quality, storm water and wastewater management, and environmental restoration planning. Integrating regional water management and planning benefit the San Francisco Bay Area Region through facilitated implementation of innovative, cost-effective and efficient multi-objectives water management solutions. Through an integrated plan, the Bay Area has been able to compete more effectively for funding from broader sources such as state bond funds and federal appropriations.

Through BAWAC, EBMUD partners with other local member agencies (Alameda County Water District, Bay Area Water Users Association, CCWD, SCVWD, and SFPUC) to formulate and support a mutually agreeable set of actions to improve water quality and supply reliability in the San Francisco Bay Area. Examples of such collaboration include: the ongoing study of a regional desalination project, in cooperation with the SFPUC, CCWD and SCVWD and (as of 2010) the Zone 7 Water Agency; completion of the SFPUC-Hayward-EBMUD Intertie Project between SFPUC, Hayward, and EBMUD; completion of the FRWP; and preparation of numerous regional grant applications submitted between 2005 through 2010 that resulted in the utilization of state funds (funds as made available through Proposition 50 and Proposition 84) to implement a broad range of supplemental supply projects, conservation programs, recycling projects, and additional regional planning work.

Mokelumne River Basin Partnerships

In collaboration with the Upper Mokelumne River Watershed Authority (UMRWA) partners from Alpine, Amador, and Calaveras counties, EBMUD received approximately $1 million in grants to complete a watershed assessment and a plan for the Upper Mokelumne (above Pardee Reservoir) watershed. That plan was completed in 2008. The project collected and assembled watershed data, conducted additional monitoring, developed a model for assessing changes in the watershed, and involved all stakeholders. Historically, watershed protection has been the most efficient and cost-effective mechanism for protecting drinking-water quality at the tap. By effectively managing its watershed lands, EBMUD can ensure that protection of the water supply is maximized, treatment costs are minimized, and natural resources are protected and sustained. Moving forward, UMRWA has taken over the development of updates to the Mokelumne/ Amador /Calaveras IRWMP, as was prepared by a range of upcountry stakeholders in 2006. UMRWA intends to apply for grant funding to support this work and work on water-saving measures such as distribution system leak detection and repairs that would benefit the entire UMRWA community.

EBMUD is also an active participant in the Mokelumne River Forum, as described in the "Inter-Regional Conjunctive Use Project" section in this Chapter.

American River Basin Partnerships

EBMUD, along with a number of water agencies and interest groups in Sacramento County, prepared the American River Basin (ARB) IRWMP in 2006/ 2007. EBMUD's participation is consistent with a 2005 agreement between SCWA and EBMUD to evaluate the potential to develop additional water supplies for both agencies through conjunctive use of surface and groundwater in the area and to transfer and deliver surface water supplies

WATER SUPPLY MANAGEMENT EFFORTS

EBMUD is in the process of developing a Water Supply Management Program that will analyze means of serving its long-term projected demands though the year 2040. EBMUD is presently supplementing the environmental analysis of the Water Supply Management Program 2040, and the District plans to adopt the Water Supply Management Program 2040 after considering the supplemental information regarding impacts and alternatives for securing supplemental supplies. This action will likely take place in 2012.

CHAPTER 3. 2010 WATER SHORTAGE CONTINGENCY PLAN

This chapter constitutes EBMUD's 2010 Water Shortage Contingency Plan, which is adopted with the resolution adopting the UWMP 2010. During times of extreme shortages, including a catastrophic interruption of water supply, EBMUD implements the Water Shortage Contingency Plan. EBMUD evaluates the availability and reliability of its supply each year in accordance with its Water Supply Availability and Deficiency Policy.

INTRODUCTION

Section 10632 of the California Water Code requires UWMPs to include an urban water shortage contingency analysis, which is incorporated into an Urban Water Shortage Contingency Plan (Contingency Plan). The relevant section of the Code is included in Appendix A. In 1992, EBMUD adopted its first Contingency Plan in Resolution 32568 as required by the Water Code. This chapter constitutes an update to that 1992 Contingency Plan as a result of the following:

- a significant increase in the population in EBMUD's service area;
- the drought management program in 2007-2010;
- the completion of the Freeport Regional Water Project (FRWP);
- a change to EBMUD's customer rationing policy;
- the increased use of technologies for broader customer outreach;
- the increased uncertainty in water supply reliability due to climate change, the regulatory environment, and water system security challenges; and
- the consideration of planning recommendations from the Urban Drought Guidebook 2008 Updated Edition.

Chapter 1 of the UWMP 2010 discusses the process for the public review, meeting, and hearing for the Contingency Plan. At its meeting on June 28, 2011, the EBMUD Board of Directors adopted its 2010 Urban Water Shortage Contingency Plan as part of the UWMP 2010. A copy of the Board Resolution is included in Appendix D of this UWMP 2010.

PURPOSE OF A WATER SHORTAGE CONTINGENCY PLAN

The EBMUD water supply system, like other large systems, is vulnerable to droughts and disasters, such as earthquakes, floods, regional power outages, and water contamination, that result in water shortages. Extreme water shortage events resulting from these disasters could compromise EBMUD's ability to supply water for drinking, fire fighting, and treating wastewater.

The Contingency Plan guides the planning and response to these emergencies through prudent management of the water supply. It lays out an orderly process for EBMUD to collect information on water supply availability, to assess conditions, and to respond appropriately based on the severity of the situation. The Contingency Plan describes EBMUD's broad powers to implement and enforce regulations and restrictions for managing a water shortage when it declares a water shortage emergency under the authority of the Water Code. It also describes EBMUD's predetermined actions to manage supply and demand before and during a water shortage to ensure a reliable water supply system. In an emergency, EBMUD dedicates the water supply to meeting essential health, safety, and fire fighting needs.

As required by the Water Code, the Contingency Plan addresses the following elements:

- stages of action in response to water shortages;
- estimated minimum supply available for three consecutive dry years (Chapter 4);
- catastrophic supply interruption preparation and response;
- prohibitions, penalties, and consumption reduction methods;
- analysis of revenue and expenditure impacts due to reduced water sales and mitigation measures;
- water shortage contingency resolution (Appendix D); and
- water reduction monitoring procedure.

The Contingency Plan also outlines EBMUD's local agency level responsibilities to manage water shortage conditions, which support both regional and statewide efforts to manage water in an emergency. The section on Emergency Preparedness Program details EBMUD's roles and responsibilities to provide mutual aid and highlights expected coordination efforts with State agencies. This coordination fits the State strategy to prepare for, respond to, and recover from droughts and water shortages as

discussed in the California Drought Contingency Plan (CDCP), November 2010. As a product of the California Water Plan development process, the CDCP is anticipated to minimize drought impact, enhance recovery, foster communication, and coordinate among agencies/organizations. The CDCP defines roles and responsibilities of state agencies, establishes the structure for integrating state interagency planning, and identifies an integrated regional approach to assessing droughts, drought action levels, and appropriate agency responses as drought severity changes.

DROUGHT PLANNING SEQUENCE

During some historical dry periods when runoff from the Mokelumne River Basin was insufficient to meet service area demands, EBMUD relied on stored water in its reservoirs to meet most of its customers' water needs. The worst hydrologic drought event in EBMUD's history was the 1976-77 drought, when runoff was only 25 percent of average and total reservoir storage decreased to 39 percent of normal. In September 1977 (at the end of the 1977 "water year") with an uncertain precipitation and runoff forecast for the following year, EBMUD continued to mandate rationing to avoid depleting the system storage. Fortunately, a very wet year (beginning in 1978) followed the critically dry year of 1977 and contributed to the system's rapid recovery. If the drought continued into the third dry year in 1978 and rationing had been lifted, EBMUD would not have had sufficient water to meet customer needs or its downstream obligations.

Three consecutive extremely dry years could occur. To plan for the possibility of such an event, EBMUD uses a three year "drought planning sequence" to assess the adequacy of its water supply. This maximum credible drought event defines EBMUD's need for additional water in its integrated water resources planning. The first and second years of this drought planning sequence are modeled with the runoff that occurred in 1976 and 1977, the driest recorded two-year period. The runoff in the third year is assumed to be 185 thousand acre-feet (TAF), which is an average of the runoff from 1976 and 1977. EBMUD's water planning model further assumes that such a severe drought would not continue beyond the third year of this sequence and that all accessible storage would be depleted during the third drought year.

Chapter 4 of this UWMP 2010 provides an assessment of EBMUD's supply and demand during normal and drought periods.

WATER SUPPLY SHORTAGE DECLARATION

DROUGHT COMMITTEE

EBMUD begins drought preparations early in the calendar year when a water shortage appears possible. Beginning each January, the senior staff member responsible for water supplies takes the lead in monitoring water supplies and, if a shortage is possible, convenes the District's Drought Committee. This committee includes senior staff representing key functions that are affected by and involved in customer response to drought. As warranted by the water supply status, this group initiates response activities necessary for addressing a potential shortage or drought and sets timelines for these activities. This multi-disciplinary team develops staff recommendations regarding water shortage and drought programs and services, manages program implementation, and monitors and reports on results. A second multi-disciplinary team of mid-level staff advises the leadership team and guides program implementation throughout the organization. Key tasks organized by function are shown in Table 3-1.

WATER SUPPLY AVAILABILITY AND DEFICIENCY POLICY

By May 1 of each year, EBMUD prepares a report that evaluates the adequacy of its current and long-term water supply in accordance with its Water Supply Availability and Deficiency Policy 9.03 (Appendix F). The report provides the Board with the basis for determining whether to enact a Drought Management Program (DMP).

EBMUD adopted its first Water Supply Availability and Deficiency Policy in 1985. Since 1989 when EBMUD revised that policy, water rationing had been limited to a maximum of 25 percent of total customer demand until 2010 when the Board adopted Policy 9.03. That policy lowered the customer rationing threshold to a maximum of 15 percent of total annual demand if additional supplemental supplies are developed. The new policy is designed to lessen the burden of rationing during extended droughts on customers. On-going water conservation and recycling have decreased the flexibility customers have to further reduce demand during droughts. However, unless dry-year supplemental supplies (as discussed in Chapter 2) are secured, and water conservation and recycled water initiatives are fully carried out, EBMUD may not be able to limit rationing to 15 percent.

Table 3-1 Drought Committee Key Roles and Responsibilities

Communications
■ Explain the reasons why the water shortage occurred, the elements of EBMUD's DMP, and what is expected of customers and employees.
■ Provide opportunities for public input and feedback on customer actions as the drought response continues.
Customer Service Management
■ Provide conservation services to help customers save water.
■ Bill customers consistent with drought regulations and help customers understand charges.
■ Enforce water use restrictions through Board-approved fees and/ or service interruption.
■ Enforce water use prohibitions (e.g. irrigation restrictions, no new meters, no hydrant meters.)
Data Management
■ Complete programming to set customer water use allocations, update the billing structure, and modify EBMUD's website to accommodate drought-related programs and services.
■ Prepare and run reports that provide data to manage and evaluate drought programs and services.
Financial Management
■ Analyze costs of providing drought services and perform rate analyses to recommend drought rates and charges.
■ Monitor budgetary impacts.
Legal Support
■ Clarify legal authority and restrictions on EBMUD drought programs.
■ Advise on water use restriction enforcement.
Recreation Management
■ Plan for recreational impacts of lowered reservoir levels and communicate issues to users.
Water Operations
■ Provide updated information as needed on the water supply.
■ Assure all EBMUD facilities and maintenance activities use water efficiently and avoid water waste.
Water Recycling Operations
■ Make recycled water available for construction and other uses.

Water Supply Shortage Response

Drought Management Program

EBMUD's Drought Management Program (DMP) is designed to minimize drought impacts on EBMUD customers while continuing to meet stream flow release requirements and obligations to downstream water users. In conjunction with Policy 9.03, the DMP provides guidelines to manage demand so that customer needs can be met in the following year with carryover storage at no more than 15 percent deficiency in the system. The DMP guided EBMUD in successfully managing demand during mandatory and voluntary rationing periods in calendar years 1976-1978, 1987-1994, and 2007-2010 when supplies were limited. Under the previous policy, water rationing was anticipated to not exceed 25 percent of total annual customer demand despite a supply that could drop below 50 percent of normal, such as during the 1976-1977 and 1987-1992 hydrologic droughts.

Stages of Action

The supply storage projected in April for the end of a water year in the Water Supply and Availability Report determines the need for requiring customers to change their water use. The DMP level of rationing is dependent on supply storage, modeled after the DMP guidelines established in the 1992 Contingency Plan and modified to reflect the maximum 15 percent rationing goal as adopted by the Board in October 2009. The DMP follows this process:

- based on water year runoff predicted in April, estimate total system storage that will be available at end of water year (September 30);
- if total system storage is projected to be less than 500 TAF, prepare and implement a DMP; and
- adjust the DMP as conditions change during an extended dry period.

The resulting Long-Term Drought Management Program Guidelines are shown in Table 3-2.

TABLE 3-2 LONG-TERM DROUGHT MANAGEMENT PROGRAM GUIDELINES

STAGE	APRIL PROJECTION OF TOTAL SYSTEM STORAGE[1] ON SEPTEMBER 30[2]	PERCENT OF MAXIMUM SYSTEM STORAGE[3]	RATIONING REDUCTION GOAL	VOLUNTARY/ MANDATORY
NORMAL	500 TAF OR MORE	65% OR GREATER	NONE	
MODERATE	500 – 450 TAF	59% TO 65%	0 TO 10%	VOLUNTARY
SEVERE	450 – 300 TAF	39% TO 59%	10 TO 15%	MANDATORY
CRITICAL	LESS THAN 300 TAF	39% OR LESS	15%	MANDATORY

[1] Total System Storage represents total storage in Pardee, Camanche, and Terminal reservoirs.
[2] Without consideration of supplemental supplies that may be available.
[3] Maximum system storage represents the maximum Total System Storage capacity of approximately 767 TAF.

Effective in 2010, EBMUD implemented Interim DMP Guidelines (Appendix G-2.1), which reflect the temporary reduction in customer demand resulting from the residual effects of the recent drought and the adverse economic conditions, and account for dry-year water available from EBMUD's Central Valley Project (CVP) contract through the Freeport Regional Water Facility. The revised guidelines will remain in effect until the economy recovers and post-drought consumption rebounds to demand planning levels in the 2040 Demand Study.

Typical actions that may be undertaken during each stage of a drought are presented in Table 3-3. EBMUD's response to the Severe Drought Stage is applicable for system storage at less than 50 percent of maximum.

Central Valley Project Public Health and Safety Supply

EBMUD, like all CVP contractors, receives an allocated CVP supply from the United States Bureau of Reclamation (USBR) during shortage conditions. If drought conditions become severe, cutbacks in allocations may have to be limited to sustain a "Public Health and Safety" (PH&S) level of supply. The USBR determines the quantity of CVP water needed to supplement EBMUD's supply up to that PH&S level during a critical drought. Appendix G-1, as part of this Contingency Plan, discusses operating principles for the EBMUD system to be recognized in estimating EBMUD's available supply from non-CVP sources in a critical drought. An illustration is also provided on EBMUD's approach for determining the minimum CVP supply required to meet PH&S needs in a critical drought when the USBR's initial allocation is less than the amount requested by EBMUD.

EMERGENCY PREPAREDNESS PROGRAM

Under Policy 7.03 (Appendix F), EBMUD maintains an active emergency preparedness program and coordinates emergency responses with other public and private organizations. EBMUD's Security and Emergency Preparedness Section coordinates and publishes the EBMUD Emergency Operations Plan (EOP), which details the internal organizational structure used in the response to all emergencies, including regional power outages and earthquakes. The EOP was last revised in 2009 and fully complies with the California Standardized Emergency Management System (SEMS), which includes all National Incident Management System (NIMS) guidance for federal emergency operations plans. EBMUD also prepared Business Continuity plans for all key departments and functions in coordination with EOP actions.

In response to an emergency incident or an event requiring significant planning for a potential emergency, a well-trained team of EBMUD personnel will form the Emergency Operations Team (EOT) to carry out the five SEMS functions (Command/ Management, Operations, Planning, Logistics, and Finance/ Administration). Operating under the EOP, the Operations Section Chief establishes response priorities based on the nature of the emergency, focusing on actions to address life safety, incident stabilization, restoration of normal operations, and working with the Planning Section to determine the needs for mutual aid/ assistance resources, the scope of work to be done, and the planning objectives to accomplish this work.

Inter-Agency Emergency Support

Mutual Assistance and Coordination With Other Agencies

Effective coordination with state and local agencies is critical in responding to a catastrophic event that interrupts water supplies. As one of the eight major water suppliers in the San Francisco Bay Area, EBMUD, as do the other agencies, recognizes that in the event of a regional catastrophic event, assistance from other local agencies is not guaranteed. To mitigate the risk of limited access to local mutual aid, EBMUD entered into an agreement with Los Angeles Department of Water and Power (LADWP) to mutually supply as much of the requested resources as

TABLE 3-3 DROUGHT MANAGEMENT PROGRAM ELEMENTS

DROUGHT STAGE	ACTIONS
MODERATE SHORTAGE <10%	■ ESTABLISH VOLUNTARY OR MANDATORY WATER USE GOALS AND DETERMINE USE RESTRICTIONS NEEDED AND SERVICES THAT WILL BE OFFERED TO HELP CUSTOMERS COMPLY WITH THE RESTRICTIONS. ■ INITIATE A PUBLIC INFORMATION CAMPAIGN TO EXPLAIN THE WATER SUPPLY ISSUES AND WHAT CUSTOMERS NEED TO DO. WORK WITH THE MEDIA AND KEY STAKEHOLDER GROUPS TO PROMOTE CUSTOMER AWARENESS OF THE SHORTAGE. INCREASE ADVERTISING OF WATER-SAVING DEVICES PROVIDED FREE TO CUSTOMERS AND OTHER FREE CONSERVATION SERVICES. ■ INCREASE EFFICIENCY OF SYSTEM WATER SUPPLIES, E.G. INTENSIFY ENFORCEMENT OF HYDRANT-OPENING REGULATIONS; INCREASE METER-READING EFFICIENCY AND METER MAINTENANCE; AND INTENSIFY LEAK DETECTION AND REPAIR PROGRAM. ■ PREPARE AND DISSEMINATE EDUCATIONAL INFORMATION (WEB SITE INFORMATION, BILL INSERTS, ETC.) THAT EXPLAIN THE WATER SHORTAGE AND WAYS IN WHICH CUSTOMERS CAN SAVE WATER. ■ CONDUCT OUTREACH TO SPECIFIC CUSTOMER TYPES ON WAYS TO SAVE WATER.
SEVERE 10% < SHORTAGE <15%	■ DECLARE A WATER SHORTAGE EMERGENCY (DEPENDING ON AVAILABLE SUPPLIES FOR FUTURE YEARS). ■ IMPLEMENT RATE AND WATER RESTRICTION CHANGES APPROPRIATE TO SHORTAGE. ■ INTENSIFY ALL OF THE MODERATE STAGE STEPS. ■ INSTITUTE RATE CHANGES TO PROMOTE CONSERVATION, IF MANDATORY WATER USE RESTRICTION PROGRAM IS IN PLACE. EXPLAIN NEW RATE SCHEDULES TO CUSTOMERS. EXPLAIN FURTHER REDUCTIONS PLANNED FOR SUCCEEDING RATIONING STAGES. ■ SEEK AND PROCURE A SUPPLEMENTAL WATER SUPPLY (DEPENDING ON AVAILABLE SUPPLIES FOR FUTURE YEARS.)
CRITICAL SHORTAGE >15%	■ INTENSIFY ALL OF THE SEVERE STAGE STEPS.

possible to the other agency, if a regional disaster impacts only one of the agencies. EBMUD is also a member of the Water Agency Response Network (WARN), which is an Omnibus Mutual Aid/ Assistance Agreement with water agencies throughout the state. The signatories may be called upon during an emergency to provide available resources.

Coordination Among Local, County, Regional, State, and Federal Governments

EBMUD and other special districts, such as schools and parks are considered local government agencies, which coordinate resources and manage operations in an emergency at the local level and interface with the Operational Area Emergency Management Agency. In California, each county is responsible for maintaining the Operational Area Emergency Management Agency. The State is divided into six regions, each of which is responsible for maintaining a Regional Operations Center (REOC). The State of California, which regulates SEMS, maintains the Emergency Management Agency that oversees these REOCs and the Operational Areas at the State Operations Center (SOC).

SEMS was mandated by Government Code 8607 following the 1991 East Bay Hills Firestorm. Reimbursement for claims filed after a disaster requires that all EBMUD emergency plans, procedures, and training follow the SEMS regulations, and that they directly correlate with the EOP. The SEMS in California and the guidelines for training for all emergency responders roll up from the states to the federal government under the national response framework. Each state has a Principle Coordination Official assigned by the federal government to coordinate planning and response under the Emergency Support Functions (ESF) established by the federal government.

In 1995, EBMUD partnered with 14 federal, state, and public agencies to develop procedures for obtaining potable water in an emergency. This California Potable Water Task Force published its January 1996 Multi-Agency Emergency Response Procedures for Potable Water Procurement and Distribution report. In 2007, EBMUD spearheaded the efforts of a working group that includes the eight largest water agencies in the Bay Area, Operational Area, and Bay Area Regional Emergency Management Agencies to update this document. Published in its second edition and formally adopted by the State of California for the first time, this document is intended to allow water agencies to request assistance from city, county, or regional SEMS response levels to acquire and distribute potable water during a state or local emergency in California. This allows water agencies that sustain heavy damage to focus on rebuilding and returning their system to a level of service that can be depended upon.

WATER SUPPLY SHORTAGE MITIGATION

In addition to managing demand, EBMUD devotes significant effort to supply-side conservation measures to extend the water supply. As part of its long-term planning, EBMUD will undertake several supplemental water supply initiatives as identified in Chapter 2. These ongoing efforts to secure supplemental supplies will provide customers not only with partial relief from frequent and severe water rationing during droughts, but also with greater assurances against other possible adverse situations, such as emergency water shortages.

However, during extreme and catastrophic water shortage conditions, EBMUD may need to explore supplemental water supply options that temporarily augment supply. Constraints, such as obtaining environmental and regulatory approvals in time to alleviate drought effects, can be overcome with streamlined planning. Temporary supplemental water supply options include:

- trucking recycled water to replace potable water use;
- drawing from reserve supplies (180 days of standby storage normally available in the terminal reservoirs);
- drawing down Camanche Reservoir dead storage (about 4,000 AF available below the low-level intake structure elevation); and
- emergency transfers.

WATER RESERVE DRAWDOWN

EBMUD's terminal reservoirs are normally operated to maintain a sufficient amount of emergency standby storage that can meet rationed customer demand for 180 days if the Mokelumne River supply is disrupted. After the emergency ends, the Mokelumne River supply is used as soon as practical to refill the terminal reservoirs to meet minimum standby storage levels. Emergency supplies through interties with the Contra Costa Water District (CCWD), San Francisco Public Utilities Commission (SFPUC), Dublin San Ramon Services District (DSRSD), and City of Hayward (Hayward) also help EBMUD's recovery in re-establishing that 180 day standby storage level.

SUPPLY-SIDE WATER USE EFFICIENCY

Supply-side conservation is part of EBMUD's standard operating practices, and includes maintaining aggressive water distribution system leak detection and repair programs, regularly testing and replacing meters, and implementing on-going pipeline replacement projects. During droughts and water shortages, EBMUD expands potential supply-side programs during droughts by including system pressure management and visible conservation strategies at District facilities, such as limiting irrigation and use of water features.

INTERTIES AND AGREEMENTS FOR TRANSFERS AND EXCHANGES

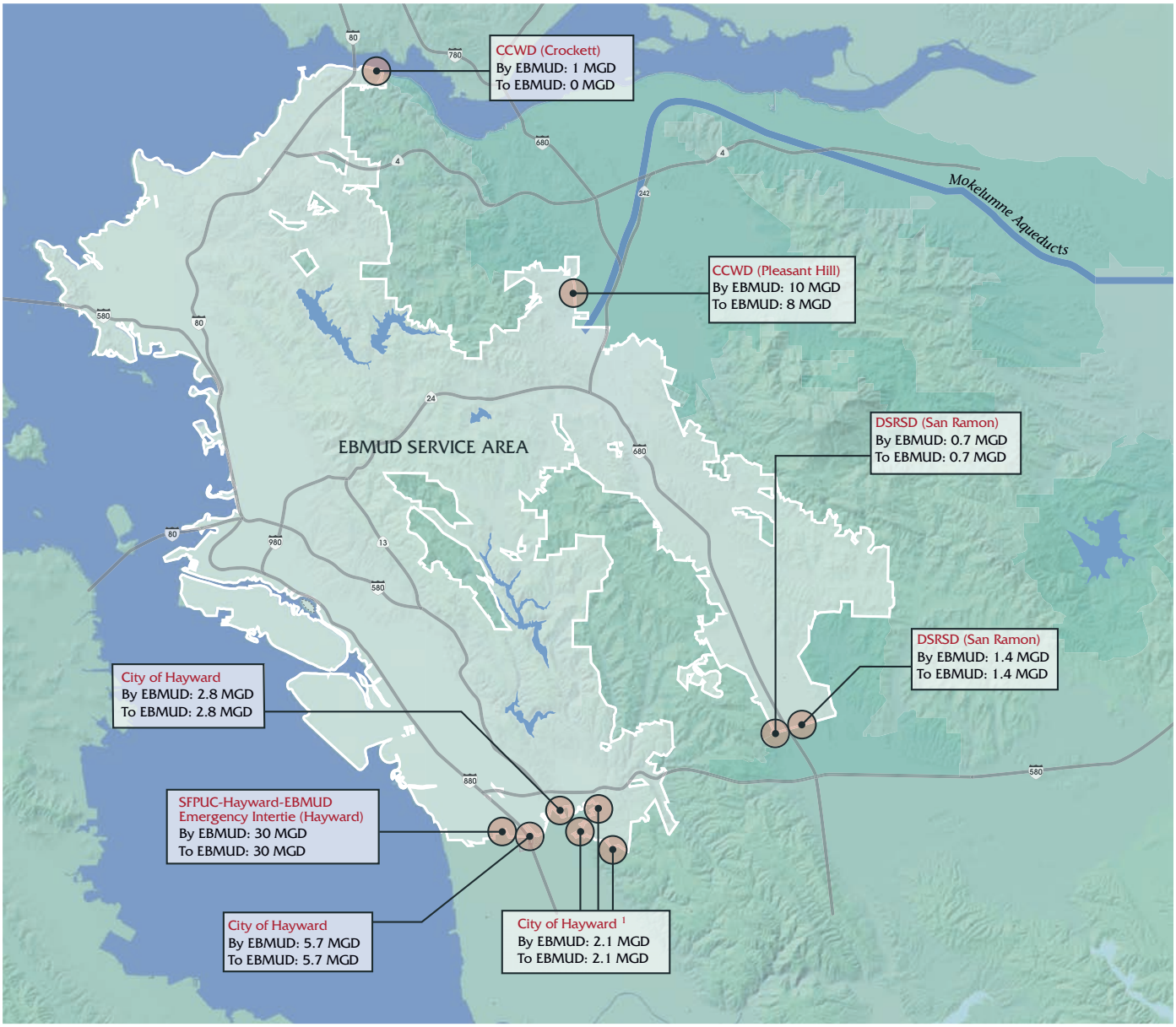
Through its involvement in the Bay Area Water Agencies Coalition, EBMUD continues its efforts to formulate and to support mutually agreeable actions, including the development of interties that improve water quality and supply reliability for the Bay Area. As a partner agency in providing mutual aid, EBMUD has limited, short-term water sharing agreements for emergencies with several neighboring agencies, including SFPUC, DSRSD, Hayward, and CCWD. Transfer/ exchanges are made only for a short-term period of one year or less. These agreements would provide an alternate source of water during planned facility outages and for emergency mutual aid to the parties, but situations involving a shortage of water due to high demand or drought do not apply. Figure 3-1 illustrates these emergency interties for transfers/ exchanges in EBMUD's service areas and lists the agreed upon quantities for transfer/ exchange with water service agencies during emergencies. EBMUD, the Freeport Regional Water Authority, County of Sacramento, and Sacramento County Water Agency entered into a long-term non-emergency agreement for water delivery with CCWD and separately with Santa Clara Valley Water District (SCVWD) as part of the negotiated settlement of the Freeport Regional Water Project (FRWP) EIR/ EIS.

Agreement for Emergency Water Services With SFPUC-Hayward-EBMUD

In 2002, EBMUD formed a regional partnership with SFPUC and Hayward to construct the SFPUC-Hayward-EBMUD Intertie Project (Intertie Project). This project increases water service reliability by allowing EBMUD and SFPUC to obtain a short-term water supply during emergencies or planned outage of critical facilities. Up to 30 MGD could be provided to either EBMUD or SFPUC and Hayward through the intertie. The Intertie Project included a new pump station and 1.5 miles of pipeline within Hayward, with minor improvements in EBMUD's and SFPUC's water systems. Construction was completed in 2007.

FIGURE 3-1

EMERGENCY INTERTIES FOR SHORT-TERM TRANSFERS AND EXCHANGES
WITH MAXIMUM FLOWS



[1] Emergency Water Transfers/Exchanges to City of Hayward are supplied through connections between fire hydrants instead of through dedicated constructed appurtenances.

Agreement for Emergency Water Services with City of Hayward

EBMUD has two locations earmarked for connecting smaller interties (2.8 and 5.7 MGD) with Hayward's water system under a 2000 agreement, and three additional sites for treated water transfer through fire hydrants (2.1 MGD each) under a 1994 agreement. Interconnections are made only for a short-term basis by mutual consent and under emergency conditions, and are not substitutes for standby or reserve sources of water for normal operations. Hayward's and EBMUD's personnel would connect the systems during a declared emergency in accordance with the conditions outlined in the agreements. Supplied water would be metered, and expenses would be billed to each agency as outlined in the agreements.

Agreement for Emergency Services with DSRSD

The 1990 agreement with the DSRSD identified two locations available for transferring treated water between the two agencies at up to 1.4 MGD at one and up to 0.7 MGD at the second location. The process and billing are outlined in an agreement similar to that with Hayward.

Agreement for Emergency Services with CCWD

Per the 2002 agreement with CCWD, intertie locations can be added, removed, or modified as mutually agreed upon by each agency. Currently two intertie locations are identified. Up to 1 MGD could be provided to CCWD at one location. The second location could allow transfer of up to 10 MGD to CCWD and up to 8 MGD to EBMUD. One agency will provide the other with water quantities that will reasonably meet needs during the emergency without endangering the supplying agency's system and overall supplies.

Agreement for Non-Emergency Services with CCWD

The 2004 agreement allows CCWD to request and receive from EBMUD 3,200 acre-feet per year (AFY) at a maximum rate of 100 MGD of water wheeled via EBMUD through the Freeport Regional Water Facilities. Wheeling cannot occur if there are unavoidable capacity-limiting conditions that prohibit either EBMUD or the Freeport Regional Water Authority (FRWA) agencies from meeting the request. CCWD, which completed construction of the interconnection facilities at the intersection of the Mokelumne Aqueducts and Los Vaqueros Pipeline in Brentwood in 2007, would pay wheeling costs for water received. The rate of delivery of the wheeled water is determined annually and concurrently with the wheeling schedule.

Agreement for Non-Emergency Services with SCVWD

The 2003 agreement entitles the SCVWD to 6.5 TAF of EBMUD's CVP contract allocation in the first year the supplemental supply from the Freeport Regional Water Facility is invoked. At EBMUD's request, the SCVWD will return the water in the second or third dry year if the drought continues. If the drought does not continue (i.e. EBMUD's Total System Storage at the end of September exceeds 500 TAF), the SCVWD will compensate EBMUD for the 6.5 TAF of CVP water taken in the first dry year. The cost of water for EBMUD and the SCVWD will be in accordance with the terms specified in each agency's USBR water service contract. The SCVWD will take delivery of EBMUD's CVP water at the Tracy Pumping Plant, and EBMUD will take delivery of the SCVWD's CVP water at the Freeport Regional Water Facility.

DEMAND REDUCTION METHODS

DROUGHT COMMUNICATION PLAN

During a water shortage emergency, EBMUD implements an aggressive public education program to promote water use reductions and improved efficiencies. The campaign explains the potential impacts of a water shortage, methods to reduce water consumption, and customers' responsibilities during a shortage. At the onset of a water shortage, EBMUD develops a detailed Drought Communication Plan (DCP) (a component of the DMP) to relay clear information to customers and other stakeholders. Components of an effective DCP include a set of well-defined, focused key messages and an action plan detailing all communication activities. The DCP outlines general and targeted communication methods. General communication methods focus on creating a strong advertising campaign, intensifying media and stakeholder outreach, and making available helpful information to customers via the web, through mailings with customer bills, and through the customer contact center. Targeted communication methods focus on increasing direct contact with high-volume water users, proactively offering more support to customers through conservation training and tools, and increasing EBMUD's interactions with customers about their water use.

General Communication Methods

Advertising Campaign and Media Outreach

Advertising campaigns used in past droughts included broadcasting conservation messages throughout the EBMUD service area on radio and cable television, in local newspapers and magazines, on bus exteriors, and on EBMUD billboards. In these campaigns, EBMUD expressed appreciation for customers' response and offered continual encouragement to customers to save water and money by fixing leaks and installing efficient outdoor landscape irrigation. EBMUD also has participated in regional advertising campaigns on radio and television when the messages between EBMUD and the region were consistent.

Customer Service on the Phone and Web Site

To ensure a continuous level of quality customer service during a water shortage, EBMUD invests in systems that support customer contacts and customer billing functions. Drought periods increase the customer contact center volume, and EBMUD ensures adequate staffing to respond to customers' questions and requests for assistance. Drought periods increase web site use by customers, and

in recent campaigns the web has proven to be an effective tool to disseminate information to customers and the media on demand.

Targeted Communication Methods

Increased Customer Direct Contact

During water shortage periods, EBMUD initiates significantly more direct customer contacts and responds to significantly more contacts from customers. Water conservation and field services staff monitor the service area and distribute drought messages and water savings devices, encourage water savings, assist customers in changing their water use, and educate customers on voluntary program requirements, and enforce mandatory requirements. Direct mail is used to deliver specific messages about water conservation targeted to specific user groups. "Out-dial" calls are used to alert customers to the start of the drought program and request curtailed water use during especially prolonged hot weather.

Increased Public Outreach

EBMUD routinely conducts outreach to civic, community, non-governmental and business groups, homeowner associations, nurseries, schools, and local officials. This work expands when the need to communicate shortages or drought information to customers develops. EBMUD educates local stakeholder groups and seek their assistance in communicating with their constituents, which generates a multiplier effect as they share the information with additional customers.

WATER USE RESTRICTIONS

Prohibitions and Penalties

EBMUD has two regulations that prohibit water waste. Section 29 (Prohibiting Wasteful Use of Water) of the *Regulations Governing Water Use by Customers of the East Bay Municipal Utility District* in Appendix F is continuously in force. Section 28 (Water Use During Water Shortage Emergency Condition) is adopted when the EBMUD Board of Directors declares a Water Shortage Emergency.

Section 29 describes on-going actions that residential and non-residential customers must observe to eliminate wasteful use. Under normal water conditions, the provisions of Section 29 are enforced through customer education. Under this program, EBMUD responds to customer and field staff reports of over-watering and water waste. Water conservation and field services personnel apprise the responsible customer of the wasteful conditions and provide recommendations on repairing leaks or using water more efficiently. If the customer cannot be located, and the water loss is significant, staff may turn off the water at the meter until the customer is contacted or the problem is resolved. The ongoing provisions in Section 29 are supplemented temporarily with additional water use restrictions invoked through Section 28 when a DMP is adopted.

Section 28 identifies water use rules and provides guidance to customers on reducing water use during a declared water shortage emergency. Provisions in that section are tailored to the severity of the water shortage. Section 28 defines water use allocations and reduction goals based on customer account type, prohibits certain types of water uses, provides guidelines on efficient water use, provides for enforcement measures, and may include drought rates. It may also include restrictions on annexations and new connections in conjunction with Section 31 on Water Efficiency Requirements for new water services (see Appendix F). These regulations are enforced with warnings, installation of flow restrictors, and, finally, disconnection of service. Drought rates under Section 28 are implemented using a two-step rate setting process through public notification and adoption at a public hearing.

Section 28 was adopted in May 2008 in response to a severe water shortage emergency and subsequently rescinded in June 2009 when the water supply condition improved. Examples of prohibitions enforced during the recent drought included:

- filling and operating decorative ponds, lakes, and fountains;
- washing vehicles using hoses without shutoff nozzles;
- washing hard-surfaced areas not required for public health and sanitation;
- irrigating outdoor lawns frequently;
- creating wasteful run-off;
- flushing sewers, hydrants, or washing streets with potable water not for essential operations; and
- using potable water for construction, soil compaction, and dust control instead of available alternatives (e.g. recycled water).

Water Waste Restriction Enforcement

During a water shortage, staff monitors the service area to encourage water savings, assists customers in changing their water use, and enforces program requirements and water waste prohibition rules. In the recent shortage, EBMUD developed a Water Savings Team staffed by EBMUD employees that patrolled the service area

responding to reports of water waste, placing warning hangers on doors, educating customers to save water, and assisting customers with conservation activities, such as identifying leaks and installing water-efficient fixtures and appliances.

During shortages, a higher volume of calls are received from neighbors who report water waste within their communities via the EBMUD website and Water Waste Hotline. The location and nature of the waste are reported to the Water Savings Team, who follows up on necessary corrections. The reporting system also helps staff adjust priorities for responding to reported distribution system leaks.

WATER CONSUMPTION REDUCTION

EBMUD partners with its customers to implement customer-oriented rationing programs that produce significant and sustained demand reductions. In past droughts, EBMUD has encouraged water consumption reduction using a combination of a tiered-volume rate structure for single family residents and uniform rate increases for other customers. In addition, surcharges have been applied to individual accounts when consumption exceeded water use allocations. Incentives and rebate programs that encouraged greater water use efficiency and enforcement of water waste restrictions further supported customer water savings efforts. Appendix G-3 details actions implemented during the 2008-2009 DMP and lessons learned that could be applied in future droughts. The specific response to each impending drought will continue to be developed with community input.

Maximum Rationing Targets

EBMUD will implement a maximum rationing level of up to 15 percent of total annual customer demand in conformance with Policy 9.03. Table 3-4 lists example customer category reduction goals that EBMUD estimates would be required to achieve this district-wide rationing target. Specific reduction goals by customer class are set by EBMUD's Board of Directors after the Board declares a drought.

TABLE 3-4 EXAMPLE OF CUSTOMER CATEGORY REDUCTION GOALS

CUSTOMER CATEGORY	REDUCTION GOAL*
SINGLE-FAMILY RESIDENTIAL	19%
MULTI-FAMILY RESIDENTIAL	11%
COMMERCIAL	12%
INSTITUTIONAL	9%
INDUSTRIAL	5%
IRRIGATION	30%
TOTAL CUSTOMER DEMAND RATIONING GOAL	**15%**

*Annual average goals estimated to achieve 15% reduction of year 2040 total demand.

The reduction goals are based on an analysis of the total demand of each customer category, the outdoor water use of each category, and the potential aggregate economic impact on the service area. Several factors are considered: drought management principles; analysis of historical consumption; and likelihood that customers in each category can achieve their water use reduction goals through indoor and outdoor demand management. The distribution of rationing varies across customer categories, and the actual savings from each customer category could vary due to several factors, including methods of implementation and enforcement. Modeled from the experience of the 2008-2009 DMP, key assumptions and data for setting customer goals are:

1. Balancing water use reductions across customer categories based on four principles:
   - emphasizing reductions in non-essential uses of water;
   - avoiding and limiting impacts to the economy and the environment;
   - safeguarding water supplies for uses that meet public health needs; and
   - considering the perceived equity of water use reduction expectations.
2. Evaluating each customer category's actual historical consumption:
   - determining the percent of total water demand by customer category, and
   - determining the percent of indoor and outdoor demand by customer category.
3. Gauging customer response to water savings measures:
   - assessing the likelihood of achieving the potential savings from each measure;
   - assessing research on customer ability and willingness to comply with measures; and
   - considering previous EBMUD experience in managing and monitoring measures.

Water Use Allocation

During the 2008-2009 DMP, individual water use allocations and baseline uses were printed on water bills for each billing cycle to help customers gauge their progress toward meeting their conservation goals. A

discussion of the process used in the 2008-2009 DMP for determining baselines and allocations is included in Appendix G-3. As rationing begins in the second half of the year following the first recognition of drought conditions in April when the annual Water Supply Availability and Deficiency report is prepared, allocations are set at one-half of the year's reduction goals in the first dry year for practicality. This allocation is also considered in the water supply management and planning process. During the 2008-2009 DMP, private fire service, hydrant meter, recycled and raw water accounts were exempt from water use allocation assignments.

Drought Rate Structure

When a DMP is adopted, EBMUD considers increasing water rates and adding drought surcharges both to give customers a financial incentive to conserve water and to maintain adequate system revenue during periods of reduced water sales. Drought rates and surcharges are uniquely determined for each drought event. Appendix G-3 includes a discussion of the drought rate structure adopted for the 2008-2009 DMP, which is provided as a past example, but does not necessarily reflect future planned actions.

In 2008-2009, the drought rate structure increased water volume charges across the three existing tiered inclining rates for Single Family Residential (SFR) customers but exempted those SFR customers whose usage did not exceed 100 gallons per day in a billing period. This structure provides an incentive to conserve water since the rate and total charges are directly proportional to water use. Higher drought volume charges also apply to the existing single-tier rate for non-SFR customers.

The 2008-2009 drought surcharge added an additional water volume charge to each customer's consumption that exceeded their allotted water use. Some customers affected by special circumstances were eligible for exemptions to the drought surcharge. Exceptions for residential customers included medical requirements, incorrect customer classification, inappropriate basis of historical use from change in ownership or tenancy, and change in occupancy. Exceptions for non-residential customers included creation of unnecessary and undue hardship including adverse economic impacts, and causing an emergency condition affecting sanitation, fire protection, or customer/ public health and safety. Recycled water customers, who met their needs by substituting potable water with sufficiently available recycled water sources, were also exempt. In addition, raw water customers were exempt from the drought rate structure for reasons similar to the recycled water customers.

Potentially an additional surcharge will be imposed on all potable water consumed whenever supplemental water is delivered to EBMUD through the Freeport Regional Water Facility. EBMUD will develop the specific approach for each future drought. Supplemental water benefits all customers by increasing water supplies to reduce the need for water rationing and drought restrictions. A surcharge recovers the added Freeport operating costs. The duration of the applied surcharge will be adjusted to recover the actual operating costs.

CONSUMPTION REDUCTION MONITORING

EBMUD monitors customer consumption during a drought to assess the effectiveness of its DMP in reducing water use. The consumption data helps determine the need to propose refinements to the drought rate structure or to adjust public outreach efforts to garner greater response.

CUSTOMER CONSUMPTION AND WATER PRODUCTION MONITORING

During a DMP, EBMUD evaluates both billed consumption and daily water production data relative to reduction goals. Using this process, staff gauges EBMUD's effectiveness in managing overall demand and customers' responsiveness to conserve. The results are presented to the EBMUD Board of Directors in regular drought management reports. The reporting frequency depends on the level of activity occurring and the severity of the drought.

EBMUD customers' accounts are metered, providing bi-monthly (single-family residential) and monthly consumption data that can be evaluated by customer category characteristics. Water production data tracks treated water input to the distribution system leading to customers' taps. Temperature variations are also tracked with water production to observe the effects of weather conditions on consumption behavior. Using financial records summarized from customer bills, EBMUD analyzes whether customer groups are reaching their conservation targets based on the distribution of customers affected by drought surcharges and higher drought rates.

EBMUD assesses the effectiveness of its demand management programs on the projected water supply in each report. This ensures timely action can be taken to recommend improvements to the DMP for Board consideration if results fall short of EBMUD's water use reduction goals.

WATER BILL MONITORING

The success of a DMP depends on customers reducing their water use. Experience shows that providing clear feedback on consumption relative to goals, benchmarking efficient water use among customer sectors, clearly stating the financial penalties for overuse, and acknowledging customers' efforts to save water all reinforce prudent behavior. EBMUD uses its Customer Information System (CIS) to inform customers of their current and past water uses and allocations through printed messages on customer water bills. This information helps customers monitor their individual rationing efforts and encourage adjustments to usage.

In 2008-2009, each customer received a customized bill that compared current use to the consumption baseline, customer category goal, and the individual customer allocation goal that would trigger a drought surcharge if the goal was not met. The bill itemized charges at the drought rate and applicable drought surcharges for use that exceeded the allocation goal.

FINANCIAL IMPACT ANALYSIS

Water sales provide approximately 76 percent of EBMUD's operating revenues. The balance includes fees and charges, taxes, hydropower sales revenue, and interest. Appendix F includes the water rates.

In addition, EBMUD sells bonds and maintains financial reserves. These funding sources affect EBMUD's annual operating budget and corresponding rate analysis for water sales. EBMUD's budget and related rates and charges are determined by two types of project costs associated with disaster preparation and drought-related water shortages: the multi-year large capital project costs to mitigate disaster and drought-related water shortages, and annual costs for projects in the drought management programs adopted under water shortage emergencies.

EBMUD prepares for disaster or drought-related shortages by investing in major capital improvements that are funded by several different revenue sources. The diversity minimizes impacts on customers and distributes the costs equitably to both existing and future customers through water rates, fees and charges. For example, infrastructure improvements include EBMUD's recently completed Seismic Improvement Program and other major capital projects, such as the seismic strengthening of the Mokelumne Aqueducts, as well as development of EBMUD's supplemental water supply, which are discussed in Chapter 2 of this UWMP 2010.

IMPACT ANALYSIS OF REDUCED SALES ON REVENUES AND EXPENDITURES

EBMUD includes an assessment of water availability or deficiency in its financial planning and annual rate review process for budgeting purposes. When the assessment recommends implementing mandatory water use reductions to promote conservation, EBMUD adopts a revenue schedule to allow increasing the volume rate, adding a drought surcharge, and using the contingency and rate stabilization reserve fund to fully recover costs of providing ongoing water service, mitigate expenses of implementing the DMP, and recover lost revenues from lower water consumption. However, when revenues were suppressed in the absence of a drought emergency during the voluntary water use reduction and post-drought demand recovery period from FY10 to FY11, the budget was balanced by reducing expenditures through a hiring freeze, operational efficiencies, and deferred capital projects.

The rates and charges implemented through EBMUD's DMP are designed to distribute the financial impacts equitably to each customer category and to avoid long-term financial impacts to EBMUD. Consumption analyses helps determine the reduction goals for each customer category and the rate adjustments needed to recover revenue.

Revenue recovery covers the increased expenses of the DMP. As an example, Table 3-5 lists items from the $5.2 million 2008-2009 DMP implementation budget.

The actual costs for program elements were under budget for the 2008-2009 DMP as a result of overall management of program costs and strong customer drought response. Costs for the DMP were partially offset by leveraging use of

TABLE 3-5 2008-2009 DROUGHT MANAGEMENT PROGRAM IMPLEMENTATION BUDGET

ADVERTISING CAMPAIGN AND MEDIA OUTREACH	$2,175,000
INCREASED DIRECT CONTACT WITH CUSTOMERS, ADDITIONAL STAFF HIRES, AND CONSERVATION REBATES, DEVICES AND KITS	$2,084,000
INCREASED OUTREACH TO COMMUNITY LEADERSHIP GROUPS AND TO SCHOOLS, ADDITIONAL STAFF HIRES	$435,000
ENSURE HIGH QUALITY CUSTOMER SERVICE ON THE PHONE AND WEB SITE, INCLUDING ADDITIONAL STAFF HIRES	$520,000
TOTAL	**$5,200,000**

existing personnel and equipment and expanding ongoing outreach. EBMUD can selectively reallocate and reassign current employees based on compatible skill sets to different duties to address priorities of the DMP. These functions include responding to outside inquiries, modifying billing software, and conducting and responding to leak surveys. The District's routine public outreach activities also were redirected to focus heavily on drought management.

Increased Resource Demands

Additional resources and revenues are needed to implement a DMP to meet goals and to support expanding personnel and equipment resources, increasing outreach efforts, and offering more water conservation rebates and free devices for distribution.

Human Resources

Employing temporary staff increases salary costs. During a DMP, fiscal year budgets may be amended mid-year to hire temporary staff to increase outreach to include informing customers of their water reduction use goals and conservation tips, assisting them in meeting their goals, and managing and enforcing the drought activity program. Duties may include:

- providing administrative support to respond to customer and media inquiries;
- providing field support to perform water use audits;
- assisting customers in monitoring leaks and conducting water use audits;
- providing information technology support for bill adjustments; and
- assisting with outreach efforts using mass media.

Outreach Efforts

Outreach is intensified during a DMP. Costs and funding increase for media advertisement, web services, publications, automated "out-dial" phone calls, informational and outreach mailings, conservation-related devices offered free to the public, and seminars stressing conservation tips in meeting water use reduction goals. These efforts enable EBMUD to heighten awareness of water use prohibitions, emphasize individual customer responsibilities in the drought, and assist customers with coping with the drought.

Distribution of Water Conservation Devices, Kits, and Rebates

Drought revenues fund DMPs to promote conservation and to assist customers with changing their water use habits. During droughts, EBMUD will distribute more water saving devices and water conservation kits to customers. Devices include showerheads, faucet aerators, small irrigation equipment, sprinkler spray heads, drip irrigation equipment, and soil sensors. Kits include dye tabs, water measurement bags, indoor and outdoor WaterSmart saving tips, and publications. Additional costs are also incurred for increased rebates to improve water conservation and efficiency, such as for toilets and clothes washers, high-efficiency fixtures/ equipment, and water-efficient commercial equipment.

RATE CHANGE NOTIFICATION

PROPOSITION 218 NOTICE REQUIREMENTS FOR RATE CHANGES

Proposition 218, approved by California voters in 1996, added Article XIII C (taxes) and D (fees and assessments) to the California Constitution. Proposition 218 establishes specific rules for implementing new rates or adjusting rates that apply to EBMUD and other water suppliers proposing to adopt drought rates. Proposition 218 requires that charges cannot exceed the proportional cost of service, written notice of the proposed charges be mailed, a public meeting be held not less than 45 days after the mailing, and if written protests are presented by a majority, the agency cannot impose the fee or charge.

By implementing drought rates in a timely manner, EBMUD increases its ability to successfully manage water supplies during the upcoming warm dry months of the year. Proposition 218 notification requirements control the schedule for selecting and implementing drought rates and charges. Consequently, EBMUD must consider options for drought rate structures prior to the anticipated start of a drought program. Efforts will be coordinated with the water supply forecast and drought planning process of EBMUD's Water Supply Availability and Deficiency report presented by May. This approach provides sufficient time for public input, alternative feasible drought rate design reviews, and deliberation prior to issuing a Proposition 218 notice so that drought rates can be promptly implemented to curtail water use at the height of summer in the affected year.

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CHAPTER 4. WATER DEMAND

Currently, water consumption within the EBMUD service area has dropped as a result of an economic downturn in the Bay Area, suppressed demand in response to the drought management program, and unusually cool weather. In looking out to year 2040, EBMUD's water supply is not sufficient to meet customer demand during single- and multi-year drought periods. A supply and demand assessment was done based on a land-use based method to forecast demands.

PAST AND CURRENT DEMAND

Historical water use within the EBMUD service area is illustrated in Figure 4-1. Total demand has remained relatively constant with some variance despite the increase in the number of water service accounts (or service connections). Water use dipped significantly during periods of drought rationing in calendar years 1976-78, 1987-94, and recently in 2007-2010.

Many factors contributed to the reduced water use from the amount that would otherwise be anticipated including:

- water restrictions imposed for drought management in 1976-78, 1987-94, and recently in 2007-2010;
- EBMUD's aggressive water conservation and recycling activities;
- changed consumption demographics to a variety of land use conversions, many of which also have high efficiency water use patterns;
- legislative changes including new plumbing efficiency standards, landscape ordinances, the 1992 and 2005 Federal Energy Policy Act; and
- the economic downturn within EBMUD's service area and the region that has continued since 2007.

Figure 4-2 displays how total metered water consumption is distributed among different customer categories. The single-family residential customer category is the largest water user category followed by multi-family residential, industrial and petroleum, commercial, irrigation, and institutional users. Approximately 63 percent of the historical total water consumption was delivered to

FIGURE 4-1 EBMUD WATER ACCOUNTS AND TOTAL DEMAND

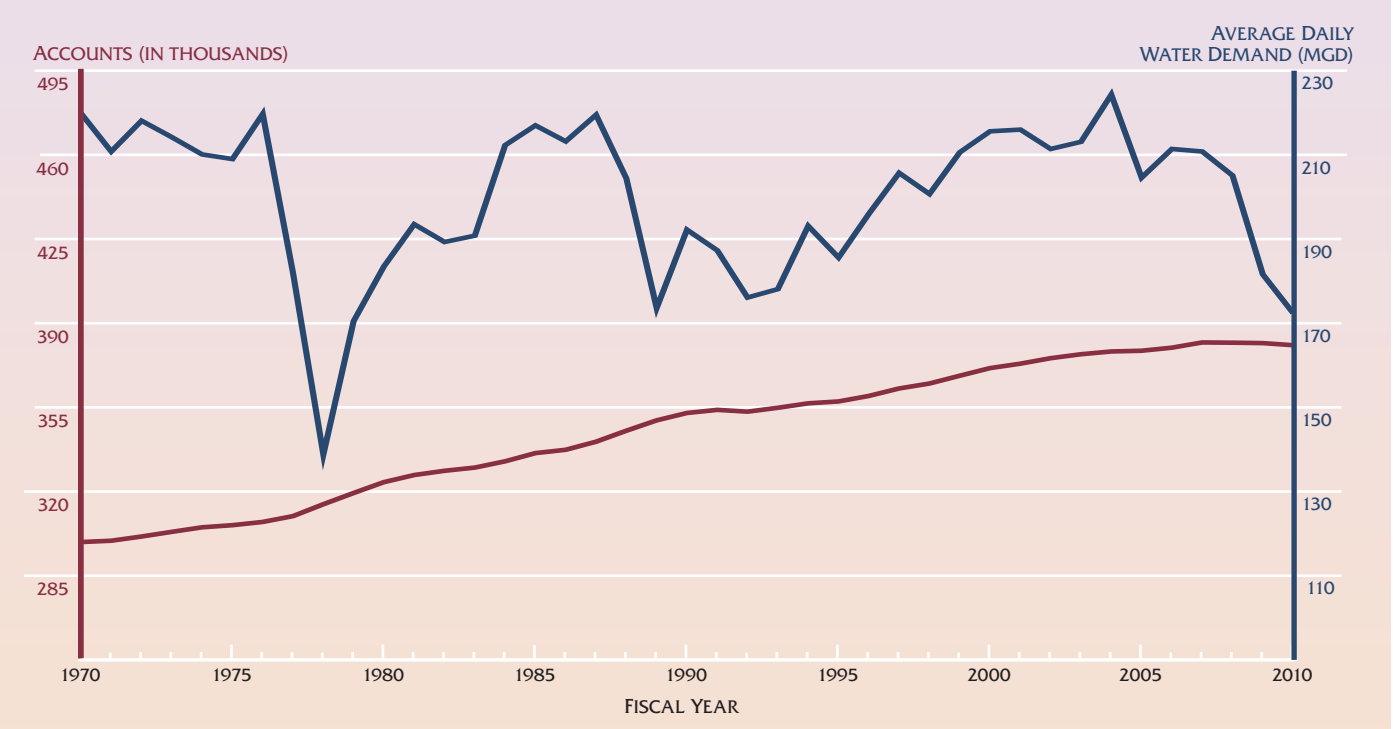
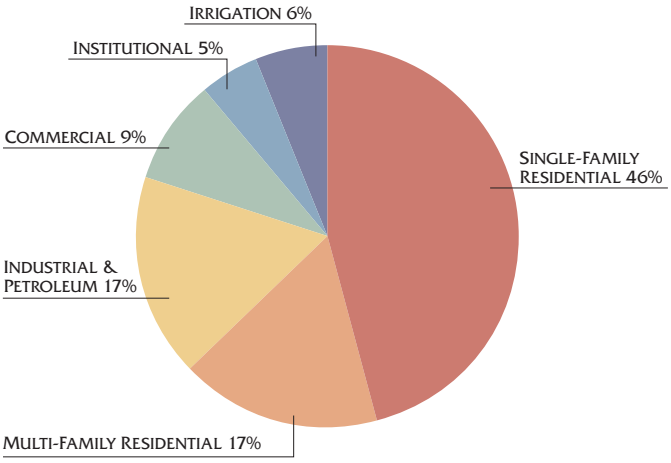


FIGURE 4-2 WATER USE BY CUSTOMER CATEGORY



NOTE:
Based on Calendar Year 1975-2010 consumption data.

EBMUD's residential customers. Historical water use for each EBMUD customer land use category is presented in Figure 4-3. It illustrates the number of accounts and metered water consumption for single-family residential, multi-family residential, industrial and petroleum, commercial, institutional, and irrigation customer categories from 1975-2010.

Other characteristics of historical water use (also from 1975-2010) are illustrated in Figures 4-4 through 4-5. In Figure 4-4, winter season water use is compared to summer season water use for each customer category. In Figure 4-5, water consumption for each customer category is differentiated between accounts situated east and west of the Oakland-Berkeley Hills. Figure 4-6 illustrates the regional variations in historical daily average water use per account for the single-family residential category within the EBMUD service area relative to the historical District-wide average.

Figures 4-7 and 4-8 illustrate residential water use characteristics. In Figure 4-7, indoor water use for an average single-family residential household is presented by specific use categories based on most recent available data from calendar year 2009 (for a drought affected year in a down economy). In Figure 4-8, indoor residential water use in calendar year 2010 averaged 68 percent of the total residential water use, and outdoor residential use averaged 32 percent.

PROJECTED WATER DEMAND

EBMUD's water demand projections are based on the *2040 Demand Study*, which was completed in 2009. The 2040 Demand Study uses a land-use based method to project average annual water demands of the distribution system out to year 2040.

The land-use based methodology relies on existing land uses and existing water consumption data for the study area. Demand projections were based on consumption data from year 2005, which provided the last complete year of conservation and water consumption data preceding development of the 2040 Demand Study and is unaffected by distribution system operation anomalies. The land use and water consumption data were used to calculate Land use Unit Demands (LUDs), a measure of water consumption per acre for each land use category. The 2005 LUDs were adjusted for historical weather effects (i.e. dry vs. wet year) and non-weather effects (e.g. economic conditions) to produce a "normalized" year. Additional adjustments to LUDs included accounting for unmetered water and future density growth. These LUDs were then applied to acreages of projected land uses that were determined by local planning agencies. The land use categories consisted of seven residential, four mixed-use (residential above commercial in the same building), and 12 non-residential. The demand projections were made for years 2010, 2015, 2020, 2025, 2030, and 2040.

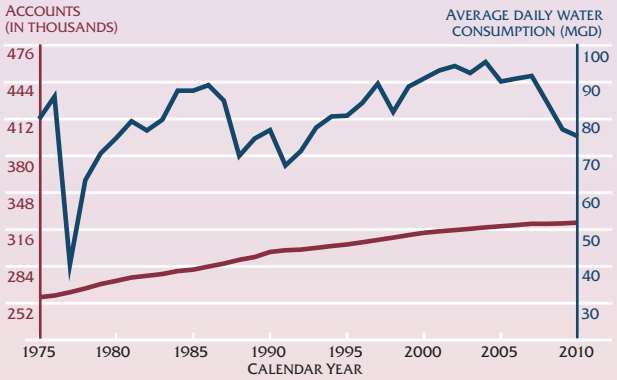
The land use, consumption data, adjustment factors, and demand projections were developed in a geographic information system database, which allows for the spatial allocation of data. For example, consumption data was allocated by meter location and future growth adjustments by demand model regions (EBMUD service area is divided into 11 regions). The end result consists of demand projections that can be aggregated by land use and location.

The 2040 Demand Study relied on the adopted general plans of the cities and counties in the EBMUD service area and on a series of meetings with local planning agencies regarding the timing and direction of future development in their respective communities. The district-wide land use analysis was conducted during a period reflecting an expectation of continued economic expansion. Although the economy began a period of recession in December 2007, the Demand Study projections are consistent with the anticipated level of developments in the general plans. Therefore, instead of reflecting the highest potential water demands, the demand projections in this analysis reflect

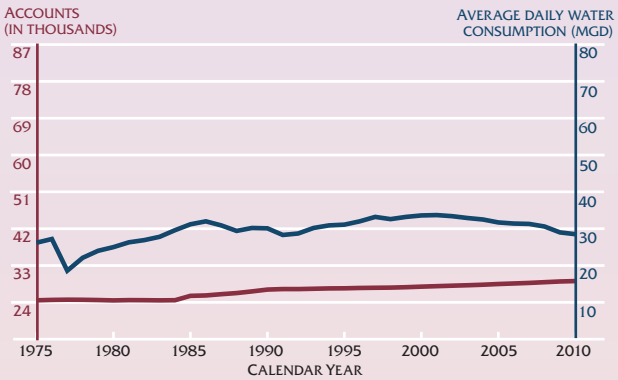
FIGURE 4-3

EBMUD WATER ACCOUNTS AND CONSUMPTION

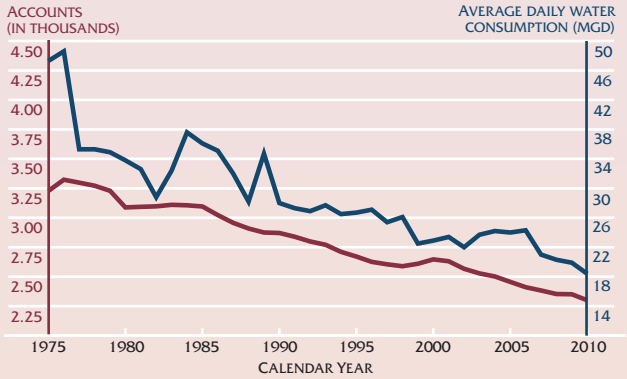
SINGLE-FAMILY RESIDENTIAL



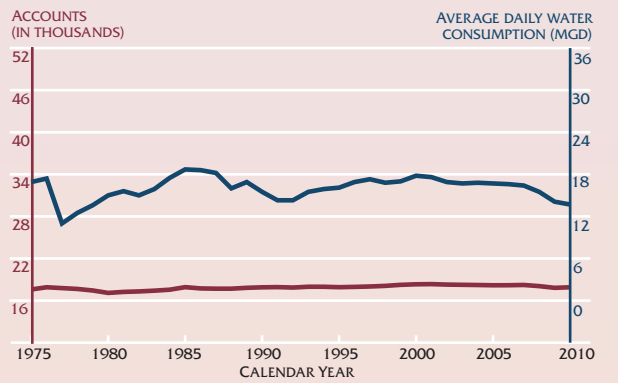
MULTI-FAMILY RESIDENTIAL



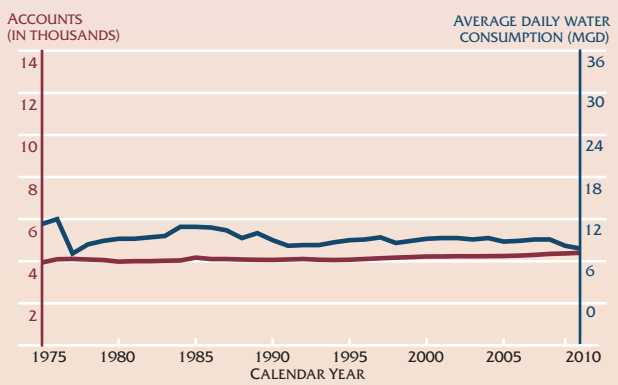
INDUSTRIAL & PETROLEUM



COMMERCIAL



INSTITUTIONAL



IRRIGATION

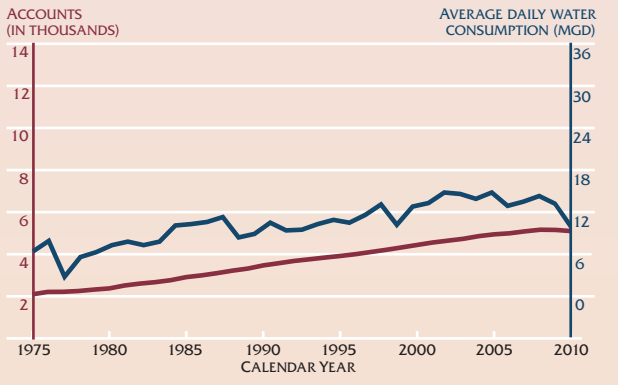
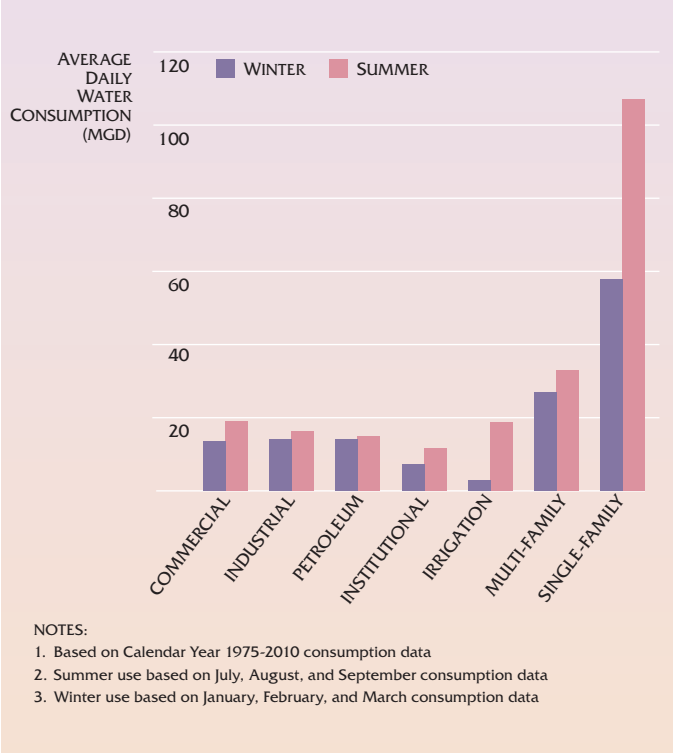
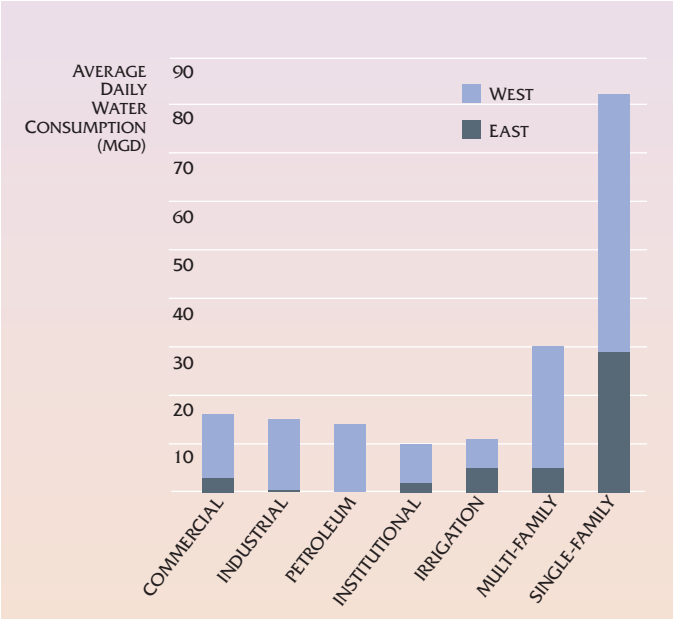


FIGURE 4-4
WINTER AND SUMMER WATER USE BY CUSTOMER CATEGORY



NOTES:
1. Based on Calendar Year 1975-2010 consumption data
2. Summer use based on July, August, and September consumption data
3. Winter use based on January, February, and March consumption data

FIGURE 4-5
EAST-OF-HILLS AND WEST-OF-HILLS WATER USE BY CUSTOMER CATEGORY



NOTE:
Based on Calendar Year 1975-2010 consumption data.

current planning policy by land use agencies. Higher demand projections may be associated with other forecasting techniques. These include long range population projections or demands based on assumptions that most land uses will increase in density over time, which do not specifically reflect community policy. While the actual developments and the associated increase in water demand will very likely be realized more slowly in the near term until 2020, the 2040 Demand Study still reflects a reasonable expectation for growth over the long term for demand in year 2040. Future Demand Studies will reflect updates of the general and specific plans of the cities and counties within the EBMUD service area.

The 2040 Demand Study forecasts an unadjusted customer demand of 312 million gallons per day (MGD) for the year 2040. Assuming that cumulative savings since implementation of the WCMP in 1994 of 62 MGD is achieved through existing and future conservation efforts and cumulative savings of 20 MGD is achieved through existing and future recycled water programs, the adjusted 2040 forecasted planning level of demand is 230 MGD. As a long-term planning tool, the planning level of demand remains unchanged through the current drought or other events that may temporarily impact demands. Chapters 5 and 6 of this UWMP 2010 provide further details on projected recycled water and conservation savings goals, respectively.

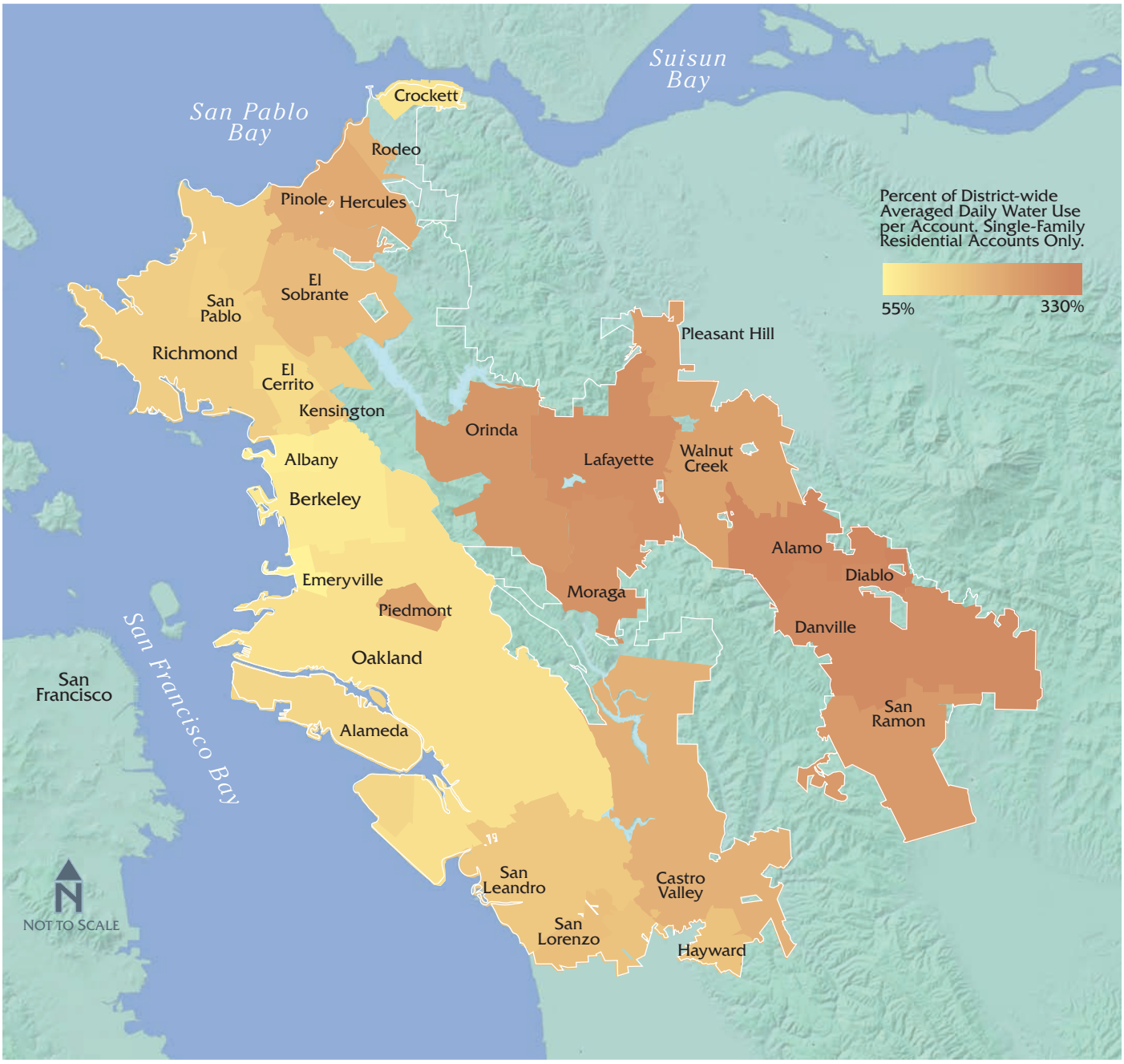
Table 4-1 illustrates water demand projections for each customer category (or water use sector): single- and multi-family, commercial, industrial, institutional, and irrigation users. The demand projections for the six customer categories are consolidated from the 23 land use categories, based on the predominant customer category found in each land use category.

WATER DEMAND PROJECTIONS FOR LOWER INCOME HOUSING

Water Code Section 10631.1 requires an estimate of projected water use needed for lower income single-family and multi-family residential housing within the EBMUD service area, which is summarized in Table 4-2. The estimated lower income water demand is based on available housing data published by the Association of Bay Area Governments (ABAG), consumption data from EBMUD water accounts, and EBMUD's water demand projections. The most recent 2008 housing data from ABAG and its projected 2007-2014 housing needs data are derived from the housing element portion of city and county general plans. The percentage of lower income housing units (4.4%) within the total housing stock in

FIGURE 4-6

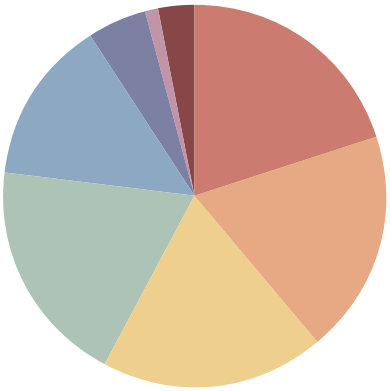
HISTORICAL SINGLE-FAMILY RESIDENTIAL WATER CONSUMPTION BY REGION WITHIN THE EBMUD SERVICE AREA



Potable water accounts only. Based on historical daily average consumption, 1975-2010
Representation of non-EBMUD boundaries is not necessarily authoritative

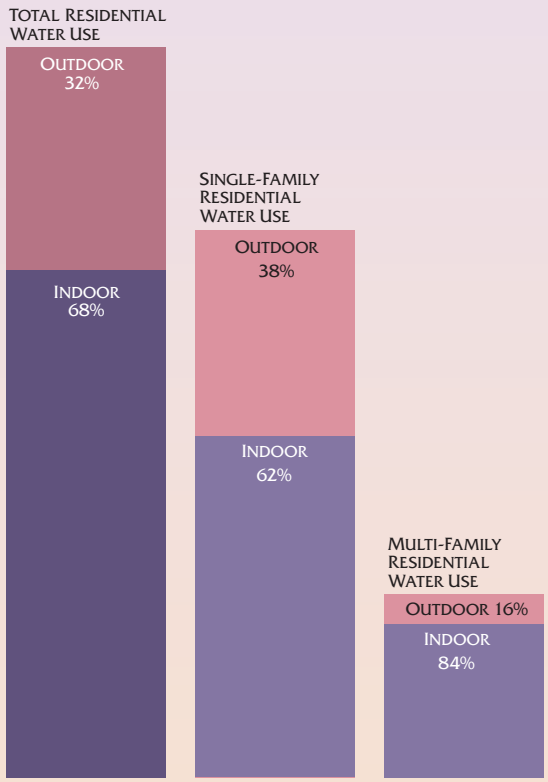
EBMUD's service area in year 2008 as estimated by ABAG is assumed the same as the percentage of lower income accounts that make up EBMUD's residential accounts in 2008. This estimated number of lower income accounts will be the 2008 baseline from which extrapolations will be made. Using an annualized average growth rate (5.85%) derived from ABAG's projection of lower income housing growth for years 2007-2014, EBMUD extrapolated the number of lower income EBMUD accounts for years 2015 to 2040. The total lower income water demand was estimated by assuming that water use for each account is equivalent to the average use of an EBMUD Customer Assistance Program (CAP) account in 2008. Income qualified single-family and multi-family (homeless shelter) accounts that enroll in the CAP receive discounted water rates. However, income eligibility requirements for CAP,

FIGURE 4-7
AVERAGE SINGLE-FAMILY RESIDENTIAL HOUSEHOLD INDOOR WATER USE



ELEMENT OF INDOOR USE	CALENDAR YEAR 2009 USE PER HOUSEHOLD (GAL/DAY/HH)	PERCENT OF USE
TOILET	35.3	20
CLOTHES WASHER	33.5	19
SHOWER	33.3	19
FAUCETS	33.2	19
LEAKS	25.6	14
BATH	9.7	5
DISHWASHER	2.3	1
OTHER	5.7	3
TOTAL	178.6	100

FIGURE 4-8
INDOOR AND OUTDOOR RESIDENTIAL WATER USE



NOTE:
Based on Calendar Year 2010 consumption data.

