URBAN WATER MANAGEMENT PLAN 2020

EAST BAY MUNICIPAL UTILITY DISTRICT

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The Urban Water Management Plan provides an overview of EBMUD's water supply and demand assessments to a planning horizon of 2050 based on a range of scenarios. The plan describes a diversified and resilient portfolio which includes recycled water and conservation programs and outlines the strategies to respond to uncertainties in the future. The UWMP and the attached Water Shortage Contingency Plan are part of EBMUD's long-range planning to ensure water service reliability to meet multiple needs, especially during multi-year drought periods.

WATER RESOURCES PLANNING DIVISION • EAST BAY MUNICIPAL UTILITY DISTRICT • JUNE 2021

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Chapter 1 – General Information

1.1 Report Format

The 2020 Urban Water Management Plan (UWMP) summarizes important information and updates on EBMUD's water supply planning including projects, studies, and recycled water and conservation program activities undertaken since the 2015 UWMP. This report consists of the following chapters which satisfy the provisions of the Urban Water Management Planning Act.

CHAPTER 1
General Information

A summary of the UWMP Act and an overview of the organization, watershed, and water supply system.

CHAPTER 2
Water Supply System Reliability

An overview of the factors that affect the availability of water supplies.

CHAPTER 3
Water Demand

A discussion of past, current, and projected demand.

CHAPTER 4
Resilient & Diversified Portfolio

Plans and progress in developing a resilient & diversified water supply portfolio.

CHAPTER 5
Wastewater & Recycled Water

An overview of the wastewater systems in the service area, current and planned recycled water projects, and other existing non-potable water projects.

CHAPTER 6
Water Conservation

An overview of demand and supply-side conservation programs, current and planned conservation projects, and compliance with SBx7-7– 2009; the Water Conservation Act of 2009.

APPENDIX A

The UWMP Act and its amendments.

APPENDIX B

Newspaper public notices and details of the public review process.

APPENDIX C

Comments received and the responses to those comments.

APPENDIX D

Board Resolution adopting the UWMP 2020 and the Water Shortage Contingency Plan.

APPENDIX E

Detailed description of the East Bay Plain and the Eastern San Joaquin subbasins.

APPENDIX F

Detailed information on EBMUD's methodology for complying with SBx7-7 Water Conservation Act of 2009.

APPENDIX G

EBMUD regulations and the rate structures for water and wastewater service.

APPENDIX H

Information on demonstration of consistency with Delta Plan WR P1.

APPENDIX I

Local Hazard Mitigation Plan.

APPENDIX J

Reporting of Energy Intensity.

APPENDIX K

2020 Water Supply Availability and Deficiency Report.

APPENDIX L

A glossary of terms used in the 2020 UWMP.

ATTACHMENT 1
Water Shortage Contingency Plan

EBMUD's Drought Management Program and potential response actions during water shortages.

1.2 The Urban Water Management Planning Act

The East Bay Municipal Utility District (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 2015 were included in the following legislation:

- SB 606, Hertzberg, 2018 (Water Management Planning)
- AB 1668, Friedman, 2018 (Water Management Planning)
- AB 1414, Friedman, 2019 (Urban Retail Water Suppliers Reporting)

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

Table 1-1 **Urban Water Management Planning Act & Amendments**

Bill	Introduced by	Title	Chaptered
AB 2661	Klehs	Urban Water Management Planning Act	1990
AB 11X	Filante	Urban Water Management Planning Act	1991
AB 1869	Speier	Urban Water Management Planning Act	1991
AB 892	Frazee	Urban Water Management Planning Act	1993
SB 1017	McCorquodale	Groundwater	1994
AB 2853	Cortese	Urban Water Management Planning	1994
AB 1845	Cortese	Water Service Reliability Assessment	1995
SB 1011	Polanco	Urban Water Suppliers	1995
AB 2552	Bates	Urban Water Supply Planning	2000
SB 553	Kelley	Urban Water Management Plans	2000
SB 610	Costa	Water Supply Planning	2001
AB 901	Daucher	Water Supply Planning	2001
SB 672	Machado	California Water Plan	2001
SB 1348	Brulte	Water Conservation	2002
SB 1384	Costa	Governance	2002
SB 1518	Torlakson	Agricultural Land Preservation	2002
AB 105	Wiggins	Agricultural and Water Omnibus Act	2004
SB 318	Alpert	Develop Desalinated Water Component	2004
SB 1087	Florez	Housing Elements	2005
AB 1420	Laird	Water Demand Management Measures	2007
SBx7-7	Steinberg	Water Conservation	2009
AB 2409	Nestande	Water Shortage Contingency Analysis	2010
AB 2067	Weber	Urban Water Management Plans	2014
SB 1420	Wolk	Water Management	2014
SB 1036	Pavley	Urban Water Management Plans	2014
SB 606	Hertzberg	Water Management Planning	2018
AB 1668	Friedman	Water Management Planning	2018
AB 1414	Friedman	Urban Retail Water Suppliers Reporting	2019

1.2.1 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 2020 is an update of the UWMP 2015. It is designed to satisfy the requirements of the Urban Water Management Planning Act and provide the public with a supply and demand report on EBMUD's progress in implementing conservation and water recycling programs, including efforts to secure supplemental water supply sources. The UWMP 2020 also contains data on EBMUD's compliance with SBx7-7, the state law mandating that urban water agencies reduce water use in order to achieve a statewide reduction of 20% by 2020. EBMUD prepared the UWMP 2020 to comply with all current applicable regulations and statutes. In adopting its UWMP, EBMUD commits to managing water demand efficiently using its water supplies to protect both its customers and its water and natural resources, and making every effort to ensure the appropriate level of water service reliability is met given varied water demands during normal, dry, and multiple dry years.

1.2.2 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 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 March 8, 2021, 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 2020 was distributed for review and comment beginning April 7, 2021 ending the comment period on May 12, 2021.

Notice of the public hearing and the public comment period and intent to adopt was posted in relevant newspapers on March 25 and April 1, 2021. A copy of the public notice and a list of newspapers with dates on which the notice was published are included in Appendix B. A notice of the hearing, virtual public comment meeting and the public comment period was also mailed to all parties included in EBMUD's 2020 mailing list on April 7, 2021, and was posted on EBMUD's website on the same date. EBMUD held a virtual public comment meeting on the Draft UWMP 2020 on April 29, 2021 in addition to the public hearing during the Board meeting on May 11, 2021 to further provide an opportunity for the public to provide input.

The UWMP 2020 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 22, 2021, the EBMUD Board of Directors adopted UWMP 2020 and the 2020 Water Shortage Contingency Plan. A copy of the adoption resolution is included in Appendix D. By July 1, the adopted UWMP 2020 was submitted electronically to the California Department of Water Resources (DWR) and by July 22, copies of the UWMP 2020 were sent to the California State Library, and cities, and counties within EBMUD's service area and posted on EBMUD's website.

1.3 THE EAST BAY MUNICIPAL UTILITY DISTRICT

1.3.1 FORMATION

The 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 Alameda and Contra Costa Counties created EBMUD in 1923 to provide water service. In 1929, upon completion of construction of Pardee Dam and the first Mokelumne Aqueducts, EBMUD began delivering water from the Sierra Nevada Mountains to customers in the East Bay.

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 its release into the San Francisco Bay. Wastewater treatment for those cities began in 1951 and later expanded to include the Stege Sanitary District, which includes Kensington, El Cerrito, and parts of Richmond.

1.3.2 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

FIGURE 1-1 **EBMUD SERVICE BOUNDARY**

implemented through the direction of the General Manager. Activities of EBMUD are guided by the following Mission Statement: "To manage the natural resources with which the EBMUD 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."

1.3.3 SERVICE AREA

EBMUD supplies water and provides wastewater treatment for a large part of Alameda and Contra Costa counties. Based on 2010 census data and Association of Bay Area Government's (ABAG) Projections 2040, approximately 1.4 million people are currently served by EBMUD's water system in a 332-square-mile area extending from Crockett on the north, southward to San Lorenzo and portions of Hayward (encompassing the major cities of Oakland and Berkeley), eastward from San Francisco Bay to Walnut Creek, and south through the San Ramon Valley (including Alamo, Danville, and San Ramon). The wastewater system serves approximately 740,000 people in an 88-square-mile

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	4.84	60	47	53	5.65	60	38	49
FEB	4.27	62	47	54	5.05	62	39	51
MAR	3.71	65	48	56	4.12	66	42	54
APR	1.92	67	50	59	1.98	70	44	57
MAY	0.67	69	53	61	0.7	73	48	61
JUN	0.21	73	56	65	0.15	80	52	66
JUL	0.03	75	58	66	0.02	84	54	69
AUG	0.07	75	58	67	0.06	83	54	69
SEP	0.31	76	58	67	0.25	82	52	67
OCT	1.48	73	55	64	1.38	76	47	62
NOV	3.17	65	50	58	3.22	67	42	55
DEC	4.45	58	45	52	4.97	59	38	49
ANNUAL	25.10	68	52	60	27.56	72	46	59

NOTE:
West-of-Hills rainfall data is based on measurements from the USL Water Treatment Plant Station for 1953-2019. West-of-Hills temperature data is based on measurements from the USL Water Treatment Plant Station for 2005-2019. East-of-Hills rainfall data is based on measurements from the Lafayette Reservoir station from 1953-2019. East-of-Hills temperature data is based on measurements from the Orinda Filter Plant Station from 2005-2019. Average WOH and EOH temperatures are computed using min/max values.

area of Alameda and Contra Costa counties along the Bay's east shore, extending from Richmond in the north, southward to San Leandro. EBMUD water customers include residential, industrial, commercial, institutional, and irrigation water users.

1.3.4 BOUNDARIES

The EBMUD water 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, detachments, or other changes of organization thereafter. The Ultimate Service Boundary 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 which is illustrated in Figure 1-1. Through the SOI, LAFCOs define the area that EBMUD can serve.

1.3.5 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 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 (referred to as west of hills, or WOH) 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 (referred to as east of hills, or EOH) 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 and 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.

1.3.6 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

Protected Watershed Lands — Carr Ranch

In 2016, EBMUD partnered with John Muir Heritage Land Trust (JMHLT) to protect the 604-acre Carr Ranch property in perpetuity. Holding title, EBMUD's ongoing role is to preserve the watershed and protect water quality, enhance wildlife habitat, maintain open spaces and natural scenery, and preserve the historical ranching heritage. JMLT manages permanent public access to Carr Ranch for light recreation such as hiking, wildlife viewing, dog walking and equestrian activities.

EBMUD owns and manages 57,000 acres of watershed lands in the East Bay and Sierra foothills. The newly protected Carr Ranch joins the watershed lands owned by EBMUD that drain into the Upper San Leandro Reservoir, a drinking water supply for tens of thousands of East Bay families. The undeveloped property provides habitat for endangered reptiles and amphibians — and for large animals such as deer, American badger, golden eagle, and mountain lion.

areas include Pleasant Hill, the San Ramon Valley, and Walnut Creek. Over the next 20 years, projected increase in water demand primarily results from expected increased densities in existing developed urban areas, as formerly lower consumption land uses are replaced with more intensive mixed uses and other developments. See Chapter 3 for more discussion of projected demands.

EBMUD owns and manages approximately 29,000 acres of land and water surface in the East Bay, including portions of the watershed lands that feed EBMUD's local reservoirs. There are numerous land uses on EBMUD-owned lands. The predominant agricultural land use is livestock grazing that reduces the danger of wildfires in the watershed and in the wildland/urban interface. EBMUD also leases its watershed lands for other agricultural uses such as Christmas tree and hay farming.

In 2018, EBMUD updated the East Bay Watershed Master Plan and addressed many contemporary issues that have arisen since the plan was adopted in 1996, such as climate change, invasive mussels, and toxic algae. It also incorporated plans for habitat conservation, grazing and fire protection, and proposed changes to allow limited access to specific watershed trails by cyclists. In addition, changes to the master plan seek to reduce the use of pesticides on the watershed. On May 22, 2018, the EBMUD Board of Directors, adopted a Negative Declaration analyzing the potential environmental impacts of the plan update, made findings related to the California Environmental Quality Act, and approved the East Bay Watershed Master Plan Update.

In 2017 EBMUD established the Oursan Ridge Conservation Bank (ORCB) which encompasses 430 acres of pristine watershed lands owned by EBMUD and located approximately 3 miles southeast of Pinole, California. EBMUD is the Bank Sponsor and the entity operating the ORCB. ORCB was approved by the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service to offer habitat credits for the California red-legged frog and the Alameda whipsnake. The sale of conservation credits helps support the continued protection of those species, both of which are listed under the California Endangered Species Act. The ORCB also preserves East Bay watershed lands for natural resources protection. Through the end of 2020, ORCB sold more than 32 of the bank's nearly 430 available credits.

EBMUD's East Bay watershed provides extensive recreational opportunities with recreational areas at Lafayette, San Pablo, and Chabot Reservoirs available for the public to use. The facilities vary at each recreation area, but they generally include opportunities for boating, fishing, and picnicking. Body contact recreational activities are prohibited to protect the drinking water supply and public health and safety. A recreational trail system also provides controlled public access to a large portion of the watershed. More information on the watershed trail system can be found at: *www.ebmud.com/recreation/east-bay/east-bay-trails*.

1.3.7 POPULATION PROJECTIONS

Customized population projections were developed for EBMUD's service area. The projections incorporated data from the U.S. Census Bureau and Association of Bay Area Governments (ABAG).

ABAG is responsible for forecasting changes to the population and economy and provides local governments with information on how the region is expected to change over time. EBMUD uses population data published in the Plan Bay Area Projections 2040[1]. The Plan Bay Area takes into account land use policy, using information from local plans and associated growth as well as legislative mandates, to provide the projected population growth. The ABAG projections show Alameda County growing by 577,000 people from 2010 to 2040, reaching a total of nearly 2.1 million people. Employment projections show the county gaining about 247,000 jobs in the same period. In Contra Costa County, ABAG forecasts that by 2040, the population will be over 1.3 million, an increase of approximately 335,000 people from 2010. Contra Costa County is also expected to add over 138,000 new jobs in the same period.

[1] The Projections document is a statistical companion to Plan Bay Area 2040, a plan adopted by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) in July 2017 to meet state law requirements for a coordinated land use and transportation planning process.

CITIES/TOWNS/CDPS IN SERVICE AREA

The 46 U.S. Census cities, towns, and Census Designated Places that are entirely or partially within EBMUD's service are divided into the following counties:

Alameda – Alameda, Albany, Ashland, Berkeley, Castro Valley, Cherryland, Emeryville, Fairview, Hayward, Kensington, Oakland, Piedmont, San Leandro, San Lorenzo.

Contra Costa – Acalanes RidgeRide, Alamo, Bayview, Blackhawk, Camino Tassajara, Castle Hill, Crockett, Danville, Diablo, East Richmond Heights, El Cerrito, El Sobrante, Hercules, Lafayette, Montalvin Manor, Moraga, Norris Canyon, North Richmond, Orinda, Pinole, Pleasant Hill, Reliez Valley, Richmond, Rodeo, Rollingwood, San Miguel, San Pablo, San Ramon, Saranap, Shell Ridge, Tara Hills, Walnut Creek.

EBMUD's service area spans portions of Alameda and Contra Costa counties. The population forecast is based on published data sets provided by:

- Census Tract data from Metropolitan Transportation Commission (MTC)/ABAG;
- Census Block data from National Historical Geographic Information Systems and;
- Unincorporated areas from Environmental Systems Research Institute.

EBMUD developed a method using GIS to parse out the population growth within the service area. Census tract data provided by ABAG was imported into GIS and overlaid on EBMUD's service area boundary. In cases where only a portion of the census tract was contained within the EBMUD service area, only a portion of the population was counted. A weighted census block to census tract ratio was developed for each individual census tract. These ratios were then applied to ABAG's

TABLE 1-3 **POPULATION PROJECTIONS**

REGION	2020	2025	2030	2035	2040
ALAMEDA COUNTY POPULATION WITHIN EBMUD SERVICE AREA	933,000	979,000	1,029,000	1,075,000	1,152,000
CONTRA COSTA COUNTY POPULATION WITHIN EBMUD SERVICE AREA	473,000	490,000	513,000	531,000	552,000
EBMUD SERVICE AREA	1,405,000	1,468,000	1,542,000	1,606,000	1,704,000
PROPORTION OF EBMUD SERVICE AREA POPULATION WITHIN ALAMEDA COUNTY	66%	67%	67%	67%	68%
PROPORTION OF EBMUD SERVICE AREA POPULATION WITHIN CONTRA COSTA COUNTY	34%	33%	33%	33%	32%

population projections. The population projections from 2020 to 2040 are summarized in Table 1-3.

1.4 The 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 1-2). The Mokelumne Aqueducts convey the Mokelumne River supply from Pardee Reservoir, located upstream of Camanche Dam, across the Sacramento-San Joaquin River Delta (Delta) to local storage and treatment facilities in the East Bay. After treatment, water is distributed to the incorporated cities and unincorporated communities in Alameda and Contra Costa counties that EBMUD serves.

Based on the historical average, approximately 90 percent of the raw water entering EBMUD's system originates from the Mokelumne River watershed, and approximately 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 about 627 square miles of mountains and foothills. The elevation in the watershed ranges from 235 feet at Camanche Dam to 10,000 feet in the headwater region.

Table 1-4 Mokelumne Basin Runoff & Climate Statistics

Month	Average Runoff[1] (ft^3/sec)	Average Precip.[2] (in)	Average Temp. (°F)
January	908	8.69	26
February	1142	7.96	26
March	1413	7.22	31
April	2161	4.1	35
May	3089	2.26	42
June	2032	0.78	50
July	469	0.23	58
August	88	0.26	58
September	59	0.77	52
October	106	2.65	43
November	317	5.49	33
December	641	7.9	26
Annual Total	1035	48.3	40

1 Average True Natural Flow at Mokelumne Hill Gaging Station, 1930-2019.
2 EBMUD 4-station average, 1930-2019.
3 Average temperatures from NOAA Blue Lakes station (GHCND:USS0019L05S), 1990-2019. National Climatic Data Center (http://www.ncdc.noaa.gov/).

1.4.1 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 early 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 contributes 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 the Pacific Gas and Electric Company. EBMUD diverts Mokelumne stream flow in Pardee and Camanche reservoirs. A portion of the water diverted at Pardee Reservoir is then conveyed to the EBMUD service area via the Mokelumne Aqueducts, and a portion of the stored water is released along with water that is allowed to pass directly through the reservoirs to meet downstream flow obligations. Jackson Valley Irrigation District obtains its water from the Mokelumne River through the Jackson Creek Spillway and Dike outlet located on the north arm of Pardee Reservoir.

1.4.2 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 and 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

FIGURE 1-2

EBMUD WATER SUPPLY SYSTEM

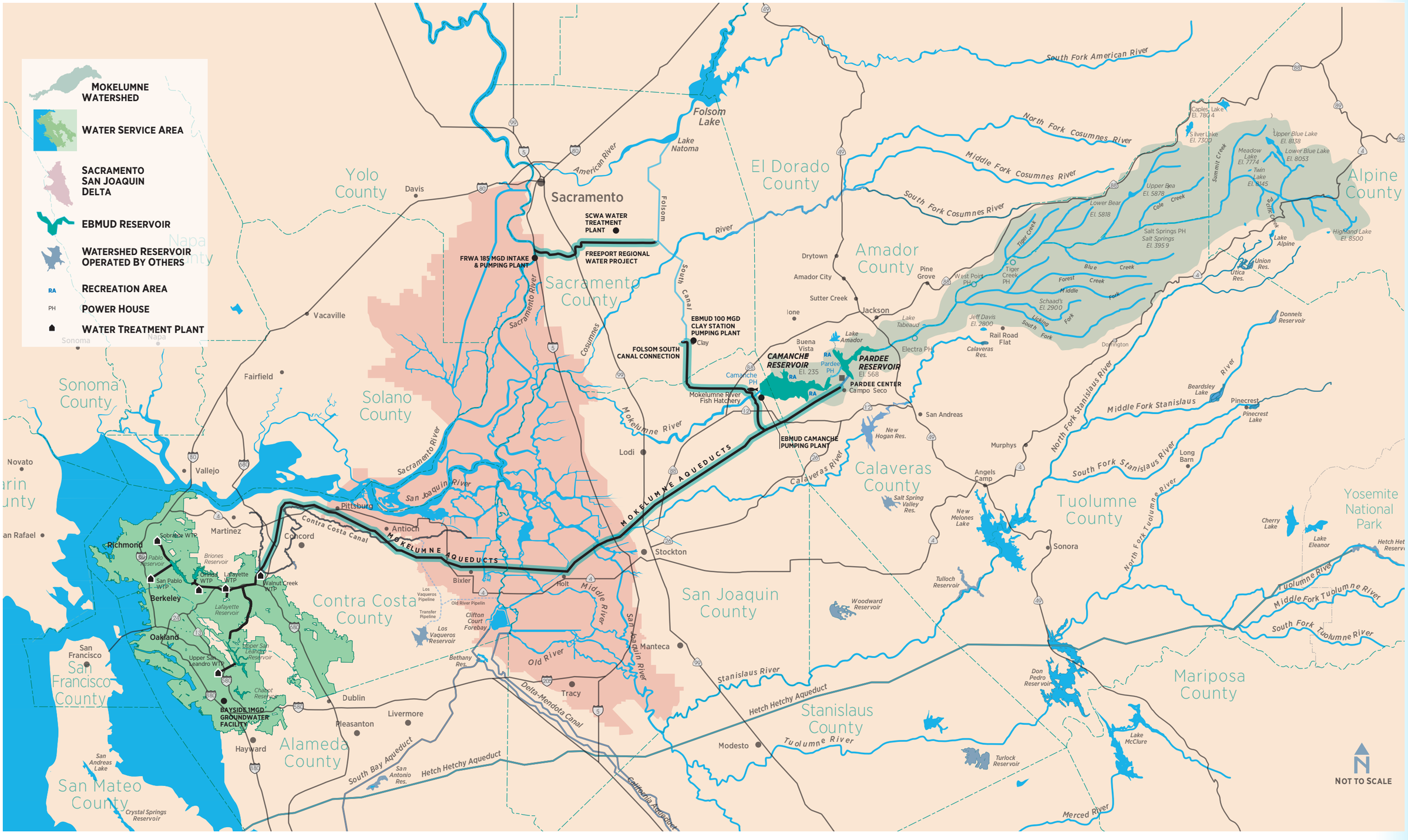
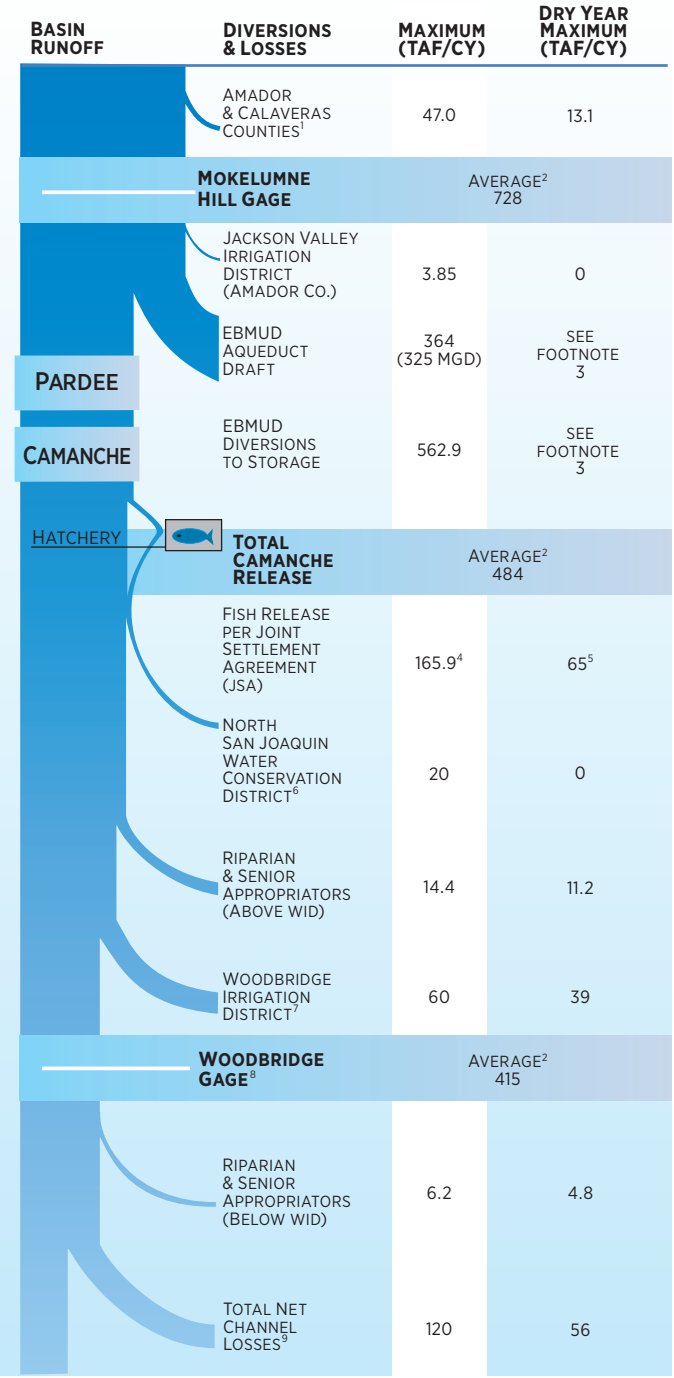


FIGURE 1-3 EBMUD FLOW COMMITMENTS



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. Varies with runoff and storage conditions.
4. Water releases committed by EBMUD to protect fishery per "Normal and Above" water year type under JSA criteria.
5. 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.
6. May be "0" if no water is available surplus to EBMUD needs.
7. 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.
8. Includes local runoff between Camanche and WID.
9. "Net Channel Loss" is defined as all met additions and losses in a river system. This includes components such as flow to and from adjacent groundwater, overland flow, direct precipitation to and evaporation from the channel, plant transpiration, and seepage losses to underlying groundwater.

(including winter sports facilities). There are minor industrial and commercial uses in the watershed, with logging as 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. More information on the Sierra foothills trail system can be found at: *www.ebmud.com/recreation/sierra-foothills/sierra-foothills-trails.*

1.4.3 WATER SUPPLY SOURCES

Mokelumne River Commitments

The Mokelumne River serves a variety of uses, including agriculture, fisheries, hydropower, recreation, and municipal and industrial use. 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 numerous flow release obligations. EBMUD's Mokelumne River flow commitments are determined by hydrology, water rights priorities, agreements with state and federal regulatory agencies, California State Water Resources Control Board (SWRCB) orders and decisions, federal directives, court decrees, and numerous agreements between EBMUD and other Mokelumne River users, both upstream and downstream of EBMUD's Mokelumne River facilities.

Figure 1-3 provides information regarding EBMUD's flow commitments, including maximum flows that could be required and flows during a typical dry year. 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.

To comply with the requirements of the 1998 Joint Settlement Agreement (JSA) among EBMUD, U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW), EBMUD continues to meet its flow commitment to protect the lower Mokelumne River by providing in-stream flow releases from EBMUD's Camanche Dam to improve fishery conditions. The Mokelumne River provides important habitat for fall run Chinook salmon, which migrate from the ocean and reach the Mokelumne

in late summer and early fall to spawn. In the spring, the juvenile salmon then migrate to the ocean, grow, and ultimately return to the Mokelumne two to three years later to spawn. Salmon spawn in the river below Camanche Dam and many also enter the Mokelumne River Fish Hatchery located at the base of EBMUD's Camanche Dam, where eggs are collected, fertilized, incubated, and raised for release in the spring.

In collaboration with the CDFW, the USFWS, and the National Marine Fisheries Service, EBMUD uses many strategies to protect and enhance Mokelumne River fisheries resources. These strategies include spawning and rearing habitat restoration, removal of non-native predator fish species below Woodbridge Irrigation District Dam, screening riparian diversions, conducting a comprehensive science program, and investing in one of the most modern and productive salmon hatcheries in the Central Valley. Additionally, Mokelumne origin salmon have comprised approximately 20% to 40% annually of the recreational and commercial catch off the California Coast.

East Bay Area Watershed and Hydrology Runoff Characteristics

EBMUD's secondary water supply source is local runoff from the East Bay area watersheds, which is stored in the terminal reservoirs within EBMUD's service area. The availability of water from local runoff depends on two factors: hydrologic conditions and terminal reservoir storage availability. In dry and critically dry years, evaporation can exceed runoff, resulting in net loss of local supply. Local runoff supplies the East Bay, on average, 23 MGD during normal hydrologic years.

Emergency Standby

EBMUD's terminal reservoir storage generally provides, among other uses, a 180-day (6-month) emergency standby reserve in the event of outages or failure of one or more of the Mokelumne Aqueducts. The local terminal reservoir system has a total capacity of 151,670 acre-feet. Due to the EBMUD's policy to maintain a standby water supply reserve, there is limited amount of storage available to capture and store local runoff.

USBR Central Valley Project Supply

During multi-year droughts, the Mokelumne River and local runoff alone cannot meet EBMUD's projected customer demands, even with mandatory water use restrictions. Furthermore, EBMUD's Mokelumne River supply is expected to be reduced as demands on the Mokelumne River increase from the growing needs of riparian users and small number of senior appropriators

EBMUD's Role as a Groundwater Sustainability Agency for the East Bay Plain Subbasin

In 2013, the District completed a Groundwater Management Plan (GMP) for the southern portion of the East Bay Plain Subbasin to coordinate regional planning and ensure sustainability of the East Bay Plain Subbasin; the GMP is available on the District's website.[1] In 2014, following completion of the GMP, the Department of Water Resources (DWR) approved the District's application to become the California Statewide Groundwater Elevation Monitoring Program (CASGEM) entity for the East Bay Plain Subbasin and the associated monitoring program.

As a result of three legislative bills (AB 1739, SB 1168, and SB 1319) signed into law in September 2014 and collectively known as the Sustainable Groundwater Management Act (SGMA), EBMUD initiated stakeholder outreach efforts in 2015 to identify eligible local agency interests in the formation of a Groundwater Sustainability Agency (GSA) for the East Bay Plain Subbasin. Stakeholders requested EBMUD to take the lead in SGMA compliance efforts and form a GSA as EBMUD was deemed suited to undertake the SGMA compliance responsibilities. On November 29, 2016, the District became an exclusive Groundwater Sustainability Agency (GSA) for the portion of the East Bay Plain Subbasin which underlies the District's service area pursuant to Water Code §10723.8(c) and (d). The City of Hayward is the GSA for the portion of the East Bay Plain Subbasin that underlies its service area. A description of the East Bay Plain Subbasin is provided in Appendix E.

As GSAs and because DWR has listed the East Bay Plain Subbasin as a medium-priority groundwater basin, EBMUD and the City of Hayward are responsible for completing a single Groundwater Sustainability Plan (GSP) for the East Bay Plain Subbasin by January 31, 2022. The GSP will establish management actions that ensure the East Bay Plain Subbasin is sustainable within 20 years of implementation. EBMUD and the City of Hayward will be responsible for implementing the GSP management actions. Progress on the status of the GSP will be available on EBMUD's website.

[1] https://www.ebmud.com/about-us/construction-and-maintenance/construction-my-neighborhood/south-east-bay-plain-basin-groundwater-management/

with water rights senior to those of EBMUD's in Amador, Calaveras, and San Joaquin counties.

EBMUD's efforts to identify additional sources of supply to meet long-term demand began in the mid-1960s. In 1970, EBMUD executed a contract with the United States Bureau of Reclamation (USBR) for delivery of Central Valley Project (CVP) water from the American River. In 2000, USBR, EBMUD, and Sacramento region parties reached an agreement to modify the contract and develop a joint water supply intake on the Sacramento River, rather than the American River. This agreement led to the construction of the Freeport Project, discussed in Section 1.4.4.

In 2006, EBMUD signed a Long-Term Renewal water service contract with USBR that modified its original contract for CVP supplies. The contract provided for delivery of up to 133,000 AF in a single qualifying year, not to exceed a total of 165,000 AF in three consecutive qualifying years. Qualifying years for obtaining CVP deliveries are those in which EBMUD's total stored water supply is forecast as of March 1, updated monthly through May 1, to be below 500 TAF on September 30 of that year. Because EBMUD relies on CVP deliveries during dry and critically dry periods, the CVP supply constitutes a critical component of EBMUD's water supply reliability. EBMUD exercised its contract and received CVP water during the 2014-2015 drought period. In 2014 EBMUD received 18,641 acre-feet of CVP water, and in 2015 EBMUD received 33,250 acre-feet of CVP water.

On February 28, 2020 the EBMUD signed a Contract with US Bureau of Reclamation (USBR) which "converted" its 2006 water service contract to a permanent repayment contract pursuant to the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act. The converted contract superseded the 2006 contract and removes the requirement to periodically renew the contract while retaining the other essential water service terms and conditions. Conversion to a permanent repayment contract is intended to protect EBMUD's water supply reliability from the uncertainty of regulatory requirements that may exist in year 2046, when the 2006 Long-Term Renewal water service contract was set to expire[1].

1.4.4 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 and pipelines that convey Mokelumne River water from Pardee Reservoir to EBMUD customers. EBMUD's facilities and operations are heavily regulated by numerous local, state, and federal agencies, as illustrated in Figure 1-4. Each of these facility types are deemed to be Critical Infrastructure/Key Resources (CI/KR) facilities, by the United States Department of Homeland Security.

Pardee Dam & Reservoir

Pardee Dam and Reservoir are located approximately 38 miles northeast of Stockton near the Town of

[1] The United States Bureau of Reclamation's approval of conversion of several CVP contracts to permanent repayment contracts, including EBMUD's contract, has been challenged in pending litigation.

Pardee Dam & Reservoir

Valley Springs. Pardee Dam, constructed in 1929, is a concrete gravity arch structure rising 345 feet above the riverbed. The reservoir has 37 miles of shoreline, a surface area of 2,260 acres, and a capacity of 203,795 acre-feet (AF) at spillway crest elevation (permitted quantity is 209,950 AFY). A 23.6-megawatt (MW) Pardee Powerhouse (based on generator nameplate capacity), located at the base of the dam, was placed in service in 1930 and generates 140 million kilowatt hours (kWh) during a median runoff year.

Pardee Reservoir is used principally for EBMUD's municipal water. Secondary uses include power generation; source supplies for Jackson Valley Irrigation District; recreation for the public; and protection and enhancement of the lower Mokelumne River ecosystem and fishery resources.

Camanche Dam & 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 capacity of 417,120 AF at spillway crest elevation (permitted quantity is 431,500 AFY). The 10.7-MW Camanche Powerhouse (based on generator nameplate capacity), located at the base of the dam, was placed in service in 1983 and generates 46 million kWh during a median runoff year. Camanche Reservoir also provides a variety of different recreation opportunities.

Camanche Reservoir is operated jointly with Pardee Reservoir to maintain numerous downstream obligations, which include stream flow for fisheries and riparian habitat, flood control, and obligations to downstream diverters.

Mokelumne Aqueduct System

Untreated water from Pardee Reservoir is transported approximately 90 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 50 hours to reach EBMUD's service area. The Pardee Tunnel is a 2.2-mile, 8-foot-high horseshoe structure that was constructed in 1929. The Mokelumne Aqueducts (see Table 1-5 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 design capacity of 202 MGD by gravity flow and up to 325 MGD with pumping at the three Walnut Creek Raw Water Pumping Plants.

Lafayette Aqueduct System

The system is a mix of cylinder pipe, cast-in-place concrete pipe, steel pipe, and tunnels. Lafayette Aqueduct No. 1 was constructed in 1926 and Lafayette Aqueduct No. 2, a parallel set of pipes and tunnels, was constructed in 1963. The system has undergone repairs and realignments (for example, the construction of Highway 24) over the years.

Lafayette Aqueduct No. 1 is a 2.9-mile long, 108-inch, cast-in-place, "horse-shoe" shaped pipe that was placed in service in 1929. The facility has been in near-continuous service since then.

Camanche Dam & Reservoir

Figure 1-4 **EBMUD and Regulatory Agencies**

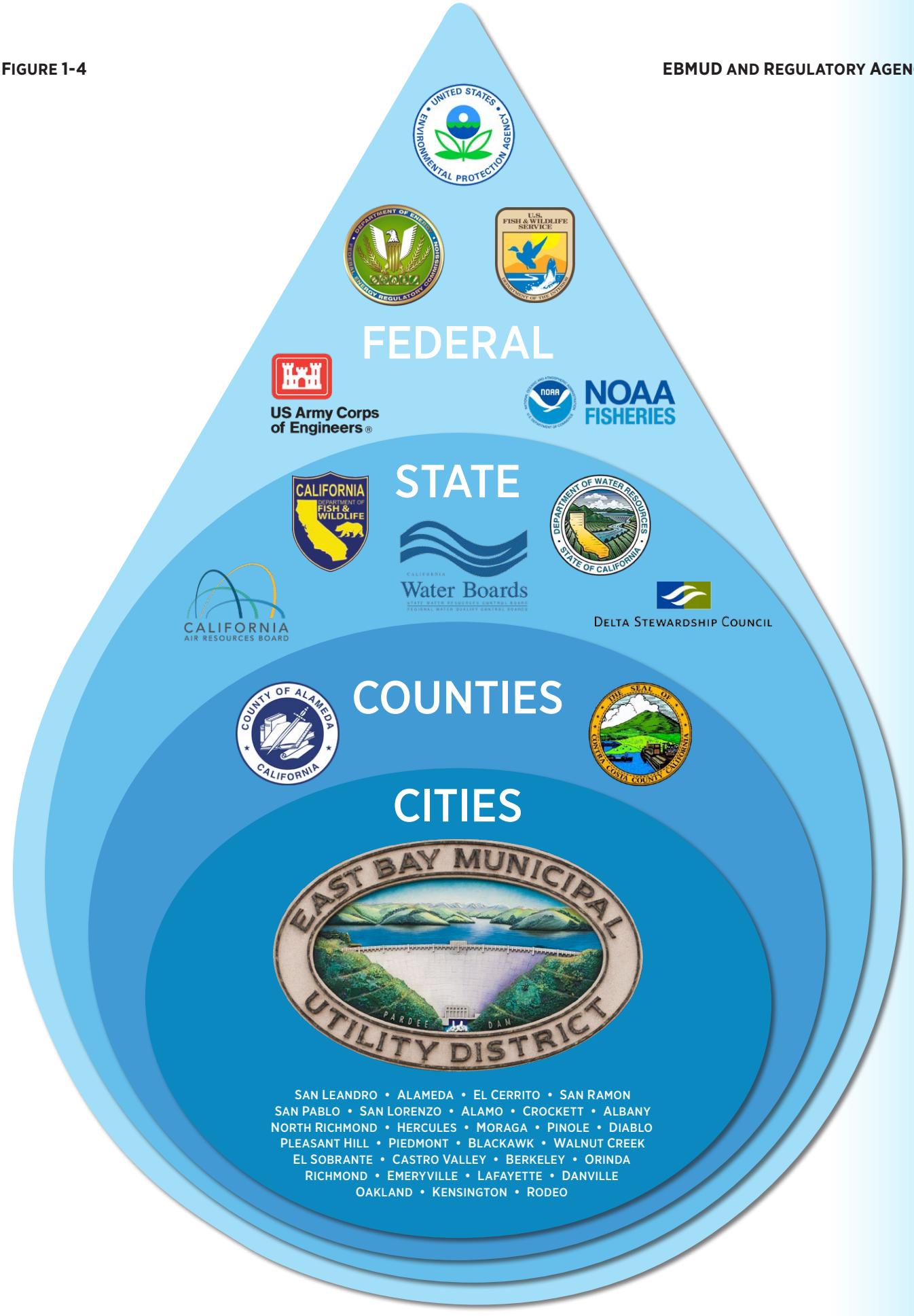


Table 1-5 EBMUD Water Supply System Characteristics

Reservoir Data		
Capacities		
Mokelumne River Facilities		
Pardee (licensed capacity)		209,950 AF
Camanche (permitted capacity)		431,500 AF
Service Area Facilities		
Local Terminal Reservoirs (East Bay)		151,670 AF
Maximum Elevations (at spillway crest)		
Pardee		567.7 feet
Camanche		235.5 feet
Dead Storage[1]		
Pardee		12,200 AF
Camanche		4,000 AF
Local Terminal Reservoirs (East Bay)		17,500 AF
Aqueduct Data		
	Gravity Flow	Pumped Flow
Maximum Capacity Total[2]	202 MGD	325 MGD
Aqueduct 1 (65-inch)	41 MGD	67 MGD
Aqueduct 2 (67-inch)	54 MGD	87 MGD
Aqueduct 3 (87-inch)	107 MGD	172 MGD
Hydropower Plant Capacities (Nameplate)		
Power Generation		
Pardee		23.6 MW
Camanche		10.7 MW

NOTE:
1 Dead storage capacity is defined as that volume of a reservoir below the level of the lowest outlet.
2 Aqueduct capacity is dependent on Pardee elevation. Higher flow rates (up to 325 MGD maximum capacity) require pumping at the Walnut Creek Pumping Plant.
AF = acre-feet; MGD = million gallons per day; MW = megawatts.

The Lafayette Aqueduct No. 2 is a 2.9-mile long, 108-inch, Mortar Lined and Coated (MLC) pipeline that was placed in service in 1963. The facility has been in continuous service since 1963. This Aqueduct system includes seven tunnel reaches along its alignment between Walnut Creek and Orinda Water Treatment Plants (Walnut Creek, Pleasant Hill, Lafayette Tunnels, Brown, Oak Hill, Dolores and Burton). The Lafayette Aqueducts supply the Orinda WTP, Walnut Creek WTP and Lafayette WTP. All of the Mokelumne Aqueduct flows under gravity and pumped conditions can be conveyed by Lafayette No. 2 Aqueduct.

Water Treatment Infrastructure

Water from Pardee Reservoir is transported to the EBMUD service area via the Mokelumne Aqueducts, which terminate in Walnut Creek. From Walnut Creek, the water is sent directly to EBMUD's three inline filtration water treatment plants (WTPs) or to the EBMUD five terminal reservoirs (see Figure 1-2).

EBMUD has six WTPs located in the EBMUD service area. Three of the WTPs are conventional treatment plants that use rapid mixing, flocculation, sedimentation, filtration, and free chlorine disinfection to treat water. Two of these plants, Sobrante and Upper San Leandro, also have ozone and peroxide for taste and odor control. The three inline WTPs have a simpler treatment process consisting of coagulation, filtration, and disinfection. They do not have a sedimentation process and rely on a pristine, low-turbidity raw water source in Pardee Reservoir. All the WTPs meet and exceed California drinking water regulations.

The three conventional WTPs – Upper San Leandro WTP, San Pablo WTP, and Sobrante WTP – treat water from EBMUD's terminal reservoirs. These three plants serve the northern and southern parts of the EBMUD distribution system west of the Oakland-Berkeley Hills.

The inline WTPs – Walnut Creek WTP, Lafayette WTP, and Orinda WTP receive water directly from Pardee Reservoir. Walnut Creek WTP and Lafayette WTP serve primarily the area east of Oakland-Berkeley Hills and Orinda WTP serves primarily the central parts of the area west of the Oakland-Berkeley Hills.

The conventional San Pablo WTP is typically out of service, except when needed to support construction outages of other facilities or other unusual circumstances. It was last utilized in 2015 to support EBMUD's drought operations. In the past EBMUD was restricted to treating CVP and transfer water in the conventional Upper San Leandro and Sobrante WTPs only. In 2015, EBMUD's drought operations necessitated processing a higher rate of CVP and transfer water, thus in addition to

Table 1-6 Water Treatment Plant Permitted Capacities

Water Treatment Plant	Permitted Capacity (MGD)[1]
Orinda WTP	175
Walnut Creek WTP	115
Lafayette WTP	35
Sobrante WTP	60
San Pablo WTP	50
Upper San Leandro WTP	60

NOTE:
1 Refers to permitted capacity issued by the State Water Resources Control Board (SWRCB) Division of Drinking Water. However, the actual treatment capacity may vary depending on raw water quality, season and other factors

bringing the conventional San Pablo WTP online, EBMUD also obtained a one-time approval from the SWRCB Division of Drinking Water in order to additionally treat Sacramento River water at inline WTPs. As a result, these dry year supplemental supplies were delivered directly to the Walnut Creek WTP and to Briones Reservoir. Table 1-6 provides the permitted capacities of the six WTPs.

East Bay Water Supply Reservoirs

There are five local water supply reservoirs (referred to as the terminal reservoirs): Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro (USL). The terminal reservoirs serve multiple functions that include:

- regulating EBMUD's Mokelumne River supply in winter and spring;
- augmenting EBMUD's Mokelumne River water supply with local runoff;
- providing emergency supply during extended drought or in the event of interruption in Mokelumne River supply delivery;
- providing local supply during high turbidity events in the Mokelumne River reservoirs;
- providing environmental and recreational benefits to East Bay communities; and
- providing some stream flow regulation

Of the five terminal reservoirs, only Briones, San Pablo, and Upper San Leandro provide water supply throughout the year to EBMUD customers; Chabot and Lafayette are not connected to the potable water distribution system but can be available as emergency standby supplies. Chabot and Lafayette reservoirs are primarily used for recreation (e.g., fishing, sailing, canoeing, hiking, jogging, bicycling, picnicking, walking, and nature observations) while Chabot also provides untreated water supply to two golf courses. Chabot can receive water from USL and local runoff while Lafayette can only be filled with local runoff.

Table 1-7 provides terminal reservoir capacity and water sources information.

Total System Storage and Total Operational Storage

Total Operational Storage (TOS) is the water supply volume accessible during standard operations. The TOS provides the most accurate reflection of total water supply available to meet the various demands on the system. TOS is a result of taking the Total

TABLE 1-7 TOTAL SYSTEM STORAGE, TOTAL OPERATIONAL STORAGE, AND TERMINAL RESERVOIR WATER SOURCES

UPCOUNTRY		CAPACITY (AF)
PARDEE		203,795
CAMANCHE		417,120
TOTAL MOKELUMNE		**620,915**
TERMINAL RESERVOIRS	**WATER SOURCES**	
BRIONES	MOKELUMNE AQUEDUCTS, BEAR CREEK	58,960
USL	MOKELUMNE AQUEDUCTS, SAN LEANDRO CREEK AND TRIBUTARIES	38,905
SAN PABLO	MOKELUMNE AQUEDUCTS, SAN PABLO CREEK, BEAR CREEK, AND BRIONES RESERVOIR	38,600
CHABOT	MOKELUMNE AQUEDUCTS, SAN LEANDRO CREEK, UPPER SAN LEANDRO RESERVOIR, AND MILLER CREEK	10,350
LAFAYETTE	LAFAYETTE CREEK[1]	4,250
TOTAL TERMINAL RESERVOIRS		**151,065**
TOTAL SYSTEM STORAGE		**771,980**
INACCESSIBLE VOLUME		74,500
TOTAL OPERATIONAL STORAGE		**697,480**

NOTE:
1 The raw water line for the Mokelumne Aqueducts was disconnected from the reservoir in 1971.
AF = acre-feet

System Storage (TSS), which is the sum of all reservoir volume capacities, while excluding inaccessible volumes. Inaccessible volumes can include dead or inactive storage; storage in reservoirs only to be used in extreme emergencies (i.e., Chabot and Lafayette reservoirs); and storage in reservoirs that is reserved for environmental releases (i.e., gainsharing water).

Dead or inactive storage refers to a portion of the reservoir storage capacity in which water cannot be drained by gravity through a dam's outlet works, spillway, or a treatment plant intake structures. Dead storage may also occur when sedimentation occupies space in a reservoir, thereby decreasing the available reservoir capacity for water. Since dead storage is inaccessible, it is always excluded from the EBMUD TOS.

As noted earlier, both Chabot and Lafayette reservoirs can be used as potential water sources during extreme emergency conditions but only after significant investment of resources; therefore, those storage capacities are considered to be inaccessible under current normal operations and as such, are excluded from EBMUD TOS.

Under the 1998 Lower Mokelumne River Joint Settlement Agreement (JSA) EBMUD agreed to increase instream flows beyond what is otherwise required by the JSA by an amount equal to 20% of the actual yield of additional water supplies developed by EBMUD from new facilities, up to a maximum of 20 TAF[1]. This additional water supply is referred to as "gainsharing" water which represents flows dedicated solely for the benefit of ecosystem enhancement; releases and schedules of gainsharing water are determined by fishery resources agencies. Since the JSA-required gainsharing water is already ear-marked for ecosystem enhancement, the volume of these prescribed flows is not considered accessible to meet water demands in service area and as such is excluded from EBMUD TOS.

The maximum Total Operational Storage (TOS) amounts to approximately 697 TAF. Table 1-7 presents the TSS and TOS volumes.

Distribution Facilities

After the water is treated at one of the WTPs, it is then distributed throughout EBMUD's service area, which is divided into 125 pressure zones ranging in elevation from sea level to 1,450 feet. Approximately 50 percent of treated water is distributed to customers purely by gravity. The water distribution network includes 4,200 miles of pipe, 131 pumping plants, and 167 water distribution reservoirs.

Water distribution reservoirs have a total system-wide capacity of 748 million gallons. The reservoirs, which are typically enclosed tanks, are sized to meet the estimated water service requirements of EBMUD's customers, including projected future water demands and fire flows. The tanks are located to provide the most effective water distribution to meet local needs, while simultaneously considering issues related to water quality, geology, seismic risk, land availability, environmental impact on the surrounding community, topography, customer elevation, economics, and conservation of hydraulic energy.

Freeport Regional Water Project

The Freeport Regional Water Authority (FRWA) is a joint powers agency created by EBMUD and the Sacramento County Water Agency (SCWA) in 2002 to implement the development of the Freeport Regional Water Project. The Freeport Project is used by SCWA to deliver water year-round, has been used by EBMUD to date to deliver water during drought periods, and as illustrated in Figure 1-2, and includes the following facilities:

- A 185-MGD water intake and pumping plant (with state-of-the-art fish screens) on the Sacramento River upstream of the town of Freeport;
- A pipeline, sized at various points from 72" to 84," that transports water eastward from the Sacramento River to both the existing Folsom South Canal and to the Agency SCWA's treatment plant;
- The aforementioned water treatment plant in central Sacramento County; and
- Approximately 20 miles of 72-inch diameter pipeline and two inline 100 MGD pumping plants that transport water from the southern end of the Folsom South Canal to EBMUD's Mokelumne Aqueducts.

Upon completion in 2011, the Freeport Project now allows EBMUD to divert and deliver CVP water and water from other sources upstream of the Freeport intake. Chapter 4 provides more information on EBMUD's water transfers program.

[1] Gainsharing water may only be used once during any drought sequence.

CHAPTER 2 – WATER SUPPLY SYSTEM RELIABILITY

2.1 VULNERABILITIES IN THE WATER SUPPLY SYSTEM

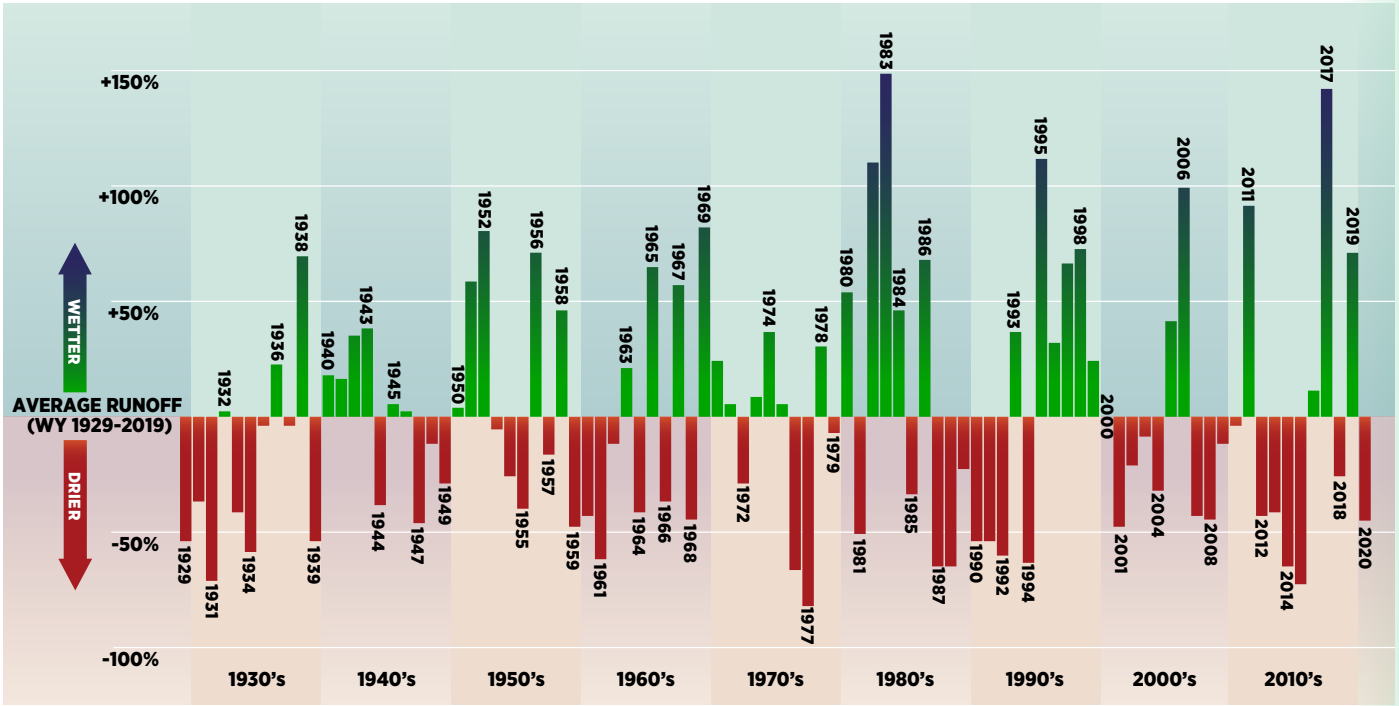
The reliability of EBMUD's water supply sources and distribution system is affected by many factors with varying degrees of impact. Droughts, water quality impacts due to wildfire, and climatic variations can adversely affect the availability of EBMUD's water supplies. Sudden catastrophic interruptions can also compromise the availability of water. The structural strength of the Mokelumne Aqueducts where they cross the Delta region could be undermined by a levee failure, especially during flooding and earthquakes. Federal authorities have also 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 (e.g., caused by a wildfire, storm, or landslides in the watershed) 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. EBMUD has invested in strengthening its infrastructure by installing large and small emergency interties with adjacent water agencies, structurally strengthening key facilities, replacing deteriorating pipes and tanks, creating a comprehensive Emergency Operations Plan, and developing mutual aid agreements which will support water supply reliability during water system failures.

2.1.1 HYDROLOGIC VARIABILITY

Northern California's water resources, including EBMUD's supplies, have historically been stressed by periodic drought cycles. Multi-year droughts in particular have significantly diminished the supplies of water available to EBMUD's customers. Figure 2-1 illustrates the variability in runoff in the Mokelumne watershed since 1929.

Annual snowfall amounts and runoff are naturally variable and that is likely to continue in the future. Natural hydrological variability is hard to predict, hence there are many sources of uncertainty associated with water supply reliability from year to year. EBMUD has in place policies and procedures to forecast and then adaptively manage operations as well as contingency plans to handle water shortage situations. Attachment 1 - Water Shortage Contingency Plan includes the details of EBMUD's drought management program and provides an assessment of the reliability of water

FIGURE 2-1 **VARIABILITY IN MOKELUMNE WATERSHED RUNOFF 1929-2020**



service for EBMUD customers during normal year, single dry, and multiple dry periods.

2.1.2 CLIMATE CHANGE

EBMUD recognizes climate change is a growing threat to the reliability of water resources. In preparation for the future uncertainties associated with climate change, EBMUD has undertaken a rigorous evaluation of potential impacts.

EBMUD continually considers climate change impacts and takes actions to understand, mitigate, and adapt to those impacts. EBMUD maintains a Climate Change Monitoring and Response Plan (CCMRP) to inform planning efforts for future water supply, water quality, and infrastructure, and to support water and wastewater infrastructure investment decisions. Assessments were made to identify potential impacts to EBMUD in the areas of water supply and demand, water quality and the environment, flood control management, infrastructures, and energy

- In water supply, decreased runoff and timing of runoff poses impacts to carryover storage.
- Water demand and usage could increase as a result of warmer climate, as well as result in increased frequency of rationing due to water supply shortages.
- Water quality could decrease as a result of warmer air temperatures shifting in spring runoff, and increasing peak runoff. Managing cold water pool levels in Camanche and Pardee Reservoirs becomes more challenging with more frequent dry water year types and warming rivers and reservoirs. Any modifications to temperatures in the river could lead to impacts to fisheries.
- Rising sea levels could lead to increase in storm surge flood events, thereby posing challenges for flood control management due to the timing of the runoff and increased peak runoff. Sea level rise could damage infrastructure in the Delta and near the shore; primary concerns for EBMUD include the potential inundation of the Mokelumne Aqueducts from levee failure/overtopping in the Delta.
- Lastly, climate change could negatively affect hydropower generation as a result of changes in runoff timing and patterns, and management of cold water pool. The electricity transmission lines could lose transmitting capacity in high air temperatures, and there is an increase in the probability of wildfire exposure for some major transmission lines.

Adaptation and mitigation strategies are covered in the CCMRP to address these various potential climate change impacts.

Consistent with EBMUD's Energy Policy, EBMUD completes an annual greenhouse gas (GHG) emissions inventory and continually works to reduce GHG emissions; both of these efforts are consistent with EBMUD's Energy Policy. EBMUD's goal for the water system is to eliminate GHG emissions for indirect and direct emissions by 2030. EBMUD's goal for the wastewater system is to eliminate indirect GHG emissions and reduce direct GHG emissions by 50 percent compared to 2000 levels by 2040. Direct emissions are emissions from sources controlled by the District, including the burning of fossil fuels and emissions related to wastewater processes. Indirect emissions are emissions from the District's purchase of electricity.

Attachment 1 contains more detailed discussions on how climate change has been integrated in the demand-supply assessment.

2.1.3 REGULATORY CONSTRAINTS

EBMUD's water supply system operating goals and objectives must conform to state and federal law, to State Water Resources Control Board (SWRCB) Decisions, Court Decisions, Federal Energy Regulatory Commission (FERC) Licenses and Orders, and various water right licenses, permits, and contractual agreements. EBMUD is obligated to meet multiple operating objectives, including providing municipal water supply, stream flow regulation, fishery/public trust interests, recreation, hydropower generation, flood control, temperature management, and release obligations to downstream diverters.

Water Rights

EBMUD's ability to use its full entitlement of Mokelumne River water is constrained by various regulatory requirements and the terms and conditions set forth in the state-issued water right licenses and permits that grant EBMUD the right to serve its customers from the Mokelumne River. Although EBMUD's water supply system was designed and constructed to deliver 325 MGD, the extent to which EBMUD's water rights can be exercised, especially in dry years, is further constrained by other Mokelumne River water users with water entitlements that hold water rights that are senior to those held by EBMUD.

EBMUD holds two municipal water rights on the Mokelumne River allowing it to divert up to 325

MGD for use within its service area. In June 1956 the State Engineer (SWRCB's predecessor) issued the junior water right Permit 10478 which allowed EBMUD to expand its existing Mokelumne Project and construct Camanche Reservoir and associated facilities. In 1964 EBMUD completed construction of Camanche Reservoir to store and use waters diverted under EBMUD's Mokelumne River water rights. Permit 10478 identified December 1, 2000 as the date by which EBMUD was to have completed application of the water to beneficial use. In November 2000 EBMUD filed a petition with the SWRCB to extend and continue the terms of the Permit to the year 2040. In 2016, SWRCB issued Order WR-2016-0019-EXEC approving the petition for extension of time until year 2040.

During critically dry years, EBMUD's water rights can also be constrained by SWRCB. In June 2014 and April 2015, the SWRCB issued Notices of the Unavailability of Water Supply for diversions based on a water priority date of 1914 or later. During these curtailment periods, EBMUD was restricted from diverting and storing the late spring natural river flow subsequent to the notice, until the curtailment notice was lifted by the SWRCB in late fall. During the curtailment periods, EBMUD relied on water that was previously stored to maintain water delivery to its service area.

Federal Hydropower License

The Federal Energy Regulatory Commission (FERC), which regulates hydroelectric generating facilities, issued a license for the Lower Mokelumne River Project 2916 on March 3, 1981 for 50 years, expiring on March 10, 2031. This license sets requirements for Pardee and Camanche reservoirs and dams. These regulations prescribe terms for operations related to dam safety, public safety, recreation use, and environmental protection. Under the FERC license and through an agreement with U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife, referred to as the Joint Settlement Agreement (JSA), EBMUD releases flows to the lower Mokelumne River to improve water quality, flow regimes, and local physical habitat for the benefit of the river's fish populations, riparian zones, associated uplands, and recreational angling. Additional efforts to improve the health of the river ecosystem have been implemented through the Water Quality and Resource Management Program (WQRMP). The WQRMP includes a comprehensive monitoring and applied research program integrated with a well-coordinated program to adaptively manage water and power supply operations, flood control, hatchery operations, and ecosystem rehabilitation actions.