TABLE 4-1
WATER DEMAND PROJECTIONS FOR EACH WATER USE SECTOR
AVERAGE ANNUAL DEMANDS (MGD)[1]

CALENDAR YEAR	SINGLE-FAMILY	MULTI-FAMILY	COMMERCIAL	INDUSTRIAL	INSTITUTIONAL	IRRIGATION	TOTAL
2010 [2]	120	31	26	22	8	9	216
2015 [3]	121	36	26	23	8	9	223
2020	118	41	26	20	8	8	221
2025	117	47	26	19	7	8	224
2030	117	53	26	18	7	8	229
2035 [4]	117	54	26	18	7	7	229
2040	117	54	27	18	7	7	230

[1] Demand represents the Planning Level of Demand.
[2] 2010 demands are based on projections, which differ from actual water consumption.
[3] 2015 demands are based on projections and do not reflect the demand during the recovery period. The slight increase in total demand as compared to 2010 and 2020 is due to implementing conservation and recycled water projects later than anticipated as the customer demand recovers in the post-drought and from the economic downturn.
[4] 2035 values are interpolated from 2030 and 2040 demand projections.

which are based on the California Life Line Annual Income schedule, is a subset of the classification of "lower income households" as defined in Section 50079.5 of the California Health and Safety Code. Based on the ratio of projected demand between single- and multi-family categories derived from Table 4-1, EBMUD applied the same ratios to the total lower income water demand for each reporting year to estimate the appropriate allocation of the single- and multi-family categories. EBMUD's Water Service Policy 3.07 (in Appendix F) ensures that priority for new water service connections during restrictive periods is given to lower income households and that their demands are met first. This policy assures that the portion of overall water demands, as provided in Table 4-1, for lower income single-family and multi-family residential households can be met.

Effect of SBx7-7 Requirements on Projected Demand

Senate Bill No. 7 (SBx7-7) that establishes the program known as the Water Conservation Act of 2009 and often referred to as '20 by 2020,' creates a framework for future planning and actions by urban and agricultural water suppliers to reduce California's water use and requires urban water agencies to assist in reducing statewide per capita water consumption by 20 percent by the year 2020. Specifically, among other requirements, this bill establishes four methods for urban water suppliers to select from to achieve the statewide goal of a 20 percent reduction in urban water use. The act requires urban water suppliers to set an interim urban water use target for 2015 and meet the overall target by 2020.

As a water supplier, EBMUD is required to comply with the requirements of this bill to be eligible for water related state grant funding or loans. Chapter 6 and Appendix H discuss the development of the water use baseline and the targets. The projected demand of 221 MGD in year 2020 is expected to meet the requirements of SBx7-7.

Supply-Demand Assessment

In order to meet its customers' water needs now and in the future, EBMUD must balance water supply and customer demand. Both supply and demand vary seasonally and become critical during drought periods which can last several years. For planning purposes and looking to the year 2040, EBMUD's current supply is insufficient to meet customer needs during single- and multi-year droughts despite EBMUD's aggressive water conservation and recycled water programs.

Past and Current Supply-Demand

EBMUD's water demand in 1970 reached as high as 220 MGD. Subsequently, demand dropped sharply as a result of cutbacks during the three most recent drought rationing periods when drought-related programs were in effect in 1976-1978, 1987-1994, and 2007-2010. Demand was low in wetter years that immediately followed the first two droughts. This temporary event reflected changed customer water use behavior, successfully implemented conservation practices, and delayed post-drought recovery in customer consumption. As time progressed, demand recovered to pre-drought levels. Current demand levels remain lower than the planning level of demand as a result of residual effects from the 2007-2010 drought, a depressed economy, and unusually cool temperatures. In FY10, EBMUD's system demand was on average 174 MGD.

Table 4-2
Water Demand Estimates for Lower Income Residential Accounts

	Single-Family		Multi-Family		Total Residential	
Calendar Year	Demand (MGD)	% of Sector Demand	Demand (MGD)	% of Sector Demand	Demand (MGD)	% of Total Residential Sector Demand
2015	2.4	2%	0.7	2%	3.1	2%
2020	3.1	3%	1.1	3%	4.2	3%
2025	3.9	3%	1.6	3%	5.5	3%
2030	5.1	4%	2.3	4%	7.4	4%
2035	6.7	6%	3.1	6%	9.8	6%
2040	8.9	8%	4.1	8%	13.0	8%

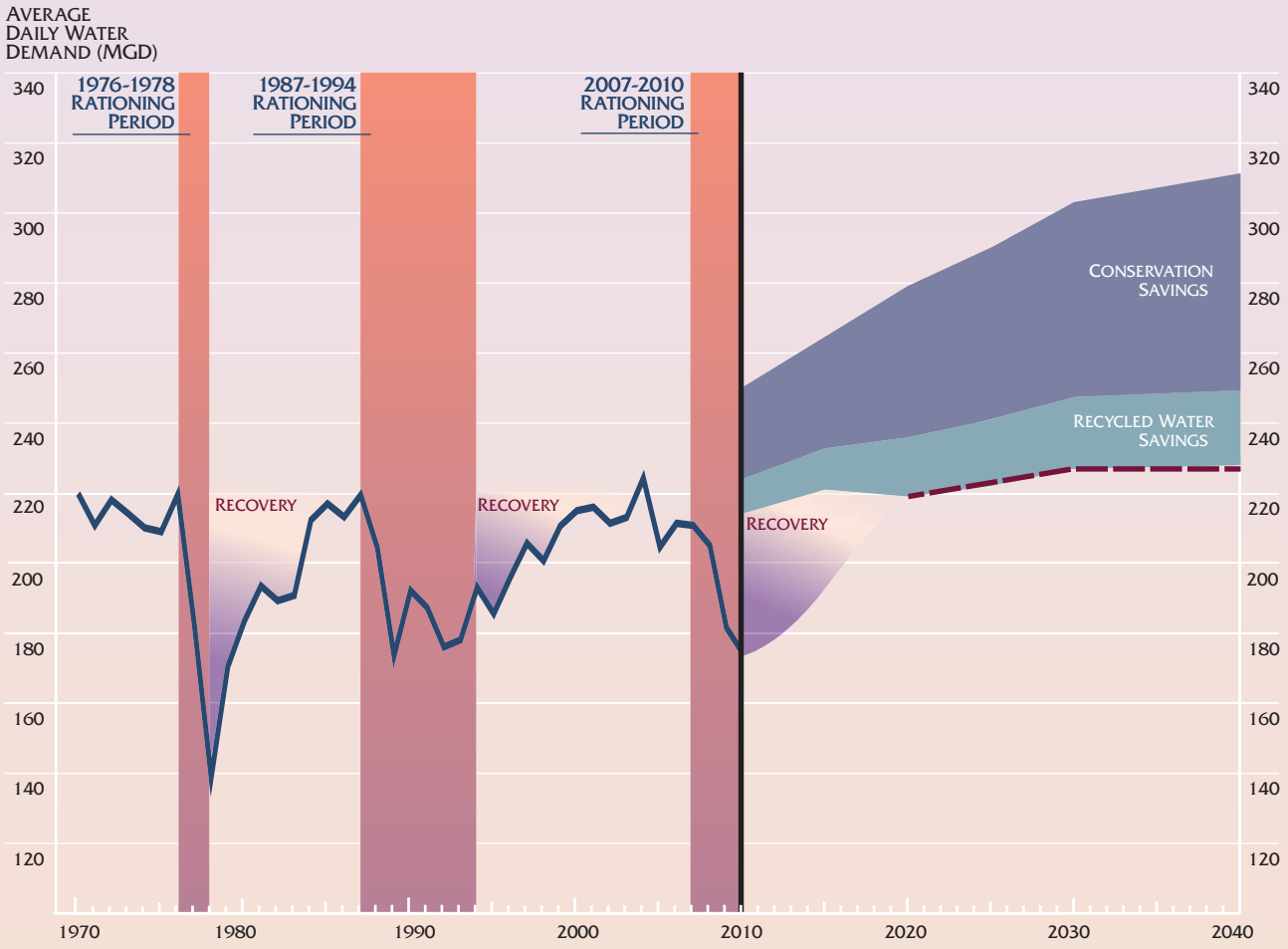
PROJECTED SUPPLY-DEMAND

Planning Level of Demand

The planning level of demand does not include the short-term reduction and rebound in demand caused by the multi-year drought and the downturn in the economy. The planning level of demand is used to assess demands as dictated by community policies. The 2040 Demand Study projected, on average, less than a one percent growth each year in customer demand through 2030 followed by a much lower increase thereafter to a 2040 planning level of demand of 230 MGD after applying reductions from conservation and recycled water savings. However, due to the current suppressed demand that is lower than estimated in the 2040 Demand Study, some planned recycled water projects and conservation programs will be deferred until the end of the anticipated recovery period. Consequently, the projected planning level of demand for 2015 has been revised to 223 MGD and is reflected in Table 4-3. Figure 4-9 shows both historical and projected demands and projected recycled water and conservation savings from 2010 to 2040.

A summary of EBMUD's demand and supply projections over the next thirty years is provided in Table 4-3. The

FIGURE 4-9 HISTORICAL AND PROJECTED DEMAND



NOTES:

1. Rationing periods include both voluntary and mandatory use restrictions imposed as part of the adopted Drought Management Program.
2. Within the projected drought recovery period following 2010, demand estimates are based on observed trends from the two past drought recovery periods and are subject to change depending on actual conditions.
3. Refer to Table 4-3 for the projected demand, projected conservation and recycled water program savings values.
4. Historical demand is plotted for fiscal years whereas projected demand is plotted for calendar years.

TABLE 4-3 EBMUD DEMAND AND SUPPLY PROJECTIONS

	2010	2015	2020	2025	2030	2035 [1]	2040
PROJECTED DEMAND (MGD)							
CUSTOMER DEMAND [2]	251	266	280	291	304	308	312
ADJUSTED FOR CUMULATIVE CONSERVATION [3]	(26)	(32)	(43)	(49)	(56)	(59)	(62)
ADJUSTED FOR RECYCLED WATER [4]	(9)	(11)	(16)	(18)	(19)	(20)	(20)
PLANNING LEVEL OF DEMAND	216	223	221	224	229	229	230
PROJECTED AVAILABLE SUPPLY AND NEED FOR SUPPLEMENTAL SUPPLY (MGD)[5]							
NORMAL YEAR	>216	>223	>221	>224	>229	>229	>230
SUPPLEMENTAL SUPPLY NEED	0	0	0	0	0	0	0
SINGLE DRY YEAR (MULTIPLE DRY YEARS – YEAR 1)							
AVAILABLE SUPPLY	211	217	215	218	223	222	222
CUSTOMER RATIONING [6]	2%	3%	3%	3%	3%	3%	4%
SUPPLEMENTAL SUPPLY NEED [7]	5	6	6	7	7	8	8
MULTIPLE DRY YEARS – YEAR 2							
AVAILABLE SUPPLY	183	189	188	190	194	194	195
CUSTOMER RATIONING [6]	15%	15%	15%	15%	15%	15%	15%
SUPPLEMENTAL SUPPLY NEED [7]	21	21	21	21	22	22	22
MULTIPLE DRY YEARS – YEAR 3							
AVAILABLE SUPPLY	183	189	188	190	183	164	144
CUSTOMER RATIONING [6]	15%	15%	15%	15%	15%	15%	15%
SUPPLEMENTAL SUPPLY NEED [7]	21	21	21	21	33	53	73
THREE-YEAR DROUGHT							
TOTAL SUPPLEMENTAL SUPPLY NEED (TAF)[7]	53	54	54	55	69	93	115

[1] Projected demand for 2035 is interpolated.

[2] Customer demand values are based on the demand projections from the "2040 Demand Study," Feb 2009. These projected water demands are based on land use in EBMUD's ultimate service area and is unadjusted for conservation and non-potable water. The values are also unadjusted for the current suppressed demand due to the 2007-2010 rationing period and the economic downturn.

[3] Existing conservation saving from the "1994 Water Conservation Master Plan" and planned conservation program savings based on the "2011 Water Conservation Master Plan".

[4] Existing recycled water achieved per the "1993 Water Supply Management Program" and planned recycled water program savings as outlined in Chapter 5 of the UWMP 2010.

[5] Projected available supply data includes dry year supply deliveries from the Freeport Regional Water Project (FRWP) and Bayside Groundwater Project, Phase 1. Delivery rules for the FRWP follow the rules as developed in the Freeport EIR, 2003.

[6] Rationing reduction goals are determined according to projected system storage levels in the Long-Term Drought Management Program guidelines per Table 3-2 in Chapter 3 of the UWMP 2010.

[7] The supplemental supply need is based on EBMUDSIM modeling studies. It is the amount of water needed based on EBMUD's updated demand projections, the provisions of the 1998 Joint Settlement Agreement and the rationing policy stated in Table 3-2, Chapter 3 of the UWMP 2010. The actual need will be dependent on antecedent conditions and the severity of actual drought conditions. Supplemental supply stored during the initial year of the drought could be later released, diminishing supplemental supply needs. During the drought that continued into 2010, the combined effects of water rationing and an economic downturn suppressed demand below the planning level of demand to maintain a sufficient water supply and deferred the need for supplemental water. However, if the drought had continued into its second year, most likely supplemental supplies would have been obtained from the Freeport Regional Water Facility as anticipated in the Interim Drought Management Program Guidelines discussed in Appendix G-2.

demand data is based on EBMUD's 2040 Demand Study (as discussed in the Projected Water Demand section of this chapter) and revised projections. The supply data is derived from EBMUD's water supply system Simulation Model (EBMUDSIM).

EBMUD evaluates and forecasts water supply availability for any calendar year based on forecasted runoff and existing storage levels in the reservoirs. A "normal year" is a year in which EBMUD does not need to implement a Drought Management Program. For a normal year, the April projection of the total system storage at the end of September would be 500 thousand acre-feet (TAF) or greater (as shown in Table 3-2). EBMUD can meet customer demands through the year 2040 during normal year conditions; therefore, the available supply is considered equal to or greater than demand. However, as discussed in Chapter 2, unless supplemental water supplies are developed and while EBMUD's Mokelumne River supply continues to decrease, the frequency of normal year-types will decrease in the future. The frequency of dry years that require customer rationing is expected to increase.

In evaluating its water supply availability, EBMUD takes into account diversions of both upstream and downstream water right holders and fishery releases. The available water supply shown in Table 4-3 in years one, two, and three of a multiple-year drought is derived from EBMUDSIM analyses with the following assumptions:

- EBMUD's drought planning sequence is used for 1976, 1977, and 1978 (as discussed in Chapter 3);
- total system storage is depleted to minimum operating levels by the end of the third year of the drought planning sequence;
- EBMUD will implement its Drought Management Program when necessary (as described in Chapter 3);
- the diversions by Amador and Calaveras counties upstream of Pardee Reservoir continues to increase up to 47 TAF in 2040;
- releases from Camanche are sufficient to meet the requirements of downstream senior water right holders;
- minimum instream flow requirements for the Lower Mokelumne River are in accordance with the 1998 Joint Settlement Agreement;
- dry-year supply of CVP water, through the Freeport Regional Water Facility, is available beginning in 2010; and
- Bayside Groundwater Project, Phase 1, is available beginning in 2010.

In Table 4-3, "Single Dry Year" (or Multiple Dry Years - Year 1) is a year in which EBMUD would implement Drought Management Program elements at the "moderate" stage with the goal to achieve a reduction between zero to ten percent in customer demand (as shown in Table 3-2). Based on this EBMUD rationing policy, rationing in the first year of a drought is estimated at two percent of the planning level of demand in 2010 and four percent in 2040 only if additional supplemental supplies beyond the dry-year supply available through the Freeport Regional Water Facility and through the Bayside Groundwater Facility are obtained. Therefore, deficiencies continue to exist unless additional supplemental supplies are obtained.

Year 2 of "Multiple Dry Years" is a year in which EBMUD would implement Drought Management Program elements at the "severe" stage with the goal to achieve between 10 to 15 percent reduction in customer demand (as shown in Table 3-2). Year 3 of "Multiple Dry Years" is a year in which EBMUD would implement Drought Management Program elements at the "critical" stage. Despite water savings from EBMUD's aggressive conservation and recycling programs and rationing of up to 15 percent, additional supplemental supplies beyond those provided through the Freeport Regional Water Facility and the Bayside Groundwater Facility will be needed during Years 2 and 3 of a three year drought. In Table 4-3, the term "Supplemental Supply Need" is the additional amount of water necessary to limit customer rationing to 15 percent during droughts while meeting the requirements of senior downstream water right holders and the provisions of the 1998 Joint Settlement Agreement. The forecasted need for supplemental supply ranges from 21 MGD in 2010 to 73 MGD by 2040 during Year 3 of a three year drought.

As indicated in Table 4-3, EBMUD has a total supplemental supply need of 69 TAF over multiple dry years for 2030 level demands, beyond the current supplemental supplies provided through the Freeport Regional Water Facility and the Bayside Groundwater Facility. EBMUD plans to meet this need by relying on short-term supplemental supply sources that include the Northern California Water Transfers (expected to provide up to 13 MGD (15 TAF/yr) of dry-year water) and the Bayside Groundwater Project Expansion (expected to provide up to 9 MGD (10 TAF/yr) of dry-year water) as described in Chapter 2. Beyond 2030 and outside the current required 20-year planning horizon of the UWMP, EBMUD's supplemental supply needs will be met by implementing long-term conceptual supplemental supply sources, whose project capacities can only be quantified in subsequent UWMPs through refined project developments. Chapter 3 discusses how EBMUD would plan for and manage a water supply shortage.

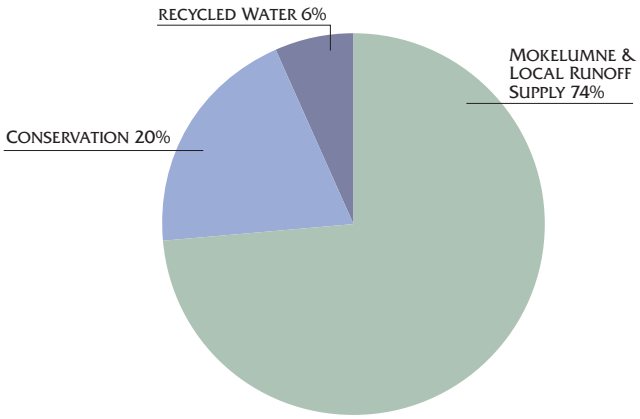
Figure 4-10 illustrates the projected water supply available to EBMUD by 2040. In a normal year, conservation and recycled water programs will play a very important role in future reliability of EBMUD's supply. In a normal year for a 312 MGD demand, conservation is expected to offset about 20 percent of the needed supply, and recycled water programs will offset about 6 percent. For a 312 MGD demand in an average drought year of a three year drought sequence projected for year 2040, rationing and supplemental supply will account for 25% and the projected shortfall to be met by developing supplemental water supply sources will be about 11%.

Interim Level of Demand

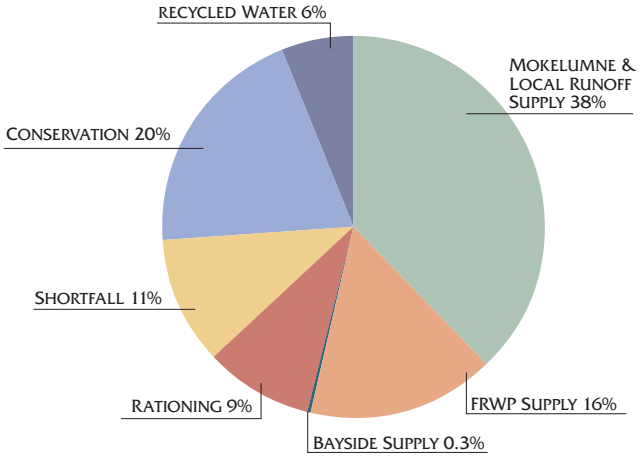
During the recent 2007-2010 rationing period, EBMUD customers were subjected to mandatory and voluntary water use restrictions. The residual rationing effect of the recently ended drought management program and the suppressed demand from the downturn in the economy has led EBMUD to adopt interim drought management program guidelines. These interim guidelines recognize that demand is below the planning level during the recovery period as depicted in Figure 4-9. During this time, when demand remains significantly suppressed, below the planning level of demand, the existing water supply is sufficient, which defers the need for any supplemental drought year water supply. Appendix G-2 provides further discussion on the interim drought management program guidelines.

FIGURE 4-10 PROJECTED (2040) WATER SUPPLY — 312 MGD

NORMAL YEAR



THREE YEAR DROUGHT AVERAGE YEAR



NOTE:
Numbers may not add to 100% due to rounding.

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Chapter 5. Wastewater And Recycled Water

EBMUD and several other wastewater utilities collect and treat wastewater in the EBMUD water service area. Currently four wastewater treatment facilities provide recycled water to EBMUD customers. Recycled water use reduces the demand for EBMUD's potable water supplies. Successful partnerships with the public, recycled water users, water and wastewater utilities, and state and federal agencies that provide funds to support resource conservation projects continue to help advance EBMUD's water recycling projects.

Wastewater System

EBMUD's wastewater service district (known as Special District No. 1, or SD-1) was established as a separate wastewater district within EBMUD's water service area in 1944. SD-1 is governed by EBMUD's Board of Directors and is administered by EBMUD's Wastewater Department.

SD-1 treats domestic, commercial and industrial wastewater for the cities of Alameda, Albany, Berkeley, Emeryville, Oakland and Piedmont, and for the Stege Sanitary District, which includes El Cerrito, Kensington and parts of Richmond. Each of these communities operates sewer collection systems that discharge into one of five EBMUD sewer interceptors (Adeline, Alameda, North, South, and South Foothill) as illustrated in Figure 5-1.

Wastewater Generation, Collection and Treatment

Based on 2010 census data, approximately 1.34 million people are served by EBMUD's water service district. Within this service area as shown in Figure 5-1, there are several wastewater utilities operating in addition to EBMUD's SD-1. SD-1 serves approximately 650,000 people in an 88 square-mile area of Alameda and Contra Costa counties along the east shore of the San Francisco Bay, extending from Richmond in the north to San Leandro in the south. Table 5-1 lists wastewater utilities shown on Figure 5-1 with their capacities and average dry weather wastewater flow projections from 2010 to 2040. Some of these districts, such as Dublin San Ramon Services District (DSRSD) and Oro Loma Sanitary District, are similar to SD-1 because they operate and maintain intercepting sewers that receive and transport wastewater from collection systems, which are owned and operated by communities within these districts. The cities of San Leandro, Pinole, Richmond, Rodeo and Hercules own and maintain both the collection systems and the interceptor systems within their respective utility districts.

Wastewater Collection System

EBMUD's collection facilities are comprised of the interceptor system and collection system pumping stations. The interceptors consist of 29 miles of reinforced concrete pipes ranging from 12 inches to 9 feet in diameter. They collect wastewater from approximately 1,400 miles of sewers owned and operated by the communities in the SD-1 service area. Fifteen collection system pumping stations, ranging in capacity from 0.5 to 54.7 MGD, lift wastewater throughout the interceptors as it travels to the Wastewater Treatment Plant.

Wastewater Treatment System

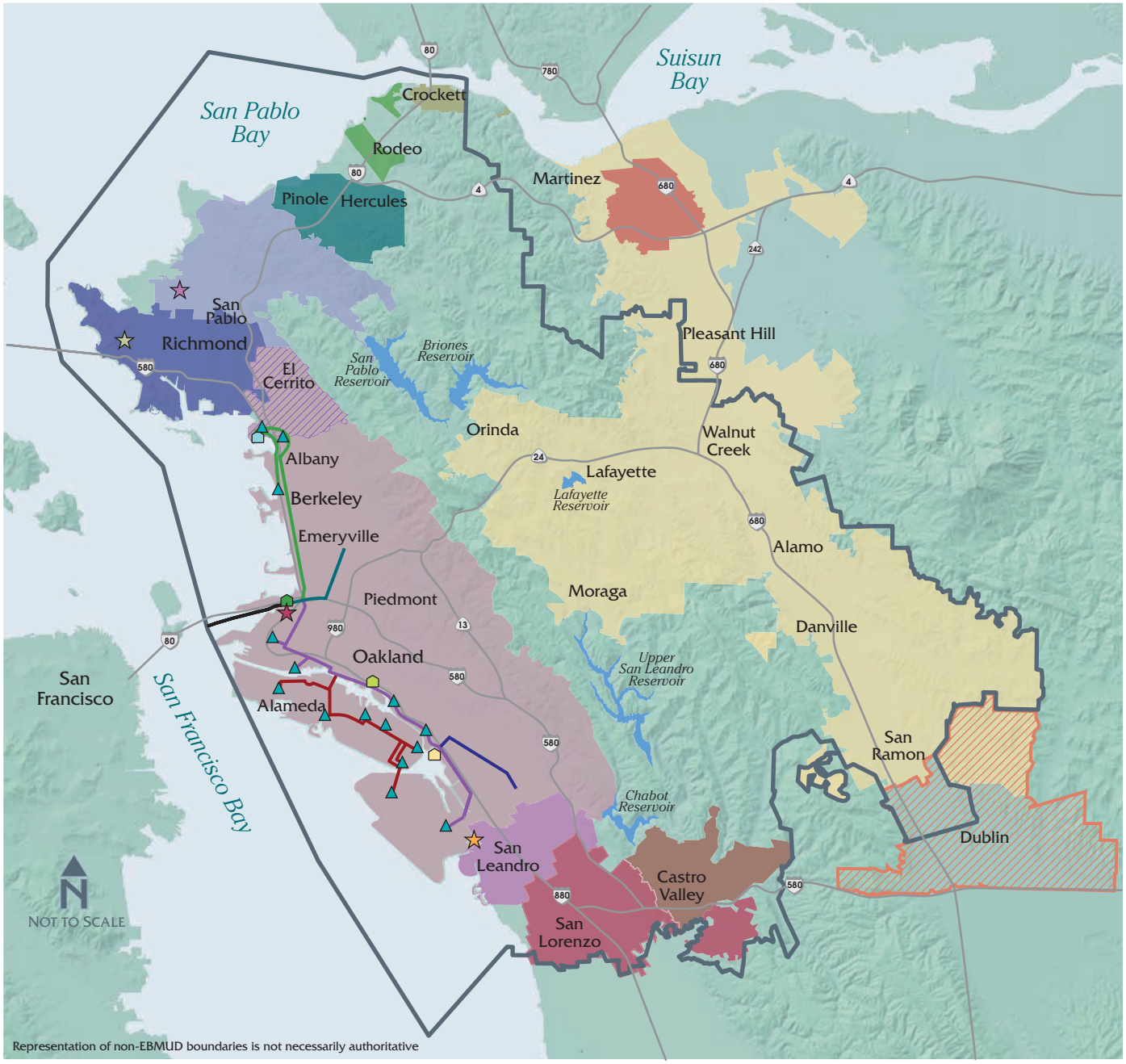
Wastewater collected by the interceptors flows to EBMUD's Main Wastewater Treatment Plant (MWWTP), which is located in Oakland near the foot of the San Francisco-Oakland Bay Bridge. The plant provides secondary treatment for a maximum flow of 168 MGD. Primary treatment can be provided for up to a peak flow of 320 MGD. The average annual daily flow is approximately 65 MGD.

Primary treatment removes floating materials, oils and greases, sand and silt and organic solids heavy enough to settle in water. Secondary treatment biologically removes most of the suspended and dissolved organic and chemical impurities that would deplete life-giving oxygen from the waters of the Bay if allowed to decompose naturally. The treatment steps are pre-chlorination (for odor control), screening (to remove large objects), grit removal, primary sedimentation, secondary treatment using high-purity oxygen-activated sludge, final clarification, sludge digestion, and dewatering. The treated effluent is then disinfected, dechlorinated and discharged through a deep-water outfall one mile off the East Bay shore into San Francisco Bay.

Wastewater Disposal

Treated wastewater produced by the wastewater treatment plants within the EBMUD water service area is discharged through pipelines or outfalls to San Francisco Bay, Suisun Bay, or to San Pablo Bay and also provides a supply for recycled water programs. Table 5-2 illustrates characteristics of treated wastewater and the projected

FIGURE 5-1 WASTEWATER DISTRICTS WITHIN EBMUD'S WATER SERVICE BOUNDARY



WASTEWATER DISTRICTS

- SD-1
- STEGE SANITARY DISTRICT
- CITY OF RICHMOND SANITARY DISTRICT
- WEST COUNTY WASTEWATER DISTRICT
- CITY OF PINOLE/HERCULES
- RODEO SANITARY DISTRICT
- CROCKETT COMMUNITY SERVICES DISTRICT
- MOUNTAIN VIEW SANITARY DISTRICT
- CENTRAL CONTRA COSTA SERVICES DISTRICT
- DUBLIN -SAN RAMON SERVICES DISTRICT
- CASTRO VALLEY SANITARY DISTRICT
- ORO LOMA SANITARY DISTRICT
- CITY OF SAN LEANDRO

FACILITIES

- OAKPORT WET WEATHER FACILITY
- SAN ANTONIO CREEK WET WEATHER FACILITY
- MAIN WASTEWATER TREATMENT PLANT
- POINT ISABEL WET WEATHER FACILITY
- SAN LEANDRO RECYCLED WATER FACILITY
- EAST BAYSHORE RECYCLED WATER FACILITY
- NORTH RICHMOND RECYCLED WATER FACILITY
- RARE WATER PROJECT
- EBMUD PUMPING STATION

EBMUD ULTIMATE SERVICE BOUNDARY

EBMUD INTERCEPTORS

- SOUTH
- FOOTHILL
- ALAMEDA
- ADELINE
- NORTH
- MAIN WWTP

Table 5-1 Collected and Treated Wastewater Generated in EBMUD Service Area[1]

Agency	Wastewater Treatment Plant Characteristics		Current Treated Wastewater Disposal Method	Collected and Treated Wastewater Flows (MGD)[2]						
	Location (City)	Capacity (MGD)		2010	2015	2020	2025	2030	2035	2040
EBMUD Special District No.1	Oakland	168	Discharged & Recycled	74	74	74	74	74	74	74
City of San Leandro	San Leandro	9.7	Discharged & Recycled	5	5.34	5.68	6.02	6.36	6.7	7
Dublin San Ramon Services District	Pleasanton	11.5	Discharged & Recycled	11.7	12.43	15.64	17.56	18.45	18.71	18.71
Central Contra Costa Sanitary District	Martinez	70	Discharged & Recycled	37	39	41	43	46	48	50
City of Pinole/Hercules	Pinole	4.06	Discharged & Recycled[3]	3.5	4	4	4	4	4	4
City of Richmond	Richmond	16	Discharged	8.5	8.5	8.5	8.5	8.5	8.5	8.5
West County Wastewater District	Richmond	12.5	Discharged & Recycled	6.6	8	8	8	8	8	8
Rodeo Sanitary District	Rodeo	1.14	Discharged & Recycled[3]	0.55	0.65	0.65	0.65	0.7	0.7	0.7
Oro Loma Sanitary District[4]	San Lorenzo	20	Discharged & Recycled	13.5	14	14.5	15	17	17	17
Crockett Sanitary Department[5,6]	Crockett	1.78	Discharged	0.7	0.7	0.7	0.7	0.7	0.7	0.7
TOTAL[7]				**161.0**	**166.6**	**172.7**	**177.4**	**183.7**	**186.3**	**188.6**

[1] Data obtained through personal communication with staff in each of the Districts.
[2] Collected and treated wastewater flows represent average dry weather flows.
[3] The Rodeo Sanitary District and City of Pinole/Hercules utilize a joint outfall. Recycled water use from this joint outfall is anticipated post 2010.
[4] Wastewater flows for Oro Loma Sanitary District includes flows generated in Castro Valley Sanitary District, which operates a sewer collection system and does not operate a wastewater treatment system.
[5] Crockett Sanitary Department includes flows from C & H Sugar.
[6] Crockett Sanitary Department was formerly known as Crockett-Valona Sanitary District.
[7] Total values have been rounded.

average dry weather flows of the portion of treated wastewater that are not recycled and that are discharged from each wastewater treatment plant within EBMUD's water service area. Many of these treatment plants recycle water for washing down filters and for other in-plant operations.

RECYCLED WATER PROGRAM

Recycled water is highly treated wastewater that is suitable for a variety of beneficial uses. Recycled water is stringently regulated by Title 22 of the California Code of Regulations, which dictates the level of treatment and use of recycled water in California.

The California Department of Public Health (CDPH) has the authority and responsibility under California law to establish health-related standards for water recycling and reuse. The California Water Code provides for the nine California Regional Water Quality Control Boards (RWQCBs) to establish water quality standards, to prescribe and enforce waste discharge requirements, and, in consultation with the CDPH, to prescribe and enforce water recycling requirements. Thus, the regional boards enforce CDPH's water recycling criteria, and each water recycling project must have a permit from the appropriate RWQCB conforming to CDPH criteria. As is the case in many states, local health agencies have independent authority and may, if they deem necessary, impose requirements more stringent than those specified by CDPH or RWQCBs. All EBMUD recycled water projects must comply with California's recycled water regulations, which are considered to be some of the strictest in the nation.

Recycled water use is a critical element of EBMUD's water supply management policies and stretches EBMUD's limited, high-quality drinking water supply, as any demand met with recycled or non-potable water reduces the demand for potable water supply. In addition to increasing water supply reliability and lessening the effect of extreme rationing during droughts, recycled water use delays or eliminates the need for more potable water facilities, sustains the economy with increased water supply reliability, protects San Francisco Bay by reducing treated wastewater discharges, safeguards community and private investments in parks and landscaping with a drought-proof or drought-resistant water supply, and contributes to a green and healthy environment.

EBMUD initiated water recycling programs that reduce demand on drinking water supplies in the early 1970s. EBMUD has been recycling water for landscape irrigation

TABLE 5-2 NON-RECYCLED WASTEWATER TREATED AND DISCHARGED IN THE EBMUD SERVICE AREA[1]

AGENCY	CURRENT DISPOSAL METHOD	CURRENT LEVEL OF TREATMENT FOR DISPOSED WASTEWATER[3]	NON-RECYCLED WASTEWATER FLOWS (MGD)[2]						
			2010	2015	2020	2025	2030	2035	2040
EBMUD SPECIAL DISTRICT NO.1	DISCHARGED TO SAN FRANCISCO BAY	SECONDARY	72.5	72.5	69.1	67.3	67.3	67.3	67.3
CITY OF SAN LEANDRO	DISCHARGED THROUGH EBDA PIPELINES TO S.F. BAY	SECONDARY	1.25	1.34	1.42	1.5	1.59	1.68	1.75
DUBLIN SAN RAMON SERVICES DISTRICT	DISCHARGED THROUGH LAVWMA/ EBDA PIPELINES TO S.F. BAY	SECONDARY	1.9	1.47	1.77	0.77	0	0	0
CENTRAL CONTRA COSTA SANITARY DISTRICT	DISCHARGED TO SUISUN BAY	SECONDARY	37	38.8	40.6	42.4	45.4	47.3	49.3
CITY OF PINOLE/ HERCULES	DISCHARGED TO PINOLE/HERCULES/RODEO OUTFALL THEN TO SAN PABLO BAY	SECONDARY	3.5	4	1.2	1.2	0.3	0.3	0.3
CITY OF RICHMOND	DISCHARGED TO SAN FRANCISCO BAY	SECONDARY	8.5	8.5	8.5	8.5	8.5	8.5	8.5
WEST COUNTY WASTEWATER DISTRICT	DISCHARGED THROUGH CITY OF RICHMOND TO SAN FRANCISCO BAY	SECONDARY	0	0	0	0	0	0	0
RODEO SANITARY DISTRICT	DISCHARGED TO PINOLE/HERCULES/RODEO OUTFALL THEN TO SAN PABLO BAY	SECONDARY	0.55	0.65	0.65	0.65	0.7	0.7	0.7
ORO LOMA SANITARY DISTRICT[4]	DISCHARGED THROUGH EBDA PIPELINES TO S.F. BAY	SECONDARY	13.24	13.74	14.24	14.74	16.74	16.74	16.74
CROCKETT SANITARY DEPARTMENT[5]	DISCHARGED TO CROCKETT	SECONDARY	0.7	0.7	0.7	0.7	0.7	0.7	0.7
TOTAL[6]			**139.1**	**141.7**	**138.2**	**137.8**	**141.2**	**143.2**	**145.3**

[1] Data obtained through personal communication with staff in each of the Districts.
[2] Assumes that non-recycled flow discharged is the difference between the average dry weather flow of the wastewater and the maximum day demand for the recycled water.
[3] There is a potential to directly use disposed of treated wastewater for recycled water applications provided that it receives further treatment to meet recycled water standards.
[4] The Rodeo Sanitary District and City of Pinole/Hercules utilize a joint outfall. Recycled water use from this joint outfall is anticipated post-2011. For this table, the recycled water demand from the outfall is attributed to City of Pinole/Hercules only.
[5] The Crockett Sanitary Department was formerly known as Crockett-Valona Sanitary District.
[6] Total values have been rounded.

and in-plant processes at its main wastewater treatment plant since 1971, and began its first golf course recycled water irrigation project in 1984. Highlights of EBMUD's recycled water program are chronicled in Table 5-3.

Stressing the importance of recycled water as part of the overall water supply picture, EBMUD's Board of Directors adopted the Non-potable Water Policy No. 9.05 (amended November 14, 2006, see Appendix F). The policy requires that EBMUD customers use non-potable water (recycled water and other non-potable water sources) for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health, and not injurious to plant life, fish or wildlife. It is EBMUD's current practice to promote recycled water to its customers for appropriate non-potable uses.

During calendar year 2010, EBMUD provided more than 9 million gallons a day (MGD) of recycled water for non-residential landscape irrigation and industrial uses including reuse at its main wastewater treatment plant. Table 5-4 compares the actual recycled use in 2010 with recycled water use as projected in the UWMP 2005. By 2040, EBMUD anticipates providing 20 MGD of recycled water.

EXISTING RECYCLED WATER PROJECTS

EBMUD's Water Recycling Program has grown significantly since EBMUD began producing and using recycled water at its MWWTP in 1971. Table 5-5 (see page 5-7) lists the characteristics of EBMUD's ten existing recycled water projects, as well as the quantity of recycled water they supplied in 2010, and the quantity they are expected to supply through 2040. In 2010, these recycled water projects supplied an average of 9.3 MGD of recycled water. The Richmond Advanced Recycled Expansion Water Project (RARE), which commenced operations in 2010, is projected to provide an additional 3.5 MGD of recycled water.

Recycled water for these projects is used for various industrial purposes and for irrigating landscape. Wastewater sources for EBMUD's existing recycling projects come from four wastewater treatment facilities owned and operated by four different agencies. In addition

Table 5-3 EBMUD's Recycled Water Program Historical Highlights

1970s	
1971	First use of recycled water at EBMUD's Main Wastewater Treatment Plant
1980s	
1984	First commercial recycled water customer - the Richmond Country Club
1987	EBMUD nonpotable water policy mandates the use of nonpotable water
1988	Office of Water Recycling is established
1990s	
1993	EBMUD Water Supply Management Plan incorporates water recycling goals
1994	Board adopts Water Conservation and Recycling Master Plans
1995	Joint Powers Authority (DERWA) forms in order to create the San Ramon Valley Recycled Water Program
1996	North Richmond Water Reclamation Plant provides recycled water to the Chevron Refinery
1999	Federal Water Resource Development Act of 1999 (WRDA) authorizes $15 million for the San Ramon Valley Recycled Water Program
2000s	
2000	Water Recycling in Landscaping Act adopted by the State of California
2002	Award winning recycled water customer training videos and manual created
2002	U.S. Army Corps of Engineers and DERWA partner to design some San Ramon Valley Recycled Water Project facilities
2003	Pipeline construction begins for the East Bayshore and San Ramon Valley recycled water projects
2004	EBMUD Board of Directors improves financial incentives for using recycled water
2004	California State Water Resources Control Board increases grants and low-interest loan funding for EBMUD recycled water projects to $44.3 million
2006	San Ramon Valley Recycled Water Project (Phase 1) provides recycled water to irrigation customers
2007	WRDA authorizes $25 million for EBMUD's recycled water program.
2007	Department of Water Resources awards a $2.1 million grant for the Richmond Advanced Recycled Expansion (RARE) Water Project
2008	East Bayshore Recycled Water Project provides recycled water to customers in Oakland
2008	Recycled Water Truck Program begins operation
2008	Construction begins on the RARE Water Project
2009	EBMUD received $3.5 million in Economic Stimulus Funding for the San Ramon Valley Recycled Water Program
2010	RARE Water Project Phase 1 begins operation at the Chevron Refinery
2010	Construction begins on San Ramon Valley Phases 2 to 4

Table 5-4 Comparison of Recycled Water Uses: 2005 Projection vs. 2010 Actual

Type of Use	2005 Projection for 2010 (MGD)	2010 Actual Use (MGD)
Agriculture	-	-
Landscape Irrigation	2.7	1.8
Wildlife Habitat	-	-
Wetlands	-	-
Industrial	9.2	7.5
Groundwater Recharge	-	-
Commercial	0.01	0.01
Indirect Potable Use	-	-
Total	**11.9**	**9.3**

NOTES:
1. Recycled water use for 2010 is a best estimate of actual use as of the publication of the UWMP 2010.
2. Total values have been rounded.

to EBMUD's MWWTP, the wastewater is supplied through external partnerships with the West County Wastewater District (WCWD), the City of San Leandro, and Dublin San Ramon Services District. Figure 5-2 depicts water recycling sites within the EBMUD service area.

Richmond Country Club

In 1984, EBMUD began operating its first golf course irrigation project at the Richmond Country Club using recycled water supplied from the WCWD's wastewater treatment plant. One hundred fifty acres are irrigated with recycled water. The WCWD treatment plant provides pretreatment, primary clarification, activated sludge secondary treatment, and chlorination. It produces a secondary effluent which meets Title 22 standards for restricted golf course irrigation. In 2010, Richmond

Country Club used an average of 0.18 MGD of recycled water. EBMUD contracts the maintenance and operation of the pump station to WCWD.

San Leandro Reclamation Facility

In 1988, EBMUD constructed the San Leandro Reclamation Facility (SLRF) to serve EBMUD's recycled water customers with treated wastewater produced by the City of San Leandro's Water Pollution Control Plant (WPCP). Dual media filtration followed by disinfection with sodium hypochlorite is used to meet Title 22 standards for restricted irrigation applications. The water recycling treatment facilities include a high head pumping station, chlorination and dechlorination facilities, and surge control systems. Customers currently served by the SLRF include the Metropolitan Golf Links complex in Oakland, the Chuck Corica Golf Complex in Alameda, and the Harbor Bay Parkway in Alameda.

In 1988, EBMUD began serving the Metropolitan Golf Links (formerly Galbraith Golf Course). The SLRF delivered an average of 0.01 MGD of disinfected secondary effluent to the golf course in 2010. It should be noted that this customer mainly uses groundwater for irrigation purposes and uses recycled water for backup or for blending.

In 1991, EBMUD extended the SLRF to include the Chuck Corica Golf Complex (formerly Alameda Golf Complex). Expansion of the facilities included minor control modifications to the City of San Leandro's WPCP and installation of more than three miles of pipeline. The project delivered an average of 0.37 MGD to the Golf Complex in 2010.

As part of the SLRF expansion, EBMUD also added piping to serve the nearby Harbor Bay Parkway. The average delivery was 0.02 MGD for roadway greenbelt irrigation in 2010.

Chevron Refinery

The Chevron Refinery is the largest single user of recycled water in EBMUD's service area. In 1996, EBMUD began supplying recycled water to the Chevron Refinery for the operation of recirculating water cooling towers. Secondary effluent from WCWD is treated to tertiary levels at EBMUD's North Richmond Water Reclamation Plant (NRWRP) and then piped to the refinery. The NRWRP treats the secondary effluent in reactor clarifiers to remove calcium, phosphorus and magnesium using caustic soda softening technology. The water is then neutralized with sulfuric acid and passed through a sand filter to remove any remaining particles. The recycled water is disinfected with sodium hypochlorite to meet tertiary treatment levels for use in Chevron's cooling towers. EBMUD and Chevron have worked together to implement improvements to recycled water service to Chevron, and have brought the average use of recycled water service up from 2 MGD in 2004 to 4 MGD in 2010. The RARE Water project, detailed below, which became operational in 2010, will increase this usage significantly.

EBMUD's Main Wastewater Treatment Plant Water Recycling

In 1971, EBMUD constructed treatment facilities to maximize the use of recycled water for plant processes and landscape irrigation at it's MWWTP. In addition, recycled water for use as equipment wash down and construction projects was made available at the plant in the 1970s and during 1987-94 when EBMUD implemented a Drought Management Program. EBMUD continues to use recycled water for in-plant processes and landscape irrigation. In 2010, the average in-plant recycled water use was 3 MGD. Recycled water use at the EBMUD MWWTP is not included in the EBMUD recycled water goal of 20 MGD by 2040. Historically, the EBMUD MWWTP had not used potable water for processes and irrigation, and as a consequence current recycled water use does not offset potable water demand at the EBMUD MWWTP.

San Ramon Valley Recycled Water Program– Phase 1

The San Ramon Valley Recycled Water Program (SRVRWP) is a partnership between EBMUD and the Dublin San Ramon Services District. Phase 1 of this multi-phased project was completed in 2006 and now delivers approximately 0.7 MGD to landscape irrigation customers in San Ramon. The project will eventually serve an annual average of 2.4 MGD of recycled water to EBMUD irrigation customers in portions of Blackhawk, Danville and San Ramon. See "Projects Under Construction" section in this chapter for more details.

Richmond Advanced Recycled Expansion Water Project – Phase 1

EBMUD's newest recycled water project, the RARE Water Project, builds on EBMUD's existing partnership with the Chevron refinery in Richmond. In collaboration with Chevron, EBMUD completed construction of the RARE Water Treatment Plant in 2010. Located within the refinery, the new RARE plant treats secondary effluent from WCWD via microfiltration and reverse osmosis to produce the high purity water quality required by the refinery's boilers.

Table 5-5

Quantities of Recycled Water Served for EBMUD Recycled Water Projects

Project and Location	Type of Use	Year Initiated	Wastewater Supply Source	Capital Cost in FY10 in Millions	Average Daily Recycled Water Use (MGD) 2010[1]	2015	2020	2025	2030	2035	2040[2]
Existing Projects											
Richmond Country Club [Richmond]	Golf Course Irrigation	1984	West County Wastewater District WWTP	—	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Metropolitan Golf Links [Oakland]	Golf Course Irrigation	1988	City of San Leandro WPCP	—	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Chuck Corica Golf Complex [Alameda]	Golf Course Irrigation	1991	City of San Leandro WPCP	—	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Harbor Bay Parkway [Alameda]	Landscape Irrigation	1991	City of San Leandro WPCP	—	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Chevron Refinery [North Richmond]	Cooling Tower Water (Industrial)	1996	West County Wastewater District WWTP	—	4	4	4	4	4	4	4
San Ramon Valley Recycled Water Program – Phase 1 [Contra Costa County]	Landscape Irrigation	2006	DSRSD WWTP	—	0.7	0.7	0.7	0.7	0.7	0.7	0.7
East Bayshore Recycled Water Project – Phase 1A [Alameda County]	Industrial, Landscape Irrigation, Toilet Flushing, in Commercial Buildings	2008	EBMUD Main WWTP	—	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Richmond Advanced Recycled Expansion (RARE) Water Project – Phase 1 [Contra Costa County]	Industrial	2010	WCWD WWTP	—	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recycled Water Truck Program	Construction water needs, sewer flushing, other non-potable uses	2008	EBMUD WWTP	—	0.003	0.003	0.003	0.003	0.003	0.003	0.003
EBMUD Wastewater Treatment Plant (In-Plant Uses) [Oakland][3]	Plant Processes (Industrial) and Landscape Irrigation	1971	EBMUD Main WWTP	—	3	3	3	3	3	3	3
Total Existing Customer Recycled Water Use[3]					**9.3**	**9.3**	**9.3**	**9.3**	**9.3**	**9.3**	**9.3**
Planned Under Construction											
San Ramon Valley Recycled Water Program — Phases 2 – 4 [Contra Costa County]	Landscape Irrigation	2015	DSRSD WWTP	$13	—	0.7	1.3	1.7	1.7	1.7	1.7
Total Planned Under Construction					**0**	**0.7**	**1.3**	**1.7**	**1.7**	**1.7**	**1.7**
Additional Planned											
Richmond Advanced Recycled Expansion (RARE) Water Project— Future Phases [Contra Costa County]	Industrial	2015	West County Wastewater District WWTP	Not Yet Determined	0	0.5	0.5	1.5	1.5	1.5	1.5
Satellite Recycled Water Projects [Alameda County/Contra Costa County]	Landscape Irrigation	2015	Satellite Facility	$42	0	0.2	0.2	0.4	0.4	0.7	0.7
East Bayshore Recycled Water Project — Phase 1B2 [Alameda County]	Landscape Irrigation, Industrial, Toilet Flushing, in Commercial Buildings	2020	EBMUD Main WWTP	$37	0	0	1.2	1.8	1.8	1.8	1.8
San Leandro Water Reclamation Facility Expansion Project [Alameda County][4]	Landscape Irrigation	2020	City of San Leandro WPCP	$16	0	0	0.5	0.5	0.5	0.5	0.5
ConocoPhillips Recycled Water Project [Contra Costa County]	Industrial	2020	Pinole/Hercules/Rodeo WWTPs (combined discharge)	$42	0	0	2.8	2.8	3.7	3.7	3.7
Reliez Valley Recycled Water Project [Contra Costa County]	Landscape Irrigation	2020	CCCSD WWTP	$3	0	0	0.2	0.2	0.2	0.2	0.2
San Ramon Valley Recycled Water Project Phases 5–6 [Contra Costa County]	Landscape Irrigation	2030	DSRSD WWTP	$9	0	0	0	0	0.3	0.5	0.5
Total Additional Planned					**0**	**0.7**	**5.4**	**7.2**	**8.4**	**8.9**	**8.9**
TOTAL OF ALL PROJECTS [3,5]					**9.3**	**10.7**	**16**	**18.2**	**19.4**	**19.9**	**19.9**

[1] The 2010 recycled water use amount shown in this table includes the projected initial phases of San Ramon Valley and East Bayshore recycled water projects once completed. RARE Phase started up in 2010.
[2] EBMUD will implement the most cost-effective of these recycled water projects in order to meet recycled water goals of 20 MGD by 2040
[3] Recycled water use at the EBMUD Main WWTP is not factored into the EBMUD recycled water goal of 20 MGD, and is not included in the Total Existing Customer Recycled Water Use in the table. Historically, in-plant uses at the EBMUD Main WWTP had not used potable water for processes and irrigation. Consequently, current recycled water use does not offset potable water demand at the EBMUD MWWTP.
[4] Capital cost amount only includes the cost of EBMUD's project. Recycled water use amounts include both EBMUD and the City of San Leandro's project.
[5] Total values have been rounded.

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FIGURE 5-2 EBMUD RECYCLED AND NON-POTABLE WATER PROJECTS

The initial phase of RARE will produce up to 3.5 MGD of recycled water, thereby offsetting an equivalent amount of potable water. In the future, as additional source water becomes available, EBMUD and Chevron may expand the project to provide 4.0 MGD or even 5.0 MGD of recycled water.

EBMUD is responsible for operating and maintaining the treatment plant and influent pump station. Chevron is responsible for transmission mains through the refinery and for boiler feedwater operations.

EAST BAYSHORE RECYCLED WATER PROJECT - PHASE 1A

The East Bayshore Recycled Water Project (EBRWP) is a multi-phased project that will provide up to 2.3 MGD of tertiary-treated recycled water from EBMUD's MWWTP to customers in parts of Alameda, Albany, Berkeley, Emeryville, and Oakland. A new 4.4-mile long recycled water transmission pipeline along the Eastshore Freeway (I-80) and up to 24 miles of distribution pipelines, separate from the drinking water system, will distribute the recycled water to customers.

TABLE 5-6 RECYCLED WATER USE BY SPECIFIC TYPE

TYPE OF USE	TREATMENT LEVEL	RECYCLED WATER USE (MGD) 2010[1]	2015	2020	2025	2030	2035	2040
AGRICULTURE	-	-	-	-	-			
LANDSCAPE IRRIGATION	SECONDARY AND TERTIARY	1.8	2.7	5.2	6.4	6.7	7.2	7.2
WILDLIFE HABITAT	-							
WETLANDS								
INDUSTRIAL	TERTIARY	7.5	8	10.8	11.8	12.7	12.7	12.7
GROUNDWATER RECHARGE	-							
COMMERCIAL	TERTIARY	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TOTAL[2,3]	**-**	**9.3**	**10.7**	**16**	**18.2**	**19.4**	**19.9**	**19.9**

[1] 2010 estimate provided as of August 2010.
[2] Recycled water use at the EBMUD Main WWTP is not factored into the EBMUD recycled water goal of 20 MGD by 2040. Historically, in-plant uses at the EBMUD Main WWTP had not used potable water for processes and irrigation. Consequently, current recycled water use does not offset potable water demand at the EBMUD Main WWTP.
[3] Total values have been rounded.

The recycled water will be used for landscape irrigation of parks, common planted areas within homeowner associations, greenbelts, roadway medians, and schools. Several industrial and commercial users will be served with recycled water for cooling towers and toilet flushing in office buildings. Wetlands restoration is another potential use of recycled water from this project.

Phase 1A is anticipated to provide approximately 0.5 MGD of recycled water to new and existing customers in portions of Albany, Berkeley, Emeryville, and Oakland. EBMUD began construction of Phase 1A distribution pipeline in the West Oakland area in 2003. Construction of the plant at the MWWTP was completed in 2008 and the first delivery of recycled water occurred on April 22, 2008 to customers in Oakland. The remainder of Phase 1A will be completed once funding is secured. EBMUD is in planning for Phase 1B, which will serve customers in Alameda.

New recycled water tertiary treatment facilities at the MWWTP in Oakland were completed in 2008 and include a pump station and 1.5 million gallons of storage. The plant filters and disinfects treated wastewater before it is used as recycled water. Tertiary treatment of secondary effluent includes microfiltration followed by disinfection with sodium hypochlorite to produce recycled water that meets California Department of Health Services standards for "disinfected tertiary recycled water" as defined in Title 22.

EBRWP has received state funding from the State Water Resources Control Board (SWRCB), which approved a $4.4 million grant and $20.1 million in low interest loans to help fund design and construction costs of the first phase of the project.

RECYCLED WATER TRUCK PROGRAM

In 2008, in response to the 2007-2010 period when EBMUD implemented a Drought Management Program, the District began a recycled water truck program (RWTP) to make recycled water available to truck customers for approved uses. Through this program, EBMUD operates two recycled water filling stations, one at the MWWTP and one at the NRWRP. These filling stations provide recycled water to permitted customers for uses which include dust control, soil compaction, power washing, decorative fountains and ponds, landscape irrigation, street washing and sewer flushing. Although EBMUD has since declared the drought over, the RWTP continues to operate. Currently the RWTP offers recycled water free of charge.

FUTURE RECYCLED WATER PROJECTS

Water recycling is a key element of EBMUD's current and future water supply portfolio. EBMUD's goal is to provide a total of 20 MGD of recycled water by 2040. Table 5-6 summarizes the quantity of recycled water use by specific type of use for 2010-2040. Projected quantities are based on average usage by existing projects and potential average delivery of planned recycled water projects. EBMUD's plan is to identify and implement the most cost-effective recycled water projects in order to meet its recycled water goal.

Although the majority of the wastewater generated within EBMUD's water service area is not recycled, recycled water use is anticipated to steadily increase over the next thirty years. Recycled water will be used primarily for industrial and landscape irrigation applications, as shown in Table 5-6, and some commercial applications. EBMUD continues to seek opportunities to use recycled water for wetlands and wildlife enhancement. At this time EBMUD does not anticipate using recycled water to recharge the existing groundwater supply.

Eight major water recycling projects are currently planned to help EBMUD meet its goal of recycling 20 MGD by 2040. One project is currently in construction and seven are in

planning phases. All projects will produce recycled water treated to the highest level (tertiary), which allows for unrestricted reuse. The project objectives include maximizing delivered volumes of recycled water to meet customer demands for non-residential irrigation, commercial, and industrial uses, thereby reducing potable demand while maintaining economic viability.

Recycled water project currently under construction is:

- San Ramon Valley Recycled Water Program (SRVRWP) - Phases 2-4.

The seven projects currently in planning phases are:

- RARE Water Project - Future Phases,
- Satellite Recycled Water Treatment Plant Project (Alameda and Contra Costa counties),
- East Bayshore Recycled Water Project (EBRWP) - Future Phases,
- San Leandro Water Reclamation Facility Expansion Project,
- San Ramon Valley Recycled Water Project - Phases 5 and 6,
- ConocoPhillips Recycled Water Project, and
- Reliez Valley Recycled Water Project.

The initial operational phases of the SRVRWP and EBRWP were completed in 2006 and 2008 respectively with additional phases anticipated in the future. The RARE Water Project became operational in 2010. The remaining projects are anticipated to be implemented by 2040. The locations of the eight planned projects are illustrated in Figure 5-2.

The Water Recycling Program identifies, funds, and implements projects in the most cost-effective manner. The scope and implementation schedules of the project elements are subject to ongoing modification and prioritization in order to provide the most cost-effective recycled water supply needed to meet the 20 MGD goal.

Project Under Construction

EBMUD completed construction of the initial phase of the SRVRWP, which began deliveries in early 2006. Table 5-5 (see page 5-7) summarizes this project's features and the quantity of recycled water it supplied in 2010, and the quantity it is expected to supply through 2040.

San Ramon Valley Recycled Water Program – Phases 2-4

The SRVRWP is a multi-phase, joint regional project between EBMUD and the Dublin San Ramon Services District (DSRSD). The two agencies formed a Joint Powers Authority in 1995 called the DSRSD-EBMUD Recycled Water Authority (DERWA) to implement the program which serves recycled water to their customers within portions of the Blackhawk, Danville, Dublin, and San Ramon areas. DERWA's mission is to provide a safe, reliable, and consistent supply of recycled water, and to maximize the amount of recycled water delivered. The project will provide 5.7 MGD of recycled water from a tertiary-treatment facility located at the DSRSD Wastewater Treatment Plant that consists of either sand filtration or microfiltration followed by ultraviolet light and chemical disinfection. DSRSD customers will receive up to 3.3 MGD, and EBMUD customers will receive up to 2.4 MGD. EBMUD's initial Phase 1 now delivers approximately 0.7 MGD to existing landscape irrigation customers located in San Ramon. Future EBMUD customers include large irrigation users in parts of Blackhawk, Danville, Dublin, and San Ramon such as golf courses, parks, common planted areas within homeowner associations, roadway medians and greenbelts, schools, and office complexes.

DERWA and its member agencies developed agreements regarding specific responsibilities for recycled water supply and sales and for facilities operation. DERWA's role is to design, build, and operate the recycled water treatment facilities, as well as the main backbone transmission system which includes pipelines, pump stations and storage reservoirs. Since the project is located in both EBMUD's and DSRSD's water service areas, each of DERWA's member agencies is responsible for designing and constructing their own recycled water distribution infrastructure within each respective service area and marketing recycled water to its respective customers.

In order to receive federal funding, DERWA partnered with the U.S. Army Corps of Engineers in 2002 to design the remaining backbone facilities. The federal Water Resource Development Act of 1999 authorized $15 million for the SRVRWP. To date, Congress has appropriated funds totaling $14.5 million for design and construction assistance through the U.S. Army Corps of Engineers. SRVRWP has received both federal and state funding. The SWRCB approved a $5 million grant and a $24.8 million low-interest loan for the first phase of the DERWA backbone facilities.

DERWA's Phase 2 construction is anticipated for completion in FY11. EBMUD's Phases 2, 3, and 4 design for the SRVRWP was completed in FY10. Construction of the pipelines for portions of Phases 2 and 3 and Phase 4 are anticipated to be completed in FY11/FY12. Completion of the remaining portions of pipeline in Phases 2 and 3 and the pump stations in Phases 3 and 4 will depend on additional outside funding assistance.

ADDITIONAL PLANNED PROJECTS

EBMUD has seven additional planned recycled water projects that increase the potential for more recycled water deliveries. The projects include the following:

- RARE Water Project Future Phases,
- Satellite Recycled Water Treatment Plant Project,
- East Bayshore Recycled Water Project (EBRWP) - Future Phases,
- San Leandro Reclamation Facility Expansion Project,
- San Ramon Valley Recycled Water Project - Phases 5 and 6,
- Conoco Philips Recycled Water Project, and
- Reliez Valley Recycled Water Project.

These planned projects are scheduled for implementation by 2040 to meet EBMUD's water recycling goal. They are expected to provide 8.9 MGD of savings by 2040, in addition to savings provided by existing projects (9.3 MGD) and projects under construction (1.7 MGD), for a total of 20 MGD by 2040. Most projects will provide recycled water use for landscape irrigation and industrial purposes. Table 5-5 (see pages 5-7) summarizes these projects' features and the quantity of recycled water use for each identified recycled water project from 2010 to 2040.

Richmond Advanced Recycled Expansion Water Project - Future Phases

The initial RARE Water Project was completed in 2010, and provides 3.5 MGD recycled water for boiler feedwater applications at the Chevron Refinery in Richmond. This second phase of the RARE project would increase the capacity to 4.0 MGD by installing additional Microfiltration membranes modules. Like the initial RARE project, this expansion may utilize wastewater from the WCWD water pollution control plant. However, if WCWD supply were unavailable, the RARE expansion project may take water from the Chevron Refinery's wastewater effluent stream. Depending on supply, this project may be operational by 2015.

A third phase, potentially operational by 2025, depending on source water supply, would build out the RARE treatment plant to increase the project's ultimate capacity to 5.0 MGD.

Satellite Recycled Water Treatment Plant Project

Satellite recycled water treatment plants, which take raw sewage from a sewer pipeline and treat it to meet the Title 22 tertiary recycled water quality requirements at the location of use, can cost-effectively serve large water users that are located a remote distance from a centralized treatment facility. Satellite treatment plants avoid the need for costly infrastructure required to move recycled water from a centralized treatment facility to distant customers.

In 2009, EBMUD evaluated five satellite recycled water treatment plant projects, each yielding from 50-200 AFY. Each project would treat raw sewage on-site for local use, which in these cases would be for irrigating cemeteries, landscaping and golf courses. The five projects that were evaluated are:

- Rolling Hills Cemetery - 45 acres, 50-200 AFY
- Diablo Country Club - 200 AFY
- Mountain View and St. Mary's Cemeteries, Oakland - 40 acres, 100-200 AFY
- Rossmoor Golf Course, Rossmoor Valley - 100-150 AFY
- Moraga Country Club, Moraga - 100 - 200 AFY

After the project-level environmental documentation process is completed, design and construction of the first of these facilities is anticipated to be completed by 2015, pending funding assistance.

East Bayshore Recycled Water Project - Future Phases

The EBRWP Phase 1B will expand recycled water deliveries by 1.2 MGD to customers in Alameda. Final design and construction of Phase 1B is pending outside funding assistance. A future Phase 2 expansion will connect additional customer and new developments in the Oakland area (0.6 MGD).

San Leandro Water Reclamation Facility Expansion Project

The current San Leandro Reclamation Facility provides approximately 0.4 MGD of secondary-treated and disinfected recycled water produced by the City of San Leandro's WPCP for irrigation at the Metropolitan Golf

Links in Oakland, the Chuck Corica Golf Complex and Harbor Bay Parkway in Alameda. When expansion of the San Leandro Reclamation Facility is complete, the expanded delivery of recycled water by an additional 0.5 MGD is anticipated to begin by 2020.

In addition to EBMUD's project, the City of San Leandro may also expand recycled water delivery to irrigate its public areas within EBMUD's water service area. If successfully implemented, the City's expansion project will offset approximately 0.1 MGD of EBMUD's potable water, which will help EBMUD reach its goal of recycling 20 MGD by 2040.

ConocoPhillips Recycled Water Project

The ConocoPhillips Recycled Water Project (previously known as the Rodeo Recycled Water Project) could potentially supply up to about 3.7 MGD of recycled water to the ConocoPhillips Refinery in Rodeo. The recycled water for this project would come from the combined wastewater discharge of Pinole-Hercules and Rodeo wastewater treatment plants. EBMUD and ConocoPhillips have entered into a Memorandum of Understanding (MOU) to evaluate the feasibility of developing this project. High purity recycled water would replace potable water currently used in plant processes.

The first phase project, which could provide up to 2.8 MGD, is in planning phases, and could be operational by 2020. The second phase could provide an additional 0.9 MGD.

San Ramon Valley Recycled Water Project - Phases 5 and 6

The SRVRWP is a joint regional program between EBMUD and Dublin San Ramon Services District (DSRSD). Phase 1 of this project was completed in 2006 and Phases 2 - 4 are scheduled to be implemented in 2010 to 2025. Phases 1 - 4 are planned to provide up to 2.4 MGD of recycled water for landscape irrigation for EBMUD customers by 2040. The source water comes from the DSRSD WWTP. The project serves tertiary treated recycled water to both EBMUD and DSRSD customers.

Phases 5 and 6, using the same water source and the same treatment facilities, are now in conceptual phases of development and will serve additional landscape irrigation uses in the San Ramon Valley area. Phase 5 would provide an average of 0.3 MGD by 2030 and Phase 6 would provide an average of 0.2 MGD of recycled water by 2035.

Reliez Valley Recycled Water Project

For this potential project, EBMUD would partner with Central Contra Costa Sanitary District (Central San) to obtain recycled water from their existing system and distribute it to two cemeteries, a golf course and to the city of Pleasant Hill for landscape irrigation. This project could supply 0.2 MGD of recycled water, reducing the demand for potable water. It is now in the conceptual planning phase, and could be operational as early as 2020.

Recycled Water Projects Implementation Challenges

EBMUD's goal is to identify and implement the most cost-effective recycled water projects so as to provide a total of 20 MGD of recycled water by 2040. As EBMUD continues to explore opportunities for implementing recycled water projects, it is faced with a number of technical challenges, which could impact the economic feasibility of the projects. One of the major challenges is the added cost associated with installing recycled water distribution systems that are separate from EBMUD's potable water distribution systems. In order to help improve the economics of recycled water projects, EBMUD seeks opportunities to coordinate construction of distribution pipelines with other construction projects, such as street maintenance projects. EBMUD also considers re-use of pipelines, reservoirs and other facilities which are no longer needed by other utilities for distributing recycled water to customers. The need for separate plumbing at each customer location is another technical and economic challenge for recycled water projects. It is more economical to install a separate plumbing system for a new project during the initial construction of the facility than it is to retrofit the project. To minimize the costs of retrofits associated with separate plumbing systems, EBMUD reviews applications for new potable water services to assess the suitability of the projects to use recycled water.

Another technical challenge for recycled water projects is determining the level of treatment needed for the recycled water. CDPH standards require certain levels of treatment for protection of public health based on the application of the recycled water. In addition, specific customer needs may dictate a higher level of treatment than prescribed by CDPH. When a distribution system serves a number of customers with varying uses, an appropriate level of treatment must be selected to meet the needs of all customers within the system. To reduce the cost of building new treatment facilities and the annual increased

chemical costs attributed to a higher level treatment, EBMUD considers the implementation of satellite treatment plants at specific customer locations. EBMUD constantly seeks to find creative solutions to the technical challenges inherent in recycled water projects in order to improve the economic viability of its projects.

NON-POTABLE/RAW WATER PROJECTS

EBMUD has a number of existing projects that utilize raw or non-potable water, as illustrated in Figure 5-2. These projects do not use treated wastewater (i.e. recycled water). Instead, they use raw, untreated water for irrigation and other purposes. Existing raw/ non-potable water projects, listed in Table 5-7, reduce demands on EBMUD's potable water supply by almost 2 MGD.

WATER FILTER PLANT WASHWATER RECLAMATION

Facilities for recycling filter backwash water from most of EBMUD's water filter plants were constructed in the late 1970s to comply with federal discharge requirements. The National Pollutant Discharge Elimination System (NPDES) permit required the majority of suspended solids to be removed from the washwater prior to discharge into a receiving stream. Rather than discharge this wastewater, EBMUD treatment plants instead recycle it, resulting in a net gain in potable water supply. The treatment plants operate sedimentation facilities to collect solids from the washwater and recover the clarified overflow which is then recycled through the potable water treatment process. The operation of filter plant recycled water facilities saves EBMUD approximately 1.7 MGD.

The ability to treat and recycle about 5 MGD of washwater at the Orinda Filter Plant became available in 1988; however, because direct discharge of washwater to the San Pablo Creek replenishes the San Pablo Reservoir and becomes available for use at the Sobrante and San Pablo Filter Plants, no additional water savings would be realized.

LAKE CHABOT GOLF COURSE

This project, completed in 1991, provided an average of 0.09 MGD of water in 2009 to irrigate the City of Oakland's Lake Chabot Golf Course. Facilities include a pump station, 9,500 feet of supply pipeline and a surge tank/storage reservoir. Since the water is drawn directly from Chabot Reservoir, which is a standby terminal reservoir of EBMUD not connected to the distribution system, demand for potable water supply is reduced. In addition, by reducing the demand for potable water, this project eliminates the need to construct the proposed Peralta No. 2 potable water reservoir.

WILLOW PARK GOLF COURSE

This project, completed in 1991, withdrew an average of 0.07 MGD of water from Lake Chabot in 2009 to irrigate the Willow Park Golf Course in Castro Valley. Facilities include a submersible pump station and 8,500 feet of distribution pipeline. Like the Lake Chabot Golf Course project, raw water is also taken from the Chabot Reservoir, reducing demand for potable water supply.

SUNSET VIEW CEMETERY LANDSCAPE IRRIGATION

This project, completed in 1998, uses raw water from EBMUD's San Pablo Reservoir to irrigate the Sunset View Cemetery, which is adjacent to the EBMUD San Pablo Filter Plant, in Kensington. In 2009, the project used an average of 0.07 MGD of non-potable water.

LAKE CHABOT RAW WATER EXPANSION PROJECT

This project would be an expansion of the Lake Chabot Golf Course and Willow Park Golf Course projects, described above. It would expand the use of raw water from the Chabot Reservoir and provide this water for irrigation and other non-potable uses at a nearby country club, the Oakland Zoo and other nearby customers. It would provide up to 1.4 MGD during peak irrigation months, or an average of up to 0.4 MGD.

TABLE 5-7 EXISTING EBMUD NON-POTABLE/RAW WATER PROJECTS

USER	WATER SUPPLY SOURCE	NON-POTABLE/ RAW WATER USE	AVERAGE DAILY 2010 DEMAND (MGD)	YEAR INITIATED
WATER TREATMENT PLANTS	WASHWATER RECLAMATION IN EBMUD WATER TREATMENT PLANTS	RECYCLE FILTER BACKWASH	1.7 (ESTIMATED)	1970S
LAKE CHABOT GOLF COURSE	CHABOT RESERVOIR	GOLF COURSE IRRIGATION	0.10	1991
WILLOW PARK GOLF COURSE	CHABOT RESERVOIR	GOLF COURSE IRRIGATION	0.03	1991
SUNSET VIEW LANDSCAPE IRRIGATION	SAN PABLO FILTER PLANT	CEMETERY IRRIGATION	0.05	1998

Encouraging Recycled Water Use

In general, EBMUD prices recycled water to provide an economic incentive to customers. EBMUD also uses state and federal funding, when available, to make recycled water projects more cost effective.

Incentive Program

A major incentive for customers to use recycled water is the reliability and availability of the supply during a drought. During a drought, the recycled water supply should not be significantly impacted.

In addition, EBMUD has provided a number of incentives to encourage customers within EBMUD's service area to use recycled water. These have been primarily in the form of subsidized costs, reduced rates for recycled water and penalties for refusing recycled water when available.

Subsidized Costs

To promote the use of recycled water, EBMUD funds cost-effective site retrofits that accommodate the use of recycled water for existing customers. EBMUD also funds the training of customers' staff in the proper use of recycled water and provides free technical support to customers who receive recycled water.

Rate Discounts

The connection fees charged to new recycled water customers are lower than those charged to new potable water customers. This is reflective of the fact that, unlike EBMUD's existing potable water distribution systems, the new recycled water distribution systems do not require upgrades and seismic retrofits. The current policy offers new recycled water customers a 20 percent volumetric rate discount for the recycled water as compared to the adopted potable water rate. For existing customers who have funded retrofits in the past and have individual contracts with EBMUD, EBMUD provides recycled water at a rate lower than the potable water rate. This lower rate is established through the individual contracts with these customers.

Grants and Low Interest Loans

Historically, EBMUD has provided low interest rate loans to customers who funded facility retrofits required to accommodate the use of recycled water and also has funded retrofit costs that were determined to be cost-effective. To help reduce the overall cost of recycled water projects, EBMUD actively pursues grant funding and low interest loans that are available for these types of projects. The grants have been applied toward the planning, design and construction phases of the projects, whereas the low interest rate loans have been used to help reduce the overall cost of constructing the projects. Some of the sources of these monies have included the State Water Bond Bill (Proposition 13 passed in March 2000), the Federal Water Resources Development Act (WRDA), the SWRCB Revolving Fund program, and the Water Reuse Financing Authority for low interest loans, and the Department of Water Resources Integrated Regional Water Management Plan (IRWMP) implementation grants. In 1999, WRDA authorized up to $15 million in grant funds for the San Ramon Valley Recycled Water Project. In 2007, WRDA authorized up to $25 million for EBMUD's recycled water program.

Grant funds from the SWRCB have been used in the planning, design, and construction phases of the EBRWP and the SRVRWP. In addition, the construction of EBMUD's NRWRP was made possible through a low interest rate loan provided through the SWRCB's low interest rate loan program. Additionally, EBMUD's RARE facility received a $2.1 million grant from the California Department of Water Resources, through the Integrated Regional Water Management Program, for the purchase of the microfiltration system. EBMUD will continue to seek outside funding sources for recycled water projects in order to help reduce the overall cost of recycled water to EBMUD customers.

Long-Term Contracts

The majority of the recycled water distributed by EBMUD is recycled water from treatment plants which are owned and operated by other utilities. It is therefore very important for EBMUD to enter into long-term agreements with the utility districts that provide the treated effluent for use by EBMUD to ensure both the stability of the price of the recycled water and the reliability of the source of the recycled water. EBMUD's Policy 9.05 requires, wherever possible, that agreements with other agencies have a term of twenty years or more. Policy 9.05 also states that the agreements should include provisions governing facilities operation and maintenance responsibilities. EBMUD has entered into long-term agreements for those existing projects that are dependent upon another agency as a source of the recycled water, and intends to maintain this policy for all future projects.

Regional Planning

As a member of the Bay Area Water Agencies Coalition (BAWAC) and Bay Area Clean Water Agencies (BACWA) EBMUD participated in a regional effort to develop a Bay Area IRWMP. This IRWMP includes EBMUD's water recycling program and provides a venue for maximizing water recycling in the Bay Area using a regional planning

perspective. EBMUD has also been a partner and active participant in the San Francisco Bay Area Regional Water Recycling Program (BARWRP). BARWRP was a cooperative effort among numerous Bay Area water and wastewater agencies and state and federal organizations. Its efforts were directed at developing a long-range Regional Water Recycling Master Plan for five Bay Area counties, namely Alameda, Contra Costa, San Francisco, San Mateo and Santa Clara. A number of the near-term recycled water projects identified in the Master Plan are in EBMUD's service area. These projects involve EBMUD partnering with other agencies, as well as one project where EBMUD will utilize its own recycled water supplies. Through its involvement with BARWRP, EBMUD was able to support the use of recycled water regionally.

In addition to participating in long-range planning efforts through BAWAC, BACWA, and BARWRP, EBMUD works with planning groups within other local planning agencies and utilities that are located in EBMUD's water service area to identify opportunities to implement recycled water projects.

Public Education/Information

In order to encourage the increased use of recycled water, EBMUD is committed to educating and informing the public that recycled water is safe for the public and for the environment. Through presentations to community groups and at conferences, coordinating workshops, meetings with potential customers, and local planning agencies, and distribution of educational materials, EBMUD is increasing public awareness of the benefits of using recycled water. EBMUD also provides information on recycled water in general and on the EBMUD's recycled water program specifically both in print and electronically through EBMUD's website at *http://www.ebmud.com.*

EBMUD developed an award-winning Recycled Water Irrigation Customer Training Program in order to provide training to irrigation customers in the safe and effective use of recycled water. This program consists of a manual and two videos covering health and safety and landscape best management practices in using recycled water. EBMUD continues to provide appropriate training and support to its recycled water customers.

Prohibit Specific Fresh Water Uses

Consistent with the California Water Code, Section 13550, EBMUD's policy is to discourage "waste or unreasonable use of [potable] water if recycled water is available which meets specified conditions."

Require Recycled Water Use

EBMUD's Policy 9.05 (consistent with California Water Code, Section 13550) requires the use of recycled water for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish or wildlife. To date, however, EBMUD has been effective in providing incentives to use recycled water, rather than mandating its use.

EBMUD proactively utilized the Water Recycling in Landscaping Act to promote the use of recycled water by new development or redevelopment approved by local cities or counties. EBMUD was able to encourage a number of cities to adopt dual-plumbing ordinances that would require new development or redevelopment to separately plumb for appropriate recycled water uses if it is determined that EBMUD would be able to provide recycled water for these uses.

Recycled Water Optimization Plan

EBMUD's goal is to maximize the cost-effectiveness of recycled water projects while maximizing the volume of water delivered. This requires detailed assessments of future recycled water customer needs. It also requires careful planning in order to develop cost-effective distribution systems that will maximize the quantity of recycled water delivered to customers. By encouraging local planning agencies to require separate recycled water plumbing during the permitting process, a customer base will be generated and be ready to use recycled water as soon as the water is available in the area. By ensuring the installation of separate plumbing while the project is initially being designed and constructed, the cost and disruption associated with facility retrofitting can be minimized. Long-term contracts with other agencies will also be an important component of future recycled water projects. Additionally, continued public education and outreach programs will be essential to the success of EBMUD's recycled water program.

Over 160 MGD of wastewater is currently generated within EBMUD's service area, and that quantity is expected to increase to nearly 190 MGD by the year 2040. By tapping into this resource and working jointly with other agencies to make recycled water available to customers in EBMUD's water service area, EBMUD has the ability to greatly increase its water supply resources.

CHAPTER 6. WATER CONSERVATION

Water conservation is a major component of EBMUD's water supply portfolio designed to increase water supply reliability. EBMUD's long-standing water conservation program continually makes an aggressive push to educate its customers on water-efficiency and to increase their conservation efforts. EBMUD monitors water demand, new technology, and changes in consumer preferences, and works closely with other local, regional, state and national entities to enhance its water conservation services. California's 2009 legislation (SBx7-7) calling for a statewide 20 percent reduction in per capita water consumption by 2020 sets new water conservation standards that EBMUD is prepared to meet.

INTRODUCTION

Since the 1970s demand management has been an important part of EBMUD's water practices and policies, designed to promote reasonable and efficient use of supplies. EBMUD's water conservation efforts and water conservation actions are chronicled in Table 6-1. This chapter specifically discusses EBMUD's water conservation efforts following the implementation of its first Water Conservation Master Plan (WCMP) adopted in 1994.

EBMUD's water conservation program addresses both supply-side (water supplier) and demand-side (customer) measures. Demand-side water conservation measures improve customer water use efficiency and include incentives for residential and non-residential customers, education and outreach activities, market support activities and regulatory programs. Supply-side water conservation measures, which improve water use efficiency before and after use by the customer, include distribution system leak detection and repair programs and water recycling programs (discussed in greater detail in Chapter 5).

In 2011, EBMUD is developing its WCMP to include existing and planned efforts in support of meeting long-term water conservation planning goals to the year 2040. The WCMP is designed to achieve cost-effective and sustained water savings going forward, while maintaining high-quality savings achieved from past EBMUD conservation efforts implemented since the 1970s. The established and future water conservation approach includes identified conservation measures, implementation strategies, and budgetary resources required to meet the need-for-water and drought management program goals to minimize customer rationing during a water shortage. Conservation measures include, for example, greater customer outreach, expanded water use surveys, increased technical and financial incentives, device distribution, and new water efficiency regulations. The WCMP presents a phased implementation of conservation measures based on threshold water production and customer demand levels designed to achieve a cumulative 62 million gallons per day (MGD)[1] of water savings by 2040.

A list of about 100 conservation measures considered potentially appropriate for the EBMUD service area was developed from known technology and services that would save water. Fifty-three selected conservation measures were further analyzed and combined into multiple component programs of increasingly higher water savings and implementation costs. The conservation savings are based on 10 percent to 90 percent market saturation for existing accounts and new development ordinances (account participation). A summary of the long-term water conservation program measures is listed in Table 6-2.

During the recent multi-year (2007-10) rationing period, EBMUD imposed voluntary and mandatory rationing within its drought management program. During the mandatory rationing program, EBMUD set a 15 percent average water savings goal. EBMUD emphasized educating customers on water conservation activities that return quick savings, while reinforcing the long-term hardware, infrastructure and behavioral changes that residential and business customers can make to realize savings for years to come. The drought management program dramatically increased water conservation staffing, outreach activities, services, and incentives; and customers responded with water savings of 36 MGD[2] in fiscal year (FY)10. A Water Saving Team of technicians, who supplemented existing conservation efforts with a supportive field presence, investigated water waste and distributed informational materials. EBMUD also launched a comprehensive $1.8

[1] The WCMP adopted in 1994 provided measures that resulted in 23 MGD savings as of 2008.

[2] The reduced demand is compared relatively to the average demand of FY05-07 and includes the effect of drought, local economic conditions, and mandatory conservation.

TABLE 6-1 WATER CONSERVATION PROGRAM HISTORICAL HIGHLIGHTS

PRE-1970	
	ALL EBMUD CUSTOMERS HAVE ALWAYS BEEN METERED.
1961	DISTRIBUTION SYSTEM LEAK DETECTION AND PIPE REPLACEMENT PROGRAM BEGINS.
1970S	
1974	SCHOOL EDUCATION PROGRAM BEGINS. OVER 1.5 MILLION STUDENTS HAVE RECEIVED MATERIAL AND TRAINING SINCE 1974.
1976	COMMUNITY SPEAKERS BUREAU IS FORMED.
1977	DROUGHT RESPONSE PROGRAM. EBMUD CUSTOMERS ACHIEVE 39 PERCENT ANNUAL REDUCTION IN USE.
1978	FILTER PLANT BACKWASH RECYCLING BEGINS.
1980S	
1982	FIRST FOUR IN A SERIES OF WATER-CONSERVING DEMONSTRATION GARDENS IS DEDICATED.
1983	EBMUD SPONSORS THE CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT (ASSEMBLY BILL 797).
1984	FIRST OF FIVE GOLF COURSES BEGINS USING RECYCLED WATER.
	WATER CONSERVATION ADMINISTRATOR IS HIRED TO IMPLEMENT BROAD-BASED CONSERVATION PROGRAM.
1985	UWMP IS ADOPTED AND IMPLEMENTATION IS INITIATED.
1986	EBMUD SPONSORS FIRST NORTHERN CALIFORNIA XERISCAPE CONFERENCE.
	EBMUD *Water Conserving Plants and Landscapes for the Bay Area* BOOK IS RELEASED.
1987	RESIDENTIAL AND LARGE LANDSCAPE SITE WATER USE SURVEYS ARE OFFERED.
	LANDSCAPE PLAN REVIEWS ARE OFFERED.
1988	PUBLIC LANDSCAPE ADVISORY COMMITTEE IS FORMED.
	FIRST WEATHER STATION IS INSTALLED WITH TELEPHONE HOTLINE FOR LANDSCAPE WATER REQUIREMENT INFORMATION.
	WATER SERVICE REGULATION SECTION 29 IS ADOPTED PROHIBITING WASTEFUL WATER USE PRACTICES.
	LANDSCAPE VIDEO IS DEVELOPED WITH SUNSET MAGAZINE AND 28 OTHER AGENCIES.
	COMMUNITY WATER CONSERVATION PORTABLE DISPLAY PROGRAM IS INITIATED (40 SITES).
1989	QUARTERLY LANDSCAPE ADVISORY NEWSLETTER IS INITIATED.
	METER DISCOUNT PROGRAM INITIATED FOR PUBLIC AGENCIES INSTALLING WATER-CONSERVING LANDSCAPES.
1990S	
1990	IRRIGATION REBATE PROGRAM IS OFFERED TO IRRIGATION CUSTOMERS.
	CONSERVATION "WELCOME" PACKET PROGRAM FOR NEW HOMEOWNERS OFFERED AT MODEL HOME SITES.
1991	STUDY IS CONDUCTED ON PERFORMANCE/SAVINGS OF 1.6 GALLON PER FLUSH TOILETS AND WATER-SAVING SHOWERHEADS.
	FOUR LANDSCAPE RECYCLED WATER PROJECTS INITIATED, SAVING 0.65 MGD.
1992	INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL WATER USE SURVEYS ARE OFFERED.
	PROJECT FIRESCAPE INITIATED WITH TWO DEMONSTRATION GARDENS AND BROCHURE PROMOTING FIRE SAFETY/ WATER CONSERVATION.
	URBAN WATER SHORTAGE CONTINGENCY PLAN ADOPTED.
1993	BOARD ADOPTS WATER SUPPLY MANAGEMENT PROGRAM 2020.
	BOARD DIRECTS STAFF TO DEVELOP WATER CONSERVATION AND WATER RECLAMATION MASTER PLANS.
	EBMUD SIGNS STATEWIDE CUWCC MOU REGARDING IMPLEMENTATION OF BEST MANAGEMENT PRACTICES.
1994	BOARD ADOPTS WATER CONSERVATION MASTER PLAN AND RECLAMATION IMPLEMENTATION PLAN.
	TOILET REBATE PROGRAM IS OFFERED.
	WATER CONSERVATION BASELINE STUDY CONDUCTED TO ESTABLISH MONITORING AND EVALUATION PROGRAM.
1995	EBMUD INDUSTRIAL WATER RECYCLING PROJECT COMPLETED, CAPACITY OF 5.4 MGD.
	RATE STUDY IS COMPLETED AND BOARD ADOPTS NEW RESIDENTIAL TIERED WATER-CONSERVING RATE STRUCTURE.
	COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL REBATE PROGRAM IS OFFERED.
	NON-RESIDENTIAL PLAN REVIEW PROGRAM IS INITIATED.
1996	CLOTHES WASHER REBATE PROGRAM OFFERED TO SINGLE-FAMILY CUSTOMERS.
1998	LANDSCAPE REBATE PROGRAM OFFERED TO SINGLE-FAMILY CUSTOMERS (FOR IRRIGATION AND GRAYWATER SYSTEMS, PLANT MATERIAL).
	GRAYWATER STUDY IS COMPLETED.
	MARKET PENETRATION STUDY OF TOILETS, SHOWERHEAD AND FAUCET AERATORS IS CONDUCTED.
1999	CLOTHES WASHER REBATES OFFERED TO ALL CUSTOMER GROUPS.

Table 6-1 Water Conservation Program Historical Highlights Continued

2000s	
2000	EBMUD named to California Urban Water Conservation Council (CUWCC) Steering Committee.
	EBMUD named to CALFED Water Use Efficiency Subcommittee.
2001	EBMUD sponsors successful passage of Senate Bill 221, linking water supply and land use planning.
2002	EBMUD re-elected to CUWCC Steering Committee.
2003	Launched WaterStart™ conservation certification and product labeling program.
	EBMUD Residential End-Use Study Completed.
	Initiated Strategic Marketing Plan for Water Conservation and Recycling.
	Demand Management Advisory Committee Report Completed.
2004	New edition of EBMUD plant book *Plants and Landscapes for Summer Dry Climates* is published.
	EBMUD National Multi-Family Residential Sub-meter Study completed.
2005	Awarded $1 million in grants for various water conservation studies/ projects.
2006	Launched Weather-Based Irrigation Controller Rebate Program.
	EBMUD re-elected to CUWCC Steering Committee.
2007	Awarded $1.9 million in grants for various water conservation studies/ projects.
	Established water service regulations/ efficiency requirements for all new water service accounts.
2008	EBMUD publishes Water Smart guidebook for businesses.
	Water Savings Team patrols conduct drought response.
	EBMUD re-elected to CUWCC Steering Committee.
	Pipeline and Aqueduct leak detection studies launched.
2009	EBMUD adopts individual metering requirements for new multi-family residential and commercial uses.
	EBMUD Water Smart Business Certification Program launched.
2010	EBMUD re-elected to CUWCC and AWE Boards of Directors.
	Development of the Water Conservation Master Plan initiated.

million marketing campaign using television, radio, and print media to inform customers of the severe water shortage, rationing goals, and ways to conserve.

As a result of its customers' efforts and ample spring rainfall in 2009, EBMUD ended mandatory rationing in June 2009 and maintained 10 percent voluntary rationing to further protect future supplies and to support Governor Arnold Schwarzenegger's request for water savings from all Californians. The voluntary restrictions were lifted in May 2010 due to the positive water supply outlook and customers' continuing conservation efforts. See Chapter 3 for further details on EBMUD's Drought Management Program.

Water Conservation Master Plan

The WCMP details water conservation programs and methodologies and goals that are established in water supply planning and mandated by regulation or statute. The primary purpose of the WCMP is to define the implementation strategies, objectives, and tactics required to achieve long-term water conservation savings. The 2011 WCMP will highlight a ten-year implementation plan designed to achieve savings that meet EBMUD's adopted per capita demand reduction targets identified in the UWMP 2010 required under SBx7-7 legislation (2009) and under the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU) for Statewide Urban Water Conservation in the year 2020 and beyond.

Existing and expanded EBMUD water conservation programs include water use surveys, water-saving device distribution, financial incentives, targeted education and outreach, market support, new technology research, and regulatory activities. To be eligible for water service, new EBMUD customers must meet rigorous indoor and outdoor water-efficiency standards for plumbing fixtures, appliances, landscaping, and for commercial processes that use water. Additional savings are expected to result from "natural replacement." Natural replacement occurs through EBMUD-supported market advancement in technology, standards and codes, and water use practices, such as the installation of increasingly efficient hardware (toilets, showerheads, and faucets) and landscape conversions.

TABLE 6-2 WATER CONSERVATION PROGRAM MEASURES

RESIDENTIAL MEASURES	COMMERCIAL, INSTITUTIONAL OR INDUSTRIAL MEASURES
ARTIFICIAL TURF SF RESIDENTIAL	CII REBATES TO REPLACE INEFFICIENT EQUIPMENT
CISTERNS	CII SURVEYS
CONDO SURVEYS	CII SURVEYS WITH AMS
CONDO WATER SURVEYS WITH AUTOMATED METER SYSTEMS (AMS)	DENTAL VACUUM PUMP
GARBAGE DISPOSAL SF	HIGH-EFFICIENCY URINAL REBATE (<0.25 GALLON)
GRAYWATER NEW SF	IRRIGATION WATER SURVEYS
GRAYWATER RETROFIT SF	REQUIRE 0.5 GAL/FLUSH URINALS IN NEW BUILDINGS
HIGH-EFFICIENCY TOILET (HET) REBATES (EXPANDED)	REQUIRE PLAN REVIEW FOR NEW CII
HIGH-EFFICIENCY TOILET (HET) REBATES	WATER BROOMS
MULTI-FAMILY SUBMETER INCENTIVE	**IRRIGATION MEASURES**
MULTI-FAMILY TOILET ORDINANCE	ARTIFICIAL TURF SPORTS FIELDS
MULTI-FAMILY SURVEYS	IRRIGATION WATER BUDGETS
MULTI-FAMILY SURVEYS WITH AMS	REQUIRE LANDSCAPE AND IRRIGATION REQUIREMENTS
MULTI-FAMILY WASHER REBATE	UPDATED IRRIGATION WATER BUDGETS W/ AMS ON EXISTING ACCOUNTS
MULTI-FAMILY WASHER REBATE (EXPANDED)	**MEASURES FOR ALL CUSTOMERS**
PUBLIC INFORMATION PROGRAM	FINANCIAL INCENTIVES FOR IRRIGATION UPGRADES
REQUIRE EFFICIENT DISHWASHERS	FINANCIAL INCENTIVES FOR IRRIGATION UPGRADES (EXPANDED)
REQUIRE HIGH-EFFICIENCY CLOTHES WASHERS	INSTALL AMS
REQUIRE HIGH-EFFICIENCY FAUCETS AND SHOWERHEADS	REAL WATER LOSS REDUCTION – I
REQUIRE HIGH-EFFICIENCY TOILETS (HET)	REAL WATER LOSS REDUCTION – II
REQUIRE HOT WATER ON DEMAND	REAL WATER LOSS REDUCTION – III
REQUIRE MULTI FAMILY SUBMETERING ON NEW ACCOUNTS	**RESIDENTIAL AND IRRIGATION MEASURES**
REQUIRE PLUMBING FOR FUTURE GRAY WATER USE	SMART IRRIGATION CONTROLLER REBATES
REQUIRE SMART IRRIGATION CONTROLLERS AND RAIN SENSORS	
SINGLE-FAMILY TOILET ORDINANCE	
SINGLE-FAMILY WATER SURVEYS I	
SINGLE-FAMILY WATER SURVEYS I WITH AMS	
SINGLE-FAMILY WATER SURVEYS II	
SINGLE-FAMILY WATER SURVEYS II WITH AMS	
SINGLE-FAMILY WATER SURVEYS III	
SINGLE-FAMILY WATER SURVEYS III WITH AMS	
WASHER REBATES	
WASHER REBATES FOR HIGH-EFFICIENCY MACHINES	

ESTIMATED WATER SAVINGS AND PROGRAM BUDGET

Water savings from conservation programs, especially those that rely on customer behavioral changes, diminish or "depreciate" at varying levels over time. Despite EBMUD's efforts to encourage water-saving behavior, customer behaviors are expected to change over time, and savings from hardware replacements can degrade with product wear. EBMUD reports on total conservation savings efforts that incorporate depreciation to reflect a more conservative estimate of achieved annual savings toward meeting the long-term conservation goal of 62 MGD through 2040. Water savings estimates are summarized by program participation according to individual customer accounts, rather than by customer class levels, to improve estimate accuracy. Methods of water savings estimates are based on previous EBMUD research, pilot studies, and water consumption monitoring. Savings calculations include measuring site-specific savings from implemented conservation measures, using standard industry values from scientifically established savings rates for each fixture or appliance, and applying a percentage reduction in actual (average) pre-intervention consumption.

Since adoption of the WCMP in 1994, EBMUD has achieved an estimated additional conservation savings of 26 MGD through 2010 year-end (see Figure 6-1). Since the 1970s EBMUD has invested more than $65 million for implementation of customer-targeted water conservation programs. EBMUD's WCMP five-year budgetary plan

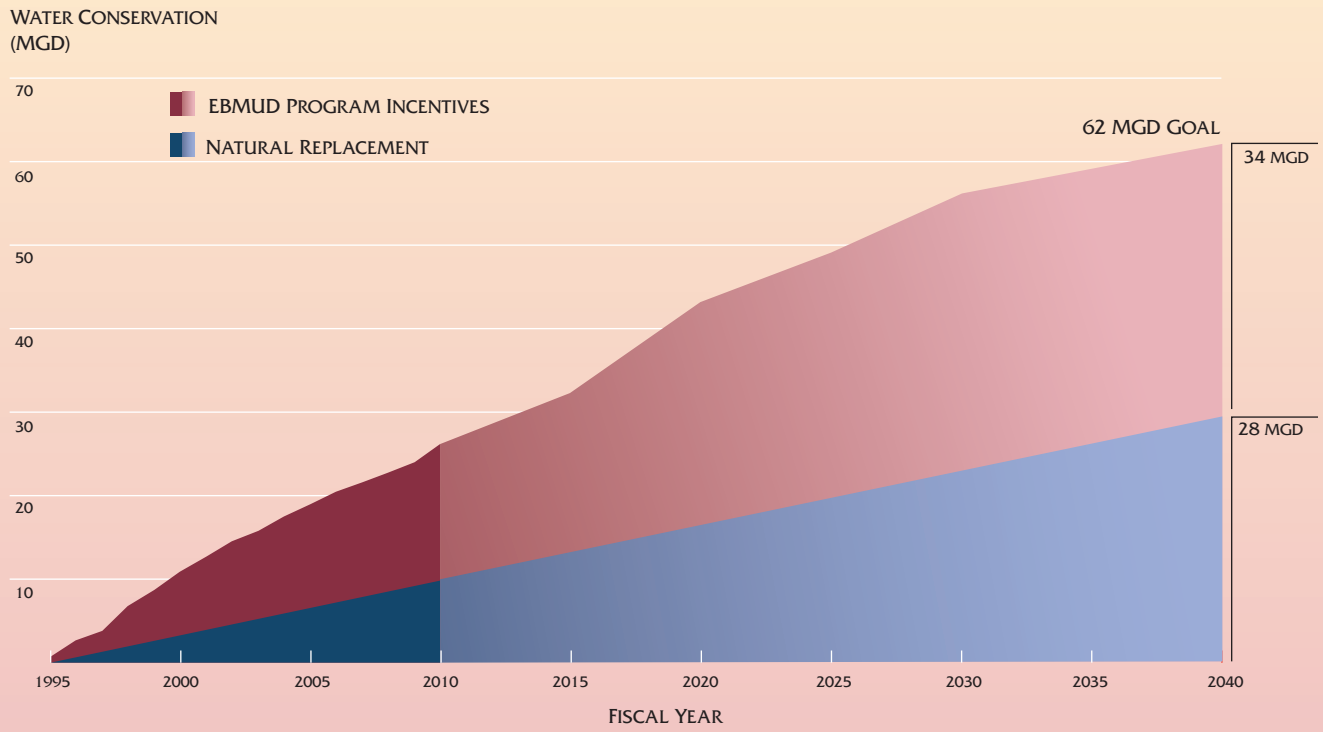
through FY15 includes an additional $18.3 million for water conservation program funding, as shown in Figure 6-2. By 2015, EBMUD will have invested more than $60 per capita on customer-targeted conservation programs since 1970. Water Conservation Program expenditures do not include additional expenditures for EBMUD funded conservation-related activities, such as distribution system leak detection, meter testing and replacement, or other field service customer assistance and education efforts.

EBMUD water rates and charges support the cost of implementing the conservation program and continued investments in achieving water use efficiencies as outlined in the WCMP. The water rates and rate structure are established biennially by the EBMUD Board of Directors. Any increases in the cost of the conservation program would be reflected in proposed water rate changes, subjected to a procedure of public notice and hearing to allow for input from the public and rate payers.

Key EBMUD water conservation program accomplishments in FY09 and FY10 are listed in Table 6-3 and include:

- nearly 36,000 rebates totaling more than $4.5 million were distributed to EBMUD customers;
- nearly 125,000 free water-saving devices (e.g. showerheads, faucet aerators) were distributed;
- more than 16,000 water use site surveys and self-survey kits were completed;
- more than 2,000 water waste reports were handled during the drought;
- more than 66,000 restaurant tent cards, hotel and health club stickers were distributed to some 800 restaurants and 30 health clubs to announce the drought and ask customers to use water efficiently and sparingly; and
- EBMUD sold more than 3,500 copies of its award-winning book Plants and Landscapes for Summer Dry Climates.

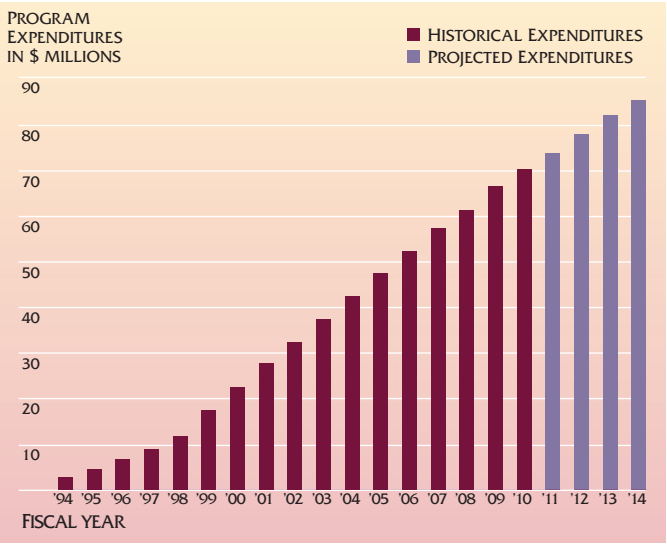
FIGURE 6-1 WATER CONSERVATION AND GOALS



NOTES:

1. This figure depicts EBMUD's conservation efforts since the implementation of the Water Conservation Master Plan in 1994 and projected in the 2011 Water Conservation Master Plan, and it excludes savings associated with prior conservation efforts implemented in the 1970s.

FIGURE 6-2
CUMULATIVE CONSERVATION PROGRAM BUDGET



SBX7-7 WATER USE BASELINE AND TARGETS

Senate Bill No. 7 (SBx7-7) established the Water Conservation Act of 2009 program that is often referred to as "20x2020." The legislation calls for a 20 percent reduction in per capita water use statewide by the year 2020. All urban water agencies are required to report their baseline per capita water use and reduction targets in their 2010 UWMP.

Since the 1970s, demand management has been an important part of EBMUD's water practices and policies to promote reasonable and efficient use of supplies. Figure 6-3 of the Draft UWMP shows that EBMUD has made significant strides in decreasing historical daily per capital water demand as a result of EBMUD's aggressive water conservation and recycling efforts and other factors. Gross overall water demand has remained relatively consistent as the number of accounts has grown steadily. This continuous effort has resulted in more than a 25% reduction in daily per capita water use and goes beyond the short-term focus on consumption reduction as required through SBx7-7.

To allow agencies including EBMUD to capture previously realized conservation and recycled water savings, SBx7-7 was designed with flexibility to allow suppliers to select one of four methods for establishing its SBx7-7 targets. EBMUD researched each of the four target methodologies and selected a target method that would allow EBMUD to:

- be credited for its aggressive water conservation and recycling programs;
- implement demand management program budgets that are appropriately tailored to customer usage;
- anticipate the post-drought and economic rebound; and
- account for anticipated demand hardening in consumption behavior.

The three alternative target methodologies, which EBMUD did not use, are not suitable to the EBMUD service area as the per capita use targets could perpetuate the economic downturn and subject customers to further hardship.

In conformance with the reporting requirements of SBx7-7, Table 6-4 summarizes EBMUD's analyses of its baseline daily per capita water use and water use targets for 2015 and 2020. Because EBMUD's recycled water supply makes up less than ten percent of its measured retail water demand for 2008, EBMUD meets the criteria for applying the ten year baseline period to developing the target levels of per capita water use. The selected ten-year period is calendar years 1995-2004. Figure 6-3 illustrates the historical daily per capita water demand and the 2020 target demand for EBMUD's selected target method. Detailed calculations supporting the analyses of the baseline and target water use to meet the requirements of SBx7-7 are presented in Appendix H. The target water use will be finalized in the next UWMP submittal in 2015, and compliance reporting will be presented in future Urban Water Management Plans beginning in 2015.

To comply with SBx7-7, EBMUD will achieve its target water use by implementing recommendations for conservation programs as outlined in the WCMP and for recycled water programs as discussed in Chapter 5 of this UWMP 2010. The conservation and recycled water programs are based on long-term water supply planning levels.

EBMUD's 2020 water use target of 175 gallons per capita per day (GPCD) is calculated using Target Method No. 2. As a result of the 2020 target being greater than the minimum 5% reduction from EBMUD's 2003-07 five-year baseline, EBMUD will pursue a lower target of 150 GPCD. EBMUD's 2015 interim target is 158 GPCD. Implementing its planning level programs, EBMUD projects a lower demand level of 151 GPCD for year 2015. In addition, EBMUD's UWMP 2010 planning level programs project an even more aggressive and lower 2020 demand level of 144 GPD.

Table 6-3 Key Fiscal Year 2009 and 2010 Water Conservation Program Accomplishments

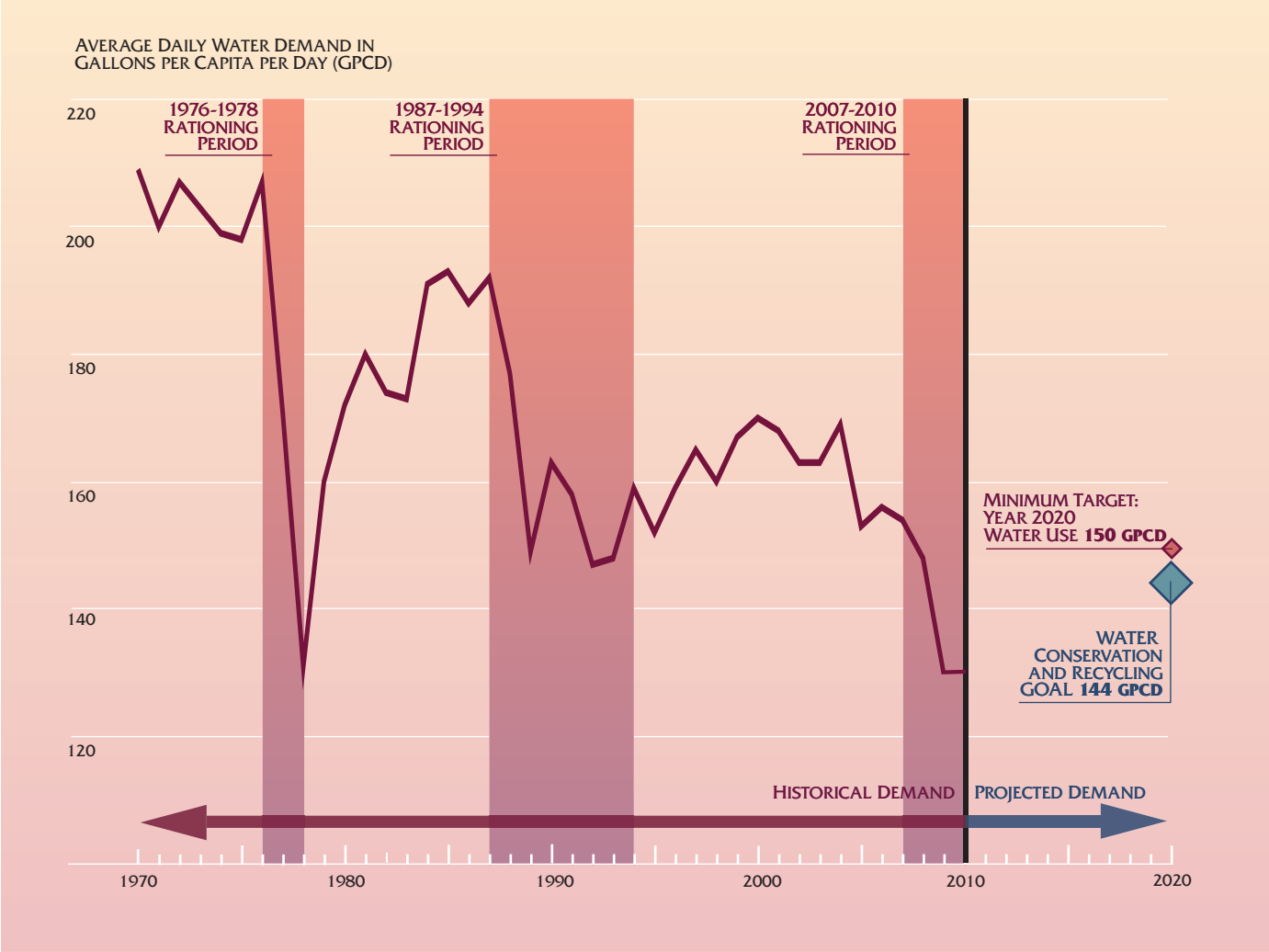
Program Description	Activity or Accounts	Incentives ($)	Water Savings (GPD)
Residential Services			
Single-Family Surveys	812	NA	56,000
Multi-Family Surveys	931	NA	165,400
CYES Student Surveys	1,283	NA	83,500
Home Water Use Do-It-Yourself Survey Kits	16,152	NA	174,100
Leak Detection Advice	11	NA	1,000
Residential Incentives			
High-Efficiency Clothes Washer Rebates	21,179	$2,310,510	400,300
High-Efficiency Toilet Rebates	13,000	$1,650,710	290,400
Residential Landscape Rebates	175	$129,509	8,900
Free Device Distribution	124,412	$190,000	78,400
Subtotal Residential Program Savings/Incentives	**177,955**	**$4,280,729**	**1,258,000**
Non-Residential Services			
Commercial Surveys	372	NA	32,700
Industrial Surveys	20	NA	2,200
Institutional Surveys	79	NA	10,700
Leak Detection Advice	7	NA	39,500
Non-Residential Incentives			
Commercial Clothes Washer Rebates	96	$18,300	10,000
Custom Non-Residential Rebates	208	$9,198	1,600
Commercial Dishwashing Spray Valves	27	$810	3,000
Toilet/Urinal Rebates	639	$68,551	16,100
Subtotal Non-Residential Program Savings/Incentives	**1,448**	**$96,859**	**115,800**
Irrigation Services/Incentives			
Irrigation Surveys	416	NA	233,000
Irrigation Reduction Information System	486	NA	90,300
Landscape Irrigation Upgrade Rebates	92	$97,446	75,200
Irrigation Controllers (Residential & Commercial)	158	$38,997	38,400
Subtotal Irrigation Savings/Incentives	1,152	$136,443	436,900
Total EBMUD Program Incentives/Savings FY09 &10	**180,555**	**$4,514,031**	**1,810,700**

Water savings rounded to 100 gpd

Table 6-4 SBX7-7 Baseline Water Use and Water Use Targets

	Daily per Capita Water Use (GPCD)
10-yr Average Baseline (Calendar Years 1995–2004)	165
Selected Target Method #2 (55 GPCD Residential Indoor; 70-80% ET_o Outdoor Landscape Use; 10% CII Reduction)	175
5-yr Average Baseline (Calendar Years 2003–2007)	158
Minimum Water Use Reduction Requirement (5% Reduction)	150
Year 2015, Interim Target	158
Year 2020, Using Minimum Water Use Reduction Requirement	150

FIGURE 6-3 SBX7–7 2020 WATER USE TARGET



DEMAND-SIDE CONSERVATION

RESIDENTIAL WATER CONSERVATION PROGRAMS

EBMUD's array of demand-side water conservation programs and services covers all customer categories. Residential water conservation programs are designed to offer customers water conservation incentives and to educate them about water supply, water use habits, and water-saving technologies and behaviors. Programs and services include free water surveys and water-savings devices, incentives for installing water-saving plumbing fixtures, appliances, and irrigation equipment, lawn conversion, water-efficiency plan review requirements for new water services, and education and outreach programs. EBMUD continually monitors these programs to ensure that conservation objectives are being met. The importance of water conservation is emphasized to customers not only during droughts, but also every year, whether or not a drought is occurring, as water conservation stretches limited resources and plays a crucial part in EBMUD's water supply portfolio.

Water Conservation Survey Programs

Single-Family Water Surveys

Water surveys for single-family residential customers include measuring and assessing indoor and outdoor end uses of water and offering customized recommendations on how to save water in and around the home. Targeting high water use customers is key to maximizing water savings from delivery of this service. WCMP conservation program implementation identifies a target of 2,500 surveys annually. To achieve this target, staff will expand existing delivery mechanisms and develop outreach

initiatives to enlist customer participation. Existing delivery mechanisms include self-survey kits, telephone surveys, and in-person surveys.

Home Water Use Do-It-Yourself Survey Kits

In advance of a scheduled in-person survey, EBMUD provides customers with free self-survey kits to help guide them through a step-by-step self-assessment of their water use. Customers who return completed self-surveys identifying high-water using devices, such as showerheads or faucet aerators, may request free first-time water-efficient replacements from EBMUD.

Self-surveys are currently made available to customers in print and online via the EBMUD WaterSmart Center as downloadable files. The customer is directed to check for indoor and outdoor leaks, take inventory of water-using hardware and equipment, and measure flow rates. While potentially more cost-effective than in-person surveys, this survey delivery mechanism limits the customization of water saving recommendations and results in only minimal data collection for the small percentage of customers that complete and return survey forms.

Self-guided surveys will be expanded through development of an interactive web-based user interface comprised of simple step-by-step instructions for completing a home water uses assessment. Development of an online interactive self-survey via the EBMUD WaterSmart Center will help customers assess their water usage, compare personal usage to benchmarks, and view available technical information, water conservation tips, rebates, and incentives based on their individual responses. The online service will also include an irrigation scheduling calculator that incorporates imagery of individual parcels and a measurement tool to allow customers to measure irrigated areas and establish landscape water budgets.

An automated online service will give customers access to water services during all days and times rather than just during EBMUD business hours and automate program data collection and entry. Envisioned future development of online applications for mobile devices would allow customers to move throughout their home/ site while conducting self-surveys. Development of a self-guided user interface and functionality requires a robust database and the integration of existing EBMUD information systems. Therefore, it is a substantial software application development project dependent upon the availability of EBMUD information system development resources. In the near term, the existing manual self-survey process will be updated and marketed and will serve as a basis for developing online content and automation.

Telephone Surveys

EBMUD customers can currently obtain telephone consultation and advice regarding their water consumption and conservation tips. Most of these interactions are initiated by customers as high bill complaints and are handled by a Customer Service Representative in EBMUD's Contact Center. Customers needing additional consultation are referred to Water Conservation staff for more detailed consultation where staff assists the customer in reviewing and assessing their water consumption and end uses of water. Planned enhanced services include separate tracking of customer contacts generated in the Contact Center and revising the process for conducting telephone surveys to improve data collection, documentation of outcomes, and EBMUD-initiated follow-up within EBMUD's Customer database.

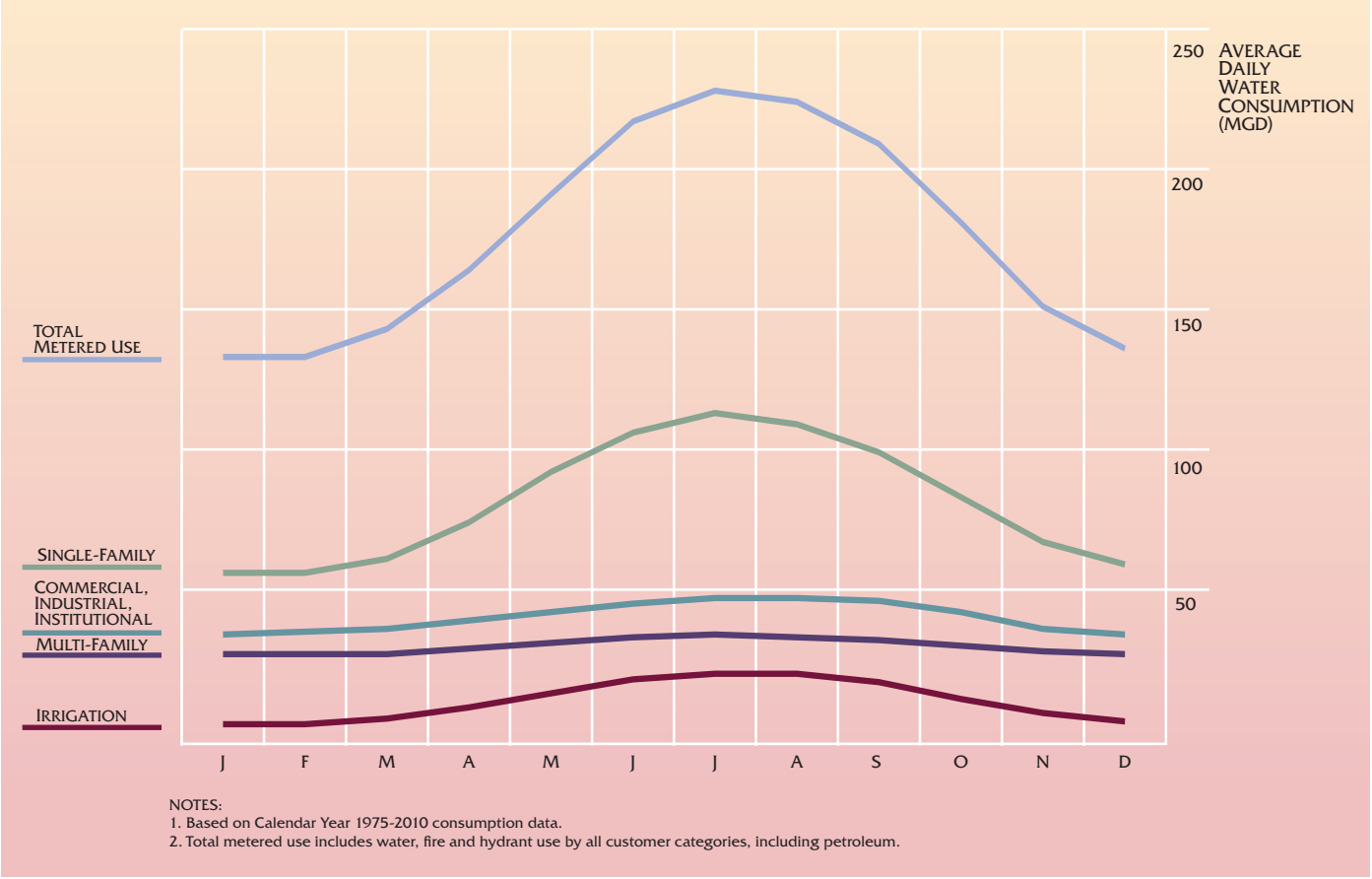
In-Person Surveys

Currently, EBMUD customers can schedule free in-person water surveys with EBMUD staff. A site visit, which typically lasts up to one hour, includes a meeting with a resident/ homeowner to review water consumption history, a test for leaks, an assessment of indoor water using fixture flow rates, and outdoor landscape irrigation. Recommendations for water-efficiency improvements and informational brochures are provided as needed. While all EBMUD customers are eligible for in-person surveys, a number of customers are initially directed to self or telephone surveys. As online and telephone survey delivery mechanism are further developed, higher-cost in-person services will be de-emphasized in favor of more cost-effective and interactive delivery mechanisms.

Landscape Consultations

Landscape consultations are in-person surveys with additional emphasis on efficient landscape irrigation scheduling, irrigation hardware efficiency, automatic irrigation controller programming, and sustainable landscape design and maintenance. Landscape consultations are scheduled at sites with high dry-season water and automatic irrigation systems. While available to all customers, the majority of sites that benefit from this service are in communities with low-density housing on large lots with installed landscapes. Development of interactive online tools to assess outdoor use will automate and improve the ability to assess landscape water use efficiency by customers but will not completely replaced the need for in-person services. This service will be

FIGURE 6-4 MONTHLY WATER USE BY CUSTOMER CATEGORY



increasingly targeted to high-water use sites with pre-identified irrigation usage. Figure 6-4, which illustrates monthly water use by customer category, emphasizes residential consumption as the single largest component of total consumption and highlights the difference in residential use in winter months versus summer months.

Multi-Family Water Surveys

Multi-family water surveys target existing multi-family residential customers at sites with five or more units. WCMP water conservation planning targets 200 accounts and approximately 3,400 dwelling units annually. Surveys are provided in-person through scheduled appointments with property managers and apartment building owners. The survey includes the same elements as single-family audits. At each site, representative samples of dwelling units are inspected and assessed for indoor water use efficiency. Outdoor water use served by mixed-use (indoor and outdoor) water meters is also assessed. Sites with high-water use and multiple sites under the same ownership or manager are targeted for this service. On-site surveys are required for high volume water-saving device distribution, and free devices are delivered as part of this service.

Rebate and Incentive Programs

Incentives and rebates for indoor water-efficient appliances, plumbing fixtures, and outdoor irrigation systems (irrigation controllers and drought-tolerant landscaping), and distribution of devices (clothes washers, high-efficiency toilets, free water-efficient showerheads, faucet aerators, and quick-closing toilet flappers) are offered to residential customers. These rebates to residential customers totaled nearly $4.3 million in FY09 and FY10.

Residential Landscape Consultations and Rebate Program

Implemented in February 1998, the Residential Landscape Program promotes outdoor water use efficiency in the single-family residential sector. EBMUD offers residential customers free on-site landscape consultations to help

with new plantings and improvements to their landscape irrigation efficiency. The consultations emphasize proper irrigation scheduling, low water use plant selection, and other sustainable landscape practices such as mulching and proper maintenance. In FY09 and FY10, EBMUD continued to offer rebates to qualifying residential customers for converting lawns to sustainable landscaping and coordinated an online mulch coupon offer with local retailers. There is a strong educational component to the program; pre- and post-conversion site visits include in-person education regarding water conservation, water-efficient landscape design, irrigation scheduling, and maintenance practices.

Residential High-Efficiency Clothes Washer Rebate Program

EBMUD's Residential Clothes Washer Rebate Program, one of the first such programs offered in the nation, has been available to EBMUD's residential customers since 1996. EBMUD continues its participation in a regional initiative with Pacific Gas and Electric and with Bay Area water agencies to offer combined water and energy efficiency rebates for high-efficiency clothes washers and increase program visibility regionally among customers and appliance retailers.

EBMUD is among the first water agencies to enhance its clothes washer rebate with tiered rebates based on the water-efficiency level of eligible clothes washer models. Tiered rebates influence consumers to purchase appliance models that meet or exceed higher efficiency standards. FY09 and FY10 were the two single highest years of EBMUD customer participation with more than 21,000 clothes washers rebated that totaled more than $2.3 million in incentives distributed and saved an estimated 146 million gallons of water annually. EBMUD has rebated more than 77,000 clothes washer purchases since the program began in 1996. EBMUD also offers rebates for the installation of family-sized clothes washers in multi-family housing.

High-Efficiency Toilet Rebate Program

Since 1995, EBMUD has offered its residential customers rebates and free installations of new toilets to support replacement of higher water-volume models. The current program rebates the purchase of high-efficiency toilet (HET) models that use 20 percent less water than the standard 1.6 gallons per flush ultra low-flow toilets. As a United States Environmental Protection Agency (USEPA) WaterSense Partner, EBMUD promotes WaterSense labeled products through home improvement retailers, manufacturers, and distributors throughout its service area. EBMUD and other water agencies working directly with manufacturers, distributors, and retailers encourage expanded production and distribution of water-efficient toilets. In FY09 and FY10, HET retrofits were popular with customers, with households receiving 13,000 rebates totaling more than $1.6 million. Those toilets save an estimated 290,000 gallons of water or more every day or nearly 106 million gallons annually.

Device Distribution Program

EBMUD has been distributing free low-flow showerheads, faucet aerators, and other water-saving devices to customers since the 1980s. The devices are distributed primarily during customer water use surveys, through direct mail, and over the counter at EBMUD offices. A Market Penetration Study completed in FY02 found that EBMUD's service area was effectively "saturated" with low-flow showerheads and faucet aerators. Much of this high saturation can be attributed to EBMUD's ongoing free distribution program. Nearly 80,000 water-efficient devices and products were distributed to EBMUD customers during the FY09-FY10 period.

Non-Residential Water Conservation Programs

EBMUD tailors an array of demand-side water conservation programs to commercial, industrial, institutional and landscape irrigation customers to assist with improving their indoor and outdoor water use efficiency. Non-residential water conservation programs include free water surveys, water-saving device distributions, technical consultations, plan reviews, and life-cycle cost and savings estimates. Financial incentives support the installation of water-efficient appliances, plumbing fixtures, and process equipment. In FY09 and FY10 nearly 1,400 non-residential customer surveys and over 1,200 conservation rebates saved more than 550,000 gallons per day (GPD) or more than 200 million gallons annually.

East Bay businesses helped with water savings during the recent drought through their own indoor and outdoor water savings initiatives, as well as working with EBMUD to install water-efficient appliances, plumbing fixtures, process equipment, and irrigation systems. Business customer water use was down an average of five million gallons per day compared to the pre-drought three-year average from 2005 to 2007.

Water Conservation Survey Programs

Commercial, Industrial, and Institutional Surveys

Commercial, Industrial, and Institutional (CII) surveys are designed to help businesses and institutional customers use water more efficiently. CII water surveys consist of free on-site visits conducted by EBMUD staff. Staff works with consultants and landscape and facility managers to identify opportunities to increase water use efficiency and achieve associated benefits in reduced energy use, wastewater discharge, chemicals, and downsized treatment facilities. Irrigation water surveys include a review of current and past water use efficiencies, on-site inspection of irrigation equipment, tests for system leaks and sprinkler uniformity, training of landscape personnel in principles of efficient irrigation systems, assistance with irrigation scheduling, and recommendations for improving irrigation system efficiency. If the surveyor determines that existing devices are not efficient, first-time free water-efficient devices are provided, which include quick-closing toilet flapper valves, water-conserving showerheads, low-flow faucet aerators, and commercial dishwashing spray valves.

Businesses with relatively simple end uses of water have successfully used self-survey kits. Small metering devices are available for loan to verify water use characteristics before implementing conservation measures. This approach allows the customer and EBMUD to identify the most cost-effective measures, including opportunities that may qualify for rebates.

Irrigation Water Surveys

EBMUD offers free surveys and incentives for business customers to improve irrigation efficiency. Irrigation audits include an evaluation of current and past water use, on-site inspection of irrigation systems, tests for sprinkler uniformity, training landscape personnel on principles of efficient irrigation, and recommendations for increasing water use efficiency. Irrigation water surveys are targeted at nearly 5,000 EBMUD irrigation accounts where landscape irrigation comprises most or all of the use at the site.

Homeowners associations (HOA) continue to represent a large participant sector. Two strategies have proven successful in helping to secure customer participation in both the water use survey and irrigation system upgrade programs: targeted presentations by EBMUD staff and telephone contacts via high-water consumption billing inquiries.

Rebate and Incentive Programs

EBMUD offers non-residential customers financial incentives in the form of customized rebates, free water-efficient device distributions, and fixed rebates for water-efficient products, including plumbing fixtures, commercial appliances, process and cooling equipment, and irrigation system upgrades.

Toilet/Urinal Replacement Program

EBMUD administers both a fixed and customized rebate program for the purchase of qualifying high-efficiency toilet (HET) and high-efficiency urinal (HEU) models. EBMUD continued a long-term assessment of HEU products through installation within its own facilities.

Commercial Clothes Washer Rebates

EBMUD offers rebates for the installation of commercial-grade units in common area laundries, businesses or institutions with on-premise laundry facilities, and coin laundry stores.

Commercial Landscape Irrigation Upgrade Program

This program seeks to minimize customer water consumption and utility costs, and to introduce customers to new efficient irrigation technology to help large-landscape irrigators improve the efficiency of their existing irrigation systems.

Irrigation Reduction Information System

EBMUD's Irrigation Reduction Information System (IRIS) continues to be a leader in landscape water budget programs across the state. The Geographic Information System (GIS) based program is designed to inform EBMUD irrigation customers on how much water should have been used during a billing period. Water use estimates are based on actual irrigated landscape areas and real time weather data from local weather stations. The IRIS program prints the water budget on every water bill that the customer receives after joining the program. The information helps customers improve management of their irrigation systems by reducing water use and increasing cost savings. In FY10, over 20,000 landscape water budgets were printed on water bills for more than 3,300 irrigation customers.

Device Distribution Program

Since the early 1980s, EBMUD has been distributing free low-flow showerheads, faucet aerators, high-efficiency hose nozzles, "water brooms," and low-volume toilet flush valve retrofit kits. Devices are provided to customers primarily through water use surveys. Some water-efficient hardware and devices are loaned to customers for testing in their business settings.

Water-Efficient Fixtures and Appliance Incentives

EBMUD provides rebates to business customers for purchasing water-efficient plumbing fixtures such as high-efficiency gravity and pressurized toilets, low or zero-water using urinals, commercial-grade clothes washers, and pre-rinse dishwashing spray valves.

Custom Financial Incentives

EBMUD offers custom financial and technical assistance to businesses that undertake specialized water-efficiency projects. Rebates offset a portion of the initial costs of installing water-saving equipment and systems, and they shorten the payback period for the customer's investment in equipment upgrades. Rebate values are based on estimated water savings and may be up to 50 percent of the costs of implementing hardware or process changes that demonstrate improved water use efficiency. Incentives covered multiple technologies and practices, such as boiler-less food steamers, air-cooled ice machines, and recirculating cooling systems, dishwashing, water treatment, wash down equipment, and others.

On a case-by-case basis, EBMUD also partners with business and industrial customers on joint research to develop new technologies and water management practices that demonstrate and promote cost-effective water savings. Each custom project is required to enter into a performance contract with EBMUD and achieve a project-defined water budget to be eligible for EBMUD financial assistance.

EDUCATION AND OUTREACH ACTIVITIES

Education and outreach activities support all other conservation programs and increase both customer awareness and acceptance of EBMUD conservation efforts. EBMUD has a long history of providing customers with educational services including publications, newsletters, school curricula, public workshops and events, and demonstration projects. To make its water conservation programs and services more visible, EBMUD works cooperatively with other agencies and organizations by participating in trade shows and community events. Outreach activities include general and targeted marketing, community presentations and workshops, and participation in regional and statewide conservation organizations.

Education

Publications are a valuable educational tool for promoting conservation practices. In 2004 EBMUD published its award-winning *Plants and Landscapes for Summer-Dry Climates of the San Francisco Bay Region*. The book is a modern, updated reference on low water use and drought adapted plants for Mediterranean climates and further establishes EBMUD as a leader in outdoor conservation education. The book describes over 630 plants adapted to summer-dry climates and features over 540 stunning color photographs of plants and landscapes. Charts provide quick reference, and lists identify plants for special situations such as hot, dry sites, and dry shade. Articles contributed by notable horticulturists bring to life the weather, seasons, and design principles that shape the summer-dry landscape. The publication is both part of a growing awareness of climate compatible and resource-conserving landscaping and an educational tool to further the application of a cutting-edge garden aesthetic within and beyond EBMUD's communities.

Recognizing its many educational benefits, EBMUD expanded its school outreach programs to help increase water-efficiency at schools to save water and money; provided school community outreach and support; and educated students on responsible water use and environmental protection. Since 1974, EBMUD has provided water conservation curricula and supplemental materials to teachers and students as part of its Project WATER (Water Awareness Through Education and Research) school program. The program is free to public and private schools within the EBMUD service area and includes K-12 curricula and watershed service learning with EBMUD Rangers/ Naturalists. In 2000, EBMUD also initiated a School Garden Grant Program in partnership with the nonprofit Watershed Project to support local Kids in Gardens projects. These projects were popularized by the California Department of Education's initiative to create "a garden in every school." Through workshops sponsored by both EBMUD and other agencies, educators and their students learn how to reduce water and pesticide use in the garden.

Outreach

EBMUD continues to market its water conservation programs in two overarching ways: general and specific. The "general" or broad-based marketing approach communicates the value of water and the importance of efficient water use. The "specific" approach includes

interactions with individual customers or groups of customers and marketing of EBMUD conservation programs, technologies, and services tailored to them.

Examples of marketing tools that EBMUD has used include:

- web-based resources;
- bill inserts;
- newspaper and magazine ads;
- billboards;
- AC Transit posters;
- BART billboards;
- promotional items at community events;
- theater ads;
- cable television;
- EBMUD WaterSmart™ Business Certification Program; and
- support of WaterSense product labeling initiatives.

EBMUD initiated a strong public information campaign to spread the word about ways with which the customers could save water in their homes and businesses. In FY09, EBMUD expanded its website and online *Drought Help Center*, a one-stop education resource. Online videos highlighted what customers were doing in their own homes and yards to save water, and weekly conservation tips showcased simple changes that could add up to significant savings. Customers could view the historical water use and projected allocations, as well as place web orders for free water-saving devices such as showerheads, faucet aerators, hose shut-off nozzles, and conservation publications.

In 2003, EBMUD initiated its long-term strategic Marketing Plan to enhance the branding and marketing of EBMUD's water conservation and recycling programs. The WaterSmart program is designed to brand water conservation services that inform customers and retailers of the best available technology and management practices to help EBMUD achieve its conservation goals. In FY09, EBMUD formally launched its WaterSmart Business Certification Program following development and focus group testing. Mirrored closely to other green business certification programs, EBMUD's program is designed to heighten awareness of water (and energy) conservation benefits by recognizing businesses that implement water-efficiency measures and reach or exceed defined efficiency benchmarks. EBMUD staff work one-on-one with businesses, green business certification programs, and the local energy provider to promote changes that not only help customers save money by lowering water use, but also save energy and chemical costs. The WaterSmart Certification Program was developed specifically to:

- improve branding of water-efficient EBMUD services;
- promote water-efficient products and technologies through product labeling, analogous to the USEPA's WaterSense and ENERGY STAR programs; and
- register and recognize those businesses and customers that meet or surpass EBMUD demand management goals and objectives.

In FY09, EBMUD partnered with the CUWCC to conduct WaterSmart Guidebook training workshops in northern and southern California. In FY10, EBMUD continued to market its WaterSmart Business Development Guidebook to promote the latest water-efficient technologies, products, and best practices to city planners, water professionals, and commercial, industrial, and institutional customers.

SUPPORT ACTIVITIES

Support activities are those that support the implementation of the water conservation program. These activities include database monitoring, studies/ research, committee and association work, identification of funding sources, cooperative efforts, and the submittal of internal and external reports.

EBMUD regularly partners with a number of California, U.S., and international water agencies, energy utilities, green business organizations, and other research entities to study water use and pilot new water-efficiency programs and technologies. EBMUD is active in statewide water conservation venues and is represented in all significant industry-related discussions involving state and federal agencies, public interest groups, and professional associations. For example, EBMUD is a member of the Bay Area Water Agencies Coalition (BAWAC) established by several Bay Area water agencies to act in a unified manner on water planning activities. EBMUD also remains an active Board member of the CUWCC, California Urban Water Agencies (CUWA), and the national Alliance for Water Efficiency.

Partnerships

EBMUD recognizes that partnerships broaden the visibility of conservation programs, create cost-sharing opportunities and potential economies of scale, and can

TABLE 6-5 WATER CONSERVATION PARTNERSHIPS

LANDSCAPE ADVISORY COMMITTEE

Formed in 1988, the Landscape Advisory Committee (LAC) brings together green-industry professionals representing the landscape designers, contractors, nurseries, sod producers, educators and product manufacturers and distributors. Committee members assist staff in identifying best principles and practices for smart landscaping. The LAC has been meeting annually to provide comments on District conservation programs, new technologies, industry trends, and presentations.

THE GREEN BUSINESS PROGRAM

EBMUD contributes funding to both the Alameda County and the Contra Costa County Green Business Programs, and conducts water conservation surveys at local businesses interested in becoming a certified Green Business. The Program began targeting automobile repair shops, printing facilities, and office buildings, and now has expanded to nearly all small and medium sized businesses. Through this partnership, EBMUD helped certify over 400 businesses since the inception of the Green Business Program.

STOPWASTE

A project of the Alameda County Waste Management Authority, StopWaste targets larger industries for comprehensive assessments to help implement environmental solutions. EBMUD staff coordinates outreach and water use surveys with environmental assessments, and helps to provide customers with one-stop shopping for waste management and resource conservation services. Bay-Friendly Landscape is a program of StopWaste that promotes resource conservation, waste reduction, and pollution prevention in the design and maintenance of urban landscaping. EBMUD promotes and leverages Bay-Friendly Landscape informational resources in customer outreach, lends expertise to workshops and educational presentations, and is pursuing co-branding and joint outreach initiatives to the nursery industry.

BAY-FRIENDLY LANDSCAPE COALITION

The Bay-Friendly Landscape Coalition is an initiative to promote Bay-Friendly Landscape Principles regionally. EBMUD is a signatory to the Bay-Friendly Landscape Principles and a founding sponsor of a developing non-profit organization. EBMUD sponsored and participated in two regional conferences in 2008 and 2010.

THE FOOD SERVICE TECHNOLOGY CENTER (FSTC)

The Center is a primary resource for food service operators, designers, consultants, vendors and manufacturers. It promotes efficient design and operation of food service facilities. EBMUD partnered with the FSTC to offer workshops for food service providers and to develop performance specifications for water and energy-efficient spray valves used in dishwashing operations. EBMUD has partnered with FSTC and other water purveyors to monitor and measure the water and energy savings potential of the new "connectionless" commercial food steamers and commercial ice machines. EBMUD continues to partner with FSTC on dual audits of large kitchen facilities.

CALIFORNIA YOUTH ENERGY SERVICES (CYES)

EBMUD partners with local schools and community groups to support youth training projects that educate students about water resources and water conservation. EBMUD contributes financially and through in-kind services to California Youth Energy Services, a local non-profit, to provide students involved in job training projects with water conservation information, educational activities, and support for residential and business water conservation retrofit projects. These partnerships build communities of youth with passion for resource conservation and community service and the know-how to accomplish real water and energy savings. Since the beginning of this partnership, over 5,000 student surveys have been performed.

WATER AGENCIES

Joint grant applications, primarily with water utility partners, improve the likelihood that proposals for conservation funding will be awarded. EBMUD customers who participate in the grant funded programs directly benefit from the supplemental funding for rebates, installations, and on-going water savings. EBMUD was among the water agency's Prop. 50 grant recipients in support of the regional clothes washer water and energy initiative implemented with Pacific Gas and Electric Company (PG&E). EBMUD continued to host and participate in meetings of the Bay Area Water Conservation Coordinators, an informal group of regional water utility water conservation practitioners who meet to share information about research and implementation, and to discuss emerging technologies and issues impacting water use efficiency.

TABLE 6-5 WATER CONSERVATION PARTNERSHIPS CONTINUED

BAY AREA WATER AGENCIES COALITION (BAWAC)

BAWAC represents a coalition of Bay Area water agencies collaborating on comprehensive water management strategies and innovative approaches for securing a reliable, high quality Bay Area water supply. Shared efforts include, but are not limited to, water quality and treatment, demand management (conservation and recycling), and watershed protection. In FY10, EBMUD was among several water agencies that initiated preparation of a Prop. 84 Integrated Regional Water Management Plan grant proposal with water conservation, recycling, and green infrastructure components.

THE CALIFORNIA URBAN WATER AGENCIES (CUWA)

CUWA is a non-profit corporation providing a forum for its member agencies to study and promote the need for a reliable, high quality water supply for the state's current and future urban water needs. EBMUD is active on a number of agency supported committees and worked closely with the CUWA Conservation Committee on a number of research projects to identify potential urban water conservation savings and implementation barriers toward achieving those savings.

CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC)

The Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California created and implemented a broadly supported agreement specifying urban water conservation Best Management Practices (BMPs). CUWCC, a non-profit organization consisting of urban water suppliers, environmental organizations, and other interested parties, is charged with overseeing the best practices implementation process. EBMUD staff actively participated in the 2007-09 BMPs revision process, and served on the organization's governing Board and subcommittees. EBMUD funded work performed by the CUWCC to develop and improve plumbing standards that impact water use efficiency. EBMUD sponsors CUWCC through membership dues and staff participation, and its Water Conservation Program complies with MOU requirements. In FY09 and FY10, EBMUD staff supported CUWCC's role in the statewide SBx7-7 implementation.

DELTA PLAN DEVELOPMENT

In November 2009, the comprehensive "Delta Legislative Bill Package" was enacted, effectively replacing the CALFED Bay-Delta Program and imposing a new urban conservation goal of 20 percent per capita reduction in water use by 2020 in SBx7-7. EBMUD staff is directly engaged with DWR and other stakeholders in developing the regulatory framework for this law. With the implementation of the stringent conservation and recycling goals for long-term planning, EBMUD anticipates full compliance with SBx7-7.

THE WATERSHED PROJECT

The Watershed Project works to promote environmental responsibility and to preserve and protect the environment for future generations through education and outreach to teachers, students, and the community. From FY05 through FY08, EBMUD co-sponsored teacher workshops within the East Bay and funded teacher-action grants for school projects that emphasize water conservation. The Kids in Gardens program promotes watershed stewardship by encouraging educators to create and use healthy, low-maintenance gardens to teach pesticides-free gardening methods and the importance of water conservation and urban runoff pollution prevention.

THE WATER CONSERVATION SHOWCASE

Each March since 2004, EBMUD along with PG&E's Pacific Energy Center and the U.S. Green Building Council, Northern California Chapter, have joined together to present the Water Conservation Showcase. The Water Conservation Showcase has included over 90 presentations by water experts from the Bay Area and nationwide. Presentations over the Showcase's seven year history have addressed almost every water conservation topic, from innovative water treatment techniques to infrastructure development. Additional topics have included California's water history, water reuse solutions, water quality, and water rights.

expand customer benefits by addressing multiple conservation areas such as water, energy, wastewater, and solid waste. In FY10, EBMUD continued its co-sponsorship with Pacific Gas and Electric, and the U.S. Green Building Council of the 2010 Water Conservation Showcase at the Pacific Energy Center in San Francisco. Each year the event draws a larger audience, and more vendor exhibitors showcase water-efficient technologies and services. Other FY10 EBMUD partnerships are listed in Table 6-5.

Demand Management Advisory Committee

In mid-2001, EBMUD's Board of Directors established a "Demand Management Advisory Committee" (DMAC). The committee's charge was to review the water conservation and recycling programs and assist staff in identifying cost-effective demand management approaches and partnerships. The DMAC was composed of seventeen members with broad representation from local government, the green industry, environmental interests, the business community, taxpayer groups, and nonprofit organizations. The DMAC reviewed EBMUD's water conservation programs and generally concurred with its objectives and approach. Many of the DMAC recommendations are reflected in current and planned future incentives. More recently during the water supply planning process, a Community Liaison Community (a community stakeholder group) also reviewed and advised the Board on programs of interest, including conservation that were incorporated into EBMUD's water supply plan.

National Multi-Family Residential Sub-Meter Study

EBMUD actively supports research and technical studies to enhance understanding of water use patterns, conservation potential, and the impacts of conservation measures and programs. In June 2004, EBMUD completed a National Multi-Family Residential Sub-Meter Study. The study was conceived, organized and administered by EBMUD, and was developed in cooperation with the USEPA, nine water utilities in seven states, and two national apartment associations. The study represents a nationwide assessment of conservation potential and other policy issues associated with metering and/ or submetering within the multi-family sector.

Residential End-Use Studies

EBMUD has completed a number of residential end-use studies to quantify end uses of water by sector, water-using technology, and climate and consumer demographics. These studies help quantify current demand and future potential conservation savings from applied technology retrofits and behavioral change. In 2003 EBMUD monitored water use at 33 single-family homes to assess end uses of water, and measured the impacts of conservation retrofits. The study found that while indoor per capita single-family use varied, the average use could be reduced approximately 20-25 percent to approximately 55 GPD. Study findings will be used to estimate water savings more accurately from incentives programs, to assist in marketing customer benefits from conservation measures, and to prioritize EBMUD conservation budgeting.

EBMUD is participating in a statewide study to evaluate the current water use patterns and the current state of water-efficiency in single-family homes. This study will be used to make generalized projections of the remaining potential for water conservation and to better facilitate water supply planning efforts. 120 participating EBMUD customers were selected at random to represent water usage patterns typically found in the service area. During March and April of 2007, these homes were equipped with datalogger devices which were used to help determine the end uses within each home and how much water was used in each application. Participants were also asked to complete surveys describing the types of appliances they have within their homes. The California Department of Water Resources (DWR) co-sponsored this program along with ten participating water agencies. In FY10, EBMUD participated in draft research report review and field data verification.

Advanced Metering Studies

EBMUD is conducting several small advanced metering infrastructure (AMI) pilot studies in its service area to test new metering technologies that can collect, record, and remotely transmit monthly, daily, and hourly water consumption data to improve customer water-efficiency practices. The pilot studies are co-funded by grants from DWR and the United States Bureau of Reclamation (USBR).

Other Studies

EBMUD conducted numerous market saturation studies (1995, 1998, and 2001) to collect data on water conservation attitudes and behaviors, determine the types and market saturation of water-conserving hardware, assess water conservation potential for identified market sectors, and compare current and previous study findings.

EBMUD partnered with other water utilities, such as the USEPA and the California Urban Water Conservation Council. They completed the study conducted by the

TABLE 6-6 WATER CONSERVATION RESEARCH ACTIVITIES

METER TECHNOLOGY STUDY

EBMUD continues its metering technologies research to provide customers and conservation staff with instantaneous or "real-time" water consumption information. This technology could be used as a conservation tool by helping increase customer awareness of their water use patterns as well as allow for earlier leak detection for increased savings.

CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC)

EBMUD supports research conducted by the CUWCC through its membership, and it participated in the CUWCC Research and Evaluation (R&E) Committee. The R&E Committee oversees assessments of technology as Potential Best Management Practices (PBMPs). PBMPs are studied to identify possible implementation of economically reasonable Best Management Practices.

SELF-ADJUSTING WEATHER-BASED IRRIGATION CONTROLLERS

The California Department of Water Resources (DWR) awarded EBMUD, in cooperation with five other agencies, a $1.6 million Prop. 13 grant for a Weather-Based Irrigation Controller Program to install state-of-the-art controllers within six counties in Northern California. Through this grant, EBMUD's portion of the program was $625,000 for 800 controllers. Program implementation began in January 2007. Outdoor water savings to date for customers who participated in the pilot program total nearly 175 million gallons.

MULTI-FAMILY SUBMETERING

In April 2006, the EBMUD Board of Directors authorized acceptance of a Prop. 50 matching grant in the amount of $150,000 from DWR to investigate the business case for individually metering multi-family dwelling units. The grant contains three phases, each receiving matching funds of $50,000. The first phase, a study of the costs, benefits, and administrative issues of metering new multi-family dwelling units, was completed in September 2006. As a result of the first phase, the EBMUD Board adopted a new regulation effective January 1, 2009, requiring individual metering for multi-family and multi-occupancy structures three stories and under. In September 2008, Phase Two of the metering study was initiated and included a voluntary pilot incentive program for customers to sub-meter existing multi-family residential properties. The final phase, slated for implementation in 2011-12, involves studying the accuracy, and applicability of point-of-use metering technology.

COMMERCIAL, INSTITUTIONAL, AND INDUSTRIAL (CII) PLAN REVIEW

EBMUD was awarded a Prop. 50 grant from the DWR to develop a resource guidebook for reviewing plans of new CII developments for water use efficiency and to pilot a CII plan review program. The guidebook was published in 2008 and presents the technology associated with water-efficient hardware and processes applicable to the CII sector. In addition, EBMUD together with the CUWCC has held training classes in both Northern and Southern California on the guidebook. A final report on the plan review water savings is expected in 2012.

AMERICAN WATER WORKS ASSOCIATION RESEARCH FOUNDATION (AWWARF)

EBMUD has partnered with the AWWARF in the following cooperative studies: (1) "Water Efficiency Programs for Integrated Water Management" (#2935) investigating avoided costs associated with water conservation programs and comparing those costs to other supply-side options, (2) "Water Budgets and Rate Structures" (#3094) investigating the role of water budgets in rate setting, and (3) "Environmental Leadership" (#2854) investigating how management perceives their environmental leadership role.

RESIDENTIAL END-USE OF WATER

EBMUD is participating in a DWR Prop. 50 grant to determine single-family indoor and outdoor end uses of water and water use efficiency at 1,200 homes in California. Indoor and outdoor water use will be determined using dataloggers. Indoor water use efficiency will be evaluated by comparing use by fixture/ appliance, and outdoor water use efficiency will be determined by comparing the irrigated landscape area to the use.

PIPELINE LEAK DETECTION PROJECT

With partial funding from a USBR grant, EBMUD is investigating the cost-effectiveness of permanent installation of water leak detection logger equipment versus the lift and shift method. EBMUD has installed approximately 850 acoustic leak detection loggers covering approximately 250 miles of pipe within the city of Berkeley and has continually collected leak detection data for 18 months. EBMUD investigated and repaired over 100 leaks identified. An additional 150 loggers are used in a lift and shift manner. Other goals of the study are to accelerate leak identification and repair, learn the nature and cause of leaks, measure how long leaks take to surface, and learn how much water can be saved by aggressive leak detection methods.

Table 6-6 Water Conservation Research Activities Continued

Aqueduct Leak Detection Project

With partial funding from a USBR grant, EBMUD is demonstrating the use of specialized water leak detection equipment on large pipelines and aqueducts where traditional equipment does not work. EBMUD tested three different acoustic technologies on the same and similar pipelines and compared the benefits and weaknesses of each method. One technology deemed to be more cost-effective was selected for a second phase inspection on a larger number of pipelines. During the study, approximately 86 miles were surveyed, and numerous leaks were identified. The technology was also used as a method to help inform pipeline condition assessment and prioritize pipe replacements and repair strategies.

Fixed Network Leak Detection Project

With partial funding from a USBR grant, EBMUD is demonstrating the use of leak detection technology utilizing remote sensors that can detect leaks in pipelines and can then report the information to EBMUD without requiring a field visit. This project is expected to monitor approximately 20 miles of pipeline in the same area as an Advanced Metering Infrastructure Pilot and may use the same telemetry equipment.

WaterSmart Advanced Metering Infrastructure (AMI) Pilot

With partial funding from the USBR and DWR grants, EBMUD is investigating the conservation potential of using AMI technology in conjunction with a web interface. The WaterSmart Toolbox web interface allows customer to monitor their yearly, monthly, daily, and even hourly water usage on a user-friendly web interface. The toolbox also provides corresponding weather information, can send users emails when they have leaks or exceed user-defined water budgets, and also offers friendly tips on ways to save water. Aside from saving water directly, the goal of the study is to better define the conservation of this technology for future use and to optimize savings and customer services.

Combined AMI and ET Controller Project

With partial funding from the USBR, EBMUD is investigating the use of Evaporation (ET) Controller technology with customers that have the WaterSmart Toolbox and AMI technology. These users will be better able to ascertain the performance of their ET technology and hopefully improve the savings potential of both technologies.

System Operations Review and AMI Implementation Plan

With partial funding from the USBR, EBMUD is conducting a review of its system performance and water losses, identifying ways to optimize this performance, and reducing overall leakage. The potential benefits of using an AMI system to optimize the system will be studied. The project will then identify the best way to implement this AMI technology to maximize system performance as well as meter reading processes.

American Water Works Association Research Foundation on the efficacy of water budget-based rate structures as a tool to provide a meaningful price signal to increase water use efficiency and manage drought response.

Table 6-6 lists research projects that EBMUD is currently pursuing. A comprehensive list of EBMUD Research Projects is included in Appendix I-2.

Regulatory Programs

EBMUD's Water Service Regulations include a number of water-efficiency requirements to enhance supply reliability. A number of these regulations govern all water use.

Water-Efficiency Requirements

In 2007, EBMUD adopted a new water service regulation, Section 31 (Appendix F), that identifies water-efficiency requirements for water service and a procedure for notifying applicants that water-efficiency measures are required. Water service shall not be furnished to any applicant for new or expanded service unless all the applicable water-efficiency measures described in this regulation are installed at the applicant's expense. Applicants for expanded service may be required to retrofit existing water service facilities or uses to comply with these requirements. Applicants are required to maintain design documents and construction and installation records and furnish a copy of said documents and records to EBMUD upon request. EBMUD may inspect the installation of water-efficiency measures to verify that the items are installed and performing to the required water use levels.

EBMUD has also adopted a new water service regulation on applying for service, Section 2 (Appendix F), affecting multi-family and multi-space commercial/ industrial developments of three stories or less in height. Effective January 1, 2009, the new regulation requires a developer to

plumb every unit or space so that it can be individually metered by EBMUD at an approved metering site. EBMUD will require individual metering of each separate unit in a structure of three stories or less in height, whenever it is feasible in the opinion of EBMUD to do so. Individual metering of each unit or space would be required regardless of their number in the structure or how the hot water is supplied. For example, if the hot water to each apartment or commercial space is supplied by a common boiler, then the cold water supply for each unit must be metered by EBMUD at the approved metering site and the hot water will be metered separately as a "house" or landlord meter.

Landscape Plan Review

EBMUD's services complement the DWR's 2009 Updated Model Water Efficient Landscape Ordinance, which is codified in Title 23 of the California Code of Regulations (Sections 490-495) and required by the Water Conservation in Landscaping Act. From 1995-2000, EBMUD has offered voluntary plan review for non-residential new construction projects at the time new service connections are requested. All projects with new service connections of three inches or larger were encouraged to submit plans to the Water Conservation Division for review and comment. Since 2007, as part of its review and approval of proposed new water service to landscape projects, EBMUD determines compliance with water-efficiency requirements, such as minimized overspray and run-off, appropriate use and groupings of plants, and required automatic irrigation systems and schedules.

EBMUD works with cities and counties within its water service area to support local and state landscape ordinances through landscape plan review requirements and services for all new water service accounts. EBMUD also provides voluntary plan review for existing customers upon request. All plans are reviewed for irrigation system efficiency and scheduling, if provided, and for plant selection and planting design. Comments are returned to the jurisdiction that submitted the plan for EBMUD's review.

SUPPLY-SIDE CONSERVATION

DISTRIBUTION AND RAW WATER SYSTEM LOSS ACCOUNTING

EBMUD's water distribution system includes approximately 4,100 miles of pipe. EBMUD implements best practices to manage water losses for the supply-side of the distribution

TABLE 6-7 DISTRIBUTION WATER LOSSES AND RAW WATER LOSSES ACCOUNTING

DISTRIBUTION WATER LOSSES	APPARENT LOSSES	UNAUTHORIZED CONSUMPTION E.G. THEFT – ILLEGAL TAPS, UNAUTHORIZED FIRE HYDRANT USE (UNMETERED CONSTRUCTION CREWS, ILLEGAL HYDRANT OPENINGS)
		CUSTOMER METERING INACCURACIES E.G. METER ERROR ADJUSTMENTS
		SYSTEMATIC DATA HANDLING ERRORS E.G. ERRORS THAT OCCUR ANYWHERE FROM THE TIME THE METER READING IS REGISTERED TO THE FINAL REPORTING AND USE OF THE CONSUMPTION DATA
	REAL LOSSES	LEAKAGE ON MAINS E.G. TRANSMISSION AND DISTRIBUTION PIPELINE LEAKAGE AND BREAKS
		LEAKAGE AND OVERFLOWS AT STORAGES E.G. LOSSES FROM OPEN-CUT RESERVOIRS, STORAGE TANKS, AND TERMINAL STORAGE RESERVOIRS
		LEAKAGE ON SERVICE CONNECTIONS UP TO CUSTOMER METERING E.G. LOSSES ON LATERALS FROM DISTRICT MAIN TO CUSTOMER METER
RAW WATER LOSSES	APPARENT LOSSES	UNAUTHORIZED USE
		METERING INACCURACIES E.G. METER ERROR ADJUSTMENTS
	REAL LOSSES	LEAKAGE ON AQUEDUCTS AND RAW WATER PIPELINES E.G. AQUEDUCT LEAKAGE AND BREAKS, REAL LOSSES IN THE WATER TREATMENT PLANTS
		LEAKAGE AT WATER TREATMENT PLANTS E.G. REAL LOSSES AT THE WATER TREATMENT PLANTS

NOTE:
Components adopted from American Water Works Association (AWWA) and International Water Association Audit Components.

and raw water systems. Modeled after the American Water Works Association (AWWA) Water Audits standards, EBMUD has a protocol for identifying and assessing water losses. The supply-side management program is integral to operating and maintaining the water system and is critical to ensuring efficient management of EBMUD's limited water supply. A standardized procedure to account for all losses in the distribution and raw water systems helps EBMUD understand the nature of those water losses such that it can take appropriate action to reduce them. EBMUD has also identified and made staff accountable for measuring, collecting, assessing, retrieving, validating, and reporting data on District water supply losses.

The difference between the volume of water produced at the treatment plants (also called Distribution System Input) and the sum of all billed and unbilled authorized consumption (also called Authorized Consumption) is termed Distribution Water Losses. Distribution Water Losses consist of all apparent losses and all real losses in the distribution system. Apparent losses are the total losses of treated water from unauthorized consumption (theft), inaccuracies associated with customer metering, and systematic data handling errors. All real losses are the total physical losses of treated water from storage system overflows or draining, main and service line breaks, and background leakages. EBMUD's Distribution Water Losses from 2001-2010 are around 11 percent.

Raw water losses consist of apparent losses and real losses in the raw water system. Raw water apparent losses are the total losses of raw water due to raw water meter errors, unauthorized use from theft, and transmission line blow-offs and flushings. Raw water real losses are the total physical losses of raw water that include overflows and leakage up to and at the water treatment plants, such as leaks and breaks from aqueducts, transmission lines, or other parts of the raw water distribution system, and water treatment plant losses. Table 6-7 summarizes several examples of both distribution water losses and raw water losses.