Bay-Delta Water Quality Control Plan

The California SWRCB is in the process of preparing an update to the Bay-Delta Water Quality Control Plan (Bay-Delta Plan). The updated Bay-Delta plan will identify (1) beneficial uses of water, such as municipal and industrial use, fisheries use, and agricultural uses of water; (2) water quality objectives to protect those beneficial uses; and (3) a program of implementation to achieve the water quality objectives. The last comprehensive update of the Bay-Delta Plan was conducted by the SWRCB in 1995, with minor amendments in 2006.

The SWRCB is also preparing California Environmental Quality Act environmental documentation, a Substitute Environmental Document (SED), on the proposed updates to the Bay-Delta Plan. The timing of the release of the proposed updated Bay-Delta Plan and the draft SED, as well as their finalization, is to be determined. EBMUD is participating in the Bay-Delta update process to ensure that any proposed changes affecting the Mokelumne River do not undermine the fisheries' success attained under the existing JSA on the Mokelumne River, and do not adversely affect the continued viability of the EBMUD Mokelumne River supply that provides vital water to its service area.

2.1.4 WATER SUPPLY QUALITY

EBMUD provides safe, reliable drinking water every day, which consistently meets or surpasses state and federal health standards. EBMUD also sets internal water quality goals that are more stringent than regulatory standards, and which EBMUD uses to guide its operations to ensure regulatory compliance.

Mokelumne River Water Supply

As EBMUD's primary water supply from the Mokelumne River comes from a mostly undeveloped watershed, it typically requires only limited treatment to meet or surpass health standards. EBMUD continues to protect Pardee Reservoir through conservation easements purchases in adjacent areas where there could be significant residential development, which could potentially degrade reservoir water quality. 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 toxins.

Wild and Scenic Designation

In June 2018, thirty-seven miles of the Mokelumne River upstream of Pardee Reservoir were designated California's 12th Wild and Scenic River through the signing of SB 854 by Governor Brown. The designation was the culmination of a multi-year collaborative effort involving local governments, utility agencies, NGOs, and State representatives and senators. As part of the effort, the California Natural Resources Agency authored the Mokelumne River Wild and Scenic River Study Report, which included recommendations to protect local water supplies and the river's natural values.

Further, EBMUD and its partners in the Upper Mokelumne River Watershed Authority (UMRWA) are implementing forest health projects that improve wildfire resiliency and protect water quality, particularly in areas along roadways where wildfires are most likely to ignite. Contracted crews are also restoring meadows to improve water quantity and quality. As of fall 2019, nearly 4,000 acres of overgrown forest have been treated[1] or are under contract for completion. UMRWA is completing its third year of forest management work aimed at improving forest health north of Highway 4 between Cottage Springs and Bear Valley. Catastrophic wildfires in the Mokelumne Watershed would significantly impact the quality and reliability of EBMUD's supply. Forest thinning, meadow restoration, and related projects reduce that threat.

To further help safeguard public health with respect to water quality implications, EBMUD and county health departments post warnings to notify the public about fish consumption and potentially elevated mercury levels in reservoirs and lakes. EBMUD and county health departments have posted health warnings to notify the public about fish consumption and potentially elevated mercury levels in reservoirs and lakes throughout California. Mercury in the foothills, including in Pardee and Camanche reservoirs, has been associated with historical gold mining activity; however, mercury has never been detected in EBMUD's water supply from Pardee or Camanche Reservoirs at levels above the California Public Health Goal (PHG) of 0.2 micrograms per liter (µg/L). It can, however, bioacculumate in the tissue of fish over their lifetime, therefore necessitating public warnings about fish consumption.

Drought, fire, and extreme weather present water quality challenges for EBMUD. The majority of the watershed is considered "very high" or "high" risk[2] for wildfire due to overgrowth and historical aggressive replanting of commercial lumber trees after logging activities. The water treatment plants that treat water from the Mokelumne River use inline filtration, a technology with limited capabilities. High intensity wildfire followed by subsequent heavy rainfall results in large quantities of sediment, organic material, and other contaminants washing into the river. The inline Water Treatment Plants (WTP) cannot remove large amounts of organic material or even modest amounts of sediment. In addition, major wildfires can lead to elevated concentrations of nutrients in the water, supporting algal growth. These impacts can last for many years depending on the size of the fire.

In September 2015, the Butte Fire burned over 70,000 acres of forest, including a 12,000- acre section of the Mokelumne watershed. This was followed by the first relatively wet winter in four years (2016); the next winter (2017) was the wettest since 1995. During winter storms, runoff in the watershed carried accumulated debris from the drought, including loosened soil and burned materials from the fire, into the river and reservoir.

[1] "Treated", for the purposes of the watershed protection efforts, means using various technologies to reduce fuel loads and remove excess vegetation. Biologists identify, count, and mark the large native trees to be left undisturbed and create a plan for removal of the smaller trees and brush that is minimally disruptive to resident and migratory animals and achieves the target densities of the native tree species. Examples include mastication, selective manual logging, use of grazing animals, and prescribed burns. The method(s) selected depend on the individual site conditions.

[2] Buckley, M., N. Beck, P. Bowden, M. E. Miller, B. Hill, C. Luce, W. J. Elliot, N. Enstice, K. Podolak, E. Winford, S. L. Smith, M. Bokach, M. Reichert, D. Edelson, and J. Gaither. 2014. "Mokelumne watershed avoided cost analysis: Why Sierra fuel treatments make economic sense." A report prepared for the Sierra Nevada Conservancy, The Nature Conservancy, and U.S. Department of Agriculture, Forest Service. Sierra Nevada Conservancy. Auburn, California. Online: http://www.sierranevadaconservancy.ca.gov/mokelumne.

In order to be prepared for a scenario in which the Mokelumne River supply becomes temporarily unavailable, terminal reservoirs are normally operated so they can provide 180 days of standby storage at reduced consumption. After the severe winter storms in January 2017 described above, turbidity in Pardee Reservoir exceeded the water quality limits that EBMUD inline plants could reliably treat to meet regulatory standards. The Mokelumne Aqueducts were shut down for 69 days, the longest recorded shutdown duration for a water quality event, and the fourth since 1982. During this event, water from Briones Reservoir supplied the inline plants.

In addition to the high turbidity, during the spring and early summer of 2017, EBMUD found elevated levels of trihalomethanes (THMs) in the distribution system, in areas served by Pardee water via the inline plants. THMs are a group of regulated disinfection byproducts formed by reactions between natural organic matter and chlorine. Natural organic matter is present in all natural waters from decomposition of plants and organisms in the watershed and in the water. EBMUD adds chlorine to the water for disinfection as part of the water treatment process. The THM concentrations in 2017 were higher than they had been in twenty years. Drought, fire, and heavy runoff likely led to a change in the quality of Pardee Water, which resulted in the increase in THM levels. In response to the elevated THMs, EBMUD implemented numerous operational and system changes, and the concentrations returned to normal in late summer 2017.

Sacramento River Water Supply

Sacramento River water quality is highly variable and can require additional treatment compared to water from Pardee Reservoir. Turbidity can be very high on the Sacramento River, though much of the turbidity settles out as the water travels slowly through the Folsom South Canal (FSC) as part of EBMUD's diversion. Algae can also grow in the FSC, degrading water quality. On average, Sacramento River water has higher concentrations of turbidity, organic carbon, taste and odor causing compounds, nutrients, and various inorganic constituents, compared to Pardee water.

During the drought in 2014 and 2015, EBMUD diverted water from the Sacramento River to the East Bay through the Freeport Regional Water Project (FRWP) and Folsom South Canal Connection (FSCC) in order, to supplement the supply from Pardee Reservoir. The water was primarily diverted to San Pablo and Upper San Leandro reservoirs, blended with the waters in these reservoirs and eventually treated at EBMUD conventional water treatment plants. In 2015, some of the FSCC water was also diverted to Briones Reservoir, blended, and further treated at Orinda Water Treatment Plant (WTP); and for thirty days in 2015 the supplemental supply was sent

directly to Walnut Creek WTP for treatment. During this period, Walnut Creek WTP was able to treat the FSCC water to comply with regulatory standards, but some customers reported objectionable taste and odor associated with the treated FSCC water.

Two taste and odor-causing compounds formed by algae are geosmin and 2-methylisoborneol (MIB). These compounds do not pose a health threat; however, they create an earthy or musty taste and odor that is objectionable to customers at very low concentrations. Geosmin and MIB are present every year in both San Pablo and Upper San Leandro Reservoirs, but generally not in Pardee Reservoir. In spring and summer 2018, high levels of these compounds, were present in San Pablo Reservoir. Both the Sobrante and Upper San Leandro WTPs have the capability to add ozone to the water, which is effective for controlling geosmin and MIB. In early 2018 the ozonation equipment at both treatment plants was being replaced; therefore ozonation was not available when the Sobrante WTP was started up to meet seasonal demands. EBMUD installed a temporary powdered activated carbon treatment system at Sobrante WTP to reduce the levels of MIB and geosmin in the treated water until the newly upgraded ozonation facilities were available.

As evident from the past five years, unexpected events cause water quality challenges that require planning, adaptability, and fortitude. In order to continue to ensure sound preparedness with respect to water quality, EBMUD is planning water treatment plants upgrades and improvements that will render the system even more resilient in the face of future extreme weather events and natural disasters. Many of these changes are currently in the design phase and will be constructed in the next five to ten years.

2.1.5 EARTHQUAKES

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 faults pose varying degrees of risk to the water distribution system and to the Mokelumne Aqueducts in the Delta area. These faults include the San Andreas, San Gregorio, Rodgers Creek, Hayward, Calaveras, Concord, Antioch, Greenville, Mt. Diablo Thrust, Midland, and others, as depicted in Figure 2-2. The most significant seismic threat comes from the Hayward Fault. See Table 2-1 for a list of significant earthquakes that have occurred in the Bay Area since 1836.

In addition to the faults located in EBMUD's service area and aqueduct right-of-ways, EBMUD's Mokelumne River facilities are also located in a seismically active area. In 2020, EBMUD completed a study that evaluated the surface-fault rupture and seismic hazard posed by faults within the Foothills Fault System near Pardee Dam. Two faults were classified as "inactive" per state criteria (no fault rupture in the past 35,000 years), and five of the faults were classified as either active or conditionally active. However, that probabilistic fault rupture hazard analysis concluded that the surface fault rupture displacement hazard to Pardee Dam is very low to negligible. Seismic hazard analysis parameters were developed based on the nearby fault sources within 10 km of Pardee Dam.

However, a seismic study in 2010 did conclude that a major earthquake on the Foothills Fault System could cause liquefaction of the tailings materials under the Camanche Main Dam embankment. The resultant deformation would likely be limited to the downstream toe area and would not affect overall dam stability nor lead to dam failure. It has also been determined that seismic activity could compromise the Mokelumne Aqueducts and their supports as they cross the Delta where the soils are subject to liquefaction, either directly or via levee failure.

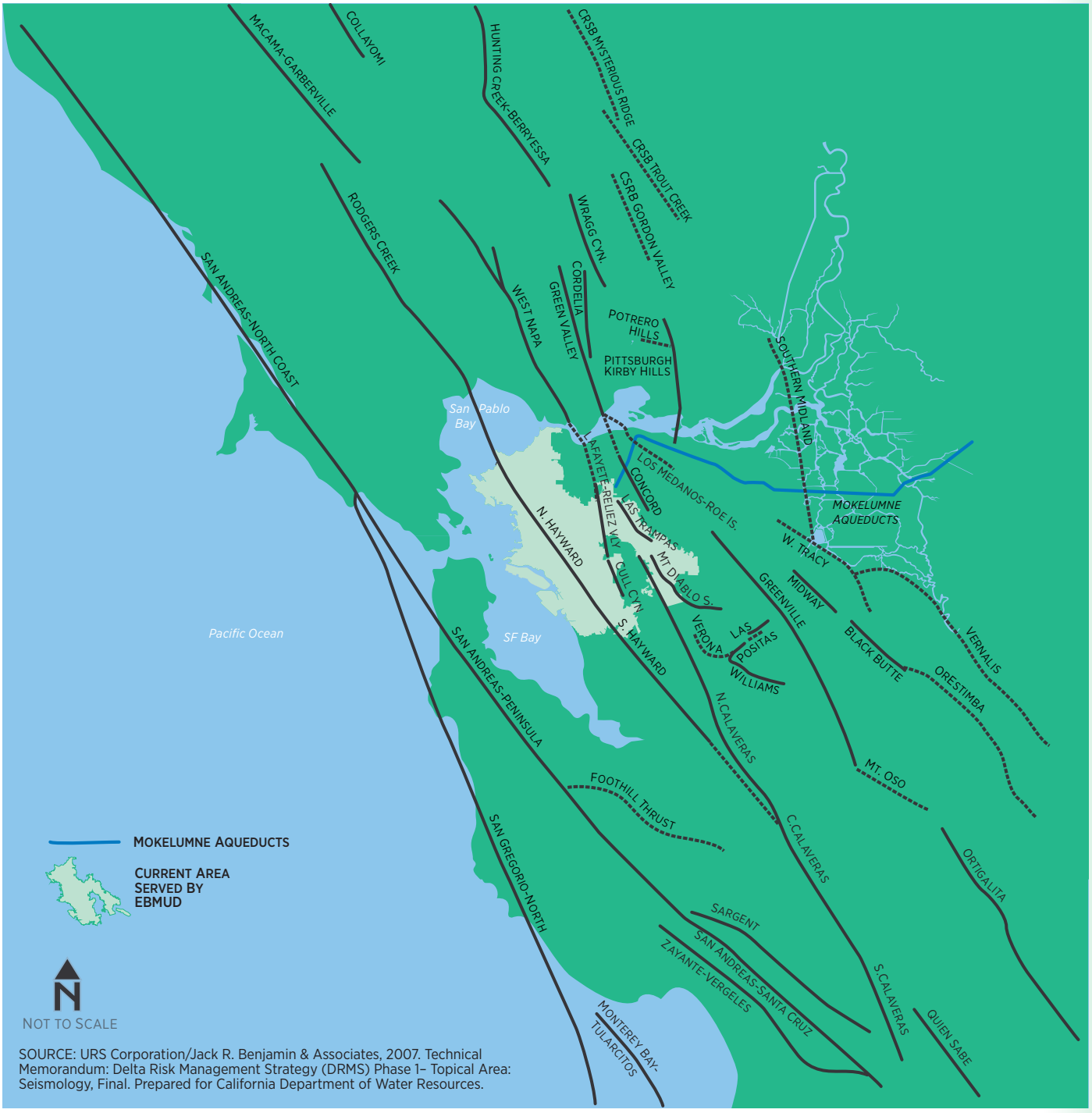
2.1.6 DELTA FLOODS

There is a long history of levee failures in the Delta, including the region where the Mokelumne Aqueducts cross the Delta in transporting water supplies from source to service area. EBMUD experienced a near-catastrophic event in 1980 when Lower Jones Tract flooded and the railroad embankment adjacent to the Mokelumne Aqueducts

TABLE 2-1 SIGNIFICANT BAY AREA EARTHQUAKES

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
2014	WEST NAPA	6.0

FIGURE 2-2 **SAN FRANCISCO BAY AREA REGION FAULTS**

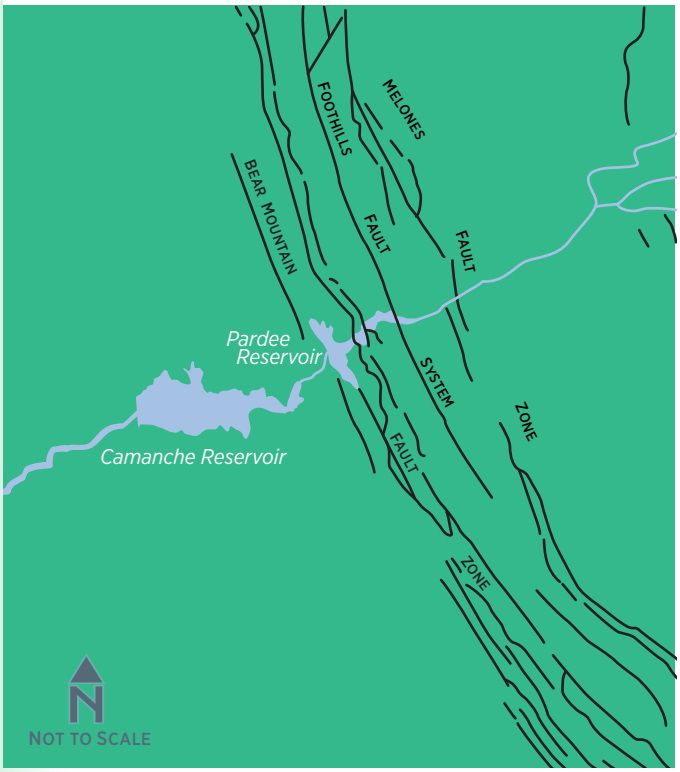


SOURCE: URS Corporation/Jack R. Benjamin & Associates, 2007. Technical Memorandum: Delta Risk Management Strategy (DRMS) Phase 1– Topical Area: Seismology, Final. Prepared for California Department of Water Resources.

subsequently failed, allowing floodwater to flow into Upper Jones Tract. This event nearly undermined the Mokelumne Aqueduct supports in the area.

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 Mokelumne Aqueducts remained in full operation the entire time. Subsequent investigation of the damage concluded that the aqueducts and their supports were structurally sound while the exterior coatings of the aqueducts and the maintenance road and drainage system sustained damage.

FIGURE 2-3 **UPCOUNTRY AREA REGION FAULTS**



2.2 IMPROVEMENTS TO THE WATER SUPPLY SYSTEM

To improve the reliability of its water supply, EBMUD implements infrastructure upgrade programs and projects, maximizes resources through continuous improvements in the delivery and transmission of available water supplies, and makes investments to ensure the safety and resilience of its existing water supply facilities.

2.2.1 INFRASTRUCTURE IMPROVEMENT PROJECTS

EBMUD has developed a number of programs and projects to improve the reliability of its water supply system. These programs span all segments of the water supply system, including transmission, treatment, and distribution. Projects like the Large Diameter Pipeline Master Plan and the Pipeline Rebuild Program demonstrate EBMUD's commitment to proactively replace aging infrastructure, reduce main breaks, and minimize customer service outages.

Raw Water Master Plan

In 2014, EBMUD completed a Raw Water Master Plan (RWMP) analyzing all elements of the raw water system, including upcountry reservoirs, terminal reservoirs, the Mokelumne and Lafayette Aqueducts, and associated facilities. The RWMP evaluated whether these facilities were operating as designed and identified system enhancements needed to meet future requirements. EBMUD plans to update the RWMP in 2024.

The RWMP evaluated the vulnerability of raw water system components to earthquake events and considered the potential impact of flooding of Delta islands through which the Mokelumne Aqueducts pass. Projects were identified, evaluated, and prioritized with the broad objective of sustaining and improving reliability, robustness, and operability. EBMUD has used results from the RWMP to prioritize potential projects for its capital improvement program. Specific high priority proposed projects identified in the RWMP include relining the three Mokelumne Aqueducts; conducting a seismic/structural assessment of Lafayette Aqueduct Number 2; implementing seismic improvements at Briones tower; and conducting a comprehensive assessment and developing an upgrade or rehabilitation plan for Briones Center.

Levee Improvements

EBMUD's Mokelumne Aqueducts are vulnerable to flooding in the Delta. Since the early 1980's, EBMUD has voluntarily contributed a total of about $16 million towards levee repairs and improvements on the five Delta islands that protect the Mokelumne Aqueducts. Levee improvements have included raising the crest at least one foot above the 100-year flood level, widening the crest, reducing levee slopes, and adding riprap to reduce wind-wave erosion.

For several years, EBMUD has worked cooperatively with the levee reclamation districts responsible for maintaining the levees that protect the Mokelumne Aqueducts. Most recently in 2017, EBMUD and several reclamation districts applied for and were awarded a grant by the California Department of Water Resources (DWR) to assist the Reclamation Districts with improving the levee systems that protect EBMUD's water supply aqueducts from flood related damage. The DWR awarded the grant funding in early 2017 and subdivided the shares into 85 percent state ($13.6 million) and 15 percent local ($2.4 million to be paid by EBMUD).

Delta Interconnection Project

As previously noted, the Mokelumne Aqueducts are vulnerable to seismic events and Delta flooding. In 2007 EBMUD completed a risk-based alternative analysis and recommended short- and long-term projects to mitigate risks in the Delta. In 2014 EBMUD

completed the recommended short-term mitigation through completion of the Mokelumne Aqueduct Interconnection Project which improves the reliability of EBMUD's water supply by both increasing the operational control and flexibility of the raw water supply system in the event of a disaster in the Delta, and by reducing the risk of a prolonged outage. These objectives were accomplished by bypassing segments of the Mokelumne Aqueducts that may be damaged by a levee failure or seismic event. The Delta Interconnection project installed valves, piping, and associated appurtenances on both the east and west sides of the Delta alignment to be able to isolate potentially damaged pipelines within the Delta after a flood or earthquake event. EBMUD's recommended long-term mitigation measure for protecting its raw water supply is to construct a tunnel across the Delta. EBMUD is actively advancing the preliminary design of the Delta Tunnel: in 2014 a conceptual design study was completed; and in 2018 a comprehensive geotechnical investigation program was developed. The preliminary design and conceptual engineering work is in progress to provide information for the Project Description in advance of initiating CEQA review. Conceptual engineering work in progress includes detailed analysis of the geotechnical data, soil structure interaction modeling, alternatives analysis, environmental studies, cost estimating, and preliminary design.

Large Diameter Pipeline Master Plan

EBMUD's water transmission system within the service area includes approximately 332 miles of large diameter pipelines, defined as any pipeline 20 inches or greater in diameter. EBMUD's past approach for selecting which large diameter pipes to replace was based solely on break history data analyses. In order to shift to a more proactive replacement program, EBMUD prepared the first Large Diameter Pipeline Master Plan (LDPMP) in 2015 to prioritize pipeline replacement or mitigation based upon a risk model. The risk model is a comprehensive, proactive method of selecting large diameter pipeline replacement projects for the Capital Improvement Program.

The LDPMP ranked each large diameter pipeline segment by calculating a risk score based on its likelihood and consequence of failure. To quantify the likelihood of failure, EBMUD evaluated criteria related to the pipeline's age, material, joint type, lining, coating, and leak history. EBMUD also considered whether the pipeline had been exposed to any hazards such as seismic activity, liquefaction, landslides, floods, tsunami, or sea level rise. When considering the consequence of failure, EBMUD's criteria included collateral damage concerns, access issues, customer impacts, and system hydraulic importance.

Water Treatment Plant (WTP) Improvements

The Water Treatment Plant Improvements projects were developed and selected based on key number of project drivers such as replacing aging infrastructure, improving reliability, maintaining water quality, drought preparedness, and increasing WTP capacity to meet customer demands. The following projects have the highest priority:

- Upper San Leandro (USL) WTP Maintenance and Reliability Improvements
- Orinda WTP Disinfection Improvements Project
- Sobrante WTP Maintenance and Reliability Improvements
- Walnut Creek WTP Pretreatment Upgrades

Upper San Leandro

The project would replace aging infrastructure, reliably produce 60 million gallons of water per day (MGD), and maximize use of Folsom South Canal Connection water during drought.

Orinda

The project would improve disinfection, bring reliability up to 200 MGD, minimize disinfection byproducts (DBPs), and improve chemical dosing.

Sobrante

The project would replace failing infrastructure, reliably produce 60 MGD, reduce DBPs, and improve treated water stability.

Walnut Creek

The project would improve reliability during periods of poor water quality, increase flexibility to take drought supplies, and improve regional reliability.

Pipeline Rebuild Program

Pipeline Rebuild is a multi-department initiative to improve and modernize EBMUD's pipeline replacement work by: streamlining and improving workflows; driving innovation through carefully planned and reviewed pilots; bridging work silos with new collaborations; and documenting and scaling up proven pilot study conclusions.

The mission of Pipeline Rebuild is to create a sustainable pipeline renewal program that cost

Seismic Retrofit Projects

In 2018, EBMUD completed the seismic retrofit of Upper San Leandro Reservoir Tower with additional braces to provide seismic stability and replaced the outlet tower valves and controls to improve reliability. The Maloney Reservoir seismic stability evaluation was completed also in 2018. The seismic retrofit alternatives for the Lafayette Tower were evaluated. In late fiscal year 2020, EBMUD plans to begin construction of seismic improvements to the Briones Tower, and in 2020 and 2021, will review the seismic stability of Danville Reservoir and Pardee Dams.

effectively maintains a reliable water distribution system for EBMUD customers. EBMUD launched the four-year Pipeline Rebuild Pilot Program in FY15 and in addition to piloting new workflows and innovations, the annual pipeline replacement rate increased from 10 miles in FY15 to 17.5 miles in FY20, with a goal to reach 20 miles per year in FY21.

Dam Safety Program

EBMUD owns 19 active open-cut reservoirs. The California Department of Water Resources' Division of Safety of Dams (DSOD) has jurisdiction over the two upcountry dams, five terminal dams, and 13 of the 19 open cut dams. Pardee and Camanche dams are also regulated by the Federal Energy Regulatory Commission (FERC) as they are hydropower generating facilities.

FERC requires an Owner Dam Safety Program for Pardee and Camanche, which the District satisfied in 2014 with the Dam Safety Program of Board Policy 9.07 (Appendix G). For consistency and simplicity, the District modified its previously existing dam safety program for all District dams to conform to the FERC-based Dam Safety Program at that time.

Policy 9.07 outlines the goals of the Dam Safety Program, which are to manage EBMUD-owned dams in a manner that ensures dam safety, structural integrity, and operational security for the protection of life, property and the environment. The Dam Safety Program is a comprehensive program under which staff performs regular site inspections, monitors instruments, submits dam safety reports to regulatory agencies, maintains emergency plans, and performs maintenance or capital improvements as needed. EBMUD staff applies the latest geotechnical, structural, and earthquake engineering technology when monitoring, inspecting, and evaluating the dams. DSOD and FERC conduct their annual dam inspections independent of EBMUD monitoring and inspections. The Dam Safety Program helps establish specific, detailed roles and responsibilities for key staff. Currently work under the program is geared towards dam safety training development that will target all levels of the organization, including management, operations, maintenance, consultants, and contractors. This organization-wide safety training builds on the District's past technical dam safety training program for engineers and inspectors.

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 first PFMA for Pardee and Camanche dams. The PFMA is reviewed every five years with the most recent one completed in 2018. The 2018 comprehensive review determined that both Pardee and Camanche facilities are safe for continued operation. The review also provided recommendations to refine methods, improve monitoring plans, and update studies based on latest data to proactively maintain the conditions for continued safe and reliable operation into the future.

EBMUD initiated a Dam Safety Steering Committee (DSSC) that monitors, reviews, and oversees dam safety practices and activities at all District-owned dams. The DSSC is chaired by the Director of Engineering and Construction, who oversees all dam safety surveillance, capital construction, and emergency inspections and is the designated Chief Dam Safety Engineer (CDSE). The DSSC's primary members are the Director of Water and Natural Resources, the Director of Operations and Maintenance, the Manager of Water Operations, and Manager of Engineering Services, who is the alternate CDSE. The CDSE is accountable for dam safety activities within EBMUD and provides an annual update on all current and projected dam safety related actions on behalf of the DSSC to EBMUD's General Manager and Board of Directors.

Under DSOD oversight, all of the District's dams have been analyzed for seismic safety. Detailed spillway assessments have also been performed. In addition to monitoring and improving the structures under the jurisdiction of DSOD and FERC, EBMUD continues to improve the seismic safety of its other ten dams not under such jurisdictions. Such improvements include the seismic upgrade of Chabot Dam, which included improvements to stabilize the dam and retrofit the outlet works. In 2018 EBMUD completed construction on the Upper San Leandro Reservoir Tower to install braces for seismic stability and to replace valves and controls for improved reliability. Also, in 2018, the Maloney Reservoir seismic stability evaluation was completed. Design of seismic upgrades of Briones Tower and Lafayette Tower are underway and scheduled for construction in 2021-2022. In 2020 the District issued a report concluding that the Waters Peak Fault at Pardee Dam is inactive according to DSOD criteria, a technical memorandum showing that Pardee Dam meets or exceeds acceptable factors of safety for seismic sliding, and a technical memorandum documenting that liquefaction and localized deformation at the downstream face of Camanche Dam would not lead to uncontrolled reservoir release or limit the District's ability to lower the reservoir using the outlet works. These studies were submitted to DSOD and FERC.