Distribution water losses and raw water losses are part of non-revenue water. The benefits of managing and minimizing non-revenue water include:

- reducing demand on scarce water supplies and minimizing the need to develop an additional supply;
- reducing water and revenue losses;
- reducing pumping and treatment costs;
- increasing knowledge of the distribution system; and
- reducing property damage through improved maintenance.

Leak Detection

EBMUD controls water loss using a variety of efforts. The first is to identify the magnitude and source of that loss. The second is to review accuracy of meters used to measure system inflow and outflow. The third is to develop an appropriate leak detection program. The fourth is to have a reasonable program to respond to identified leaks. The final step is a pipe replacement program that helps to ensure a tight distribution system. Techniques used to locate leaks include visual inspections, sonic leak detection (in both the pipe and externally connected devices), and customer reports. EBMUD crews are equipped with electronic sound detection equipment to routinely detect leaks in the field.

EBMUD is conducting two pilot projects looking at new and developing technology in distribution pipeline leak detection. These projects will find leaks in pipelines and allow EBMUD to fix them before water is seen on the street. Both of these projects identify leaks using acoustic technology that recognizes the sound made by a small leak in a pipeline. One project tests the performance with sonic probes placed on the inside of large pipelines or hydrophones connected to available taps (such as hydrants and air valves) on the pipelines while water is flowing through them. The second project tests the performance with sonic probes placed at fixed locations on the outside of smaller pipelines instead. The pilot studies are partially funded with grants from the USBR. Field work was completed in 2010, and the final reports are anticipated to be completed in 2011.

Pipe Replacement

Many conditions affect the rate of deterioration of pipelines in the distribution system, including pipe type and size, soil conditions, and ground movement. As a result of systematic replacement of the most troublesome pipes in the system, use of cathodic protection, and improved leak detection methods, the system has a relatively stable leak rate where the rate of overall system deterioration has been stabilized to minimize impacts over time. The Pipeline Replacement Program identifies potential main failures and renews those pipelines in need of replacement based on maintenance histories and leak records.

FOUNDATIONAL AND PROGRAMMATIC BMPS

TABLE 6-8

FOUNDATIONAL BMPS - BMPS CONSIDERED TO BE ESSENTIAL WATER CONSERVATION ACTIVITIES.

NEW BMP CATEGORY	OLD BMP NAME
A. UTILITY OPERATIONS PROGRAMS	
1.1 OPERATIONS PRACTICES	WHOLESALE AGENCY ASSISTANCE PROGRAM (N/A)
	CONSERVATION COORDINATOR (EBMUD STAFFS AND MAINTAINS THE POSITION OF WATER CONSERVATION COORDINATOR.)
	WATER WASTE PROHIBITION
1.2 WATER LOSS CONTROL	SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR
1.3 METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS	METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS (ALL SERVICE CONNECTIONS WITHIN EBMUD SERVICE AREA ARE METERED.)
1.4 RETAIL CONSERVATION PRICING	CONSERVATION PRICING (EBMUD MAINTAINS RATE STRUCTURE CONSISTENT WITH BMP'S DEFINITION OF CONSERVATION)
B. EDUCATION PROGRAMS	
2.1 PUBLIC INFORMATION PROGRAMS	PUBLIC INFORMATION PROGRAMS
2.2 SCHOOL EDUCATION PROGRAMS	SCHOOL EDUCATION PROGRAMS

PROGRAMMATIC BMPS - BMPS THAT PROMOTE NEW INITIATIVES IN WATER CONSERVATION.

NEW BMP CATEGORY	OLD BMP NAME
A. RESIDENTIAL	WATER SURVEY PROGRAMS FOR SINGLE-FAMILY AND MULTI-FAMILY RESIDENTIAL CUSTOMERS
	RESIDENTIAL PLUMBING RETROFIT
	HIGH-EFFICIENCY CLOTHES WASHING MACHINE FINANCIAL INCENTIVE PROGRAMS
B. COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL	RESIDENTIAL ULFT REPLACEMENT PROGRAMS
	CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CII) ACCOUNTS SCHOOL EDUCATION PROGRAMS
C. LANDSCAPE	LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

CORROSION CONTROL

EBMUD's corrosion control program has been active since its inception in 1923. The corrosion control program extends the useful life of EBMUD pipelines by installing and upgrading cathodic protection systems. The program, covering the Mokelumne Aqueducts and distribution piping and facilities, effectively reduces corrosion and related deterioration of EBMUD's infrastructure, resulting in substantial leak reduction and reduced loss of water. The Mokelumne Aqueduct pipelines have an extensive corrosion control system with 44 individual impressed current cathodic protection systems and approximately 650 test locations to monitor the levels of corrosion control. The distribution system pipelines are protected from corrosion by 155 impressed current cathodic protection stations and over 1,300 galvanic anode stations. These systems are continually monitored to ensure proper operation. This program has resulted in a continual reduction in leaks on both cast iron and steel pipes. Internal corrosion in these pipelines is controlled with lime additions to the water system to raise pH levels. Designs for all structures are carefully reviewed to select proper coatings, materials, and other corrosion control measures to maximize the life of EBMUD facilities and pipelines.

BEST MANAGEMENT PRACTICES

EBMUD is a founding author of the "Memorandum of Understanding Regarding Urban Water Conservation in California" (MOU), administered by the California Urban Water Conservation Council (CUWCC) and first adopted September 1991 and last amended June 2010. As a long-standing member of the CUWCC, EBMUD has remained in compliance with the MOU in the implementation of water conservation Best Management Practices (BMPs). A BMP is a policy, program, practice, rule, regulation or ordinance, or the use of devices, equipment, or facilities that results in the efficient use or conservation of water as an established and generally accepted practice among water suppliers.

The Council's 14 BMPs instituted before the 2010 MOU amendment are now organized into five new categories. Two categories, Utility Operations and Education, are "Foundational BMPs". The remaining three categories, 1) Residential, 2) Commercial, Industrial, and Institutional (CII), and 3) Landscape, are "Programmatic BMPs". Foundational BMPs are further divided into sub-categories. Conservation practices which currently meet the definition of a BMP, as per the MOU are listed in Table 6-8, are discussed in this Plan.

EBMUD currently implements all of the identified BMPs as well as a number of additional conservation measures that go beyond the BMPs. EBMUD's compliance with the 2009 and 2010 Urban Water Conservation MOU coverage requirements for programmatic BMP implementation is presented in a tabular format in Appendix I-1. On-going upgrades to the CUWCC reporting database preclude the use of the CUWCC reporting format. Overall, EBMUD has self-certified that its water conservation achievements to date are on-track, ahead of schedule or have reached 100% completion for all established BMP, Flex Trak or GPCD coverage requirements.

Conservation In The Future

Water conservation is a central component of EBMUD's long-term water supply planning efforts which seek to address issues that impact the reliability of EBMUD's water supply now and in the future. EBMUD is committed to continue investing in water conservation programs to meet EBMUD's water conservation goals, to provide a reliable water supply, and to help meet the statewide per capita water use reduction goals of SBx7-7. Developed as part of the implementation plan with water recycling efforts for compliance with SBx7-7, the WCMP outlines the various conservation programs that will assure EBMUD achieves its water use targets.

Looking at water demand and supply projections, the contribution of conservation to water supply is evident. Conservation and water recycling are expected to account for 26 percent of projected demand not met by Mokelumne River, Freeport Regional Water Project, and Bayside supplies. In normal rainfall years, conservation will play an important role in the future reliability of supply and will reduce the frequency of shortages. A further discussion on projected water supply is presented in Chapter 4 and Figure 4-10.

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Appendix A. Urban Water Management Planning Act

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CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

All California Codes have been updated to include the 2010 Statutes.

WATER CODE
SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact

on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

WATER CODE SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city

and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

WATER CODE SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water

supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

WATER CODE SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.
(2) A schedule of implementation for all water demand management measures proposed or described in the plan.
(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall

determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of

the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic

sequence for the agency's water supply.
(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
(6) Penalties or charges for excessive use, where applicable.
(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
(8) A draft water shortage contingency resolution or ordinance.
(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.
(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:
(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
(e) The projected use of recycled water within the supplier's

service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

WATER CODE SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

WATER CODE
SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section

10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

WATER CODE
SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the

"Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

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Appendix B. Public Notice

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Appendix B. Public Notice

EBMUD published public notices in the following newspapers on the dates indicated below. A sample declaration of the published notices is provided in subsequent pages of this appendix.

Table B-1 Legal Notice Advising of the Second Comment Period Extension

Date (2011)	Alameda Newspaper Group	Contra Costa Newspaper Group	Sacramento Bee	Calaveras Enterprise	Amador Ledger	Lodi News Sentinal	Stockton Record
Monday, May 9						■	
Tuesday May 10				■	■		
Thursday, May 12							
Friday, May 13	■	■	■	■	■	■	■
Saturday, May 14	■	■	■			■	■
Sunday, May 15	■	■	■				■
Monday, May 16						■	
Tuesday, May 17				■	■		
Thursday, May 19							
Friday, May 20	■	■	■	■	■	■	■
Saturday, May 21	■	■	■			■	■
Sunday, May 22	■	■	■				■

Legal Notice Advising of the Hearing Postponement and Comment Period Extension

Date (2011)	Alameda Newspaper Group	Contra Costa Newspaper Group	Sacramento Bee	Calaveras Enterprise	Amador Ledger	Lodi News Sentinal	Stockton Record
Thursday, April 21							
Friday, April 22	■	■	■	■		■	■
Saturday, April 23	■	■	■			■	■
Sunday, April 24	■	■	■				■
Monday, April 25						■	
Tuesday, April 26				■			
Thursday, April 28							
Friday, April 29	■	■	■	■	■	■	■
Saturday, April 30	■	■	■			■	■
Sunday, May 1	■	■	■				■
Monday, May 2						■	
Tuesday, May 3				■	■		
Thursday, May 5							
Friday, May 6					■		

Legal Notice Announcing the Publication of the Draft UWMP

Date (2011)	Alameda Newspaper Group	Contra Costa Newspaper Group	Sacramento Bee	Calaveras Enterprise	Amador Ledger	Lodi News Sentinal	Stockton Record
Tuesday, April 12				■	■		
Thursday, April 14							
Friday, April 15	■	■	■	■	■	■	■
Saturday, April 16	■	■	■			■	■
Sunday, April 17	■	■	■				■
Monday, April 18						■	

The Sacramento Bee

P.O. Box 15779 • 2100 Q Street • Sacramento, CA 95852

RECEIVED
MAY 24 2011
SECRETARY'S OFFICE

EAST BAY MUNICIPAL UTILITY DIST
375 11TH ST ms806
OAKLAND, CA 97607

DECLARATION OF PUBLICATION
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interest ed in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 379071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

May 13, 14, 15, 20, 21, 22, 2011

I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on **May 22, 2011.**

(Signature)

NO 482 PUBLIC NOTICE

NOTICE OF SECOND COMMENT PERIOD EXTENSION

East Bay Municipal Utility District
Draft Urban Water Management Plan 2010,
2010 Water Shortage Contingency Plan, and
SBx7-7 Implementation Plan.

THIS IS TO ADVISE YOU THAT, IN RESPONSE TO A REQUEST FROM THE PUBLIC, THE COMMENT PERIOD FOR THE DRAFT UWMP 2010 HAS BEEN EXTENDED FOR A SECOND TIME. AN UPDATED DRAFT UWMP 2010 WAS RELEASED ON MAY 6, 2011 AND THE PUBLIC REVIEW AND COMMENT PERIOD WILL NOW END ON MAY 31, 2011.

The Urban Water Management Plan (UWMP) brings together important information on water supply and usage, recycled water and conservation programs at East Bay Municipal Utility District (EBMUD). In accordance with the statutory requirements, EBMUD is updating its 2005 UWMP to reflect current conditions and legislation including requirements established in SBx7-7, Water Conservation Act of 2009. The UWMP presents EBMUD's efforts to promote efficient water use consistent with the California Urban Water Management Planning Act as part of the California Water Code.

EBMUD will review and consider all comments received (or postmarked) by May 31, 2011, 4:30pm. All written comments should be submitted to Suzie Corralejo by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the Updated Draft UWMP 2010 are available at the public libraries located within the EBMUD service area, the California State Library, and the plan is posted onwww.ebmud.com. Additionally copies may be requested by contacting Suzie Corralejo by telephone at 510-287-0109, by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

The UWMP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled EBMUD Board meeting, beginning at 1:30 pm on June 28, 2011, in the Board Room, EBMUD Administration Building, 375 Eleventh Street, Oakland, California. The next revision to the UWMP will occur no earlier than 2015.

5/13, 5/14, 5/15, 5/20, 5/21, 5/22
Lynelle M. Lewis
Secretary of the District

The Sacramento Bee

P.O. Box 15779 • 2100 Q Street • Sacramento, CA 95852

EAST BAY MUNICIPAL UTILITY DIST
375 11TH ST MS806
OAKLAND, CA 97607

DECLARATION OF PUBLICATION
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interest ed in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 379071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

April 29, 30, 2011 &
May 1, 2011

I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on **May 1, 2011**

(Signature)

NO 453 PUBLIC NOTICE

NOTICE OF HEARING AND COMMENT PERIOD EXTENSION

East Bay Municipal Utility District Draft Urban Water Management Plan 2010, 2010 Water Shortage Contingency Plan, and SBx7-7 Implementation Plan.

THE UPDATED DRAFT UWMP 2010 WILL BE RELEASED ON MAY 6, 2011 AND THE PUBLIC REVIEW AND COMMENT PERIOD IS EXTENDED THROUGH MAY 20, 2011. A PUBLIC HEARING ON THE DRAFT UWMP 2010 WILL NOW BE HELD DURING THE REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:30 PM ON MAY 10, 2011 IN THE BOARD ROOM, EBMUD ADMINISTRATION BUILDING, 375 ELEVENTH STREET, OAKLAND, CALIFORNIA.

The Urban Water Management Plan (UWMP) brings together important information on water supply and usage, recycled water and conservation programs at East Bay Municipal Utility District (EBMUD). EBMUD is updating its 2005 UWMP to reflect current conditions and legislation including requirements established in SBx7-7, Water Conservation Act of 2009. The UWMP presents EBMUD's efforts to promote efficient water use consistent with the California Urban Water Management Planning Act as part of the California Water Code.

The May 10 hearing will provide the public an opportunity to comment on EBMUD's UWMP, Water Shortage Contingency Plan, and SBx7-7 Implementation Plan. EBMUD will review and consider all comments received (or postmarked) by May 20, 2011, 4:30pm. All written comments should be submitted to Suzie Corralejo by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the Updated Draft UWMP 2010 will be available at the public libraries located within the EBMUD service area, and at the California State Library, and will also be posted on www.ebmud.com on May 6, 2011. Additionally copies may be requested by contacting Suzie Corralejo by telephone at 510-287-0109, by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

The UWMP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled EBMUD Board meeting, beginning at 1:30 pm on June 28, 2011, in the Board Room, EBMUD Administration Building, 375 Eleventh Street, Oakland, California. The next revision to the UWMP will occur no earlier than 2015.

Lynelle M. Lewis
Secretary of the District

The Sacramento Bee

P.O. Box 15779 • 2100 Q Street • Sacramento, CA 95852

EAST BAY MUNICIPAL UTILITY DIST
375 11TH ST
OAKLAND, CA 97607

DECLARATION OF PUBLICATION
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 379071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

April 22, 23, 24, 2011

I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on **April 24, 2011**

(Signature)

NO 480 PUBLIC NOTICE

NOTICE OF HEARING POSTPONEMENT AND COMMENT PERIOD EXTENSION

East Bay Municipal Utility District Draft Urban Water Management Plan 2010, 2010 Water Shortage Contingency Plan, and SBx7-7 Implementation Plan.

THIS IS TO ADVISE YOU THAT THE PUBLIC HEARING SCHEDULED TO BEGIN AT 1:45 PM ON APRIL 26, 2011 IN THE BOARD ROOM, EBMUD ADMINISTRATION BUILDING, 375 ELEVENTH STREET, OAKLAND, CALIFORNIA HAS BEEN CANCELLED. EBMUD IS REVISING THE DRAFT UWMP 2010, WITH A NEW SCHEDULE AS FOLLOWS.

THE UPDATED DRAFT UWMP 2010 WILL BE RELEASED ON MAY 6, 2011 AND THE PUBLIC REVIEW AND COMMENT PERIOD IS EXTENDED THROUGH MAY 20, 2011. A PUBLIC HEARING ON THE DRAFT UWMP 2010 WILL NOW BE HELD DURING THE REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:30 PM ON MAY 10, 2011 IN THE BOARD ROOM, EBMUD ADMINISTRATION BUILDING, 375 ELEVENTH STREET, OAKLAND, CALIFORNIA.

The Urban Water Management Plan (UWMP) brings together important information on water supply and usage, recycled water and conservation programs at East Bay Municipal Utility District (EBMUD). EBMUD is updating its 2005 UWMP to reflect current conditions and legislation including requirements established in SBx7-7, Water Conservation Act of 2009. The UWMP presents EBMUD's efforts to promote efficient water use consistent with the California Urban Water Management Planning Act as part of the California Water Code.

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Copies of the updated Draft UWMP 2010 will be available at the public libraries located within the EBMUD service area, and at the California State Library, and will also be posted on www.ebmud.com on May 6, 2011. Additionally copies may be requested by contacting Suzie Corralejo by telephone at 510-287-0109, by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

The UWMP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled EBMUD Board meeting, beginning at 1:30 pm on June 28, 2011, in the Board Room, EBMUD Administration Building, 375 Eleventh Street, Oakland, California. The next revision to the UWMP will occur no earlier than 2015.

Lynelle M. Lewis
Secretary of the District

The Sacramento Bee

P.O. Box 15779 • 2100 Q Street • Sacramento, CA 95852

EAST BAY MUNICIPAL UTILITY DIST
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DECLARATION OF PUBLICATION
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 379071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

April 15, 16, 17, 2011

I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on **April 17, 2011**

(Signature)

NO 479 PUBLIC NOTICE

East Bay Municipal Utility District Draft Urban Water Management Plan 2010, 2010 Water Shortage Contingency Plan, and SBx7-7 Implementation Plan.

To be released for public review and comment beginning on April 15, 2011 AND ENDING on May 6, 2011. A public Comment meeting on the uwmp will be held on april 21, 2011 at 6:00 pm. In addition, A public hearing will be held during the regularly scheduled EBMUD Board meeting beginning at 1:45 pm on April 26, 2011. The Hearing and the comment meeting will be held in the Board Room, EBMUD Administration Building, 375 Eleventh Street, Oakland, California.

The Urban Water Management Plan (UWMP) brings together important information on water supply and usage, recycled water and conservation programs at East Bay Municipal Utility District (EBMUD). EBMUD is updating its 2005 UWMP to reflect current conditions and legislation including requirements established in SBx7-7, Water Conservation Act of 2009. The UWMP presents EBMUD's efforts to promote efficient water use consistent with the California Urban Water Management Planning Act as part of the California Water Code.

The April 21 comment meeting and the April 26 hearing will provide the public an opportunity to comment on EBMUD's UWMP, Water Shortage Contingency Plan, and SBx7-7 Implementation Plan. EBMUD will review and consider all comments received at the hearing, comment meeting and written comments received (or postmarked) by May 6, 2011, 4:30pm. All written comments should be submitted to Suzie Corralejo by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP may also be downloaded from www.ebmud.com, or copies may be requested by contacting Suzie Corralejo by telephone at 510-287-0109, by email to scorrale@ebmud.com, or by mail to: Attn: Ms. S. Corralejo, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

The UWMP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled EBMUD Board meeting, beginning at 1:45 pm on June 28, 2011, in the Board Room, EBMUD Administration Building, 375 Eleventh Street, Oakland, California. The next revision to the UWMP will occur no earlier than 2015.

Dated: April 15, 16, 17, 2011
Lynelle M. Lewis
Secretary of the District

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Appendix C. Comments and Responses

Appendix C–Table of Contents

In addition to changes identified in the responses to comments above, editorial and clarification changes were made throughout the document.

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APPENDIX C. COMMENTS AND RESPONSES

Tom Infusino, et. al.

Date Comment Received: 05/31/2011
Name of Organization/ Agency/ Individual: Tom Infusino on behalf of the Foothill Conservancy, California Sportfishing Protection Alliance, and Friends of the River

Comment:

From: Tom Infusino [mailto:tomi@volcano.net]
Sent: Tuesday, May 31, 2011 3:35 PM
To: Corralejo, Suzanne
Subject: Comments on the 2010 DUWMP

Dear Ms. Corralejo:

Attached are comments on the Draft Urban Water Management Plan. Please contact me if you have any trouble opening the attachment.

Sincerely,

Tom Infusino

Thomas P. Infusino
P.O. Box 792
Pine Grove, CA 95665
tomi@volcano.net
(209) 295-8866

5/31/11

East Bay Municipal Utility District
Water Resources Planning
Attn: S. Corralejo
P.O. BOX 24055, MS #901
Oakland, CA 94623-1055

Re: Comments on Draft Urban Water Management Plan 2010.

Dear Ms. Corralejo:

My name is Tom Infusino and I am writing on behalf of the Foothill Conservancy, California Sportfishing Protection Alliance, and Friends of the River. They encourage you to drop Pardee Expansion as a potential future water supply enhancement, and to revise the 2010 Draft Urban Water Management Plan (2010 DUWMP) to conform to the requirements of the Water Code.

As you know, the future water supply projects relied upon in the Draft 2010 Urban Water Management Plan (DUWMP) include expanding the size of Pardee and Lower Bear reservoirs by building a new dam (Pardee) and raising the heights of the existing dam (Lower Bear). The reservoirs are located in Amador and Calaveras counties. Also, the 2010 DUWMP relies on additional water supplies from the Interregional Conjunctive Use Plan + (IRCUP+). In addition to the Bear and Pardee expansions, IRCUP+ includes the construction of a reservoir at Duck Creek, which requires the condemnation of an existing California Department of Fish and Game wildlife conservation easement. Participating in the expansion of Los Vaqueros Reservoir is not listed among the supply options available to EBMUD, despite the invitation to do so by Contra Costa Water District, and a recent court ruling requiring the consideration of that alternative in EBMUD's Water Supply Management Plan 2040 (WSMP 2040) PEIR.

I. Members of the Foothill Conservancy will be harmed by your dam plans.

The Foothill Conservancy is a nonprofit organization with members who live and work in the Mokelumne River watershed. The Foothill Conservancy seeks to restore, protect, and sustain the natural and human environment in and around Amador and Calaveras Counties. The Foothill Conservancy's vision for this area includes protected scenic quality, conserved forest lands, restored natural diversity of native plants and animals, free-flowing

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rivers, coordinated land use planning, and balanced economic development that is ecologically and socially sustainable.

Our Infrastructure Planning and Development Principles ask agencies to employ demand-side management techniques, including conservation and efficiency, before taking on expensive expansion projects, and to develop infrastructure with minimal harm to the natural and built environment. Our River and Watershed Principles

- Recognize that the ecological health of our rivers and watersheds is of primary importance,
- Support National Wild and Scenic River designation for the Mokelumne River,
- Oppose new on-stream dams, and
- Encourage safe public access and recreational use of rivers.

These principles are more than currently popular platitudes. They are the culmination of wisdom learned through two decades of conservation work by the Foothill Conservancy in the Mokelumne River watershed. Over those years we played a key role in negotiating a settlement agreement for the relicensing of PG&E's hydroelectric project on the Mokelumne River, which set a national precedent; led to the breaching, dismantling or removal of three dams on North Fork Mokelumne tributary streams; and began improvements to river health and recreation. We sponsor annual Mokelumne River Cleanups. We helped secured public access to the Middle Bar reach of the Mokelumne River (below Highway 49 to Pardee Reservoir), which had been closed to public access for more than 30 years. We helped protect more than nine miles of the North Fork of the Mokelumne River by stopping the proposed Devil's Nose Dam project. We recently won a court ruling requiring EBMUD to set aside approval of its 2040 WSMP and EIR certification for failure to consider impacts from Pardee Expansion and failure to consider a broad range of alternatives.

The Foothill Conservancy has its headquarters in Amador County. Members of the Foothill Conservancy and their families have taken their place in the Sierra Nevada foothills. Like the many shoots that form a willow basket, their diverse lives and cherished memories are interwoven with the multifaceted landscape of this unique region. It is the place they work and struggle, where they stick out the hot summers and the muddy winters. They endure lower incomes, limited career opportunities and inadequate levels of public service because they love our landscape and quality of life.

The Mokelumne River is one of the special places that bind our members to the land. Members of the Foothill Conservancy rely on the Mokelumne River and its watershed not only as a source of water, but as a place of residence, business, recreation and spiritual renewal. It is where young couples meet and fall in love. It is where they take long walks to discuss their future. It is where they run the rapids. It is where their children will catch their first trout, and learn about rivers and nature. It is where they live today, and where they will be laid to eternal rest tomorrow.

The uses made of the Mokelumne River watershed by members of the Foothill Conservancy, and by the public at large, will be impaired by the proposed foothill dams.

Expanding Pardee as proposed would inundate the Middle Bar Reach recreation area, valued for whitewater rafting and kayaking, fishing, gold panning, wildflower viewing, family picnics, bird watching, and historic and cultural resources and Native American cultural activities. Expanding Pardee would remove the Middle Bar Bridge, eliminating a first responder access and a resident evacuation route in the event of a wildland fire, putting lives and property at grave risk, and increasing the likelihood of catastrophic wildland fire on EBMUD’s watershed lands with resulting harm to EBMUD’s water quality.

Furthermore, members of the Foothill Conservancy suffer from local political arenas too often focused on divisive debate over controversial projects thrust upon us by outside interests, and too infrequently focused on making progress in our broad fields of agreement for the good of the local citizenry. EBMUD’s proposed foothill projects drag our communities’ energies away from making progress on water supplies we agree on and force us to focus time and money on fighting another colonial raid on our resources.

We urge EBMUD to withdraw the Pardee Expansion from further consideration as a component of its 2010 UWMP. The project is included in the plan to meet water needs that are not adequately demonstrated, using water that will likely not be available for diversion above the Sacramento-San Joaquin Delta. The project will harm the communities,

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economy, and natural environment of our foothill counties. And it plainly conflicts with the stated objectives of the Urban Water Management Planning Act.

II. Drop Pardee Expansion (PE) from the 2010 Urban Water Management Plan. TI-1

A) Drop PE because it is not consistent with the intent of the UWMP Act.

The amendments to the UWMP Act over the last decade reflect two key beliefs of the California State Legislature. The first is that, "[T]he people of California will best be served by meeting municipal, agricultural and environmental water needs of each hydrologic region to the maximum extent practicable without diminishing the resources of other regions that are necessary to meet the present and future needs of those regions." The second is that, "The health, safety, and well-being of the people of the State of California will best be served by employing current and developing water treatment and conservation technologies." (Stats of 2001, c. 320 (S.B. 672).) "Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses." (Water Code, sec. 10608.)

Given the State's focus on regional self-sufficiency, the use of new technologies and management practices, and the desire to avoid harm to other regions, it seems inconceivable that EBMUD's response in the 2010 DUWMP is to rebuild its 20th century dam and to further harm the foothill region. Right in EBMUD's own backyard, Contra Costa Water District is expanding a state-of-the-art low-impact water storage facility, with room to grow to accommodate EBMUD's needs. If EBMUD feels the need for a new storage facility, Los Vaqueros Expansion (LVE) is the modern local alternative that EBMUD should pursue. Please include LVE as a possible future supply in the final 2010 UWMP.

B) Drop PE from the 2010 DUWMP because it does not provide the water supply security that your constituents want.

One of the important topics discussed in an UWMP is water supply reliability. (Water Code, secs. 10631, subd. (c) and 10635.) During the 2040 WSMP process, EBMUD hand picked a Community Liaison Committee to review future policies and water supply options. The water supply portfolio concept that got the most support from the CLC was the proposal to develop a new source of water storage closer to EBMUD's customers, not on the other side of the geologically unstable Central Valley. Pardee Expansion does not provide this key element of water supply security to EBMUD customers (a need, incidentally, recognized by EBMUD since the 1950s). Please drop Pardee Expansion from the 2010 DUWMP. Los Vaqueros Expansion would give your customers the security to know that a major component of their water storage is close at hand. Please include LVE as a possible future supply enhancement in the final 2010 UWMP.

C. Drop PE from the 2010 DUWMP because your Board already knows PE is neither needed nor desirable.

An important focus of an UWMP is the comparison of future supply and future demand. (Water Code, sec. 10631, subds. (a - h).) During the 2040 WSMP hearing, members of the EBMUD Board correctly assessed that Pardee Expansion was an unnecessary water supply source, that its construction and operation would be unnecessarily harmful to people and the environment, and that its inclusion in EBMUD plans would lead to litigation and strained relations with foothill interests. These Board members were right on all three counts. If EBMUD simply uses its 2002 growth projections and its 25 percent rationing policy, there is no need to include Pardee Expansion in future water plans. EBMUD's inclusion of Pardee Expansion in the 2040 WSMP did lead to strained relations and litigation. As noted by the court in *Foothill Conservancy, et al. v. EBMUD*, the Pardee Expansion has the potential to significantly impact public safety, Miwok cultural practices, and river recreation. Please do not make the same mistake again. Please leave Pardee Expansion out of the 2010 UWMP.

III. EBMUD must comply with the many provisions of the UWMP before it can qualify for state grants and loans. TI-2

The Urban Water Management Plan Act compels water suppliers to evaluate current and future water demand, evaluate current and future water supply, describe opportunities for water transfers, implement feasible water conservation measures, plan for responding to droughts, and reduce the water rate hardships of low-income customers.

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Unfortunately, even after 20 years of implementation, water suppliers have done a poor job of completing and implementing urban water management plans. In its report to the Legislature in 2006, the Department of Water Resources indicated that, of the 460 water suppliers required to file an UWMP in 2005, 166 didn't even manage to file a plan. Of the 139 plans reviewed by DWR, only 39 plans (28 percent) were complete. Over half the plans reviewed lacked a water shortage contingency plan, a recycled water plan, or a plan to implement 10 of the 14 proposed demand management measures. (DWR, Summary of the Status of 2005 Urban Water Management Plans, pp. A-12 and B-1.) Considering that the completion and implementation of these plans is critical to California's future water supply for people, for the environment, and for economic growth; these dismal compliance numbers are appalling.

To create a disincentive for non-compliance, the Legislature has now determined that failure to complete an UWMPA and implement its demand management plan may result in a water supplier being ineligible for state grants and loans. (Water Code, secs. 10631.5 and 10656.)

IV. We have the following comments regarding specific provisions of the 2010 DUWMP.

A) Chapter 1: General Information.

Page 1-4: The plan states that population growth in the EBMUD service area will increase from 1,474,000 in 2015 to 1,751,000 in 2035. That is an increase of 18.8 percent. However, during this same period (by 2020), the State of California is trying to reduce per capita customer demand by 20 percent. EBMUD seeks to take advantage of compliance options to limit its per capita reduction to only 12.7 percent (from 165 to 144 GPCD). However, if EBMUD instead continued to do its part, and reduced per capita demand by the full 20 percent (from 165 to 132 GPCD), it could absorb the projected population increase without the need for costly water supply enhancements. Right now, EBMUD's current use averages 130 GPCD. Why not strive to keep the GPCD low?

TI-3

Page 1-4: The plan provides run-off statistics for the Mokelumne watershed, but not for the watersheds in the EBMUD service area. The report should identify the amount of stormwater runoff that is captured in the Bay Area. Rather than running this water through stormdrains and disposing of it as untreated discharge to the Bay, this water could be treated and used for landscape irrigation, industrial purposes and other beneficial uses. It is the intent of the California Legislature that each hydrologic region seek to meet its own needs first, before taking or despoiling the resources of other regions. Please add the run-off information in the final 2010 UWMP, and identify a program for stormwater collection, treatment, and use.

TI-4

B) Chapter 2: Water Supply and Water Supply Planning.

Page 2-1: The plan states:

> "In the long-term, during drought periods, the Mokelumne River cannot meet EBMUD's projected customer demands, even with an 'up to 15%' rationing imposed under EBMUD's Board Policy 9.03 (see Appendix F) and use of existing dry-year supplemental supplies."

The change from 25 percent dry-year rationing to 15 percent dry-year rationing was made by the EBMUD Board in the 2040 WSMP. EBMUD has been directed by the California Superior Court to set aside certification of the 2040 WSMP Program EIR, and "and all related project approvals." (Judge Timothy M. Frawley, Peremptory Writ of Mandate, *Foothill Conservancy et al. v. EBMUD*, 5/25/11, p. 1.) Thus, pending completion of the 2040 WSMP PEIR, EBMUD's 2010 UWMP and the analyses therein must not presume a reduction to a 15 percent rationing level during droughts. The presumption of the 15 percent rationing level would effectively reinstate the 2040 WSMP prior to completion of the PEIR, in violation of CEQA and the court's writ.

TI-5

Page 2-1: The plan states that storing local run-off is limited by reservoir capacity, yet no mention is made of increasing local reservoir capacity to capture additional local runoff. It is the intent of the California Legislature that each hydrologic region seek to meet its own needs first, before taking or despoiling the resources of other regions. In the final UWMP, please identify the potential for storing, treating, and using local runoff.

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Page 2-1: The plan states:

> "Pardee Reservoir also is operated to provide recreational facilities to the public and to protect and enhance the fishery resources and ecosystem of the lower Mokelumne River."

While this is a true statement, it is far from the whole truth. The whole truth is that the operation of Pardee Reservoir has severely limited public access to the Mokelumne River for traditional public trust uses. In addition, the existence of Pardee Reservoir (and the later-constructed Camanche Reservoir downstream) prevents the migration of salmon and steelhead to their native spawning beds upstream. Please add this information to the final 2010 UWMP. Without this information, the description of Pardee Reservoir is not entirely accurate. The UMWMP should be a factual document, and as such, must include all of the pertinent facts.

TI-7

Figure 2-2: What exactly is this figure intended to show? Does it show that in an average year there is insufficient flow in the Mokelumne River to meet the maximum water allocations for all appropriators and fish releases? In the final 2010 UWMP, please provide a better discussion of the water rights held by the Mokelumne appropriators, and the impact that the future use of these rights will have on both EBMUD's supply and the amount of water remaining in the river. The environmental information is needed for the evaluation of demand management measures pursuant to Water Code, sec. 10631, subd. (g)(1).

TI-8

Page 2-5 and 2-6: The plan lists a series of supply vulnerabilities. With the exception of drought, the plan provides no indication of the historic frequency of any of the other supply interruptions over the years. Such information is essential if EBMUD is to prioritize the most pressing supply vulnerabilities and to cost-effectively improve water supply reliability.

TI-9

Page 2-7: The plan states:

> "EBMUD consistently provides the highest quality water possible. EBMUD's primary water supply from the Mokelumne River requires only limited treatment to meet or surpass health standards, because it comes from a remote, mostly undeveloped watershed and is transported within two days to the EBMUD's service area in large steel pipes."

This method of protecting water quality precludes water from flowing farther downstream to restore fisheries and riparian ecosystems. When Pardee Reservoir began operations in the late 1920s, water purification technologies were rudimentary by modern standards, and urban water diversions from the Mokelumne River were smaller. At that time, it probably made sense to grab the purest water as high in the Sierra as feasible and deliver it to Bay Area customers. However, today the water diversion demands on the Mokelumne River are much greater, and water suppliers have a host of modern technologies available to purify water diverted much farther downstream. Urban Water Management Planning is supposed to result in the use of improvements in technology and water management practices to help meet the need for water for environmental uses. (Water Code, sec. 10608, subd. (f).) Nevertheless, in the 2010 DUWMP, EBMUD does not look at taking its Mokelumne River water farther downstream from Pardee Reservoir. Nor does it explore exchange opportunities with other water suppliers to allow them to take Mokelumne River water further downstream. (Water Code, sec. 10631, subd. (d).) Please evaluate these options in the final 2010 UWMP.

TI-10

Page 2-7: The plan states:

> "As a result, the Mokelumne River supply is not exposed to common sources of contaminants such as pesticides, agricultural or urban runoff, municipal sewage, or industrial toxics."

This is not an entirely accurate statement. Urban runoff is affecting Mokelumne River water supplies even farther upstream than Pardee Reservoir. For example, the Amador Water Agency's is planning to move the water intake for its CAWP system upstream to the Tiger Creek Regulator Reservoir specifically to avoid water quality degradation from development runoff. In addition, recent studies on the Mokelumne River have identified bacterial contamination hot spots upstream of Pardee Reservoir. Also, the Pardee water supply is not immune from contamination by toxins. Right now, EBMUD is developing health warnings due to the elevated levels of mercury in the fish in Pardee Reservoir, most likely

TI-11

Tom Infusino, et. al.

from historic mining activity in the watershed. Please disclose these facts in the final 2010 UWMP.

TI-11

Page 2-17: The plan states:

> "In recognition of the extensive conservation savings that EBMUD has achieved to date and issues associated with demand hardening, EBMUD has set the rationing goal up to 15% during multi-year droughts."

The change from 25 percent dry-year rationing to 15 percent dry-year rationing was made by the EBMUD Board in the 2040 WSMP. EBMUD has been directed by the California Superior Court to set aside certification of the 2040 WSMP Program EIR, and "and all related project approvals." (Judge Timothy M. Frawley, Peremptory Writ of Mandate, *Foothill Conservancy et al. v. EBMUD*, 5/25/11, p. 1.) Thus, pending completion of the 2040 WSMP PEIR, EBMUD's 2010 UWMP and the analyses therein must not presume a reduction to a 15 percent rationing level during droughts. The presumption of the 15 percent rationing level would effectively reinstate the 2040 WSMP prior to completion of the PEIR, in violation of CEQA and the court's writ.

Page 2-20: Just like the 2040 WSMP, the 2010 DUWMP discusses the IRCUP+ as a potential supplemental water supply. The plan describes IRCUP+ as including Pardee Expansion and/or Duck Creek Reservoir as components. (See also, EBMUD, *IRCUP Terms & Conditions Agreement*, 2009.) Just like the 2040 WSMP, the 2010 DUWMP discusses enlarging EBMUD's existing facilities on the Mokelumne River. Just like the 2040 WSMP, the 2010 DUWMP makes no mention of the possibility that a Los Vaqueros Expansion could be an option for EBMUD's future water supply.

TI-12

EBMUD has been directed by the California Superior Court to set aside certification of the 2040 WSMP Program EIR, and "and all related project approvals." (Judge Timothy M. Frawley, Peremptory Writ of Mandate, *Foothill Conservancy et al. v. EBMUD*, 5/25/11, p. 1.) Thus, pending completion of the 2040 WSMP PEIR, EBMUD's 2010 UWMP and the analyses therein must *not* presume the upcountry reservoir expansions are the only ones available to supplement EBMUD's future water dry-year water supply. If EBMUD approves a legally required UWMP with a supply analysis that lists the upcountry reservoir expansions to the exclusion of LVE, it effectively reinstate the 2040 WSMP prior to completion of the PEIR, in violation of CEQA and the court's writ. It also impermissibly prejudices the selection of alternatives when the 2040 WSMP EIR is revised.

C) Chapter 3: Water Shortage Contingency Plan.

Pages 3-2 to 3-4, and 3-10: The text refers to EBMUD's 2010 change from the 25 percent dry-year rationing limit to the 15 percent dry-year rationing limit.

The change from 25 percent dry-year rationing to 15 percent dry-year rationing was made by the EBMUD Board in the 2040 WSMP. EBMUD has been directed by the California Superior Court to set aside certification of the 2040 WSMP Program EIR, and "and all related project approvals." (Judge Timothy M. Frawley, Peremptory Writ of Mandate, *Foothill Conservancy et al. v. EBMUD*, 5/25/11, p. 1.) Thus, pending completion of the 2040 WSMP PEIR, EBMUD's 2010 UWMP and the analyses therein must not presume a reduction to a 15 percent rationing level during droughts. The presumption of the 15 percent rationing level would effectively reinstate the 2040 WSMP prior to completion of the PEIR, in violation of CEQA and the court's writ.

TI-13

D) Chapter 4: Water Usage.

Page 4-2 to 4-3: The plan states that the demand figures are from the 2040 Demand Study using the land-based method, and that these figures still reflect a reasonable expectation for growth over the long to 2040.

However, there is a great risk in basing expensive future infrastructure plans on one set of demand projections. As a result, prudent planners generally look at a range of possible future demand, and then make contingency plans accordingly. This is especially prudent when EBMUD's demand estimates have *increased* greatly, but actual demand has not.

TI-14

In the past EBMUD has used the projected growth model rather than the land use based model. EBMUD shifted to the land use model in 2002, and then modified that land use model again for the 2040 plan. The 1992 data analysis based on projected growth

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estimated EBMUD gross demand in 2020 at 277 million gallons per day. (*Foothill Conservancy et al. v. EBMUD,* 66 Administrative Record (AR) 25685; 93 AR 35626) Using a land use method, the 2005 Urban Water Management Plan estimated EBMUD's gross demand in 2030 to be 281 mgd. (*Foothill Conservancy et al. v. EBMUD,* 106 AR 40299 – 40301.) That is not a major difference. However, just five years later, the Land Use Model was altered and all of a sudden the 2030 demand shot up from 281 mgd to 304 mgd, with the 2040 gross demand estimated at 312 mgd. (*Foothill Conservancy et al. v. EBMUD,* 10 AR 4312) Thus, by choosing to tweak the model, EBMUD created a 23 mgd increase in gross demand in 2030. By way of comparison, that 23 mgd is more water than any single component of the 2040 WSMP other than Conservation (39 mgd) and Pardee Expansion (51.2 mgd.) (*Foothill Conservancy et al. v. EBMUD,* 4 AR 771)

We agree that community-centered growth and infill development are likely to play an important role in future growth in the EBMUD service area. The biggest problem with these new demand figures is that they are based upon the questionable assumption that population and economic growth in the service area will *accelerate* to fill the increased available development capacity of the local-government-generated land use planning maps for the region. (Of course, another possibility is that the same rate of growth will take place and merely use up less land in the process.) The "if you map it they will come faster" theory has obvious limitations, not the least of which are the ability of such dense infill development opportunities to attract investors to build the units and consumers to purchase the units in the numbers estimated by EBMUD. Unfortunately, the huge caveat on page 3-15 of the 2040 Demand Study is rarely fully appreciated when its results are considered: "Although the total demands still reflect development per the general plans, *the timing of development and therefore demands may be slower than that projected in this study."* (Emphasis added.) However, the demand inflation did not stop there.

The 2040 WSMP EIR shows that the reduction in dry-year rationing from 25% down to 15%created the need for an additional 20 mgd of water. (*Foothill Conservancy et al. v. EBMUD,* 4 AR 774) Thus, by choosing a modified demand methodology (plus 23 mgd), and a new rationing policy (plus 20 mgd), EBMUD increased its 2040 gross water demand by 43 mgd. By way of comparison, according to the 2040 WSMP DEIR, that 43 mgd is more water than is produced by any single 2040 WSMP component other than Pardee Expansion (51.2 mgd.). (*Foothill Conservancy et al. v. EBMUD,* 4 AR 771)

In the final 2010 UWMP, please also look at the multiple dry-year demand given the prior demand model and the 25 percent dry-year rationing. Given this information, and the true extent of the impacts of Pardee Expansion, we hope that the EBMUD Board will chose to stick with the 25 percent dry-year rationing, and/or choose to stick with the 2002 demand model. These two things, in combination with the desalination component (up to 20 mgd yield), would avoid any need for Pardee Expansion. (*Foothill Conservancy et al. v. EBMUD,* 4 AR 771)

TI-14

Pages 4-6 to 4-10: An UWMP is supposed to, "Identify and quantify, to the extent practicable, the existing and planned sources of **water** available to the supplier" in five-year increments. If one of the supplies is groundwater, the UWMP must provide a copy of any applicable groundwater management plan, a description of the basin, information as to whether the basin is overdrafted, efforts being undertaken to eliminate long-term overdraft, and the amount of groundwater expected to be pumped. (Water code, sec. 10631, subd. (b).) The 2010 DUWMP does not do this.

TI-15

Furthermore, an Urban Water Management Plan is required to:

> "Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
> (A) An average water year.
> (B) A single dry water year.
> (C) Multiple dry water years.
> For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable." (Water code, sec. 10631, subd. (c).)

The 2010 DUWMP does not do this.

TI-16

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Finally, and Urban Water Management Plan must:

> "Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program." (Water code, sec. 10631, subd. (h).)

The 2010 DUWMP does not do this.

TI-17

Chapter four of DWR's *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan,* provides an explanation of the information needed to conform to the requirements of the aforementioned code sections. (See, DWR Guidebook, pp. 4-1 to 4-4; Section I, pp. I-4 to I-6. items 13-23.) :

*The failure to provide this information is perhaps the most glaring inadequacy in the 2010 DUWMP***.** In recent amendments to the UWMPA, the Legislature declared that, "As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years." The Legislature acknowledged that," The quality of source supplies can have a significant impact on water management strategies and supply reliability." The intent of UWMPA is "to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water." (Water Code, sec. 10610.2, subds. (a)(4), (a) (9), and (b).)

In short, an Urban Water Management Plan is supposed to compare future water *demand* and future water *supply*. By failing to identify the yield of each potential supplemental supply source, the timing of its implementation, and its reliability in average, dry, and multiple dry years, EBMUD has failed to complete the challenging half the of its 2010 DUWMP. This failure is magnified by EBMUD omitting details about the groundwater basins that it seeks to use for future supply. Instead of dealing with these issues head on, EBMUD hid important supply distinctions by aggregating future supply and reliability information, and not filling supply gaps. (See 2010 DUWMP, pp. 4-10.) That is a far cry from the source-by-source disclosure envisioned in the UWMPA.

TI-18

E) Chapter 5: Wastewater and Recycled Water.

Table 5-5: This table indicates that recycled water use will increase from 9.3 mgd to 19.9 mgd from 2010 to 2040. However, the 19.9 mgd figure is still only 10.6 percent of the total 188.6 mgd of waterwater to be collected and treated in 2040. Why is the recycling percentage so low? In rural Calaveras County, where the low average income of the customers and the geographic challenges are much greater than in the East Bay, the water district currently recycles over 85 percent of the wastewater it collects, and expects to continue to do so through 2040. (Calaveras County Water District, 2010 *Draft Urban Water Management Plan*, Chapter 5.) If Calaveras County can do this to keep water in the Mokelumne River for fish, wildlife and recreation; why can't EBMUD? If EBMUD were to recycle 85 percent of the wastewater it expects to collect in 2040, that would result in a water supply enhancement of over 160 mgd, or *three times the yield of the Pardee Expansion.* Put another way, EBMUD would only have to recycling 27.2 percent of the effluent it expects to collect in 2040 to equal the yield of the Pardee Expansion. This 51.2 mgd of recycled water could be used to supply residential outdoor demand (about 54 mgd in 2040) and irrigation demand (7 mgd in 2040).

TI-19

The amendments to the UWMP Act over the last decade reflect two key beliefs of the California State Legislature. The first is that, "[T]he people of California will best be served by meeting municipal, agricultural, and environmental water needs of each hydrologic region to the maximum extent practicable without diminishing the resources of other

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regions that are necessary to meet the present and future needs of those regions." The second is that, "The health, safety, and well-being of the people of the State of California will best be served by employing current and developing water treatment and conservation technologies." (Stats of 2001, c. 320 (S.B. 672).) Given the State's focus on regional self-sufficiency, the use of new technologies and management practices, and the desire to avoid harm to other regions, please consider a higher level of water recycling in the final 2040 UWMP.

F) Chapter 6: Water Conservation.

Table 6-4: This table shows that EBMUD will take advantage of Senate Bill 7 compliance options to limit its per capita reduction to only 12.7 percent (from 165 to 144 GPCD). We recommend that EBMUD instead reduced per capita demand by the full 20 percent (from 165 to 132 GPCD). Please make the commitment to do this in the final 2010 UWMP. In addition, EBMUD could further reduce its water demand and set an example for the rest of the state. According to the U.S. Geological Survey, cited in the Sierra Club *Yodeler* (May-June 2010), New Mexico has reduced residential water consumption to 107 GPCD.

V. Conclusions

A) EBMUD's 2010 DUWMP is deficient in many respects.

Most notably, Chapter 1 fails to describe a potential local source of water (local stormwater runoff) that could offset the need to construct damaging foothill dams. Chapter 2 fails to consider a downstream diversion point to reduce impacts of water taken from the Mokelumne River. Chapter 4 relies on a single inflated demand calculation based upon an admittedly weak assumption, relies on a drought rationing policy set aside by the Superior Court, and does not provide basic required information about each future source of water supply. Finally, in Chapter 5 EBMUD commits to only a very low level of water recycling. Please bring the final 2010 UWMP into compliance with the Water Code.

B) EBMUD's 2010 DUWMP violates CEQA and the Court's Writ.

The Public Resources Code, section 21168.9(a) (2) allows a court administering a writ to suspend agency activities that "will prejudice the consideration or implementation of particular mitigation measures or alternatives to the project." In *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, the court chose not to allow any portion of the project to proceed, including non-impacting aspects like surveying, to avoid just this sort of bureaucratic momentum from building up prior to completion of a CEQA-compliant revised EIR.

The writ in *Foothlill Conservancy, et al. v. EBMUD* directed EBMUD to set aside the 2040 WSMP PEIR and related project approvals, pending completion of a valid PEIR that better evaluates impacts of Pardee Expansion, and considers a broad range of alternatives, including Los Vaqueros Expansion.

Nevertheless, the 2010 DUWMP repeatedly relies upon components adopted as part of the 2040 WSMP. It also relies upon water supply alternatives selected in the 2040 WSMP, to the exclusion of other alternatives such as LVE. For example:

> Chapter 2 regarding "Water Supply System & Water Resources Planning" still refers to the reduction in drought rationing to 15%. ("In recognition of the extensive conservation savings that EBMUD has achieved to date and issues associated with demand hardening, EBMUD has set the rationing goal up to 15% during multi-year droughts." [P. 2-17].) This change occurred after the proposal was adopted in the 2040 WSMP, in April 2010. Also, Chapter 2 makes no mention of the possibility Los Vaqueros Expansion as an option for future EBMUD water supply.
>
> Chapter 3 regarding "2010 Water Shortage Contingency Plan" refers to the change from 25% to the 15% rationing limit, and specifies that its success is contingent on development of additional water supply components. (pp. 3-2 to 3-3, 3-10.).
>
> Chapter 4 on "Water Demand" is still using the inflated demand model from the 2040 WSMP (p. 4-2), and the 15% rationing assumption (p. 4-9.)

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Appendix F listing EBMUD Policies and Rates still includes Policy 9.03, approved in April 2010 following the 2040 WSMP approval that changed the drought rationing limit to 15% from 25%. (pp. F-6 & F-7)

Appendix G on the "2010 Water Shortage Contingency Plan Supplement" plan is based on the change to a 15% rationing limit (p. G-3).

While the 2010 UWMP is not subject to CEQA review, the 2040 WSMP ruling sets aside the 2040 WSMP and EIR, and directs EBMUD to comply with CEQA in evaluating alternatives including Pardee Expansion and Los Vaqueros Expansion. If EBMUD approves a legally required UWMP with 20-year demand that presumes the same components as the 2040 WSMP (the reduction to a 15 percent rationing level, the 2040 WSMP demand numbers, the 2040 WSMP levels of conservation and recycling) then that UWMP prejudices the selection of alternatives when the 2040 WSMP EIR is revised. Similarly, if the 2010 UWMP's supply analysis lists the upcountry reservoir expansions to the exclusion of LVE, it also prejudices the selection of alternatives when the 2040 WSMP EIR is revised. As the court put it, "By adopting the Water Supply Plan, the District committed itself to particular rationing, conservation, and recycling levels. This, in turn, committed the District to a specific programmatic direction that will require the District to pursue various supplemental water supply projects to bridge the gap between supply and demand." (Ruling, pp. 9-10.)

Furthermore, EBMUD's completion of the 2010 UWMP opens the door to state funding for its water supply components. By including PE as a potential supply source, but excluding LVE as a potential supply source, EBMUD is prejudicing the LVE alternative to the 2040 WSMP by unnecessarily burdening it with funding barriers and additional administrative costs (e.g. for a subsequent 2010 UWMP amendment).

Thus, pending completion of the 2040 WSMP PEIR, EBMUD's 2010 UWMP and the analyses therein must not presume a reduction to a 15 percent rationing level during droughts. It must not presume that the upcountry reservoir expansions are the lone reservoir expansion options. Instead, EBMUD must leave open the opportunity that LVE is an option. EBMUD must not presume that the 2040 WSMP's inflated demand figures alone are valid, and must consider other valid options. To do otherwise would essentially reinstate the 2040 WSMP prior to completion of the PEIR, in violation of CEQA and the court's writ.

C) EBMUD's 2010 DUWMP repeats the mistakes of the 2040 WSMP

TI-23

The 2040 Water Supply Management Plan made many mistakes. It relied on a single inflated demand calculation based upon an admittedly weak assumption. It failed to consider and adopt alternatives that would reduce the impacts of EBMUD's water supply including the collection of local stormwater runoff, an increase in the rate of water recycling, the use of a downstream diversion point for water taken from the Mokelumne River, and the Los Vaqueros Expansion. It did not provide basic information about each future source of water supply that was necessary to empower the Board to make a rational decision. As noted above, the 2010 DUWMP makes these same mistakes.

We strongly encourage EBMUD to learn from the mistakes made in the 2040 WSMP, and not repeat them in the final 2010 UWMP. This is your first, best chance to correct those mistakes and move on. Please embrace this opportunity.

D) Drop PE and embrace a better future.

TI-24

For years the leadership at EBMUD has periodically lurched forward, against EBMUD's own history and internal bureaucratic inertia, toward a more enlightened approach to water supply, demand management, and conflict resolution. As a result of that leadership, EBMUD staff and customers have implemented conservation programs that have repeatedly yielded greater results than the naysayers and statisticians anticipated. However, in the face of these great accomplishments, periodically EBMUD leadership returns out of fear to its old security blanket: bigger dams in the Mokelumne River watershed. The hard-working Mokelumne River does not deserve your bigger dam. It deserves your tender, loving care. Your successful conservation employees do not deserve your fear. They deserve your confidence and support. Your customers' desire for the security of a local reservoir does not deserve to be ignored. They deserve your attention. Drop PE from the 2010 UWMP. If you set your sights on a better future today, the future will thank you for it tomorrow.

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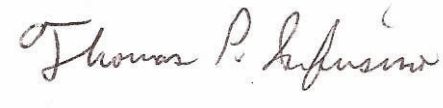
We hope that your final UWMP will properly address the concerns detailed in this letter, and those of expressed by other commenters. Please notify us a when the final UWMP is available, and when EBMUD intends to make its decision.

Sincerely,



Thomas P. Infusino,

for the Foothill Conservancy, California Sportfishing Protection Alliance, and Friends of the River

cc: Mr. John Beuttler, California Sportfishing Protection Alliance
Mr. Chuck Bonham, Trout Unlimited
Mr. Jim Eicher, Bureau of Land Management
Mr. Terry Davis, Sierra Club Mother Lode Chapter
Ms. Sonia Diermayer, Sierra Club Bay Chapter
Mr. Stuart M. Flashman
Mr. Mike Jackson, California Sportfishing Protection Alliance
Mr. Bill Jennings, California Sportfishing Protection Alliance
Mr. Curtis Knight, CalTrout
Mr. David Moller, PG&E
Mr. Matt Morrison, Sierra Club Bay Chapter
Mr. David Nesmith, Environmental Water Caucus
Ms. Beth Paulson, US Forest Service
Mr. Chris Shutes, California Sportfishing Protection Alliance
Mr. Dave Steindorf, American Whitewater
Mr. Ron Stork, Friends of the River
Mr. Steve Evans, Friends of the River
Supervisor Steve Wilensky, Calaveras County
Ms. Ann Hayden, Environmental Defense Fund
Mr. Spreck Rosekrans, Environmental Defense Fund

EBMUD Response:

TI-1 Response

EBMUD reorganized the text in the UWMP to clarify the discussion in the UWMP regarding potential future supplemental water supply sources. The "Potential Supplemental Water Supply Sources" section (pages 2-17 through 2-21) has been divided into "Short-Term Potential Supplemental Water Supply Projects" and "Long-Term Conceptual Supplemental Water Supply Projects" with the intent to recognize that some of the longer term supplemental supply sources are not likely to be developed in the 20-year time frame that is the primary focus of the UWMP. Projects listed under the Short-Term Potential Supplemental Water Supply Projects are anticipated to be implemented by 2030, which is within the 20-year planning horizon as mandated by the UWMP Act (Water code, Secs. 10631 (h) and 10635.) Projects, including those for expansion of surface supply, that are listed under the Long-Term Conceptual Supplemental Water Supply Projects section are in the conceptual stage and are anticipated to take place beyond the UWMP's 20-year planning horizon. The project scope and availability of these long-term supplemental supplies will be refined in subsequent UWMPs, which are updated every 5 years.

In the "Long-Term Conceptual Supplemental Water Supply Projects" section, EBMUD updated the text of the UWMP to acknowledge its commitment to examine its participation in the Los Vaqueros Expansion as a means of satisfying its future long-term need for supplemental supply as part of the effort to supplement the analysis of impacts and alternatives in the Program Environmental Impact Report for the WSMP 2040. As noted on page 2-21 of the UWMP, if pursued in the future, any expansion of surface water storage on the Mokelumne River, as well as

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any participation in the expansion of local reservoir projects, will be subject to "additional negotiations, as well as planning, design and environmental review."

TI-2 Response

EBMUD's UWMP acknowledges the legal requirements in the provisions of the UWMP Act. (see Water Code, secs. 10631.5 and 10656 in Appendix A-7 and A-15)

TI-3 Response

Since the 1970s, demand management has been an important part of EBMUD's water practices and policies to promote reasonable and efficient use of supplies. Figure 6-3 of the UWMP shows that EBMUD has made significant strides in decreasing historical daily per capita water demand as a result of EBMUD's aggressive water conservation and recycling efforts and other factors. This continuous effort in reducing daily per capita water use goes beyond the short-term focus on consumption reduction as required through SBx7-7.

SB x7-7 was drafted with the intent to allow agencies including EBMUD to capture previously realized conservation and recycled water savings, and the law thus provides flexibility to allow suppliers to select one of four methods for establishing its SBx7-7 targets. EBMUD selected a target method that would allow EBMUD to be credited for its aggressive water conservation and recycling programs, implement demand management program budgets that are appropriately tailored to customer usage, and account for anticipated demand hardening in consumption behavior that is the result, in part, of EBMUD's existing aggressive conservation efforts.

EBMUD is also committed to achieving an estimated projected use at 144 gallons per capita per day (gpcd) in year 2020, which exceeds the requirement of its SBx7-7 target of 150 gpcd.

TI-4 Response

The comment is unclear on the exact action requested. Runoff – includes both the runoff from precipitation that falls on watershed lands within the basin of a reservoir or runoff from precipitation that falls on urbanized areas and is captured in storm drains. Both types of runoff are addressed in the UWMP to the extent that they are relevant to EBMUD's supplies and means of reducing demand and serving its customers.

As noted in Chapter 2 of the UWMP, East Bay reservoir runoff from EBMUD's local watersheds to the reservoirs constitutes a portion of EBMUD's secondary supply source. About 15-25 MGD of EBMUD's supply comes from local runoff in normal hydrologic years. In dry years, evaporation can exceed local runoff and result in no net local supply.

Secondly, as noted in Table 6-2, EBMUD's long-term water conservation planning efforts includes future measures for capturing graywater. Specifically the identified measures include drain line plumbing for future installation of graywater systems in new and retrofitted single-family homes. EBMUD has promoted the study of graywater as an alternative local water source for decades, including its 1996 study with the California Department of Water Resources. EBMUD also works with local jurisdictions and interested parties on advancing the knowledge and science of rainwater catchment systems.

It is important to note that only cities/ counties have the authority to implement programs that allow for storm water collection, treatment and use, and that management of graywater systems is outside of EBMUD's jurisdiction. The measures included within EBMUD's long-term water conservation program are designed to encourage the use of graywater. Since measures for capturing graywater are currently identified as potentially appropriate and included as

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part of the long-term water conservation program, any further developments in graywater use in the community served by EBMUD will be discussed in future UWMPs.

TI-5 Response

The actions taken in lowering the targeted level of customer rationing to 15%, as adopted by EBMUD's BOD through Policy 9.03 is independent of the ongoing WSMP 2040 process and is the result of the recognition that EBMUD has instituted an aggressive conservation program that has limited the ability to achieve further water use reductions during dry and critical dry years without severe economic hardship. The discussion in the UWMP is consistent with the legislative goal of ensuring that the District explores the reliability of its supplies and the specific factors that affect that reliability.

As noted in Figure 4-10, rationing is a critical component of EBMUD's water supply portfolio, and EBMUD expects that its customers will curtail their use during droughts. To ease the burden on its customers, while recognizing possible economic hardships to specific customer class categories; and as EBMUD customers are approaching demand hardening, which limits their ability to ration further, and heightens the impact of additional water use reductions in dry and critical dry years as a result of extensive conservation practices already put in place, EBMUD's BOD lowered its targeted customer rationing level to 15 percent. However, as noted, to obtain the 15 percent rationing level, EBMUD will need to pursue and implement the short term potential supplemental water supply projects as identified in Chapter 2.

TI-6 Response

East Bay Municipal Utility District operates five local reservoirs – Briones Dam, Chabot Dam, Lafayette Dam, San Pablo Dam and Upper San Leandro Dam as described in Chapter 2 of the UWMP. Due to urban development in the area and limitations in topography, none of the five reservoirs is a candidate for significant future expansion and an expansion of these reservoirs would not feasibly yield significant supplemental supplies.

Other local storage options that EBMUD had evaluated included potential surface storage construction within Bollinger Canyon, Cull Canyon, Curry Canyon, and Kellogg Canyon., all within the East Bay. But these new projects all involve significant issues and environmental effects.

TI-7 Response

The referenced statement appears on page 2-2. The UWMP Act requires the supplier to describe its service area, projected water needs, and to identify and quantify existing and planned sources available to serve demand over a 20 year planning period. (Water Code, sec. 10631). The requested information is not required to be included in an urban water management plan and is not relevant to an assessment of EBMUD's water supply and demand.

TI-8 Response

The amounts available for Mokelumne River use vary in a given year depending on a number of factors, including hydrology, which itself is highly variable as depicted in Figure 2-3. The purpose of Figure 2-2 is to illustrate how Mokelumne River flows are generally allocated to various uses.

Please note that because the identified needs must be met (particularly fish requirements) they are not affected by EBMUD's actions to institute demand management measures discussed in Water Code section 10631, subd. (g)(1). EBMUD is in compliance with the California Urban Water Conservation Council's Memorandum of Understanding

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through the implementation of urban water conservation best management practices (BMPs) as well as a number of additional conservation measures that go beyond the BMPs. (pages 6-22 to 6-23 of the UWMP)

TI-9 Response

EBMUD has updated the text of the UWMP to include the historic frequency of supply vulnerabilities listed in Chapter 2 (pages 2-6 to 2-10).

EBMUD has updated the text of the UWMP to include a table of earthquakes of significance that have occurred in the Bay Area since 1836.

EBMUD has updated the text of the UWMP to clarify water quality impacts to water supply.
The 1997 shutdown of the Mokelumne Aqueducts caused Briones Reservoir to be drafted down to its lowest level since it was first filled. Briones holds more than half of the District's standby storage, and it was crucial to replace the water by pumping at the Walnut Creek Pumping Plant once the aqueducts were back online. The cause of the high turbidity in Pardee was due to a landslide that occurred on January 9, 1997 on a slope by the Mokelumne River in the wilderness are of the Upper Mokelumne River watershed. The slide created very high turbidity in Pardee Reservoir and the water entered the Mokelumne Aqueduct reached a peak turbidity of about 60 NTUs. As the District's in-line water treatment plants are not designed to adequately treat water of this range of turbidity, EBMUD switched the source of supply from Pardee Reservoir to Briones Reservoir.

TI-10 Response

Consistent with the UWMP Act, EBMUD's UWMP describes the service area of the supplier and the projected water needs, and identifies and quantifies existing and planned sources available to serve demand over a 20 year planning period and the infrastructure that makes these sources available. (Water Code, sec. 10631). As noted in Water Code, sec 10631 (d) referenced on page A-5 of the UWMP, EBMUD has acknowledged the requirement to discuss opportunities for supplemental water supplies through exchanges/ transfers of water supplies with other suppliers. Long term exchange/ transfer opportunities are discussed on pages 2-19, 2-20 and 2-21 of the UWMP; short-term exchange/ transfer opportunities are discussed on pages 3-6 through 3-8. As this text recognizes, while EBMUD may obtain supplemental supplies through transfers or exchanges, there are few exchange opportunities that would allow for EBMUD to meet its demands through diversions of Mokelumne River water further downstream.

TI-11 Response

EBMUD has updated the text of the UWMP to clarify that the Mokelumne River supply is "minimally" exposed to common sources of contaminants and to acknowledge that despite precautionary warnings of mercury found in the fish, mercury has never been detected in the water supply in Pardee Reservoir at levels above the California Public Health Goal (PHG) of 1.2 ug/L on page 2-8.

TI-12 Response

The statement has been modified in the text of the UWMP on page 2-19. Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 and TI-5 found on page Appendix C-13 of EBMUD's UWMP (as related to LVE).

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TI-13 Response

Please see EBMUD Response TI-5 found on page Appendix C-13 of EBMUD's UWMP.

TI-14 Response

The demand study is based on a land use model, which is viewed within the field of water demand estimating as the most rigorous analysis methodology, as compared to using population projections or growth rate projections and population based demand category correlation. The demand study was developed with direct input from city and county land-use planning agencies reflecting the agencies' best estimate of both land use and timing of both new development and redevelopment through 2040. This approach also supports the intent of the UWMP Act, which requires that "[e]ach urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies...." (Water Code, sec. 10620, subd. (d)(2).). In planning and developing any long-term supplemental supply projects, EBMUD would confirm the demand estimates and assess the necessity of the project.

TI-15 Response

EBMUD has updated the text of the UWMP to clarify that native groundwater is used only to a limited extent as part of the implementation of the injection/extraction system associated with the Bayside Groundwater Facility. As noted on page 2-17, the project supplies supplemental water to EBMUD customers only when supplemental water is needed, and overall, the quantity of water injected into the aquifer of the South East Bay Plain Groundwater Basin will exceed the quantity of water extracted.

TI-16 Response

Consistent with Water Code, Sec. 10631, subd. (c), Table 4-3 of the UWMP provides water supply data for average, single and multiple dry water years. Although the supply sources included in Table 4-3 are currently expected to be available on a consistent level, factors, other than droughts, that may temporarily affect these sources or factors whose impacts have not been quantified at the present (such as global climate change) are described on page 2-6 and 2-7 of the UWMP.

TI-17 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP. The UWMP identifies possible yields from the short-term supplemental supply projects.

TI-18 Response

Please see response TI-16 for consistency with Water Code, Sec. 10631, Subd. (c), and response TI-15 for SEBPB discussion.

Tom Infusino, et. al.

EBMUD has updated the text of the UWMP to clarify how the projected supplemental supply need anticipated in dry years (and presented in Table 4-3 of the UWMP) will be met by EBMUD. Information regarding the individual project capacities that will be used to met the need during dry years (provided on pages 2-17 through 2-19 of the UWMP), has also been restated in Chapter 4.

TI-19 Response

In accordance with the California Water Code, EBMUD's policy requires the use of recycled water for appropriate uses when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish and wildlife. EBMUD has an appropriate recycled water program in an urban environment where recycled water projects are developed based on supply and demand locations.

Recycled water projects are developed if there is adequate wastewater supply and sufficient demands near the supply source to implement cost-effective projects. EBMUD's service area spans 332 square miles and includes 20 incorporated cities and 15 unincorporated communities in two counties. Building recycled water projects and extensive distribution systems in an urban environment is difficult and more costly than compared to a rural environment.

In some cases where wastewater supply is available, there isn't sufficient demand close to the supply source to develop a project that utilizes all of the supply. Therefore, a cost-effective project is developed where a portion of the wastewater supply is used. An example is the East Bayshore Recycled Water Project (see discussion on page 5-9 of the UWMP). In other cases, there is sufficient demand close to the wastewater supply to develop a project that utilizes all of the supply. Therefore, a cost-effective project is developed where all of the wastewater supply is used. An example is the Richmond Advanced Recycled Expansion Water Project (see discussion on pages 5-6 and 5-9 of the UWMP).

Almost all of EBMUD's recycled water customers are existing urban users where each customer site has to be retrofitted to use recycled water, an added complexity and expense. Also, a higher level of treatment, primarily tertiary, is required which is more costly. There are no agricultural recycled water customers in EBMUD's service area.

It is not appropriate to compare EBMUD's recycled water program to other programs in rural areas where a minimum level of treatment and less infrastructure are needed to meet a large agricultural irrigation demand. Complete detail of EBMUD's recycle water program is in Chapter 5 of the UWMP.

TI-20 Response

Please see EBMUD Response TI-3 found on page Appendix C-12 of EBMUD's UWMP.

EBMUD's baseline per capita water use and SBx7-7 target is well below the statewide average of 192 gpcd. Per capita water use represents an approximation tool or metric for water utilities to measure consumption patterns and trends within their own agency over time. Per capita water use is not a good measure for comparing use between agencies or geographic areas due to the inherent differences in land use, climate, service area demographics, business and industrial markets, and more. These factors affecting per capita use is evident in the wide variation of reported baseline per capita water use within California's hydrologic regions of 154 to 346 gpcd.[1]
.

[1] 20x2020 Water Conservation Plan, California Department of Water Resources, State Water Resources Control Board, California Bay-Delta Authority, California Energy Commission, California Department of Public Health, California Public Utilities Commission, California Air Resources Board, February 2010.

Tom Infusino, et. al.

TI-21 Response

EBMUD has prepared the 2010 Urban Water Management Plan in order to comply with the Urban Water Management Planning Act and the Water Conservation Act of 2009. The final 2010 UWMP meets the requirements of California law.

For questions on Chapter 1, please see EBMUD Response TI-4 found on page Appendix C-12 to C-13.
For questions on Chapter 2, please see EBMUD Response TI-10 found on page Appendix C-14.
For questions on Chapter 4, please see response EBMUD Response TI-14 found on page Appendix C-15 and TI-18 found on page Appendix C-15 to C-16.
For questions on Chapter 5, please see EBMUD Response TI-19 found on page Appendix C-16.

TI-22 Response

EBMUD's legally mandated adoption of the 2010 UWMP is not an action that will prejudice the consideration or implementation of particular mitigation measures or alternatives to the Water Supply Management Program 2040, which is presently under review. The Urban Water Management Planning Act requires EBMUD to prepare and adopt an urban water management plan that provides a description of EBMUD's water demand management measures and includes an evaluation of economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors affecting the implementation of new water demand management measures.

EBMUD's Drought Management Program includes a policy to implement rationing at a maximum of 15% of total annual demand based on the recognition that on-going water conservation and recycling have decreased the flexibility to further reduce demand during droughts. It is this recognition that EBMUD's increasingly aggressive conservation efforts have reduced the ability to achieve further conservation during a drought that resulted in the lowering of the planned rationing level. It may be necessary for EBMUD to include greater levels of demand reduction during a multiple year drought to the extent that additional supplemental supplies cannot be obtained to meet demand but this may result in significant customer hardship, particularly as demand increases, and costs and burdens will not be distributed equally among customer categories. For the short-term, as explained in Appendix G, demand has been suppressed by the response to earlier drought conditions and the economic recession in the Bay Area. As demand and population within the service area increases, however, the aggressive conservation levels set forth in the UWMP are expected to further limit the feasibility of achieving rationing levels beyond 15% during multiple dry years without severe hardship to EBMUD's customers.

The adoption of the UWMP plan, including the mandated SBx7-7 targets, water shortage contingency actions, and the plan to continue the development of recycled water projects, will not prejudice the analysis and selection of alternatives for satisfying long-term demand projections as part of the current review and further development of the WSMP 2040. In adopting the 2010 UWMP, EBMUD is complying wit the Urban Water Management Planning Act, as well as the Water Conservation Act of 2009, and EBMUD is continuing its long-standing policy, consistent with the Water Code, to provide recycled water in lieu of potable water for landscape irrigation and certain industrial uses where feasible.

It should be noted that the 2010 UWMP is not intended to facilitate funding or development of the enlargement of EBMUD's existing facilities on the Mokelumne River or any of EBMUD's other longer term supplemental supply options, particularly because these supplemental sources are intended to be examined if necessary in the long term, as part of an interrelated set of projects. As noted in Appendix A, the Urban Water Management Plan is required to identify and quantify, to the extent practicable, the expected demand for twenty years and to identify and quantify existing and planned sources to serve that demand. The Act requires that the analysis be reviewed every five years, and these regular reviews will allow EBMUD to revisit the identified supply sources, as well as demands and

Tom Infusino, et. al.

demand reduction options. In the meantime, EBMUD does not intend to use the UWMP as the basis for funding for the identified supplemental supply sources and has instead identified potential supplemental supplies in the UWMP in order to comply with the Urban Water Management Planning Act.

TI-23 Response

Please see EBMUD Response:

- TI-1 found on page Appendix C-11 to C-12
- TI-4 found on page Appendix C-12 to C-13
- TI-10 found on page Appendix C-14
- TI-14 found on page Appendix C-15
- TI-19 found on page Appendix C-16

TI-24 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP for a discussion of the identified supplemental supply projects.

SAIC

Date Comment Received: 05/31/2011
Name of Organization/ Agency/ Individual: SAIC on behalf of Chevron Environmental Management Company

Comment:

From: Burns, Thomas A. [mailto:THOMAS.A.BURNS@saic.com]
Sent: Tuesday, May 31, 2011 1:29 PM
To: Jain, Priyanka
Cc: Anzelon, Daniel B.; Hoang, Tan T.
Subject: EBMUD Draft Urban Water Management Plan

Ms. Jain-

Attached is a letter of introduction that was sent to EBMUD in September 2009 regarding inactive former historic petroleum pipelines that were located within EBMUD's service area boundary. On behalf of Chevron Environmental Management Company (CEMC), SAIC is sending this letter and associated pipeline information to you to be used when EBMUD plans urban water management construction projects.

SAIC -1

Please contact me with any questions.

Regards-

Thomas A. Burns, PG | Benham, An SAIC Company
Principal Geologist/Program Manager
Energy, Engineering & Infrastructure Business Unit
Office: 916.979.3748

3800 Watt Avenue, Suite 210
Sacramento, CA 95821
www.saic.com
Energy | Environment | National Security | Health | Critical Infrastructure
Please consider the environment before printing this email. (optional)

Attachment

Lee Higgins, PG
Environmental Project Manager

Chevron Environmental Management Company
6111 Bollinger Canyon Road
BR1Y/3484
San Ramon, CA 94583
Tel (925) 543-2365
Fax (925) 543-2323
leehiggins@chevron.com

September 3, 2009

Stakeholder Correspondence–East Bay Municipal Utility District

Ms. Lesa R. McIntosh
Director – Ward 1
East Bay Municipal Utility District
375 11th Street
Oakland, CA 94607

Subject: **East Bay Municipal Utility District**
Chevron Environmental Management Company
Historic Pipeline Alignment–Bakersfield to Richmond

Dear Ms. McIntosh:

Chevron Environmental Management Company (CEMC) recently assessed the locations of water transmission pipelines operated by the East Bay Municipal Utility District (EBMUD) in Contra Costa County. The purpose of this letter is to notify stakeholders of EBMUD as to the location of formerly active crude-oil transportation pipelines with respect to the EBMUD Service Area. The intent is that the pipeline location information will be incorporated into future engineering and environmental documents for EBMUD infrastructure/utility projects.

In the early 1900s, Tidewater Associated Oil Company (TAOC) and Standard Oil (Standard) built pipeline systems to transport heavy crude oil from oilfields in the southern San Joaquin Valley to refineries in the San Francisco Bay Area. These pipelines were operated until the early 1970s when they were decommissioned. Currently, CEMC manages work associated with these historic pipelines.

Evidence of historic releases associated with the formerly active pipelines is sometimes identified during the course of underground utility work and other subsurface construction activities near the pipeline right-of-ways. Generally, residual weathered crude oil associated with TAOC's and Standard's historical pipeline operations can be observed visually; however, analytical testing is necessary to confirm that the likely source of the affected material is associated with these former pipelines. Analytical results from human health risk assessments performed by CEMC at several known historical pipeline release sites confirm that soil affected by the historic release of product from the pipelines is non-hazardous, and does not pose significant health risks.

CEMC's experience indicates that the potential exists for subsurface soil along and near the former TAOC and Standard alignments to be affected by undocumented residual weathered crude oil; however, encountering affected soil from these former pipelines should not delay the progress of EBMUD projects. CEMC requests to be informed of planned projects in the vicinity of the former TAOC and Standard alignments.

For more information regarding the Historical Pipeline Portfolio–Bakersfield to Richmond alignment, please visit http://www.hppinfo.com/. If you have any questions, require additional information or would like to request more detailed maps, please call SAIC consultants Tom Burns at (916) 979-3748 or Mohamed Ibrahim (916) 979-3828.