EMERGENCY ACTION PLANS FOR EBMUD DAMS

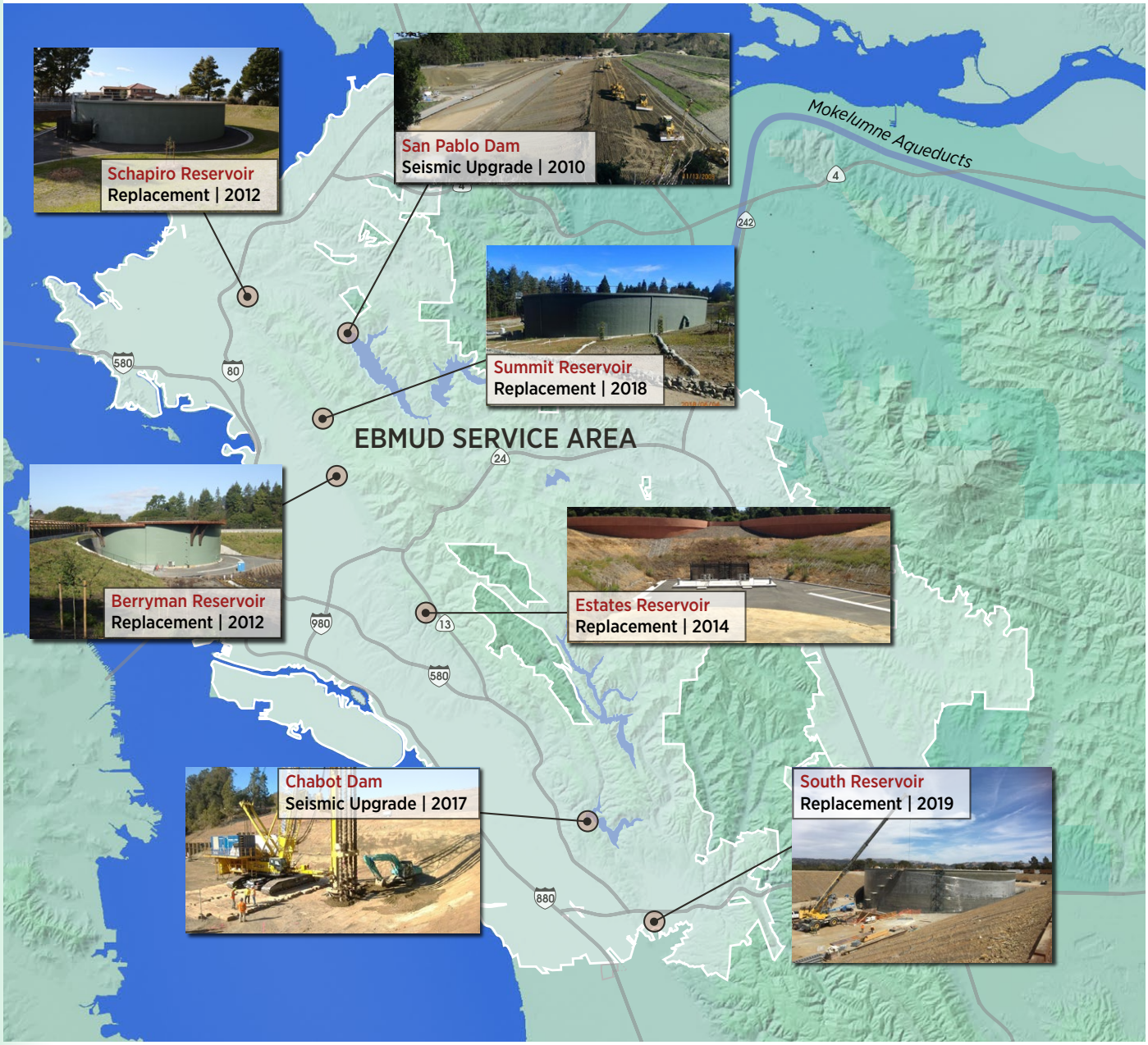
EBMUD is prepared to respond to dam emergency related incidents. As part of its emergency preparedness program, EBMUD's Emergency Action Plans (EAP) for both local service area and Mokelumne reservoir dams lay out specific responsibilities, tasks, and operational actions pertaining to dam-related emergencies to minimize loss of life and property damage. The EAPs are a Hazard Specific Response Plan Annex to the District's Emergency Operations Plan (EOP), which provides an overview of preparedness and incident management activities for emergency response and incident stabilization for broader hazards. EAPs contain procedures and information on coordination between the dam owner and emergency management agencies, such as alerting of early warning and notification messages of the emergency situation.

Through regular exercises, such as conducting notification drills and functional exercises to test technology, equipment function, and response processes, and holding annual group meetings with stakeholders, first responders, and dam safety operators from neighboring agencies in the Mokelumne region, EBMUD prepares for responding to dam-related emergencies involving high flow releases, dam failures, and security and engineering incidents. To comply with state regulations enacted following the Oroville Dam spillway failure in 2017, EBMUD, among other California dam owners, is updating its inundation maps for its DSOD-regulated dams as well for the FERC-regulated dams. These maps show potential dam failure flooding extents and will be included in the EAPs for each dam site.

2.2.2 SECURITY

Working with law enforcement and utility industry security experts, EBMUD has established a comprehensive security program to protect its water supply. Using assessment tools and best-practices recommendations of the Federal Bureau of Investigation, the American Water Works

FIGURE 2-4 SEISMIC EVALUATED AND RETROFITTED DAMS



Association, the California Office of Emergency Services, and the Federal Energy Regulatory Commission, EBMUD continually reviews and updates emergency response plans and safeguards for 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 United States Environmental Protection Agency 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 has 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 developed and implemented both physical security and cybersecurity measures for its Pardee and Camanche Dams hydroelectric facilities in accordance with FERC's security program guidelines for hydropower projects. These measures reduce the vulnerability of the physical assets and components of these dams as well as the operational network cyber components of the system to

unauthorized access that could result in unintended releases and disruption of power generation.

EBMUD conducted a detailed Security Assessment and has an updated and approved FERC Security Plan for these two dams. District staff and law enforcement partners in the Security Plan all have copies of the plan and are aware of what is expected of them if and when there are security issues at any of the locations called out in the plan documents. The same type of security guidelines are being implemented for the local dams in EBMUD's East Bay service area.

Emergency response guidelines for dams have been part of the District's Emergency Operation Plan, but were revised in 2017 and updated in 2019 to follow new formats from the California Governor's Office of Emergency Services (CalOES) for dam emergency plans. 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 raw-water supply and the treated drinking water provided to consumers from our extensive water distribution system. 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 is prepared and can readily notify the public if there is a question or concern regarding the safety of its public water supplies. These include security and law enforcement notification, response, investigation, reporting, and networking with industry and law enforcement intelligence agencies.

EBMUD's Emergency Operations Team (EOT) is ready to respond quickly and appropriately to any emergency in coordination with other public safety and first responder agencies. The EOT manages emergency responses and meets, trains, and conducts exercises routinely. EBMUD's EOT uses the California Standardized Emergency Management System that incorporates all National Incident Management System (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 Attachment 1 for details on inter-agency emergency support.

ENERGY ACCOUNTING

Water Code requirements of Section 10631.2 requires urban water management plans to include readily available information regarding the estimated amount of energy used for water diversion, conveyance, distribution, treatment, and storage. Information pertaining to the energy data are provided in tabular format in Appendix J.

CHAPTER 3 – WATER DEMAND

In this chapter EBMUD presents historical and projected water use for the service area.

3.1 PAST AND CURRENT DEMAND

Demand for water in the EBMUD's service area is primarily for municipal and industrial (M&I) uses which includes residential, commercial, institutional, industrial and irrigation. This section describes water usage with the total historic, current, and projected water demands. Figure 3-1 shows the trend of historic water use within EBMUD's service area with the number of accounts.

While the number of accounts has increased steadily since 1970, the average daily water demand has not increased correspondingly; outside of droughts, demand remains relatively stable. Water demands dropped significantly due to rationing during drought periods, as in the years 1976-1977, 1987-1994, 2007-2011, and 2014-2016.

Several factors contributed to keeping the overall water demand from rising as might otherwise be anticipated, including:

- EBMUD's water recycling and conservation programs (discussed in more detail in Chapter 5 and 6, respectively);
- Droughts and customer rationing;
- Changes in customer usage patterns or changes in customer class (i.e., a reduction in industrial and petroleum accounts with increases in single and multi-family residential accounts); and
- Legislative changes, including new State policies, new plumbing efficiency standards, CALGreen model water efficiency landscape ordinances, the 1992 and 2005 Federal Energy Policy Act, Senate Bill 606 and Assembly Bill 1668 (aimed at locking in conservation efforts in the long-term).

Different customer categories exhibit different water use trends. Figure 3-2 shows how EBMUD's total metered water consumption is distributed among different customer categories. The single-family residential category has the largest consumption, followed by multi-family residential, commercial, industrial (which includes petroleum), irrigation, and institutional uses. Historical water use and number of

FIGURE 3-1 EBMUD WATER ACCOUNTS AND TOTAL DEMAND

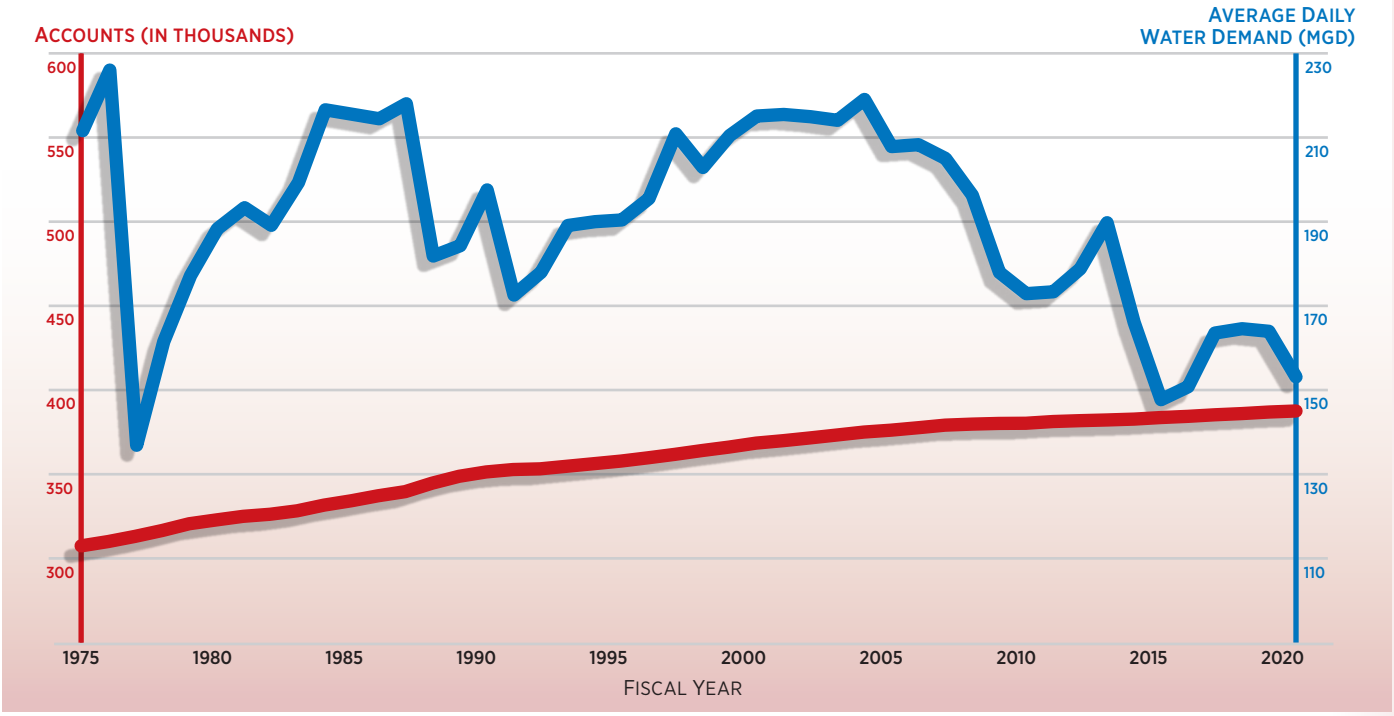
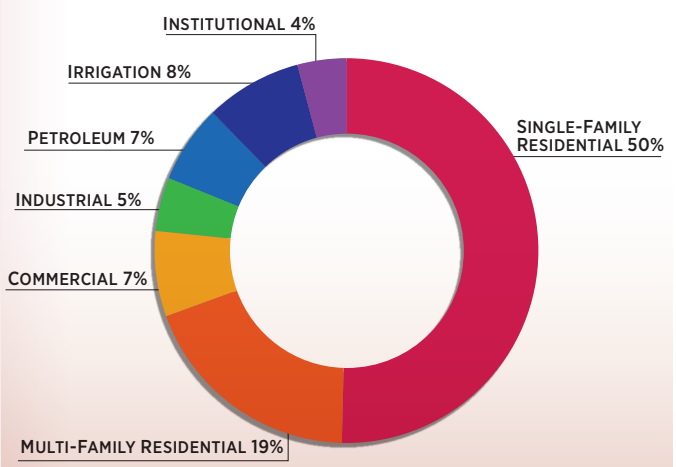


FIGURE 3-2 WATER USE BY CUSTOMER CATEGORY



NOTE:
Based on Calendar Year 2020 metered consumption data.

accounts from 1975 to 2019 for each EBMUD customer class are shown in Figure 3-3. Note that these figures only include potable water and not recycled water.

Water use varies seasonally, as shown in Figure 3-4. Typically more water is used during the summer, in particular for outdoor irrigation.

EBMUD's service area can be separated roughly into two climatic zones relative to the Berkeley-Oakland hills, East-of-Hills and West-of Hills. In the West-of-Hills area, climate tends to be more moderate due to the marine influence of San Francisco Bay, whereas summer air temperatures in the East-of-Hills area can be considerably higher. Figure 3-5 shows the water consumption for each customer category divided into East-of-Hills and West-of-Hills areas.

Figure 3-6 illustrates how single-family residential water consumption varies by region relative to the historic average. As shown in the figure, residential customers located in the East-of-Hills portion of EBMUD's service area tend to have higher water demands than customers in the West-of-Hills area.

Figure 3-7 demonstrates characteristics of residential water use and shows that outdoor water use can be a large fraction of total use for single-family customers, whereas it makes up a smaller portion of overall water use for multi-family residential customers. In total, outdoor water use accounts for approximately 28% of total water use for residential customers as a whole.

3.2 PROJECTED WATER DEMAND

3.2.1 2050 DEMAND STUDY

EBMUD performs a comprehensive demand projections study every ten years; the most recent update, the 2050 Demand Study, was completed in 2020. The 2050 Demand Study is an update of EBMUD's water demand forecasts using a land-use based approach that incorporates forecasts of dwelling units and employment from land use agencies into a newly developed water demand model.

The water demand forecasting methodology relied on long-term planning documents approved and adopted by the local and regional land use agencies together with in-person meetings with these agencies regarding timing and direction of future development in their respective communities. Growth projections in EBMUD's future water demand is a reflection of planned land-use changes and redevelopment projects forecasted by the local and regional land use agencies.

3.2.2 WATER DEMAND MODEL

The water demand model forecasted water demand using an econometric (or statistical) model developed specifically for EBMUD's service area and six customer use categories (Single Family, Multi-Family, Institutional, Industrial, Commercial, and Irrigation). The water demand model forecasts water demand using predictions of future driver units such as residential housing units, non-residential building area, and parcel area. Depending on the purpose of the forecast, the model has the ability to make further adjustments based on relationships between historical water demand and climate, drought management, economic conditions, and household size.

Table 3-1 provides the forecasted water demands projections in five-year increments through the year 2050. Cumulative water conservation and recycled water use goals are anticipated to be met, and therefore subtracted from the forecasted demand to reach the planning level of demand (PLOD). EBMUD has set goals through 2050 for the programs and has developed implementation schedules based on these goals. The goals incorporated into the projected PLOD integrate an uncertainty component. The uncertainty component factors in how much water conservation savings will increase, and whether wastewater flows will be available to implement recycled water projects. The PLOD is used to assess short-term and long-term water supply needs. The PLOD is modeled against historic

TABLE 3-1
AVERAGE ANNUAL WATER DEMAND FORECAST 2050 DEMAND PROJECTIONS (MGD)

	2020	2025	2030	2035	2040	2045	2050
FORECASTED WATER DEMAND	238	245	254	264	277	287	297
WATER CONSERVATION[1]	-48	-53	-58	-61	-63	-65	-66
RECYCLED WATER[1]	-5	-6	-6	-9	-13	-13	-13
RAW WATER	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
PLANNING LEVEL OF DEMAND (ROUNDED)	181	186	190	194	201	209	218

1. See Chapters 6 and 5 for more specific program details on conservation and water recycling, respectively. The goals reflected in this table take into account uncertainty as described in Section 5.2.3 and Section 6.1.3.

hydrology to assess the reliability of its water supply against different year types to meet future demands.

Note that the demand projections in Table 3-1 are planning level estimates and may differ from actual demand in any given year due to weather and other variables. As such, the PLOD does not include the short-term reduction and rebound in demand caused by rationing during drought periods. After droughts, a rebound effect occurs over a period of years where demands rise back up closer to pre-drought levels.

Table 3-2 shows the demand projections broken down into six customer use categories: single family residential; multi-family residential; commercial; industrial; institutional; and irrigation users. These demand projections account for forecasted water conservation and recycled water use.

3.2.3 WATER DEMANDS FOR LOW-INCOME HOUSING

California Water Code Section 10631.1 requires that UWMPs include an estimate of projected water demand for lower income single-family and multi-family residential housing within EBMUD's service area. The Metropolitan Transportation Commission (MTC) established low-income thresholds in 2016 for Plan Bay Area 2040[1] to account for the Bay Area's high cost of living. The MTC defined low-income residential households as those identified by the Census Bureau with income below 200 percent of the federal poverty level, which is $25,520 for a single person living alone and $52,400 for a family of four in January 2020 dollars.

MTC collects and reports the percentage of households within each census tract in EBMUD's service area that are below 200 percent of the federal poverty level. The information is periodically updated and the most recent data available was updated August 2020. For each census tract, the most recent MTC percentages of low income single-family and multi-family households were applied to single-family and multi-family demand projections from EBMUD's 2050 Demand Study to estimate the projected lower-income residential demand. Table 3-3 provides EBMUD's estimated demand projections in five-year increments to year 2050 for single-family and multi-family lower income households.

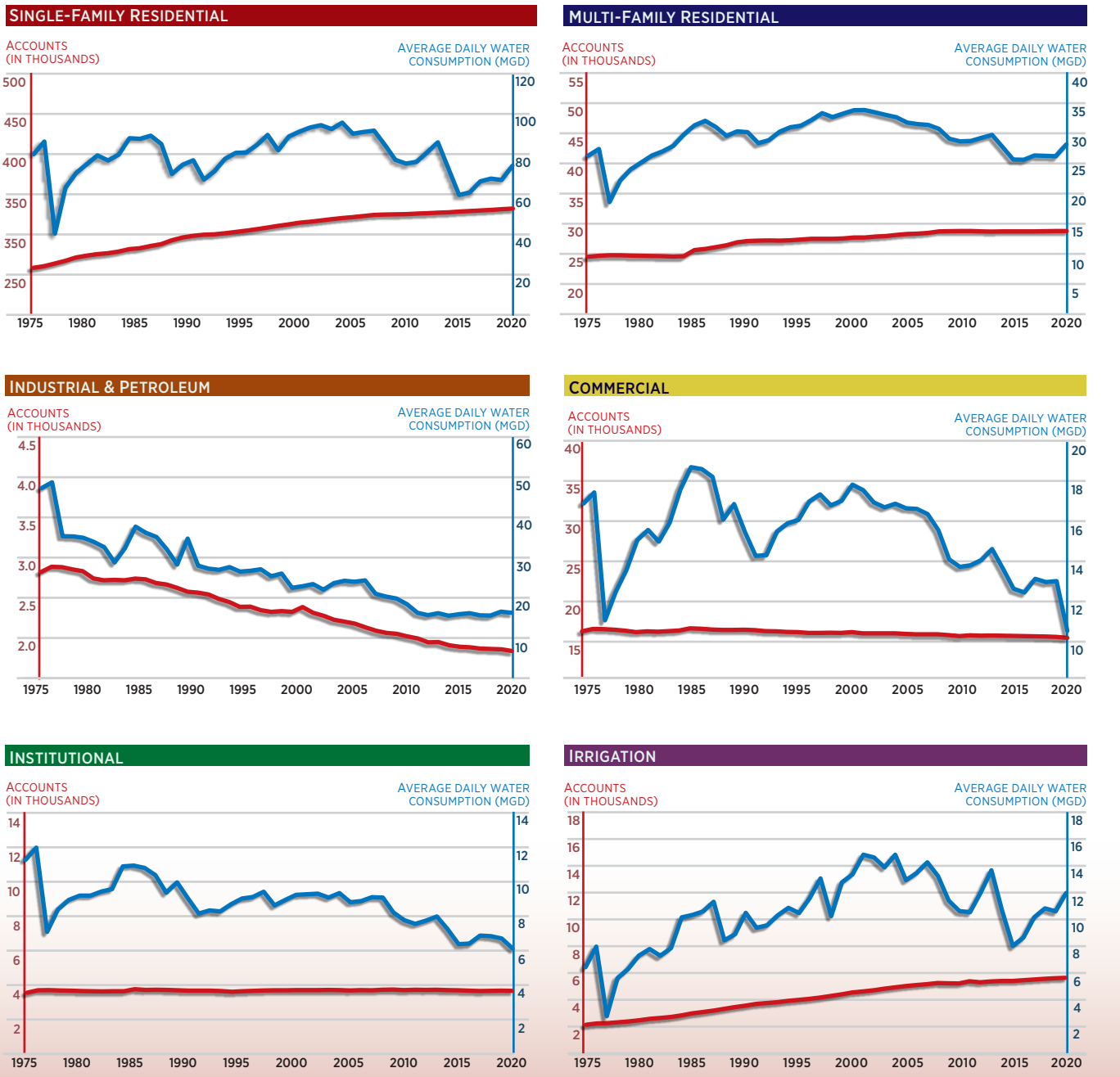
EBMUD's Board of Directors approved Policy 3.07 which ensures that priority for new water service

[1] http://2040.planbayarea.org/sites/default/files/2020-02/Equity_Report_PBA 2040 _7-2017.pdf

TABLE 3-2
AVERAGE ANNUAL DEMAND PROJECTIONS BY CUSTOMER USE CATEGORY (MGD)

	2020	2025	2030	2035	2040	2045	2050
SINGLE-FAMILY RESIDENTIAL	115	117	119	121	125	126	129
MULTI-FAMILY RESIDENTIAL	40	44	48	52	59	63	67
INSTITUTIONAL	17	18	20	21	22	24	26
INDUSTRIAL	33	35	35	36	36	37	37
COMMERCIAL	16	18	19	21	22	24	25
IRRIGATION	13	13	13	13	13	13	13
TOTAL	234	245	254	264	277	287	297
WATER CONSERVATION	-48	-53	-58	-61	-63	-65	-66
NON-POTABLE WATER	-5	-6	-6	-9	-13	-13	-13
PLANNING LEVEL OF DEMAND (ROUNDED)	181	186	190	194	201	209	218

FIGURE 3-3 **EBMUD WATER ACCOUNTS & CONSUMPTION**



connections during restrictive periods is given to proposed developments within EBMUD's existing service area that include housing units affordable to lower income households in accordance with California Government Code 65589.7. Policy 3.07 also states that EBMUD will not deny an application for services to a proposed development that includes affordable housing unless certain specific conditions are met which could include a water shortage emergency condition, or if EBMUD is subject to a compliance order by the Department of Public Health that prohibits new water connections. Based on the requirement to provide priority to developments that include housing units affordable to lower income households, Policy 3.07 assures that the portion of overall water demands for lower-income households, as provided in Table 3-3, can be met.

TABLE 3-3 WATER DEMAND ESTIMATES FOR LOWER-INCOME RESIDENTIAL ACCOUNTS (MGD)

		2020	2025	2030	2035	2040	2045	2050
SINGLE-FAMILY	DEMAND (MGD)	14	14	13	13	13	13	13
	% OF SECTOR	17	17	16	16	16	16	16
MULTI-FAMILY	DEMAND (MGD)	12	14	15	16	19	20	22
	% OF SECTOR	32	32	33	33	33	33	34
TOTAL RESIDENTIAL	DEMAND (MGD)	26	27	28	29	32	33	35
	% OF TOTAL	21	22	22	23	23	23	24

3.2.4 DEMAND PROJECTIONS AND CLIMATE CHANGE

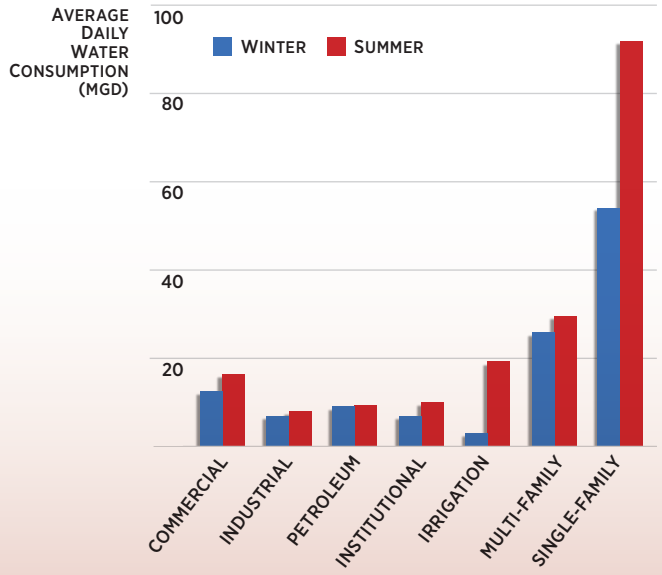
Climate change adds significant uncertainty to demand forecasts which are already challenging due to general temporal variability. This determination has been recognized by state legislation with several sections in the revised California Water Code (Water Code) relevant to urban water management plans (UWMPs) emphasizing the need to consider impacts of climate change on projected future use and reliability of water supplies. This section provides an overview of the analysis done for demand projections. Attachment 1 - Water Shortage Contingency Plan provides information on climate change in relation to future availability of water supplies.

To evaluate the impacts, the water demand model looked at two climate variables, rainfall and air temperature, to forecast changes in water consumption. Referencing guidance from the California Climate Change Technical Advisory Group (CCTAG), a 14-member scientific advisory group assembled by the California Department of Water Resources, an ensemble of ten Global Climate Models[1] (GCMs) were used in this analysis which the CCTAG deemed to closely simulate California-specific climate features.

There are four standard sets of climate scenarios known as Representative Concentration Pathways (RCPs) otherwise known as greenhouse gas concentration trajectory. The CCTAG recommended using RCPs 4.5 and 8.5 which corresponded to specific levels of carbon dioxide emission scenarios, Lower

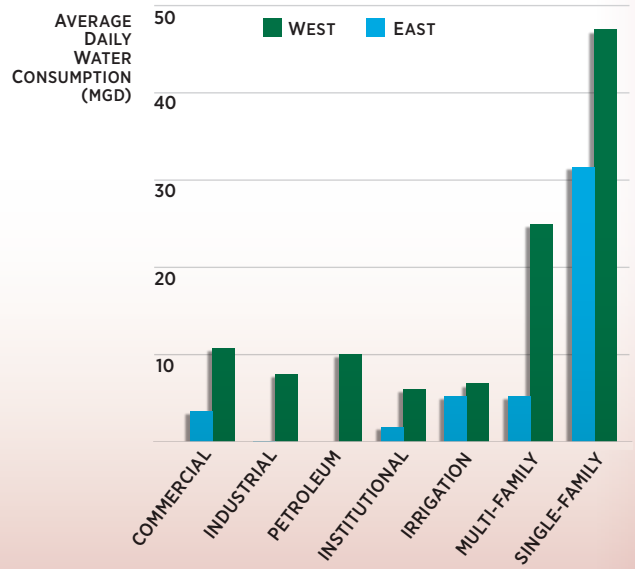
[1] GCMs for use for California Water Resources include: ACCESS-1.0, CanESM2, CCSM4, CESM1-BGC, CMCC-CMS, CNRM-CM5, GFDL-CM3, HadGEM2-CC, HadGEM2-ES, MIROC5.

FIGURE 3-4 WINTER AND SUMMER WATER USE BY CUSTOMER CATEGORY



NOTES:
1. Based on Calendar Year 2010-2019 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 3-5 EAST-OF-HILLS AND WEST-OF-HILLS WATER USE BY CUSTOMER CATEGORY



NOTE:
Based on Calendar Year 2010-2020 consumption data.

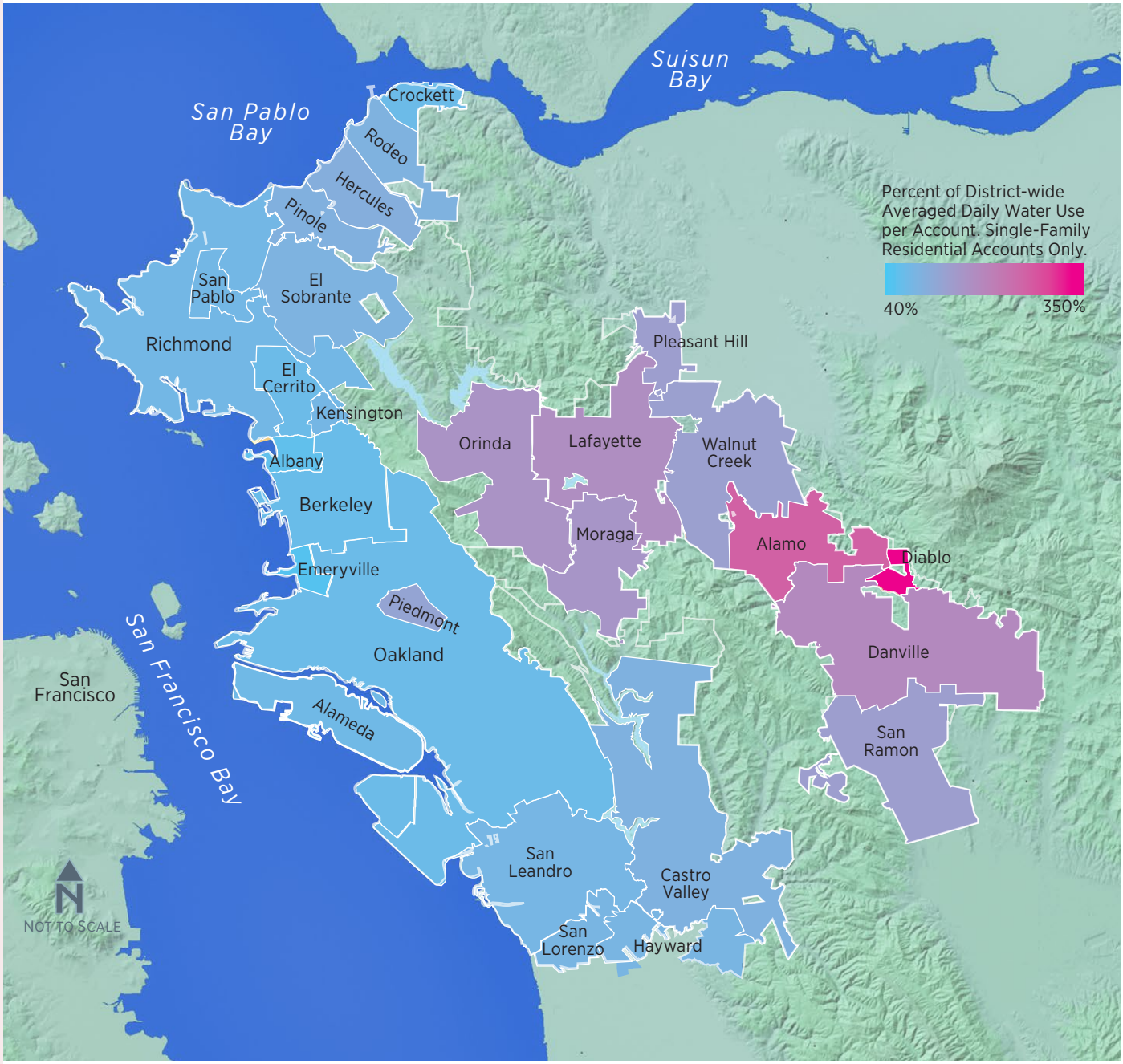
Emissions Scenario and Higher Emissions Scenario, respectively, which were then applied to the GCMs.