Sincerely,

Lee Higgins, PG

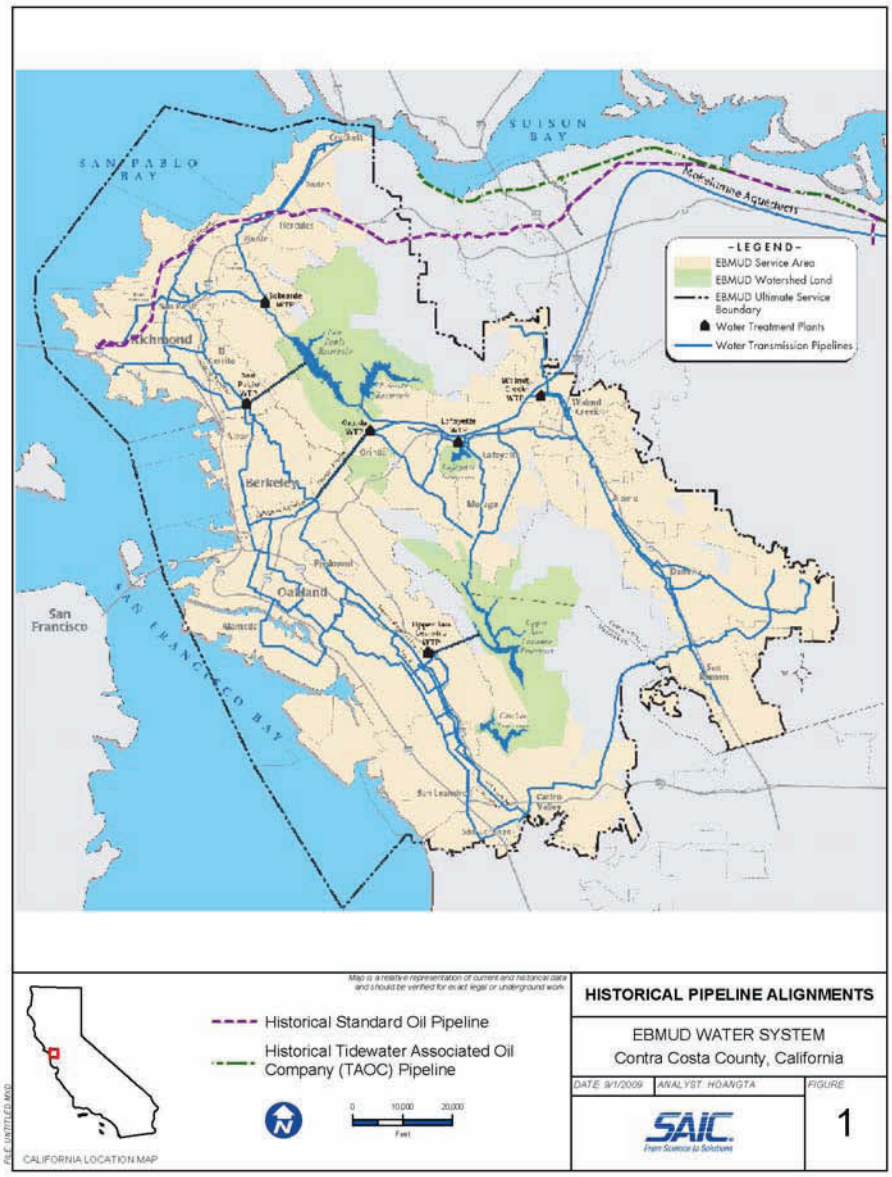
LPH/klg

Enclosures:
Figure 1. Historic Pipeline Alignments

cc: Mr. Tom Burns – SAIC
3800 Watt Avenue, Suite 210, Sacramento, California 95821
Mr. Mike Jenkins – SAIC (letter only)
3800 Watt Avenue, Suite 210, Sacramento, California 95821
Mr. Mohamed Ibrahim – SAIC
3800 Watt Avenue, Suite 210, Sacramento, California 95821

SAIC

Attachment



EBMUD Response:

SAIC -1 Response

EBMUD's Urban Water Management Plan 2010 provides an assessment of water supply availability and water demand for a 20 year horizon as well as a water shortage contingency plan. Your comment is intended for use during construction projects and would not be applicable to this water management plan. Your comment has been noted.

Amador Water Agency

Date Comment Received: 05/31/2011
Name of Organization/ Agency/ Individual: Amador Water Agency

Comment:

A Public Agency

12800 Ridge Road, Sutter Creek, CA 95685-9630 • www.amadorwater.org • OFFICE: (209) 223-3018
FAX: (209) 257-5281

May 26, 2011

Mr. Alexander Coate
General Manager
EBMUD
375 11th Street
Oakland, CA 94607

Re: EBMUD Urban Water Management Plan Update

Dear Mr. Coate,

The Amador Water Agency values its partnership with EBMUD in the Mokelumne Water Forum and Upper Mokelumne River Watershed Authority. We encourage EBMUD to continue to seek regional solutions for future water supply. Like you, we are working to ensure that the future water needs of our ratepayers can be met in the most cost-effective manner with the least controversy and minimal social, economic and environmental harm.

We look forward to continue working with EBMUD to develop regional water solutions that will provide the future water supply security that all parties in the Mokelumne Forum desire and to protect the Mokelumne River and its important environmental resources.

AWA-1

Sincerely,

Gary Thomas
Amador Water Agency
Vice President, Board of Directors

EBMUD Response:

AWA-1 Response

EBMUD's Urban Water Management Plan 2010 contains a discussion of regional conjunctive use projects on page 2-21 which can provide benefits to a broad range of Mokelumne River basin stakeholders. Your comment has been noted.

Edith Luis

Date Comment Received: 05/23/2011 and 06/03/2011
Name of Organization/ Agency/ Individual: Edith Luis

Comment:

EAST BAY MUNICIPAL UTILITY DISTRICT

May 24, 2011

Edith Luis
14946 Raven Rd.
Pioneer, CA 95666

RE: Correspondence

Dear Ms. Luis,

We received your letter dated May 19, 2011. Thank you for your comments on the Draft Urban Water Management Plan 2010 (UWMP 2010). Comments received by May 31, 2011 will be addressed in the final UWMP 2010.

In order to respond to your letter (enclosed), please clarify the following statement:

"Could we revise a bit less a bit more often? 2011-2013 \ 2013-2015"

Thank you for participating in the public review process.

Sincerely,

Priyanka K. Jain
Project Manager – UWMP 2010

RECEIVED
JUN 03 2011
WATER RESOURCES PLANNING DIV.

PKJ:smc

Enclosure

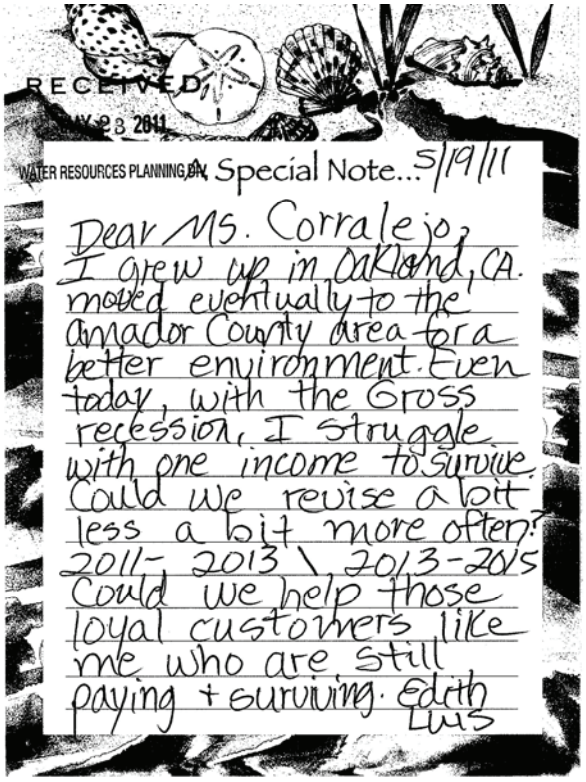
example: Change rates at lower cost every 2 yrs instead of "like" every 4 yrs — to long for customers like me...

Thank you
Edith Luis

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . TOLL FREE 1-866-40-EBMUD

EL-1

Edith Luis



EBMUD Response:

EL-1 Response

EBMUD water rates and rate structure are established biennially by the EBMUD Board of Directors. Any changes are subjected to a procedure of public notice and hearing to allow for input from the public and rate payers. Page 3-13 of the UWMP provides more information on this public notification process.

Randy Berg

Date Comment Received: 05/17/2011
Name of Organization/ Agency/ Individual: Randy Berg

Comment:

RECEIVED
MAY 17 2011
WATER RESOURCES PLANNING DIV.

May 12, 2011

To the board of EBMUD,

I happened to attend the February 4th hearing in Judge Frawleys' court room. One of the first things that your attorney stated was that EBMUD **DID NOT NEED TO ENLARGE THE PARDEE RESERVOIR**. Was he lying to the judge? Why is the enlargement of the Pardee Reservoir still listed as a possible surface water supply option in your draft UWMP? You lost that lawsuit. The Judge ordered, among other things, that you evaluate and consider the option of joining in the Los Vaqueros expansion. Why is that NOT in your draft UWMP? The environmental groups are not going to go away. They will fight you to the bitter end on this and cost you plenty of your ratepayer's dollars. Doug Linney stated back in October 2009 that the Pardee Reservoir expansion would be an albatross around your necks and he is right. The Los Vaqueros expansion has no opposition by environmental groups. Storing your water closer to your customers so any catastrophe in the delta won't cut off your supply seems like a no brainer. Perhaps that's your problem. no brains! Stop listening to your attorneys who only want to line their pockets by fighting this issue. Step into the 21st century and leave the technology of the 20th century behind! Remove the option to enlarge the Pardee Reservoir from your plans!!!

RB-1

Sincerely,

Randy Berg

Randy Berg
PO Box 266
Jackson, CA 95642

EBMUD Response:

RB-1 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP for a discussion of the identified supplemental supply projects.

Lary Heath

Date Comment Received: 05/14/2011
Name of Organization/ Agency/ Individual: Lary Heath

Comment:

From: Lary Heath [laryheath@sbcglobal.net]
Sent: Saturday, May 14, 2011 12:00 PM
To: Corralejo, Suzanne
Subject: Conservation first

Ms. Corrale,

Before the Pardee, do more for conservation and grey water. If we did, probably would not need the dam.
Thank you.

Lary Heath

LH-1

EBMUD Response:

LH-1 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP for a discussion of the identified supplemental supply projects.

Please see EBMUD Response TI-3 found on page Appendix C-12 of EBMUD's UWMP for further details on EBMUD's conservation efforts.

Please see EBMUD Response TI-4 found on page Appendix C-12 to C-13 of EBMUD's UWMP for a discussion of graywater.

Michael J. Spadoni

Date Comment Received: 05/12/2011
Name of Organization/ Agency/ Individual: Michael J. Spadoni

Comment:

From: Michael J. Spadoni [mailto:michaeljack@volcano.net]
Sent: Thursday, May 12, 2011 6:27 AM
To: Corralejo, Suzanne
Subject: NO Pardee Expansion up the Mokelumne River

Expand Los Vaqueros instead!

Better Yet: Teach EBMUD and its customers (better called "consumers"?) to conserve and reuse water, and leave all natural flows NATURAL...

MJS-1

Michael J. Spadoni
PO Box 430 / 1902 Garner Road
Rail Road Flat, CA 95248

EBMUD Response:

MJS-1 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP for a discussion of the identified supplemental supply projects.

Please see EBMUD Response TI-3 found on page Appendix C-12 of EBMUD's UWMP for further details on EBMUD's conservation efforts.

Please see EBMUD Response TI-18 found on page Appendix C-15 to C-16 of EBMUD's UWMP for further details on EBMUD's recycled water program.

Lee R. Peterson

Date Comment Received: 05/12/2011
Name of Organization/ Agency/ Individual: Lee R. Peterson

Comment:

From: solarnwind@gmail.com [mailto:solarnwind@gmail.com]
Sent: Thursday, May 12, 2011 9:13 AM
To: Corralejo, Suzanne
Cc: Linda & John Judd; Phyllis Murdoch; Jane P. Hodgson; Nadine Peterson; Mike Tuciarone; Lindsey Peterson
Subject: It's Time for EBMUD to Drop its Plans to Expand the Pardee and Destroy the Mokelumne Wild River !

Dear EBMUD Board Members,

As a former resident of the East Bay and someone that still has most of my extended family living in the East Bay; I understand how important it is for EBMUD to work toward securing water for its residents and customers in the future.

As someone that is concerned about protecting our environment, I am deeply concerned about EBMUD's apparent obsession with moving ahead with plans to raise Pardee Reservoir and thereby destroy this wonderful whitewater section of the Mokelumne River. This is in spite of overwhelming public and local opposition from environmentalists and residents in and around Jackson, including conservation groups, fishermen, rafting and kayaking enthusiasts.

The court ruling that EBMUD lost on April 11th of this year was overwhelming. EBMUD failed to properly and honestly analyze or mitigate impacts to the river's cultural and recreational resources. EBMUD violated the California Environmental Quality Act by failing to consider the expansion of Los Vaqueros Reservoir as one of its water supply alternatives. Los Vaqueros is right in EBMUD's back yard, EBMUD refused to look at Los Vaqueros Reservoir as an alternative and viable source.

EBMUD's reputation as a responsible utility district has suffered. This reflects negatively on all residents in the East Bay.

EBMUD's Board of Directors have a stated "Public Responsibility to Preserve the region's resources and set industry standards for how the water utilities conduct themselves" http://www.ebmud.com/about-ebmud/board-directors/your-board-members

I believe if EBMUD Directors continue to conduct themselves in this fashion, by pursuing this course of action, then you are in violation of your public trust. Your responsibilities should extend beyond the perimeter that makes up EBMUD's customers. It should also reflect that of local communities that your actions have a direct impact on.

It's time to drop the Pardee expansion from EBMUD's long-term water plans.
It's time to stop EBMUD plans that would destroy the wild & Scenic Section of the Moke
It's time to consider the expansion of Los Vaqueros Reservoir, which the court ordered EBMUD to consider.

Thank you for listening, if you're listening,

Sincerely,
Lee R. Peterson

LRP-1

EBMUD Response:

LRP-1 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP for a discussion of the identified supplemental supply projects.

Wayne and Valerie Brunmeier

Date Comment Received: 05/11/2011
Name of Organization/ Agency/ Individual: Wayne and Valerie Brunmeier

Comment:

From: Wayne Brunmeier [mailto:wbrunmeier@hotmail.com]
Sent: Wednesday, May 11, 2011 11:26 AM
To: Corralejo, Suzanne
Subject: Pardee Expansion

Dear Ms. CORRALEJO,

As a long time resident of Calaveras County we encourage EBMUD to drop the Pardee expansion from their long-term water plans and fully support National Wild and Scenic River designation for the Mokelumne from Salt Springs Dam to the backwaters of Pardee Reservoir.

WB-1

Thank you,

Wayne Brunmeier
Valerie Brunmeier

Valley Springs, Ca.

EBMUD Response:

WB-1 Response

Please see EBMUD Response TI-1 found on page Appendix C-11 to C-12 of EBMUD's UWMP for a discussion of the identified supplemental supply projects.

John Knox White

Date Comment Received: 04/21/2011
Name of Organization/ Agency/ Individual: John Knox White

Comment:

Note: Comment below is typed verbatim as heard on the recorded tape during the April 21, 2011 UWMP 2010 Public Meeting.

Comment by John Knox White:

Thank you for the presentation and clearly this is the result of a lot of work. I have a couple of comments that I [am] probably less comfortable making being the only person speaking here. Quickly, I'm pretty new to a lot of this water management, water management plans, and whatnot; by which I mean I didn't know they existed until about two weeks ago.

Reading through the Water Management Planning Act, one of the three policy goals of the Act is for Urban Water Suppliers should be required to develop water management plans to actively pursue the efficient use of available supplies. And yet, I found that this Plan['s] directly stated goal is designed to satisfy the requirements of this Planning Act, but to provide the public with a report on EBMUD's progress implementing conservation. I think that in reading the Plan it seems to have missed the goal of actually actively pursuing policies and planning to…it's the actual pursuit part that seems to be missing in the Plan. The Plan is more of a static document that kind of faithfully provides the required elements that are in the Planning Act, but it doesn't actually plan for the next thirty years. It represents Plans that have already been put together, and says here what we are doing and here's what we have done. I think that it's a missed opportunity; I'm unclear on whether or not it meets the letter of what the goal was, and I'm uncomfortable given that you guys are one of the implementing agencies for getting the Planning Act started, and together; I won't tell you what it's suppose to be for. But, I think that it's a great snapshot and it shows that you guys are doing a lot of work and whatever else, but it's a missed opportunity to come to the Board with a document, that is only put together every five years, and say, OK Board we want to set a course for the future. It's more of a, if somebody wants to say hey, what we were doing in 2010 and what were we thinking could possibly happen in the future. You'd pull it off the shelf and read it and say, oh, OK that's what was going on and here's were some of the conversations that were happening.

JKW-1

An example, I think is the drought planning section, which is probably the only issue with EBMUD that I've been involved in; I was...I spoke once before the Board and it was during the drought pricing. Which was a... it wasn't contentious, but there were a variety of ideas on how the District should move forward with encouraging the voluntary reduction of water use. To me, hum, here I'm going to read what I wrote, because I'm stumbling here. The document identifies the drought committee, it lists out the committee's rules and responsibilities, it identifies what was done from 2010 during the last dry spell, and it outlines possible approaches for the future in Appendix G. But all that it presented is a process for dealing with another drought, but there is no Board…you're not asking your Board to actually say, but this is how you are going to deal with it. These, when we have to make the difficult decisions, these are the policies by which we are going to make the decisions when the staff drought committee gathers, because a drought has been declared. What are the guiding policies that the Board would expect staff to be trying to meet and coming up with a proposal for how to do it? I'm not saying that none of us know what that drought is going to look like at this time. I can be a policy and process person, I think that well design policies and processes lead us to really good results and that documents like this, which are put together every five years, are the appropriate place to really have these large conversations, and holistic discussions about how do we want to make decisions about how we are going to deal with the drought and encourage behavior and what not. It felt to me like that was missing from this document. This morning I was told that it was the Water Supply Management Plan that actually had a lot of the policies in it, but when I went to that it too just explained what has been done in terms of conservation. There were no, where are we going and how we are going to drive the decisions that lay before us. Again, that's not to say that we have to change everything that's being done, but the document does do a pretty good job of laying out issues that are coming forward. I would expect that… it would seem to me that a plan would also lay out the path for how we are going to get there, and ask the Board for direction on how we should be shaping that path. Because you know there are so many options, like I said, Appendix G lists out five or six different ways we can deal with the drought next time. That is to me the opposite of planning, that's

JKW-2

John Knox White

a menu, and maybe we should be looking at not necessarily choosing, possibly choosing, how we want to deal with the drought. But if we don't want to make that decision right now, because every drought is different and every time is different, there maybe some issues about equity, current water use etc. that the Board should be looking at and saying, OK, but when you come back with a plan we want to encourage conservation and reduction of water this way, etc. Knowing that you are trying to have this adopted into the state by July it's probably unlikely you are going to be able do that, but one might be able to adopt into this a set of policies that say we are going to start having those conversations by the next time. That the future Water Management Plans will have that kind of…laying out the path forward.

JKW-2

I have a couple of questions based on what I heard and I really appreciate it being able to hear this presented as well, but quickly, there were a couple of, just, these are just small things. There are a couple of places in which accumulative data is presented as opposed to household data, and I thought it was actually…I hadn't been aware of the Steinberg amendment from 2009 that actually set the state goals for what you guys are trying to achieve. And I was interested that those are per capita goals, and yet almost everything that is presented through here is cumulative information that shows water usage constantly going up, and I know that it is a… right…. The agency has to be aware of total water needs so that you can plan for how much more water your going to need in the future. On the other hand, I think that if you are also at the same time trying to be, to minimize that by looking at reducing household, or reducing per capita use, or per household use, a lot of the information would be well served by presenting the per capita or per household usage data as well. But I had two kind of specific examples that, I think, figure 4.5 shows the west-of-the-hills and east-of-the-hills in aggregate and it ignores, or it doesn't present at all that west-of-the-hills households in people far out number the east-of-the-hills households. And a reasonable reader reading this would assume that the west-of-the-hills households are using twice as much water, and really are, the water usage is rampant over here on the west, when in fact we know there are about three times as many people living over here and that the per household usage is about the reverse. I think that is a… where some of the graphs and whatever else, I think it would be good to show the per household…this is one where I think; actually the graph itself is showing the exact opposite of what is happening, and actually leads to misunderstanding of the District and water use within the District. I would assume that the EBMUD's databases could easily kick this out on a zip code or by city basis that would provide a more accurate and more useful presentation that would show up a picture of where is water getting used and in what ways so… and I would imagine that would be useful in terms of conservation etc. those programs that are going on.

JKW-3

And the other one, was just I found it kind of jarring to read the accumulative amounts that are being spent on the conservation programs since 1976 that was just a… it certainly sounds big when you say, since 1970's EBMUD has invested 65 million dollars in implementation of customer targeted water conservation programs. When you look at the per annual it's…you aren't spending that much and you are doing great work. I think in terms of budgeting and whatever else, it would be actually better to show what you are spending every year. If I was in charge of the department I would want to show that too; just to make sure that it doesn't dip down, you know, you can cut that budget in half and it would still show the accumulative going up. If you are trying to make the case that we need to conserve more at budget time, having a report that shows how much we are spending right now, and that we haven't really increased our spending on conservation, from what I could calculate trying to look at the differences in the accumulative, I think having that spelled out annually, what we are spending would be a little more useful. Plus 65 million dollars since the 1970's is a…I don't want to say it's a meaningless number; it's great that the money's been spent, but I'm not sure what anybody reading that can really assume, is that a big number, or a good number, or it doesn't really tell us how that relates to the works' being done and does that seem like…even…does that seem like a good number or not?

JKW-4

So those are my, I'll say criticisms, and I'm sorry, unfortunately that tends to sum up public comment [inaudible]. But in terms of planning I want to say that I think EBMUD's use of local planning documents, as a baseline for how the East Bay's going to grow is a good thing. Rather than trying to ascertain something from, let's say, the census data and whatever else, I think looking at how local communities are planning to grow and use their land use and whatever else is probably a better measure of moving forward. A comment that was…this was something I learned about during the drought that the idea of going into drought…the drought… this will give you an example of a policy that I think should be in this document. The idea that drought pricing leads to a budget gap, leads, I think that…this

JKW-5

John Knox White

is bigger than this document, but there is probably a big conversation to be had about how EBMUD is doing its pricing if encouraging people to conserve their water becomes a budget issue. And that perhaps there is a different way to price the water based on usage that might allow that to become less of a problem. Water and water availabilities only going to become probably more of a problem as we move forward, and looking at that, so that… looking at that again at a time when we don't have to implement it. Because there isn't a drought now, would maybe be the time of looking at how we might want to structure drought pricing so that it doesn't lead to cut backs. At a time according to this report EBMUD's actually going out and spending more money, because in order to get people to reduce their uh,… five million dollars for the…to do communications, whatever, for the drought plan that was a eye opening, not in a bad way, but eye opening in a wow I was surprised that you guys have brought that many more people on. I know it's not a huge number especially when you're dealing with three hundred thousand households etc. but again I…EBMUD's got to find a way to do; be able to do drought pricing and not drive itself into a hole. And again I think Plans like this are a time to do that and then you know I'm not sure if anybody, if Mr. Harris wants to answer this question or not, but I was interested that the gallons per day includes commercial and whatnot. And I'm curious how does a district like EBMUD deal with the idea that you have all these cities within the District working really hard to bring new commercial and whatever else businesses here, but the population may not grow accordingly you could end up increasing your commercial water use significantly with a small change in, probably unlikely, the small change in population and end up having to conserve more to hit that 20%. Is there a way for which…I'm just curious… does the state take that into account? And the other question I have is I know that EBMUD has been very, very successful in the conservation you guys have done compared to other water districts a really great job when we're looking at the 2020. Do you guys get credit for that or do you still have to bring down your water usage 20 whereas other districts that have kind of, let's say, allowed water use to be more rampant they're not making the same…you know, there's a certain point in time everybody cuts and cuts and cuts the next cut is harder to make the next cut is even harder to make. I don't think we are anywhere near where it's really difficult for any of us to make those cuts. My wife is from west Australia their water use there, in a place that lives as nice a lifestyle as we do here in the Bay Area, is less than half. I even want to say it's about a third we do per household, so I think there's lots of places to go. But I'm curious how the state's…how your guys past success, does that come back and bite us as a District in the behind? I'm all done, thank you.

JKW-5

JKW-6

JKW-7

EBMUD Response:

JKW-1 Response

Consistent with the UWMP Act, EBMUD's UWMP describes the service area and the projected water needs of the supplier, and identifies and quantifies existing and planned water sources available to serve demand over a 20 year planning period. (Water Code, sec. 10631).

EBMUD has in place adopted organizational principles and numerous existing policies that support planning activities to pursue the efficient use of available water supplies. These principles and policies, in conjunction with the UWMP and other water management plans, all provide guidance on demand management and water use efficiency.

For instance, the guiding principles in EBMUD's mission statement (see page 1-2 of the UWMP) clearly directs EBMUD to pursue water resource planning activities that ensure environmental responsibility and sustainability. Policies include Policy 9.05 Non-Potable Water, Section 29 Prohibiting Wasteful Use of Water, and Section 31 Water Efficiency Requirements (see Appendix F of the UWMP), which all promote recycled water use, the efficient use of available supplies, and conservation that are key components of EBMUD's long-term water supply planning objectives.

John Knox White

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JKW-5

JKW-6

JKW-7

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John Knox White

JKW-2 Response

EBMUD's water supply shortage response is presented in detail in Chapter 3 of the UWMP. Drought Management Program Elements, presented in Table 3-3 of the UWMP, outline the various actions that EBMUD may take based on the severity of a drought to encourage conservation and reduction of water use. As referenced in Appendix F of the UWMP, water service regulations Sections 28 (adopted with a water shortage emergency declaration), 29, and 31, and Policy 9.03 already provide guidance on responding to a water supply shortage. The combination of the actions outlined in Table 3-3, and the underlying regulations, and policies create the basis for developing a drought management program customized to flexibly meet the unique needs of each drought.

JKW-3 Response

Figure 6-3 of the UWMP charts historic daily per capita water demand.

EBMUD acknowledges that the east-of-hills and west-of-hills aggregate water use for single-families can lead to a misunderstanding of regional water use characteristics within the EBMUD service area. Consequently EBMUD has included a new figure (Figure 4-6) in the final UWMP that illustrates the variation in single-family water use per account within the EBMUD service area.

JKW-4 Response

Figure 6-2 of the UWMP illustrates EBMUD's cumulative annual Water Conservation Program (WCP) expenditures. Annual expenditures can be estimated from the same graph by comparing each year's cumulative expenditure with that from the previous year. As noted on pages 6-4 through 6-5 of the UWMP, EBMUD's historical expenditures for the WCP was $65 million since the 1970s, and the five-year budgetary plan through FY15 includes an additional $18.3 million. This information provides a comparison of historic and future annual expenditures.

JKW-5 Response

EBMUD's BOD considers drought rate pricing when it declares a water shortage emergency. Drought rate pricing development involves analyses of numerous complex variables including water availability, consumption behavior, and anticipated consumption reductions, which provide inherent uncertainties. As noted on page 3-12 of the UWMP, EBMUD adopts a revenue schedule to allow increasing the volume rate, adding a drought surcharge, and using the contingency and rate stabilization reserve fund to fully recover costs of providing ongoing water service, mitigate the expense of implementing the Drought Management Program, and recover lost revenues from lower water consumption. A well-designed drought rate pricing is desired. Gradual improvements in calibrating forecasts will be gained through insight from experience of past droughts.

JKW-6 Response

Since the 1970s, demand management has been an important part of EBMUD's water practices and policies to promote reasonable and efficient use of supplies. Figure 6-3 of the UWMP shows that EBMUD has made significant strides in decreasing historical daily per capital water demand as a result of EBMUD's aggressive water conservation and recycling efforts and other factors. This continuous effort in reducing daily per capita water use goes beyond the short-term focus on consumption reduction as required through SBx7-7.

John Knox White

Current statewide per capita water use has been dramatically reduced in some communities due to a combined 3-year drought and the significant economic recession. The law developed by the legislature and the methodology adopted by the Department of Water Resources, as mandated by SBx7-7, were designed to not limit the economic growth of the state, while recognizing and ensuring efficiency in past and future water use respectively.

To allow agencies including EBMUD to capture previously realized conservation and recycled water savings, SBx7-7 was designed with flexibility to allow suppliers to select one of four methods for establishing its SBx7-7 targets. EBMUD selected a target method that would allow EBMUD to be credited for its aggressive water conservation and recycling programs, implement demand management program budgets that are appropriately tailored to customer usage, anticipate the post-drought and economic rebound, and account for anticipated demand hardening in consumption behavior.

Furthermore, EBMUD is committed to an estimated projected use at 144 gallons per capita per day (gpcd) in year 2020, which exceeds the requirement of its SBx7-7 target of 150 gpcd.

JKW-7 Response

Please see EBMUD Response TI-3 found on page Appendix C-12 of EBMUD's UWMP for further details on EBMUD's conservation efforts.

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APPENDIX D. BOARD RESOLUTIONS

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APPENDIX D. BOARD RESOLUTIONS

RESOLUTION NO. 33832-11

ADOPTING THE URBAN WATER MANAGEMENT PLAN 2010

Introduced by Director Foulkes ; Seconded by Director Mellon

WHEREAS, the California Urban Water Management Planning Act ("Act") requires urban water suppliers to adopt an urban water management plan every five years; and

WHEREAS, the East Bay Municipal Utility District ("District") last updated its Urban Water Management Plan in accordance with the provisions of the Act in 2005; and

WHEREAS, in accordance with the requirements of the Act, the District commenced a review of the Urban Water Management Plan and an update to its provisions in 2010, and based upon the review, the District has prepared a revised and updated Urban Water Management Plan (Plan); and

WHEREAS, a draft of the updated Plan was made available for public inspection beginning in April 2011, and a noticed public hearing was conducted by the District Board of Directors on May 10, 2011, and all comments received from the public and from public agencies have been reviewed and considered and the District has modified the Plan.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the East Bay Municipal Utility District does hereby adopt the Plan dated June 2011, and directs the Secretary to file a copy of the Plan with the California Department of Water Resources, to distribute a copy of the Plan to the California State Library, and copies to cities and two counties within the District's

service area, within thirty (30) days of this action. The Secretary is further directed to make the Plan available for public review during normal District business hours.

ADOPTED this 28th day of June, 2011 by the following vote:

AYES: Directors Foulkes, Katz, McIntosh, Mellon, Patterson and President Coleman.

NOES: None.

ABSENT: Director Linney.

ABSTAIN: None.

President

ATTEST:

Secretary

APPROVED AS TO FORM AND PROCEDURE:

General Counsel

RESOLUTION NO. 33833-11

ADOPTING UPDATED URBAN WATER SHORTAGE CONTNGENCY PLAN FOR INCLUSION WITHIN THE EBMUD UPDATED URBAN WATER MANAGEMENT PLAN 2010

Introduced by Director Foulkes ; Seconded by Director Mellon

WHEREAS, in 1992, the Board of Directors of East Bay Municipal Utility District adopted an Urban Water Shortage Contingency Plan in accordance with the requirements of the California Urban Water Management Planning Act; and

WHEREAS, recent water resource planning changes, including an updated rationing policy, recent drought events, and the availability of an additional dry year supply from the Freeport Regional Water Facility, make it necessary to update the Contingency Plan to plan and respond to periods of water shortage; and

WHEREAS, a draft of the Contingency Plan, and the draft Urban Water Management Plan in which it is included, were made available for public inspection beginning with a first draft in April 2011; and

WHEREAS, a noticed public hearing was conducted by this Board of Directors on May 10, 2011, and all comments received from the public and from public agencies have been reviewed and considered.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors does hereby adopt the Urban Water Shortage Contingency Plan and directs the Secretary to file a copy of the Contingency Plan, as included in the 2010 Urban Water Management Plan with the California Department of Water Resources within 30 days of adoption of the 2010 Urban Water

Management Plan. The Secretary is further directed to make the plan available for public review during normal District business hours.

ADOPTED this 28th day of June, 2011 by the following vote:

AYES: Directors Foulkes, Katz, McIntosh, Mellon, Patterson and President Coleman.

NOES: None.

ABSENT: Director Linney.

ABSTAIN: None.

President

ATTEST:

Secretary

APPROVED AS TO FORM AND PROCEDURE:

General Counsel

APPENDIX E. SOUTH EAST BAY PLAIN GROUNDWATER BASIN OVERVIEW

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Appendix E. South East Bay Plain Groundwater Basin Overview

In accordance with the Urban Water Management Planning Act under California Water Codes section 10631(b), this appendix of the Plan provides a comprehensive description of the South East Bay Plain Basin where the Bayside Groundwater Project (Phase 1 and the potential Phase 2) is located.

Description

The East Bay Plain Basin extends along the East Bay foothills to the Bay approximately from Richmond to Hayward as shown in Figure E-1. Consisting of a portion of the East Bay Plain Basin, the South East Bay Plain Groundwater Basin (SEBPB) is bounded to the east by the Hayward Fault and extends beneath San Francisco Bay to the west. The exact location of the western boundary under the Bay is not precisely known/ defined; therefore, the boundary is assumed to coincide with the edge of the Bay, consistent with the California Department of Water Resources' (DWR) depiction of the basin in their Bulletin 118. The SEBPB thins out to the north and becomes an insignificant source of groundwater near Berkeley. The southern boundary is in the City of Hayward near the San Mateo Bridge. The Niles Cone Groundwater Basin (NCGWB) begins immediately south of the SEBPB, and extends from about Hayward to Milpitas.

Hydrostratigraphic Units

The SEBPB is comprised of three main aquifer systems. The SEBPB aquifer systems include:

- The shallow aquifer is at approximately 30 to 130 feet below ground surface (bgs). Aquifers of limited extent, comprising of a water table aquifer system with relatively low vertical permeability, occur at depths of less than 50 feet in this unit. This unit is separated from the underlying aquifers by an Old Bay Mud (also known as Yerba Buena Mud) aquitard that is about 50 feet thick and pinches out to the east towards the Hayward Fault.
- The middle aquifer is comprised of deposits at depths of about 130 to 375 feet bgs. Groundwater in this aquifer occurs under confined conditions.
- The Deep Aquifer includes the upper 100 feet of the continental portion of the Alameda Formation and consists of alluvial fan deposits interfingered with water body deposits. This confined aquifer is to be used for injection and extraction of water during operation of the project. The Deep Aquifer is located over 400 feet bgs. It is thickest in the south, and thins and feathers out to the north; the unit is not substantially productive north of San Leandro. The aquifer is believed to extend toward the middle of the Bay. Fine-grained clays and silts exist below the Deep Aquifer.

Groundwater Basin Management

EBMUD collaborates with local stakeholders such as the Alameda County Public Works Department, Alameda County Water District (ACWD), City of Hayward, and the DWR to share groundwater monitoring data and project operational data. In addition, EBMUD has conducted geohydrological studies and continues conducting subsidence investigations of the SEBPB in partnership with local and federal partners. During the Bayside Groundwater Project's EIR process, EBMUD in partnership with ACWD developed a numeric groundwater flow model for the SEBPB and NCGWB, called the Niles Cone and South East Bay Plain Integrated Groundwater and Surface Water Model (NEBIGSM) to evaluate potential project impacts on groundwater levels in this area. Currently, EBMUD is exploring feasibility to collaboratively develop a groundwater management plan for the SEBPB in partnership with local stakeholders.

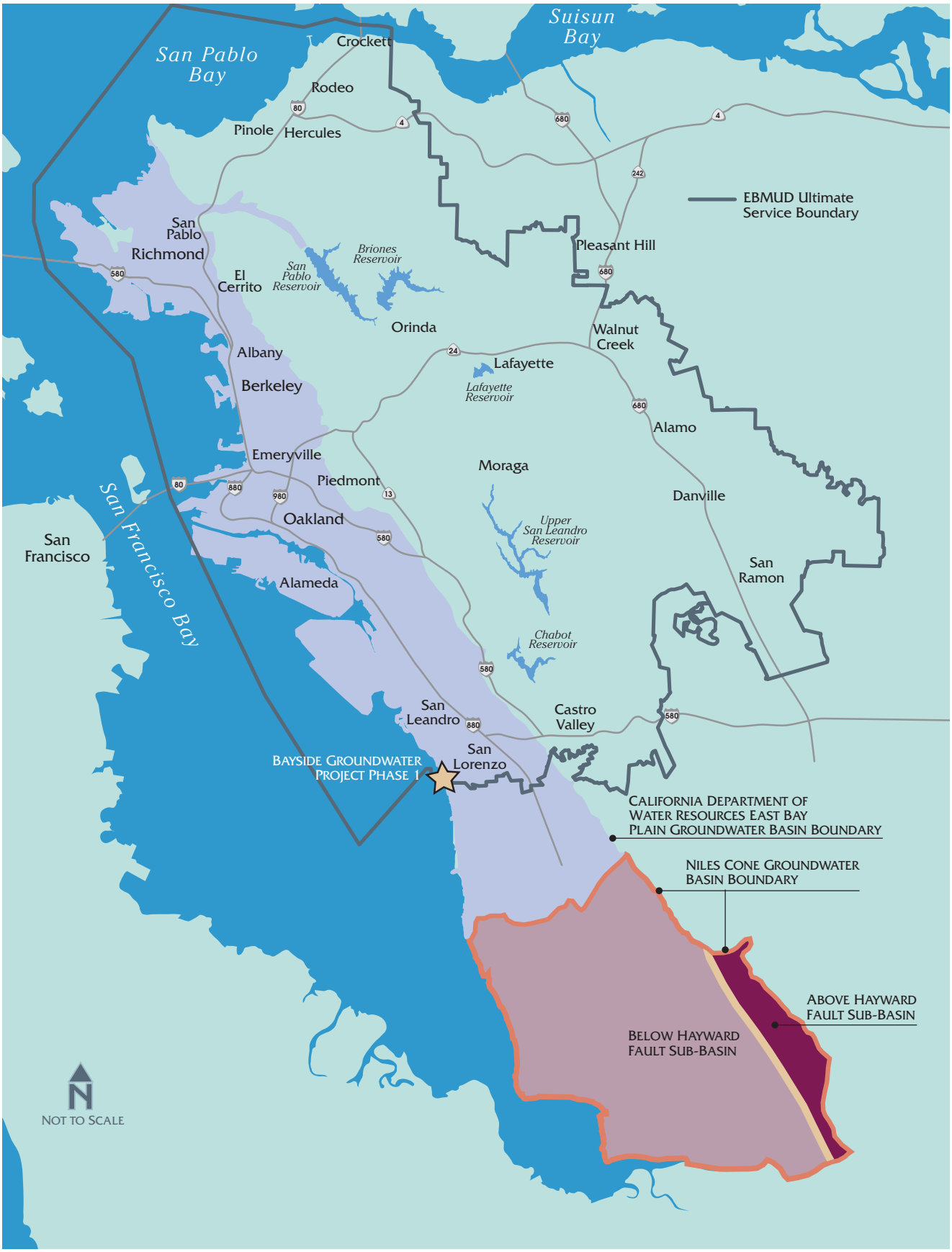
Water Budget

The historic low basin water level and associated low storage volume were observed in early 1960s. Currently the basin is fully recovered from historic pumping and basin water level is steady/ stable. The basin is not in an overdraft condition. Water balance results indicate the basin is experiencing, on average, a net recharge of 1,300 acre-feet (discharge is estimated to have averaged about 7,100 acre-feet per year. Recharge to the basin is estimated to have averaged about 8,400 acre-feet per year in the mid-1990s). This result is reflected in the field, where rising water levels in the Deep Aquifer have been observed for some time.

SEBPB Groundwater Movement

Currently, groundwater in the shallow units of the SEBPB generally flows from east to west, from the Hayward Fault

FIGURE E-1 SOUTH EAST BAY PLAIN BASIN



towards San Francisco Bay, with an average horizontal flow gradient of about 0.002. Average horizontal gradients in the middle aquifer are also about 0.002. The horizontal flow gradient in the Deep Aquifer is about 0.001 with a northerly flow component.

Vertical downward gradients (i.e., the head in the upper unit is higher than that of the adjacent lower unit) are present throughout the SEBPB where the Old Bay Mud is present. Vertical gradients are approximately 0.02 near the Bay margin (from both Newark Aquifer equivalent to Centerville and Fremont Aquifer equivalents, and from these units to the Deep Aquifer), and are insignificant near the foothills where the Old Bay Mud pinches out.

Historic Water Levels

Maximum drawdown in the SEBPB occurred in the early 1960s. Water levels were at about -90 to -110 feet below Mean Sea Level (MSL) at that time, with gradual recovery to the present. Currently, the basin water levels range approximately between -5 to -10 feet below MSL, under normal water year and basin usage conditions.

Groundwater Quality In The SEBPB

Groundwater of the shallow aquifer, based on total depths less than about 200 feet bgs, contains relatively high concentrations of total dissolved solids (TDS), chloride, nitrate, and sulfate, especially compared to deeper units, and is more vulnerable to contamination from surface sources. Groundwater from some wells completed in this aquifer exceeds the maximum contaminant level (MCL) for nitrate and the secondary MCL for TDS, chloride, sulfate, iron, and manganese. Nitrate levels in groundwater are elevated in portions of the shallow aquifer that underlies the San Leandro/ San Lorenzo area. Iron concentrations in the shallow aquifer are typically less than 0.05 parts per million. Based on available data, groundwater from wells completed within the intermediate aquifer locally exceeded the secondary MCLs for TDS, chloride, iron, and manganese. High TDS values in at least some of these wells are probably related to shallow screen intervals. Iron and manganese data for this zone are sparse.

Wells completed within the Deep Aquifer (wells with depths greater than 500 feet bgs), are primarily found in the southern-most portion of the SEBPB. Groundwater from these wells is generally of high quality with elevated concentrations of iron and manganese. Chloride, nitrate, and sulfate concentrations are relatively low in this unit. Native groundwater extracted from wells screened in the Deep Aquifer near the project area meets all current primary (health-based) drinking water standards and, with the exception of manganese, all secondary (aesthetic) drinking water standards. Note that high manganese content is common in native groundwater (not just in the SEBPB). Standard treatment methods for manganese are filtration and dilution. For the Bayside project, the treatment facility includes filter platforms and pipe assembly, which can be used to install manganese filtration system as needed. Radon, which commonly occurs in the air and soil, can also be found in groundwater and is currently not regulated. The native groundwater from the Deep Aquifer of the project area contains radon with the concentration of 800 picocuries per liter. The water quality samples from the Deep Aquifer are also analyzed for hexavalent chromium by using EPA 218.6 method. The analysis did not detect hexavalent chromium at or above the method detection limit.

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Appendix F. EBMUD Policies and Rates

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EBMUD

Policy 3.07

EFFECTIVE 27 APR 10

SUPERSEDES 14 OCT 08

RESPONSIBILITY TO SERVE WATER CUSTOMERS

IT IS THE POLICY OF EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Ensure that during times of water shortage, available water supplies are appropriately allocated to water customers.

Discussion

Water supplies that were available to EBMUD's customers were limited due to rationing necessitated by past drought conditions.

It is expected that the water available for supplying EBMUD's customers will vary over time depending on the following factors: diversions by Mokelumne River users with senior water rights, requirements for instream flows to protect fish and wildlife in the Mokelumne River, the Sacramento- San Joaquin River Delta, and the San Francisco Bay, as well as development of future supplemental supplies.

Water agencies are responsible for planning to meet the needs of their customers through periods of drought with minimal disruption to residential, commercial, and industrial activities within their service area.

Water Service Responsibility

EBMUD recognizes that when there is a water shortage or projected water shortage, EBMUD's responsibility to serve its customers and service area is prioritized as follows:

- First, to serve its existing customers within its existing service area.
- Second, to serve expected new customers within its existing service area, but only if this does not unacceptably impair EBMUD's ability to serve its existing customers.
- Third, to consider serving new customers outside of its existing service area, but only if this does not impair EBMUD's ability to serve existing and expected new customers within its service area.

In accordance with California Government Code, Section 65589.7, when new service connections are restricted by EBMUD's Board of Directors, priority shall be given to applicants for water service to proposed developments within EBMUD's existing service area that include housing units affordable to lower income households, pursuant to administrative procedures adopted and implemented by the General Manager. Applicants granted such priority shall comply with all of EBMUD's Water Service regulations and pay all requisite fees.

Restrictions on provision of new water service connections may be due to the following:

- A declaration of a water shortage emergency condition under California Water Code, Section 350, et seq.
- A determination by the Board of Directors, based on EBMUD's Urban Water Management Plan, that sufficient water supply is not available to support the granting of all requests for new service, as provided in California Government Code, Section 66473.7.

Responsibility to Serve Water Customers

NUMBER	3.07
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- A determination by the Board of Directors, based on a written engineering report, that EBMUD does not have sufficient water treatment or distribution capacity to serve the needs of proposed development.

- The imposition of a compliance order by the Department of Health Services limiting new connections.

Authority

Resolution No. 32867-94, June 28, 1994
As amended by Resolution No. 33443-04, September 28, 2004
As amended by Resolution No. 33543-06, June 27, 2006
As amended by Resolution No. 33687-08, October 14, 2008
As amended by Resolution No. 33763-10, April 27, 2010.

California Government Code, Section 65589.7

EBMUD

Policy 7.03

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SUPERSEDES 24 FEB 09

EMERGENCY PREPAREDNESS/BUSINESS CONTINUITY

IT IS THE POLICY OF EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Create and maintain an active Emergency Preparedness Program that includes an Emergency Operations Plan (EOP) written and administered to help manage the District's critical functions during any emergency and protect people, property, and the environment. The District will coordinate the EOP function and response with Federal, State, and local agencies and private entities charged with emergency duties. The District will also create and maintain a Business Continuity Program Plan to minimize impacts to critical business functions and enhance its capability to recover operations expediently and successfully following a disruptive incident.

Emergency

An emergency includes actual or threatened existence of conditions of disaster or extreme peril to critical District functions and/or the health and safety of staff or the public. These conditions may be caused by an earthquake, power outage, dam failure, freeze, water supply contamination, national security incident, and other conditions that may be beyond the capability of District forces and may require support from other political subdivisions, other agencies, volunteer and non-profit organizations, or the private sector.

Emergency Preparedness Program

The District's Emergency Preparedness Program shall include an EOP written and administered in accordance with the guidelines of the National Response Framework (NRF), the National Incident Management System (NIMS), and the California Standardized Emergency Management System (SEMS). In accordance with NIMS and SEMS, the Emergency Preparedness Program will consist of four phases of emergency management: mitigation, preparedness/planning, response, and recovery. The EOP will include guidelines for identifying and training District staff in the NIMS, designate District staff to critical positions identified in the EOP, and designate staff to represent the District in negotiations or consultations with public and private agencies on matters pertaining to response to the emergency and recovery of damaged systems and financial costs. The Regulatory Compliance Office will facilitate progress on this program.

National Response Framework

The NRF is a guide to how the nation conducts all-hazards emergency response. It is built upon scalable, flexible, and adaptable coordinating structures to align key roles and responsibilities across the nation. It describes specific authorities and best practices for managing incidents that range from the serious but purely local, to large-scale terrorist attacks or catastrophic natural disasters. It builds upon the NIMS and focuses particularly on how the Federal Government is organized to support local entities and States in catastrophic incidents.

National Incident Management System

NIMS is a system mandated by Homeland Security Presidential Directive 5 that provides a consistent nationwide approach for Federal, State, local and tribal governments, the private sector, and nongovernmental organizations to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. To provide for interoperability and compatibility among Federal, State, local and tribal capabilities, the NIMS includes a core set of concepts, principles, and terminology.

Emergency Preparedness/Business Continuity

NUMBER	7.03
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Standardized Emergency Management System

The State Office of Emergency Services regulates the SEMS which was created by Government Code Section 8607 following the 1991 East Bay Hills Firestorm. SEMS is used to establish consistent response operations, coordinate emergency response, provide a method through which jurisdictions can request assistance, and provide a means for communication among levels of government. To ensure eligibility for state funding of response-related costs, all District emergency plans, procedures, and training will follow the SEMS regulations, and coordinate with the District-wide EOP.

Authorization During District Emergencies

When an emergency condition arises that necessitates immediate action to minimize damage and inconvenience resulting from such condition, the General Manager or successor, in consultation with the President of the Board of Directors, or successor, is authorized to enter into emergency contracts not to exceed $350,000, per contract, without bids or notice.

At the next regular or special meeting of the Board of Directors following such emergency, a report shall be made to the Board of Directors summarizing all expenditures made and contracts executed in response to said emergency. Periodic reports shall be generated at the direction of the Board until the emergency is concluded.

Following a Presidential Declaration of an emergency, the Federal Government historically deploys personnel, equipment and financial resources to support the recovery effort. Following a Governor's State of Emergency Proclamation, State assistance for emergency response costs and permanent restoration assistance for mutual aid/assistance may be available. The Governor may direct execution of the State's emergency plan, or commit other State resources as the situation demands. The Emergency Operations Director (EOD) or designee is authorized to take all necessary action to complete the application procedures to access the incoming resources and to represent the District in requesting/negotiating for the needed resources.

Emergency Operations Director

The District's EOP will identify a District manager to serve as the EOD who will have the authority for developing plans, training staff and activating the EOP. In consultation with the General Manager, the EOD will identify staff to fulfill the planning and response duties listed in the EOP. As the need arises, the EOD may direct all staff or material resources of the District to combat the effects of a threatened, declared or actual emergency.

Mutual Aid/ Assistance

The California Master Mutual Aid Agreement (Government Code Sections 8561, 8615 and 8617) allows for the implementation of mutual aid during threatened, actual, or declared emergencies. The General Manager, EOD, and their successors, in accordance with the EOP, may request mutual aid/assistance from other local government and public agencies, or commit District resources to other agencies requesting aid. The General Manager may sign appropriate documents to implement mutual aid/assistance, emergency interties, and other emergency response agreements.

Emergency Preparedness/Business Continuity

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Business Continuity Program

The District provides products and services that support the economic, human, and environmental health of the East Bay. Therefore, the District must have a program that facilitates the performance of essential functions during an emergency situation that disrupts normal operations and/or the timely resumption of normal operations once the emergency has ended. The Business Continuity Program Plan (BCPP) provides the overall framework for the program and outlines the basic priorities for recovery of business functions in individual departmental Business Continuity Plans (BCPs). The Regulatory Compliance Office will manage the program and maintain the BCPP. Departments will create BCPs that outline: the critical functions, which must be performed before, during and after an event; the personnel responsible for completing the necessary actions; and the vital records, equipment, and systems required to accomplish the identified tasks. The departments are responsible to ensure that their BCPs are maintained, employees trained, plans tested, and their vital records necessary to maintain operations are available. Vital records include all information and records, which if lost, would place significant financial, operational, or legal restrictions on the continuation of District services.

Continuity of Management

The District's BCPs will list at least three successors to critical staff identified in each plan, including the General Manager. In the event the primary person is unable to respond to an emergency, each successor, in order, may assume all the duties and powers of the primary staff.

Status Reports

The General Manager will provide periodic Emergency Preparedness Program progress reports to the Board of Directors, as necessary, and the District's response to a declared District emergency, when applicable.

Authority

Resolution No. 33014-96, November 12, 1996
As amended by Resolution No. 33027-02, September 24, 2002
As amended by Resolution No. 33460-05, February 8, 2005
As amended by Resolution No. 33564-06, November 14, 2006
As amended by Resolution No. 33703-09, February 24, 2009
As amended by Resolution No. 33793-10, November 23, 2010

References

District Emergency Operations Plan
Procedure 122 - Emergency Purchases
Policy 7.13 – Security
Municipal Utility District Act – Section 12753
California Master Mutual Aid Agreement
Standardized Emergency Management System
National Response Framework
National Incident Management System

EBMUD

Policy 9.03

EFFECTIVE 14 JUN 11

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WATER SUPPLY AVAILABILITY AND DEFICIENCY

IT IS THE POLICY OF THE EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Evaluate the availability of the District's water supplies and determine the acceptable maximum level of annual customer demand for the District's service area based on limiting rationing up to a maximum of 15 percent of District-wide annual demand and implementation of current and proposed District conservation programs, recycled water programs and supplemental supply projects.

Annual Water Supplies Report

A review and report to the Board of Directors shall be made on the current and long-term adequacy of the District's water supplies before May 1st of each year. The report shall include an evaluation of the adequacy of the District's water supplies to satisfy customer demand for the current water year and a projection through the year 2040, based on the determination of the Allowable Maximum Level of Demand.

Long-Term Water Supply Reliability

An assessment of long-term water supply reliability through the year 2040 shall be made assuming:

- Water service will be provided in accordance with the District's Regulations Governing Water Service to Customers.
- Water conservation and water recycling programs will be implemented as provided in the District's current Urban Water Management Plan (UWMP).

Supplemental Supplies

The District shall pursue supplemental supplies if existing supplies are found to be inadequate either for the current year or through the year 2040 as provided in the District's current UWMP.

Rationing

The District shall have a goal of limiting customer rationing to a maximum of 15% of District-wide annual demand and will implement this policy consistent with the District's Drought Management Program Guidelines, as outlined in the current UWMP.

Notification Surplus Water

In accordance with the 1998 Joint Settlement Agreement when a determination of the availability of Mokelumne River water is made, the District will notify the Resources Agencies, specifically the United States Fish and Wildlife Services and the California Department of Fish and Game, of the availability of the additional water.

Definitions

Drought Planning Sequence (DPS) – Three year hydrology sequence presenting a worst case drought scenario derived from historical record.

Allowable Maximum Level of Demand (AMLD) – The allowable maximum level of customer demand, in MGD as an annual average, that the system can sustain under the DPS.

Water Supply Availability and Deficiency

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Definitions

Drought Planning Sequence (DPS) – Three year hydrology sequence presenting a worst case drought scenario derived from historical record

Allowable Maximum Level of Demand (AMLD) – The allowable maximum level of customer demand, in MGD as an annual average, that the system can sustain under the DPS.

Authority

Amended by Resolution 31,246, May 14, 1985
Amended by Resolution No. 32,204, May 9, 1989
Amended by Resolution No. 33175-99, November 9, 1999
Amended by Resolution No. 33759-10, April 13, 2010
Amended by Resolution No. 33821-11, June 14, 2011

References

Policy 3.01 - Annexations
Policy 3.05 - Effects of Extension of Water Beyond the Ultimate Service Boundary
Policy 3.07 - Responsibility to Serve Water Customers
Procedure 900 – Water Supply Accounting and Reporting
Procedure 901 – Recycled Water Accounting and Reporting
Procedure 902 – Water Conservation Accounting and Reporting

EBMUD's Urban Water Management Plan

Policy 9.05

EFFECTIVE 14 NOV 06

SUPERSEDES 28 SEP 04

NON-POTABLE WATER

IT IS THE POLICY OF EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Require that customers of the East Bay Municipal Utility District ("EBMUD") use non-potable water, including recycled water, for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish and wildlife. When nonpotable water satisfying these conditions is made available to the customer, the use of potable water for nondomestic purposes may constitute a waste and unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution and is prohibited.

Findings Related To Use Of Non-potable Water

The Board of Directors of EBMUD has determined that existing water supplies will not adequately accommodate existing and future demand within the EBMUD's Ultimate Service Boundary. Non-potable water resources, including treated wastewater discharged to the San Francisco Bay from EBMUD and other Bay Area treatment plants, could provide a safe and effective alternative water supply for certain non-potable purposes, increase the availability of the limited water supplies of EBMUD , assure non-potable water customers of a more reliable water supply during periods of drought, reduce wastewater discharges to the Bay, and provide EBMUD with greater flexibility to meet instream needs in the Mokelumne River. The State Legislature has also determined that the use of potable domestic water for certain non-potable uses may constitute a waste or unreasonable use of water if recycled water is available which meets specified conditions. (Water Code Section 13550 et seq.)

Definitions

Non-potable Water - All reclaimed, recycled, reused, or untreated water supplies that meet the conditions set forth in the California Water Code, Section 13550 and are determined by EBMUD to be suitable for non-domestic purposes and feasible for the particular intended use.

Non-domestic Uses - For purposes of this policy, "non-domestic uses" shall mean all applications except drinking, culinary purposes and the processing of products intended for direct human consumption.

Mandated Uses Of Non-potable Water

Customers may be required to use non-potable water for their non-domestic uses which may include, but are not limited to, the following:

- irrigation of cemeteries, golf courses, playing fields, parks, and residential and nonresidential landscaped areas;
- commercial and industrial process uses; and
- toilet and urinal flushing in nonresidential buildings.

Non-potable Water

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Determination Of Feasibility Of Non-potable Water

In determining whether non-potable water is feasible for a particular non-domestic use, EBMUD shall consider the following factors:

- Whether the non-potable water may be furnished for the intended use at a reasonable cost to the customer and EBMUD.
- Whether the non-potable water is of adequate quality for the intended use and does not require significant additional on-site treatment beyond that required for potable water.
- Whether the use of non-potable water is consistent with all applicable federal, state, and local laws and regulations.
- Whether the use of non-potable water will not be detrimental to the public health and will not adversely affect plant life, fish and wildlife.

Regulations Governing Non-potable Service

The regulations governing non-potable water service and the rates therefore shall be determined by the Board of Directors and published in the Regulations Governing Water Service and Schedule of Rates and Charges for Customers of East Bay Municipal Utility District.

Water Reuse Zones

EBMUD designates Water Reuse Zones within EBMUD's service area where non-potable water service has been determined to be reasonably available.

Non-potable Water Service Agreements

Where implementation of this Policy requires agreements, such agreements shall, wherever possible, have a term of 20 or more years and shall include provisions governing facilities operation and maintenance responsibilities. Upon termination or expiration of an agreement, customers receiving non-potable water service pursuant to that agreement shall be governed by the non-potable water service regulations and rate schedule, unless a new agreement is entered into.

Authority

Resolution No. 32981-96, April 9, 1996
As amended by Resolution No. 33443-04, September 28, 2004
As amended by Resolution No. 33564-06, November 14, 2006

References

Regulations Governing Water Service and Schedule of Rates and Charges for Customers of East Bay Municipal Utility District

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SECTION 2

APPLYING FOR SERVICE

If a service connection is already serving the premises, applications for service are taken at the business offices of the District. If a new service connection is required, applications for service are taken at the New Business Office of the District. The District's requirements for the type of service desired must be met before an application will be approved (see Section 31 – Water Efficiency Requirements).

If standard service (see Section 3) is not reasonably available, or if the premises are outside the District's boundaries, or if unusual conditions exist, the applicant will be advised of the terms and conditions which must be met before an application for service may be accepted. In determining whether the portion of an applicant's premises lying directly along a main constitutes principal frontage, the District's decision shall be final.

Effective January 1, 2009, each new multi-family residential or multi-occupancy commercial/industrial unit in a structure of three stories in height or less shall be individually metered when the District has determined it is feasible to do so. The determination of feasibility is made by the District to meter each unit individually when reasonably possible to do so and this determination by the District is final.

Continuance of service is dependent on compliance with the District's regulations governing service, and on conditions at the location of the service remaining unchanged to the extent that they do not conflict with the District's requirements for obtaining service. Where a change in conditions at the location of the service makes a customer ineligible for continued service, the customer concerned shall be responsible for promptly notifying the District in writing of the change.

Applicants for service shall pay all the applicable charges as provided in the Schedule of Rates and Charges, including the following:

- Account Establishment Charge
- Service Installation Charges
- Water Service Estimate Fee (if applicable)
- Water Main Extension Charges (if required)
- System Capacity Charge
- Charges for Annexation (if applicable)
- Wastewater Capacity Fee (if applicable)

Applicants shall provide all information determined by the District necessary to establish conditions at the location of service. This information can include, but not be limited to:

- Property descriptions
- Improvement plans, including certification of subgrade elevation
- Information regarding soils and known contaminated soil conditions
- Environmental documentation
- Fire flow form signed by responsible fire agency

SECTION 2

APPLYING FOR SERVICE
(continued)

- Topographical map(s)
- Development and site plans with hydrant locations identified and signed by the responsible fire department (if applicable)
- Hydraulic calculations for proposed fire sprinkler system (if applicable)

AMORTIZATION OF CONNECTION AND INSTALLATION FEES

Applicants for service that satisfy the criteria set forth below may make written application to the District to amortize the payment of water service installation charges (Schedules D and E), water main extension charges (Schedule G), system capacity charges (Schedule J) and wastewater capacity fees, pursuant to the following terms and conditions:

- The amount amortized shall be at least $5,000 but not more than $150,000.
- Applicant shall pay in advance a minimum of 25% of the estimated cost to provide the new service connection.
- Applicant shall enter into an agreement with the District which provides that:

  a. amortized charges that shall be paid in equal installments over a maximum period of 24 months;
  b. interest shall be applied to the balance due at a rate set by the Director of Finance;
  c. water service may be terminated for failure to pay any installment when due;
  d. repayment of the amortized charges shall be secured by real property owned by applicant and District shall have the right of foreclosure by a power of sale;
  e. applicant shall pay all escrow and title search costs incurred.

- Applicant shall execute deeds of trust which shall constitute a lien upon real property interests described therein, which property shall be situated in California and shall be sufficient to secure repayment of the amortized charges.

<u>Applicant Criteria</u>

I. Applicants providing job training in District job skills.

In order to make application to amortize charges pursuant to this section, the applicant must:

  a. make written application to the District for water service;
  b. have tax-exempt status under Internal Revenue Code section 501(c)3;
  c. provide job training, including job skills utilized in District job classifications, to unemployed individuals; and
  d. own and occupy the property for which water service application is made.

SECTION 2

APPLYING FOR SERVICE
(continued)

II. Applicants providing low income housing incorporating water conserving devices and landscaping.

In order to make application to amortize charges pursuant to this section, the applicant must:

- be organized solely for the purpose of constructing low income housing;
- provide evidence of eligibility for Community Development Block Grant (CDBG) assistance;
- own the property for which water service is requested;
- seek to amortize charges related to providing water service to a low-income housing project that:

  i) is restricted to such use for at least 15 years or such other time specified or required by law; and

  ii) will provide rental units for low-income residents or, if intended for ownership, will be owner-occupied units for low-income residents.

- incorporate water conservation features, beyond those required by law, into the design of the project and install and maintain water conserving landscaping approved by the District; and
- specify the cost benefit that will inure to residents of the project.

For purposes of this section, “housing” and “low-income housing” shall have the following meaning:

- Housing is defined to include rental housing, condominiums, cooperative housing, ownership housing, housing for families, senior housing, housing for physically and/or mentally disabled people, emergency shelters and shared housing.

- Low-income housing is defined as housing which is subsidized in whole or in part by one or more governmental agencies or foundations and which is rented or owned by individuals or families whose incomes are within ranges specified as low-income by the U.S. Department of Housing and Urban Development for Alameda and Contra Costa Counties.

III. In addition to the above criteria, applicants must make written application to the District for water service and provide evidence of tax-exempt status under Internal Revenue Code section 501(c)(3).

SECTION 3

STANDARD SERVICE

SERVICE CONNECTION EXISTS AT TIME APPLICATION RECEIVED

A standard service may be granted where a complete service connection for the premises exists, there is no change in the use of the premises, the service has been active within the previous five years, there is no change in service size, and the District's requirements are met as stated in these regulations (see Section 2, Applying for Service and Section 31 – Water Efficiency Requirements). In such cases, if sufficient advance notice is furnished to the District, the service will be turned on at the meter on the date requested by the customer, except Saturdays, Sundays, and holidays.

All requirements established for the existing service connection shall remain in effect, including the requirement for a pressure regulator or backflow prevention device.

SERVICE CONNECTION DOES NOT EXIST AT TIME APPLICATION RECEIVED

When an application is received for a standard service to premises where a service connection does not exist, or the existing service connection is inadequate, as determined by the District, a standard service may be granted and installed provided the applicant meets the District's general requirements as stated elsewhere in these regulations, and:

1. Service is reasonably available at the premises to be served.

2. The size of the service connection is approved by the District.

3. The applicable District charges have been paid.

4. The applicant agrees to install a pressure regulator or backflow prevention device when required by the District.

5. There is an immediate need for water service to the premises.

6. The applicant agrees to meter the development as specifically approved by the District.

If service is not reasonably available or if unusual conditions exist, the applicant will be advised of the terms and conditions which must be met before an application for service will be accepted.

Additional requirements for nonpotable water service are included in Sections 30 and 31 of these regulations.

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SECTION 3

STANDARD SERVICE
(continued)

In circumstances under which the District anticipates unusual conditions, the applicant shall pay installation charges based on the District's estimate of the total cost of all materials, labor and other costs incidental to the installation. Unusual conditions shall exist when, in the opinion of the District, the installation is to be made under conditions which would result in unusual or significant departure from the basic installation charges set forth in the Schedule of Rates and Charges to Customers. Such circumstances shall include, but not be limited to, the length of the lateral, the type of pavement, anticipated soil or other underground conditions, and the width or travel conditions of the roadway or right-of-way.

Water service will generally be made available by extending a main if the premises to be served does not have principal frontage on an existing water main of adequate flow and pressure (See Section 4). However, water service will not be provided by the extension of a water main where the meter(s) for the premises concerned will be located at an elevation of less than 100 feet below the overflow level of the reservoir supplying such main.

EXCEPTIONS

TEMPORARY CONSTRUCTION SERVICE

The District may grant a temporary construction service where it is expected that the service will be in use for a short period to serve a temporary operation not related to any particular premises. In such cases, the appropriate installation and system capacity charges set forth in the Schedule of Rates and Charges shall be paid in advance and billing at the current rate for a standard service shall apply.

INSTALLATION OF SERVICES CONNECTIONS IN NEW SUBDIVISIONS

Under special conditions the District may install a service connection without the meter in advance of actual need to avoid later cutting of pavement or for other reasons. In such cases, the appropriate installation charges set forth in the Schedule of Rates and Charges shall be paid in advance, but billing procedure shall not apply as the service will not be turned on until a standard service is required and approved by the District. The System Capacity Charge shall be paid in accordance with the provisions of Section 3B. If the service connection is not completed by a request for meter installation and turned on within one year of installation of the connection, the District may determine there is no immediate need for water service and may remove the service connection. Regardless of whether the service connection was removed, to establish service a new service application will be required under the Regulations and Schedule of Rates and Charges then in effect.

SECTION 3

STANDARD SERVICE
(continued)

STREET LANDSCAPING SERVICE

The District may grant a street landscaping service for planting strips or areas which lie within public streets and are devoted to and maintained for landscaping and related purposes by the public agency having jurisdiction over the streets. In such cases, the planting strip or area may be considered a single unit for the purposes of receiving, using and paying for service regardless of its division or intersection by other public streets. The District shall approve the size and location of the service and the distance or area which may constitute a single unit. The appropriate installation and system capacity charge set forth in the Schedule of Rates and Charges shall be paid, and billing at the current rate for a standard service shall apply. Additional requirements for nonpotable and potable water service are contained in Sections 30 and 31 of these regulations.

COMBINATION STANDARD AND FIRE SERVICE

The District may grant a service to provide both standard service and a supply to a private fire protection system for a single-family premises or a multi-family premises of two units. A separate fire service connection is required for service to a private fire protection system at all other premises except the following:

1. New service or the enlargement of existing connections required for large area premises with public or private educational facilities and publicly-owned facilities served with combined standard and fire service.

2. Service to multi-family residential premises when it is determined by the District that a combined service connection is acceptable for metering normal water use and is approved by the responsible fire protection agency.

3. Service to group homes or residential facilities when it is determined by the District that a combined service connection is acceptable for metering normal water use and is approved by the responsible fire protection agency.

Except for the System Capacity Charge as provided in Schedule J, the rates and charges pertaining to the service shall be based on actual meter size.

IRRIGATION METERING

A separate irrigation meter shall be required for all new (residential and nonresidential) irrigated landscaping covering an area of 5,000 square feet or more, except as provided in Section 31 of these regulations.

SECTION 3

STANDARD SERVICE
(continued)

BRANCH METERING

The District may grant two or more standard services from a single service connection for a premises other than a single-family premises. The appropriate installation charge set forth in the Schedule of Rates and Charges shall be paid.

MASTER METERING

Each separate structure of a premises shall be separately metered.

The District may grant a single service to a premises with two or more dwelling units and or commercial/industrial units such as a residential or commercial condominium project, provided all the following conditions are met:

1. The property to be served must be in single ownership, including streets containing the owner's water service pipelines. Where dwelling units are individually owned, the property surrounding the structures must be in single common ownership under a residents or homeowners association.

2. There must be a resident manager for the property who will be responsible for maintaining the private water system beyond the master meter and for payment of all water service charges.

3. The applicant must furnish a written statement from the fire district or other public agency with jurisdiction, indicating its acceptance of the proposed arrangement for providing fire flow, and that the liability for supplying water for fire protection rests solely with the property owner responsible for the private water system.

4. It has been determined by the District that individual metering of each unit is not feasible in accordance with Section 2 of these regulations

SERVICE CONNECTION NOT AT THE PRINCIPAL FRONTAGE

In certain unusual circumstances, the District may locate a conditional service connection for a premises at other than the principal frontage provided:

- service is reasonably available at that location,
- the principal frontage must be on a private road or driveway and set back no more than 150 feet from the service connection,

REGULATIONS GOVERNING WATER SERVICE TO CUSTOMERS OF THE EAST BAY MUNICIPAL UTILITY DISTRICT

SECTION 3

STANDARD SERVICE
(continued)

- there is only one premises which would be so served,
- there is no apparent possibility of further extension to serve other premises,
- there is no requirement for a fire hydrant,
- a main extension for adjacent premises would not be required.

The owner(s) of the premises shall agree in writing to the conditions of service and to relocate the service and pay any applicable costs in the future, should standard service become available at the principal frontage. This agreement shall be a covenant against the premises to be served and shall run with the land, and will be recorded by the District.

SERVICE CONNECTION AT ALTERNATE MAJOR FRONTAGE

The District may locate the service connection for a premises at that part of the perimeter immediately adjacent to a street or road of general public access, where a water main exists or may be installed, even though it is not the normal vehicle access to the property and provided that the fire hydrant location in relation to the premises is acceptable to the responsible fire protection agency.

The District may locate the service connection(s) for a multi-family residential unit(s) or multi-occupancy commercial/industrial unit(s) at that part of the perimeter immediately adjacent to a street or road of general public access in a development where individual metering of all multi-family residential or multi-occupancy commercial/industrial unit(s) has been determined to be feasible in the sole discretion of the District in accordance with Section 2 of these Regulations.

REGULATIONS GOVERNING WATER SERVICE TO CUSTOMERS OF THE EAST BAY MUNICIPAL UTILITY DISTRICT

EFFECTIVE 10/28/97

SECTION 29

PROHIBITING WASTEFUL USE OF WATER

A. REGULATIONS AND RESTRICTIONS ON WATER USE

It is hereby declared by the Board of Directors that in order to conserve the District's water supply for the greatest public benefit, and to reduce the quantity of water used by the District's customers, that wasteful use of water should be eliminated. Customers of the District shall observe the following regulations and restrictions on water use:

1. Residential Customers shall:

   a. Use water for lawn or gardening watering, or any other irrigation, in a manner which does not result in excessive flooding or runoff in gutters or other waterways, patios, driveways, walks or streets;

   b. Use water for washing sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas in a manner which does not result in excessive runoff or waste;

   c. Use water for washing cars, boats, trailers or other vehicles and machinery, preferably from a hose equipped with a shutoff nozzle, in a manner which does not result in excessive runoff or waste;

   d. Reduce other interior or exterior uses of water to minimize or eliminate excessive runoff or waste; and

   e. Repair leaks wherever feasible.

2. Nonresidential Customers shall:

   a. Use systems which recycle water where feasible; Single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains shall be prohibited;

   b. Use water for lawn or garden watering, or any other irrigation, in a manner which does not result in excessive flooding or runoff in gutters or other waterways, patios, driveways, walks or streets;

   c. Use water for washing sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas in a manner which does not result in excessive runoff or waste;

   d. Limit sewer flushing or street washing with District water as much as possible, consistent with public health and safety needs; and

PROHIBITING WASTEFUL USE OF WATER
(Continued)

2. Nonresidential Customers shall (Continued):

   e. Reduce other interior or exterior water uses to minimize or eliminate excessive runoffs or waste; and

   f. Repair leaks wherever feasible.

B. EXCEPTIONS

Consideration of written applications for exceptions regarding regulations and restrictions on water use set forth in this Section shall be as follows:

1. Written applications for exceptions shall be accepted, and may be granted, by the Manager of the Customer Service Division.

2. Denials of applications may be appealed in writing to the General Manager;

3. Grounds for granting such applications are:

   a. Failure to do so would cause an unnecessary and undue hardship to the Applicant, including, but not limited to, adverse economic impacts, such as loss of production or jobs; or

   b. Failure to do so would cause a condition affecting the health, sanitation, fire protection or safety of the Applicant or the public.

C. ENFORCEMENT

1. The District may, after one written warning, order that a special meter reading or readings be made in order to ascertain whether wasteful use of water is occurring. Charges for such a meter reading or readings or for follow-up visits by District staff shall be fixed by the Board from time to time and shall be paid by the customer.

2. In the event that the District observes that apparently excessive water use is occurring at a customer's premises, the General Manager or the Manager of Administration may, after a written warning to the customer, authorize installation of a flow-restricting device on the service line for any customer observed by District personnel to be willfully violating any of the regulations and restrictions on water use set forth in this section.

3. In the event that a further willful violation is observed by District personnel, the District may discontinue service. Charges for installation of flow-restricting devices or for restoring service may be fixed by the Board from time to time.

SECTION 31

WATER EFFICIENCY REQUIREMENTS

These regulations identify the types of water efficiency requirements for water service and the procedure for notification to Applicants that water efficiency measures are required.

A. DETERMINATION OF FEASIBILITY OF WATER EFFICIENCY MEASURES

The District will review applications for new standard services and determine the applicability of, and compliance with, water-efficiency requirements. Applicants for expanded service may be required to retrofit existing water service facilities or uses to comply with these requirements. Applicant shall maintain design documents and construction and installation records and furnish a copy of said documents and records to the District upon request. The District may inspect the installation of water efficiency measures to verify that the items are installed and performing to the required water use levels. The Applicant or their representative may be present during any District inspection.

B. WATER EFFICIENCY REQUIREMENTS FOR NEW DEVELOPMENT OR EXPANDED SERVICE

Water service shall not be furnished to any Applicant for new or expanded service unless all the applicable water-efficiency measures hereinafter described in this Section 31 have been reviewed and approved by the District. All the applicable and required water-efficiency measures shall be installed at Applicant expense.

C. RESIDENTIAL SERVICE

1. Indoor Water Use (All Applicants)

a. Toilets shall be high-efficiency or dual flush models rated and (third party) tested at a maximum average flush volume of 1.28 gallons per flush (gpf), and be certified as passing a 350 gram or higher flush test as established by the U.S. Environmental Protection Agency WaterSense Specification or other District-accepted third party testing entity. No flush or conversion devices of any other kind shall be accepted.

b. Showerheads shall be individually plumbed and have a maximum rated flow of 2.5 gallons per minute or less and be limited to one showerhead per shower stall of 2,500 sq. inches in area or less. Installation of flow restrictors in existing showerheads does not satisfy this requirement.

c. Lavatory faucets shall have aerators or laminar flow control devices (i.e. orifices) with a maximum rated flow of 1.5 gallons per minute or less.

d. Kitchen faucets shall have aerators or laminar flow control devices (i.e. orifices) with a maximum rated flow of 2.2 gallons per minute or less.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

e. Clothes washing machines shall be front loading horizontal axis or top loading models with both: (1) a water factor rating of 6.0 or less. A water factor rating of 6.0 means a maximum average water use of 6.0 gallons per cubic foot of laundry.

f. Dishwashers rated as standard size (i.e. 324 kWh/year) shall use less than or equal to 5.8 gallons/cycle. Dishwashers rated as compact size (i.e. 234 kWh/year) shall use less than or equal to 4.0 gallons/cycle.

2. Outdoor Water Use (All applicants except as noted below)

a. Landscaping.

i. Plans with design details including plants, irrigation, grading and hydrozones shall be submitted to the District for review and approval by District for compliance with these Regulations prior to planting. Landscaping shall be designed to be less than or equal to the maximum allowable landscape irrigation requirement to maintain a functional, healthy landscape and shall not exceed 70% of the reference evapotranspiration (the amount of water required to maintain a healthy landscape accounting for the evaporation of water from the soil surface and the transpiration of water through the plant foliage) for the irrigated area. Recreational turf landscaping shall be designed to be irrigated at no more than 100% of the reference evapotranspiration. Applicants with less than three residential units shall be required to complete a check list provided by the District in lieu of a detailed landscaping plan.

ii. Ornamental Turf areas shall be limited to no more than 25% of the total irrigated area. Exceptions may be granted, in the sole discretion of the District, when using drought tolerant grasses and for approved recreational areas. Turf is not permitted in areas or medians less than eight feet in width. These provisions do not apply to applicants with less than three residential units.

iii. Non-turf areas. At least 80% of the plant area shall be native or climate-appropriate low water use species and require minimal water once established. Up to 20% of the plant area may be of a non-drought tolerant variety as long as they are appropriately grouped together and irrigated separately and efficiently.

iv. Mulch: A minimum 2 inch layer of mulch shall be specified for non-turf planting areas unless there is a horticultural reason not to mulch.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

b. Irrigation.
   i. Irrigation Efficiency. Irrigation systems shall be designed, installed and operated to avoid overspray and runoff and to meet the maximum allowable landscape irrigation requirement to maintain a functional, healthy landscape and shall not exceed 70% of the reference evapotranspiration (the amount of water required to maintain a healthy landscape accounting for the evaporation of water from the soil surface and the transpiration of water through the plant foliage) for the irrigated area. These provisions do not apply to applicants with less than three residential units.

   ii. Automatic, self-adjusting irrigation controllers shall be required on all irrigation systems and shall automatically activate and deactivate the irrigation system based on changes in the climate or soil moisture. All automatic irrigation systems shall be equipped with a rain sensor shutoff. Applicants with less than three residential units are not required to install weather-based controllers.

   iii. Overhead sprinklers and spray heads shall not be permitted in areas less than eight feet wide. All sprinklers shall have matched precipitation rates within each control valve and circuit. Landscape design best practices shall include distribution uniformity, head-to-head spacing and setbacks from walkways and pavement.

   iv. Valves and circuits shall be separated (individual hydrozones) based on plant material and water need.

   v. Dedicated Irrigation Meter shall be required for irrigated landscaping of 5,000 square feet or more.

c. Swimming Pools and Spas.
   i. Covers shall be required for all pool and spa water features.