An analysis of rainfall output from the selected GCMs when compared to a 30-year average weather conditions showed that less than four percent of the long-term change in water consumption due to long-term changes in climate was associated with rainfall. The small contribution of rainfall to changes in water consumption is relatively low. Furthermore, there is significantly more uncertainty in the GCM rainfall forecasts, which is demonstrated by the extreme model variability. Consequently, rainfall forecasts from GCM models were not included in the 2050 Demand Study due to highly uncertain forecasts and small impact on consumption changes.

A comparison of the historical 30-year air temperature data to the GCMs indicated that the GCM that represented a warmer/dryer climate was closer

FIGURE 3-6

HISTORICAL SINGLE-FAMILY RESIDENTIAL WATER CONSUMPTION BY REGION WITHIN THE EBMUD SERVICE AREA



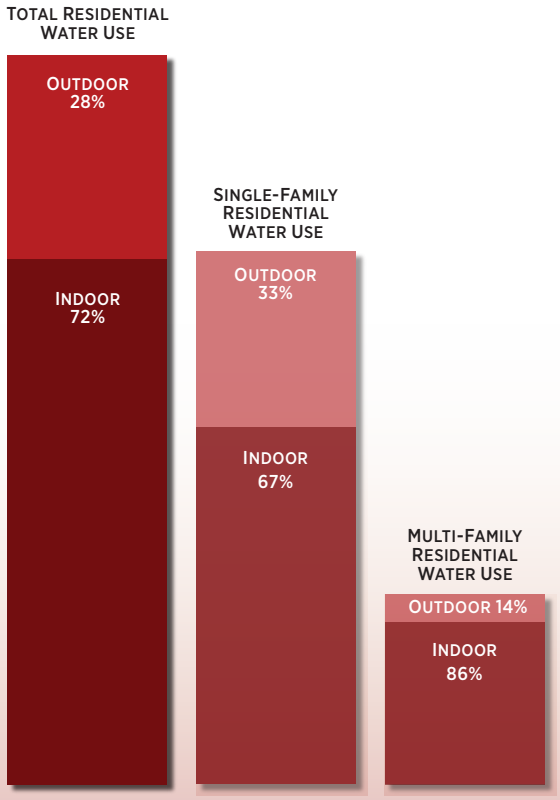
Potable water accounts only. Based on historical daily average metered consumption, 2011-2020.
Representation of non-EBMUD boundaries is not necessarily authoritative.

to the predicted trend. Consequently, the water/dryer climate GCM recommended by the CCCTAG in combination of Higher Emissions scenario was used to forecast water demand by taking the forecasted percentage increase in maximum daily air temperature and applying it to the water demand model.

SUPPLY-DEMAND ASSESSMENT

In previous UWMPs, water supply-demand assessments were included in the water demand chapter. To align with the requirements of the Water Shortage Contingency Plan (WSCP), the supply assessment discussion has been moved to Attachment 1, which is EBMUD's WSCP. The water supply-demand assessment compares the total water supply sources available to EBMUD with the long-term total projected water use over the next 30 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive years. As there is significant uncertainty in forecasting into the future, EBMUD considers a variety of scenarios in its long-term planning. The methodology used for the assessment, scenario development, and scenario results are detailed in Attachment 1.

FIGURE 3-7 INDOOR & OUTDOOR RESIDENTIAL WATER USE

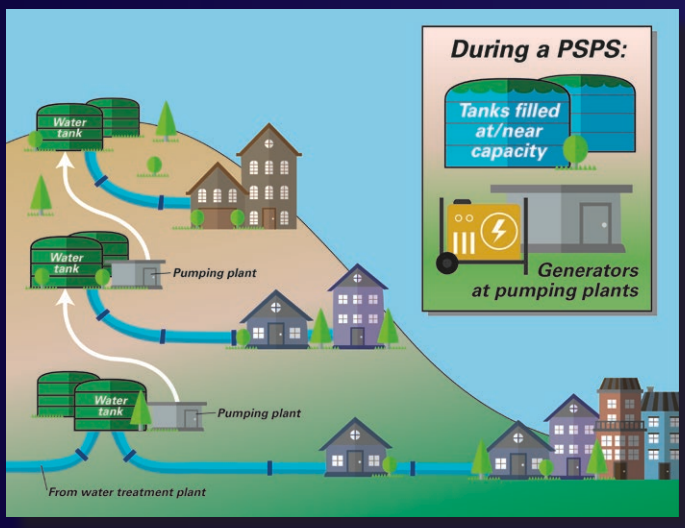


NOTE:
Based on Calendar Year 2010-2019 metered consumption data.

PUBLIC SAFETY POWER SHUTOFFS

EBMUD stationed 40 portable generators and pumps at critical facilities in Alameda and Contra Costa counties to keep water flowing during Pacific Gas and Electric's (PG&E) preemptive power outages in the fall of 2020.

The emergency equipment remained in place through the fire season to maintain reliable water service for East Bay communities and emergency responders during Public Safety Power Shutoffs (PSPS). Based on the expected event length and generator fuel use rate, some sites may be refueled daily. EBMUD also monitors the fuel storage tanks daily and ensure they are more than 75% full during the PSPS season ensuring adequate backup fuel is available. A map of affected area is available only when an event occurs and is posted on ***ebmud.com***. PG&E implements these preemptive power outages to prevent its equipment from igniting wildfires during high-fire danger periods.



"Though loss of power is always a serious challenge, no EBMUD customer lost water or wastewater service during PSPS events last year because of our preparation," said EBMUD Board President Marguerite Young. "EBMUD is prepared again this year. We have dozens of generators to supplement our equipment to keep critical operations running, including neighborhood pumping plants that play a vital role in delivering water every day."

Preparation at EBMUD facilities

Neighborhood pumping plants play an important role in the water distribution system, moving water to tanks in the hills for customers to use. These pumping plants do not typically have built-in back-up generators; so, EBMUD has taken steps to ensure they keep running by temporarily staging generators or backup pumps at many of these sites. When fire danger is high and Red Flag Warnings are in effect, EBMUD fills neighborhood tanks so they are at maximum capacity for customers and firefighters.

EBMUD's wastewater facilities at the foot of the Bay Bridge are also ready for PSPS. With advance notice of a PSPS event from PG&E, EBMUD can shift electrical loads and prepare onsite generators to ensure safe treatment and discharge of wastewater to protect public health and San Francisco Bay.

COVID-19

EBMUD's business continuity plans are in place to ensure that we continue to maintain drinking water quality and wastewater services. EBMUD employees are sworn civil servants and disaster workers who work around the clock, including during emergencies. Some work cannot be delayed. Many crews are on the ground continuing to install and maintain vital infrastructure and we ask the public to please maintain a safe social distance from EBMUD crews.

EBMUD also is limiting employees' direct contact with customers where possible, and instituting telecommuting, virtual meetings and social distancing.

"Especially during these unprecedented and fast-changing times, EBMUD remains committed to delivering on our promise of clean water and Bay protection," says Board President Marguerite Young. "At the same time, we are working to keep our employees healthy and safe so that they can continue supporting our East Bay community and providing vital services in the fight against coronavirus."

We are providing continuous water service

Because water is essential to stopping the spread of coronavirus, EBMUD has reconnected nearly all water services for customers who were disconnected due to payment issues. In addition, EBMUD will not disconnect customers' water service due to payment issues during this health emergency and is offering payment plan options to customers experiencing financial difficulty.

CHAPTER 4 – RESILIENT & DIVERSIFIED PORTFOLIO

The uncertainty of future conditions adds complexity when doing long-term water supply planning. Uncertainties can take shape in various forms as discussed in Chapter 2 and include but are not limited to increased demands by EBMUD customers, reduced availability of water supply on the Lower Mokelumne River, increased flows for ecosystem enhancement, and evolving regulatory requirements.

To meet future customer needs and other obligations, EBMUD needs to be able to adaptively manage and obtain water supplies. EBMUD's long-term water supply goals include improving its water supply reliability and diversifying its water supply portfolio.

Consistent with California's Water Resilience Portfolio, EBMUD is planning to reduce reliance on any one water source and diversify supplies to enable flexibility as conditions change. As the state indicated, diversification will look different in each region based on available water resources, but it will strengthen water security and reduce pressure on river systems across the state.

Over the last few decades, there have been numerous factors that have contributed to changes in water demand in EBMUD's service area. These factors range from effects of multi-year droughts, recessions, implementation of conservation measures, expansion of recycled water programs, and legislation and building codes which led to long-term shifts in customer usage patterns. Chapter 2 describes in more detail the factors that affect the availability of a water supply and Chapter 3 discusses uncertainties that exist in analyzing long-term projections. As a result of the shifting of both demand and supply due to future uncertainties, EBMUD continues to pursue a variety of supplemental supply projects to adapt to these future changing conditions.

In developing a reliable and robust supplemental supply portfolio, EBMUD not only explored projects within the organization but also looked for opportunities to partner with other agencies. Partnerships can offer solutions that are environmentally sound, cost-effective, and sustainable. Partnerships include collaborating with agencies on water transfer feasibility studies, long-term agreements for dry-year supply, regional groundwater banking/exchange efforts, and surface water storage expansion.

Figure 4-1 provides a summary of EBMUD's short- and long-term supplemental supply portfolio and their components. More detail about each portfolio is described below.

4.1 CONJUNCTIVE USE AND GROUNDWATER BANKING

EBMUD is exploring several conjunctive use and groundwater banking/exchange programs. Each program is discussed below.

4.1.1 BAYSIDE GROUNDWATER PROJECT

The Bayside Groundwater Project is being developed in phases to provide a diverse and robust water supply using a conjunctive water management approach that sustainably manages the East Bay Plain Subbasin. Construction of the Bayside Groundwater Project Phase 1 facilities was completed in 2010, with construction of a facility that enables EBMUD to inject potable drinking water into the deep aquifer of the East Bay Plain Subbasin during wet years and also to extract, treat, and use groundwater as a supplemental supply during times of drought. Future phases will expand on this operation.

The Phase 1 facility consists of an injection/extraction well, a water treatment plant and distribution pipelines connecting the treatment plant to the well, a subsidence monitoring system, and a network of groundwater monitoring wells. The injection/extraction system uses an approximately 600-foot deep well located in San Lorenzo. When operated in injection mode, treated water from EBMUD's distribution system is directed through the injection/extraction well into the deep aquifers of the East Bay Plain Subbasin. EBMUD operated in injection mode during wet years (2018 and 2019) when surplus water was available for storage. During droughts periods, water may be extracted and will be treated to meet all federal and state drinking water standards prior to distribution to customers.

Historical and Projected Pumping and Recharge

Except for groundwater sampling and maintenance operation, no groundwater pumping has been conducted from the Phase 1 facility. A drinking water supply permit is required to extract groundwater for public water supply. EBMUD will evaluate future project phases and

associated yield as part of the development of the GSP for the East Bay Plain Subbasin.

In 2017, injection operations commenced as a pilot test by injecting 1.3 million gallons of potable water from EBMUD's distribution system. In 2018, 8.3 million gallons was injected into the deep aquifer and followed by another 8.4 million gallons of injection in 2019. To date, a total of 18 million gallons or 55 AF has been injected into the deep aquifer of the East Bay Plain Subbasin.

4.1.2 EASTERN SAN JOAQUIN COUNTY GROUNDWATER BANKING/EXCHANGE

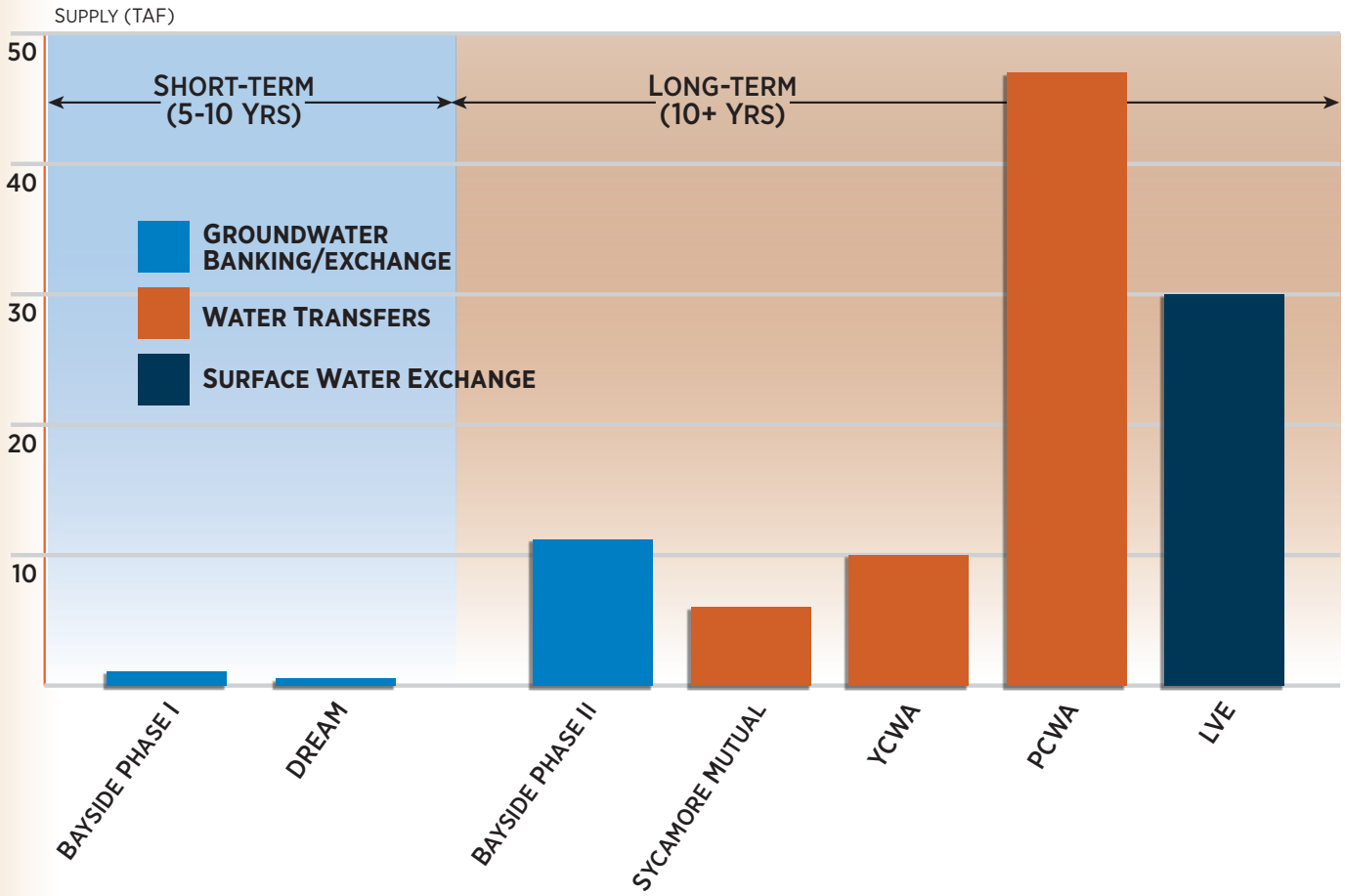
EBMUD is investigating long-range options for the combined use of groundwater and surface water sources beyond the EBMUD service area. In addition to providing a dry-year supply for EBMUD, groundwater banking can help address over-drafted groundwater basins. Over drafting can lead to seawater intrusion, land subsidence, and lowered groundwater levels.

DREAM Pilot Project

Groundwater banking efforts are currently focused in Eastern San Joaquin County where the Demonstration Recharge Extraction and Aquifer Management (DREAM) Pilot Project is underway. Pending further evaluation of the results of the DREAM Pilot Project, EBMUD, North San Joaquin Water Conservation District (NSJCWCD), San Joaquin County, and the Eastern Water Alliance may pursue a larger, longer-term groundwater banking project. The results of the pilot will also inform projected recharge and groundwater pumping for the potential larger project.

The DREAM Pilot Project provides NSJWCD with up to 1,000 AF of EBMUD surface water from the Mokelumne River that participating landowners use for irrigation in lieu of pumping groundwater from the Eastern San Joaquin (ESJ) Subbasin (see Appendix E for description); thereby, storing groundwater for future use. During dry years, EBMUD can recover up to half of the banked groundwater for use within its service area. The DREAM Project provides multiple benefits, including replenishment

FIGURE 4-1 SHORT- AND LONG-TERM SUPPLEMENTAL SUPPLY PORTFOLIO



of the critically-over drafted ESJ Subbasin and dry year supplemental water supply for EBMUD.

In 2017, San Joaquin County issued the DREAM groundwater export permit, which allows up to 500 AF of groundwater to be extracted from a well in the NSJWCD service area and conveyed to EBMUD's Mokelumne Aqueducts for use in EBMUD's service area. Construction of the additional facilities required to convey groundwater to the Aqueducts began in the fall of 2020 and is expected to be completed in 2021. Groundwater extraction, which is subject to the export permit conditions, could start by end of 2021.

In 2018 and 2019, the State Water Resources Control Board (SWRCB) granted EBMUD permits to transfer water to NSJWCD for the DREAM Project and to enhance fish and wildlife in the stretch of the Mokelumne River from Camanche Dam downstream to NSJWCD's South Pump Station. Over those two years, a total of 342 AF of the 1,000 AF of Mokelumne River was released to NSJWCD. EBMUD will obtain another temporary permit to release the remaining 658 AF of Mokelumne River water in a future year.

4.2 WATER TRANSFERS

EBMUD has developed a water transfer program to secure dry-year water supplies to meet customer demands. EBMUD plans to use the Freeport Project, discussed in Section 1.4.4, to convey the transfer water to EBMUD's service area. In addition to providing much needed water supplies, the resultant yield is subject to the JSA gainshare provision which provides for additional flows in the Lower Mokelumne River.

Figure 4-2 depicts EBMUD's most likely potential sources of transfer water, primarily from senior water rights holders in the Sacramento River Watershed. The approval process for transfers varies depending on the specific characteristics of the proposed transfer, including the length of the transfer (i.e., one-year or long-term), origin of the water, method of making water available for transfer, relative priorities and limitations of the water rights involved in or affected by the transfer, and conveyance path of the water.

Since the 2015 UWMP, EBMUD has made additional progress pursuing three long-term water transfer opportunities.

Three potential water transfer projects are at various stages of development. None of these projects have completed environmental reviews (CEQA/NEPA) nor received the permits required for implementation at this time. Future updates to the UWMP will provide additional progress information on these projects.

Placer County Water Agency

In 2013 EBMUD executed a Memorandum of Understanding (MOU) to partner with the Placer County Water Agency (PCWA) on development of a long-term transfer agreement. The proposed project would implement PCWA's long-standing Sacramento Water Forum Agreement (WFA) commitment to release additional flows from PCWA reservoirs in dry years to preserve and protect the natural resources of the lower American River. PCWA's WFA commitment to release additional water is contingent on its ability to transfer the released water to a buyer for use below the lower American River. EBMUD, as the buyer, would purchase between 10 to 47 TAF of transfer water from PCWA in dry years for diversion at the Freeport intake and delivery to EBMUD customers. PCWA and EBMUD are seeking to complete all environmental reviews and approvals to implement the proposed project by late 2022.

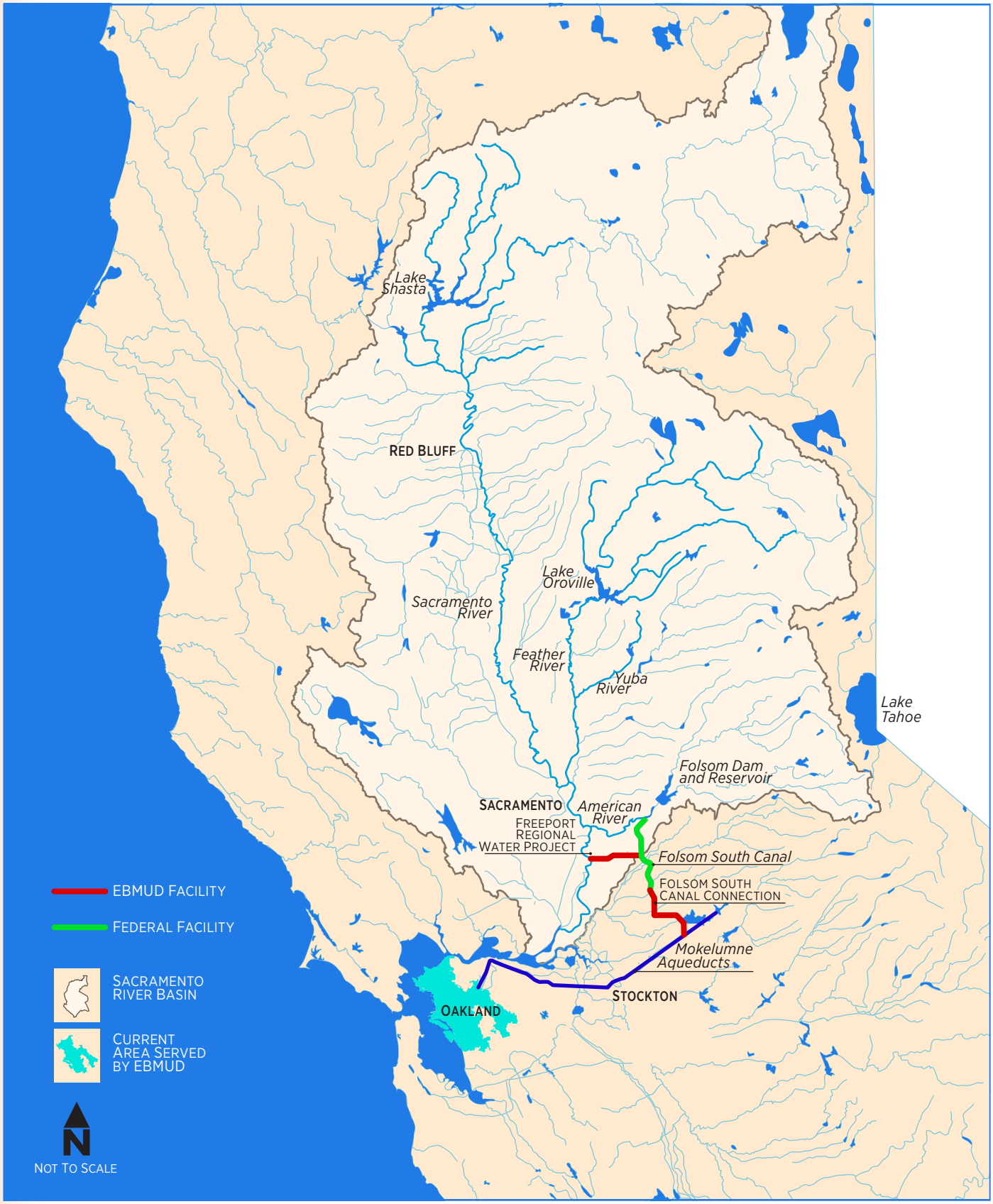
Yuba County Water Agency

Since 2014, EBMUD has been working with the Yuba County Water Agency (YCWA) on opportunities to purchase transfer water made available under the Lower Yuba River Accord (Yuba Accord). The Yuba Accord has been in effect since 2008 and provides in-stream flows for the lower Yuba River and transfer water for the environment and state and federal contractors. The revenue generated from transfer sales is used by YCWA to fund local water supply and flood control projects. In June 2014, the SWRCB approved adding the Freeport intake as a point of re-diversion for Yuba Accord transfer water. YCWA and EBMUD are continuing to work on completing other environmental reviews and approvals that would be needed to implement a long-term transfer arrangement for 10 TAF annually through the year 2025. In 2016, EBMUD secured a one-year agreement to transfer up to 10 TAF from YCWA, in preparation for continued drought conditions. Subsequent to entering the agreement, wet weather conditions returned and reservoir storage recovered. EBMUD ultimately did not exercise the option to transfer the water in 2016.

Sycamore Mutual Water Company

In 2018, EBMUD and Sycamore Mutual Water Company entered into an agreement to jointly develop a framework for a potential future long-term water transfer through a crop

Figure 4-2 Potential Water Transfer Source Areas and Conveyance



rotation program configured to conserve water and generate environmental benefits.

4.3 EXPANSION OF SURFACE WATER STORAGE

Increasing available surface water storage could help EBMUD meet demands during dry years. EBMUD, along with eight other water agencies, is evaluating potential participation in a planned expansion of Contra Costa Water District's (CCWD) Los Vaqueros Reservoir from 160 to 275 TAF. This Phase 2 Los Vaqueros Reservoir Expansion Project (Phase 2 Expansion) is a regional water storage and conveyance project, led by CCWD, that is intended to help improve Delta ecosystem conditions and complement other beneficial uses of Delta water supplies. The primary purposes of the Phase 2 Expansion are to develop water supplies for environmental benefits; improve operational flexibility and result in more reliable supplies for urban and agricultural partners; and increase the San Francisco Bay Area's ability to respond to drought and other emergencies. The project is partially funded by a grant from the California Water Commission, and would become more than fifty percent funded by grants if CCWD is able to secure additional grant funding from the United States Bureau of Reclamation. As currently envisioned, EBMUD would have the right to utilize up to 30 TAF of the reservoir's expanded capacity. EBMUD would provide water to the Los Vaqueros Reservoir in years when surplus water is available. EBMUD could then obtain water from the reservoir during droughts or regional emergencies. EBMUD is evaluating options to take delivery of water via direct conveyance from Los Vaqueros Reservoir into EBMUD's system, or alternatively via exchanges with other agencies participating in the expansion project.

EBMUD and potential partners are currently negotiating costs, terms, and governance. Governance provisions and cost allocation are anticipated be substantially negotiated by December 2021, and construction of the enlarged dam is projected to be completed by 2029. Potential supply from the expanded reservoir could be available as early as 2031.

4.4 BAY AREA REGIONAL DESALINATION PROJECT

Contra Costa Water District, San Francisco Public Utilities Commission, Valley Water, and Zone 7 Water Agency are evaluating the potential for a regional desalination project. EBMUD's current role in the regional desalination project is limited to potentially wheeling water for the Bay Area agencies that are evaluating the project. Additional information on the location, size, and timing of the regional desalination project can be found in the UWMPs of the four main water agencies evaluating the project.

4.5 BAY AREA REGIONAL PARTNERSHIPS

EBMUD also participates in the Bay Area Regional Reliability (BARR) Project. Eight of the Bay Area's largest water suppliers – CCWD, EBMUD, San Francisco Public Utilities Commission (SFPUC), Valley Water, the Alameda County Water District, Zone 7 Water Agency, the Marin Municipal Water District, and the Bay Area Water Supply and Conservation Agency, formed the BARR Project to jointly explore projects to improve regional reliability.

In 2015 the BARR Project received partial funding from USBR for completion of a Bay Area Regional Reliability Drought Contingency Plan (DCP). The plan was completed in December 2017, and one of the early-action drought mitigation measures identified in the DCP was to develop a regional water market program to facilitate voluntary transfers and exchanges and maximize efficient use of existing assets and resources.

In September 2017, USBR approved a $400,000 grant for the BARR partners to identify and define processes to resolve the institutional, regulatory, and operational issues associated with water sharing among the BARR partner agencies during drought or other shortages. As part of this effort, EBMUD together with six BARR partners initiated the Bay Area Shared Water Access Program (SWAP) in the summer of 2019. The goal of the Bay Area SWAP is to develop a Strategy Report outlining an implementation plan that will facilitate water transfers to and exchanges within the Bay Area, leveraging existing infrastructure and institutional agreements. The participating BARR Partners will submit the Strategy Report to USBR in late 2022.

4.6 INFRASTRUCTURE IMPROVEMENTS THAT INCREASE RESILIENCY

EBMUD is working on a number of major projects involving reliability and process upgrades for water treatment plants (WTPs) and construction of new transmission facilities for fiscal year 2020

through 2032. These projects will improve EBMUD resiliency, such as the ability to respond to equipment failures, water quality issues after wildfire events, and water supply shortage due to droughts, and recovering to operational normalcy from these vulnerabilities. Each project is described below.

Upper San Leandro (USL) WTP Reliability Project

The drivers for the USL Maintenance and Reliability Improvements are to replace aging infrastructure, reliably produce 60 million gallons per day (MGD) and maximize use of Folsom South Canal Connection (FSCC) water during drought. The major scope of work elements includes replacing corroded treatment equipment and pipelines, adding redundant power systems, upgrading pumps, mixers, and solids handling processes, and seismic improvements to treatment tanks and structures. Safety upgrades for chemical systems and security upgrades (fencing, cameras, lighting) throughout the WTP are also part of project scope.

Orinda WTP Disinfection Improvements (UV/CCB)

The drivers for the Orinda Disinfection (UV/CCB) Project are disinfection reliability up to 200 MGD, minimizing disinfection byproducts (DBPs), and safety upgrades for chemical systems. The major scope of work elements include constructing a 200 MGD capacity treatment system that uses ultraviolet (UV) light and a chlorine contact basin (CCB) to eliminate pathogens and add redundancy to the disinfection process.

Sobrante WTP Reliability Project

The drivers for the Sobrante WTP Improvements are to replace failing infrastructure, reliability produce 60 MGD, reduce DBPs, and improve treated water stability. The major scope of work elements are similar to the Upper San Leandro WTP project, and include replacing corroded treatment equipment and pipelines, adding redundant power systems, upgrading pumps, mixers, and solids handling processes, constructing a new CCB to improve disinfection, and replacing undersized basins used for treating solids.

Walnut Creek WTP Pre-Treatment Project

The drivers for the Walnut Creek WTP Pretreatment upgrades are improve reliability during periods of poor water quality, increase flexibility to take drought supplies, and improve regional reliability. The major scope of work elements include adding an ozonation process to remove taste and odor compounds in the raw water, settling basins to improve removal of organics, sediment, and algae, and facilities to handle plant solids.

Interties with Other Agencies

To further increase resiliency, EBMUD has partnered with several neighboring agencies to establish potable water interties. These interties consist of pipeline connections that allow utilities to share water resources in the event of an emergency. EBMUD has agreements with partnered agencies that will be sharing the connections. These agencies include Contra Costa Water District, City of Hayward, San Francisco Public Utilities Commissions, and the Dublin San Ramon Services District. Attachment 1 Section 4.3 provides more detail of the interties and agreements for transfers and exchanges between EBMUD and partnered agencies.