D. NONRESIDENTIAL SERVICE (including Residential Common Area)

1. Indoor Plumbing

a. Toilets shall be high-efficiency or dual flush models rated and (third-party) tested at a maximum average flush volume of 1.28 gallons per flush (gpf), and be certified as passing a 350 gram or higher flush test as established by the U.S. Environmental Protection Agency WaterSense Specification or other District-accepted third party testing entity. Pressure-assisted type toilets shall be high-efficiency rated at a maximum 1.0 gpf. No flush or conversion devices of any other kind shall be accepted.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

b. Urinals shall have a maximum rated flow of 0.5 gpf or less, or be zero water consumption urinals.

c. Showerheads shall be individually plumbed and have a maximum rated flow of 2.5 gallons per minute or less, and be limited to one showerhead per shower stall of 2,500 sq. inches in area or less. Installation of flow restrictors in existing showerheads does not satisfy this requirement.

d. Lavatory faucets shall have aerators or laminar flow control devices (i.e. orifices) with a maximum rated flow of 1.5 gallons per minute or less.

e. Kitchen faucets shall have aerators or laminar flow control devices (i.e. orifices) with a maximum rated flow of 2.2 gallons per minute or less.

f. Laundry washing machines shall be front loading horizontal axis or top loading models with both: (1) a maximum water factor rating of 6.0 or less. A water factor of 6.0 means a maximum average water use of 6.0 gallons per cubic foot of laundry or less.

g. Cooling towers not utilizing recycled water shall be equipped with recirculating systems and operate at a minimum of five (5) cycles of concentration. Newly constructed cooling towers shall be operated with conductivity controllers, as well as make up and blowdown meters.

h. Food steamers in all food service facilities shall be boiler less or self-contained models where applicable.

i. Ice machines shall be air-cooled or use no more than 25 gallons of water per 100 pounds of ice and shall be equipped with a recirculating cooling unit.

j. Commercial refrigeration shall be air-cooled or if water-cooled, must have a closed looped system. No once through, single pass systems are permitted.

k. Pre-Rinse Dishwashing Spray Valves shall have a maximum rated flow of 1.6 gpm or less.

l. Vehicle wash facilities shall reuse a minimum of 50% of water from previous vehicle rinses in subsequent washes.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

2. Outdoor Water Use

a. Landscaping.

i. Plans with design details including plants, irrigation, grading and hydrozones shall be submitted to the District for review and approval by District for compliance with these Regulations prior to planting. Landscaping shall be designed to be less than or equal to the maximum allowable landscape irrigation requirement to maintain a functional, healthy landscape and shall not exceed 70% of the reference evapotranspiration (the amount of water required to maintain a healthy landscape accounting for the evaporation of water from the soil surface and the transpiration of water through the plant foliage) for the irrigated area. Recreational turf landscaping shall be designed to be irrigated at no more than 100% of the reference evapotranspiration.

ii. Ornamental Turf areas shall be limited to no more than 25% of the total irrigated area. Exceptions may be granted, in the sole discretion of the District, when using drought tolerant grasses and for approved recreational areas such as sports fields, parks and picnic grounds. Turf is not permitted in areas or medians less than eight feet in width.

iii. Non turf areas. At least 80% of the plant area shall be native or climate-appropriate low water use species and require minimal water once established. Up to 20% of the plant area may be of a non-drought tolerant variety as long as they are appropriately grouped together and irrigated separately and efficiently.

b. Irrigation.

i. Irrigation Efficiency. Irrigation systems shall be designed, installed and operated to avoid overspray and runoff and to meet the maximum allowable landscape irrigation requirement to maintain a functional, healthy landscape and shall not exceed 70% of the reference evapotranspiration (the amount of water required to maintain a healthy landscape accounting for the evaporation of water from the soil surface and the transpiration of water through the plant foliage) for the irrigated area.

ii. Automatic, self-adjusting irrigation controllers shall be required on all irrigation systems and shall automatically activate and deactivate the irrigation system based on changes in climate or soil moisture. All automatic irrigation systems shall be equipped with a rain sensor shutoff.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

iii. Overhead sprinklers and spray heads shall not be permitted in areas less than eight feet wide. All sprinklers shall have matched precipitation rates within each control valve and circuit. Landscape design best practices shall include distribution uniformity, head-to-head spacing, and setbacks from walkways and pavement.

iv. Valves and circuits shall be separated (individual hydrozones) based on plant material and water need.

v. Dedicated Irrigation Meter shall be required for irrigated landscaping of 5,000 square feet or more.

vi. Mulch: A minimum 2 inch layer of mulch shall be specified for non-turf planting areas unless there is a horticultural reason not to mulch.

E. PENALTIES/CONSEQUENCES

Failure of Applicant to conform to this Regulation and these water-efficiency requirements stated herein may result in:

1. A requirement to resubmit water service application and water-efficiency plan at Applicant's expense until District approves water service.

2. District's inability to release water meter(s) for installation and inability to activate account until water-efficiency plan is approved by District.

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

PAGE NUMBER 1-A

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

The following rates apply to water service received inside and outside District boundaries unless otherwise indicated.

A. ONE MONTH BILLING

Bills for all metered services shall consist of:

FIRST - A SERVICE CHARGE and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on the size of a standard meter:

SIZE	SERVICE CHARGE AMOUNT	SEISMIC IMPROVEMENT SURCHARGE
5/8 and 3/4 inch meters	$11.54	$1.08
1 inch meter	18.55	2.71
1-1/2 inch meter	29.91	5.41
2 inch meter	43.69	8.65
3 inch meter	75.84	16.21
4 inch meter	121.76	27.01
6 inch meter	236.58	54.03
8 inch meter	374.36	86.43
10 inch meter	535.10	124.25
12 inch meter	741.77	172.86
14 inch meter	948.44	221.49
16 inch meter	1,201.03	280.91
18 inch meter	1,453.63	340.33

The service charge and seismic improvement program surcharge for a special type of meter or for a battery of meters installed on one service in lieu of one meter will be based on the size of a single standard meter of equivalent capacity as determined by the District.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer in order to maintain adequate water pressure, the maximum service charge amount and seismic improvement surcharge shall be set at the 4-inch meter level.

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

A. ONE MONTH BILLING (Continued)

SECOND - A SEISMIC IMPROVEMENT SURCHARGE for each Single Family Residential or Multiple Family Residential account.

	SEISMIC IMPROVEMENT SURCHARGE PER ACCOUNT
Single Family Residential Accounts	$1.08
Multiple Family Residential Accounts	5.08

THIRD - A CHARGE FOR WATER DELIVERED and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on one month meter readings for all water delivered per 100 cu. ft.:

	WATER DELIVERED CHARGE PER 100 CU. FT.	SEISMIC IMPROVEMENT SURCHARGE PER 100 CU. FT.
INSIDE DISTRICT BOUNDARIES		
Potable Water Service		
Single Family Residential Accounts:		
For the first 172 gpd	$2.28	$--
For all water used in excess of 172 gpd, up to 393 gpd	2.83	--
For all water used in excess of 393 gpd	3.47	--
Multiple Family Residential Accounts:		
For all water used	2.89	--
All Other Water Use:		
For all water used	2.99	.12

All individually metered multi-family dwelling units or individually metered mobile home residential units that receive District service shall be billed at the single family residential rate.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

A. ONE MONTH BILLING (Continued)

	WATER DELIVERED CHARGE PER 100 CU. FT.
Nonpotable Water Service	
For all water used	$2.49

Nonpotable Water Use Incentive Rate

A customer for whom the District has determined, pursuant to Section 30 of the Water Service Regulations, that the provision of nonpotable water service is feasible and to whom the District has issued written notification that specifies a date by which the customer site must be ready to accept nonpotable water service, shall ready the site by the date specified or pay the Nonpotable Water Use Incentive Rate for all potable water used during the period of noncompliance. The Nonpotable Water Use Incentive Rate shall be charged at a rate 20 percent higher than the applicable potable water rate.

OUTSIDE DISTRICT BOUNDARIES

Charge per 100 cu. ft. will be twice the charge applicable for inside District Boundaries.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

B. TWO MONTH BILLING

Bills for all metered services shall consist of:

FIRST - A SERVICE CHARGE and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on the size of a standard meter:

SIZE	SERVICE CHARGE AMOUNT	SEISMIC IMPROVEMENT SURCHARGE
5/8 and 3/4 inch meters	$23.08	$2.16
1 inch meter	37.10	5.42
1-1/2 inch meter	59.82	10.82
2 inch meter	87.38	17.30
3 inch meter	151.68	32.42
4 inch meter	243.52	54.02
6 inch meter	473.16	108.06
8 inch meter	748.72	172.86
10 inch meter	1,070.20	248.50
12 inch meter	1,483.54	345.72
14 inch meter	1,896.88	442.96
16 inch meter	2,402.06	561.82
18 inch meter	2,907.26	680.66

The service charge and seismic improvement program surcharge for a special type of meter or for a battery of meters installed on one service in lieu of one meter will be based on the size of a single standard meter of equivalent capacity as determined by the District.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer in order to maintain adequate water pressure, the maximum service charge amount and seismic improvement surcharge shall be set at the 4-inch meter level.

SECOND - A SEISMIC IMPROVEMENT SURCHARGE for each Single Family Residential or Multiple Family Residential account.

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

B. TWO MONTH BILLING (Continued)

	SEISMIC IMPROVEMENT CHARGE PER ACCOUNT
Single Family Residential Accounts	$2.16
Multiple Family Residential Accounts	10.16

THIRD - A CHARGE FOR WATER DELIVERED and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on two month meter readings for all water delivered per 100 cu. ft.

	WATER DELIVERED CHARGE PER 100 CU. FT.	SEISMIC IMPROVEMENT SURCHARGE PER 100 CU. FT.
INSIDE DISTRICT BOUNDARIES		
Potable Water Service		
Single Family Residential Accounts:		
For the first 172 gpd	$2.28	$--
For all water used in excess of 172 gpd, up to 393 gpd	2.83	--
For all water used in excess of 393 gpd	3.47	--
Multiple Family Residential Accounts:		
For all water used	2.89	--
All Other Water Use:		
For all water used	2.99	.12

All individually metered multi-family dwelling units or individually metered mobile home residential units that receive District service shall be billed at the single family residential rate.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

B. TWO MONTH BILLING (Continued)

	WATER DELIVERED CHARGE PER 100 CU. FT.
Nonpotable Water Service	
For all water used	$2.49

Nonpotable Water Use Incentive Rate

A customer for whom the District has determined, pursuant to Section 30 of the Water Service Regulations, that the provision of nonpotable water service is feasible and to whom the District has issued written notification that specifies a date by which the customer site must be ready to accept nonpotable water service, shall ready the site by the date specified or pay the Nonpotable Water Use Incentive Rate for all potable water used during the period of noncompliance. The Nonpotable Water Use Incentive Rate shall be charged at a rate 20 percent higher than the applicable potable water rate.

OUTSIDE DISTRICT BOUNDARIES

Charge per 100 cu. ft. will be twice the charge applicable for inside District Boundaries.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

C. EXCEPTION TO TWO MONTH BILLING

Except as provided below, customer accounts will be subject to bi-monthly meter reading and customer billing schedules.

- Accounts for which the average monthly bill is estimated to exceed $1500; such account will be billed monthly.
- Accounts for which there are reasonable and justifiable customer requests for monthly billing.
- Accounts for which the average monthly bill is estimated to be between $100 and $1500, and the customer service manager recommends monthly billing based on an evaluation of credit and/or collection problems.

D. PRIVATE FIRE SERVICES

Effective July 1, 2005, the rates for Private Fire Services shall consist of:

FIRST - A MONTHLY SERVICE CHARGE and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on the size of a standard meter:

SIZE	SERVICE CHARGE AMOUNT	SEISMIC IMPROVEMENT SURCHARGE
5/8 and 3/4 inch meters	$9.75	$1.08
1 inch meter	14.00	2.71
1-1/2 inch meter	20.92	5.41
2 inch meter	29.31	8.65
3 inch meter	48.88	16.21
4 inch meter	76.82	27.01
6 inch meter	146.67	54.03
8 inch meter	230.52	86.43
10 inch meter	328.34	124.25
12 inch meter	454.09	172.86
14 inch meter	579.84	221.49
16 inch meter	733.55	280.91
18 inch meter	887.26	340.33

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

D. PRIVATE FIRE SERVICES (Continued)

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer in order to maintain adequate water pressure, the maximum service charge amount and seismic improvement surcharge shall be set at the 4-inch meter level.

SECOND - A CHARGE FOR WATER DELIVERED based on two-month meter readings for all water delivered per 100 cu. ft.:

There shall be no charge for water used through such services extinguishing accidental fires, but any water lost through leakage or used in violation of the District's Regulations shall be paid for at double the rate for general use.

E. ELEVATION SURCHARGE

Elevation Designator	AMOUNT PER 100 CU. FT.
0 and 1	$0.00
2 through 5	0.43
6 and greater	0.88

Elevation surcharge is determined by the pressure zone in which the service connection is located. Pressure zones are identified by designations which include an elevation designator.

F. SUPPLEMENTAL SUPPLY SURCHARGE

Potable Water Service	Surcharge Amount
All potable water customer accounts	14% of the total Charge for Water Delivered for the Billing Period

The supplemental supply surcharge is effective on each potable water bill after the District Board declares a need to use the Freeport Project to deliver supplemental supplies from outside of the District's normal watershed. The supplemental supply surcharge shall not be applied to nonpotable water service.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

The following rates apply to water service received inside and outside District boundaries unless otherwise indicated.

A. ONE MONTH BILLING

Bills for all metered services shall consist of:

FIRST - A SERVICE CHARGE and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on the size of a standard meter:

SIZE	SERVICE CHARGE AMOUNT	SEISMIC IMPROVEMENT SURCHARGE
5/8 and 3/4 inch meters	$12.23	$1.14
1 inch meter	19.66	2.87
1-1/2 inch meter	31.70	5.73
2 inch meter	46.31	9.17
3 inch meter	80.39	17.18
4 inch meter	129.07	28.63
6 inch meter	250.77	57.27
8 inch meter	396.82	91.62
10 inch meter	567.21	131.71
12 inch meter	786.28	183.23
14 inch meter	1,005.35	234.78
16 inch meter	1,273.09	297.76
18 inch meter	1,540.85	360.75

The service charge and seismic improvement program surcharge for a special type of meter or for a battery of meters installed on one service in lieu of one meter will be based on the size of a single standard meter of equivalent capacity as determined by the District.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer in order to maintain adequate water pressure, the maximum service charge amount and seismic improvement surcharge shall be set at the 4-inch meter level.

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

A. ONE MONTH BILLING (Continued)

SECOND - A SEISMIC IMPROVEMENT SURCHARGE for each Single Family Residential or Multiple Family Residential account.

	SEISMIC IMPROVEMENT SURCHARGE PER ACCOUNT
Single Family Residential Accounts	$1.14
Multiple Family Residential Accounts	5.38

THIRD - A CHARGE FOR WATER DELIVERED and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on one month meter readings for all water delivered per 100 cu. ft.:

	WATER DELIVERED CHARGE PER 100 CU. FT.	SEISMIC IMPROVEMENT SURCHARGE PER 100 CU. FT.
INSIDE DISTRICT BOUNDARIES		
Potable Water Service		
Single Family Residential Accounts:		
For the first 172 gpd	$2.42	$--
For all water used in excess of 172 gpd, up to 393 gpd	3.00	--
For all water used in excess of 393 gpd	3.68	--
Multiple Family Residential Accounts:		
For all water used	3.06	--
All Other Water Use:		
For all water used	3.17	.13

All individually metered multi-family dwelling units or individually metered mobile home residential units that receive District service shall be billed at the single family residential rate.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

A. ONE MONTH BILLING (Continued)

	WATER DELIVERED CHARGE PER 100 CU. FT.
Nonpotable Water Service	
For all water used	$2.64

Nonpotable Water Use Incentive Rate

A customer for whom the District has determined, pursuant to Section 30 of the Water Service Regulations, that the provision of nonpotable water service is feasible and to whom the District has issued written notification that specifies a date by which the customer site must be ready to accept nonpotable water service, shall ready the site by the date specified or pay the Nonpotable Water Use Incentive Rate for all potable water used during the period of noncompliance. The Nonpotable Water Use Incentive Rate shall be charged at a rate 20 percent higher than the applicable potable water rate.

OUTSIDE DISTRICT BOUNDARIES

Charge per 100 cu. ft. will be twice the charge applicable for inside District Boundaries.

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

B. TWO MONTH BILLING

Bills for all metered services shall consist of:

FIRST - A SERVICE CHARGE and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on the size of a standard meter:

SIZE	SERVICE CHARGE AMOUNT	SEISMIC IMPROVEMENT SURCHARGE
5/8 and 3/4 inch meters	$24.46	$2.28
1 inch meter	39.32	5.74
1-1/2 inch meter	63.40	11.46
2 inch meter	92.62	18.34
3 inch meter	160.78	34.36
4 inch meter	258.14	57.26
6 inch meter	501.54	114.54
8 inch meter	793.64	183.24
10 inch meter	1,134.42	263.42
12 inch meter	1,572.56	366.46
14 inch meter	2,010.70	469.56
16 inch meter	2,546.18	595.52
18 inch meter	3,081.70	721.50

The service charge and seismic improvement program surcharge for a special type of meter or for a battery of meters installed on one service in lieu of one meter will be based on the size of a single standard meter of equivalent capacity as determined by the District.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer in order to maintain adequate water pressure, the maximum service charge amount and seismic improvement surcharge shall be set at the 4-inch meter level.

SECOND - A SEISMIC IMPROVEMENT SURCHARGE for each Single Family Residential or Multiple Family Residential account.

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

B. TWO MONTH BILLING (Continued)

	SEISMIC IMPROVEMENT CHARGE PER ACCOUNT
Single Family Residential Accounts	$2.28
Multiple Family Residential Accounts	10.76

THIRD - A CHARGE FOR WATER DELIVERED and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on two month meter readings for all water delivered per 100 cu. ft.

	WATER DELIVERED CHARGE PER 100 CU. FT.	SEISMIC IMPROVEMENT SURCHARGE PER 100 CU. FT.
INSIDE DISTRICT BOUNDARIES		
Potable Water Service		
Single Family Residential Accounts:		
For the first 172 gpd	$2.42	$--
For all water used in excess of 172 gpd, up to 393 gpd	3.00	--
For all water used in excess of 393 gpd	3.68	--
Multiple Family Residential Accounts:		
For all water used	3.06	--
All Other Water Use:		
For all water used	3.17	.13

All individually metered multi-family dwelling units or individually metered mobile home residential units that receive District service shall be billed at the single family residential rate.

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

B. TWO MONTH BILLING (Continued)

	WATER DELIVERED CHARGE PER 100 CU. FT.
Nonpotable Water Service	
For all water used	$2.64

Nonpotable Water Use Incentive Rate

A customer for whom the District has determined, pursuant to Section 30 of the Water Service Regulations, that the provision of nonpotable water service is feasible and to whom the District has issued written notification that specifies a date by which the customer site must be ready to accept nonpotable water service, shall ready the site by the date specified or pay the Nonpotable Water Use Incentive Rate for all potable water used during the period of noncompliance. The Nonpotable Water Use Incentive Rate shall be charged at a rate 20 percent higher than the applicable potable water rate.

OUTSIDE DISTRICT BOUNDARIES

Charge per 100 cu. ft. will be twice the charge applicable for inside District Boundaries.

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

C. EXCEPTION TO TWO MONTH BILLING

Except as provided below, customer accounts will be subject to bi-monthly meter reading and customer billing schedules.

- Accounts for which the average monthly bill is estimated to exceed $1500; such account will be billed monthly.
- Accounts for which there are reasonable and justifiable customer requests for monthly billing.
- Accounts for which the average monthly bill is estimated to be between $100 and $1500, and the customer service manager recommends monthly billing based on an evaluation of credit and/or collection problems.

D. PRIVATE FIRE SERVICES

Effective July 1, 2005, the rates for Private Fire Services shall consist of:

FIRST - A MONTHLY SERVICE CHARGE and A SEISMIC IMPROVEMENT PROGRAM SURCHARGE based on the size of a standard meter:

SIZE	SERVICE CHARGE AMOUNT	SEISMIC IMPROVEMENT SURCHARGE
5/8 and 3/4 inch meters	$10.34	$1.14
1 inch meter	14.84	2.87
1-1/2 inch meter	22.18	5.73
2 inch meter	31.07	9.17
3 inch meter	51.81	17.18
4 inch meter	81.43	28.63
6 inch meter	155.47	57.27
8 inch meter	244.35	91.62
10 inch meter	348.04	131.71
12 inch meter	481.34	183.23
14 inch meter	614.63	234.78
16 inch meter	777.56	297.76
18 inch meter	940.50	360.75

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

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SCHEDULE A

RATE SCHEDULE FOR WATER SERVICE

D. PRIVATE FIRE SERVICES (Continued)

The seismic improvement program surcharge is effective on each potable water bill through February 28, 2025. The seismic improvement program surcharge shall not be applied to nonpotable water service.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer in order to maintain adequate water pressure, the maximum service charge amount and seismic improvement surcharge shall be set at the 4-inch meter level.

SECOND - A CHARGE FOR WATER DELIVERED based on two-month meter readings for all water delivered per 100 cu. ft.:

There shall be no charge for water used through such services extinguishing accidental fires, but any water lost through leakage or used in violation of the District's Regulations shall be paid for at double the rate for general use.

E. ELEVATION SURCHARGE

Elevation Designator	AMOUNT PER 100 CU. FT.
0 and 1	$0.00
2 through 5	0.46
6 and greater	0.93

Elevation surcharge is determined by the pressure zone in which the service connection is located. Pressure zones are identified by designations which include an elevation designator.

F. SUPPLEMENTAL SUPPLY SURCHARGE

Potable Water Service	Surcharge Amount
All potable water customer accounts	14% of the total Charge for Water Delivered for the Billing Period

The supplemental supply surcharge is effective on each potable water bill after the District Board declares a need to use the Freeport Project to deliver supplemental supplies from outside of the District's normal watershed. The supplemental supply surcharge shall not be applied to nonpotable water service.

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Appendix G. 2010 Water Shortage Contingency Plan Supplement

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Appendix G. 2010 Water Shortage Contingency Plan Supplement

G-1. Central Valley Project Supply

As detailed in Chapter 2, EBMUD has a long-term renewal contract with the United States for the Central Valley Project (CVP) supplemental water supply. The contract term ends in 2046 and can be renewed for additional terms of 40 years. During specified drought conditions, EBMUD may request delivery of the CVP water and convey it by using the Freeport Regional Water Facility. The key contractual limitation on this supply is that EBMUD's maximum cumulative delivery over three sequential dry years is 165,000 acre-feet (AF). The contractual maximum delivery in any single dry year is 133,000 AF. EBMUD anticipates that it would generally utilize its full contractual amount of 165,000 AF of CVP water over any three year drought period. The year-by-year decisions on how much CVP water to request involve the following considerations:

- current projections of customer demand;
- current-year projection of total system storage (with reference to Table 3-2);
- supply conditions in the two key CVP reservoirs (Shasta and Folsom), which indicate whether EBMUD may receive the full amount of CVP water it requests, or whether CVP shortages may lead to reduced deliveries (see below for a fuller discussion); and
- the remaining amount of the 165,000 AF three year contractual quantity available to EBMUD in the current CVP contract year based on deliveries taken in the preceding two CVP contract years.

Allocation by the United States Bureau of Reclamation (USBR) of CVP water among all contractors during shortage conditions is subject to the draft CVP Municipal and Industrial (M&I) Shortage Policy; this policy was under review in 2010, and may be revised and issued as a revised draft or final policy in 2011 or later. The policy reflects the fact that in some dry years there will not be sufficient CVP water available to meet the aggregate amount requested by contractors. Furthermore, the policy recognizes that under severe drought conditions, cutbacks in allocations to M&I contractors, such as EBMUD, may have to be limited so that a "Public Health and Safety" (PH&S) level of supply can be sustained.

CVP Supply to Meet Public Health and Safety

EBMUD's understanding is that the USBR will follow its then-existing M&I Shortage Policy in determining the quantity of CVP water needed to bring EBMUD's supply up to a PH&S level during a critical drought. Whereas the policy is currently under review and, in any event, cannot be assumed to be static over the long-term, it appears likely that the policy will always contain at least the following basic elements applicable to PH&S levels of supply:

- determination of an M&I contractor's PH&S need that is based on population served (for residential need) as well as historical deliveries to commercial, institutional, and industrial customers; and
- estimation of an M&I contractor's available supply from non-CVP sources in a critical drought.

In estimating EBMUD's available supply from non-CVP sources in a critical drought in the context of its PH&S needs, the following operating principles should be recognized:

1. EBMUD currently defines the threshold between Severe and Critical Conditions as an end-of-water-year total system storage level of 300,000 AF, as depicted in Table 3-2 (and also, for the near term, in Table G-2.1). When projected total system storage levels indicate Severe or Critical conditions, EBMUD prepares for the possibility that the following water year will also be critically dry.
2. EBMUD's ability to divert from the Mokelumne River or from its storage is restricted, especially during a critical drought, because the following reservations and releases must be achieved:
   a. Required releases from Camanche Reservoir per the 1998 Joint Settlement Agreement (JSA) with state and federal resource agencies for fishery protection are at a minimum of 22,500 AF in a critically dry water year and increase when more water is available.
   b. The JSA also requires EBMUD to reserve up to 20,000 AF (beyond the above mentioned prescribed fish releases) once in a drought period to enhance flows for fish species in the lower Mokelumne River.

c. Releases for senior appropriations and riparian water rights along the lower Mokelumne River are at least 58,000 AF.

d. A minimum of 38,000 AF must be released from Camanche Reservoir in critically dry water years to make up for channel losses.

e. A minimum of 88,000 AF of storage in EBMUD's East Bay local surface reservoirs (part of total system storage) is reserved for up to six months of emergency supply to cope with potential infrastructure damage to its Mokelumne Aqueducts as a result of disruptive events such as earthquakes or Delta flooding.

f. Approximately 16,000 AF of the total system storage is dead pool storage in Pardee and Camanche Reservoirs.

Considering the sum of the quantities in items (a) through (f) above, a minimum of 242,500 AF of water supply must be reserved or released and cannot be used as non-emergency supply for EBMUD's customers.

EBMUD's understanding is that when the USBR's initial allocation in a CVP contract year[1] is less than the amount requested by EBMUD based on its contractual limits, EBMUD may submit to the USBR a determination of how much CVP water is required to meet EBMUD's PH&S needs. Table G-1.1 illustrates, using two examples of Critical Conditions, how EBMUD intends to make such a determination. The calculations illustrated in Table G-1.1 incorporate a projection of non-CVP supply in the *following* water year based on the assumption of Critical conditions in that year also.

Further to the calculation illustrated in Table G-1.1, assume that the USBR and EBMUD determine that EBMUD's PH&S need is 150,000 AF:

- Using example number 1 for the Critical Condition, the quantity needed from the CVP to meet PH&S needs in the current CVP contract year is *zero*, since EBMUD projects it will have sufficient supply through the remainder of the current water year and at least 150,500 AF available for supply in the following water year. The 150,500 AF available for the following water year exceeds the PH&S annual need of 150,000 AF.
- Using example number 2 for the Critical Condition, the quantity needed from the CVP to meet PH&S needs is *59,500 AF*, since EBMUD projects that although it will have sufficient supply for the remainder of the current water year, it may have as little as 90,500 AF available for supply in the following water year excluding any CVP supply. The 90,500 AF (without CVP supply) available for the following water year, assuming it is also Critical, is insufficient to meet the PH&S annual need of 150,000 AF.

G-2. INTERIM DROUGHT MANAGEMENT PLAN GUIDELINES

EBMUD temporarily revised its Drought Management Program Guidelines. The resulting Interim Drought Management Program Guidelines (Table G-2.1) were implemented in January 2010. They will remain in effect until the economy recovers and post-drought consumption rebounds to 2040 Demand Study (February 2009) planning levels. Based on past consumption trends for previous droughts in the 1970s and 1980s, the suppressed demand is expected to rebound and return to anticipated planning levels as projected in the 2040 Demand Study by 2020.

TABLE G-1.1 ILLUSTRATION: DETERMINING MINIMUM CVP SUPPLY TO MEET PUBLIC HEALTH AND SAFETY NEEDS

	EXAMPLE NUMBER 1 OF CRITICAL CONDITION IN CURRENT WATER YEAR[1]	EXAMPLE NUMBER 2 OF CRITICAL CONDITION IN CURRENT WATER YEAR[1]
A. PROJECTED TOTAL SYSTEM STORAGE AT END OF CURRENT WATER YEAR	260,000 AF	200,000 AF
B. CRITICAL-YEAR RUNOFF ASSUMED FOR THE FOLLOWING WATER YEAR[2]	133,000 AF	133,000 AF
C. MINIMUM REQUIRED RELEASES FROM CAMANCHE RESERVOIR AND MINIMUM STORAGE RESERVATIONS	242,500 AF	242,500 AF
D. NET QUANTITY AVAILABLE FOR SUPPLY IN A FOLLOWING CRITICAL WATER YEAR WITHOUT ADDITION OF CVP SUPPLY[3] [= ROW A + ROW B - ROW C]	150,500 AF	90,500 AF

[1] EBMUD's water year extends from October 1 through September 30 of the following calendar year. The determination as to whether a Severe or Critical condition exists in the current water year is typically made in April under policy 9.03 (Appendix F) using total system storage projected forward to September 30, the end of the current water year.

[2] Runoff into Pardee Reservoir (i.e. net of upstream diversions) is 133,000 AF for a 1977 hydrological year when modeled using estimated 2010 upstream diversions. This is the most critical water year on record.

[3] Adjustments must be made for supplies available to EBMUD from other sources including the Bayside Groundwater Project.

[1] The CVP contract year runs from March 1 through February 28/29 of the following calendar year.

Table G-2.1 Interim Drought Management Program Guidelines[1]

Stage	April Projection of Total System Storage on September 30 (Thousand Acre-Feet)	Percent of Maximum System Storage[2]	CVP Import Quantity (Thousand Acre-Feet)	Rationing Reduction Goal[3]
Normal	500 or more	65% and greater	0	None
Moderate	500-450	65 to 59%	0	0-15% - voluntary
	450-425	59 to 55%	up to 35	0-15% - voluntary
Severe	425- 300	55 to 39%	35 - 65	15% - mandatory
Critical[4]	<300	39% and below	65	15% - mandatory

[1] Source: Revised Drought Management Program Guidelines Memorandum, issued January 21, 2010 to the Board of Directors. It is based on numerical modeling that accounts for 2010 projected demand of 189 million gallons per day (MGD) with CVP supplies via Freeport. This level of demand was reduced from the 2040 Demand Study (February 2009) assumption of 216 MGD for year 2010 from recent rationing and adverse economic conditions. Demand is expected to return to long term planning levels when the post-drought consumption rebound ends and the economy recovers.

[2] Maximum system storage represents the maximum reservoir capacity of approximately 767 TAF.

[3] Policy 9.03 limits rationing up to 15 percent in planning for drought management.

[4] With the availability of CVP supplies and up to 15 percent rationing, critical conditions would only occur in the third year of the design drought.

The interim guidelines account for the following recent developments affecting drought planning:

- completion of the Freeport Regional Water Facility in 2010;
- change of a maximum rationing level of up to 15 percent of overall demand; and
- current suppressed customer demand resulting from the aftereffects of the recent drought and adverse economic conditions.

These guidelines factor in operating conditions for initiating customer rationing and for importing water under the Freeport Regional Water Project (EBMUD's Central Valley Project (CVP) contract). Constraints were considered, such as the water delivery schedule under the CVP contract and the risk of reduced allocations from the USBR due to supply shortages. When the projected end-of-September total system storage falls below 500 thousand acre-feet (TAF), voluntary rationing up to 15 percent will be considered. Early rationing minimizes the need for CVP supplies and mandatory rationing if dry conditions persist and ensures that a sufficient water supply is available in following years. In accordance with the interim guidelines, when total system storage falls between 450 and 425 TAF, EBMUD will access CVP supplies to minimize the risk of exhausting remaining water supplies at the end of a severe three year drought. When projected total system storage, including CVP supplies, falls below 425 TAF, mandatory rationing to achieve 15 percent demand reduction will be implemented.

G-3. 2008-2009 Drought Management Program

The following sections highlight the process used during the 2008-2009 Drought Management Program (DMP) to determine reduction goals, water use allocations, and drought rate structure pricing. This recent drought, as well as the 1976-77 and 1987-92 droughts, provided guidelines and experiences that EBMUD could consider for future drought management programs. For each drought period in the future, EBMUD will develop and implement a specific drought management program.

Recent Reduction Goals

Table G-3.1 illustrates the reduction goals for each customer group and their anticipated reductions in indoor and outdoor use from the implementation of the 2008-2009 DMP. The expected reductions were based on experience and discretionary use.

Customers were expected to achieve an overall 10 percent reduction for indoor use and an overall 27 percent reduction for outdoor use. Water use reduction goals for each customer class were determined by taking the weighted average of the expected reductions for indoor and outdoor water use and the proportion of indoor and outdoor water use to the total. For example, Single-Family Residential customers are expected to reduce indoor water use by 13 percent and outdoor use by 28 percent. The weighted average of these reductions and the indoor/ outdoor use (62 percent indoor/ 38 percent outdoor) is calculated to be 19 percent for the customer class reduction goal.

Water Use Allocation

During the 2008-2009 DMP, each customer's water use allocation was based on a percentage of their baseline use. The baseline use and individual water use allocation for each customer were determined using the following principles:

1. Each customer's baseline water use was the customer's three year average consumption from FY 2005 to FY 2007. Each billing cycle had its own baseline water use.

TABLE G-3.1 2008-2009 DROUGHT MANAGEMENT PROGRAM GOALS BY CUSTOMER CLASS

CUSTOMER CLASS	% USE[1]			% REDUCTION[2]			PROPORTION (%) OF EBMUD'S GOAL
	TOTAL	INDOOR	OUTDOOR	INDOOR	OUTDOOR	GOAL	
SINGLE-FAMILY RESIDENTIAL	46	62	38	13	28	19	58
MULTI-FAMILY RESIDENTIAL	17	86	14	10	21	11	13
IRRIGATION	6	0	100	0	30	30	12
INSTITUTIONAL	3	85	15	7	24	9	2
COMMERCIAL	11	90	10	11	25	12	9
INDUSTRIAL	17	98	2	5	30	5	6
TOTAL	100						
SERVICE AREA-WIDE AVERAGE		**72**	**28**	**10**	**27**	**15**	**100**

[1] Actual use based on 1970-2004 long-term average.
[2] Customer class rationing goals estimated to achieve district-wide rationing target.

2. Accounts with less than one year's billing history or no billing history had baselines estimated for missing billing cycles using the procedures for SFR and non-SFR customers listed below.
3. Water use allocation estimates were rounded up to whole numbers.
4. Private fire service, hydrant meter, recycled and raw water customers were not assigned water use allocations.

Special Procedures for SFR Customers:

- If baseline use was unavailable for a billing period because of missing data or no consumption, EBMUD used the average SFR customer consumption in the SFR customer's zip code for the baseline use for each corresponding billing period.

Special Procedures for non-SFR Customers:

- For the FY 2005 to FY 2007 period, billed consumption from the service address was used to calculate the current customer's baseline use if the Business Classification Code (BCC) for the service address had not changed.
- If the baseline use for a billing period could not be calculated because of missing data, EBMUD estimated the missing baseline using either the average ratio of the customer's available consumption with the average consumption for the same BCC or the consumption from similar facility and customer characteristics.

DROUGHT RATE STRUCTURE

The drought rate structure adopted in FY 2009 consisted of:

1. Increasing the FY 2009 volume charges by ten percent for all customers with some exceptions.
2. Setting individual water use allocations for customers, based on using half of the water use reduction goal for the customer category as a percentage of the baseline water use.
3. Instituting a drought surcharge of $2.00 per ccf (1 ccf = 100 cubic feet = 748 gallons) for consumption exceeding the allocated water use with some exceptions.
4. Using up to $31 million of the $43 million rate stabilization reserve fund in FY 2009 to partially offset reduced water sales revenue.

All customers (except industrial) who conserved and met their water use reduction goals paid less for total water use under the drought rate structure than under the pre-drought adopted FY 2009 rates. However, industrial customers who achieved their reduction goals of only five percent saw their bills increase by four percent, and those who reduced their consumption by ten percent paid the same as under the pre-drought adopted FY 2009 rates. Certain customer groups were recognized for significantly reducing their potable water consumption. For instance, SFR customers with low use (using an average of 100 gallons per day (GPD) or less per billing period during the drought emergency) and recycled water customers were exempt from incentive pricing tied to allocations and surcharges.

FUTURE CONSIDERATIONS

The experience from the 2008-2009 DMP provided insight into future program improvements, such as processes to develop more effective allocations, consumption analyses, and consumption feedback. Despite being the only mandatory program in the San Francisco Bay Area, the DMP successfully increased customer awareness of water conservation and achieved substantial water savings. It was also EBMUD customers' first experience with mandatory

rationing in nearly two decades. Although the following considerations were not part of the DMP, there are other available tools that could be considered in the future.

Exploration of Rate Alternatives

Water use varies over EBMUD's geographically diverse service area characterized by regional land use and weather patterns. A drought rate structure based on water allocations or an absence of it (i.e. severe use restrictions with heavy enforcement or steep tier pricing) may not necessarily be an appropriate fit for such diverse water use patterns. Experience from the 2008-2009 DMP suggests that sufficient time should be allocated to exploring rate alternatives and soliciting public input in developing an equitable drought rate structure.

Allocation Adjustment Process

Experience during the recent 2008-2009 DMP validated that a clear and transparent process for customers to seek allocation adjustments helped ensured equity and would also be vital in future programs for accommodating special circumstances for some customers. Audits for approved allocation adjustments ensure that accurate information was submitted and assure the integrity of the process.

Water Consumption Data Analysis

Effective demand reduction measures are designed based on analyses of historical consumption data, which models customer consumption behavior. Statistical analyses on average, monthly, seasonal, annual, and indoor and outdoor water use data provide insight into potential impacts on customers from implementing planned demand restrictions, allocation structures, and rationing goals. These analyses can also help assess the effect of drought water rates and surcharges on revenues. Data on average consumption grouped by zip code for each customer category, by the BCC, and by per capita daily water use are examples of water use characteristics that could be considered as the basis for adjusting water use allocations.

Monthly vs. Bimonthly Billing

A DMP that increases the frequency of billing cycles from bimonthly to monthly would send more timely price signals to encourage customers to conserve. When conservation measures are quickly implemented, a drought response program realizes conservation benefits sooner and effectively preserves more water and emergency storage for the remaining and following years. Rationing earlier at uncomfortable yet manageable levels and at graduated intensity is preferred over waiting and rationing later at extreme levels.

The current staggered bimonthly billing cycles requires more time for customers to adjust their water consumption behavior in response to adopted drought rates and water allocations. A monthly billing format may enable EBMUD to better gauge customers' current consumption response relative to allocation targets and to assess the need to adjust conservation earlier. Due to resource constraints with current meter reading technology, monthly billings for all accounts is not practical unless meters were upgraded to accommodate automated meter readings. EBMUD has begun a pilot study of automated meter reading.

Other Industry Methods

Other allocation methods used by the water retail industry include percentage reduction; financial rationing; per connection allotment; per capita allotment, and hybrid per capita/ percentage.

- *A percentage reduction* assigns each customer a consumption reduction goal that is a percentage of the historical consumption level. Required percent reductions can be constant, stepped, or variable. Excess use charges are applied to water consumption above a baseline allotment level. EBMUD used this method during the 2008-2009 DMP.
- *Financial rationing* sets tiers based on past use for non-residential customers and the average number of occupants for each account for residential customers.
- *Per Connection allotment* (for residential customers only) establishes a customer's water consumption goal on a unit basis (based on, for example, the number of bedrooms per single family home or multi-family unit) calculated from an estimate of essential uses.
- *Per Capita allotment* (for residential customers only) provides a fixed amount of water per person.
- *Hybrid per capita/percentage allotment* programs allow limited outside irrigation and distinguish between single-family and multi-family dwellings with different water use requirements. The hybrid provides water for inside use and a percentage of the five year average for outside use. A geographic information system (GIS) could be used to estimate the outside use portion of the hybrid system based on the landscaped area served by each meter. A maximum per customer allocation is necessary because it limits the amount of water allocated to large parcels.

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APPENDIX H.
SBX7-7 20X2020 BASELINE AND TARGET METHODOLOGY

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APPENDIX H.
SBX7-7 20X2020 BASELINE AND TARGET METHODOLOGY

In late 2009 the legislature adopted Senate Bill x7-7 (SBx7-7), the Water Conservation Act of 2009, which calls for a 20 percent statewide reduction in per capita water use by the year 2020 and directs urban retail water suppliers to set 2020 urban water use targets. Under the bill and the 2020 Water Conservation Plan adopted by the California Department of Water Resources, all urban water agencies are required to report their per capita water use and reduction targets in their Urban Water Management Plan (UWMP). This appendix presents the background data, methodology, and calculations for the baseline and target using one of the target methods established by law.

EBMUD will achieve its target water use by implementing water conservation and recycling programs identified in its long-term integrated resources planning. Phased implementation of water savings programs are incorporated into EBMUD's Water Conservation Master Plan, as summarized in Chapter 6 of this UWMP and recycled water programs as discussed in Chapter 5 of this UWMP 2010. The target water use will be finalized in the next UWMP submittal in 2015.

BASELINE CALCULATION

Water suppliers must define a ten year base period for water use that will be used to develop their target levels of per capita water use. Water suppliers must also calculate water use for a five year baseline period, and use that value to determine minimum required reduction in water use by 2020.

GROSS WATER USE

Section 10608.12(g) of the California Water Code defines "Gross Water Use" as:

the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

EBMUD gross water use is a measure of water supplied to the entire distribution system including raw water within the Service Area Boundary over a continuous 12-month calendar year, adjusted for changes in distribution system storage and recycled water deliveries. The methodology for calculating gross water use broadly follows American Water Works Association (AWWA) Manual M36 guidance for calculating Distribution System Input. Table H-1 presents tallied gross water use data for the calendar years 1995 thru 2004 and includes both treated and untreated water for residential and non-residential uses, and fire safety.

TABLE H-1 EBMUD GROSS WATER USE (1995-2004)

CALENDAR YEAR	ANNUAL WATER PRODUCTION (MG)	ANNUAL WATER PRODUCTION (MGD)
1995	69,663	191
1996	71,533	196
1997	77,188	211
1998	74,258	203
1999	77,058	211
2000	78,719	216
2001	78,871	216
2002	78,637	215
2003	78,360	215
2004	80,180	220

Sample Gross Water Use calculation: Raw water source volume (+/-) meter accuracy adjustment (+/-) change in distribution storage.

SERVICE AREA POPULATION

As a Category 1 water supplier, EBMUD service area population data was compiled from the Association of Bay Area Governments and from EBMUD's UWMPs since 1990. Where individual yearly data was not available, it was interpolated using published projections. The data is checked against other state and federal sources such as the California Department of Finance and U.S. Census.

BASE DAILY PER CAPITA WATER USE

Base Daily Per Capita Water Use is defined as average gross water use, expressed in gallons per capita daily (GPCD) for a continuous, multi-year base period. The Water Code specifies two different base periods for

TABLE H-2 EBMUD BASELINE DAILY PER CAPITA WATER USE CALCULATION (1995-2004)

CALENDAR YEAR	POPULATION	ANNUAL WATER PRODUCTION (MG)	ANNUAL WATER CONSUMPTION (GPCD)
1995	1,225,000	69,663	156
1996	1,234,000	71,533	159
1997	1,243,000	77,188	170
1998	1,252,000	74,258	162
1999	1,261,000	77,058	167
2000	1,270,000	78,719	170
2001	1,283,600	78,871	168
2002	1,297,200	78,637	166
2003	1,310,800	78,360	164
2004	1,324,400	8,0180	166
10-YEAR AVERAGE BASELINE			**165**

TABLE H-3 EBMUD MINIMUM DAILY PER CAPITA WATER USE CALCULATION (2003-2007)

CALENDAR YEAR	POPULATION	ANNUAL WATER PRODUCTION (MG)	ANNUAL WATER CONSUMPTION (GPCD)
2003	1,310,800	78,360	164
2004	1,324,400	80,180	165
2005	1,338,000	76,065	156
2006	1,352,800	76,218	154
2007	1,367,600	75,021	150
5-YEAR AVERAGE BASELINE			**158**
5% MINIMUM WATER USE REDUCTION REQUIREMENT			**150**

calculating Base Daily Per Capita Water Use. EBMUD's ten year base daily per capita water use was calculated over a continuous 1995-2004 baseline period (Water Code Section 10608.20). Figure H-1 illustrates a map of the service area boundary changes that occured during the 1995-2004 base period.

The following calculation is required only if the five year baseline per capita water use per Section 10608.12 (b) (3) is greater than 100 GPCD. The calculation is used to determine whether the water supplier's 2015 and 2020 per capita water use targets meet the legislation's minimum water use reduction requirement per Section 10608.22.

EBMUD's second continuous baseline period covers the years 2003-07 and was used to calculate the minimum water use reduction target requirement per Section 10608.22 of the Water Code. The tabulated data is presented in Tables H- 2 and H-3. Figure H-2 illustrates a map of the service area boundary changes that occurred during the 2003-2007 base period

TARGET DAILY PER CAPITA WATER USE

An urban retail water supplier must set a 2020 water use target and a 2015 interim target using one of the methods outlined in the legislation and by the Department of Water Resources.

The Water Code directs that water suppliers must compare their actual water use in 2020 with their calculated targets to assess compliance. Water suppliers must also report interim compliance in 2015 as compared to an interim target (generally halfway between the baseline water use and the 2020 target level). A water supplier is allowed to revise its water use target in its 2015 UWMP or in an amended plan.

EBMUD's target is based on Target Method #2 (TM2) using the following components to calculate the water use target for 2020:

- Indoor Residential Water Use = 55 gallons per capita daily water use (GPCD) (provisional standard subject to adjustment by Legislative statute);
- Commercial, Industrial, and Institutional (CII) Uses = 10% reduction in water use from the baseline CII water use; and
- Landscaped Area Water Use = water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 of Division 2 of Title 23 of the California Code of Regulations.

Under TM2, the target year per capita water use is determined as the sum of residential indoor use, the landscaped area water use and commercial, industrial, and institutional (CII) water use. As shown in Table H-4, EBMUD's calculated 2020 Target Daily Per Capita Use is 175 GPCD. This exceeds the required minimum reduction shown in Table H-3, therefore the lower minimum water use reduction target of 150 GPCD will be used. The midpoint between this 2020 target level and the baseline

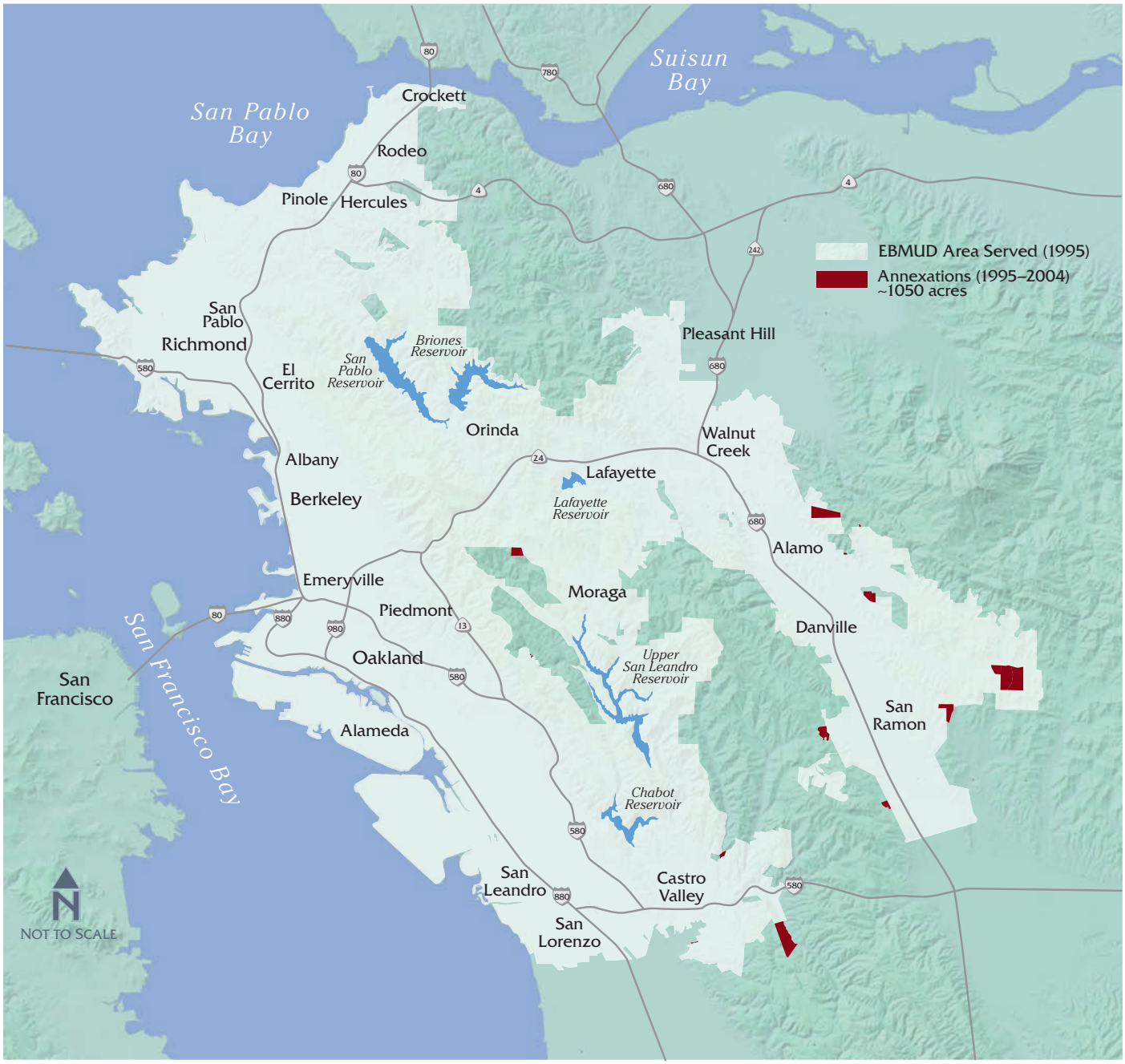
TABLE H-4 EBMUD TM2 TARGET DAILY PER CAPITA WATER USE

PROJECTED USE	2020 MGD	2020 GPCD[1]
RESIDENTIAL INDOOR	85	55
LANDSCAPE (IRRIGATION & RESIDENTIAL INDOOR)	105	68
COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL[2]	80	52
TOTAL	**269**	**175**

[1] Based on projected 2020 population of 1,538,000 sourced from ABAG Projections 2009. The 2020 target may be updated in UWMP 2015 as revised ABAG projections based on the 2010 census data become available.

[2] Institutional use includes District uses and other non-revenue water uses.

FIGURE H-1 1995 AREA SERVED WITH ANNEXATIONS FROM 1995–2004



water use is the interim 2015 target of 158 GPCD. EBMUD anticipates it will meet this interim 2015 target through its planning level programs, which project an even more aggressive and lower demand level of 151 GPCD for year 2015.

Though Section 10608.20(b)(2)(A) sets a provisional standard for efficient indoor use (55 GPCD) that urban retail water suppliers using TM2 must use to set their 2020 target, suppliers can use a combination of the indoor residential use, landscaped area water use and commercial, industrial, and institutional (CII) water use to collectively meet the overall 2020 target.

CII WATER USE

As shown in Table H-5, the base CII water use is 58 GPCD. Applying the required ten percent reduction results in a target of 52 GPCD for 2020.

FIGURE H-2 2003 AREA SERVED WITH ANNEXATIONS FROM 2003–2007

LANDSCAPE WATER USE

As outlined by DWR, landscaped area for the purposes of calculating the TM2 target shall mean the water supplier's estimate or measurement of 2020 landscaped areas that are irrigated and served by residential or dedicated landscape meters or connections. Water suppliers shall develop a preliminary estimate (forecast) of 2020 landscaped areas for purposes of setting urban water use targets and interim urban water use targets under Subdivision 10608.20 (a) (1). For final compliance-year calculations, water suppliers shall update the estimate of 2020 landscaped areas using one of the techniques allowed.

Water suppliers shall follow five steps to calculate Landscaped Area Water Use:

- Identify applicable State Model Water-Efficient Landscape Ordinance (MWELO) (1992 or 2010) by parcel.

Table H-5 Calculation of Baseline Commercial, Industrial and Institutional (CII) Water Use Component

Calendar Year	Population	Annual Water Production (MG)	Annual Water Consumption (GPCD)
1995	1,225,000	24,885	56
1996	1,234,000	24,639	55
1997	1,243,000	27,511	61
1998	1,252,000	28,665	63
1999	1,261,000	27,798	60
2000	1,270,000	28,132	61
2001	1,283,600	27,042	58
2002	1,297,200	26,596	56
2003	1,310,800	27,438	57
2004	1,324,400	27,842	58
10-Year Average Baseline			**58**
10% Reduction Target			**52**

Table H-6 Estimated Number of 2020 EBMUD Customer Landscape Water Use Accounts

Parcel Area/ Strata (sq.ft.)	WOH	CENT	EOH
0-4,000	44,163	11,653	3,051
4,001-8,000	111,730	46,855	11,310
8,001-12,000	16,307	15,477	12,518
12,001-16,000	5,377	6,580	6,538
16,001-20,000	2,346	4,061	3,942
20,001-24,000	1,392	3,746	3,654
>24,001	7,417	11,351	7,871
TOTAL	**188,732**	**99,723**	**48,884**

- Estimate irrigated landscaped area for each parcel.
- Determine reference evapotranspiration for each parcel.
- Use the Maximum Applied Water Allowance (MAWA) equation from the applicable MWELO to calculate annual volume of landscaped area water use.
- Convert annual volume to GPCD.

The estimated landscape water use component under TM2 is 68 GPCD. This value factors total estimated landscape areas and associated water budgets utilizing historical landscape water use over the 10-year baseline period of 1995-2004, water efficiency requirements for new accounts under EBMUD's Water Service Regulations and the MWELO, and estimated account growth between 2010-2020.

Before computing landscaped area, water suppliers must determine how MWELO ordinances apply to specific parcels in their service areas. Two versions of MWELO apply according to the date when landscaping was installed in a given parcel:

- For landscaped areas installed on or after January 1, 2010, the MAWA equation and all applicable criteria from the 2009 version of the ordinance or its equivalent shall be used.
- For landscaped areas installed before January 1, 2010, the MAWA equation and all applicable criteria from the 1992 version of the ordinance or its equivalent shall be used.

For the current 2020 landscape water use estimate, approximately 99% of the landscapes were installed prior to January 1, 2010 and all applicable criteria from the 1992 version of the MWELO were applied.

- The landscaped area must be measured or estimated for all parcels served by a residential or dedicated landscape water meter or connection in the water supplier's service area.
- Only irrigated landscaped area served by residential or dedicated landscape water meter or connection is included in the calculation of Landscaped Area Water Use.
- Landscape served by CII connections and non-irrigated landscape is excluded.

The purpose of this landscape measurement is to estimate the irrigation efficiency of EBMUD customers. It requires a measurement (or estimate) of landscaped area and of the landscape water use per unit area based on a reference evapotranspiration (ET). All landscape irrigated by dedicated or residential meters must be included, including multi-family residential parcels irrigated through dedicated or residential meters or connections. The selected methodology relies on the collection of a statistical random, stratified sample of customer parcels, irrigated area, outdoor water use group by parcel size which is statistically field verified and extrapolated for the rest of the District. Estimates are based on (Geographical Information System) GIS images, photographs provided by Google, and from a representative number of sites and field visits.

Division of Service Area

For the purposes of this analysis, the EBMUD service area was divided into six distinct areas with similar weather patterns/characteristics as follows:

- **West of Hills (WOH):** Cities of Alameda, Albany, Berkeley, Castro Valley, Crockett, El Sobrante,

Richmond, El Cerrito, Emeryville, Hayward, Hercules, Oakland, San Leandro, San Lorenzo.

- **Central (CENT)**: Cities of Lafayette, Moraga, Orinda.
- **East of Hills (EOH)**: Cities of Alamo, Danville, Pleasant Hill, San Ramon, Walnut Creek.

Parcels within each area were then segmented into seven subcategories by parcel size.

Measuring with Remote Sensing

The landscaped area was determined through a combination of measurements using remote sensing (aerial or satellite imaging) and field site visits to identify the landscaped areas in conjunction with a GIS representation of the parcels in service area.

- The remote-sensing information must be overlaid onto a GIS representation of each parcel boundaries to estimate the irrigated landscaped area in each parcel.
- The remote-sensing imagery must have a resolution of 1 meter or fewer per pixel.
- The remote-sensing technique must be verified for accuracy by comparing its results to the results of field-based measurement for a subset of parcels selected using random sampling.

Using Sampling to Estimate Landscaped Area on Small Parcels

The landscaped area for smaller-sized parcels was calculated by measuring the percentage of total parcel area that is landscaped in a sample of similar parcels and applying that percentage to the remaining parcels. This technique was used for parcels with a total land area of 24,000 square feet or less. The parcels for which this technique was used was divided into groups, or strata, based on parcel size increments of 4,000 square feet or less. (For example, parcels up to 4,000 square feet would form one group, parcels between 4,001 and 8,000 square feet would form another group, and so forth.)

Field-based measurement and remote sensing was used to calculate the landscaped area for a subset of parcels sampled at random in each parcel size group. The percentage of landscaped area to total land area for the sampled parcels in each group was then be used to calculate the landscaped area for all other parcels in the group. Parcels greater than 24,000 square feet are to be measured separately.

The methodology/technique was tested for accuracy by comparing the results of satellite and field-based measurement for a subset of parcels. Satellite and field-based measurement were performed for a subset of parcels selected at random. The percent error between the calculations of landscaped area produced by the selected satellite technique and those produced by field-based measurements were used to create coefficient values for extrapolating parcel data across a total of 168 customer account categories, micro-climate regions, and parcel size tier. Summary findings from this analysis in included in Table H-6.

Data Collection

The goal of this analysis is to collect data about a representative number of parcels to determine irrigation efficiency. A combination of field visits, GIS, Google Earth and Google Street maps was used to determine the nature of each property. For each property the following information was used obtained and/or measured:

- Parcel size (county records and polygon of parcel).
- Square footage of property on County Records.
- Footprint of home and structures on property.
- Hardscape not including footprint. This may include items such as driveway, patio, sidewalks, or other paved areas.
- Irrigable area which is ground where plants could be grown but not necessarily where there are plants now or where intentional irrigation is taking place. This is calculated as the difference between recorded or measured lot size and footprint plus hardscape.
- Total Turf Area.
- Other Irrigated area. This is calculated as the area defined by polygons where plants are known or believe to be irrigated.
- Total Irrigated Area. This is the sum of turf and non-turf areas that appear to be irrigated.
- Non-irrigated irrigable area. This is the remainder of irrigable area minus Total Irrigated Area.
- Outdoor water use based on monthly consumption.

Number of Statistical Samples

From each subgroup a statistical number of sample services were collected. Additional samples were taken and landscape estimates were measured with the use of GIS until the results are repeatable and a smaller standard deviation is achieved. The confidence coefficient should be 95%.

Extrapolation of Results

Once the confidence coefficient has been achieved for each subgroup a number of relationships were defined that

Image 1

Image 2

were extrapolated for the rest of the group and a calculation of current landscape efficiency was measured. Examples of relationships are shown below.

Sample calculation

For homes in WOH between 4,000 and 8,000 SF:

- Average square footage = 6,000 SF
- Average footprint =1802 SF
- Average hardscape = 1000 SF
- Ratio of hardscape to average square footage = 1000/6000
- Average irrigable area = 6000-1802-1000 = 3198
- Ratio of irrigable area to average square footage = 3198/6000
- Average area of irrigated turf = 1200 SF
- Average area of irrigated non-turf = 825 SF
- Total area of irrigated area = 2025
- Ratio of irrigable area which is irrigated = 2025/3198
- Ratio of irrigated area to lot size = 2025/6000

ArcGIS

EBMUD maintains a sophisticated GIS database. Images for the analysis were at a resolution of between 4 and 6 inches per pixel. Alameda and Contra Costa County records including parcel and building footprint statistics were used and overlayed on the aerial photos. Described below are the steps taken to measure water service characteristics consistent with the adopted state methodology. Results of the landscape water use analysis for single-family, multi-family, and irrigation accounts are presented in Tables H-7 through H-9.

Calculating Footprint

Polygons were drawn around the footprint of obvious structures. (Images 1 and 2) Obvious structures include any structure which a person can enter:

- Building
- Garage or Carport
- Shed
- Covered gazebo

Properties and structures were also viewed in Google Earth or Google Street View when available to improve viewpoints (see Images 3 to 5 of a second sample site).

Measuring Polygons-HardScape

Hardscape is defined as any grade level area which can not support landscape such as driveways, sidewalks or compacted dirt. It also includes grade level structures such as decks, patios, or stone pathways. It may also include artificial turf or sheet mulched areas (see Image 6).

IMAGE 3

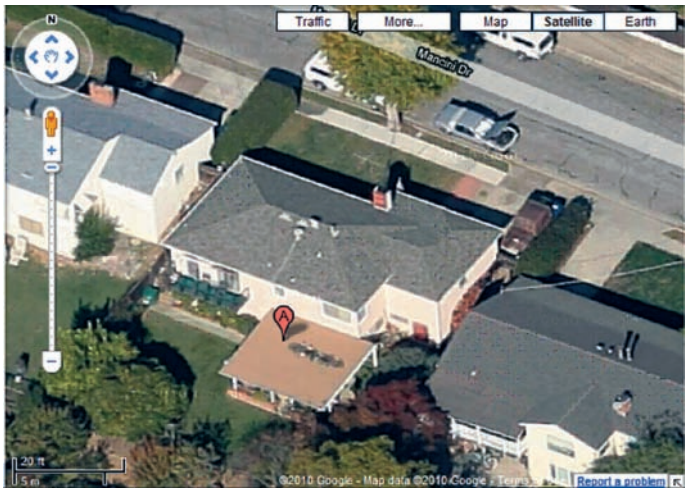
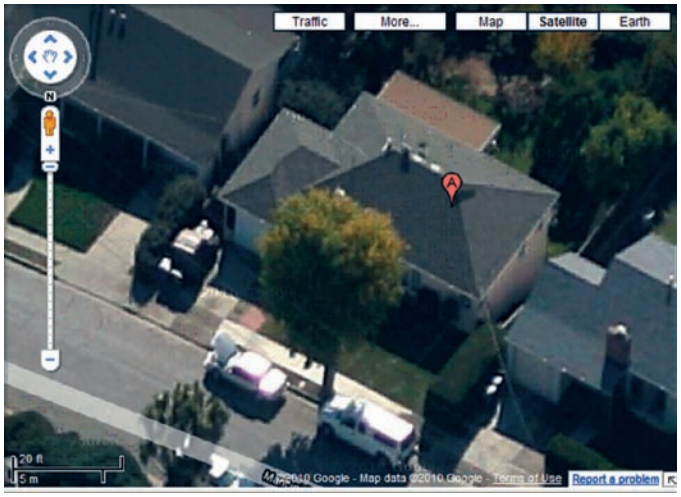


IMAGE 4



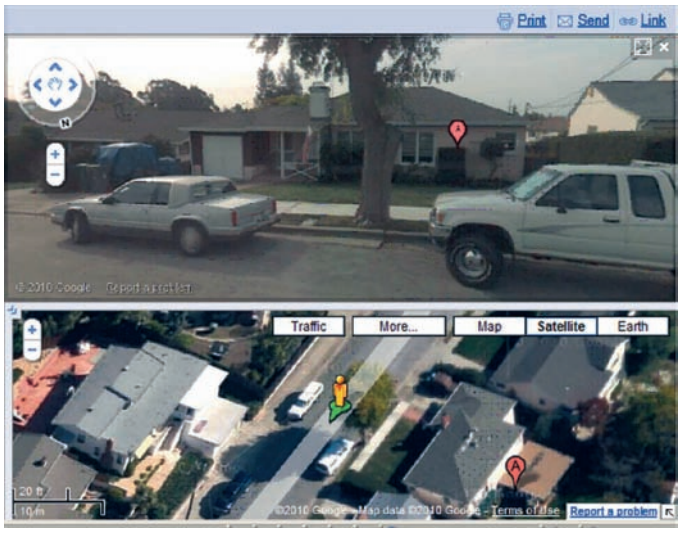
Measuring – Landscape Area-Irrigable

Irrigable area is defined as any property which is neither under the footprint of a building or hardscape. Therefore, it can be calculated as the difference between the parcel size and (hardscape plus footprint). It would include any vegetated area or non-vegetated area that is not otherwise covered.

Measuring – Irrigated Areas-Turf and Non-Turf

Determining whether landscape is being actively irrigated from photographs is an inexact science. However certain clues help make the work more accurate. The first is by looking at different imagery to see if the landscape is brown during different seasons. That would indicate that it may not be irrigated. Another clue is to look at the water use for a property to see if the usage is reasonably higher

IMAGE 5



in summer vs. winter for the size of the estimated landscape.

In Image 7 the property appears to have both a front and rear lawn. It also appears to have manicured shrubs in the front and larger trees in the back. The shrubs on either side of the property appear to be shared with neighbors with approximately half of the watering of these shared areas taken by each adjacent neighbor. In this case, the trees are not likely to be separately watered but probably obtain some water from the irrigated turf, so the assumption is that the area of lawn hidden by the tree canopy is lawn or equivalent root zone of the trees.

In Image 7 the green polygon represents the irrigated turf areas. The irrigated non-turf areas are in the gaps northwest and southeast of the house to the parcel line.

Field Verification

EBMUD landscape water budgets and GIS calculations were performed on statistically sampled sites, which were visited to verify the accuracy of the GIS method, establish uniform correction factors, or determine if more field visits were necessary. A field visit consists of the following:

- Random selection of the sites to be visited.
- Contacting the customer of record and asking the following:
  a. Area of their property.
  b. What is the type of landscape they have?
  c. Would it be okay to visit their backyard?
  d. Would they be interested in receiving a free water audit?