CHAPTER 5 – WASTEWATER AND RECYCLED WATER

5.1 WASTEWATER

EBMUD and several other agencies provide wastewater treatment service within EBMUD's potable water service area. Effective wastewater treatment protects public health and the environment, and it can also provide a local water supply in the form of recycled water.

5.1.1 WASTEWATER IN THE EBMUD SERVICE AREA

Based on 2010 census data, approximately 1.4 million people are served by EBMUD's water service district. Within this service area, as shown in Figure 5-1, wastewater collection and treatment are handled by several cities and utilities. EBMUD's wastewater service district provides wastewater treatment for approximately half of the population within the EBMUD water service area. The remainder of EBMUD's water service area receives wastewater treatment from the agencies listed in Table 5-1.

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. It serves approximately 740,000[1] 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.

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

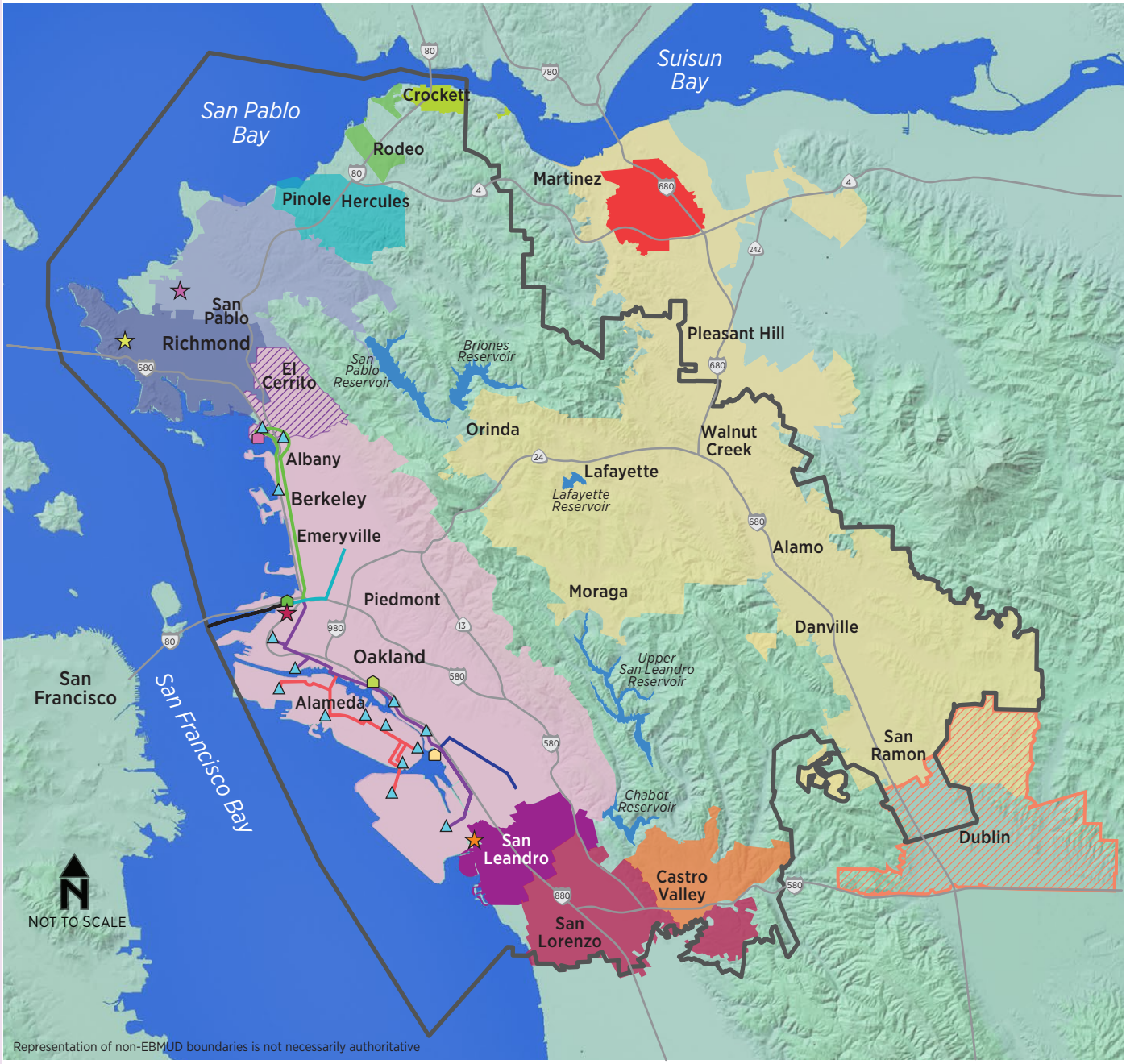
[1] The population forecast is based on published data sets provided by Census Tract data from Metropolitan Transportation Commission (MTC)/Association of Bay Area Governments; Census Block data from National Historical Geographic Information Systems and; Unincorporated areas from Environmental Systems Research Institute. Chapter 1 *Section 1.3.7 Population Projections* has a detailed discussion on method used for the population projections

TABLE 5-1 COLLECTED & TREATED WASTEWATER GENERATED IN EBMUD SERVICE AREA[1]

AGENCY	WATER TREATMENT PLANT LOCATION	CAPACITY (MGD)	CURRENT TREATED WASTEWATER DISPOSAL METHOD	COLLECTED AND TREATED WASTEWATER FLOWS (MGD)[2]					
				2020	2025	2030	2035	2040	2045
EBMUD SPECIAL DISTRICT NO.1	OAKLAND	168	DISCHARGED & RECYCLED	52	54	56	58	61	63
CITY OF SAN LEANDRO	SAN LEANDRO	9.7	DISCHARGED & RECYCLED	4.9	5.2	5.4	5.7	6.0	6.3
DUBLIN SAN RAMON SERVICES DISTRICT[8]	PLEASANTON	11.5	DISCHARGED & RECYCLED	10.3	11.0	11.6	12.3	13.2	13.2
CENTRAL CONTRA COSTA SANITARY DISTRICT	MARTINEZ	70	DISCHARGED & RECYCLED	35	37	39	41	41.4	41.8
CITY OF PINOLE/HERCULES	PINOLE	4.06	DISCHARGED & RECYCLED[3]	2.7	3.0	3.4	3.7	4.1	4.1
CITY OF RICHMOND	RICHMOND	16	DISCHARGED	4.7	4.8	5.0	5.1	5.2	5.4
WEST COUNTY WASTEWATER	RICHMOND	12.5	DISCHARGED & RECYCLED	7.5	8.2	8.9	9.6	9.6	9.6
RODEO SANITARY DISTRICT	RODEO	1.14	DISCHARGED & RECYCLED[3]	0.5	0.5	0.5	0.5	0.5	0.5
ORO LOMA SANITARY DISTRICT[4]	SAN LORENZO	20	DISCHARGED & RECYCLED	12.0	12.6	13.3	13.9	14.6	15.4
CROCKETT SANITARY DEPARTMENT[5,6,8]	CROCKETT	1.78	DISCHARGED	0.23	0.23	0.23	0.24	0.24	0.24
TOTAL[7]				130	137	143	150	155	159

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 beginning in 2025.
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.
8 DSRSD data is for that portion of its service area which is within EBMUD's service area.

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

sewer interceptors (Adeline, Alameda, North, South, and South Foothill) as illustrated in Figure 5-1.

5.1.2 SPECIAL DISTRICT ONE

EBMUD's wastewater interceptor system includes large diameter pipelines and 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 interceptor system pumping stations, ranging in capacity from 0.5 to 54.7 MGD, help to convey flows to the wastewater treatment plant.

Wastewater collected by the interceptors flows to EBMUD's Main Wastewater Treatment Plant (MWWTP), which is located in Oakland near the foot of the Bay Bridge. The MWWTP provides secondary treatment for a maximum flow of 168 MGD. Primary treatment can be provided for up to 320 MGD. The average dry weather flow from 2010 to 2019 was approximately 54 MGD.

Upon entering the MWWTP, wastewater is pre-chlorinated for odor control. Odors are managed through pre-chlorination and an odor control system at the Influent Pump Station. Initial treatment includes screening that removes large objects and grit removal. Primary sedimentation then removes floating materials, oils and greases, sand, silt, and organic solids heavy enough to settle.

Secondary treatment using high-purity oxygen-activated sludge biologically removes most of the organic and chemical impurities that would deplete oxygen from the receiving waters if discharged and allowed to decompose naturally. The treated effluent is disinfected with sodium hypochlorite (chlorine bleach) to remove bacteria and viruses. Prior to discharge, the disinfected wastewater is then de-chlorinated to remove any residual chlorine. The de-chlorinated wastewater is discharged through an outfall 1.2 miles off the East Bay shore into the San Francisco Bay. Solids are pumped to digesters for stabilization and are then dewatered and hauled offsite. Methane generated by the digesters is used to produce renewable energy.

5.1.3 OTHER WASTEWATER TREATMENT UTILITIES

Table 5-1 lists wastewater utilities shown on Figure 5-1 with their capacities and average dry weather wastewater flow projections from 2020 to 2045.

MAIN WASTEWATER TREATMENT MASTER PLAN

The goal of the Integrated Main Wastewater Treatment Plant (MWWTP) Master Plan is to provide a 30-year roadmap for the MWWTP. The Master Plan will help determine the projects needed to repair, replace, and/or upgrade the MWWTP's aging infrastructure; it will proactively address increasingly stringent water quality and environmental regulations to protect public health and promote stewardship of San Francisco Bay; and it will serve as a guide to prioritize available funding to complete the required projects. The Master Plan will outline a strategy to prioritize new facilities and interweave the necessary upgrade or decommission of existing facilities.

The following planning objectives guided the development of the Master Plan:

- Develop a roadmap for preserving and replacing assets, while also considering nutrients, biosolids management, odor management, aging infrastructure, and resource recovery and maintaining fair and reasonable rates.
- Provide reliable capacity to manage and treat all wastewater flows within the existing wastewater service area, including during peak wet weather conditions. After meeting service area needs, utilize additional capacity for ratepayer benefit.
- Identify and implement ways to beneficially use treatment byproducts (sidestream, final effluent, and biosolids). Continue to meet increasingly stringent water quality and environmental regulations and proactively upgrade wastewater facilities to comply with regulatory requirements.
- Achieve sustainability goals by maximizing energy recovery and minimizing energy consumption and greenhouse gas emissions.
- Maintain cost-effective MWWTP operations and competitive rates through efficient operations, flexibility, and evaluation of new technologies.
- Develop a capital improvement plan that incorporates resiliency, taking into account climate change including the impacts of sea level rise on the MWWTP and wastewater infrastructure.
- Reduce visual, noise, and odor impacts from MWWTP operations to neighbors to the extent practicable.

Table 5-2 **Wastewater Discharged in the EBMUD Service Area[1]**

Agency	Discharge Location	Disposal Method	Does This Agency Treat Wastewater Generated Outside EBMUD's Service Area?	Treatment Level	Non-Recycled Wastewater Flows (MGD)[2]					
					2020	2025	2030	2035	2040	2045
EBMUD Special District No. 1[2]	San Francisco Bay	EBMUD Outfall	No	Secondary	52.0	54.0	53.5	55.9	58.9	60.9
City of San Leandro	San Francisco Bay	EBDA Pipeline	Yes	Secondary	4.4	4.2	3.9	4.2	4.5	4.8
Dublin San Ramon Services District	San Francisco Bay	LAVWMA/ EBDA Pipeline	Yes	Secondary	5.8	5.1	5.3	5.5	6.3	6.3
Central Contra Costa Sanitary District	Suisun Bay	Deep Water Outfall	Yes	Secondary	31.2	30.7	31.7	32.2	30.7	–
Cities of Pinole and Hercules[3]	San Pablo Bay	Pinole-Hercules-Rodeo Outfall	No	Secondary	3.5	3.7	3.6	3.5	3.8	3.8
City of Richmond	San Francisco Bay	West County Agency Outfall	No	Secondary	5.2	5.4	5.5	5.6	5.8	5.9
West County Wastewater[4]	San Francisco Bay	West County Agency Outfall	No	Secondary	4.0	1.1	1.8	2.5	–	–
Rodeo Sanitary District[5]	San Pablo Bay	Pinole-Hercules-Rodeo Outfall	No	Secondary	0.5	0.5	0.5	0.5	0.5	0.5
Oro Loma Sanitary District	San Francisco Bay	EBDA Pipeline	Yes	Secondary	11.9	12.6	13.3	13.9	14.6	15.4
Crockett Sanitary Department	Crockett	Deep Water Outfall	No	Secondary	0.76	0.74	0.73	0.73	0.73	0.73

1 Based on personal communication with staff in each of the Districts.
2 Based on Special District No. 1 ADWFs, minus anticipated flows for East Bayshore Recycled Water Project.
3 Based on information from City of Pinole, taking into account anticipated flows for EBMUD Phillips66 recycled water project.
4 Assumes that all WCW dry weather effluent is recycled by EBMUD at NRWRP and RARE projects.
5 Rodeo Sanitary District recycles a small amount of wastewater each month for sewer maintenance.

Dublin San Ramon Services District (DSRSD) owns and operates the sewers in the Cities of Dublin and San Ramon, and it also treats wastewater collected in the City of Pleasanton under contract. Oro Loma Sanitary District owns and operates sewers in its service area and also provides wastewater treatment services for Castro Valley Sanitary District and the Cities of San Leandro and Hayward. The cities of San Leandro, Pinole, Richmond, Rodeo and Hercules own and maintain both the collection systems and the wastewater treatment facilities within their respective utility districts.

The majority of the treated effluent produced by 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. A portion of the wastewater provides a supply for recycled water programs. Table 5-2 illustrates characteristics of treated wastewater and the projected average dry weather flows of the portions 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.

5.2 Recycled Water

As our community faces continued cycles of drought, recycled water helps create a nonpotable water supply for the future that we can rely on. Recycled water is highly treated wastewater effluent 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.

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

FIGURE 5-2 EBMUD'S RECYCLED WATER PROGRAM HISTORICAL HIGHLIGHTS

1970's

- 1971 — First use of recycled water at EBMUD's Main Wastewater Treatment Plant

1980's

- 1984 — First commercial recycled water customer - the Richmond Country Club
- 1987 — EBMUD non-potable water policy mandates the use of non-potable water
- 1988 — Office of Water Recycling is established; EBMUD constructs San Leandro Reclamation Facility (SLRF) to serve Galbraith Golf Course

1990's

- 1991 — EBMUD expands SLRF to serve Chuck Corica Golf Complex
- 1993 — EBMUD Water Supply Management Plan incorporates water recycling goals
- 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

2000's

- 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
- 2006 — San Ramon Valley Recycled Water Project (Phase 1) provides recycled water to irrigation customers
- 2008 — East Bayshore Recycled Water Project provides recycled water to customers in Oakland
  - Recycled Water Commercial Truck Program begins operation
  - EBMUD Board of Directors sets goal of delivering 20 MGD of recycled water by year 2040

2010's

- 2010 — RARE Water Project Phase 1 begins operation at the Chevron Refinery
  - Construction begins on San Ramon Valley Phases 2 to 4
- 2012 — EBMUD signs Memorandum of Understanding with Diablo Country Club and CCCSD to investigate feasibility for first EBMUD satellite recycled water project
- 2013 — East Bayshore Albany pipeline construction completed in partnership with City of Albany
- 2016 — San Ramon Bishop Ranch expansion completed
  - East Bayshore Emeryville expansion completed
- 2018 — DERWA Treatment Plant Expansion is completed, increasing water recycling capacity for the San Ramon Valley project from 9.7 to 16.2 MGD

2020's

- 2020 — EBMUD transitions recycled water program regulatory compliance from General Order 96-011 to new State Water Resources Control Board General Permit
  - Residential Recycled Water Fill Station pilot program launched.
  - Groundwater supply pilot for the San Ramon Valley Recycled Water Program initiated.

Table 5-3 Calendar Year 2020 EBMUD Recycled Water Production (Million Gallons)

Month	EBMUD WWTP[2]		Irrigation Projects[1]				Other	Industrial		Total	Total
			Chuck Corica Golf Complex[3]	Harbor Bay Parkway	SRVRWP[4]	EBRWP[5]	RWTP[6]	Chevron (NR)	Chevron (RARE)[7]	(MG)	(AF)
Jan	18.1	70.3	0.0	0.0	4.8	0.8	0.01	77.1	100.0	271.0	831.5
Feb	20.9	52.0	0.0	0.0	8.2	2.2	0.01	25.4	94.8	203.4	624.0
Mar	21.3	50.8	0.0	0.0	11.2	2.7	0.00	56.6	103.4	246.1	755.1
Apr	17.9	38.4	0.0	0.0	21.9	4.1	0.00	56.9	95.4	234.6	719.9
May	19.0	35.8	0.0	0.0	32.6	4.8	0.02	81.4	96.5	270.0	828.4
Jun	18.2	34.5	0.0	0.0	56.3	7.8	0.02	68.1	88.1	272.9	837.5
Jul	18.0	34.5	0.0	0.0	58.7	8.1	0.00	82.6	81.0	283.0	868.3
Aug	14.7	37.0	0.0	0.0	54.7	7.2	0.00	85.3	78.9	277.8	852.3
Sep	15.9	46.7	0.0	0.0	44.9	7.7	0.00	73.3	81.9	270.3	829.6
Oct	16.4	56.7	0.0	0.0	27.6	6.4	0.05	41.8	90.4	239.3	734.2
Nov	17.3	45.7	0.0	0.0	18.1	5.5	0.02	33.7	94.4	214.8	659.0
Dec	19.9	47.6	0.0	0.0	3.5	1.7	0.01	67.9	90.8	231.4	710.1
Total	217.6	549.8	0.0	0.0	342.5	59.0	0.1	750.0	1,095.5	3,014.5	9,250.1
MGD	0.6	1.5	0.0	0.0	0.9	0.2	0.0	2.1	3.0	8.3	

1 Data excludes raw water irrigation projects (Redwood Canyon & Chabot Golf Courses).
2 #2W and #3W recycled water use data (monthly averages) are provided by EBMUD wastewater operations staff.
3 Chuck Corica Golf Complex was formerly Alameda Golf Complex.
4 San Ramon Valley Recycled Water Program.
5 East Bayshore Recycled Water Project. Service started in April 2008.
6 Recycled Water Truck Program began service in August 2008.
7 Richmond Advanced Recycled Water Project began service in July 2010.

a drought-proof or drought-resistant water supply, and contributes to a green and healthy environment.

5.2.1 Background

EBMUD initiated water recycling programs that reduce demand on drinking water supplies in the early 1970s. EBMUD has been recycling water for landscape irrigation 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 Figure 5-2.

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 9.05 (amended March 24, 2020, see Appendix G). 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.

In February 2019, EBMUD completed a Recycled Water Master Plan (RWMP) Update to guide future projects and priorities with a goal of serving 20 million gallons per day (MGD) of recycled water by 2040. However, as noted in the RWMP, there is uncertainty regarding the potential for some of EBMUD's anticipated recycled water projects to fully meet their recycled water supply forecasts. Sources of uncertainly include, but are not limited to, available wastewater supply and planned and unplanned facility outages.

EBMUD will continue to pursue the full development of its 20 MGD recycled water goal. However, the recycled water forecast used in the 2050 Demand Study is 13 MGD to reflect the current best estimate of recycled water project developments reasonably certain to occur by the year 2050.

5.2.2 Current EBMUD Water Recycling Projects

EBMUD's recycled water program has grown significantly since EBMUD began using recycled water at its MWWTP in 1971. The program has expanded to provide more recycled water to a diverse array of customers for a variety of uses. EBMUD has also worked to develop partnerships with other wastewater treatment entities to make recycled water available more broadly in its water service area. Innovative programs like the Recycled Water Commercial Truck Program have broadened

FIGURE 5-3 EBMUD RECYCLED AND NON-POTABLE WATER PROJECTS

the recycled water customer base, and EBMUD has led or participated in research studies related to recycled water. Table 5-3 lists characteristics of EBMUD's current projects and the amount of recycled water they produced in 2020.

Table 5-4 compares the amount of recycled water delivered by EBMUD in 2020 against the amount predicted in the 2015 UWMP. In calendar year 2020, EBMUD provided approximately 8.3 MGD of recycled water to customers for a variety of uses.

Figure 5-3 shows EBMUD's current and planned recycled water projects. Currently EBMUD supplies recycled water produced from the effluent of four different wastewater treatment plants. In addition to treating secondary effluent from its own MWWTP at the East Bayshore Recycled Water Project (EBRWP) facilities, EBMUD partners with other agencies to increase the geographic coverage of recycled water in its service area. EBMUD partners with West County Wastewater (WCW) for the North Richmond Water Recycling Plant and the Richmond Advanced Recycled Expansion (RARE) Water Project, both of which serve the Chevron Richmond refinery. In summer months, EBMUD

Table 5-4 Recycled Water 2015 UWMP Use Projection Compared to 2020 Actual

Type of Use	2015 UWMP Projection (MGD)	2020 Actual Use[1] (MGD)
Agricultural Irrigation	-	-
Landscape Irrigation (Except Golf Courses)[2]	1.8	0.9
Golf Course Irrigation	0.3	0.2
Commercial Use	0.0	0.0
Industrial Use	1.5	5.1
Geothermal or Energy Production	-	-
Seawater Intrusion Barrier	-	-
Recreational Impoundment	-	-
Wetlands or Wildlife Habitat	-	-
Groundwater Recharge	-	-
Total	3.6	6.2

1 Recycled water use at EBMUD's MWWTP is not factored into the EBMUD recycled water goal and is not included as a customer recycled water use in the table. Historically, the EBMUD MWWTP had not used potable water for processes or irrigation; consequently, current recycled water use does not offset potable water demand.
2 Landscape irrigation use includes a small volume of water used for building cooling systems at two locations; both irrigation and cooling systems are served by the same meters.

often uses all of WCW's effluent, eliminating WCW's direct discharge to San Francisco Bay. After use in the refinery, some of the recycled water is processed in the refinery's own wastewater treatment system. The refinery wastewater treatment plant discharges into San Pablo Bay and has its own discharge permit. EBMUD also partners with the Dublin San Ramon Services District (DSRSD) to make recycled water available in the eastern portion of its service area via the DSRSD-EBMUD Recycled Water Authority (DERWA). Lastly, EBMUD works with the City of San Leandro to make secondary effluent from the San Leandro WPCP available to customers.

Water Recycling at EBMUD's Main Wastewater Treatment Plant

In 1971, EBMUD constructed treatment facilities to maximize the use of recycled water for plant processes and landscape irrigation at its 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 2019, the average in-plant recycled water use was 1.7 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 these processes or for irrigation, and as a consequence current recycled water use does not offset any previous potable water demand at the EBMUD MWWTP.

San Leandro Reclamation Facility

In 1988, EBMUD constructed the San Leandro Reclamation Facility (SLRF) to serve EBMUD customers with recycled water produced by the San Leandro Water Pollution Control Plant (WPCP). The San Leandro WPCP utilizes primary sedimentation, a trickling filter, activated sludge, secondary clarification, and disinfection by sodium hypochlorite to treat wastewater to Title 22 standards for restricted irrigation application. The water recycling treatment facilities include a high head pumping station, chlorination and de-chlorination facilities, and surge control systems.

Starting in 1991 EBMUD began serving the Chuck Corica Golf Complex (formerly Alameda Golf Complex) and nearby Harbor Bay Parkway with water from SLRF. The project delivered varying volumes of recycled water to the two sites depending on weather conditions, reaching 100-115 million gallons in peak years. Since 2017, the Golf Complex's demand for recycled water has temporarily ceased due to major renovation activity at the golf course. EBMUD expects to begin serving water to Chuck Corica Golf Course again in the summer of 2021. EBMUD has also served recycled water from SLRF for temporary demands such as a construction site at the Oakland Airport in 2015 which used a total of about 3.9 million gallons.

North Richmond Water Recycling Project

The Chevron refinery in Richmond is EBMUD's largest water customer. In 1996, EBMUD started the North Richmond Water Recycling Project (NRWRP) to deliver recycled water to the Chevron refinery in Richmond for use in its cooling towers. The North Richmond plant treats secondary effluent from WCW via 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 EBMUD has also worked extensively with WCW to improve its effluent water quality.

NRWRP has a design capacity of 5.4 MGD, but typically produces about 4 MGD. In 2016 and 2017, the District's NRWRP experienced interruption of influent supply from West County due to construction shutdowns and elevated ammonia concentrations, necessitating the need for potable supplement water to serve Chevron's cooling towers. The NRWRP remained out of service for one additional year beginning in early 2018 to accommodate the District's rehabilitation of the NRWRP equalization tank. The NRWRP went back into service in May 2019.

East Bayshore Recycled Water Project – Phase 1A

The 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. New recycled water transmission pipelines and distribution pipelines have been constructed and will continue to be constructed to distribute the recycled water to customers. The first phase, Phase 1A included the construction of a pump station, microfiltration treatment system, 1.5 million gallons of storage, and more than 10 miles of transmission and distribution pipelines. The first delivery of recycled water occurred in 2008 to customers in Oakland. EBMUD has continued to expand the distribution system and at the end of 2019, there were 37 sites connected. Current customers use the recycled water for irrigation. In 2019, the project provided an average of 0.15 MGD of recycled water to customers.

RARE Water Project

Building on the success of the NRWRP, in 2010 EBMUD brought online the Richmond Advanced Recycled Expansion (RARE) Water Project to provide high purity recycled water for boilers at the Chevron Richmond refinery. EBMUD and Chevron collaborated on the design and construction of new project facilities including a new treatment plant located within the refinery. The RARE Water Treatment Plant treats secondary effluent from WCW via microfiltration and reverse osmosis to produce the high degree of purity required by the refinery boilers. EBMUD is responsible for the operation and maintenance of the treatment plant and influent pump station. Chevron is responsible for the transmission mains throughout the facility and for the provision of utilities to the treatment plant. Chevron reimburses EBMUD for all capital and operating and maintenance costs for the project.

The initial phase of the RARE Water Project was designed to produce up to 3.5 MGD of recycled water. In 2019, RARE delivered 3.36 MGD of water to Chevron, of which 1.73 MGD was recycled water and 1.63 MGD was potable water supplement. The higher use of supplementary potable water at RARE in 2019 was primarily due to the need for blending of potable water to meet Chevron's water quality requirements. Average monthly potable water usage decreased beginning in September 2019, corresponding to the replacement of the RARE reverse osmosis membranes. As discussed in Section 5.2.3, EBMUD and Chevron completed a feasibility study evaluating the potential to expand production at RARE in 2016.

San Ramon Valley Recycled Water Program

The San Ramon Valley Recycled Water Program (SRVRWP) is a partnership between EBMUD and the Dublin San Ramon Services District (DSRSD) to provide recycled water to both agencies' customers. DSRSD treats wastewater from its main wastewater treatment plant via filtration, ultraviolet disinfection, and chlorine addition to levels that meet California standards for unrestricted use. The project provides tertiary treated recycled water to large landscape irrigation customers including municipal parks, golf courses, business parks, greenbelts, and roadways.

The multi-phased project was originally planned to eventually serve up to an annual average of 2.5 MGD of recycled water to EBMUD irrigation customers in portions of Blackhawk, Danville, and San Ramon. Phases 1 and 2 of the project are complete, serving EBMUD customers at 75 locations. In 2019, the SRVRWP delivered an average of 0.89 MGD of recycled water to EBMUD customers.

Recycled Water Truck Program

In 2008, as part of its 2008-2010 Drought Management Program, EBMUD developed a recycled water commercial truck program to make recycled water available to commercial truck customers for approved uses. Through this program, EBMUD installed recycled water filling stations at its MWWTP and at the North Richmond Water Recycling Project. These filling stations provide recycled water to permitted customers for uses like dust control, soil compaction, power washing, landscape irrigation, street washing, and sewer flushing.

Although the 2008-2010 drought was the impetus for creating the recycled water commercial truck program, after the drought ended, EBMUD

continued to operate the program and to offer recycled water at the fill stations at no charge.

In May 2016, EBMUD ceased operation of the commercial truck fill station in North Richmond due to plant maintenance, as well as the full utilization of recycled water from the North Richmond Water Reclamation Plant for industrial demands at the Chevron Richmond Refinery. EBMUD has continued to run the commercial truck fill station at its MWWTP in West Oakland since 2015. In 2017, EBMUD relocated the fill station to a new location. This location is outside of the main gate of the MWWTP, allowing for easier and safer access for commercial customers. The new fill station features two hydrants instead of one, which are protected by fenced enclosures and accessed by a keypad system, allowing EBMUD to track access by customer.

Recycled water fill station use fluctuates depending on demand and weather conditions. In 2016, the program provided over 2 million gallons of recycled water, while in 2019 the program supplied 0.4 million gallons.

In summer 2020, EBMUD also conducted a four-month pilot program to test the feasibility of providing limited access for residential customers to the MWWTP fill station. The results of this pilot program will help staff determine feasibility and logistics for a residential fill station in future drought years.

Customer Compliance Program

The RARE, San Ramon, East Bayshore, and commercial truck recycled water projects are permitted by the San Francisco Regional Water Quality Control Board. The permit requires recycled water producers to establish permitting, tracking, recordkeeping, monitoring, and inspection procedures for all water recycling projects. To meet these requirements, EBMUD has established programs to permit and train customers and to track their compliance with self-monitoring requirements.

Before obtaining recycled water, each customer is required to apply for and receive a Water Reuse Permit from EBMUD. The permit defines customer responsibilities for proper recycled water use, monitoring, and inspection. The permit lists the owner, location, and approved use(s) of recycled water. Customers are also responsible for designating a Site Supervisor to oversee recycled water use at the approved site.

EBMUD provides training for the Site Supervisor on the safe and allowed uses of recycled water, appropriate actions to take in an emergency, details of required inspections and monitoring reports, and conditions for recycled water use as specified in the permit. For irrigation customers, the training also touches on appropriate landscape maintenance and management practices related to recycled water.

Customers are required to periodically inspect the recycled water system to verify that the system's operation is consistent with good management practice, and to submit self-monitoring reports regularly. The self-monitoring reports guide the customer through the items that they must check during the site inspection. Customers must check for potential issues like leaks in the irrigation system, confirm proper signage and markings, and ensure there are no visible cross-connections. Currently EBMUD requires customers to submit self-monitoring reports twice per year.