Image 6

Image 7

- Bring a 11x17 copy of the aerial photograph marked up with polygons indicating landscape of presumed irrigated area. Green for grass, blue for shrubs.
- Mark up the aerial photograph with any corrections. Data collected for each analyzed parcel includes:
  a. Service #
  b. City
  c. Square footage of home from county records
  d. Square footage of parcel size
  e. Footprint of home measured
  f. Hardscape measured
  g. Irrigable area calculated
  h. Irrigated Turf measured
  i. Irrigated non-turf measured
  j. Total irrigated area calculated
  k. Non-irrigated irrigable area calculated
  l. Outdoor water use
  m. GIS Operator
  n. Field corrected turf irrigated area
  o. Field corrected non-turf irrigated area.
  p. Field Inspector

TABLE H-7

ESTIMATED 2020 EBMUD SINGLE FAMILY RESIDENTIAL LANDSCAPE WATER USE

LOCATION	TIER (SQ.FT.)	NUMBER OF SERVICES	AVE. PARCEL AREA (SQ.FT.)	SUM PARCEL AREA (SQ.FT.)	AVE. BLDG. AREA (SQ.FT.)	SUM BLDG. AREA (SQ.FT.)	AVE. YEAR BUILT	NUMBER OF POOLS	% OF MULTI-STORY BLDG.	AVE. BLDG. HARD-SCAPE-ADDED PER SERVICE[1] (SQ.FT.)	AVE.LOT OTHER FEATURES ADDED PER SERVICE[2] (SQ.FT.)	TOTAL AVE. BUILDING FOOTPRINT[3] (SQ.FT.)	SUM OF TOTAL BUILDING FOOTPRINT (SQ.FT.)	IRRIGATABLE AREA (SQ.FT.)	IRRIGATED AREA FACTOR (%)	IRRIGATED AREA (SQ.FT.)	REF.ET (IN.)	TOTAL MAWA (GPD)
EOH	0-4,000	3,001	2,955	8,867,373	1,735	5,120,419	1987	4	71%	2,251	330	2,581	7,744,686	1,122,687	53%	599,430	50	40,972
EOH	4,001-8,000	11,167	6,489	72,467,098	2,144	23,709,502	1982	895	54%	2,868	431	3,298	36,832,129	35,634,969	46%	16,406,694	50	1,121,422
EOH	8,001-12,000	12,284	9,983	122,6341,24	2,243	27,394,085	1973	2,700	43%	3,786	1,119	4,905	60,258,450	62,375,674	76%	47,251,511	50	3,229,711
EOH	12,001-16,000	6,404	14,113	90,379,179	2,498	15,824,349	1973	2,287	38%	4,489	1,474	5,963	38,183,945	52,195,234	61%	31,729,890	50	2,168,785
EOH	16,001-20,000	3,827	17,912	68,550,843	2,761	10,377,124	1973	1,670	36%	5,123	1,639	6,762	25,877,354	42,673,489	48%	20,398,450	50	1,394,264
EOH	20,001-24,000	3,552	21,807	77,458,727	2,901	10,095,366	1971	1,805	33%	5,039	1,899	6,938	24,645,537	52,813,190	28%	14,927,352	50	1,020,307
EOH	24,000+	6,300	95,702	602,923,964	10,091	49,981,824	1975	2,498	33%	16,981	8,743	25,724	162,059,293	440,864,671	22%	97,140,499	50	6,639,698
SUBTOTAL		**46,535**		**1,043,281,308**		**142,502,669**		**11,859**					**355,601,395**	**687,679,913**		**228,453,826**		**15,615,159**
AVERAGE			**24,137**		**3,482**		**1976**		**44%**	**5,791**	**2,233**	**8,024**			**48%**		**50**	
WOH	0-4,000	40,036	3,268	130,825,254	1,452	57,305,609	1931	45	19%	2,039	386	2,426	97,110,418	33,714,836	35%	11,711,365	38	604,487
WOH	4,001-8,000	98,929	5,501	544,214,748	1,871	183,285,529	1939	793	21%	2,621	672	3,293	325,723,903	218,490,845	53%	116,502,000	38	6,013,299
WOH	8,001-12,000	13,764	9,612	132,293,789	2,718	36,118,761	1949	476	26%	3,878	759	4,637	63,828,816	68,464,973	21%	14,300,693	38	738,136
WOH	12,001-16,000	4,285	13,733	58,845,582	3,129	12,125,808	1952	218	26%	4,048	1,669	5,718	24,500,740	34,344,842	17%	5,873,989	38	303,188
WOH	16,001-20,000	1,810	17,923	32,440,551	4,048	6,160,305	1956	112	28%	5,876	1,463	7,339	13,284,108	19,156,443	45%	8,710,526	38	449,597
WOH	20,001-24,000	1,035	21,839	22,603,343	4,937	3,816,399	1958	54	23%	6,391	1,799	8,190	8,476,453	14,126,890	54%	7,586,835	38	391,598
WOH	24,000+	4,428	128,085	567,161,621	10,051	18,212,786	1959	239	12%	8,508	7,625	16,134	71,439,332	495,722,289	12%	57,851,820	38	2,986,046
SUBTOTAL		**164,287**		**1,488,384,888**		**317,025,197**		**1,937**					**604,363,770**	**884,021,118**		**222,537,229**		**11,486,352**
AVERAGE			**28,566**		**4,030**		**1949**		**22%**	**4,766**	**2,053**	**6,819**			**34%**		**38**	
CENT	0-4,000	11,246	3,038	34,161,251	1,379	15,080,592	1965	15	40%	1,546	309	1,855	20,865,313	13,295,938	81%	10,782,789	45	66,1447
CENT	4,001-8,000	44,972	5,806	261,090,536	1,599	71,523,149	1959	942	18%	2,748	607	3,354	150,850,846	110,239,690	57%	62,614,541	45	3,840,953
CENT	8,001-12,000	14,816	9,803	145,239,251	1,950	28,551,754	1965	1,490	22%	3,645	626	4,271	63,281,852	81,957,399	35%	29,076,735	45	1,783,649
CENT	12,001-16,000	6,201	13,842	85,835,560	2,225	13,563,896	1964	1,020	22%	4,190	1,589	5,779	35,833,313	50,002,247	38%	19,059,955	45	1,169,192
CENT	16,001-20,000	3,788	17,933	67,928,753	2,417	8,911,112	1962	804	21%	4,886	1,800	6,686	25,326,634	42,602,119	38%	16,066,722	45	985,578
CENT	20,001-24,000	3,531	21,975	77,594,465	2,745	9,202,163	1964	925	24%	5,082	2,152	7,234	25,544,292	52,050,173	22%	11,339,717	45	695,610
CENT	24,000+	9,111	90,010	820,083,869	5,448	39,842,102	1966	2,344	23%	9,185	5,542	14,727	134,177,731	685,906,138	20%	135,196,927	45	8,293,362
SUBTOTAL		**93,665**		**1,491,933,685**		**186,674,768**		**7,540**					**455,879,981**	**1,036,053,704**		**284,137,387**		**17,429,792**
AVERAGE			**23,201**		**2,538**		**1964**		**24%**	**4,469**	**1,804**	**6,272**			**42%**		**45**	
TOTAL		**304,487**		**4,023,599,881**		**646,202,634**		**21,336**					**1,415,845,145**	**2,607,754,736**		**735,128,441**		**44,531,302**
AVERAGE			**25,301**		**3,350**		**1963**		**30%**	**5,009**	**2,030**	**7,039**			**41%**		**44**	

2020 POPULATION: 1,538,000

2020 GPCD: 29

[1] Sidewalks, patios, decks, roofline
[2] Driveways, detached garage, pool, sheds
[3] Including hardscape and features

Table H-8 Estimated 2020 EBMUD Multi-Family Residential Landscape Water Use

Location	Tier (sq.ft.)	Number of Services	Ave. Parcel Area (sq.ft.)	Sum Parcel Area (sq.ft.)	Ave. Bldg. Area (sq.ft.)	Sum Bldg. Area (sq.ft.)	Ave. Year Built	Number of Pools	Ave. Bldg. Hard-scape-added per Service[1] (sq.ft.)	Ave.Lot Other Features Added per Service[2] (sq.ft.)	Total Ave. Building Footprint[3] (sq.ft.)	Sum of Total Building Footprint (sq.ft.)	Irrigatable Area (sq.ft.)	Irrigated Area Factor (%)	Irrigated Area (sq.ft.)	Ref.ET (in.)	Total MAWA (gpd)
EOH	0-4,000	23	2,556	58,787	1,530	29,061	1979		1,324	-	1,324	30,444	28,343	43%	12,234	50	836
EOH	4,001-8,000	92	6,713	617,620	2,528	227,498	1961	2	3,767	874	4,641	426,967	190,653	32%	60,692	50	4,148
EOH	8,001-12,000	158	9,795	1,547,543	3,732	574,743	1965	10	5,110	1,592	6,702	1,058,944	488,599	26%	125,946	50	8,609
EOH	12,001-16,000	92	14,063	1,293,829	5,058	419,829	1969	11	9,877	1,535	11,412	1,049,929	243,900	49%	120,726	50	8,252
EOH	16,001-20,000	81	18,006	1,458,492	5,662	356,692	1970	9	3,728	5,928	9,656	782,129	676,363	95%	643,857	50	44,009
EOH	20,001-24,000	75	21,995	1,649,638	5,407	346,076	1969	22	5,965	4,616	10,581	793,582	856,056	36%	308,079	50	21,058
EOH	24,000+	854	224,974	192,127,819	44,364	18,544,274	1977	83	22,919	29,652	52,571	44,895,613	147,232,206	16%	23,985,986	50	1,639,478
Subtotal		**1,375**		**198,753,728**		**20,498,173**		**137**				**49,037,608**	**149,716,120**		**25,257,519**		**1,726,389**
Average			**42,586**		**9,754**		**1970**		**7,527**	**6,314**	**13,841**			**43%**		**50**	
WOH	0-4,000	3,947	3,236	12,771,340	2,311	8,793,636	1918	2	2,030	369	2,399	9,468,079	3,303,261	27%	889,073	38	45,890
WOH	4,001-8,000	12,331	5,715	70,470,898	3,506	41,516,050	1928	20	3,140	829	3,969	48,945,199	21,525,699	28%	6,039,928	38	311,753
WOH	8,001-12,000	2,357	9,688	22,833,743	7,430	15,900,518	1939	13	4,336	1,380	5,716	13,472,040	9,361,703	76%	7,100,771	38	366,509
WOH	12,001-16,000	956	13,769	13,163,152	12,086	9,934,282	1948	18	7,544	3,633	11,177	10,685,011	2,478,141	43%	1,053,633	38	54,384
WOH	16,001-20,000	434	18,069	7,841,902	16,896	6,352,924	1954	14	6,525	3,549	10,075	4,372,489	3,469,413	44%	1,541,735	38	79,577
WOH	20,001-24,000	261	21,911	5,718,731	20,344	3,967,050	1964	9	9,989	2,634	12,622	3,294,452	2,424,279	37%	891,006	38	45,990
WOH	24,000+	1,664	182,648	303,927,076	74,366	81,058,764	1974	142	33,704	28,798	62,502	104,004,045	199,923,031	80%	159,397,050	38	8,227,345
Subtotal		**21,950**		**436,726,842**		**167,523,224**		**218**				**194,241,317**	**242,485,525**		**176,913,198**		**9,131,448**
Average			**36,434**		**19,563**		**1946**		**9,610**	**5,885**	**15,494**			**48%**		**38**	
CENT	0-4,000	357	3,063	1,093,501	2,017	625,388	1942		1,536	301	1,837	655,850	437,651	21%	93,400	45	5,729
CENT	4,001-8,000	1,681	5,753	9,670,347	2,639	4,337,997	1950	4	2,770	1,036	3,806	6,397,432	3,272,915	21%	692,925	45	42,506
CENT	8,001-12,000	585	9,747	5,701,991	3,318	1,837,971	1955	8	3,285	2,700	5,985	3,501,208	2,200,783	18%	402,208	45	24,673
CENT	12,001-16,000	343	13,881	4,761,265	4,201	1,293,937	1953	9	3,693	5,690	9,383	3,218,264	1,543,001	19%	288,950	45	17,725
CENT	16,001-20,000	227	18,000	4,085,959	4,965	1,042,611	1954	12	3,144	9,347	12,491	2,835,464	1,250,495	16%	204,427	45	12,540
CENT	20,001-24,000	167	21,823	3,644,519	5,957	941,213	1959	10	9,115	4,491	13,606	2,272,283	1,372,236	9%	122,669	45	7,525
CENT	24,000+	1,410	251,100	354,050,526	100,502	102,712,641	1979	103	78,498	39,767	118,265	166,753,923	187,296,603	14%	26,718,258	45	1,638,974
Subtotal		**4,770**		**383,008,108**		**112,791,758**		**146**				**185,634,424**	**197,373,684**		**28,522,838**		**1,749,672**
Average			**46,195**		**17,657**		**1956**		**14,577**	**9,047**	**23,625**			**17%**		**45**	
Total		**28,095**		**1,018,488,678**		**300,813,155**		**501**				**428,913,349**	**589,575,329**		**230,693,555**		**12,607,509**
Average			**41,738**		**15,658**		**1958**		**10,571**	**7,082**	**17,653**			**36%**		**44**	

2020 Population: 1,538,000

2020 GPCD: 8

[1] Sidewalks, patios, decks, roofline
[2] Driveways, detached garage, pool, sheds
[3] Including hardscape and features

Table H-9 Estimated 2020 EBMUD Irrigation Only Landscape Water Use

Location	Tier (sq.ft.)	Number of Services	Average Parcel Area (sq.ft.)	Sum Parcel Area (sq.ft.)	Average Building Area (sq.ft.)	Sum Building Area (sq.ft.)	Average Year Built	Number of Pools	Irrigated Area Factor (%)	Irrigated Area (sq.ft.)	Ref.ET (in.)	Total MAWA (gpd)
EOH	0-4,000	27	2,524	68,145	1,811	23,542	1984	0	37%	25,148	50	1,718
EOH	4,001-8,000	51	6,175	314,906	2,274	97,788	1988	3	43%	135,097	50	9,229
EOH	8,001-12,000	76	9,990	759,231	2,696	161,745	1979	14	36%	275,399	50	18,813
EOH	12,001-16,000	42	13,752	577,591	3,084	101,776	1985	9	38%	219,782	50	15,013
EOH	16,001-20,000	34	17,893	608,355	6,319	132,696	1991	3	46%	277,354	50	18,946
EOH	20,001-24,000	27	22,017	594,464	4,615	59,995	1980	5	38%	223,306	50	15,254
EOH	24,000+	717	439,444	315,081,265	57,807	13,758,127	1984	29	48%	150,861,416	50	10,305,419
Subtotal		**974**		**318,003,957**		**14,335,669**		**63**		**152,017,503**		**10,384,392**
Average			**73,113**		**11,229**		**1984**		**35%**		**50**	
WOH	0-4,000	180	2,881	518,658	2,385	224,169	1969	0	31%	158,504	38	8,181
WOH	4,001-8,000	470	5,892	2,769,306	3,584	1,222,164	1955	4	36%	1,005,495	38	51,899
WOH	8,001-12,000	186	9,858	1,833,519	6,158	677,375	1952	3	38%	699,082	38	36,083
WOH	12,001-16,000	136	13,873	1,886,767	10,229	675,086	1962	0	35%	665,064	38	34,328
WOH	16,001-20,000	102	17,930	1,828,849	9,947	467,511	1963	3	44%	805,509	38	41,577
WOH	20,001-24,000	96	22,020	2,113,882	20,699	890,052	1973	1	30%	638,393	38	32,951
WOH	24,000+	1,325	567,809	752,347,315	68,183	31,296,088	1980	22	41%	308,804,232	38	15,939,059
Subtotal		**2,495**		**763,298,296**		**35,452,445**		**33**		**312,776,281**		**16,144,078**
Average			**91,466**		**17,312**		**1965**		**32%**		**38**	
CENT	0-4,000	50	2,727	136,337	1,767	53,014	1990	0	31%	41,988	45	2,576
CENT	4,001-8,000	202	6,051	1,222,377	2,152	335,665	1977	2	42%	513,391	45	31,493
CENT	8,001-12,000	76	9,988	759,120	3,088	142,030	1974	1	43%	323,346	45	19,835
CENT	12,001-16,000	36	14,172	510,186	3,015	57,294	1980	0	31%	156,267	45	9 ,586
CENT	16,001-20,000	46	18,015	828,686	5,579	150,638	1981	2	26%	214,193	45	13,139
CENT	20,001-24,000	48	21,747	1,043,879	8,286	248,565	1986	0	26%	271,302	45	16,642
CENT	24,000+	830	1,163,543	965,740,594	104,021	36,823,497	1984	29	34%	332,407,223	45	20,390,800
Subtotal		**1,288**		**970,241,179**		**37,810,703**		**34**		**333,927,708**		
Average			**176,606**		**18,273**		**1982**		**29%**		**45**	**20,484,071**
Total		**4,757**		**2,051,543,432**		**87,598,817**		**130**		**798,721,491**		**47,012,541**
Average			**113,729**		**15,605**		**1977**		**32%**		**44**	

2020 Population: 1,538,000

2020 GPCD: 31

Appendix I. 2009-2010 CUWCC MOU Activity Reports and EBMUD Conservation Research Projects

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Appendix I. 2009-2010 CUWCC MOU Activity Reports and EBMUD Conservation Research Projects

I-1. 2009-2010 CUWCC MOU Activity Reports

Water Usage - 2009					Water Sources - 2009		
Property Type	**Metered Accounts**	**Metered Water Delivered (AF/Year)**	**Un-Metered Accounts**	**Un-Metered Water Delivered (AF/Year)**	**Supply Source Name**	**Quantity Supplied AF/Year**	**Water Supply Type**
Potable							
Single-Family	321,727	86,625	0	0	**Own Sources**		
Multi-Family	28,355	32,521	0	0	Mokelumne River	191,290	Potable
Commercial	15,433	15,551	0	0	Local reservoirs	9,770	Potable
Industrial	1,968	22,258	0	0	Subtotal	201,060	
Institutional	3,695	9,198	0	1,831	**Imported Water**	NA	NA
Irrigation	5,123	12,789	0	0	**Exported Water**	NA	NA
SubTotal	376,301	178,942	0	1,831	Total	201,060	
Non-Potable							
Single-Family	0	0	0	0	**Own Sources**		
Multi-Family	0	0	0	0	Wastewater Treatment	8,504	Recycled
Commercial	2	2	0	0	Local reservoirs	254	Raw
Industrial	1	4,418	0	0	Subtotal	8,758	
Institutional	0	0	0	0	**Imported Water**	NA	NA
Irrigation	57	1264	0	0	**Exported Water**	NA	NA
SubTotal	60	5,684	0	0	Total	8,758	
Total	**376,361**	**184,626**	**0**	**1,831**	**Total**	**209,818**	

Water Usage - 2010					Water Sources - 2010		
Property Type	**Metered Accounts**	**Metered Water Delivered (AF/Year)**	**Un-Metered # Account**	**Un-Metered Water Deliveries (AF/Year)**	**Supply Source Name**	**Quantity Supplied AF/Year**	**Water Supply Type**
Potable							
Single-Family	322,306	84,526	0	0	**Own Sources**		
Multi-Family	28,412	32,019	0	0	Mokelumne River	187,166	Potable
Commercial	15,386	15,037	0	0	Local reservoirs	13,192	Potable
Industrial	1,943	20,638	0	0	Subtotal	200,358	
Institutional	3,688	8,695	0	1,825	**Imported Water**	NA	NA
Irrigation	5,116	11,928	0	0	**Exported Water**	NA	NA
SubTotal	376,851	172,844	0	1,825	Total	200,358	
Non-Potable							
Single-Family	0	0	0	0	**Own Sources**		
Multi-Family	0	0	0	0	Wastewater Treatment	11,746	Recycled
Commercial	2	0	0	0	Local reservoirs	NA	Raw
Industrial	2	5,695	0	0	Subtotal	11,746	
Institutional	0	0	0	0	**Imported Water**	NA	NA
Irrigation	61	1152	0	0	**Exported Water**	NA	NA
SubTotal	65	6,847	0	0	Total	11,746	
Total	**376,916**	**179,691**	**0**	**1,825**	**Total**	**212,104**	

Operation Practices - 2009				
Conservation Coordinator				
Name	Richard Harris		Street Address 1	375 11th Street
Title	Manager of Water Conservation		Street Address 2	
Phone	510-287-1675		City	Oakland
Mobile	510-384-8499		State	CA
Email	rharris@ebmud.com		Zip	94607
Water Waste Prevention				
Option A	EBMUD Water Service Regulation Section 28 - "Water Use During Water Shortage" and Section 29 - "Prohibiting Wasteful Use of Water" establish dry-year and normal year conditions/restrictions to limit the waste of indoor and outdoor water use among residential and non-residential customers; the regulations can be found at www.ebmud.com			
Option B	EBMUD Procedure 900 - Water Supply Accounting and Reporting; Procedure 901 - Recycled Water Accounting and Reporting; and Procedure 902 - Water Conservation Accounting and Reporting establish utility operations best management practices, definitions, procedures and reporting frequencies to account for all water supply and demand to maximize efficiency.			
Option C	EBMUD 2009 Drought Management Program included a Water Savings Team canvassing the service area; mandatory water rationing allocations and enforcement measures.			
Enforcement Reporting	**Water Waste Prevention Type**	**Importance Ranking**	**Description**	**Actions**
Water Savings Team, Field Services	Excessive runoff and overspray	NA	Correspondence, followed by field visit and ultimately flow restriction and or account interruptions.	
Financial Investments & Bulking Partnerships	**BMP Name**	**Expense**	**Equivalent Resources Provided**	**Actions**
NA	NA	NA	NA	NA
Technical Support	**Tech Support Type**	**Tech Support Expense**	**Description**	**Actions**
NA	NA	NA	NA	NA
Program Management	**BMP Name**	**Program Description**	**Organization Name**	**Actions**
NA	NA	NA	NA	NA
Water Shortage Allocation				
Agency has a water shortage allocation plan or policy				**Yes**
Date of Adoption: Water Supply Availability and Deficiency Rule				
Encourage CUWCC Membership				
List efforts to recruit retail agencies			Board and committee member participation; present CUWCC activities, encourage participation at Bay Area Water Agencies Coalition and other water industry events.	
Amount of dues paid on behalf of retail agencies				NA

Operation Practices - 2010

Conservation Coordinator			
Name	Richard Harris	Street Address 1	375 11th Street
Title	Manager of Water Conservation	Street Address 2	
Phone	510-287-1675	City	Oakland
Mobile	510-384-8499	State	CA
Email	rharris@ebmud.com	Zip	94607

Water Waste Prevention	
Option A	EBMUD Water Service Regulation Section 29 - "Prohibiting Wasteful Use of Water" establish dry-year and normal year conditions/restrictions to limit the waste of indoor and outdoor water use among residential and non-residential customers; the regulations can be found at www.ebmud.com
Option B	EBMUD Procedure 900 - Water Supply Accounting and Reporting; Procedure 901 - Recycled Water Accounting and Reporting; and Procedure 902 - Water Conservation Accounting and Reporting establish utility operations best management practices, definitions, procedures and reporting frequencies to account for all water supply and demand to maximize efficiency.

Enforcement Reporting	**Water Waste Prevention Type**	**Importance Ranking**	**Description**	**Actions**
Water Savings Team, Field Services	Excessive runoff and overspray	NA	Correspondence, followed by field visit and ultimately flow restriction and or account interruptions.	

Financial Investments & Bulking Partnerships	**BMP Name**	**Expense**	**Equivalent Resources Provided**	**Actions**
NA	NA	NA	NA	NA

Technical Support	**Tech Support Type**	**Tech Support Expense**	**Description**	**Actions**
NA	NA	NA	NA	NA

Program Management	**BMP Name**	**Program Description**	**Organization Name**	**Actions**
NA	NA	NA	NA	NA

Water Shortage Allocation	
Agency has a water shortage allocation plan or policy	**Yes**
Date of Adoption: Water Supply Availability and Deficiency Rule	

Encourage CUWCC Membership	
List efforts to recruit retail agencies	Board and committee member participation; present CUWCC activities, encourage participation at Bay Area Water Agencies Coalition and other water industry events.
Amount of dues paid on behalf of retail agencies	NA

Encourage CUWCC Membership	
List efforts to recruit retail agencies	Board and committee member
Amount of dues paid on behalf of retail agencies	NA

Water Loss Control - 2009	
AWWA Water Audit	
Agency to complete a water audit & balance using the AWWA software upload worksheets (AWWA Water Audit)	Yes
Agency test source, import & production meters this reporting year	Yes
Water Audit Validity Score	84
Agency completed training in the AWWA Water Audit Method	Yes
Agency completed training in the Component Analysis Process	In Progress
Completed/Updated the Component Analysis (at least every 4 years)?	In Progress
Component Analysis completed/updated Date	In Progress
Water Loss Performance	
Agency Demonstrated Progress in Water Loss Control Performance	Yes
Agency repaired all reported leaks & breaks to the extent cost effective	Yes
Agency established and maintained a record keeping system for the repair of reported leaks for the following	Yes
Leak Location	Yes
Leak running time from report to repair	Yes
Cost of Repair	Yes
Date/Time Reported	Yes
Type of leaking pipe segment or fitting	Yes
Leak volume estimate	Yes
Agency located and repaired unreported leaks to the extent cost effective	Yes
Type of Program activities used to detect unreported leaks	
EBMUD conducts routine field leak surveys of pipe. EBMUD conducted research projects involving (a) semi-permanent installation of acoustic leak detection loggers on 250 miles of pipe and (b) a large pipe leak detection technologies on approximately 100 miles of pipe.	
Procedure 900 - Water Supply Accounting and Reporting and On-line Water Loss Control Manual stipulate EBMUD procedures, actions to account and report on apparent and real water loss.	

Water Loss Control - 2010	
AWWA Water Audit	
Agency to complete a water audit & balance using the AWWA software upload worksheets (AWWA Water Audit)	Yes
Agency test source, import & production meters this reporting year	Yes
Water Audit Validity Score	84
Agency completed training in the AWWA Water Audit Method	Yes
Agency completed training in the Component Analysis Process	In Progress
Completed/Updated the Component Analysis (at least every 4 years)?	In Progress
Component Analysis completed/updated Date	In Progress
Water Loss Performance	
Agency Demonstrated Progress in Water Loss Control Performance	Yes
Agency repaired all reported leaks & breaks to the extent cost effective	Yes
Agency established and maintained a record keeping system for the repair of reported leaks for the following	Yes
Leak Location	Yes
Leak running time from report to repair	Yes
Cost of Repair	Yes
Date/Time Reported	Yes
Type of leaking pipe segment or fitting	Yes
Leak volume estimate	Yes
Agency located and repaired unreported leaks to the extent cost effective	Yes
Type of Program activities used to detect unreported leaks	
EBMUD conducts routine field leak surveys of pipe. EBMUD conducted research projects involving (a) semi-permanent installation of acoustic leak detection loggers on 250 miles of pipe and (b) a large pipe leak detection technologies on approximately 100 miles of pipe.	
Procedure 900 - Water Supply Accounting and Reporting and On-line Water Loss Control Manual stipulate EBMUD procedures, actions to account and report on apparent and real water loss.	

AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.1

Back to Instructions

? Click to access definition

Water Audit Report for: East Bay Municipal Utility District
Reporting Year: CY2009 1/2009 - 12/2009

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

WATER SUPPLIED		<< Enter grading in column 'E'		
Volume from own sources:	9	66,431.900	Million gallons (US)/yr (MG/Yr)	
Master meter error adjustment (enter positive value):	9	1,391.200	over-registered	MG/Yr
Water imported:	n/a	0.000	MG/Yr	
Water exported:	n/a	0.000	MG/Yr	
WATER SUPPLIED:		65,040.700	MG/Yr	

AUTHORIZED CONSUMPTION				Click here: ? for help using option buttons below
Billed metered:	9	58,312.300	MG/Yr	
Billed unmetered:	n/a	0.000	MG/Yr	
Unbilled metered:	8	8.800	MG/Yr	Pcnt: Value:
Unbilled unmetered:	6	108.400	MG/Yr	108.400
AUTHORIZED CONSUMPTION:		58,429.500	MG/Yr	

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)				
		6,611.200	MG/Yr	
Apparent Losses				Pcnt: Value:
Unauthorized consumption:	4	74.000	MG/Yr	74.000
Customer metering inaccuracies:	6	466.000	MG/Yr	466.000
Systematic data handling errors:	6	0.700	MG/Yr	
Apparent Losses:		540.700		
Real Losses (Current Annual Real Losses or CARL)				
Real Losses = Water Losses - Apparent Losses:		6,070.500	MG/Yr	
WATER LOSSES:		6,611.200	MG/Yr	

Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

NON-REVENUE WATER			
NON-REVENUE WATER:		6,728.400	MG/Yr
= Total Water Loss + Unbilled Metered + Unbilled Unmetered			

SYSTEM DATA				
Length of mains:	9	4,108.0	miles	
Number of active AND inactive service connections:	9	381,728		
Connection density:		93	conn./mile main	
Average length of customer service line:	10	0.0	ft	(pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	3	83.0	psi	

COST DATA				
Total annual cost of operating water system:	10	$230,490,000	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$4.86	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	5	$220.00	$/Million gallons	

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	10.3%	
Non-revenue water as percent by cost of operating system:	1.7%	
Annual cost of Apparent Losses:	$2,627,802	
Annual cost of Real Losses:	$1,335,510	

Operational Efficiency Indicators

Apparent Losses per service connection per day:	3.88	gallons/connection/day
Real Losses per service connection per day*:	43.57	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.52	gallons/connection/day/psi
? Unavoidable Annual Real Losses (UARL):	2,407.95	million gallons/year
From Above, Real Losses = Current Annual Real Losses (CARL):	6,070.50	million gallons/year
? Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.52	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 80 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Variable production cost (applied to Real Losses)
2: Unauthorized consumption
3: Customer metering inaccuracies

For more information, click here to see the Grading Matrix worksheet

Metering with Commodity - 2009					
Implementation					
Does agency have any unmetered service connections?					No
If yes, has your agency completed a meter retrofit plan?					NA
If yes, number of previously unmetered accounts fitted with meters during reporting year:					NA
Are all new service connections being metered?					Yes
Are all new service connections being billed volumetrically?					Yes
Has your agency completed and submitted electronically to the Council a written plan, policy, or program to test, repair, and replace meters?					Yes
Matrix					
Account Type	**# Metered Accounts**	**# Metered Accts. Read**	**# Metered Accts. Billed by Volume**	**Billing Frequency by Year**	**# Volume Estimates**
Single Family	321,727	321,727	321,727	Bi-monthly	NA
Multi-Family	28,355	28,355	28,355	Bi-monthly	NA
Commercial	15,433	15,433	15,433	Bi-monthly	NA
Industrial	1,968	1,968	1,968	Monthly	NA
Institutional	3,695	3,695	3,695	Bi-monthly	NA
Landscape Irrigation	5,123	5,123	5,123	Bi-monthly	NA
Subtotal	376,301	376,301	376,301		
Feasibility Study					
Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?					No
If yes, please fill in the following information:					NA
When was the feasibility study conducted?					NA
Description, upload, link:					NA
Number of CII accounts with mixed use meters					2,745
Number of CII accounts with mixed use meters retrofitted with dedicated irrigation meters.					13
At Least as Effective As					
Is your agency implementing an "at least as effective as" variant of this BMP?					No
If yes, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective"					NA

Metering with Commodity - 2010					
Implementation					
Does agency have any unmetered service connections?					No
If yes, has your agency completed a meter retrofit plan?					NA
If yes, number of previously unmetered accounts fitted with meters during reporting year:					NA
Are all new service connections being metered?					Yes
Are all new service connections being billed volumetrically?					Yes
Has your agency completed and submitted electronically to the Council a written plan, policy, or program to test, repair, and replace meters?					Yes
Matrix					
Account Type	**# Metered Accounts**	**# Metered Accts. Read**	**# Metered Accts. Billed by Volume**	**Billing Frequency by Year**	**# Volume Estimates**
Single Family	322,306	322,306	322,306	Bi-monthly	NA
Multi-Family	28,412	28,412	28,412	Bi-monthly	NA
Commercial	15,386	15,386	15,386	Bi-monthly	NA
Industrial	1,943	1,943	1,943	Monthly	NA
Institutional	3,688	3,688	3,688	Bi-monthly	NA
Landscape Irrigation	5,116	5,116	5,116	Bi-monthly	NA
Subtotal	376,851	376,851	376,851		
Feasibility Study					
Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?					No
If yes, please fill in the following information:					NA
When was the feasibility study conducted?					NA
Description, upload, link:					NA
Number of CII accounts with mixed use meters					2,745
Number of CII accounts with mixed use meters retrofitted with dedicated irrigation meters.					10
At Least as Effective As					
Is your agency implementing an "at least as effective as" variant of this BMP?					No
If yes, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective"					NA

Retail Conservation Pricing - 2009				
Implementation (Water Rate Structure)				
Compliant?				Yes
Water Rate Structures that are assigned to the majority of your customers, by customer class				
Rate Structure Option	**Customer Class Name**	**Total Revenue Commodity Charges ($Millions)**	**Total Revenue Customer Meter/Service (Fixed) Charges ($Millions)**	**Commodity vs. Fixed Ratio (%)**
Volumetric 3-Tier	Single-Family Residential	103.6	44.7	70%
Volumetric Single-Tier	Multi-Family Residential	41.2	7.1	85%
Volumetric Single-Tier	Commercial	21.8	3.4	87%
Volumetric Single-Tier	Industrial	28.7	0.8	97%
Volumetric Single-Tier	Institutional / Government	13.4	1.2	92%
Volumetric Single-Tier	Dedicated Irrigation	18.5	1.6	92%
Volumetric Single-Tier	Recycled	5.7	0.1	98%
Volumetric Single-Tier	Raw	0.2	0.02	91%
	Total	**233.1**	**58.9**	**80%**
Implementation Option				
Retail Waste Water (Sewer) Rate Structure by Customer Class				
Compliant?				Yes
Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your				
Rate Structure Option	**Customer Class Name**	**Total Revenue Commodity Charges ($Millions)**	**Total Revenue Customer Meter/Service (Fixed) Charges ($Millions)**	**Commodity vs. Fixed Ratio (%)**
Volumetric 3-Tier	Single-Family Residential	5.7	17	**25%**
Volumetric Single-Tier	Multi-Family Residential	7.8	3.5	**69%**
Volumetric Single-Tier	Commercial	7.7	0.7	**92%**
Volumetric Single-Tier	Industrial	0.1	2.7	**4%**
Volumetric Single-Tier	Institutional / Government	NA	NA	NA
Volumetric Single-Tier	Dedicated Irrigation	NA	NA	NA
Volumetric Single-Tier	Recycled	NA	NA	NA
Volumetric Single-Tier	Raw	15.6	6.9	**69%**
	Total	**36.9**	**30.8**	**55%**
At Least as Effective As				
Is your agency implementing an "at least as effective as" variant of this BMP?				No
If yes, please explain in detail how your implementation of this BMP differs				NA
Exemption Request				
Agency has requested an exemption from implementing this BMP				No
Exemption Type				NA

Retail Conservation Pricing - 2010				
Implementation (Water Rate Structure)				
Compliant?				Yes
Water Rate Structures that are assigned to the majority of your customers, by customer class				
Rate Structure Option	**Customer Class Name**	**Total Revenue Commodity Charges ($Millions)**	**Total Revenue Customer Meter/Service (Fixed) Charges ($Millions)**	**Commodity vs. Fixed Ratio (%)**
Volumetric 3-Tier	Single-Family Residential	95.8	47.7	67%
Volumetric Single-Tier	Multi-Family Residential	37.9	7.8	83%
Volumetric Single-Tier	Commercial	19.3	3.7	84%
Volumetric Single-Tier	Industrial	27.3	0.9	97%
Volumetric Single-Tier	Institutional / Government	11.2	1.4	89%
Volumetric Single-Tier	Dedicated Irrigation	15.5	1.8	90%
Volumetric Single-Tier	Recycled	4.8	0.1	98%
Volumetric Single-Tier	Raw	0.2	0.02	91%
	Total	**212.0**	**63.4**	**77%**
Implementation Option				
Retail Waste Water (Sewer) Rate Structure by Customer Class				
Compliant?				Yes
Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your				
Rate Structure Option	**Customer Class Name**	**Total Revenue Commodity Charges ($Millions)**	**Total Revenue Customer Meter/Service (Fixed) Charges ($Millions)**	**Commodity vs. Fixed Ratio (%)**
Volumetric 3-Tier	Single-Family Residential	5.9	17.7	**25%**
Volumetric Single-Tier	Multi-Family Residential	8.2	3.7	**69%**
Volumetric Single-Tier	Commercial	8	0.7	**92%**
Volumetric Single-Tier	Industrial	2.9	0.1	**97%**
Volumetric Single-Tier	Institutional / Government	NA	NA	NA
Volumetric Single-Tier	Dedicated Irrigation	NA	NA	NA
Volumetric Single-Tier	Recycled	NA	NA	NA
Volumetric Single-Tier	Raw	19.1	4.5	**81%**
	Total	**44.1**	**26.7**	**62%**
At Least as Effective As				
Is your agency implementing an "at least as effective as" variant of this BMP?				No
If yes, please explain in detail how your implementation of this BMP differs				NA
Exemption Request				
Agency has requested an exemption from implementing this BMP				No
Exemption Type				NA

Public Outreach - 2009		
Is the Retail Agency Performing Public Outreach?		**Yes**
Public Information Program List		
# Public Contacts	**Public Information Programs**	**Did at least one contact take place during each quarter of the reporting year?**
2.3 million	Individual mailings sent six times annually to over 376,000 water service accounts including flyers and/or brochures, bill stuffers including *Pipeline* newsletter with conservation articles and messages printed on bill.	Yes
119,304	WaterSmart Center website hits to www.ebmud.com/watersmart which includes conservation rebates and services information, water saving tips and videos, publications, access to free water saving devices, and links to information resources.	Yes
4	Workshops and media campaigns with Bay Friendly Landscaping and Gardening.	Yes
3,298	Conservation-related customer telephone contacts with EBMUD Contact Center and Water Conservation.	Yes
2	Website links to Irrigation Association of California and StopWaste.	No
2,000	EBMUD initiated customer contacts to high consumption accounts (approximately 800 annually) and responses to conservation-related email inquiries (approximately 1,200 annually).	Yes
25	Responses to Garden Grant Program application requests.	Yes
10	Conservation booths at community events.	Yes
18,930	Provide bi-monthly water use reports to customers with comparison of water use to water budget.	Yes
258	Conduct conservation presentations to community groups, schools, and other agencies. 38-(Water Conservation), 220-(Public Information Office)	Yes
42	Conduct media outreach: news releases, editorial board visits, written editorials, newspaper contacts, television, contacts, radio contact, articles or stories resulting from outreach.	Yes
1	Conducted Adult Education/Training Programs: Irrigation Courses.	Yes
3	Sponsor or co-sponsored landscape workshops/training for homeowners and/or homeowners associations: 2-Bay Friendly Presentations/year. 1-Master Gardener Presentation/year.	Yes
$3.66 million	Total reporting period budget expenditure for public outreach/training/adult education programs including 31 Water Conservation and temporary drought response staffing, three Public Information staff, and a $1.8 million drought response multi-media marketing campaign.	Yes
Contact with the Media		
# Media Contacts	**Media Contact Types**	**Did at least one contact take place during each quarter of the reporting year?**
12	Press Releases	Yes
30	Television and radio media	Yes
Performing Website Updates:		Yes
URL (website address):		http://www.ebmud.com/

Public Outreach - 2009		
Water conservation related updates to website:		
1	Quarterly Qualifying High-Efficiency Clothes Washers and WaterSense Toilets.	Yes
2	Biannual program information updates for all rebate programs	Yes
3	Biannual updates to online Mulch Coupon Offer	Yes
4	Quarterly updates to WaterSmart Center messages	Yes
5	Quarterly updates and maintenance to website online store	Yes
6	As needed updates and maintenance of Water Conservation publications & links to other sites	Yes
7	Monthly Workshops & Events updates	Yes
Public Outreach Expenses		
Expense Amount	**Expense Category**	**Personnel Costs Included?**
$22,416	Staffing Community Events.	Yes
$23,571	Water Conservation Presentations to community groups.	Yes
Additional Public Information Program		
Were there additional Public Outreach efforts?		Yes
Public Information Programs		
	Annual Water Conservation & Recycling Program Report	NA
	WaterSmart (Business) Certification Program	Yes
	WaterSmart Garden Grant Program	NA
	Annual Water Conservation Showcase	NA
	California Youth Energy Services	Yes
	Field Learning Environmental Education Sites: Chabot, Nunes and Valle Vista.	Yes
Social Marketing Programs/Branding		
Does your agency have a water conservation "brand", "theme" or mascot?		Yes
	WaterSmart is an umbrella brand for EBMUD conservation programs depicting environmentally friendly and customer oriented services. Originally developed through market research and testing, the brand is consistently deployed for water-conservation-related online and print communications.	
Market Research		
Have you sponsored or participated in market research to refine your message?		Yes
Market Research Topic:		WaterSmart Certification Program
Community Committees		
Do you have a community conservation committee?		Yes
Select the name(s) of Focus or Foci:		Landscape Advisory Committee

Public Outreach - 2010		
Is the Retail Agency Performing Public Outreach?		**Yes**
Public Information Program List		
# Public Contacts	**Public Information Programs**	**Did at least one contact take place during each quarter of the reporting year?**
2.3 million	Individual mailings sent six times annually to approximately 377,000 water service accounts including flyers and/or brochures, bill stuffers including *Pipeline* newsletter with conservation articles and messages printed on bill.	Yes
120,390	WaterSmart Center website hits to www.ebmud.com/watersmart which includes conservation rebates and services information, water saving tips and videos, publications, access to free water saving devices, and links to information resources.	Yes
4	Workshops and media campaigns with Bay Friendly Landscaping and Gardening.	Yes
2,000	Conservation-related customer telephone contacts with EBMUD Contact Center and Water Conservation.	
2	Website links to Irrigation Association of California and StopWaste.	No
2,000	EBMUD initiated customer contacts to high consumption accounts (approximately 800 annually) and responses to conservation-related email inquiries (approximately 1,200 annually).	Yes
5,000	Direct mail for WaterSmart Certification Program.	No
10	Conservation booths at community events.	Yes
18,930	Provide bi-monthly water use reports to customers with comparison of water use to water budget.	Yes
74	Conduct conservation presentations to community groups, schools, and other agencies.	Yes
8	Conduct media outreach: news releases, editorial board visits, written editorials, newspaper contacts, television, contacts, radio contact, articles or stories resulting from outreach.	Yes
2	Conducted Adult Education/Training Programs: Irrigation Courses.	Yes
3	Sponsor or co-sponsored landscape workshops/training for homeowners and/or homeowners associations: 2-Bay Friendly Presentations/year. 1-Master Gardener Presentation/year.	Yes
$2 million	Total reporting period budget expenditure for public outreach/training/adult education programs including, 16 Water Conservation and 3 Public Information staff.	Yes
Contact with the Media		
# Media Contacts	**Media Contact Types**	**Did at least one contact take place during each quarter of the reporting year?**
8	Press Releases	Yes
30	Television and radio media	Yes
Is Your Agency Performing Website Updates:		Yes
URL (website address):		http://www.ebmud.com/

Public Outreach - 2010		
Water conservation related updates to website:		
1	Quarterly Qualifying High-Efficiency Clothes Washers and WaterSense Toilets.	Yes
2	Biannual program information updates for all rebate programs	Yes
3	Biannual updates to online Mulch Coupon Offer	Yes
4	Quarterly updates to WaterSmart Center messages	Yes
5	Quarterly updates and maintenance to website online store	Yes
6	As needed updates and maintenance of Water Conservation publications & links to other sites	Yes
7	Monthly Workshops & Events updates	Yes
Public Outreach Expenses		
Expense Amount	**Expense Category**	**Personnel Costs Included?**
$31,952	Staffing Community Events.	Yes
$17,195	Water Conservation Presentations to community groups.	Yes
Additional Public Information Program		
Were there additional Public Outreach efforts?		Yes
Public Outreach Additional Information		
Public Information Programs		
	Annual Water Conservation & Recycling Program Report	NA
	WaterSmart (Business) Certification Program	Yes
	WaterSmart Garden Grant Program	NA
	Annual Water Conservation Showcase	NA
	California Youth Energy Services	Yes
	Field Learning Environmental Education Sites: Chabot, Nunes and Valle Vista.	Yes
Social Marketing Programs/Branding		
Does your agency have a water conservation "brand", "theme" or mascot?		Yes
	WaterSmart is an umbrella brand for EBMUD conservation programs depicting environmentally friendly and customer oriented services. Originally developed through market research and testing, the brand is consistently deployed for water-conservation-related online and print communications.	
Market Research		
Have you sponsored or participated in market research to refine your message?		Yes
Market Research Topic:		Customer surveys
Community		
Do you have a community conservation committee?		Yes
Select the name(s) of Focus or Foci:		Landscape Advisory Committee

School Education - 2009		
Required School Programs		
Is a wholesale agency implementing school programs which can be counted to help your agency comply with this BMP?		No
Materials meet state education framework requirements?		Yes
Description of Materials		
Materials distributed to K-6 Students?	Coloring books, educational comic books, education lesson courses, and water awareness activity workbooks.	
Description of materials distributed to K-6 Students.	Creative and age appropriate introduction to water awareness consisting of coloring and comic books with simple sentences structure and content. Story lines follow "Captain Hydro's" life in the water world.	
Number of students reached:		47,793
Materials distributed to 7-12 Students?	Educational workbooks, educational lesson courses, and water awareness activity lessons.	
Description of materials distributed to 7-12 Students.	Materials focus on where EBMUD water comes from, how water is treated, stored, and delivered. Other lessons and lesson plans include pollution prevention waste water treatment as they relate to world history and geography and integrate with other science and social science awareness.	
Number of Distribution:		19,522
Annual Budget of school education program:		$200,000
Description of all other water supplier education programs:	Newsletters (Customer Pipelines and Equalizer) Reports (Annual, Technical, and Water Supply Resource); Fact Sheets (Budget by Fiscal Year, EBMUD Energy, EBMUD & Delta, Family Disaster Preparedness, and Waterlines are Lifelines) Workshops and Events (Water Conservation Showcase, Bay Friendly Gardens, and Native Garden Tours and Irrigation Workshops); and coordination with Environmental Education Organizations (Chabot, Nunes and Valle Vista).	
Voluntary School Program Activities		
Large group assemblies:		
Number of presentations:		4
Number of attendees:		185
Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:		
Number of presentations:		2
Number of attendees:		40
Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):		
Description:	Newsletters and Educational School Books distributed twice a year to all schools including 155 School Superintendents, School Board Members and County Offices of Education; 563 schools and outdoor educational entities such as Scout groups; and 30 to various water agencies and related groups. Also, Pencils & Sharpeners were distributed to all the schools.	
Number distributed:	14,364 - Newsletters. 1,000 - Educational School Books. 30,000 Pencils & Sharpeners.	

School Education - 2010		
Required School Programs		
Is a wholesale agency implementing school programs which can be counted to help your agency comply with this BMP?		No
Materials meet state education framework requirements?		Yes
Description of Materials		
Materials distributed to K-6 Students?	Coloring books, educational comic books, education lesson courses, and water awareness activity workbooks.	
Description of materials distributed to K-6 Students.	Creative and age appropriate introduction to water awareness consisting of coloring and comic books with simple sentences structure and content. Story lines follow "Captain Hydro's" life in the water world.	
Number of students reached:		47,793.00
Materials distributed to 7-12 Students?	The materials distributed to 7 - 12 students were educational workbooks, educational lesson courses, and water awareness activity lessons.	
Description of materials distributed to 7-12 Students.	Materials focus on where EBMUD water comes from, how water is treated, stored, and delivered. Other lessons and lesson plans include pollution prevention waste water treatment as they relate to world history and geography and integrate with other science and social science awareness.	
Number of Distribution:		19,522
Annual Budget of school education program:		$150,000
Description of all other water supplier education programs:	Newsletters (Customer Pipelines and Equalizer) Reports (Annual, Technical, and Water Supply Resource); Fact Sheets (Budget by Fiscal Year, EBMUD Energy, EBMUD & Delta, Family Disaster Preparedness, and Waterlines are Lifelines) Workshops and Events (Water Conservation Showcase, Bay Friendly Gardens, and Native Garden Tours and Irrigation Workshops); and coordination with Environmental Education Organizations (Chabot, Nunes and Valle Vista).	
Voluntary School Program Activities		
Large group assemblies:		
Number of presentations:		1
Number of attendees:		20
Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:		
Number of presentations:		2
Number of attendees:		40
Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):		
Description:	Newsletters and Educational School Books distributed twice a year to all schools including 155 School Superintendents, School Board Members and County Offices of Education; 563 schools and outdoor educational entities such as Scout groups; and 30 to various water agencies and related groups. Also, Pencils & Sharpeners were distributed to all the schools.	
Number distributed:	14,364 - Newsletters. 1,000 - Educational School Books.	

Programmatic BMP Implementation Component and Coverage Requirement		Coverage Requirement Basis							
Implementation Component	**Coverage Requirement Description**	**Coverage Requirement Component**	**Annual Coverage Rate**	**Total Coverage Requirement**	**2008 Base Amount**	**Base Unit**	**Annual Coverage Requirement**	**Coverage Requirement Through 2010**	**Total Coverage Requirement**
BMP 3 Residential									
Residential Assistance	Provide leak detection assistance to an average of 1.5 percent per year of current single-family accounts and 1.5 percent per year of current multi-family units during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or not less than 0.75 percent per year of current single-family accounts and 0.75 percent per year of current multi-family units. Showerhead distribution will be considered complete when 75 percent market saturation is achieved.	SF Leak Detection	1.50%	15.00%	320,785	Accounts	4,812	9,624	48,118
		MF Leak Detection	1.50%	15.00%	254,043	Dwelling Units	3,811	7,621	38,106
		Showerhead Saturation	7.50%	75.00%	849,670	Showerheads	63,725	127,451	637,253
Landscape Water Survey	Provide landscape water surveys to an average of 1.5 percent per year of current single-family accounts during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or no less than 0.75 percent per year of current single-family accounts.	SF Surveys	1.50%	9.80%	320,785	Accounts	794	1,588	7,939
High efficiency clothes washers	Provide financial incentives for the purchase of HECWs that meet an average water factor value of 5.0. If the WaterSense Specification is less than 5.0, then the water factor value will decrease to that amount. Incentives shall be provided to 0.9 percent of current single-family accounts during the first reporting period following BMP implementation, rising to 1.0 percent per year of current single-family accounts for the remainder of ten year period following signing of the MOU. An alternative method is to demonstrate 1.4 percent per year of the market penetration during the first ten years after signing the MOU.	SF incentives WSS HEW	0.90%	10.00%	320,785	Accounts	2,887	5,774	32,079
HET Rebate Program	A financial incentive shall continue to be offered for toilets meeting the current WSS and updated standard whenever a more efficient toilet is identified by WSS. Compliance will entail demonstrating a number of toilet replacements of 3.5 gpf or greater, toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75% is demonstrated, whichever is sooner.	Toilet Saturation < 3.5 gpf	7.50%	75.00%	978,500	Toilets	73,388	146,775	733,875
WSS New Development	An incentive shall continue to be offered until a water agency, or local, state or federal regulation is in effect meeting at a minimum, WSS for water efficient single-family homes. Multi-family housing shall also meet the WSS in all applicable criteria regardless of the total number of stories in the building.	Regulation	Incentive or Regulation	Incentive or Regulation	NA				

Programmatic BMP Implementation Component and Coverage Requirement		Coverage Requirement Basis							
Implementation Component	**Coverage Requirement Description**	**Coverage Requirement Component**	**Annual Coverage Rate**	**Total Coverage Requirement**	**2008 Base Amount**	**Base Unit**	**Annual Coverage Requirement**	**Coverage Requirement Through 2010**	**Total Coverage Requirement**
BMP 4 CII									
Water Savings	Coverage shall consist of meeting the annual water savings goal in Section A. Although it is not one of the criteria in meeting implementation, agencies will be considered on track if estimated savings as a percent of baseline water use equals or exceeds the following: 0.5% by the end of first reporting period (year two), 2.4% by the end of year four, 4.3% by the end of year six, 6.4% by the end of year eight, and 9% by the end of year ten. Percentages will be adjusted proportionally for up to 50% past credit referred to in the Implementation section.	Percentage of 2008 Baseline Consumption	0.50%	10.00%	49,919	Acre Feet	NA	125	4,992
BMP 5 Landscape									
Water Budgets	1) ETo-based water use budgets developed for 90% of CII accounts with dedicated irrigation meters at an average rate of 9% per year over 10 years.	Water Budgets (dedicated meters)	9.00%	90.00%	5,167	Accounts	465	930	4,650
Technical Assistance	2) Offer site-specific technical assistance annually to all accounts that are 20% over budget within six years of the date implementation was to commence.	Annual Assistance (to over budget accts)	20.00%	Accounts > 20 percent over water budgets		Accounts	Varies by year		
Water Use Surveys	3) Complete irrigation water use surveys for not less than 15% of CII accounts with mixed-use meters and un-metered accounts within 10 years of the date implementation is to commence. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both the Landscape and CII BMPs.) An agency will be considered on track if the percent of CII accounts with mixed-use meters receiving a landscape water use survey equals or exceeds the following: 1.5% by the end of the first reporting period (year two) following the date implementation is to commence; 3.6% by the end of year four; 6.3% by the end of year six; 9.6% by the end of year eight; and 13.5% by the end of year ten. Agency may credit 100% of the number of landscape water use surveys for CII accounts with mixed-use meters completed prior to July 1, 2007 that have received a follow-up inspection against the coverage requirement; agency may credit 50% of surveys that have not received follow-up inspections. Agency may credit 100% of the number of landscape water use surveys completed for CII accounts with mixed-use meters after July 1, 2007 against the coverage requirement.	Mixed-use Account. Water Surveys	1.50%	15.00%	2,745	Accounts	41	82	412
Incentives for Retrofit	4) Agency will implement and maintain a customer incentive programs) for irrigation equipment retrofits.	Maintain Program	NA	NA	Program Implemented	Yes or No			

Programmatic BMP Implementation Component and Coverage Requirement			EBMUD Coverage Requirement			2009-2010 Activity and Compliance Status					
Implementation Component	**Coverage Requirement Description**	**Coverage Requirement Component**	**Total Activity Thru 2008**	**EBMUD Basis**	**Remaining Annual Target**	**Annual Activity 2009**	**Annual Activity 2010**	**Total Activity to Date**	**Percent Coverage Requirement Thru 2010**	**Percent of Total Coverage Requirement**	**Status**
BMP 3 Residential											
Residential Assistance	Provide leak detection assistance to an average of 1.5 percent per year of current single-family accounts and 1.5 percent per year of current multi-family units during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or not less than 0.75 percent per year of current single-family accounts and 0.75 percent per year of current multi-family units. Showerhead distribution will be considered complete when 75 percent market saturation is achieved.	SF Leak Detection	38,313	9,805	980	884	546	39,743	413%	83%	On Track
		MF Leak Detection	45,682	0	0	3,375	3,411	52,468	688%	138%	Complete
		Showerhead Saturation	781,696	0	0	5,119	1,656	788,471	619%	124%	Complete
Landscape Water Survey	Provide landscape water surveys to an average of 1.5 percent per year of current single-family accounts during the first ten years after signing the MOU. After completing the ten-year 15 percent target, agencies will maintain a program at the level of high-bill complaints or no less than 0.75 percent per year of current single-family accounts.	SF Surveys	2,624	5,315	532	178	35	2,837	179%	36%	On Track
High efficiency clothes washers	Provide financial incentives for the purchase of HECWs that meet an average water factor value of 5.0. If the WaterSense Specification is less than 5.0, then the water factor value will decrease to that amount. Incentives shall be provided to 0.9 percent of current single-family accounts during the first reporting period following BMP implementation, rising to 1.0 percent per year of current single-family accounts for the remainder of ten year period following signing of the MOU. An alternative method is to demonstrate 1.4 percent per year of the market penetration during the first ten years after signing the MOU.	SF incentives WSS HEW	62,883	0	0	10,465	10,258	83,606	1448%	261%	Complete
HET Rebate Program	A financial incentive shall continue to be offered for toilets meeting the current WSS and updated standard whenever a more efficient toilet is identified by WSS. Compliance will entail demonstrating a number of toilet replacements of 3.5 gpf or greater, toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75% is demonstrated, whichever is sooner.	Toilet Saturation < 3.5 gpf	615,816	118,059	11,806	39,140	39,140	694,096	473%	95%	On Track
WSS New Development	An incentive shall continue to be offered until a water agency, or local, state or federal regulation is in effect meeting at a minimum, WSS for water efficient single-family homes. Multi-family housing shall also meet the WSS in all applicable criteria regardless of the total number of stories in the building.	Regulation	Regulation Implemented 2007	New Service Water Conservation Meet WSS Requirements		New Service Water Conservation Regulation Implementation			100%	NA	On Track

Programmatic BMP Implementation Component and Coverage Requirement			EBMUD Coverage Requirement			2009-2010 Activity and Compliance Status					
Implementation Component	**Coverage Requirement Description**	**Coverage Requirement Component**	**Total Activity Thru 2008**	**EBMUD Basis**	**Remaining Annual Target**	**Annual Activity 2009**	**Annual Activity 2010**	**Total Activity to Date**	**Percent Coverage Requirement Thru 2010**	**Percent of Total Coverage Requirement**	**Status**
BMP 4 CII											
Water Savings	Coverage shall consist of meeting the annual water savings goal in Section A. Although it is not one of the criteria in meeting implementation, agencies will be considered on track if estimated savings as a percent of baseline water use equals or exceeds the following: 0.5% by the end of first reporting period (year two), 2.4% by the end of year four, 4.3% by the end of year six, 6.4% by the end of year eight, and 9% by the end of year ten. Percentages will be adjusted proportionally for up to 50% past credit referred to in the Implementation section.	Percentage of 2008 Baseline Consumption	19,695	2,496	250	105	1,299	1,404	1125%	56%	On Track
BMP 5 Landscape											
Water Budgets	1) ETo-based water use budgets developed for 90% of CII accounts with dedicated irrigation meters at an average rate of 9% per year over 10 years.	Water Budgets (dedicated meters)	NA	4,650	465	3,155	3,315	3,315	356%	71%	On Track
Technical Assistance	2) Offer site-specific technical assistance annually to all accounts that are 20% over budget within six years of the date implementation was to commence.	Annual Assistance (to over budget accts)	All accounts offered assistance	Varies by year		All sites over budget are offered technical assistance			100%	NA	On Track
Water Use Surveys	3) Complete irrigation water use surveys for not less than 15% of CII accounts with mixed-use meters and un-metered accounts within 10 years of the date implementation is to commence. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both the Landscape and CII BMPs.) An agency will be considered on track if the percent of CII accounts with mixed-use meters receiving a landscape water use survey equals or exceeds the following: 1.5% by the end of the first reporting period (year two) following the date implementation is to commence; 3.6% by the end of year four; 6.3% by the end of year six; 9.6% by the end of year eight; and 13.5% by the end of year ten. Agency may credit 100% of the number of landscape water use surveys for CII accounts with mixed-use meters completed prior to July 1, 2007 that have received a follow-up inspection against the coverage requirement; agency may credit 50% of surveys that have not received follow-up inspections. Agency may credit 100% of the number of landscape water use surveys completed for CII accounts with mixed-use meters after July 1, 2007 against the coverage requirement.	Mixed-use Account. Water Surveys	485	2,260	226	13	10	508	617%	123%	Complete
Incentives for Retrofit	4) Agency will implement and maintain a customer incentive programs) for irrigation equipment retrofits.	Maintain Program	Program Implemented	NA	NA	Program Implemented			100%	NA	On Track

I-2. EBMUD Conservation Research Projects

Table I-2.1 Conservation Research Projects

Project Name	Funding Year	EBMUD Cost	Description
1.6 Gallon Per Flush (GPF) Toilets Study	1991	$125,000	To determine toilet and showerhead water savings and impact on sewer lines.
Impacts of Ultra Low-Flow Toilets (ULFT) on Sewer Laterals and Wastewater Operations Study	1992	$75,000	To determine the impact of 1.6 GPF toilets on sewer lateral flows and on wastewater operations.
Customer Incentive for Water Conservation Study	1994	$10,000	To determine the efficacy of various water conservation incentive programs.
Water Conservation Baseline Study	1995	$100,000	To determine baseline customer knowledge of water conservation practices and market penetration of water saving fixtures.
Potential Energy Savings with Off-Peak Irrigation Study	1995	$10,000	To determine irrigation habits in the EBMUD service area and estimate potential energy savings from off-peak irrigation.
Water Conservation Rate Structures Study	1997	$10,000	To determine innovative ways to price urban water service.
The High-Efficiency Laundry Metering and Marketing Analysis (THELMA) Project	1998	$25,000	To collect information to help transform the clothes washer industry to change to more efficient products.
Best Management Practices (BMPs) Costs and Savings Study	2000	$20,000	To develop methods and data to enact economic analysis for water conservation BMPs.
Laboratory Evaluation of Selected 1.6 GPF Toilet Fixtures	2001	$10,000	To determine performance of selected 1.6 GPF toilets and to propose industry testing standards.
Commercial, Industrial, and Institutional (CII) ULFT Savings Study	2001	$10,000	To determine water savings of 1.6 GPF toilets in the business sector.
Water Conservation Market Penetration Study	2002	$300,000	To determine market penetration of water saving fixtures and equipment.
Water Closet Performance Testing Study	2002	$30,000	To develop information on product performance, water savings reliability, and to help consumers evaluate products.
Demand Hardening Study	2002	$10,000	To determine the impact of demand hardening on future conservation and ability to respond to water shortages.
Toilet Freeriders Study	2002	$10,000	To determine the impact of freeriders on cost-effectiveness of toilet rebates.
Evapotranspiration (ET) Controller Evaluation	2002	$65,000	To evaluate different weather based controllers and their potential water savings.
Marketing Plan Study	2003	$50,000	To make marketing recommendations for promoting water conservation.
Residential End Use Study	2003	$100,000	To determine indoor water use and water use of different fixtures.
National Submetering Study	2004	$75,000	To determine water savings associated with submetering in multi-family dwellings.
Urban Water Conservation Potential	2004	$10,000	To determine urban water conservation potential in California.
BMP Costs and Savings Study	2004	$20,000	To determine the costs and water savings of various new water saving products.
Self-Contained Food Steamers Study	2004	$25,000	Field study on boiler versus boilerless steamers and the potential water savings and cost-effectiveness.
Pre-rinse Spray Valve and Dishwasher Study	2005	$100,000	To analyze water savings from the installation of water and energy efficient pre-rinse spray valves and dishwashers at food services.
Irrigated Area and Water Use by Major Plant Type	2005	$10,000	To determine the total irrigated area in the EBMUD service area by major plant type and the amount of water used by plant type.
Water Loss and Control Strategy	2005	$10,000	To develop an interactive On-Line Water Loss Control Manual.
Non-Compliant Showerhead Testing Study	2005	$10,000	To test selected showerheads for compliance with State and Federal Plumbing Codes.
End Use Demand and Metering Technology Study	2005-2008	$125,000	Using automated meter reading (AMR) technology to provide customer feedback on use and potential leaks.

Conservation Research Projects Continued

Project Name	Funding Year	EBMUD Cost	Description
Valuing the Environmental Benefits of Urban Water Conservation	2006	$10,000	To determine the value of saved water to the environment and society.
Expanded Metering Pilot Program and Study (Submetering)	2006	$150,000	To determine issues associated with the EBMUD metering in multi-family (MF) sector and to recommend a program.
Water-Efficiency Programs for Supply Planning	2006	$10,000	To investigate the relationship between water-efficiency programs and supply planning.
Ice Machine Efficiency Study	2006	$15,000	Field study on air and water-cooled ice machines to determine water savings potential and cost-effectiveness.
X-Ray Film Processor Pilot Project	2006	$50,000	To replace water using x-ray machines with digital x-ray machines and to determine water savings.
Pipeline Leak Detection Study	2006-2010	$500,000	Testing acoustic technology to detect leaks in the distribution system.
Aqueduct Leak Detection Study	2006-2010	$300,000	To demonstrate advanced leak detection technologies in transmission mains.
PG&E Embedded Energy Study	2007	$5,000	To evaluate utility energy savings through water conservation.
Water Budgets and Rate Structures Study	2007	$20,000	To determine impact of water budgets and rate structures on water savings.
California Single Family Water-Use Efficiency Study	2007-2011	$15,000	Provide detailed water use data and benchmark efficiency for a sample of California homes.
Water Conservation through Automated Meter Reading (AMR) Systems	2007-2012	$800,000	Provided 4,000 customers with web access to their real-time consumption information in a graphical format (capable of hourly interval displays) incorporating water budgets and leak notification
Weather Based Irrigation Controller (WBIC) Program and Study	2008	$15,000	To evaluate water savings of pilot weather based irrigation controllers.
Potential BMPs Study	2008	$10,000	Using Automated Meter Reading (AMR) To determine the efficacy of potential new water conservation measures.
WaterSmart Guidebook Project	2008	$100,000	To determine business end uses of water and to identify water efficient fixtures, appliances, and processes.
Urban Water Conservation Accomplishments Study	2008	$5,000	To determine what California urban water agencies have accomplished in water conservation.
WaterSmart Certification and Recognition Program Marketing Plan	2009	$25,000	Pilot study to test customer interest and market acceptance of a certification program for Water Efficient Businesses
Plan Review Pilot Study	2009	$100,000	To review business construction plans for water-efficiency and estimate water savings and program cost-effectiveness.
Irrigation Controller Study	2009	$15,000	To develop testing standards to evaluate irrigation controllers for water-efficiency potential.
Subsurface Irrigation Study	2009	In-kind services	To determine the efficacy of subsurface irrigation systems.
Water system optimization through the development of an Advanced Metering Infrastructure (AMI) Implementation Plan	2009-2011	$600,000	Evaluation and implementation planning for system-wide advanced metering infrastructure and and conservation benefits study
Customer (Efficiency) Opinion Research	2009-2011	$150,000	Customer surveys, focus groups, and seminars to gain insight into customers' drought response, conservation practices and use of water-efficient technology
Fixed Network Acoustic Leak Detection	2009-2011	$50,000	Demonstration of remote reading of acoustic pipeline leak detection equipment using AMR systems
GIS-Based Landscape Water Budgeting Calculator	2010	$300,000	Development of an automated landscape water budgeting tool for customer to meet model landscape ordinance requirements
California Public Utilities Commission (CPUC) Water Profile Study	2010-2011	$7,000	Identify water and energy use patterns and water-conservation related energy savings potential for California's resource planning purposes
Water Savings Evaluation Study	Ongoing	$50,000	To determine water savings by program measure using pre- and post-intervention analysis.

Since 1991 EBMUD has fully or partially sponsored 51 conservation research projects costing approximately 3.49 million dollars. These studies are conducted to apply results and lessons learned to future conservation activities and to advance the science of water conservation. These studies are summarized in Table I-2.1.

Discussion of Research Projects

The 51 research projects itemized in Table I-2.1 are discussed chronologically in more detail below.

1.6 Gallons Per Flush (gpf) Toilets Study. This 1991 study involved the retrofitting of 25 single-family homes in the EBMUD service area to determine the water savings associated with 1.6 gpf toilets and the water and energy savings associated with water saving showerheads. This study found that (1) despite a slight increase in double flushing over conventional toilets, there were still significant water savings (5.3 gallons/person/day), and (2) the savings associated with lower flow showerheads was 2.8 gallons/person/day. This study indicated there was no energy savings because the water temperature increased with the water savings showerhead to offset showerhead aeration.

Impacts of Ultra Low-Flow Toilets (ULFT) on Sewer Laterals and Wastewater Operations Study. In 1992, when 1.6 gpf toilets were introduced into the marketplace, there was concern over their (1) impact on flows in the sanitary laterals and distribution system, and (2) impact on the wastewater treatment facility. Through a literature search and a survey of wastewater agencies, this study found that (1) there was no increase in the maintenance requirements in the sanitary line distribution system, and (2) the operating costs for a wastewater treatment plant in most cases decreased and in a few cases increased slightly.

Customer Incentive for Water Conservation Study. In 1995, EBMUD, in a collaborative effort, investigated the efficacy of various water conservation incentive programs. The purpose of this study was to assess various incentive programs from different water providers and energy companies and to make recommendations for future conservation incentive efforts.

Water Conservation Baseline Study. The purpose of this 1995 study was to determine how customers used water by (1) identifying the types and saturation of water-using hardware for selected customer groups, (2) characterizing water conservation attitudes and behaviors of the general public, and (3) developing a recommended monitoring and evaluation plan. The information collected helped in designing a plan to best market water conservation through targeted programs.

Potential Energy Savings with Off-Peak Irrigation Study. This 1995 study was conducted to determine the potential to shift current irrigation scheduling for large irrigators to off-energy peak hours. This study found that in the EBMUD service area, most irrigation customers already irrigated during off-energy peak hours, namely at night or in the early morning.

Water Conservation Rate Structures Study. EBMUD was a co-sponsor in this 1997 study titled "Designing, Evaluating and Implementing Conservation Rate Structures," which looked at methods for designing conservation-oriented rates. The handbook, while not recommending a specific rate structure, discussed the many issues a utility needs to consider in implementing conservation rates.

The High-Efficiency Laundry Metering and Marketing Analysis (THELMA) Project. This 1998 collaborative study involving EBMUD was designed to obtain data and insights for utility promotion of front loading clothes washers, which at the time of this study had only a 2% market penetration in the United States despite significant energy and water savings. EBMUD, which started offering incentives for water and energy efficient clothes washers in 1996, used this information to help transform the clothes washing market to more efficient ones. By 2005, nearly 20% of EBMUD customers had installed water and energy efficient clothes washers.

Best Management Practices (BMPs) Costs and Savings Study. EBMUD was involved in this 2000 collaborative study which served as a guide to the data and methods for cost-effectiveness analysis of urban water conservation BMPs. This study assembles the best available information currently available for quantifying and valuing conservation activity.

Laboratory Evaluation of Selected 1.6 gpf Toilet Fixtures. EBMUD was a co-sponsor in this 2001 collaborative study to identify, purchase, and laboratory test a series of water closets for which field experience is available and to analyze the gathered data as supporting documentation for the recommended tests proposed for the American Society of Mechanical Engineers (ASME) standard. The goal of this study was to determine if and how the proposed standards and test protocols would represent an improvement over the current ASME requirements.

Commercial, Industrial, and Institutional (CII) ULFT Savings Study. EBMUD was a co-sponsor in this 2001 collaborative study to empirically estimate water savings per ULFT installation in different CII market segments and to develop a practical approach for estimating the number

of toilets by CII market segment with the service area of a given water provider. This study indicates that the highest per toilet savings in the CII sector (about 52 gallons/toilet/day) were at wholesalers, food stores, and restaurants, and the lowest per toilet savings (about 20 gallons/toilet/day) were at offices, and hotels/ motels.

Water Conservation Market Penetration Study. This 2002 EBMUD study was conducted to (1) collect current data on water conservation attitudes and behavior, (2) determine the types and saturation of water-conserving hardware (fixtures and appliances), (3) assess water conservation potential for identified market sectors, and (4) relate the study findings to those of previous studies to infer market penetration rates of water conservation hardware.

Water Closet Performance Testing Study. This 2002 study co-sponsored by EBMUD was conducted to (1) develop information on toilet performance, water savings reliability, and physical characteristics that will assist the consumer in evaluating and making purchasing choices, and (2) evaluating current flush performance test protocol as a potential supplement to existing ASME pass/ fail protocols for the purpose of developing discriminatory data on toilet fixture performance.

Demand Hardening Study. This 2002 collaborative study involving EBMUD investigated the impact of past conservation efforts on the potential to reduce future use upon request during water shortages. This study found that past conservation efforts can reduce the frequency and depth of future drought responses and that habit change still represents an important element in meeting drought curtailment goals.

Toilet Freeriders Study. EBMUD was a funding partner in this 2002 study to determine freerider rates associated with ULFT programs offered by water providers in California. Freeriders are defined as utility incentive program participants who, without the incentive program, would still have replaced their toilets because of the state plumbing code requirements for ULFTs in effect since 1992. This study provides information on how to design a ULFT program to minimize the freerider potential. It also found that the highest freerider rates were associated with rebate programs (approximately 60%) and the lowest freerider rates were associated with free distribution programs (approximately 20%).

Evapotranspiration (ET) Controller Evaluation. In 2002, EBMUD, in collaboration with other water providers, initiated a study to evaluate different weather-based irrigation controllers and their potential for capturing water savings.

Marketing Plan Study. In 2003**,** EBMUD hired a marketing consultant to review EBMUD's current marketing efforts and to make recommendations for future marketing of the water conservation and recycling programs. The recommended marketing plan was presented in 2003, and elements of the plan were implemented in 2004. In developing the marketing plan, a number of messages and themes were tested on focus groups representing customers throughout the EBMUD service area.

Residential End Use Study. This study, funded in part with a grant from the United States Environmental Protection Agency (EPA) was completed in 2003. This study involved the monitoring of water use at 33 single-family homes within EBMUD and was designed to assess end uses of water and to measure the impacts of conservation retrofits on use. This study found that indoor per capita single-family use can be reduced to around 50 gallons/capita/day (gpcd). It also found that customers generally liked the more efficient products better than their conventional ones. One surprising study finding was the prevalence of leaks at a number of homes; accounting for nearly 30% of indoor water use at the 33 study sites. Most of the leaks disappeared when new toilets were installed indicating that flapper valve leaks is an issue that requires a targeted marketing effort.

National Submetering Study. In 2004, in cooperation with eight other water utilities and two apartment associations in seven states, EBMUD, as program administrator, implemented a nationwide assessment of conservation potential and administrative issues associated with submetering and allocation programs in multi-family residential settings. This national study investigated issues and water savings associated with third party billing programs of residents in the multi-family sector. This study indicates that submetering multi-family residents can achieve approximately a 15% savings in indoor water use. It also found that there are numerous issues associated with the mostly unregulated third party metering and allocation programs. This study furthered the water providers' understanding of third party billing and allocation practices and the national regulatory framework.

Urban Water Conservation Potential. This 2004 study, administered by the California Urban Water Agencies (CUWA) and co-funded by EBMUD in a collaborative effort, was conducted to generate an independent validation and update of the CALFED Bay-Delta Program (CALFED) estimates of water provider-funded efforts to study Best Management Practices (BMPs) for urban water conservation potential. This study provides estimates of

expected BMP-driven conservation savings and incorporates the key economic concept of cost-effective levels of BMP activities.

BMP Costs and Savings Study. This 2004 study, co-funded by EBMUD in a collaborative effort, is an update of information provided in the 2000 study under a similar name. This follow-up study updated information provided in the earlier study and added cost and savings information on new water conservation measures and devices.

Self-Contained Food Steamers Study. In 2005, EBMUD partnered with Pacific Gas and Electric (PG&E), Food Service Technology Center, and the United States Bureau of Reclamation (USBR), Mid-Pacific Region on an innovative conservation project to quantify the water and energy savings for "self-contained" or "boiler-less" commercial food service steamers. Atmospheric (boiler-based) compartment steamers are primary appliances in many commercial kitchens with recorded water consumption ranging from 20 to 40 gallons per hour, while the consumption for "boiler-less" or "connectionless" steamers can be up to 90% lower at less than 3 gallons per hour. Study results indicated significant water and energy savings.

Pre-Rinse Spray Valves and Dishwashers Study. The 2005 study administered by EBMUD in co-operation with two other California utilities involved (1) the installation of 4,400 pre-rinse spray valves and 32 dishwashers, and (2) the analysis of water savings. This study found that the water saving pre-rinse nozzles saved approximately 1.56 gallons per minute over conventional spray nozzles or 94 gallons per day (GPD) assuming one hour of use. The water savings from the more efficient dishwasher was estimated at 2,290 GPD based on an evaluation of actual metered use.

Irrigated Area and Water Use by Major Plant Type. An analysis was conducted in 2005 using Geographic Information System (GIS) information and EBMUD consumption data to estimate the irrigated area and water use by plant type in the EBMUD service area. This study found that lawn comprised about 50% of the irrigated plant material and used approximately 80% of the outdoor water. This information is important in helping to target long term and drought response efforts.

Water Loss and Control Strategy. In 2005, EBMUD began developing an interactive On-Line Water Loss Control Manual. The manual describes all state-of-the-art methods EBMUD uses to control and prevent water loses with its infrastructure and to properly account for all water delivered to its customers. This document will link other loss control programs into one comprehensive program to effectively manage losses.

Non-Compliant Showerhead Testing Study. In 2005, EBMUD took the lead in administering the testing of six suspected non-complying showerheads in cooperation with the Seattle Public Utilities and the California Energy Commission. The test results found that none of the six showerheads tested passed for compliance with State and Federal flow rate and energy standards. Based on the test results, a complaint was filed with the Federal Trade Commission.

End Use Demand and Metering Technology Study. EBMUD began working on this project in 2005 after receiving a $75,000 grant from USBR. This study used new and developing metering technologies to collect real-time demand data from customer meters. This project involved retrofitting customer meters with electronic registers that collected, recorded, and transmitted hourly and even minute-by-minute consumption. EBMUD completed studies in four areas with four different technologies. Two of the study areas used fixed network technology (tower based collector), and two of the study areas used mobile network technology (car mounted collector). The results of the study were published in the May 2008 AWWA OpFlow magazine.

Valuing the Environmental Benefits of Urban Water Conservation The purpose of this 2006 study, co-sponsored by EBMUD in a collaborative effort, was to create a methodology to assign economic value to the environmental benefits of raw water savings. The purpose of the environmental benefits model was to provide a practical tool with which utilities can estimate the environmental benefits, or costs, associated with a given BMP. This study uses the varying value of water savings based on hydrological regions, which in turn was based on changes in fish populations, vegetation, and wetlands affected by the saved water.

Expanded Metering Pilot Program and Study (Submetering). In 2006, EBMUD began a two year study that (1) investigated the issues, costs, and water savings associated with its metering of new individual multi-family (MF) dwelling units and commercial properties, (2) quantified factors impacting MF customer water use to help guide potential EBMUD policy and programs for new and existing MF service accounts, and (3) researched potential conservation incentive program to encourage

additional metering within existing MF properties. In January 2009, EBMUD began metering the individual units in MF and commercial properties in its implementation of an expanded metering program. EBMUD's expanded metering program is an important conservation tool since, in the future, more MF units will be built proportionally to the current single-family/ MF ratio. This research was a follow-up to an EBMUD sponsored national study on submetering that indicated a significant potential for water conservation savings through metering of MF units.

Water-Efficiency Programs for Supply Planning. In 2006, EBMUD did a collaborative study on the relationship between water conservation programs and water supply planning. Results of EBMUD flow modeling of the Mokelumne River (related to precipitation in the watershed) indicated that more efficient water use leads to less frequent and less severe water shortages.

Ice Machine Study. From 2006-2007 EBMUD co-sponsored a study on the efficacy of air-cooled versus water-cooled ice machines. The objectives of this study were to (1) measure actual water and energy usage in commercial ice-cube machines, (2) compare the field-measured water and energy usage rates to the Air Conditioning and Refrigeration Institute (ARI) and/ or manufacturer supplied testing data, (3) determine for each machine the annual water, wastewater, and energy consumption and savings that could be achieved through retrofits with models that are more water/ energy efficient, and (4) capture filed data that can be used to quantify the energy savings potential from reductions in regional water distribution and wastewater treatment.

X-Ray Film Processor Pilot Project. In 2006, EBMUD was awarded a $152,000 California Department of Water Resources research grant for the installation of up to 50 *WaterSaver Plus*® water recirculation units in existing x-ray film processors within EBMUD's service area. Because some film processors can use up to 2.5 gallons per minute and operate 24/7, this water recirculation unit represents a significant conservation potential with up to 85% in water savings. The grant will provide up to $3,000 in EBMUD pre-approved vouchers for each x-ray unit purchased by eligible EBMUD customers who must go through an on-site survey and inspection. Once approved, the customer will then work directly with x-ray retrofit equipment distributors. In FY05, EBMUD secured two agreements with local x-ray retrofit equipment distributors to help market EBMUD's incentive program and to provide services.

Pipeline Leak Detection Study. EBMUD began working on this project in 2006 after receivinga $300,000 grant from USBR. EBMUD installed approximately 1,000 acoustic leak detection loggers on approximately 250 miles of distribution piping in and around the City of Berkeley. The purpose of the project is to obtain water savings from intensive leak detections and subsequent repairs and to better define the nature of pipeline leaks. This project was completed in December 2010.

Aqueduct Leak Detection Study. EBMUD began working on this project in 2006 after receiving a $300,000 grant from UBR. EBMUD demonstrated advanced leak detection technologies on large pipes for which traditional leak detection technologies have not been successful. This project was intended to accelerate water savings through the identification and repair of leaks on large pipelines and aqueducts and better understand the nature of leaks on these facilities. As part of this project, three different acoustic technologies were evaluated and performed on approximately 90 miles of EBMUD's large pipelines and aqueducts. This project was completed in December 2010.

PG&E Embedded Energy Study. In 2006, EBMUD began working with its local energy company, PG&E, to determine where energy efficiency could be improved. This study involves a review of pumping schedules and equipment for the water system.

Water Budgets and Rate Structures Study. In 2007, EBMUD, in a collaborative effort, investigated the impact of water budgets and rate structures on water savings. This study found that by establishing and applying water budgets to properties based on irrigated area and plant water requirements, the water supplier can send an effective message to end users. Since water budgets are based on efficiency standards, over-watering can be identified and billed at a higher rate.

California Single-Family Water Use Efficiency Study. In 2007, EBMUD was among ten water utilities in California that provided historic consumption data and supported data collection at selected study sites. Automated data recording technology and an analytic technique known as "flow trace analysis" was used to characterize the end uses of water within a representative sample of California homes. Findings were analyzed to benchmark water use efficiency relative to comparable studies and assess water conservation potential in California. In 2010-2011, EBMUD provided extensive review of draft study reports, findings, and recommendations. Release of a final report is pending at this time.

Water Conservation through Automated Meter Reading (AMR) Systems. EBMUD began working on this project in 2006 after receiving grants from both USBR and DWR. The purpose of the project is to obtain water savings by providing customers web access to their real time water use, working with them to identify conservation opportunities, such as ET Controllers, and better evaluating the conservation benefit from these measures. This project was completed in December 2010. This project uses Advanced Metering Infrastructure (AMI) to collect real-time demand data from customer meters, which is then made available to customers via a secure website. This project uses fixed network AMI technology where the meter reading transmissions will be picked up by collector towers located within the vicinity of the meters, which will then transmit the meter reads to a centrally located computer server. The water usage data collected from the meter reads can then be accessed in graphical format via an EBMUD-supported Intranet connection where it will be shared with customers for their use in identifying water conservation opportunities. EBMUD water conservation staff will then work with these customers to identify water conservation strategies, such as fixing leaks, alternative irrigation techniques, and replacing older appliances with new higher efficiency models. EBMUD staff believes that this faster, more immediately available and customer-friendly data will facilitate water conservation.

Weather Based Irrigation Controller (WBIC) Program and Study. In 2004, the California Department of Water Resources (DWR) awarded EBMUD and five northern California partnering agencies a $1.6 million Proposition 13 Grant for the Northern California WBIC Grant Program. EBMUD served as lead agency in administering the DWR grant and reporting on the effort for northern California. EBMUD installed approximately 800 ET based controllers as part of the study that included an analysis of water savings. Self-adjusting irrigation timers have proven effective in pilot studies in reducing outdoor irrigation. A web-based database tracked implementation of the program and was used to help evaluate water savings and program cost-effectiveness. A report was issued in 2009 on the cost-effectiveness of the WBIC program and the estimated water savings.

Potential Best Management Practices (PBMPs) Study. In 2007, EBMUD, in collaboration with other water providers in California completed an initial three year study of PBMPs for possible implementation as a BMP if they are economically reasonable. Three reports were prepared in which a total of 14 PBMPs were evaluated.

WaterSmart Guidebook Project. In 2008, EBMUD produced a 242-page guidebook on end uses of water and water efficient hardware and processes in the commercial, industrial, and institutional sector. The purpose of the guidebook is to help developers be more water efficient by providing information and programs for new projects. The information may also be used by water provider staff to review water uses and hardware for water-efficiency at existing businesses. The WaterSmart Guidebook was placed on the EBMUD website for use by others. In addition, two-day training workshops on technical information provided in the guidebook are being offered.

Urban Water Conservation Accomplishments Study. This 2008 study compiled the water conservation accomplishments of the 11 members of the California Urban Water Agencies (CUWA) representing over 23 million people. CUWA's members have invested hundreds of millions of dollars over four decades to diversify their water supply portfolios to reduce dependence on imported water and to develop balance, sustainable, and reliable water supplies.

WaterSmart Certification and Recognition Program Marketing Plan. EBMUD is seeking to enhance its WaterSmart conservation services brand and water savings through the development of a WaterSmart Certification and Recognition Program targeting non-residential customers (businesses, industry, and institutions). The Program rewards organizations for implementing water-savings strategies and achieving established community-wide benchmarks for their water conservation efforts by providing visible, third-party recognition of those efforts. This effort included an assessment of market interest, potential program participants and partners, and a comprehensive Strategic Marketing and Implementation Plan.

Plan Review Pilot Study. In 2009, EBMUD began a one year plan review for water use efficiency for new construction projects. The one year pilot program will also include an evaluation of both water savings and the cooperation between EBMUD and planning agencies. As a precursor to the pilot program, a 242-page guidebook was developed, titled ***WaterSmart Guidebook***, on water end uses and water efficient technology in the commercial, industrial, and institutional sector to be use as a resource guide in the plan review process. One important goal of the pilot program is to communicate the plan review requirements to project developers as early in the planning process as possible. A report will be issued in 2010 on the results of the pilot program.

Irrigation Controller Study. In 2009, EBMUD, in a collaborative effort, initiated a study to determine testing standards to evaluate irrigation controllers for water-efficiency. The Center of Irrigation Technology in Fresno was retained to conduct the testing. This study will allow for an easy review of controller features by water providers to help promote the products that have features needed for the most efficient management of an automatic irrigation system

Subsurface Irrigation Study. EBMUD provided in-kind services in 2008-2009 for a study on the water-efficiency effectiveness of subsurface irrigation systems conducted by U.C. Berkeley on large lawn areas on its campus. Early results indicate that there has been no observable water savings with the use of subsurface drip systems..

Water System Optimization through the Development of an Advanced Metering Infrastructure (AMI) Implementation Plan. This study will include the investigation of all potential costs and benefits of an Advanced Metering Infrastructure (AMI) system to improve EBMUD's operational efficiency and the water efficiency of its customers. This investigation will serve as an example for other similar small, medium, and large water utilities to follow. The study will include the development of a comprehensive implementation plan for a full AMI system deployment across more than 380,000 customer accounts and more than 400,000 meters

Customer (Efficiency) Opinion Research. Quantitative research to evaluate how EBMUD's 2008-2009 drought campaign and the evolving statewide water picture have modified customers' feelings toward water use restrictions, their opinions regarding their personal efforts to conserve, and their sense of responsibility for achieving water use reductions. Conducting this additional research through surveys, focus groups, and facilitated meetings will enable EBMUD to evaluate attitudinal changes among its 1.4 million customers and to build the most cost-effective and efficient long-term customer conservation program and strategies.

Fixed Network Acoustic Leak Detection. This project involves the installation and testing of approximately 100 fixed network acoustic leak detection technology "loggers" in Danville, California in an area known as "Blackhawk." These acoustic logging devices will identify leaks on pipes and provide early detection of pipeline leaks before they become main failures. EBMUD will receive daily signals from these devices via fixed network Advanced Metering Infrastructure (AMI) installed in the Danville area. EBMUD has previously received grants from USBR to install the AMI system in Blackhawk and to install approximately 1,000 acoustic loggers in the City of Berkeley using a mobile network collection system. This new approach will not only improve the response time to leaks in Blackhawk area, but also help establish the methodology to potentially utilize this new and developing technology throughout the EBMUD service area as well as in other comparable Western State water utilities.

GIS-Based Landscape Water Budget Calculator. This project involves developing an automated landscape water budget tool to assist customers in meeting the recently enacted Maximum Allowable Water Allowance (MAWA) within the California Model Water Efficient Landscape Ordinance. Currently EBMUD has calculated more than 5,000 water budgets for its irrigation accounts, and more than 3,200 of those accounts receive budget information printed on their water bills. The water budget information is in a plain text format that is difficult for the customer to see. The proposed water budget report will automate the presentation of the target water efficiency levels along with estimated water bill savings for residential and non-residential accounts.

California Public Utilities Commission (CPUC) Water Profile Study. In 2010, EBMUD supported a research effort to better understand the linkage between water use and energy demands. The study was managed for the CPUC by the California Institute for Energy and the Environment. EBMUD provided data for study sites and coordinated installation of automatic data recording instruments at multi-family, institutional, and industrial sites. The research aimed to determine to what extent it may be possible to impact the energy demands from municipal water agencies by means of altering the volumes and timing of water demands from their retail customers. The final report study is pending.