5.2.3 PLANNED RECYCLED WATER PROJECTS

Recycled water is an important component of EBMUD's diverse portfolio for future water supply planning. In 2010, EBMUD's Board of Directors set a goal of delivering up to 20 MGD of recycled water by the year 2040. In 2019, EBMUD completed a Recycled Water Master Plan Update identifying a portfolio of recycled water projects that could be implemented to meet that goal, depending on the availability of funding, customer demands, and other factors. EBMUD's plan is to identify and implement the most cost-effective recycled water projects to meet its recycled water goal.

Based on EBMUD's current assumptions about which projects it is likely to implement, Table 5-5 shows the projected quantity of recycled water use by specific type for the years 2020-2045. Projected uses are based on average usage for current projects and potential average uses for planned projects. Recycled water will be used predominantly for irrigation and industrial use, with some commercial use as well. EBMUD continues to seek innovative applications of recycled water to expand its use. Some of these proposed projects would require the construction of new treatment facilities, while others would involve expanding the distribution systems for existing projects to reach additional customers. As noted previously, there is uncertainty regarding the potential for some of EBMUD's anticipated recycled water projects to fully meet their recycled water supply forecasts. EBMUD will continue to pursue the full

TABLE 5-5 **EBMUD PROJECTIONS OF RECYCLED WATER SERVICE THROUGH 2045**

PROJECT	RECYCLED WATER DELIVERIES (MGD)				
EXISTING PROJECTS	2025	2030	2035	2040	2045
NORTH RICHMOND RECLAMATION PLANT	3.5	3.5	3.5	3.5	3.5
RICHMOND ADVANCED RECYCLED WATER (RARE)	3.6	3.6	3.6	3.6	3.6
EAST BAYSHORE RECYCLED WATER PROJECT, PHASE 1A	0.14	0.15	0.15	0.15	0.15
SAN RAMON VALLEY RECYCLED WATER PROJECT, PHASE 1	1.04	1.04	1.04	1.04	1.04
RECYCLED WATER TRUCK PROGRAM	0.002	0.002	0.002	0.002	0.002
CHUCK CORICA GOLF COURSE COMPLEX	0.05	0.05	0.05	0.05	0.05
TOTAL EXISTING RECYCLED WATER USE	8.28	8.29	8.29	8.29	8.29
FUTURE PROJECTS	2025	2030	2035	2040	2045
DIABLO COUNTRY CLUB SATELLITE	0.22	0.22	0.22	0.22	0.22
SAN RAMON VALLEY RECYCLED WATER PROJECT	0.71	0.98	1.3	1.3	1.3
PHILLIPS 66 REFINERY RECYCLED WATER PROJECT	0	2.6	3.7	3.7	3.7
EAST BAYSHORE RECYCLED WATER PROJECT, PHASE 1	0.04	0.05	0.05	0.05	0.05
EAST BAYSHORE RECYCLED WATER PROJECT, PHASE 2	0	0.25	2.1	2.1	2.1
RICHMOND ADVANCED RECYCLED WATER (RARE) / NORTH RICHMOND	0	0	0	3.84	3.84
OTHER POTENTIAL PROJECTS	0.25	0.25	0.5	0.5	0.5
TOTAL FUTURE PROJECTIONS	1.22	4.35	7.87	11.71	11.71
TOTAL RECYCLED WATER PROJECTED DEMAND	9.50	12.64	16.16	20.00	20.00

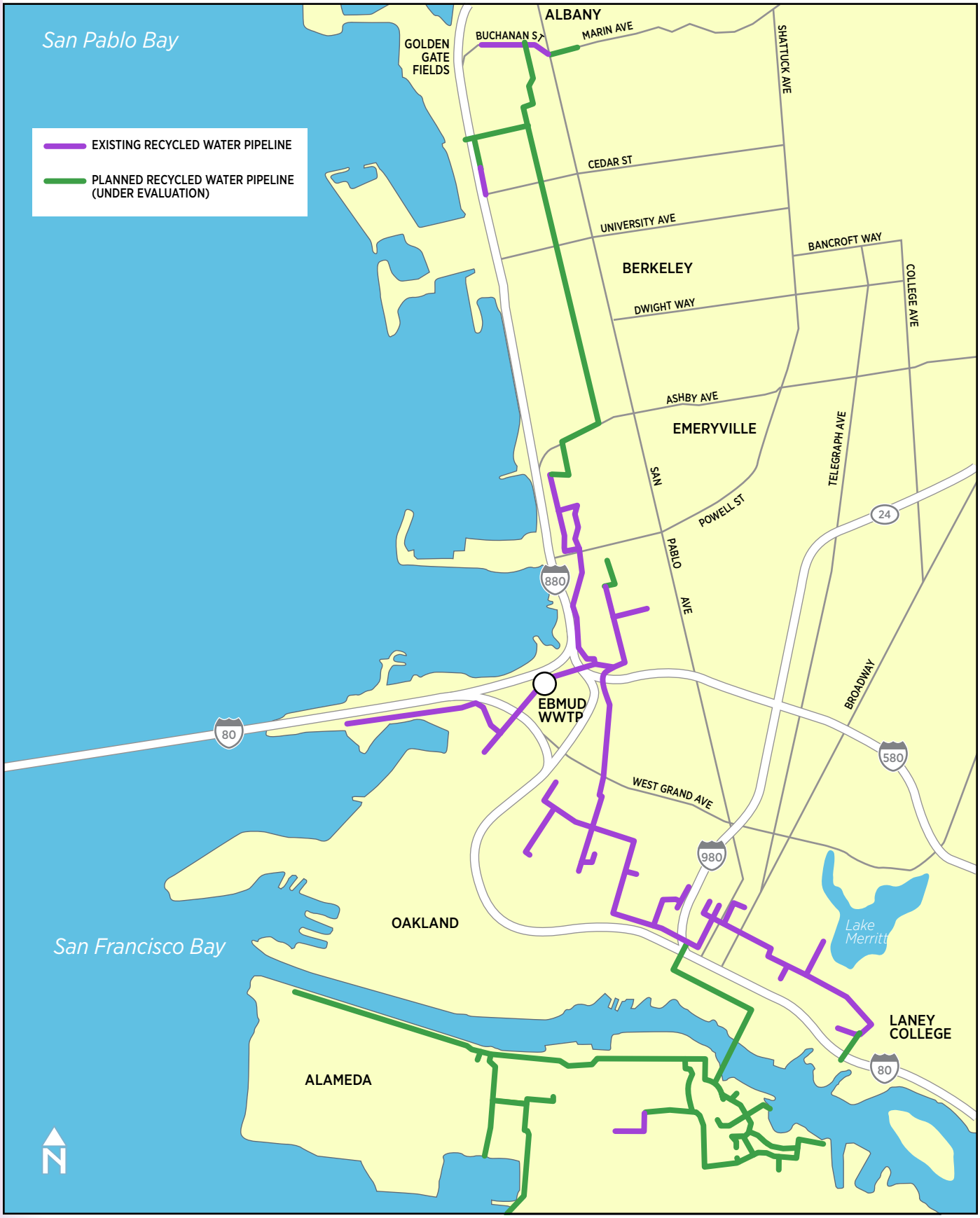
development of its 20 MGD recycled water goal. However, the recycled water forecast use in the 2050 Demand Study is 13 MGD to reflect the current best estimate of recycled water project developments reasonably certain to occur by the year 2050. The projections in Table 5-5 represent ideal future conditions and do not account for the uncertainty in fully meeting recycled water delivery goals.

In addition to implementing the recommended non-potable reuse projects, EBMUD will continue to encourage development of non-potable reuse projects self-financed and implemented by EBMUD water customers. Although EBMUD will not provide financing for construction of these projects, staff will be available to help with programmatic aspects of implementation. An example of this type of customer self-financed project is Diablo Country Club, which is exploring the feasibility of constructing a recycled water facility using raw wastewater from Central Contra Costa Sanitary District's collection system, offsetting about 250 AFY of potable water currently used for golf course irrigation. Satellite treatment projects, even small ones, would contribute to EBMUD's 20 MGD recycled water goal.

The following projects are currently in the planning/study phase:

- RARE Water Project Future Phases
- North Richmond Water Recycling Plant Expansion
- Satellite Recycled Water Treatment Plant Projects
- San Ramon Valley Recycled Water Project Phases 3A, 3B, 3C, 4, 5, and 6
- East Bayshore Recycled Water Project Phases 1B and 2
- Phillips 66 Recycled Water Project

FIGURE 5-4 EAST BAYSHORE RECYCLED WATER PROJECT



Richmond Refinery Recycled Water Study

EBMUD has been providing recycled water to the Chevron Richmond refinery since 1995 and currently operates two treatment plants, the North Richmond Water Recycling Facility and the RARE Water Project. Collectively, the two facilities provide the refinery with about 7.5 MGD of recycled water.

Building on the success of these projects, in 2014 EBMUD and Chevron began work on a feasibility study to explore options for expanding recycled water use at the refinery.

The Richmond Refinery Recycled Water Study (R3 Study), completed in 2016 and summarized in relevant part below, evaluated options for expanding production and improving water quality at RARE and the North Richmond Water Recycling Project.

RARE Water Project Future Phases

The RARE water treatment plant has a capacity of up to 3.5 MGD, but the facility was designed to be expandable to 4.0 MGD with the installation of additional microfiltration modules. Expansion to 5.0 MGD would require the construction of additional facilities. Since WCW effluent supply is limited, expansion at RARE will require an additional feed source. The R3 Study identified the potential to use the refinery's own process wastewater effluent as a feed source for RARE. Using Chevron's process effluent would require the construction of new facilities to convey the water to RARE; and additional treatment facilities could be needed depending on water quality. Due to the significant input and financial support from Chevron that would be required to move forward, this option is no longer considered viable. EBMUD identified an alternate potential feed source to increase production at RARE: effluent from the City of Richmond's Water Pollution Control Plant (WPCP). Using effluent from the City of Richmond's WPCP as a feed source for RARE would also require construction of new conveyance and treatment facilities. Due to the additional planning and coordination required, future expansion of the RARE facility to 5.0 MGD is estimated to be completed in a 20-year time frame.

North Richmond Water Recycling Plant Expansion

The R3 Study also evaluated options for the North Richmond Water Recycling Project. The existing North Richmond plant is more than 20 years old and needs significant maintenance. In addition, the R3 Study concluded that the treatment process was challenged by the variable quality of the secondary effluent received from WCW, and sometimes could not treat the water to the level that Chevron requires. However, implementing process improvements at the North Richmond plant to consistently meet Chevron's water quality needs would be very expensive to implement, specifically with respect to ammonia removal. The R3 Study recommended further evaluation of ammonia removal improvements at WCW's treatment plant to determine the most cost-effective solution. In 2018, WCW completed construction of significant plant upgrades, resulting in the capability to provide more consistent water quality and enhanced ammonia removal. In March 2020, EBMUD and WCW entered into an updated supply agreement with provisions to ensure consistent effluent water quality is supplied to EBMUD's North Richmond and RARE facilities.

Based on the outcome of the R3 Study, expansion of the North Richmond plant to 5.0 MGD was not included as a recommended project in the 2019 Recycled Water Master Plan Update.

East Bayshore Recycled Water Project – Future Phases

Future work on the multi-phase EBRWP will involve expanding the distribution system to serve additional customers in Oakland, Emeryville, Berkeley, Albany, and Alameda. Figure 5-4 shows the different phases of the EBRWP, as well as which segments of pipeline have been completed and which are planned.

Phase 1A, which is partially complete, will ultimately serve customers in Oakland, Emeryville, Berkeley, and Albany. EBMUD plans to extend the transmission main as far north as Albany. While some of this pipe is already in place, more than 4 miles still need to be completed. EBMUD began this construction in 2012, installing a section of pipeline under the MacArthur Maze. The next segment of the pipeline was completed in 2016. In addition, in 2013 EBMUD entered into an agreement with the City of Albany to install 1,800 feet of recycled water distribution piping as part of a bikeway project the City was undertaking. In 2015, EBMUD and Albany partnered again to install another 2,000 feet of pipe. Ultimately this pipeline will extend to the Ohlone Greenway in order to supply recycled water for landscape irrigation, once the I-80 transmission pipeline is complete.

EBRWP Phase 1B includes the installation a new recycled water transmission main under the Oakland-Alameda Estuary to serve users in northern Alameda. Future redevelopment in this area, including the

former Alameda Naval Air Station, is expected to result in increased demand for water for irrigation. The planning phase of this project began in 2014.

In Phase 2, EBMUD would install pipeline extensions off of existing mains to serve users in downtown Oakland. Most potential users would be located close to existing transmission mains, and connecting them would only require installation of short sections of lateral. However, the high density urban environment would make design and construction challenging.

EBMUD has undertaken an expansion study aimed at identifying changed conditions and new recycled water users since the last Facilities Plan was completed in 2000. Customer demands and locations have changed due to redevelopment. The study also evaluated transmission and distribution capacities and alignments needed to provide services to the potential customers. Results of the study show that in addition to expanding the transmission and distribution systems, recycled water quality improvements are also needed to increase the deliveries to customers. Pilot studies will be implemented based on the study recommendation to determine design and operation parameters of the improvements.

San Ramon Valley Recycled Water Project – Future Phases

When complete, the San Ramon Valley Recycled Water Project will include up to 75 miles of transmission and distribution pipelines. Figure 5-5 shows existing and planned project phases. Phase 1, 2 and portions of 3 have already been completed. Expansion will be dependent upon adequate recycled water supply. In the future, EBMUD will complete Phases 3A, 3B, and 6 to serve additional customers in San Ramon and Danville. Phases 4 and 5 would extend service to customers in the community of Blackhawk.

Phillips 66 Recycled Water Project

The Phillips 66 Recycled Water Project could provide up to 3.7 MGD of recycled water to the Phillips 66 Refinery in Rodeo for use in the refinery boilers and cooling towers. A new recycled water treatment plant would treat secondary effluent from the Pinole-Hercules and Rodeo wastewater treatment plants. The project would occur in two phases, delivering 2.6 MGD in Phase 1 and up to 3.7 MGD in Phase 2. Completion of Phase 1 is anticipated in 2030. Additional studies are needed to confirm recycled water demands, water quality requirements, availability of supply, and funding sources.

Satellite Recycled Water Treatment Plant Projects

Satellite recycled water treatment plants take raw sewage from a sewer pipeline and treat it to meet the Title 22 standards required for a specific project. These systems can cost-effectively serve large water users that are located far from a centralized wastewater treatment facility. EBMUD has identified several potential satellite recycled water treatment plant projects that could provide recycled water to customers.

In 2012, EBMUD signed a Memorandum of Understanding with the Diablo Country Club and Central Contra Costa Sanitary District (CCCSD) in which the parties agreed to cooperate on a feasibility study to evaluate the use of a satellite recycled water treatment plant to provide a portion of the irrigation water for the Diablo Country Club golf course. The feasibility study, completed in 2012 and updated in July 2013, recommended a satellite project that could recycle up to approximately 0.51 MGD of sewage from the CCCSD collection system to provide water for irrigation. This would equate to an annualized average flow of 0.2 MGD to offset potable water demand. A second MOU to better define the project, responsibilities, and fees was executed in 2015.

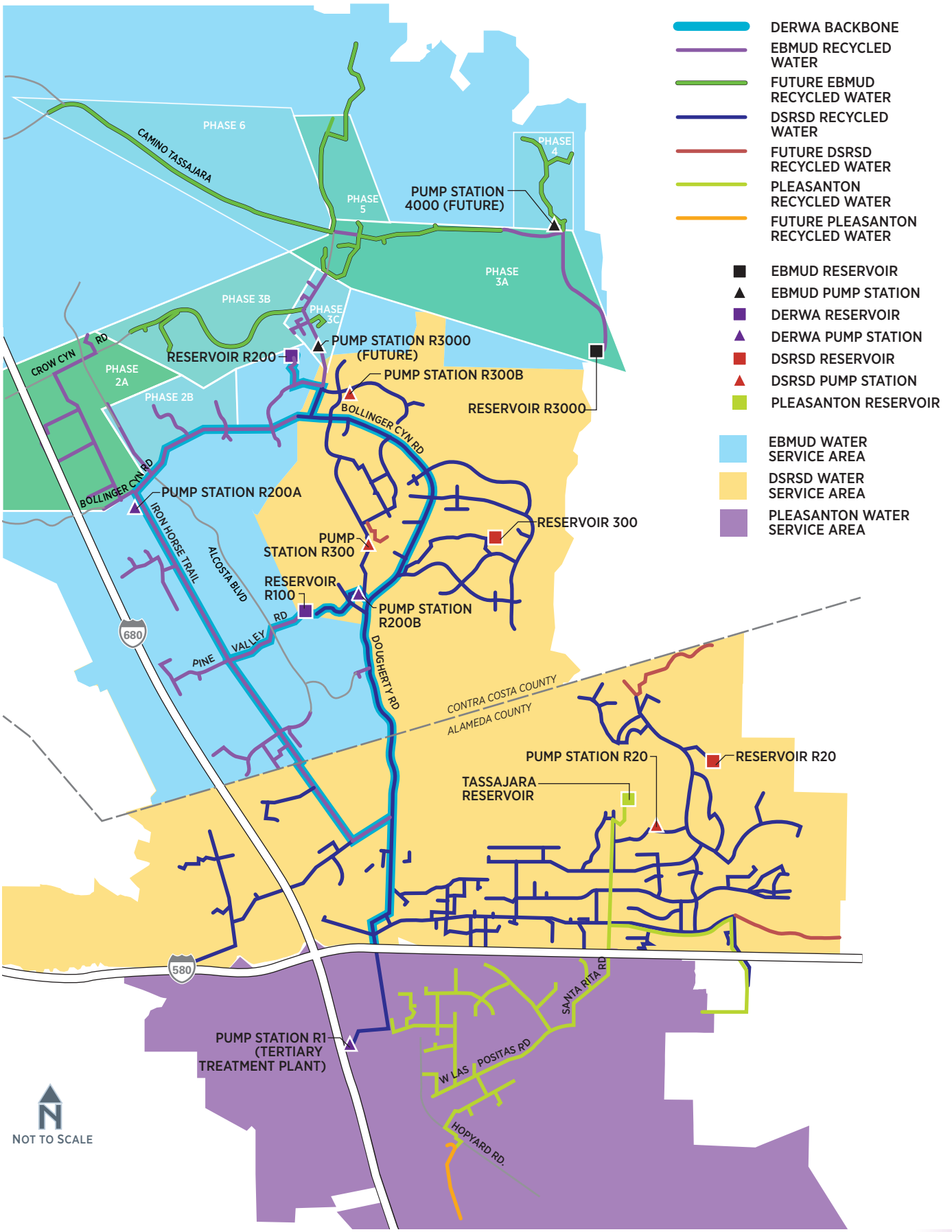
In addition, EBMUD conducted a study to evaluate the viability of three alternate non-potable water supplies in the Oakland Hills, to serve customers including the Oakland Zoo, the Sequoyah Country Club, and the future Oak Knoll Development. The Oakland Hills Alternative Water Supply Feasibility Study, completed in 2017, evaluated the potential for diverting raw wastewater from local sewers to a 0.5 MGD satellite recycled water treatment plant located at the Sequoyah Country Club. Sequoyah Country Club has since proposed a self-financed 0.1 MGD satellite facility to meet a portion of their golf course irrigation demand with recycled water.

5.3 RECYCLED WATER OPTIMIZATION PLAN

EBMUD plans to implement the most cost-effective projects to meet its overall goal of delivering 20 MGD of recycled water by the year 2040. Following is a discussion of the challenges to expanding the use of recycled water and EBMUD's attempts to address those challenges.

FIGURE 5-5

SAN RAMON VALLEY RECYCLED WATER PROJECT



5.3.1 Challenges to Implementation

Although there is growing acceptance of the importance of recycled water in meeting California's water needs, there continue to be challenges to implementing recycled water projects. EBMUD has identified financial and technical challenges and has developed strategies to improve the feasibility of recycled water projects.

Financial Challenges

One of the main challenges to expanding the recycled water customer base is the cost associated with installing and maintaining a separate distribution system for the recycled water. California regulations set strict guidelines on how pipes, valves, and other appurtenances must be installed to prevent cross-connection or contamination of the potable water system. Installing new recycled water pipelines can be expensive, particularly in dense, urban areas where utility corridors are already packed with utilities.

In addition, the cost of retrofitting customer sites to use recycled water can also be quite high because a separate piping system must be installed for the recycled water. For some customers, installing and testing the new system requires disrupting their normal business operations, which can have financial impacts. EBMUD has identified several strategies to improve the financial viability of recycled water projects, which are discussed in Section 5.3.2, "Encouraging Recycled Water Use."

Technical Challenges

One of the principle technical challenges associated with recycled water production is matching water quality to the customer's specific needs. California state law and EBMUD's recycled water permits set requirements for protecting human health and the environment, but some customers have water quality needs that require additional treatment. Industrial customers can have very specific water quality requirements that can be challenging to meet given the wastewater source quality and conventional recycled water treatment technologies.

For example, customers using recycled water for industrial cooling systems may require very low levels of ammonia or hardness. For customers using recycled water for irrigation, the level of salts, as measured by total dissolved solids (TDS), inherent in the wastewater supply can be damaging to some species of plants.

Securing sufficient wastewater effluent supply is another challenge associated with future implementation of EBMUD's recycled water program. Additional wastewater supply will be needed in order to implement new recycled water projects and expand existing projects. Bay Area wastewater treatment plants have experienced declining wastewater flows due in part to increased water conservation efforts. As such, there is a degree of uncertainty regarding EBMUD's forecasted recycled water production.

In some cases, EBMUD has invested in advanced treatment technologies to meet customer water quality requirements, such as at the RARE facility. EBMUD also provides training to irrigation customers on the effective use of recycled water for landscaping. At times, EBMUD has also made available to those customers the services of a horticulturalist to help address any concerns related to specific plants or landscaping issues.

5.3.2 Encouraging Recycled Water Use

Given the importance of recycled water as part of EBMUD's overall water supply portfolio, EBMUD has developed numerous strategies and policies for encouraging its use. Financial incentives, grants and loans, and long-term contracts help to make recycled water more economical. Public education and regional partnerships help to improve acceptance of recycled water projects. EBMUD also has policies in place to promote the use of recycled water where feasible.

Financial Incentives for Customers

EBMUD has developed policies and programs to minimize the financial impacts of converting sites to recycled water. In general, EBMUD priced recycled water to provide an economic incentive to customers. A major incentive for customers to use recycled water is the reliability and availability of the supply during a drought, which is not subject to rationing or surcharges. 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 and reduced rates for 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.

POTENTIAL FOR POTABLE REUSE

Potable reuse is defined as recycled water that is further treated through advanced processes and purified sufficiently so that it is safe for human consumption. When the purified water is used to augment a groundwater aquifer (groundwater augmentation) or surface water body (reservoir augmentation) before being withdrawn, treated, and blended with other water supplies for potable distribution, that is known as indirect potable reuse. Direct potable reuse is the term used for purified water introduced directly to the potable water system and blended with other treated water supplies (treated water augmentation) or blended with the raw water supply immediately upstream of a water treatment plant (raw water augmentation).

EBMUD's 2019 Recycled Water Master Plan Update considered the potential for potable reuse in EBMUD's water service area. When EBMUD last updated the Recycled Water Master Plan in 2012, there were no uniform statewide criteria for potable reuse, although several groundwater augmentation projects were operating in southern California. Since then, potable reuse regulations for groundwater augmentation were adopted in 2014, and potable reuse regulations for reservoir augmentation were adopted in 2018. The State's Division of Drinking Water is currently working on regulations for raw water augmentation, aiming for completion by 2023. There is no timeline for treated water augmentation regulations.

In the 2019 Recycled Water Master Plan Update, potable reuse alternatives were evaluated by conducting a supply assessment to identify all possible sources of treated municipal wastewater within or adjacent to EBMUD's water service area. Each potable reuse alternative is associated with specific targets: groundwater basins, surface water reservoirs, surface water treatment plants or aqueducts, and large pipelines or tanks within EBMUD's treated water distribution system. Three dozen alternatives were evaluated, covering a variety of advanced water treatment processes and ranging in size from 1 MGD up to 30 MGD. Each non-potable and potable reuse project alternative was evaluated based on quantified cost and qualitative non-cost factors to determine unit costs per acre-foot of water delivered.

Several potable reuse options were identified with comparable unit costs to non-potable reuse, but the total capital investment needed up front is significantly greater. Therefore, EBMUD will maintain a recycled water supply goal of 20 MGD by 2040 to be met through non-potable reuse. Potable reuse will become more promising when EBMUD's need for water supply increases, wastewater treatment plants within EBMUD's water service area have completed upgrades to remove nutrients in wastewater discharged to San Francisco Bay (which is not expected before 2024), statewide regulations are adopted for raw and treated water augmentation, and other agencies have demonstrated successful potable reuse projects. Therefore, potable reuse opportunities will be re-evaluated in 2024 to determine if any projects should be incorporated into the EBMUD water supply portfolio.

EBMUD also offers lower rates for recycled water than for potable water. 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 non-residential potable water rate.

Grants & Loans

To help reduce the overall cost of recycled water projects, EBMUD actively pursues state and federal funding in the form of grants and low-interest loans. Funding sources have included the State Water Bond Bills (Propositions 13 and 84), the Federal Water Resources Development Act (WRDA), the SWRCB Revolving Fund program, and the Water Reuse Financing Authority, 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. This authorization is nearly fully appropriated, with funding used to develop the SRVRWP distribution system. In 2007, WRDA authorized up to $25 million for EBMUD's recycled water program, although no appropriations have been received under this authorization.

Grant funds from the SWRCB have been used in the planning, design, and construction phases of

the EBRWP and the SRVRWP. 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 was awarded Proposition 84 grant funding through the IRWMP process to expand the East Bayshore and San Ramon Valley distribution systems. EBMUD was awarded $741,000 in 2013 and $1,000,000 in 2014 for East Bayshore, and $2 million in 2014-2015 for San Ramon Valley.

In 2018, the SWRCB awarded a $2.5 million Green Project Reserve 100% Principal Forgiveness loan for the expansion of the recycled water treatment plant for the SRVRWP.

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 that are owned and operated by other utilities. It is therefore very important for EBMUD to enter into long-term agreements with the utilities that provide the treated effluent for use by EBMUD to ensure that both the price and the supply of recycled water are stable. 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 EBMUD intends to maintain this policy for all future projects.

In some cases, EBMUD also enters into long-term contracts with customers for specific projects. EBMUD and Chevron executed 25-year agreements for the RARE Water Project in 2008. In 2018, EBMUD and Chevron executed an updated agreement with a 10-year term to continue operating the NRWRP. These long-term contracts allow EBMUD to invest in the treatment facilities needed to meet specific customer water quality requirements.

Regional Planning

EBMUD participates in a variety of regional and statewide organizations involved in regional planning for recycled water. EBMUD is active in the Bay Area Clean Water Agencies (BACWA) Recycled Water Committee, the WateReuse Association Northern California Chapter, WateReuse California Legislative/Regulatory Committee, WateReuse CA Board, and CUWA Water Reuse Committee, among others. Through involvement in these organizations, EBMUD and other agencies share technical information, discuss emerging regulatory and policy trends, and work cooperatively to expand the use of recycled water.

EBMUD also participated in the development of the 2013 Bay Area Integrated Regional Water Management Plan (IRWMP) Update. The IRWMP is a nine-county effort to improve water supply reliability, protect water quality, manage flood protection, and protect habitat and watershed resources. EBMUD's water recycling program is included in the IRWMP, and EBMUD has been awarded grant funding for recycled water projects through DWR's Proposition 50 and 84 programs for IRWMP 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. EBMUD increases public awareness of the benefits of using recycled water through presentations to community groups and at conferences, coordination of workshops, meetings with potential customers and local planning agencies, and distribution of educational materials. 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 ***www.ebmud.com/recycledwater***.

EBMUD staff provides trainings on recycled water to Site Supervisors at all recycled water sites, as well as regularly to each EBMUD maintenance yard and other relevant EBMUD work groups including customer services, the new business office, and public affairs. EBMUD also presents to local groups

including ReScape, which permits businesses and individuals in green landscaping principles.

Prohibiting Specific Fresh Water Uses/ Requiring 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. 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.

Research & Studies

EBMUD has also led or participated in several research studies related to recycled water. EBMUD participated in the second phase of a corrosion study evaluating the effects of recycled water on common indoor plumbing materials. This study helped EBMUD to determine which plumbing materials should be used for recycled water, thereby making it easier to expand the use of recycled water for indoor applications like toilet and urinal flushing. EBMUD also conducted an evaluation of onsite treatment alternatives to address odor and color issues associated with the indoor use of recycled water. EBMUD installed and tested several onsite treatment systems at its own Administration Building, where recycled water was used for flushing public toilets and urinals.

EBMUD is also provided financial support to the Direct Potable Reuse (DPR) initiative organized by the WateReuse Foundation and the WateReuse Association California which includes 26 research projects that address the technical, regulatory, scientific, and attitudinal issues surrounding direct potable reuse projects in California. The results of the DPR initiative studies helped inform regulators, utilities, and communities as they consider implementation of potable reuse.

EBMUD completed the East Bayshore Water Quality Study in May 2019 to identify future recycled water uses and demands within the East Bayshore Recycled Water Program service area, improvements to address recycled water quality for current and future use, and to develop a project phasing and expansion plan to increase annual average deliveries of recycled water. The study recommended additional outreach to confirm interest in the use of recycled water for cooling tower uses, additional wastewater quality characterization studies, and pilot testing of treatment technologies.

EBMUD completed the Updated Recycled Water Master Plan in February 2019. The Updated Recycled Water Master Plan evaluated the existing recycled water system and identified and assessed opportunities for non-potable and potable reuse to prepare for the future needs of expanded water recycling efforts. The Updated Recycled Water Master Plan recommended an approach to meet EBMUD's goal of providing 20 MGD of recycled water by 2040 through non-potable reuse projects across EBMUD's water service area. The projects and opportunities for potable reuse will be periodically evaluated as water supply needs and regulatory status for potable ruse are tracked.

5.4 OTHER NON-POTABLE WATER USE

EBMUD has a number of existing non-potable water projects, whose locations are shown in Figure 5-3. These projects do not use treated wastewater (i.e., recycled water). Instead,

TABLE 5-6 EXISTING EBMUD NON-POTABLE/RAW WATER PROJECTS

USER	WATER SUPPLY SOURCE	NON-POTABLE/ RAW WATER USE	AVERAGE DAILY 2020 DEMAND (MGD)	YEAR INITIATED
WATER TREATMENT PLANTS	WASHWATER RECLAMATION	RECYCLE FILTER BACKWASH	3.25	1970
LAKE CHABOT GOLF COURSE	CHABOT RESERVOIR	GOLF COURSE IRRIGATION	0.11	1991
WILLOW PARK GOLF COURSE	CHABOT RESERVOIR	GOLF COURSE IRRIGATION	0.03	1991

they use reclaim water for filter backwash or raw/non-potable water for irrigation.