Water Savings Evaluation Study. EBMUD estimates water conservation savings resulting from a variety of water conservation measures. A computer program is used to analyze water savings based on customer pre- and post-intervention water use. That estimate is normalized for the effect of weather and natural replacement rates. This program is best suited for analyzing water savings in the residential sector where use is affected by fewer variables than in the non-residential sector, which is affected also by production changes and economic impacts. The savings are reported in a *"Water Savings Analysis Report"* that is updated bi-annually.

APPENDIX J. GLOSSARY

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APPENDIX J. GLOSSARY

J-1.ACRONYMNS

ABAG	ASSOCIATION OF BAY AREA GOVERNMENTS
ACT	URBAN WATER MANAGEMENT PLANNING ACT
ACWD	ALAMEDA COUNTY WATER DISTRICT
AF	ACRE-FEET
AFY	ACRE-FEET PER YEAR
AMI	ADVANCED METERING INFRASTRUCTURE
AMR	AUTOMATED METER READING
ARB	AMERICAN RIVER BASIN
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AWWA	AMERICAN WATER WORKS ASSOCIATION
AWWARF	AMERICAN WATER WORKS ASSOCIATION FOUNDATION
BACWA	BAY AREA CLEAN WATER AGENCIES
BARDP	BAY AREA REGIONAL DESALINATION PROJECT
BARWRP	SAN FRANCISCO BAY AREA REGIONAL WATER RECYCLING PROGRAM
BAWAC	BAY AREA WATER AGENCIES COALITION
BCC	BUSINESS CLASSIFICATION CODE
BGS	BELOW GROUND SURFACE
BMPS	BEST MANAGEMENT PRACTICES
CALFED	CALFED BAY-DELTA PROGRAM
CAP	CUSTOMER ASSISTANCE PROGRAM
CCF	HUNDRED (CENTI-) CUBIC FEET
CCWD	CONTRA COSTA WATER DISTRICT
CDCP	CALIFORNIA DROUGHT CONTINGENCY PLAN
CDFG	CALIFORNIA DEPARTMENT OF FISH AND GAME
CDPH	CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
CENT	CENTRAL
CENTRAL SAN	CENTRAL CONTRA COSTA SANITARY DISTRICT
CII	COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL
CIMIS	CALIFORNIA IRRIGATION MANAGEMENT INFORMATION SYSTEM
CIS	CUSTOMER INFORMATION SYSTEM
CONTINGENCY PLAN	URBAN WATER SHORTAGE CONTINGENCY PLAN
CREAT	CLIMATE RESILIENCE EVALUATION AND ASSESSMENT TOOL
CUWA	CALIFORNIA URBAN WATER AGENCIES

CUWCC	CALIFORNIA URBAN WATER CONSERVATION COUNCIL
CVP	CENTRAL VALLEY PROJECT
CYES	CALIFORNIA YOUTH ENERGY SERVICES
DCP	DROUGHT COMMUNICATION PLAN
DELTA	SACRAMENTO-SAN JOAQUIN RIVER DELTA
DERWA	DSRSD-EBMUD RECYCLED WATER AUTHORITY
DMAC	DEMAND MANAGEMENT ADVISORY COMMITTEE
DMP	DROUGHT MANAGEMENT PROGRAM
DSOD	CALIFORNIA DIVISION OF SAFETY OF DAMS
DSRSD	DUBLIN SAN RAMON SERVICES DISTRICT
DWR	DEPARTMENT OF WATER RESOURCES
EB	ENVIRONMENTAL BENEFITS
EBMUD	EAST BAY MUNICIPAL UTILITY DISTRICT
EBMUDSIM	EBMUD RESERVOIR OPERATIONS PLANNING MODEL
EBRWP	EAST BAYSHORE RECYCLED WATER PROJECT
EIR	ENVIRONMENTAL IMPACT REPORT
EOH	EAST-OF-HILLS
EOP	EMERGENCY OPERATIONS PLAN
EOT	EMERGENCY OPERATIONS TEAM
EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ESF	EMERGENCY SUPPORT FUNCTIONS
ET	EVAPOTRANSPIRATION
FERC	FEDERAL ENERGY REGULATORY COMMISSION
FORUM	MOKELUMNE RIVER FORUM
FRWA	FREEPORT REGIONAL WATER AUTHORITY
FRWP	FREEPORT REGIONAL WATER PROJECT
FSTC	FOOD SERVICE TECHNOLOGY CENTER
FY	FISCAL YEAR
GIS	GEOGRAPHIC INFORMATION SYSTEM
GMP	GROUNDWATER MANAGEMENT PLAN
GPCD	GALLONS PER CAPITA PER DAY
GPD	GALLONS PER DAY
GPF	GALLONS PER FLUSH
HAYWARD	CITY OF HAYWARD
HET	HIGH-EFFICIENCY TOILET
HEU	HIGH-EFFICIENCY URINAL
HOA	HOMEOWNERS ASSOCIATION
INTERTIE PROJECT	SFPUC-HAYWARD-EBMUD INTERTIE PROJECT

IRCUP	MOKELUMNE RIVER INTER-REGIONAL CONJUNCTIVE USE PROJECT
IRIS	IRRIGATION REDUCTION INFORMATION SYSTEM
IRWMP	INTEGRATED REGIONAL WATER MANAGEMENT PLAN
JSA	1998 JOINT SETTLEMENT AGREEMENT
KM	KILOMETER
KWH	KILOWATT HOURS
LAC	LANDSCAPE ADVISORY COMMITTEE
LADWP	LOS ANGELES DEPARTMENT OF WATER AND POWER
LAFCOS	LOCAL AGENCY FORMATION COMMISSIONS
LAWU	LANDSCAPED AREA WATER USE
LTRC	LONG TERM RENEWAL CONTRACT
LUDS	LAND USE UNIT DEMANDS
MAWA	MAXIMUM APPLIED WATER ALLOWANCE
MCL	MAXIMUM CONTAMINANT LEVEL
MF	MULTI-FAMILY
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
M&I	MUNICIPAL AND INDUSTRIAL
MOU	MEMORANDUM OF UNDERSTANDING
MSL	MEAN SEA LEVEL
MUD	MUNICIPAL UTILITY DISTRICT
MW	MEGAWATT
MWELO	STATE MODEL WATER-EFFICIENT LANDSCAPE ORDINANCE
MWWTP	EBMUD'S MAIN WASTEWATER TREATMENT PLANT
NCGWB	NILES CONE GROUNDWATER BASIN
NEBIGSM	NILES CONE AND SOUTH EAST BAY PLAIN INTEGRATED GROUNDWATER AND SURFACE WATER MODEL
NIMS	NATIONAL INCIDENT MANAGEMENT SYSTEM
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NRWRP	NORTH RICHMOND WATER RECLAMATION PLANT
PBMPS	POTENTIAL BEST MANAGEMENT PRACTICES
PFMA	POTENTIAL FAILURE MODE ANALYSIS
PG&E	PACIFIC GAS AND ELECTRIC COMPANY
PH&S	PUBLIC HEALTH AND SAFETY
PHG	PUBLIC HEALTH GOAL
R&E	RESEARCH AND EVALUATION
RARE	RICHMOND ADVANCED RECYCLED EXPANSION WATER PROJECT
REOC	REGIONAL OPERATIONS CENTER
RWQCBS	CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

RWTP	RECYCLED WATER TRUCK PROGRAM
SBX7-7	SENATE BILL NO. 7
SCVWD	SANTA CLARA VALLEY WATER DISTRICT
SCWA	SACRAMENTO COUNTY WATER AGENCY
SD-1	SPECIAL DISTRICT NO. 1
SEMS	CALIFORNIA STANDARDIZED EMERGENCY MANAGEMENT SYSTEM
SEPS	SECURITY AND EMERGENCY PREPAREDNESS SECTION
SFPUC	SAN FRANCISCO PUBLIC UTILITIES COMMISSION
SFR	SINGLE-FAMILY RESIDENTIAL
SLRF	SAN LEANDRO RECLAMATION FACILITY
SOC	STATE OPERATIONS CENTER
SOI	SPHERE OF INFLUENCE
SQ. FT.	SQUARE FEET
SRVRWP	SAN RAMON VALLEY RECYCLED WATER PROGRAM
SWRCB	STATE WATER RESOURCES CONTROL BOARD
TAF	THOUSAND ACRE-FEET
TDS	TOTAL DISSOLVED SOLIDS
THELMA	THE HIGH-EFFICIENCY LAUNDRY METERING AND MARKETING ANALYSIS
TM2	TARGET METHOD #2
ULFT	ULTRA LOW-FLOW TOILET
UMRWA	UPPER MOKELUMNE RIVER WATERSHED AUTHORITY
USB	ULTIMATE SERVICE BOUNDARY
USBR	UNITED STATES BUREAU OF RECLAMATION
USEPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
USFWS	US FISH AND WILDLIFE SERVICE
UWMP	URBAN WATER MANAGEMENT PLAN
WARN	WATER AGENCY RESPONSE NETWORK
WATER	WATER AWARENESS THROUGH EDUCATION AND RESEARCH
WBIC	WEATHER BASED IRRIGATION CONTROLLER
WCMP	WATER CONSERVATION MASTER PLAN
WCWD	WEST COUNTY WASTEWATER DISTRICT
WOH	WEST-OF-HILLS
WPCP	WATER POLLUTION CONTROL PLANT
WRDA	FEDERAL WATER RESOURCES DEVELOPMENT ACT
WTP	WATER TREATMENT PLANT
WTTIP	WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM

J-2. SELECTED DEFINED TERMS

BEST MANAGEMENT PRACTICES	A POLICY, PROGRAM, PRACTICE, RULE, REGULATION OR ORDINANCE, OR THE USE OF DEVICES, EQUIPMENT OR FACILITIES THAT RESULTS IN THE EFFICIENT USE OR CONSERVATION OF WATER AS AN ESTABLISHED AND GENERALLY ACCEPTED PRACTICE AMONG WATER SUPPLIERS
CONSUMPTION	METERED WATER-USE BY CUSTOMERS
DEMAND OR TOTAL DEMAND	QUANTITY OF TREATED WATER DELIVERED TO THE DISTRIBUTION SYSTEM, INTERCHANGEABLE TERM WITH SYSTEM DEMAND
DROUGHT PLANNING SEQUENCE	THREE YEAR HYDROLOGY SEQUENCE REPRESENTING A WORST CASE DROUGHT SCENARIO DERIVED FROM HISTORICAL RECORD
EAST-OF-HILLS	EBMUD'S SERVICE AREA REGION EAST OF THE OAKLAND-BERKELEY HILLS RIDGE
EBMUD SPHERE OF INFLUENCE	DEFINES THE AREA THAT CAN BE SERVED BY EBMUD, AS DEFINED BY THE LOCAL AGENCY FORMATION COMMISSIONS OF ALAMEDA AND CONTRA COSTA COUNTIES
EBMUD ULTIMATE SERVICE BOUNDARY	A BOUNDARY DEFINED BY EBMUD TO DEFINE ITS LIMITS OF FUTURE ANNEXATION FOR EXTENSION OF WATER SERVICE
INTERIM LEVEL OF DEMAND	TEMPORARILY SUPPRESSED DEMAND LEVEL BELOW THE PLANNING LEVEL OF DEMAND THAT IS ANTICIPATED DURING THE RECOVERY PERIOD TO 2020 AS A RESULT OF RESIDUAL RATIONING EFFECT OF THE RECENTLY ENDED 2007-2010 DROUGHT MANAGEMENT PROGRAM AND FROM THE ECONOMIC DOWNTURN
LOWER INCOME HOUSEHOLDS	PERSONS AND FAMILIES WHOSE INCOME DOES NOT EXCEED QUALIFYING LIMITS FOR LOWER INCOME FAMILIES AS DEFINED IN SECTION 50079.5 OF THE HEALTH AND SAFETY CODE. THE INCOME LIMITS FOR LOWER INCOME HOUSEHOLDS IS AT 80 PERCENT OF THE AREA MEDIAN INCOME, ADJUSTED FOR FAMILY SIZE
PLANNING LEVEL OF DEMAND	THE ADJUSTED DEMAND FOR PLANNING PURPOSES AFTER APPLYING CUMULATIVE CONSERVATION AND CUMULATIVE RECYCLED WATER SAVINGS ACHIEVED SINCE IMPLEMENTATION OF THE 1994 WATER CONSERVATION MASTER PLAN. PLANNING LEVEL OF DEMAND ALSO REPRESENTS PROJECTED SYSTEM DEMAND
SYSTEM DEMAND	QUANTITY OF TREATED WATER DELIVERED TO THE DISTRIBUTION SYSTEM, INTERCHANGEABLE TERM WITH DEMAND OR TOTAL DEMAND
WEST-OF-HILLS	EBMUD'S SERVICE AREA REGION WEST OF THE OAKLAND-BERKELEY HILLS RIDGE

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MUNICIPAL UTILITY DISTRICT
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Printed on 100% post-consumer recycled paper

Wastewater treatment

EBMUD's wastewater treatment plant provides an invaluable public service for 650,000 people along the eastern shore of San Francisco Bay. Sewage flows through city pipes that empty into the EBMUD collection system that delivers it to the wastewater treatment plant at the base of the Bay Bridge where it is treated.

Today, the plant treats sewage to meet stringent state and federal standards before recycling it or releasing it to the Bay. Prior to its existence, raw sewage was discharged directly into the Bay, posing serious water quality and health problems. EBMUD has received many honors and awards for its efforts to protect public health and keep pollutants from reaching the Bay, and partners with residents and businesses to help them keep contaminants out of sewers and the Bay.

EBMUD has been recycling, reusing, and producing renewable energy at its wastewater plant since the mid-1980s. The main goal of wastewater treatment is an important one – to protect public health and the environment. To do this, EBMUD collects and treats sewage. EBMUD's plant does even more. It transforms sewage and other organic wastes into green energy (/wastewater/recycling-water-and-energy/), nutrient-rich soil conditioner (/wastewater/collection-treatment/wastewater-treatment/biosolids) and recycled water (/wastewater/recycled-water).

Many large wastewater plants produce renewable energy to meet a portion of their power demand. EBMUD supplements wastewater solids with high-strength organic waste, such as food scraps. The result? EBMUD produces more than enough renewable energy to meet all onsite power demands.

Biosolids Treatment

The solids that are removed, or biosolids, undergo a separate treatment process. See the Biosolids Program (/wastewater/collection-treatment/wastewater-treatment/biosolids) page for more information.

Treatment Process

Wastewater from East Bay communities flows to EBMUD's wastewater treatment plant in Oakland near the entrance of the San Francisco-Oakland Bay Bridge. See the online tour below to get a better sense of how the treatment process works. EBMUD provides secondary treatment for a maximum flow of 168 million gallons per day (MGD). Primary treatment is provided for up to 320 MGD. Storage basins provide plant capacity for a short-term hydraulic peak of 415 MGD. On average, about 63 million gallons of wastewater is treated every day.

EBMUD's laboratory analyzes samples of treated wastewater; the tests range from cyanide, metals, and polychlorinated biphenlys (PCBs) to bioassays using juvenile fish. The treated water is chlorinated for disinfection, then dechlorinated to protect marine life before being discharged underwater one mile off the East Bay shore into San Francisco Bay.

Home (/)

Customers (/customers/)

Water and drought (/water-and-drought/)

Wastewater (/wastewater/)

Recreation (/recreation/)

About us (/about-us/)

375 11th Street Oakland, CA 94607
1-866-403-2683

ORDINANCE 2012-1

AN ORDINANCE REQUIRING ACTIONS TO REDUCE LANDFILLING OF RECYCLABLE AND ORGANIC SOLID WASTES FROM BUSINESSES, MULTI-FAMILY RESIDENCES, AND SELF HAULERS

The Board of the Alameda County Waste Management Authority ("Authority") ordains as follows:

SECTION 1 (Enactment)

The Board of the Authority does hereby enact this Ordinance in full consisting of Section 1 through Section 15.

SECTION 2 (Findings)

(a) The purpose of this Ordinance is to reduce the amount of recyclable and organic solid wastes deposited in landfills from businesses, multi-family residences, and self haulers.

(b) The Authority has the power to adopt ordinances necessary to carry out the purposes of the Joint Exercise of Powers Agreement for Waste Management ("JPA"). The JPA provides the Authority the power, duty, and responsibility to prepare, adopt, revise, amend, administer, enforce and implement the County Integrated Waste Management Plan ("CoIWMP"), and Section 5.m of the JPA specifically enumerates the power to adopt ordinances necessary to carry out the purposes of the JPA.

(c) The prohibition of certain recyclable and compostable materials at Alameda County landfills is necessary to carry out the purposes of the JPA and implement the CoIWMP, including the following goals and policies. Goal 2 of the CoIWMP calls on the Authority and its member agencies to "achieve maximum feasible waste reduction" and to "reduce the amount of waste disposed at landfills through improved management and conservation of resources." Objective 2.1 is to "achieve countywide waste reduction of 75 percent by 2010." Objective 2.4 is to reduce the amount of readily recyclable and compostable materials originating in Alameda County and deposited in landfills to no more than 10% of total materials originating in Alameda County and landfilled by 2020.

(d) The State of California through its Integrated Waste Management Act of 1989, Assembly Bill 939 (AB 939), required that each local jurisdiction significantly increase its diversion of discarded materials from landfills to 50% by December 31, 2000, and thereafter maintain or exceed that diversion rate.

(e) The Waste Reduction and Recycling Act of 1990 (Measure D), a charter amendment passed by the voters of Alameda County, established the Alameda County Source Reduction and Recycling Board and the policy goal of reducing

the total tonnage of landfilled materials generated in Alameda County by 75% by a date to be chosen by the Recycling Board and to thereafter establish a date (or dates) to reduce, recycle, and compost further quantities of discarded materials. In 2003, the Recycling Board and Authority approved 2010 as the date by which 75% diversion was to be obtained. In July 2010 the Recycling Board and Authority approved a year 2020 objective to reduce the amount of readily recyclable and compostable materials originating in Alameda County and deposited in landfills to no more than 10% of total materials originating in Alameda County and landfilled.

(f) The California Department of Resources Recycling and Recovery was developing a mandatory commercial and multifamily recycling regulation as part of implementing statewide efforts to reduce greenhouse gas (GHG) emissions pursuant to AB 32. The steps required to supply recycled materials to industry (i.e., collection, processing and transportation) use less energy than the steps to supply virgin materials (i.e., extraction, refining, processing, and transportation). These energy savings reduce GHG emissions.

(g) The use of composted organics (plant debris, food and compostable paper) reduces the need for chemical fertilizers and pesticides, which are energy intensive to manufacture and transport. The use of compost also conserves water in landscapes, and can help mitigate the decline in soil quality in California and Alameda County expected to result from climate change.

(h) The State of California has adopted legislation (AB 341) that requires multi-family property owners and businesses that generate more than 4 cubic yards of solid waste service per week to provide recycling collection service unless physical space to do so does not exist.

(i) The Countywide Waste Characterization Study conducted in 2008 found that about 60% of solid waste originating in Alameda County and disposed in landfills was readily recyclable or compostable. Significant quantities of recyclable and compostable materials continue to be landfilled (around 700,000 tons in 2008). Recycling or composting this material will aid the Cities in Alameda County and the County in achieving the GHG reduction goals contained within their Climate Action Plans, create jobs at processing facilities, and implement the CoIWMP, AB 939, AB 32, and Measure D.

(j) There are permitted facilities available that can effectively recycle cans, bottles and all recyclable paper grades discarded in Alameda County, or compost food and food-soiled paper, thereby achieving the goals and objectives cited above. Facilities that can also extract energy from organic waste through anaerobic digestion prior to composting are being developed or investigated by numerous parties.

(k) The Authority prepared the Mandatory Recycling and Single Use Bag Reduction Ordinances Environmental Impact Report, which considered two separate projects

and included the environmental review required by the California Environmental Quality Act for this Ordinance. The Authority certified those portions of the EIR relevant to this Ordinance.

SECTION 3 (Definitions)

The following definitions govern the use of terms in this Ordinance:

(a) "Alameda County" means all of the territory located within the incorporated and unincorporated areas of Alameda County.

(b) "Authority" means the Alameda County Waste Management Authority created by the Joint Exercise of Powers Agreement for Waste Management (JPA).

(c) "Authority Representative" means any agent of the Authority designated by the Authority or the Enforcement Official to implement this Ordinance, including Member Agency employees, the County Local Enforcement Agency or private contractors hired for purposes of monitoring and enforcement.

(d) "Business" means any commercial or public entity, including but not limited to: proprietorship, firm, partnership, association, venture, trust, or corporation that is organized as a for-profit or nonprofit entity. Business includes, but is not limited to, industrial or manufacturing, restaurant, retail, office, hotels, shopping centers, theaters and government entities, but for purposes of this Ordinance, does not include Multi-Family Buildings.

(e) "Compliance Plan" means the plan required pursuant to Section 7 of this Ordinance.

(f) "Composting" means the controlled biological decomposition of organic Solid Waste that is kept separate from the Refuse stream, or that is separated at a centralized facility.

(g) "Covered Jurisdiction" means a Member Agency of the JPA that has not opted out of coverage under this Ordinance pursuant to Section 12 of this Ordinance.

(h) "Covered Material" means corrugated cardboard, newspaper, white paper, mixed recyclable paper, recyclable food and beverage glass containers, metal (aluminum and steel) food and beverage cans, HDPE (high density polyethylene) bottles and PET (polyethylene terephthalate) bottles, and discarded food and compostable paper, that are Recyclable. Per the definition of Recyclables in Section 3(u) of this Ordinance, unmarketable processing residuals are not Covered Materials. A particular Covered Material becomes subject to this Ordinance pursuant to the Implementation Schedule in Section 13 of this Ordinance.

(i) "Deposit in Landfill(s)" or "Deposited in Landfill(s)" means final deposition of Solid Waste, in landfills permitted by the State of California, above liners (or above the permitted base of the landfill if a liner is not required) and below final

cover within the permitted fill area. Any Solid Waste used to create a foundation layer for final cover in excess of three (3) feet on average shall be considered "Deposited in Landfill(s)" unless a greater thickness of foundation layer is specifically required by the Regional Water Quality Control Board.

(j) "Enforcement Official" means the Executive Director of the Authority or his or her authorized designee.

(k) "Executive Director" means the individual appointed by the Authority Board to act as head of staff and perform those duties specified by the Authority Rules of Procedure and by the Board.

(l) "High Diversion Mixed Waste Processing Facility" is a Mixed Waste Processing Facility that: (i) Recycles Covered Materials except as provided in Subsection (l)(ii) of this Section; (ii) results in Solid Waste Deposited in Landfills containing no more than ten percent (10%) by weight of the Covered Materials from Solid Waste Originating in Alameda County Covered Jurisdictions from collection locations that do not have Source Separated Recycling service; and (iii) has complied with Section 8(g) of this Ordinance.

(m) "Landfill" means a state and locally permitted facility in California that accepts Solid Waste for burial.

(n) "Member Agency" means a party to the JPA. Current member agencies are the County of Alameda, the Cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City, and the Castro Valley and Oro Loma Sanitary Districts. The service areas of each Member Agency for the purpose of Section 12 of this Ordinance are:

(1) The legal boundaries of each of the Castro Valley and Oro Loma Sanitary Districts

(2) The legal boundaries of each of the 14 incorporated municipalities within Alameda County, except those portions of the Cities of Hayward and San Leandro that are within the boundaries of the Oro Loma Sanitary District.

(3) The unincorporated sections of the County not included within the above.

(o) "Mixed Waste Processing Facility" means a processing facility that separates Covered Materials from Solid Waste.

(p) "Multi-Family Building" means a structure with five or more residential dwelling units.

(q) "Operator" means a Person that has received approval from the State of California and local government agencies with applicable land use authority or health regulatory authority to operate a Landfill or Transfer Station.

(r) "Person" includes an individual, firm, limited liability company, association, partnership, political subdivision, government agency, municipality, industry, public or private corporation, or any other entity whatsoever.

(s) "Primary Enforcement Representative" is the chief executive of a Covered Jurisdiction or a qualified designee who will coordinate with the Authority regarding implementation of the Ordinance. A qualified designee shall have at least two years of municipal code enforcement experience or have undergone at least the level one municipal code compliance training program of the California Association of Code Enforcement Officers, or equivalent training program approved by the Enforcement Official.

(t) "Property Owner" means the Person or Persons that hold title to a property as shown on the most recent assessment roll.

(u) "Recycling" means the process of collecting, sorting, cleansing, treating, and reconstituting Solid Wastes and returning them to the economic mainstream in the form of raw materials that can be sold in competitive markets and satisfy all applicable Federal, State and local standards for such materials. Recycling includes Composting so long as the compost or soil amendment created by Composting can be sold in competitive markets and satisfies all applicable Federal, State and local standards for such materials. "Recyclables" are materials than can undergo Recycling. A "Recycled" material is one that has undergone Recycling.

(v) "Refuse" means Solid Waste that is neither Covered Materials, nor Recyclable materials that are acceptable to a Member Agency for co-placement in containers for Covered Materials within its service area.

(w) "Regulated Hauler" means a Person that collects Solid Waste (other than Solid Waste generated by a permitted building project) originating in Alameda County for Deposit in Landfill(s) or Recycling facilities and does so under a contract, franchise agreement or permit with a Covered Jurisdiction or the Authority.

(x) "Self Hauler" means a Person who delivers Solid Waste to a Landfill or a Transfer Station, but is not a Regulated Hauler or a Transfer Station Operator.

(y) "Solid Waste" means all materials of any kind or nature as defined in Public Resources Code section 40191.

(z) "Solid Waste Originating in Alameda County" means all Solid Waste discarded within Alameda County unless it was brought into the County for Recycling. To have "originated" within a particular jurisdiction means the Solid Waste was discarded in that jurisdiction unless it was brought into that jurisdiction for Recycling.

(aa) "Source Separated" means to have undergone the process of removing Recyclable materials from other Solid Waste, by or for the Waste Generator on

the premises at which the Recyclable materials were generated, for the purpose of Recycling.

(bb) "Transfer Station" means a facility in California that is permitted by the State of California as a transfer station and considered as a transfer station under 14 Code of Regulations section 17402, or as that section may be amended.

(cc) "Waste Generator" means a Person who produces Solid Waste.

SECTION 4 (Restrictions on Waste Generators in Covered Jurisdictions)

(a) Businesses that are Waste Generators in Covered Jurisdictions shall not discard Covered Materials such that they will be Deposited in Landfill(s). They shall comply with this requirement by either: (i) separating Covered Materials from other Solid Wastes for collection in separate Recycling containers, or (ii) providing for all Solid Waste to be taken to and processed through a High Diversion Mixed Waste Processing Facility.

(b) Businesses that are Waste Generators in Covered Jurisdictions shall not place Refuse in containers designated for Covered Materials.

(c) Waivers of these restrictions may apply pursuant to Section 10 of this Ordinance.

(d) These restrictions are implemented in phases pursuant to Section 13 of this Ordinance.

SECTION 5 (Restrictions on Property Owners and their Agents in Covered Jurisdictions)

Each Property Owner of a Business or Multi-Family Building shall be responsible for the following:

(a) Provide container(s) for Source Separated Covered Materials and other Source Separated Recyclable materials at the same location as the Property Owner provides container(s) for Solid Waste collection, unless all Solid Waste from the property is taken to and processed through a High Diversion Mixed Waste Processing Facility. The container(s) shall:

(1) Be of sufficient number and size to hold the Recyclable and Refuse quantities reasonably anticipated to be generated at the location;

(2) Bear prominent signage on or near the containers clearly describing the proper segregation and storage of Recyclable and Refuse materials.

(b) Provide for Solid Waste removal service that ensures that Source Separated Covered Materials generated at its property are collected and transported to facilities that Recycle the Covered Materials or that all Solid Wastes are taken to and processed through High Diversion Mixed Waste Processing Facilities.

(c) Provide information at least annually for tenants, employees and contractors of Waste Generator obligations under this Ordinance (if any) to keep Covered Materials separate from Refuse (when applicable) and the location of containers and the rules governing their use at each property. This same information shall also be provided to new tenants no later than 14 days after such tenants move in and no less than 14 days before tenants move out, unless a tenant does not provide 14 or more days notice to the Property Owner before leaving.

(d) Notwithstanding the foregoing, if a Property Owner enters into a written agreement with another party (such as a property manager, tenant, or other party that contracts for Solid Waste removal), to manage or obtain Solid Waste collection services, then that party as well as the Property Owner shall be responsible for compliance with this Ordinance.

(e) Waivers of these restrictions may apply pursuant to Section 10 of this Ordinance.

(f) These restrictions are implemented in phases pursuant to Section 13 of this Ordinance.

SECTION 6 (Restrictions on Self Haulers of Solid Waste originating in Alameda County)

(a) No Self Hauler shall Deposit in Landfill(s) Covered Materials originating from within Alameda County or deliver such materials to Landfills or Transfer Stations such that such Covered Materials will eventually be Deposited in Landfill(s), unless the Covered Materials are deposited in Landfills or Transfer Stations that are in compliance with Section 7 of this Ordinance, or in the case of Landfills or Transfer stations outside Alameda County but within California, unless the Landfills or Transfer Stations voluntarily comply with Section 7 of this Ordinance.

SECTION 7 (Requirements for Landfills and Transfer Stations in Alameda County)

(a) Owners and Operators at Landfills and Transfer Stations in Alameda County shall require any Self Hauler who brings a load of Solid Waste containing Covered Materials originating from within Alameda County to a Landfill or Transfer Station in Alameda County to: (1) separate Covered Materials from Refuse or (2) deposit that load such that it will be processed through a High Diversion Mixed Waste Processing Facility or (3) ensure the Self-Hauler pays a price at least 10% over the usual tipping fee that would normally apply to that Self-Hauler. Owners and Operators at Landfills and Transfer Stations in Alameda County shall provide quarterly reports to Authority that list the dates and volumes or weights of every load of Solid Waste containing Covered Materials charged the higher price described in item (3).

(b) Every owner or Operator of a Landfill or Transfer Station in Alameda County shall submit a Compliance Plan to the Authority that describes the actions to be

taken to comply with this Ordinance and help prevent Deposit in Landfill(s) of Covered Materials from Self Haulers. Previously approved Compliance Plans under Authority Ordinance 2008-01 may be amended to address the requirements of this Section.

(c) The Compliance Plan shall include the following:

(1) Methods for discouraging Covered Materials from Self Haulers from being Deposited in Landfills.

(2) Methods for assisting the Authority in identifying Waste Generators that violate this Ordinance, including recording practices to be followed when noncompliance is observed.

(3) Procedures for complying with the requirements of Section 7(a) of this Ordinance, including posted pricelists.

(4) Load checking programs to prevent the acceptance of Covered Materials from Self Haulers. This program shall at a minimum provide for:

(1) the number of random load checks to be performed;

(2) recording of load checks; and

(3) training of personnel in the recognition, proper handling, and disposition of Covered Material.

(5) Description of efforts the facility will take to install informative signage regarding the Covered Material ban at facility entrances and at waste receiving areas. The signage shall consist of permanent visible signs, prominently displayed, clearly indicating that Covered Material is prohibited from being Deposited in Landfills or delivered such that it will be Deposited in Landfills. These signs shall be in place within 30 days of approval of the Compliance Plan.

(6) Description of employee training efforts to comply with this Ordinance.

(7) Additional information reasonably requested by the Authority as necessary to determine compliance with the Ordinance and how best to achieve compliance with the Ordinance.

(8) Identification of any impediments to and suggestions relating to the ongoing implementation of this Ordinance.

(d) Every owner or Operator of a Landfill or Transfer Station in Alameda County shall submit its proposed Compliance Plan to the Enforcement Official no later than 60 days after adoption of this Ordinance.

(e) The Enforcement Official will review the Compliance Plan for adequacy and make a determination as to its adequacy within 30 days of receiving the Compliance Plan. Adequacy determinations shall be based on the inclusion of all elements required in Section 7(c) of this Ordinance and on the inclusion of all reasonable measures to effectively discourage Covered Materials from Self Haulers from being Deposited in Landfill(s). Proposed Compliance Plans shall be revised and resubmitted within 30 days after notice by the Enforcement Official that a proposed Plan is inadequate in one or more specific ways.

(f) Each Landfill and Transfer Station in Alameda County shall have an approved Compliance Plan in place no later than 60 days after approval of its Compliance Plan by Authority, but in no event later than January 1, 2013.

(g) Every owner or Operator of a Landfill or Transfer Station in Alameda County shall submit an annual report detailing the steps taken during the course of the prior year to comply with its Compliance Plan. Each annual report shall be due by the end of July for the previous 12 month period between July 1 and June 30th.

(h) Owners or Operators of Landfills and Transfer Stations in Alameda County shall update or revise the existing Compliance Plan if the Enforcement Official determines that revision is necessary to achieve compliance with this Ordinance.

(i) Failure to comply with an approved Compliance Plan shall constitute a violation of this Ordinance.

SECTION 8 (Requirements for Regulated Haulers and Mixed Waste Processing Facilities)

(a) Regulated Haulers collecting Solid Waste, Refuse, or Source Separated Recyclables from within Covered Jurisdictions shall comply with either Section 8(b) or 8(c) below. Section 8(b) shall apply to any Regulated Hauler that notifies Authority in writing that it has elected to comply with subsection (b) of Section 8 of this Ordinance. Section 8(c) shall apply in the absence of such written notification. All Regulated Haulers shall submit the information set forth in either Section 8(b) or 8(c), and the information set forth in Section 8(d) of this Ordinance to the Covered Jurisdiction and to the Authority no less frequently than once per year and more frequently if requested by the Covered Jurisdiction, unless otherwise specified in Sections 8(b) through 8(d) of this Ordinance.

(b) This subsection applies to Regulated Haulers who elect to integrate customer outreach and education about this Ordinance, and identification of possible violators, into their customer service procedures. Such Regulated Haulers shall:

(1) Include in bill inserts or other regular customer service communications with customers written materials provided by Authority (after approval of such material by the Primary Enforcement Representative from the relevant Covered Jurisdiction or other designee of the chief executive of the Covered Jurisdiction) with respect to this Ordinance, and shall send

such information in a manner specified by Authority (e.g., certified mail, return receipt requested; regular mail; overnight mail, etc.). Authority shall reimburse Regulated Haulers for the reasonable incremental cost of handling and postage for such written communications.

(2) Require that customer service staff of the Regulated Hauler participates in training provided by Authority with respect to compliance with Sections 4 and 5 of this Ordinance. Require customer service staff of the Regulated Hauler to attempt to assist customers with compliance with Sections 4 and 5 of this Ordinance. If after initial good faith efforts to assist customers, additional assistance is still required, the Regulated Hauler may refer customers to Authority or Covered Jurisdiction staff.

(3) Provide names, addresses, and customer contact information for accounts serviced that the Regulated Hauler has reason to believe may be in violation of Section 4 or 5 of this Ordinance on a quarterly basis commencing January 1, 2013.

(c) This subsection applies to Regulated Haulers who elect not to integrate customer outreach and education about this Ordinance, and identification of possible violators, into their customer service procedures pursuant to Section 8(b) of this Ordinance. Such Regulated Haulers shall:

(1) Provide a list of all Business and Multi-Family Building accounts in Covered Jurisdictions that will become subject to Phase 1 of this Ordinance by April 1, 2012, and a list of all Business and Multi-Family Buildings accounts in Covered Jurisdictions subject to Phase 2 by February 1, 2014.

(2) For each account on the lists, provide the name of the account, contact, phone number, service address, billing address, Solid Waste (including Recyclables) service information, including number, type and size of containers and days of service, and the name and location where Recyclables are delivered for processing. Specify which accounts, if any, are being served by High Diversion Mixed Waste Processing Facilities.

(d) Regulated Haulers shall provide the name of, location of, and total quantities of Solid Waste (including Recyclables) delivered to each Mixed Waste Processing Facilities (if any) in California used by the Regulated Hauler to assist Waste Generators and Property Owners in complying with this Ordinance.

(e) Regulated Haulers shall not transport Solid Waste from collection locations (within Covered Jurisdictions) that do not have Source Separated Recycling service to Mixed Waste Processing Facilities that are not High Diversion Mixed Waste Processing Facilities unless the Authority has granted a waiver pursuant to Section 10 of this Ordinance or a Mixed Waste Processing Facility is making an effort satisfactory to the Enforcement Official to qualify as a High Diversion

Mixed Waste Processing Facility per Section 8 (g). .

(f) If the Regulated Hauler believes any information required in this Section is confidential, it may submit such information with a request that it be maintained as confidential under the Public Records Act (Government Code section 6250 et al.), specifically identifying the information that it considers confidential and the legal basis for such conclusion.

(g) Mixed Waste Processing Facilities that want to qualify as High Diversion Mixed Waste Processing Facilities under this Ordinance shall comply with the following:

(1) Submit to the Authority a proposal for the protocol it will use to determine whether it is satisfying the performance standards in Ordinance Section 3(l)'s definition of High Diversion Mixed Waste Processing Facilities for Solid Waste from collection locations (within Covered Jurisdictions) that do not have Source Separated Recycling service.

(2) The Enforcement Official, after consultation with the Primary Enforcement Representatives (or other designee of the chief executive of each of the Covered Jurisdictions) from the Covered Jurisdictions that have Solid Waste processed at the Mixed Waste Processing Facility, will review and respond to the proposed protocol within 30 days of receiving the proposal, and shall approve the protocol if found that the protocol will effectively determine whether the facility satisfies the performance standards set out in Section 3(l) of the Ordinance for Solid Waste from collection locations (within Covered Jurisdictions) that do not have Source Separated Recycling service. Proposed protocol shall be revised and resubmitted within 30 days after notice by the Enforcement Official that a proposed protocol will not effectively determine whether the facility satisfies the performance standards set out in Section 3(l) of the Ordinance.

(3) Once the Authority has approved the proposed protocol, the Mixed Waste Processing Facility shall submit initial documentation, as well as documentation annually, demonstrating that, in accordance with the approved protocol, it meets the performance standards in 3(l) of this Ordinance for Solid Waste from collection locations (within Covered Jurisdictions) that do not have Source Separated Recycling service.

SECTION 9 (Inspections by Authority Representatives within Covered Jurisdictions)

(a) Authority Representatives are authorized to conduct inspections of loads of Solid Waste originating in Covered Jurisdictions and brought to Landfills, Transfer Stations, Mixed Waste Processing Facilities, or any other facility receiving Solid

Waste or Refuse located in Alameda County, subject to the following: (i) inspections cannot reasonably interfere with operations of the facility, (ii) inspector must wear appropriate safety equipment acceptable to the operator of the facility, and (iii) inspector may not conduct inspections in areas deemed to be unsafe by safety regulations or regulators or in locations where the facility operator prohibits walking or standing by its employees.

(b) Authority Representatives are authorized to conduct inspections, without notice, for compliance with this Ordinance by Waste Generators and Property Owners located in Covered Jurisdictions, subject to applicable laws.

(c) Authority Representatives are authorized to conduct inspections, at random or otherwise, of all Solid Waste at the point of collection or transfer or Deposit in Landfill(s), subject to the following: (i) inspections cannot reasonably interfere with operations of the facility, (ii) inspector must wear appropriate safety equipment acceptable to the operator of the facility, and (iii) inspector may not conduct inspections in areas deemed to be unsafe by safety regulations or regulators or in locations where the facility operator prohibits walking or standing by its employees.

(d) Authority Representatives are authorized to conduct any other inspections or investigations as reasonably necessary to further the goals of this Ordinance, subject to applicable laws.

SECTION 10 (Waivers)

(a) The Enforcement Official shall consult with the Primary Enforcement Representative from the jurisdiction of the waiver applicant prior to making any decision regarding a request for a waiver under this Ordinance.

(b) Emergency Waiver. If the Enforcement Official determines that any type of Covered Material cannot feasibly be Recycled for a limited time period due to emergency conditions, then the Enforcement Official may permit that component of Covered Materials to be Deposited in Landfill(s) for that limited time period.

(c) De Minimus Waiver. The Enforcement Official may waive some or all of the requirements of Sections 4 or 5, as appropriate, at a collection location if documentation satisfactory to the Enforcement Official is provided that Covered Materials comprise, on an on-going and typical basis, less than 10% by weight of Solid Waste taken to Landfill(s) from that collection location.

(d) Physical Space Waiver. The Enforcement Official may waive some or all of the requirements of Sections 4 or 5, as appropriate, if documentation satisfactory to the Enforcement Official is provided that physical space limitations prevent full compliance with these Sections. A Waste Generator or Property Owner seeking this waiver must provide documentation from service providers, licensed architects or engineers, or building officials from a Covered Jurisdiction that demonstrates that the Waste Generator or Property Owner does not have adequate

space for containers for Covered Material and cannot obtain collection services that direct Solid Waste to High Diversion Mixed Waste Processing Facilities.

(e) Financial Hardship Waiver. The Enforcement Official may waive some or all of the requirements of Sections 4 or 5, as appropriate, if documentation satisfactory to the Enforcement Official is provided that compliance with the Ordinance would create a financial hardship for a Property Owner. Hardship exists when implementation of this Ordinance will increase Solid Waste collection service bills for a particular collection location by more than 30% per typical billing period as compared with the cost of Solid Waste collection services in the absence of this Ordinance and State laws requiring recycling services at Businesses and Multi-Family Buildings. Hardship also exists when the sum of the change in billing described in the previous sentence plus the amortized costs of Solid Waste enclosures or other physical modifications necessary to house additional containers collected by truck, if such construction is required by Federal, State, or Local laws or regulations, exceeds 30% of the cost of Solid Waste collection services in the absence of this Ordinance and State laws requiring recycling services at Businesses and Multi-Family Buildings. Eligible construction costs shall be amortized over an appropriate period for such costs based on Internal Revenue Service or alternative authoritative guidance or standards. The financial hardship calculation shall take into consideration the cost savings potential of decreasing Refuse or Solid Waste service levels, and opportunities to reduce Solid Waste bills through changes in service providers, when that is legal within the relevant Covered Jurisdiction(s). The Enforcement Official may require compliance with some, but not all, requirements of this Ordinance if necessary to limit the increase in eligible costs to less than 30%.

(f) Unavailable Service Waiver. The Enforcement Official may waive some or all of the requirements of Sections 4 or 5, as appropriate, if documentation satisfactory to the Enforcement Official is provided that neither separate collection for Covered Materials nor the service of a High Diversion Mixed Waste Processing Facility is available.

(g) Compliance Schedule Waiver. Any Waste Generator or Property Owner (or Covered Jurisdiction on behalf of Waste Generators or Property Owners in its service area) may seek a waiver from the Enforcement Official by presenting evidence that more time is needed to fully implement a compliant program, and by providing a complete written proposal stating when full compliance will be achieved. If a compliance schedule waiver is granted, the Waste Generator or Property Owner or Covered Jurisdiction shall demonstrate on an on-going basis its good faith efforts to comply by the compliance date(s) stated in the approved waiver.

(h) Covered Materials in public litter containers (e.g., on streets or in parks), street sweepings, or in Solid Waste collected when illegal dumping is cleaned up, are not subject to this Ordinance.

SECTION 11 (Enforcement)

(a) An enforcement action under Sections 4, 5, or 8 of this Ordinance shall not be taken in any Covered Jurisdiction without written approval from the Primary Enforcement Representative of that Covered Jurisdiction. The Primary Enforcement Representative shall provide approval or disapproval of a proposed enforcement action in a timely manner.

(b) Violation of any provision of this Ordinance shall constitute grounds for assessment of a notice of violation and fine by an Authority Representative in accordance with Government Code § 53069.4 or as the code shall subsequently be amended or reorganized. Where an enforcement action is necessary to enforce this Ordinance, the Enforcement Official will typically issue a notice of violation as authorized in this subsection prior to taking the actions authorized pursuant to section 11(c) or 11(d) of this Ordinance. A separate notice of violation and fine may be imposed for each day on which a violation occurs. The fine shall not exceed the amounts detailed for misdemeanors in Section 11(d) of this Ordinance. The notice of violation shall list the specific violation and fine amount and describe how to pay the fine and how to request an administrative hearing to contest the notice of violation. The fine shall be paid within 30 days of the notice of violation and shall be deposited prior to any requested hearing. A hearing, held by a hearing officer, will be held only if it is requested within 30 days of the notice of violation. Evidence may be presented at the hearing. The Executive Director, or its designee, shall conduct the hearing and issue a final written order. If it is determined that no violation occurred, the amount of the fine shall be refunded within 30 days. The Authority shall serve the final order on the Person subject to the notice of violation by overnight, certified or first class mail.

(c) Violation of any provision of this Ordinance may be enforced by a civil action including an action for injunctive relief.

(d) Violation of any provision of this Ordinance shall constitute a misdemeanor punishable by a fine not to exceed $500 for the first violation, a fine not to exceed $750 for the second violation within one year and a fine not to exceed $1000 for each additional violation within one year. Violation of any provision of this Ordinance may also be enforced as an infraction punishable by a fine not to exceed $100 for the first violation, a fine not to exceed $200 for the second violation within one year and a fine not to exceed $500 for each additional violation within one year. There shall be a separate offense for each day on which a violation occurs.

(e) Enforcement pursuant to this Ordinance may be undertaken by the Authority through its Enforcement Official, counsel, or any Authority Representative. In any enforcement action, the Authority shall be entitled to recover its attorneys' fees and costs from any Person who violates this Ordinance.

(f) Enforcement of Phase 1 of this Ordinance (as set forth in Section 13 of this Ordinance) shall not occur before July 1, 2012. Enforcement of Phase 2 of this Ordinance shall not occur before July 1, 2014. Prior to those dates, the Authority will conduct outreach and educational efforts regarding the requirements of the Ordinance. From July 1, 2012 to December 31, 2012 for Phase 1, and from July 1, 2014 to December 31, 2014 for Phase 2, enforcement will consist of warnings rather than enforcement action. Enforcement action will be taken, as needed, after January 1, 2013 for Phase 1 and after January 1, 2015 for Phase 2.

(g) Property Owners will not be held responsible for violations of this Ordinance by Waste Generators, and Waste Generators shall not be held responsible for violations of this Ordinance by Property Owners, unless they are the same person, and so long as they cooperate with the Enforcement Official and Authority Representatives as necessary to clarify responsibility for violations. Failure to cooperate in determining responsibility as described above is a violation of this Ordinance.

(h) Regulated Haulers will not be held responsible for violations of this Ordinance by High Diversion Mixed Waste Processing Facilities, and High Diversion Mixed Waste Processing Facilities shall not be held responsible for violations of this Ordinance by Regulated Haulers, unless they are the same person, and so long as they cooperate with the Enforcement Official and Authority Representatives as necessary to clarify responsibility for violations.

SECTION 12 (Local Regulation and Opt-Out and Opt-In Provisions)

(a) Local Regulation. Nothing in this Ordinance shall be construed to prohibit any Member Agency from enacting and enforcing ordinances and regulations regarding the collection, transport, storage, processing, and Deposit in Landfill(s) of Solid Waste within its jurisdiction, including more stringent requirements than those in this Ordinance.

(b) Opt-Out Provision. Any Member Agency by a resolution of its governing body may, prior to March 2, 2012, choose to exclude its service area from Sections 4, 5, and 8, Phase 1 of this Ordinance. Any Member Agency by a resolution of its governing board may, prior to January 1, 2014, choose to exclude its service area from Sections 4, 5, and 8, Phase 2 of this Ordinance.

(c) Opt-In Provision. Any Member Agency that chooses to exclude its service area from either Phase 1 or Phase 2 may request of the Authority by a resolution of its governing board to be re-included in coverage of the Ordinance at any subsequent time. Such coverage under the Ordinance, however, shall not occur unless it is accepted in writing by the Enforcement Official or the Authority Board, and shall become effective only on the date specified in such written acceptance. Such acceptance shall not be unreasonably withheld or delayed.

(d) Dispute Resolution. In the event of a dispute between the Authority and a

Covered Jurisdiction regarding the implementation of this Ordinance, either party may request a meeting, in which case the Enforcement Official and the Primary Enforcement Representative for the Covered Jurisdiction (or other designee of the chief executive of the Covered Jurisdiction) shall meet to discuss implementation of the Ordinance's provisions. After such meeting, the parties may agree to enter into mediation to resolve any disputes between the parties related to implementation of the Ordinance. In addition, after meeting to seek to resolve any disputes between the parties and possible mediation, the Authority Board or the governing body of the Covered Jurisdiction, with at least 30 days public notice, may by resolution choose to exclude the service area of the Covered Jurisdiction from Sections 4, 5, and 8 of this Ordinance.

SECTION 13 (Implementation Schedule)

(a)

Phase Number: Effective Date	**Entities Subject to Ordinance**	**Covered Materials**
Phase 1: July 1, 2012	Business Property Owners and Business Waste Generators within Covered Jurisdictions with 4 cubic yards or more of Solid Waste (excluding Recyclables and Solid Waste generated under a permitted building project) collection service per week on an average basis as of November 1, 2011 or any later date. Multi-Family Building Property Owners within Covered Jurisdictions. Self-Haulers transporting Solid Waste originating in Alameda County. Regulated Haulers operating within Covered Jurisdictions.	Corrugated cardboard, newspaper, white paper, mixed recyclable paper, recyclable food and beverage glass containers, metal (aluminum and steel) food and beverage cans, HDPE and PET bottles
Phase 2: July 1, 2014	All Business and Multi-Family Building Property Owners and Business Waste Generators within Covered Jurisdictions. Self-Haulers transporting Solid Waste originating in Alameda County. Regulated Haulers operating within Covered Jurisdictions.	Covered Materials in Phase 1, plus discarded food and Compostable paper.

(b) A Covered Jurisdiction may add discarded food and Compostable paper, or other Recyclable materials, to the list of Covered Materials for all or a subset of the entities subject to the Ordinance at any time if requested by three or more Covered Jurisdictions. Such coverage under the Ordinance, however, shall not

occur unless it is accepted in writing by the Enforcement Official or the Authority Board, and shall become effective only on the date specified in such written acceptance. Such acceptance shall not be unreasonably withheld or delayed.

SECTION 14 (Severability)

If any provision of this Ordinance or its application to any situation is held to be invalid, the invalidity shall not affect other provisions or applications of this Ordinance which can be given effect without the invalid provision or application, and to this end the provisions of this Ordinance are declared to be severable.

SECTION 15 (Notice and Verification)

This Ordinance shall be posted at the Authority Office after its second reading by the Board for at least thirty (30) days and shall become effective thirty (30) days after the second reading.

Passed and adopted this 25th day of January, 2012 by the following vote:

AYES: Biddle, Carson, Cutter, Freitas, Green, Henson, Kaplan, Keating, Landis, Natarajan, Sullivan, Tam, Turner, West, Wile, Wozniak

NOES: Sadoff

ABSTAINING:

ABSENT:

I certify that under the penalty of perjury that the foregoing is a full, true and correct copy of the ORDINANCE NO. 2012-1.

GARY WOLFF
EXECUTIVE DIRECTOR

272511.1

CalRecycle

Waste Characterization

Residential Developments: Estimated Solid Waste Generation Rates

The data on this page is not official CalRecycle data; please read our disclaimer and background information.

Also see listings for Commercial / Industrial / Institutional / Service establishments.

Waste Generation Source	Gen. Rate	Units of Measure	Source Date	Source	Notes
Residential	12.23	lb/household/day	2006	City of Los Angeles CEQA Thresholds Guide: Your Resource for Preparing CEQA Analyses in Los Angeles (DRAFT)	Does not include generation of construction debris
Multifamily	4	lb/dwelling unit /day	Aug. 1992	Co. of Los Angeles Dept. of Regional Planning, Vesting Tentative Tract No. 47905, etc.	Cites City of LA Dept. of City Planning document "EIR Manual for Private Projects" as source
Multifamily	8.6	lb/dwelling unit /day	n/a	Draft Environmental Impact Report (EIR) for the Central Commercial Redevelopment Project (Monterey Park Redevelopment Agency)	EIR cites Athens Disposal Co. and GRC Redevel. Consultants, 1992, as source
Multifamily	3.6	lb/unit/day	Apr. 1993	Draft EIR for South Gate Commercial Corridors Redevelopment Project	EIR cites City of LA Dept. of City Planning document "EIR Manual for Private Projects" as source
Multifamily	4	lb/dwelling unit /day	Dec. 1991	Draft EIR for North Hills Development (Santa Clarita)	EIR cites City of LA Bureau of Solid Waste, 1989, as source
Multifamily	5.31	lb/dwelling unit /day	Jan. 1996	Draft Program EIR for Rye Canyon Business Park, Santa Clarita	EIR cites SWANA Tech. Bull. 85-6; Recovery Sciences, 1987; and Santa Clarita SRRE, 1990
Residential	12	lb/person/day	Apr. 1992	Stevenson Ranch Draft EIR (Phase IV) , LA County	EIR cites source as Ultrasystems
Single Family	10	lb/dwelling unit /day	Aug. 1992	Co. of Los Angeles Dept. of Regional Planning, Vesting Tentative Tract No. 47905, etc.	EIR cites City of LA Dept. of City Planning doc "EIR Manual for Private Projects" as source
Single Family	11.4	lb/dwelling unit /day	n/a	Draft EIR for the Central Commercial Redevelopment Project (Monterey Park Redevelopment Agency)	EIR cites Athens Disposal Co. and GRC Redevel. Consultants, 1992, as source
Single Family	7.8	lb/unit/day	Apr. 1993	Draft EIR for South Gate Commercial Corridors Redevelopment Project	EIR cites City of LA Manual for Private Projects
Single Family	10	lb/dwelling unit /day	Dec. 1991	Draft EIR for North Hills Development (Santa Clarita)	EIR cites City of LA Bureau of Solid Waste, 1989, as source
Single Family	9.8	lb/dwelling unit /day	Jan. 1996	Draft Program EIR for Rye Canyon Business Park, Santa Clarita	EIR cites SWANA Tech. Bull. 85-6; Recovery

					Sciences, 1987; and Santa Clarita SRRE, 1990

CalRecycle does not officially endorse any of the waste generation rates in the preceding table, and cannot validate their accuracy. However, they may be useful in providing a general level of information for planning purposes.

The table contains information extracted from various sources, which are cited. Please note that several of the documents listed were developed by city or county planning or environmental departments. Your city or county planning or environmental agency may be a source of information for a local project.

Waste Generation Rates Home

Last updated: January 16, 2013
Solid Waste Characterization, http://www.calrecycle.ca.gov/WasteChar/
Contact: Wastechar@calrecycle.ca.gov

Facility/Site Summary Details: Altamont Landfill & Resource Recv`ry (01-AA-0009)

LEA Contact: See the "Local Enforcement Agency (LEA)" information below
CalRecycle Contact: Jeffery Esquivel (916) 341-6337

Search New Facility

Detail **Inspection** **Enforcement** **Maps** **Documents**

Identification:		**Local Enforcement Agency (LEA):**
Location:	Altamont Landfill & Resource Recv`ry 10840 Altamont Pass Road Livermore, CA 94550	County of Alameda Environmental Health Department 1131 Harbor Bay Pky Ste 200 Alameda, CA 94502-6567
Latitude:	37.75389	Phone: (510) 567-6790
Longitude:	-121.65165	Fax: (510) 337-9135
GIS Confidence:	Map	
US EPA FRS ID:	110000831404	

Operator/Business Owner:	**Land Owner(s):**
Waste Management Of Alameda County 172-98th Avenue Oakland, CA 94603 Phone: (510) 613-8710 Fax: (510) 562-2854	Waste Management Of Alameda County 172-98th Avenue Oakland, CA 94603 Phone: (510) 613-8710 Fax: (510) 562-2854

Surrounding Land Use:

Agricultural, Commercial, Open Space - Nonirrigated, Range Land

Permit Details:

Current - Permit or EA Notification Issue Date: **August 22 , 2005 Type: Full** View Document

Unit Specifications:

Data Dictionary

Unit: 01

Activity:	Solid Waste Landfill	Inspection Frequency:	Monthly
Classification:	Solid Waste Facility	Max.Permitted Throughput:	11,500.00 Tons/day
Category:	Disposal	Remaining Capacity:	45,720,000 Cubic Yards
Regulatory Status:	Permitted	Remaining Capacity Date:	August 22, 2005
Operational Status:	Active	Max.Permitted Capacity:	62,000,000 Cubic Yards
Operational Type:	AB2296 LF, BOE Reporting Disposal Facility, Composite_Lined _LF_Cell(s), Financial Assurance Responsibilities,	Total Acreage:	2130.0000 Acres

PaleoDS, Remaining Capacity Landfill,
Treated Wood Waste Acceptance

Ceased Op Date:	01/01/2025	Disposal Acreage:	472.0000 Acres
Closure Type:	Estimated	WDR Landfill Class:	II,III
Waste Type:	Ash, Construction/demolition, Contaminated soil, Green Materials, Industrial, Mixed municipal, Other designated, Tires, Shreds		

Unit: 02

Activity:	ACW Disposal Site	Inspection Frequency:	Quarterly
Classification:	Solid Waste Facility	Max.Permitted Throughput:	2,000.00 Tons/day
Category:	Disposal	Remaining Capacity:	**Contact:** Jeffery Esquivel
Regulatory Status:	Permitted	Remaining Capacity Date:	January 01, 1900
Operational Status:	Active	Max.Permitted Capacity:	00 0
Operational Type:	Not Available	Total Acreage:	0.0000 Acres
Ceased Op Date:		Disposal Acreage:	0.0000 Acres
Closure Type:	Not Available	WDR Landfill Class:	II
Waste Type:	Asbestos, Asbestos, friable		

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Last updated: Data updated continuously.
Solid Waste Information System(SWIS), http://www.CalRecycle.ca.gov/SWFacilities/Directory/
Cody Oquendo, Cody.Oquendo@CalRecycle.ca.gov (916) 341-6719

Disposal Tonnages by Jurisdiction

Jurisdiction	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
Alameda	96,383	59,671	49,410	49,962	57,979	52,613	48,322	44,193	37,710	40,967	36,625	35,121
Albany	18,483	11,909	10,779	9,575	9,525	8,950	6,676	6,862	5,655	7,202	5,428	6,427
Berkeley	155,358	109,658	139,790	120,328	112,025	98,041	88,185	71,968	63,127	69,145	73,917	60,659
Dublin	41,707	35,895	30,635	41,779	39,763	36,797	33,975	27,559	24,860	27,383	24,478	27,919
Emeryville	26,816	14,738	24,938	17,571	12,741	20,162	15,045	18,113	13,341	20,855	18,052	17,973
Fremont	221,000	185,576	203,701	193,963	199,567	185,027	165,008	149,765	135,606	142,836	144,771	138,179
Hayward	215,837	144,208	172,482	144,139	133,758	173,540	142,134	123,864	119,483	108,371	106,953	101,757
Livermore	80,621	86,205	112,699	91,577	90,827	101,319	90,814	73,486	65,600	64,031	57,720	57,317
Newark	58,298	51,999	52,298	45,760	40,477	38,054	32,755	29,709	35,241	31,429	31,370	35,891
Oakland	583,298	488,676	392,776	383,505	377,619	375,389	304,818	296,847	287,823	292,298	284,151	281,139
Piedmont	9,486	6,664	5,763	6,204	5,813	5,210	4,558	2,682	3,994	4,999	4,731	3,304
Pleasanton	105,692	98,534	126,420	121,034	114,411	114,446	97,697	75,365	73,852	70,102	77,170	80,682
San Leandro	140,782	98,188	119,310	110,192	98,364	91,723	73,625	101,728	83,714	61,727	103,238	115,220
Union City	136,488	66,762	57,281	63,287	61,695	47,774	40,891	39,862	36,854	39,653	36,778	36,959
Unincorporated Alameda County	168,590	83,833	81,370	102,206	80,865	100,314	92,807	103,810	83,036	59,812	71,243	71,235
	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	2,058,839	1,542,516	1,579,652	1,501,082	1,435,429	1,449,359	1,237,310	1,165,813	1,069,896	1,040,810	1,076,625	1,069,782

Diversion Rates by Jurisdiction

Jurisdiction	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
Alameda	15%	48%	65%	68%	66%	66%	67%	71%	75%	72%	76%	77%
Albany	20%	42%	62%	70%	70%	71%	77%	78%	83%	79%	84%	81%
Berkeley	18%	41%	49%	53%	57%	62%	66%	72%	76%	74%	73%	78%
Dublin	12%	26%	54%	55%	56%	61%	66%	73%	75%	73%	76%	74%
Emeryville	10%	51%	48%	64%	75%	63%	74%	70%	77%	65%	70%	70%
Fremont	19%	49%	62%	63%	64%	64%	68%	71%	74%	73%	72%	74%
Hayward	9%	41%	52%	62%	65%	56%	63%	68%	67%	71%	72%	73%
Livermore	4%	26%	50%	63%	63%	60%	64%	71%	73%	74%	77%	77%
Newark	15%	27%	53%	62%	66%	67%	72%	75%	69%	72%	73%	69%
Oakland	11%	27%	52%	58%	59%	57%	66%	67%	65%	65%	66%	67%
Piedmont	25%	47%	63%	64%	66%	68%	73%	84%	75%	69%	71%	80%
Pleasanton	15%	28%	48%	53%	53%	55%	61%	71%	71%	73%	70%	69%
San Leandro	10%	34%	51%	59%	65%	64%	73%	61%	69%	77%	62%	58%
Union City	11%	49%	61%	62%	64%	71%	76%	77%	77%	75%	77%	77%
Unincorporated Alameda County	10%	56%	65%	60%	69%	60%	63%	59%	67%	76%	72%	72%
	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
Countywide Weighted Rate	14%	37%	54%	60%	61%	61%	67%	69%	70%	72%	71%	71%

EAST BAY
MUNICIPAL UTILITY DISTRICT

May 13, 2015

Miroo Desai, Senior Planner
City of Emeryville
1333 Park Avenue
Emeryville, CA 94608-3517

Re: Satisfaction of Water Supply Assessment for the Sherwin-Williams Development Project, Emeryville

Dear Ms. Desai:

This letter is in response to your request dated March 6, 2015 for water agency consultation concerning the reconfirmation of the Water Supply Assessment (WSA) for the revised Sherwin-Williams Development Project located in the City of Emeryville (City). East Bay Municipal Utility District (EBMUD) appreciates the opportunity to provide this response.

On January 5, 2005, EBMUD received a request from the City for a WSA for the Sherwin-Williams Emeryville Site Redevelopment Project. Pursuant to Sections 10910-10915 of the California Water Code, EBMUD approved the WSA and provided the City a written response to the WSA on March 10, 2005 (see attached).

The estimated demand for the Sherwin-Williams Emeryville Site Redevelopment Project consisting of 577 dwelling units and 35,000 square feet of commercial space in the approved WSA was about 110,000 gallons per day (gpd). EBMUD's estimate of water demand for the revised project of 540 dwelling units, 94,600 square feet of commercial space, and 90,605 square feet of open space is about 106,000 gpd. Since the overall project demand decreased, EBMUD concludes that the WSA approved on March 10, 2005 is still valid, and a second WSA is not required for the Sherwin-Williams Development Project.

The 2010 Urban Water Management Plan (UWMP) concludes that EBMUD has, and will have, adequate water supplies to serve existing and projected demand within the Ultimate Service Boundary during normal and wet years but that deficits are projected for drought years. EBMUD's Drought Management Program Guidelines establish the level of water use restrictions that EBMUD may consider based on the projected total system storage at the end of the water year. Up to a Stage 3 Drought, EBMUD-wide water use reduction goals of up to 15 percent may be required. In a Stage 4 Drought, EBMUD-wide mandatory water use reduction goals can exceed 15 percent. The Sherwin-Williams Development Project will be subject to the same drought restrictions that apply to all EBMUD customers. Please note that EBMUD updated its UWMP since the previously approved WSA, and the most current version of the UWMP should be used and referenced in the

City's revised environmental documentation. The most recent version of the UWMP can be found at http://www.ebmud.com/sites/default/files/pdfs/UWMP-2010-2011-07-21-web-small.pdf

On April 14, 2015, EBMUD declared a Stage 4 Drought and a mandatory EBMUD-wide water use reduction goal of 20 percent and adopted revised regulations regarding mandatory water use prohibitions and restrictions. This 20 percent conservation goal is consistent with the California State Governor's April 1, 2015 drought emergency order and with an April 7, 2015 California State Water Resources Control Board proposed rulemaking which specifically identifies a 20 percent water reduction goal for EBMUD.

As stated in the March 10, 2005 WSA response letter, this assessment addresses the issue of water supply only and is not a guarantee of service, and future water service is subject to rates and regulations in effect at the time.

If you have any questions concerning this response, please contact Timothy R. McGowan, Senior Civil Engineer, Major Facilities Planning at (510) 287-1981.

Sincerely,

David J. Rehnstrom
Manager of Water Distribution Planning

DJR:TRM:dks
sb15_061

Attachment

EAST BAY
MUNICIPAL UTILITY DISTRICT

March 10, 2005

Miroo Desai, Senior Planner
City of Emeryville
1333 Park Avenue
Emeryville, CA 94608-3517

Dear Ms. Desai:

Re: Water Supply Assessment – Sherwin-Williams Site Redevelopment Project

This letter responds to your request of January 3, 2005 for water agency consultation concerning the Sherwin-Williams Site Redevelopment Project (Enclosure 1). The East Bay Municipal Utility District (EBMUD) appreciates the opportunity to provide this response.

Pursuant to Sections 10910-10915 (SB-610) of the California Water Code, the project meets the threshold requirement for an assessment of water supply availability based on the amount of water this project would require, which would be greater than the amount required by a 500 dwelling unit project or 250,000 square foot commercial development.

Please note that this assessment addresses the issue of water supply only and is not a guarantee of service, and future water service is subject to rates and regulations in effect at the time.

Project Demand

The water demands for the Sherwin-Williams Site Redevelopment Project area are accounted for in EBMUD's water demand projections as published in EBMUD's 2000 Urban Water Management Plan (UWMP/Enclosure 2). EBMUD's water demand projections account for anticipated future water demands within EBMUD's service boundaries and for variations in demand-attributed changes in development patterns. The current water demand for the existing land uses in the Sherwin-Williams Site Redevelopment Project area is about 50,000 gallons per day (gpd). The estimated water demand based on the projected water consumption supplied by the applicant for the proposed development is 110,000 gpd for the highest water use, the residential intensive development scenario, and is consistent with EBMUD's demand projections that indicate densification of these types of land uses.

Project Area

The Sherwin-Williams Site Redevelopment Project area is located in the southern portion of Emeryville. The project area consists of approximately 8.6 acres. Two development

scenarios are under consideration by the City; one includes 577 dwelling units with 35,000 square feet of commercial floor area and the other, 150 dwelling units with 291,000 square feet of commercial floor area.

EBMUD Water Demand Projections

The water consumption of EBMUD customers has remained relatively level in recent years in spite of population and account growth. Between 1987 and the present, consumption has ranged from a high of approximately 220 million gallons per day (mgd) in 1987 to a low of 170 mgd in 1989. Based on extensive forecasting in EBMUD's Water Supply Management Program (WSMP) and recent land use based demand forecasting, the WSMP forecast for 2020 water demand of 277 mgd can be reduced to 229 mgd with successful water recycling and conservation programs that are in place. The Sherwin-Williams Site Redevelopment Project will not change the EBMUD 2020 demand projection.

EBMUD Water Supply and Water Rights

EBMUD has water rights and facilities to divert up to a maximum of 325 mgd from the Mokelumne River, subject to the availability of Mokelumne River runoff and the prior water rights of other users. EBMUD's position in the hierarchy of Mokelumne River water users is determined by a variety of agreements between Mokelumne River water right holders, the appropriative water rights permits and licenses that have been issued by the State, pre-1914 rights and riparian rights. Conditions that restrict EBMUD's ability to use its 325 mgd entitlement include:

- Upstream water use by prior right holders.
- Downstream water use by riparian and senior appropriators and other downstream obligations, including protection of public trust resources.
- Drought, or less than normal rainfall for more than a year.
- Emergency outage.

During periods of drought, runoff from the Mokelumne River is insufficient to supply the 325 mgd entitlement. EBMUD studies indicate that, with its current water supply and the water demands expected in 2020, deficiencies in supply of up to 67 percent could occur during a multi-year drought period.

EBMUD UWMP

The UWMP, adopted by the Board of Directors in Resolution No. 33242-01, includes planning level analyses at the County- and EBMUD-wide levels for existing and projected water demand. A summary of EBMUD's demand and supply projections in five-year increments is provided in a table (Enclosure 3) from the UWMP. The data reflects the latest actual and forecast values.

EBMUD's evaluation of water supply availability accounts for the diversions of both upstream and downstream water right holders and fishery releases on the Mokelumne River. Fishery releases are based on the requirements of a 1998 Joint Settlement Agreement (JSA) between EBMUD and State and Federal wildlife agencies. The JSA requires EBMUD to make minimum flow releases from its reservoirs to the lower Mokelumne River to benefit the fishery. As this water is released downriver, it is, therefore, not available for use by EBMUD's customers.

The available supply shown in the table (Enclosure 3) in years 1, 2 and 3 of a multiple-year drought was determined by EBMUD's hydrologic model with the following assumptions:

- EBMUD Drought Planning Sequence is used for 1976, 1977 and 1978.
- Total system storage is depleted by the end of the third year of the drought.
- The diversions by Amador and Calaveras Counties upstream of Pardee Reservoir increase over time.
- Releases are made to meet the requirements of senior downstream water right holders and fishery releases are made according to the JSA.

As discussed under the Drought Management Program section in Chapter 3 of the UWMP, EBMUD's system storage generally allows it to continue serving its customers during dry-year events. EBMUD imposes rationing based on the projected storage at the end of September. By imposing rationing in the first dry year of potential drought, EBMUD attempts to minimize rationing in subsequent years if a drought persists while continuing to meet its current and subsequent-year fishery flow release requirements and obligations to downstream agencies. Table 3-1 in the UWMP summarizes the guidelines for consumer water reduction goals based on system storage.

In the table (Enclosure 3), "Single Dry" year (or Year 1 of "Multiple Dry Years") is determined to be a year that EBMUD would implement Drought Management Program elements at the "moderate" stage with the goal of achieving between 0 to 15 percent reduction in customer demand. Year 2 of Multiple Dry Years is determined to be a year that EBMUD would implement Drought Management Program elements at the "severe" stage with the goal of achieving between 15 to 25 percent reduction in customer demand. In Year 3 of the multiple-year drought, deficiencies from about 48 percent in year 2005 to about 67 percent in year 2020 are forecast to occur. Therefore, a supplemental supply is needed, which is defined by EBMUD as the additional amount of water necessary to limit customer deficiency to 25 percent in a multiple-year drought while continuing to meet the requirements of senior downstream water right holders and the provisions of the 1998 JSA.

Supplemental Water Supply and Demand Management

The goals of meeting projected water needs and increased water reliability rely on three components: supplemental supply, water conservation and recycled water.

Chapter 2 of the UWMP describes EBMUD's supplemental water supply project alternatives to meet its long-term water demand. To address the need for a supplemental water supply during droughts, EBMUD signed a contract in 1970 with the Federal government for a supplemental supply from the Central Valley Project (CVP). In 2001, EBMUD certified the environmental documentation amending its CVP contract 14-06-200-5183A, reducing EBMUD's contract from 150,000 acre-feet (AF)/year to an entitlement not to exceed 133,000 AF in any one year or 165,000 AF over any 3 consecutive years. In 2001, EBMUD signed a Memorandum of Agreement with the City of Sacramento, the County of Sacramento and the U.S. Bureau of Reclamation to study a joint regional water project on the Sacramento River near Freeport. The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) of the Freeport Regional Water Project identifies several regulatory permits and approvals required for the implementation of the project alternatives. These are listed in Table 2-6 of the Freeport Regional Water Project Draft EIR/EIS, July 2003 and incorporated in the Final EIR/EIS for the project which was certified in April 2004.

Chapter 2 of the UWMP also describes other supplemental water projects, including the development of groundwater storage within EBMUD's service area. EBMUD is studying the environmental impacts of these proposed projects. Specific capital outlay and financing information for these projects are included in EBMUD's FY04-05 Capital Improvement Program and Five-Year Plan. The Freeport project would also allow for a future groundwater conjunctive use component and, along with the proposed local groundwater projects, emergency interties and planned water recycling and conservation efforts, would ensure a reliable water supply to meet projected demands for current and future EBMUD customers within the current service area. Without a supplemental water supply source, continued conservation efforts and further use of recycled water, deficiencies in supply are projected as noted above.

The Sherwin-Williams Site Redevelopment Project presents an opportunity to incorporate many water conservation measures. Conditions of approval for the implementation of the Sherwin-Williams Site Redevelopment Project should require that the project comply with the Landscape Water Conservation Section of the Municipal Code of the City Article 9-4.54 of Chapter 4 of Title 9. EBMUD staff would appreciate the opportunity to meet with the project sponsor to discuss water conservation programs and best management practices applicable to the proposed project. A key objective of this discussion will be to explore timely opportunities to expand water conservation via early consideration of EBMUD's conservation programs and best management practices applicable to the project.

The Sherwin-Williams Site Redevelopment Project area is located within the service area boundary of EBMUD's East Bayshore Recycled Water Project. EBMUD anticipates recycled water delivery to the project area within the next ten years and will coordinate closely with the project sponsor regarding installation of dual plumbing for use of recycled water where feasible.

The project sponsor should contact David J. Rehnstrom, Senior Civil Engineer, at (510) 287-1365 for further information.

Sincerely,

WILLIAM R. KIRKPATRICK
Manager of Water Distribution Planning Division

WRK:JLM:sb
sb05_015a.doc

Enclosures: 1. Letter of Request for Water Supply Assessment dated January 3, 2005
2. EBMUD's 2000 Urban Water Management Plan Area
3. EBMUD's Projected Demand and Available Supply Table

cc: Board of Directors w/o Enclosure 2

CITY OF EMERYVILLE

INCORPORATED 1896

1333 PARK AVENUE
EMERYVILLE, CALIFORNIA 94608-3517

TEL: (510) 596-4300 FAX: (510) 658-8095

January 3, 2005

Mr. Dave Rehnstrom, Senior Civil Engineer
East Bay Municipal Utility District
Distribution Planning Department Mail Stop 701
375 11th Street
Oakland, CA 94607

Subject: Water Supply Assessment request for Sherwin-Williams Emeryville Site Redevelopment

Dear Mr. Rehnstrom:

The City of Emeryville is currently preparing an Environmental Impact Report (EIR) for the proposed Sherwin-Williams Emeryville Site Redevelopment. The project site is located at 1450 Sherwin Avenue in Emeryville and is the current location of an 8.59 acre paint factory facility. The site is currently undergoing remediation for soil and groundwater contamination due to prior industrial uses. The proposed project includes the demolition of the paint factory and the construction of a maximum of 577 housing units and 35,000 square feet of commercial space under one scenario, or 150 housing units and 291,000 square feet of commercial space under another scenario. The final development program will likely be some combination of these scenarios, but within these parameters.

With this letter we are submitting a Water Supply Assessment (WSA) request for the Sherwin Williams redevelopment project in accordance with Section 15083.5 of the 2004 *California Environmental Quality Act Guidelines*, which requires consultation with the appropriate water agency for projects that include commercial building construction that would compromise either 500 residential dwelling units or a mixed use project that would demand an equal, or greater amount of water needed to serve a 500-dwelling unit project, and would require a General Plan Amendment. A copy of the Notice of Preparation of the Draft EIR, which was sent to EBMUD on December 17, is attached for your reference.

The City of Emeryville requests that the EBMUD provide the necessary WSA to verify that EBMUD water supplies are sufficient for the project and to determine if the proposed increase in water consumption would require new or expanded water supply facilities.

If you have any questions, please do not hesitate to contact me at 510/596-3785 or email me at mdesai@ci.emeryville.ca.us. Thank you for your assistance.

Sincerely,

Miroo Desai
Senior Planner
City of Emeryville

cc: Jason Burke, LSA Associates, Inc.

Attachment: Notice of Preparation

Enclosure 3

PROJECTED DEMAND AND AVAILABLE SUPPLY
EAST BAY MUNICIPAL UTILITY DISTRICT
(million gallons per day - mgd)

	2000	2005	2010	2015	2020
Customer Demand[1]	230	242	257	267	277
Adjusted for Conservation[2]	(8)	(14)	(20)	(27)	(34)
Adjusted for Recycled Water[3]	(6)	(9)	(11)	(12)	(14)
Planning Level of Demand	216	219	226	228	229
Available Supply & Need for Supplemental Supply					
Normal Year	>216	>219	>226	>228	>229
Supplemental Supply Need	*0*	*0*	*0*	*0*	*0*
Single Dry Year (Multiple Dry Years - Year 1) Moderate Stage (approximately 7% deficiency)[4]	200	203	210	212	213
Supplemental Supply Need	*0*	*0*	*0*	*0*	*0*
Multiple Dry Years - Year 2 Severe Stage (approximately 25% deficiency)[4]	162	164	169	171	172
Supplemental Supply Need	*0*	*0*	*0*	*0*	*0*
Multiple Dry Years - Year 3					
Available Supply	125	114	95	84	77
Deficiency	42%	48%	58%	64%	67%
Supplemental Supply Need[5] (to limit deficiency to 25%)	*87*	*102*	*128*	*142*	*154*

1. *Demand taken from the 2000 Demand Study.*
2. *Conservation water savings goals from the WCMP 1999 Annual Report, 2 mgd in 1999 and 34 mgd for year 2020, linearly interpolated into five-year increments.*
3. *Chapter 5 of UWMP.*
   Note: Conservation and Reclamation savings reported are those attributed to programs which are a part of the 1993 WSMP. Reference Chapter 6 of UWMP.
4. *Drought conditions per Table 3-1, UWMP.*
5. *The supplemental supply need is calculated from modeling studies and is the amount of water needed to limit customer deficiency to 25 percent and to implement all provisions of the 1998 Joint Settlement Agreement.*