Existing raw/non-potable water projects, listed in Table 5-6, reduce demands on EBMUD's potable water supply by almost 3.4 MGD.

5.4.1 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 as raw water supply for the plants, resulting in potable water savings. The Walnut Creek, Sobrante, and Upper San Leandro 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 on-site. At the Orinda and Lafayette treatment plants, spent filter backwash water is ultimately treated at EBMUD's downstream treatment plants. The operation of filter plant washwater reclamation facilities saved EBMUD approximately 3.25 MGD in 2020.

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.

5.4.2 Raw Water Projects

Lake Chabot Golf Course

Since 1991, EBMUD has provided raw water from Chabot Reservoir to irrigate the City of Oakland's Lake Chabot Golf Course. Since Chabot Reservoir is a standby terminal reservoir not connected to the distribution system, use of this water for irrigation reduces potable demand. In addition, the reduction of potable water demand eliminated the need to construct a proposed new potable water reservoir.

Project facilities include a pump station, 9,500 feet of supply pipeline, and a surge tank/storage reservoir. In 2020, this project supplied an average of 0.11 MGD of raw water to the golf course.

Redwood Canyon Golf Course

Similar to the Lake Chabot Golf Course project, this project uses raw water from the Chabot reservoir to irrigate the Redwood Canyon Golf Course (formerly known as the Willow Park Golf Course) in Castro Valley. Facilities include a submersible pump station and 8,500 feet of distribution pipeline. In 2020, the project supplied an average of 0.03 MGD of raw water to Redwood Canyon.

Lake Chabot Raw Water Expansion Project

In the future, EBMUD may expand the Lake Chabot Golf Course and Redwood Canyon Golf Course projects described above. The expansion would provide raw water from Chabot Reservoir 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.

CHAPTER 6 – WATER CONSERVATION PROGRAM

6.1 EBMUD CONSERVATION BACKGROUND

EBMUD's water conservation program addresses both supply-side (distribution system) and demand-side (customer) factors, as well as legislative activity. Demand-side water conservation measures improve customer water use efficiency and include water use surveys, incentives, education and outreach activities, market support activities, and regulatory programs. Supply-side water conservation measures, which improve efficiency before use by the customer, include distribution-system leak detection and repair programs.

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. A summary of key EBMUD water conservation efforts and actions are chronicled in Figure 6-1. This chapter specifically discusses EBMUD's water conservation efforts following the implementation of its Water Conservation Master Plan (WCMP), first adopted in 1994, last updated in 2011, and undergoing another update in 2021.

6.1.1 WATER CONSERVATION STRATEGIC PLAN

Since EBMUD completed its first WCMP in 1994, the document has served an important role in guiding and tracking the development of EBMUD's conservation program. The 2021 update – renamed the Water Conservation Strategic Plan (WCSP) – will include existing and planned efforts to support meeting long-term water conservation planning goals to the year 2050. It will present a phased implementation of conservation measures based on threshold water production and customer demand levels designed to achieve a cumulative 70 million gallons per day (MGD) of water savings by 2050 .

In developing its conservation goal, EBMUD evaluated a range of conservation projects suitable to its service area demographics, customer water use patterns, and changing regulations, then selected the projects best suited to provide cost-effective and measurable water savings. When calculating the potential impact of conservation projects, EBMUD assumes that the annual water savings from some projects may decrease over time. As a result, EBMUD builds in more conservative targets and implementation strategies to meet savings milestones. Water savings measurements include both active customer participation in EBMUD conservation programs and natural savings from code adoption and increased market saturation of water-efficient technology. EBMUD evaluates water savings through water usage patterns pre- and post- conservation measure adoption and in comparison to customer control groups.

The WCSP 2021 Update will detail water conservation programs, methodologies, and goals that are established in water supply planning and mandated by community-wide regulation or statute. It defines the implementation strategies, objectives, and tactics required to achieve long-term water conservation savings, presenting a ten-year implementation schedule for water conservation programs required to help meet the need for water. The ten-year planning horizon allows EBMUD to emphasize emerging water-efficient technology and recent and anticipated regulatory and legislative code changes. The WCSP 2021 Update will show how EBMUD will meet the requirements of existing and emerging State regulations, including the Long-Term Framework legislation passed in 2018 (SB606 and SB1668). The Long-Term Framework, discussed in more detail in Section 6.4, sets water use efficiency requirements that utilities must meet beginning in 2025.

The WCSP 2021 Update will maintain EBMUD's strategic shift towards balancing the use of financial incentives and rebates with programs that leverage information technology. EBMUD conducted qualitative customer opinion research in 2011 and found that rebates are not a primary driver of decisions regarding investment in water-efficiency upgrades. In addition, increasing market saturation of water-efficient products, particularly in the residential sector, is driving the need for new conservation strategies, even as some rebate programs continue to show potential for expansion. In order to maximize benefits and water savings, EBMUD, therefore, continues to balance its investments in financial incentive programs with information-based approaches that connect end-users with the information and tools needed to manage their water consumption.

EBMUD water conservation programs include projects that utilize information technology, water-saving device distribution, financial incentives,

Figure 6-1 **Water Conservation Historical Highlights**

Pre-1970	Distribution system leak detection and pipe replacement programs begin.
1970's	EBMUD starts school education programs, community speakers' bureau is formed, and first drought response program begins.
1980's	First water-conserving demonstration gardens, EBMUD sponsors the California Urban Water Management Planning Act, golf courses begins using recycled water, EBMUD Water Conserving Plants and Landscapes for the Bay Area book is released, residential and large landscape survey offered, landscape advisory committee formed, Section 29 is created to prohibit wasteful water use.
1990's	Irrigation incentive program is offered, CII surveys program is developed, two firescape demonstration gardens and brochure created, first water conservation master plan developed, irrigation account water budget report program launched, EBMUD signs CUWCC MOU for best management practices, toilet and clothes washer incentive programs begin.
2000's	WaterSmart™ conservation certification program launches, new edition of EBMUD plant book, *Plants and Landscapes for Summer Dry Climates*, is published, weather-based irrigation controller incentive program launches, water service regulations/efficiency requirements for all new water services, EBMUD adopts individual metering requirements for new multi-family residential and commercial uses.
2010's	EBMUD creates and launches landscape water budget reports for single-family residential customers and My Water Report's for single-family, multi-family, and commercial customers, plant tag nursery & mulch program begins, landscape conversion suite of incentives for customers is developed, flow meter rebate program launches.
2020's & Beyond	EBMUD begins webinar series on water efficient landscapes, water savings tips, and maintenance, installation of AMI (automated metering infrastructure), and informational services platform developed for water saving in the 21st century.

targeted education and outreach, market support, new technology research, and regulatory activities. The WCSP 2021 Update will anticipate an expanded focus on water usage reports, outreach, and services that focus on leak management and customer water use patterns. To be eligible for water service, new developments must meet indoor and outdoor water-efficiency standards for plumbing fixtures, appliances, landscaping, and commercial processes that use water. Additional savings are expected to result from "natural replacement," whereby EBMUD-supported market advancement in technology and changes in standards and codes drive the replacement of inefficient hardware (such as toilets, showerheads, and faucets) with more efficient models.

As part of the WCSP 2021 Update, staff looked at 75 conservation measures considered potentially appropriate for the EBMUD service area. Out of the initial review, 50 of these measures were further analyzed and matched to our customer classifications (i.e. single-family, multi-family, commercial, etc.). Potential water savings were evaluated based on demographics, market saturation, and anticipated levels of participation. The water conservation measures selected are listed in Appendix F. A cross-section of the water conservation programs and measures are listed in Table 6-1.

6.1.2 ESTIMATED WATER SAVINGS AND RECENT ACCOMPLISHMENTS

Since the 1970s EBMUD has invested significantly in customer-targeted water conservation programs. EBMUD estimates that, from when it first began implementing a WCMP in 1995 through 2018, it has achieved 46 MGD of water savings.

Since the 2015 UWMP, EBMUD has continued to expand its conservation activities. From 2016 to 2020, EBMUD responded to more than 3,220 customer inquiries including more than 1,670 water waste reports, and also increased EBMUD conservation education and community outreach efforts through delivery of more than 1,340 drought materials to restaurants, hotels, and health clubs, and more than 210 community presentations, events, and workshops.

Although the program is shifting away from rebates and incentives, EBMUD maintains a focus on several select rebate programs, such as lawn replacement. From 2016 to 2020, more than 2,446,150 square feet of turf were converted to water-efficient alternatives as a result of EBMUD's lawn rebate program.

Key EBMUD water conservation program accomplishments from CY2016-2020 are listed in Table 6-2 and include:

- Over 2,680,000 Home Water Reports distributed to residential customers;
- Over 65,000 customers registered on EBMUD's web portal;
- Over 47,000 leak alerts sent to customers, with 25 percent of recipients responding to the alert;
- Over 11,000 rebates totaling more than $2.5 million were distributed to EBMUD customers;
- Over 5800 free water-saving devices (e.g. showerheads, faucet aerators) were distributed;
- More than 3,000 water use surveys were conducted and more than 12,000 Home Survey Kits were requested by customers;
- 98 new businesses received certification in EBMUD's WaterSmart Business program in recognition of their water use efficiency efforts;
- 1,600 copies of EBMUD's award-winning book Plants and Landscapes for Summer Dry Climates were sold to customers; and
- More than 200 community events including conservation workshops, presentations, and festivals were attended by EBMUD water conservation representatives.

6.1.3 FUTURE PROGRAM GROWTH

As part of the recently completed 2050 Demand Study, EBMUD charted potential future program growth. High and low estimates of potential conservation were developed by varying participation rates, resulting in a range of 66 to 74 MGD. Figure

TABLE 6-1 WATER CONSERVATION PROGRAM ACTIVITIES

CROSS-SECTION OF PROGRAMS AND MEASURES FOR EBMUD CUSTOMERS	
AMI METER INSTALLATION	WATER LOSS CONTROL
DEVICE DISTRIBUTION (I.E. KITCHEN AND BATH FAUCET AERATORS, SHOWERHEADS, ETC.)	SECTION 31 WATER USE EFFICIENCY PLAN REVIEW
INCENTIVE PROGRAMS (I.E. FLOWMETER, LAWN CONVERSION, LANDSCAPE EQUIPMENT, GRAYWATER, CUSTOM REBATES)	CUSTOMER NOTIFICATIONS: UNUSUAL USE, POTENTIAL LEAKS, ON TRACK FOR A HIGH BILL, HIGH USE, ETC.
WATER BUDGET PROGRAM	MY WATER REPORTS PROGRAM (WATER REPORTS AND ONLINE PORTAL)
HOME SURVEY KIT	WATERSMART GARDENER PROGRAM (I.E. LANDSCAPE ADVISORY COMMITTEE, SPEAKER SERIES, TRAININGS AND EVENTS, ETC.)
WATER USE SITE-VISITS	WATER WASTE RESPONSE

6-2 shows the range in EBMUD's forecasted increases in water conservation over time.

In order to be conservative and ensure that it meets its long-term water conservation target, EBMUD plans its conservation program development considering whether water savings from particular measures remain constant or decrease over time. Despite EBMUD's efforts to encourage water-saving behavior, customer conservation behaviors may change; in particular, after a drought has ended customers may revert back to pre-drought behaviors, which can lead to rebounds in demand. In addition, the water savings from hardware replacements can decrease with product wear.

The potential water savings over time for water conservation activities are estimated based on data including demographics, age and size of housing stock, market saturation levels, and calculated water savings. Estimates of water savings for each activity are based on standard industry values, actual account meter readings pre-and post- conservation intervention, previous EBMUD research, pilot studies, follow-up surveys, and general water-consumption monitoring.

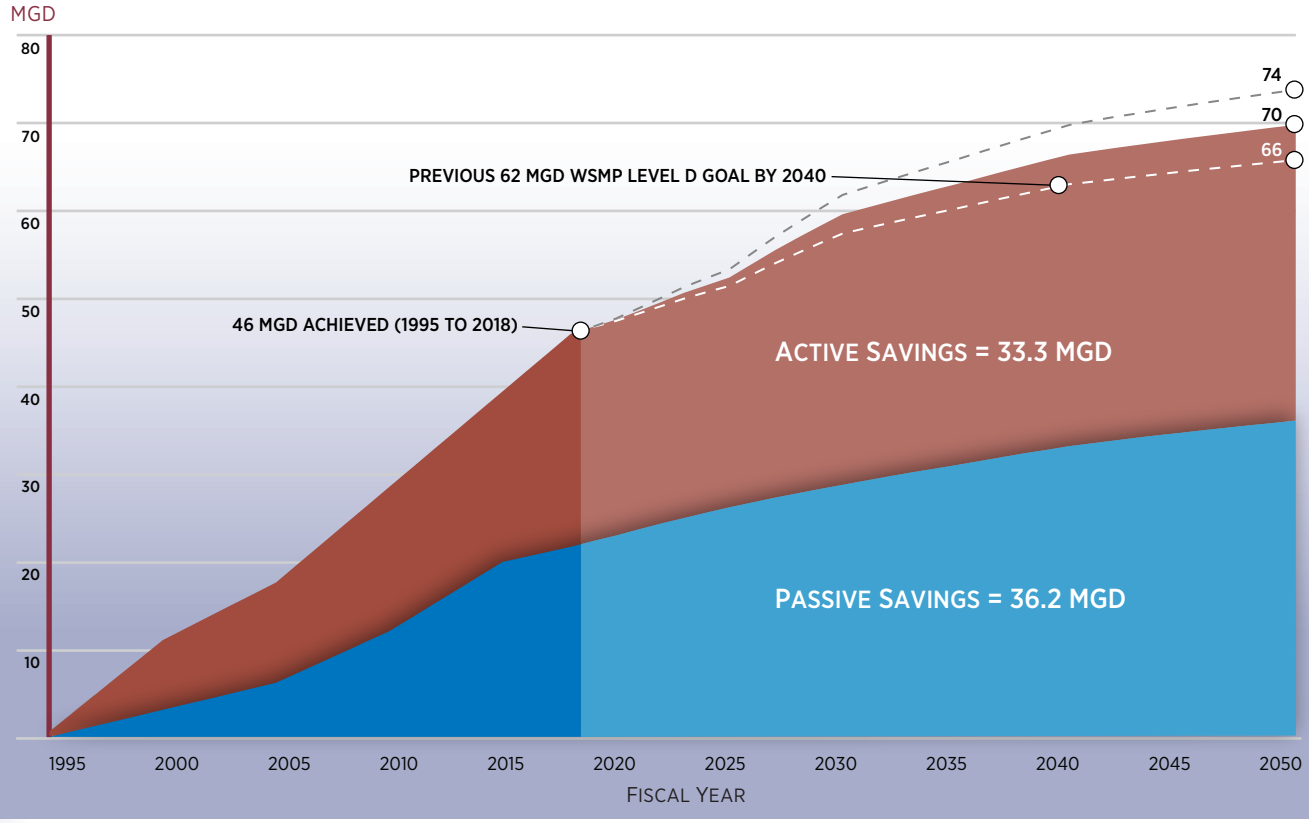
6.2 WATER CONSERVATION PROGRAM ELEMENTS

EBMUD's Water Conservation program uses a variety of different strategies to help achieve sustained water savings across customer categories and throughout its service area. Some of these strategies utilize information technology to help customers make informed decisions about water use; others include providing education and outreach, targeted to specific groups, to help effectuate behavior changes. EBMUD continues to invest in rebates and incentives to encourage customers to make water-saving changes to their properties. An industry leader, EBMUD leads and participates in research studies to help develop and understand new water efficiency technologies. Lastly, EBMUD invests significantly in supply-side water loss control measures to help conserve water and reduce losses in the distribution system.

6.2.1 WATER MANAGEMENT SERVICES

Water management services provide customers with the information needed to make informed decisions about their water use. EBMUD leverages technology to provide customers access to historical and current water consumption, interactive tools to

FIGURE 6-2 EBMUD WATER CONSERVATION FORECAST



evaluate and understand water use patterns, and customized water use recommendations based on each property's unique characteristics. Since the 2015 UWMP, EBMUD has worked to expand key initiatives including customized water consumption reports for households and businesses, landscape water budget reports for all irrigation accounts and residential parcels, leak notifications, and water use surveys.

"My Water Report" and Online Portal Program

EBMUD's My Water Report Program provides customers with personalized, direct communications on water use, high volume leaks, and water conservation recommendations such as rebates and incentive programs. Water use for single-family customers is contextualized with comparisons to other households, as research indicates that comparative norms can motivate behavior change. For non-residential customers, water use is compared to past trends at that property. Since the program launch in 2014, EBMUD has engaged nearly a third of its customers with Water Reports, reaching over 170,000 individual households with 1.8 million Water Reports and 20,000 leak alerts.

To provide Water Reports, an engagement and data analytics platform is used to generate content, deliver the reports, send automated alerts, and communicate with customers.

EBMUD uses the platform to automatically notify customers by email, text, or voice of unusual water use patterns and continuous water use (for AMI customers). Notifications are paired with an interactive leak resolution tool that guides the customer through the steps to investigate the unusual use, highlights common reasons for high water use, and allows the customer to share their findings with staff (40 percent of confirmed leaks are outdoor watering systems). Leak alerts and the resolution tool are especially well-received by customers, with over 50 percent of customers opening leak alert emails, and 25 percent engaging with the self-service resolution tool.

The online portal allows customers to access more detailed consumption information, view water-saving recommendations, and indicate which water-saving actions they are considering or have already taken (i.e. updating plumbing fixtures, replacing the lawn, or checking for leaks). Nearly 67,000 EBMUD customers have registered on the online portal.

To date, over 1 MGD of water savings can be attributed directly to the My Water Report and Online Portal

TABLE 6-2 WATER CONSERVATION PROGRAM ACCOMPLISHMENTS

PROGRAM	ACTIVITY TOTAL CY 2016-2020
WATER MANAGEMENT SERVICES	
HOME WATER REPORT – RESIDENTIAL	SF: 2,499,013 MF: 181,187
WATER REPORT- NON-RESIDENTIAL	61,835
HOME SURVEY KITS	12,960
STUDENT SURVEYS	2,675
WATER SAVING DEVICE DISTRIBUTION (SHOWERHEADS, AERATORS, TOILET BAGS, HOSE NOZZLES)	5,812
HIGH WATER USAGE NOTIFICATIONS (I.E. LEAK ALERTS)	47,080
CUSTOMER PORTAL REGISTRATIONS	65,865
ON-SITE AUDITS: SINGLE FAMILY	114
ON-SITE AUDITS: MULTI FAMILY (NUMBER OF DWELLING UNITS AUDITED)	134
COMMERCIAL ON-SITE AUDITS NON-RESIDENTIAL	399
INDUSTRIAL ON-SITE AUDITS NON-RESIDENTIAL	27
INSTITUTIONAL ON-SITE AUDITS NON-RESIDENTIAL	61
IRRIGATION AND IRIS WATER BUDGET DISTRIBUTION	>150,000
LARGE LANDSCAPE AUDITS	155
BUSINESS CERTIFICATION PROGRAM	98
CONSERVATION INCENTIVES	
HIGH-EFFICIENCY TOILETS (ENDED 2017)	1,730
HIGH-EFFICIENCY WASHERS (ENDED 2017)	3,918
LANDSCAPE CONVERSIONS (LAWN/POOL REMOVAL, MULCH, DRIP IRRIGATION, HIGH-EFFICIENCY SPRINKLER HEADS, PRESSURE REGULATORS, SUBMETERS, ET CONTROLLERS)	5,087
GRAY WATER (LAUNDRY-TO-LANDSCAPE)	30
FLOWMETER REBATES (STARTED 2019)	239
EDUCATION AND OUTREACH	
TABLE TENTS, HOTEL CARDS, SHOWER STICKERS, POSTERS	1,730
SCHOOL MATERIALS AND PUBLICATIONS	3,918
PLANT BOOKS	5,087
COMMUNITY EVENTS (I.E. CONSERVATION WORKSHOPS, PRESENTATIONS, AND FESTIVALS)	30
REGULATION AND LEGISLATION	
SECTION 31: WATER USE EFFICIENCY PLAN REVIEW	1,989 PROJECTS APPROVED
WATER WASTE RESPONSE	
RESIDENTIAL	866
COMMERCIAL	426
INSTITUTIONAL	61
STREET AND MISC.	348

Program. Customer surveys evaluating the program revealed that participants, when compared to non-participants, were more aware of ways to save water. Additionally, customers were more likely to rely on EBMUD for landscaping resources, reported higher trust and satisfaction in services provided, and considered the program to be a valuable service.

Advanced Metering Infrastructure (AMI)

Advanced Metering Infrastructure (AMI) is a system of smart meters, communications networks, and data management tools that enables two-way communication between utilities and customers. In addition to automating meter reading, AMI includes tools to monitor and analyze water consumption, and provide real-time leak detection. EBMUD has piloted projects that use AMI technology to improve demand- and supply-side conservation.

Using the existing water consumption portal described above, customers with AMI can view their hourly and daily consumption and receive timely notification of potential leaks, higher than expected daily use, or when a bill is on track to be higher than usual. Using this tool, EBMUD has identified numerous large leaks and worked with customers to reduce water demand. The online portal can identify timed irrigation and likely irrigators, so customers who are still operating their irrigation systems during winter rains can be notified.

As described in Section 6.2.6 below, EBMUD launched an AMI research project in 2019 to evaluate the water and energy savings achieved by sharing hourly water consumption data with customers.

Water Budgets

A water budget shows customers the amount of water needed to irrigate a landscaped area and compares actual water consumption to the budget goals. EBMUD calculates water budgets for each property using the size of a customer's landscaped area, plant requirements, and local weather data from weather stations maintained by EBMUD.

EBMUD's Water Budget Program is a targeted informational service for homeowners associations (HOAs), parks, golf courses, cities, counties, and businesses. These customers manage approximately 5,000 acres of land and represent 6 percent of total EBMUD water use. In 2020, more than 24,000 landscape water budgets were sent to around 3,950 customers with dedicated irrigation meters. Collectively, the customers in the IRIS program only used 76 percent of their recommended water budgets, resulting in nearly 3.3 MGD in water savings.

To expand on the outdoor water savings, EBMUD is planning to extend the water budget program to single-family customers by integrating a water budget into the My Water Report program and online portal. Proposed features will include an online irrigation calculator that can help customers establish landscape water budgets.

Irrigation Water Use Surveys

EBMUD offers surveys for business and dedicated irrigation customers to improve irrigation efficiency. Irrigation water use surveys 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 use surveys are targeted to irrigation accounts where landscape irrigation comprises most or all of the use at the site. HOAs continue to represent a large participant sector, along with golf courses, parks, and school athletic fields. Between 2016 and 2020, EBMUD conducted more than 155 water use surveys for irrigation accounts, with an estimated savings of over 77,000 gallons per day.

Residential Water Use Surveys

Residential water use surveys are important educational opportunities that help customers measure and assess indoor and outdoor water uses. EBMUD provides free self-survey kits with telephone consultations and in-person surveys at the customer's premises.

Self-survey kits guide customers through a step-by-step self-assessment of their water use. The booklet directs users to check for indoor and outdoor leaks, take inventory of water-using hardware and equipment, and measure fixture flow rates. EBMUD maintains a database of kit deliveries for future follow up with customers on additional conservation services. Customers needing additional assistance are referred to Water Conservation staff for a detailed consultation with recommendations for both saving water and lowering their bills.

A site visit typically includes a meeting with a resident, homeowner, or property manager to review water consumption history, test for leaks, assess indoor plumbing fixture flow rates, and assess outdoor landscape irrigation. For properties with landscapes,

a site visit will focus on irrigation scheduling, hardware efficiency, efficient landscape design, and maintenance practices. Landscape consultations are primarily scheduled at sites with high summer water use and automatic irrigation systems.

Figure 3-4 illustrates seasonal water use by customer category. Residential consumption is the single largest component of total consumption, and seasonal outdoor irrigation demand is significantly higher in the summer than in the winter months.

Multi-Family Water Use Surveys

Multi-family water use surveys target existing high-water use properties with five or more units and include the same elements as single-family surveys. At each site, a sample of dwelling units is inspected and assessed for indoor water use efficiency. Outdoor water use is also assessed. EBMUD requires multi-family properties to complete an on-site survey may then request high volume distribution of water-saving devices like showerheads or kitchen aerators.

Commercial, Industrial, & Institutional (CII) Water Use Surveys

CII water use surveys are designed to help businesses and institutional customers use water more efficiently. CII water use surveys consist of free on-site visits conducted by EBMUD staff. Staff works with landscape and facility managers and consultants to identify opportunities to increase water use efficiency and achieve benefits in reduced energy use, wastewater discharge, chemicals, and downsized treatment facilities. More complex commercial and industrial surveys include a review of process water use, cooling towers, water treatment, and on-site distribution systems. If the surveyor determines that existing devices are inefficient, a one-time offer of free water-efficient devices is provided. Devices include water-conserving showerheads, low-flow faucet aerators, and commercial dishwashing spray valves. Businesses with relatively simple end uses of water have successfully used EBMUD's home survey kits; though designed for residential customers, these kits can be useful for small businesses that wish to check for leaks or other water inefficiencies on their own.

Flowmeter devices are available for loan from EBMUD to help 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.

WaterSmart Business Certification Program

EBMUD has offered a WaterSmart Business Certification Program to incentivize and recognize CII customers that implement water efficient practices and conserve water. Over the next decade, the program will pivot towards a more inclusive model that will leverage the current partnerships with the Alameda and Contra Costa County Green Business Programs in order to implement a more robust program model that will reach a larger segment of CII customers. Certified businesses' water consumption will continue to be tracked annually and will be required to re-certify on a regular basis in order to continue their certification. The original program was launched in 2009, and its first recognition event was held in June 2010. Since its inception, more than 190 businesses have been certified, varying from office buildings to dry cleaners. Together these businesses have saved more than 100 million gallons annually by increasing their water use efficiency compared to baseline. With this new partnership model approach with the Green Business Network, the program will continue to help CII customers not only to achieve water savings but to contribute towards a greener economy.

6.2.2 CONSERVATION INCENTIVES

EBMUD has a long history of offering rebates and incentives to help customers improve their water use efficiency. While some rebates have been sunsetted due to market saturation, EBMUD continues to find value in offering rebates and incentives for certain water-saving features.

Landscape Rebate Program

Outdoor water use has the greatest potential for water savings. In a 2002 study, EBMUD assessed baseline saturation rates of water conservation behaviors and attitudes, and at the time, fewer than 40 percent of EBMUD customers were willing to implement outdoor conservation measures. The 2002 study showed that customers would need great motivation to reduce lawn area, change plant materials, and improve irrigation efficiency. To motivate outdoor water conservation, EBMUD launched a comprehensive landscape rebate program that bundled lawn conversion and irrigation equipment upgrades. EBMUD continues to offer landscape rebates up to $2,000 for residential customers and up to $15,000 for commercial and large multi-family properties. There is a strong educational component to the program; pre- and post-conversion site visits include

in-person education regarding water conservation, plant choices, water-efficient landscape design, irrigation scheduling, and maintenance practices.

Lawn Conversion Rebate

Customers participating in the lawn conversion rebate are reimbursed per square foot of lawn that is converted to a low water use landscape up to a set maximum (currently $2,000 for residential and $15,000 for commercial customers). Adhering to sustainable landscaping principles, the soil must be covered by a 3-inch layer of mulch, and 50 percent of the former lawn area must be covered with low water-use plants, with an emphasis on native plants that require little to no supplemental irrigation. Participation in the lawn rebate program accelerated during the 2014-2015 drought, and customers continue to take advantage of the program. From CY2016 through 2020, 1,789 customers received rebates, resulting in 2,446,150 square feet of lawn converted. Since its inception, EBMUD's lawn conversion rebate program has resulted in the conversion of approximately 4,970,000 square feet of lawn.

Irrigation Equipment Rebate

This program seeks to minimize customer water consumption and utility costs and introduce customers to new efficient irrigation technology. Technological advances have led to more weather-based controllers that can be controlled easily by smartphones. During non-drought years, smart controllers have proven to be the most popular upgrade with nearly 1,578 smart controller rebates issued from CY2016 through 2020.

Gray Water Rebate

Gray water is water from indoor sources that is captured and reused. Sources of gray water in the home include the laundry, bathroom faucets, showers, and bathtubs. EBMUD offers a rebate for the purchase of a three-way diverter, used for laundry-to-landscape gray water systems.

Flowmeter Pilot Rebate Program

A flowmeter is an internet-connected or cellular-connected remote flow sensing device that monitors water usage in near real-time. In 2019, EBMUD started a pilot program to offer customers a rebate of up to 50 percent of their total cost of the flow meter purchase (up to $200 per device). Flow meters result in water savings by giving customers information about their water use with convenient web portals or mobile applications. Customers can see their water use down to a fraction of a gallon to better understand plumbing fixtures and irrigation and to stay informed of potential leaks. Some flowmeters allow customers to shut off their water remotely in case of leaks.

Commercial Clothes Washer Rebate

Replacing conventional clothes washers with high-efficiency washers can cut water and energy use in half, saving money with every load. EBMUD customers are eligible for a rebate of $75 per qualifying washer for multi-family properties and other businesses or $125 per qualifying washer for coin laundry stores.

Customized Rebate

EBMUD offers custom financial and technical assistance to businesses that undertake specialized water-efficiency projects. Rebates offset a portion of the initial costs and shorten the payback period for the customer's investment in equipment upgrades. Rebate values are based on estimated water savings and may be given up to 50 percent of the costs of implementing hardware or process changes that demonstrate improved water use efficiency. Customized rebates cover multiple technologies and practices, such as boiler-less food steamers, air-cooled ice machines, and recirculating cooling systems. 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 financial assistance from EBMUD.

On-Bill Financing

EBMUD's On-Bill Financing program currently allows multi-family and commercial customers to finance water efficiency upgrades, such as toilets or cooling towers, on their EBMUD water bill. With On-Bill Financing, EBMUD pays for the up-front costs, the customer repays EBMUD over a set period of time on their water bill, and frequently the water savings offset the repayment costs. The program works in conjunction with EBMUD's customized rebate program to bring down the cost of projects. EBMUD is looking to expand this program to single-family residential customers in the future in order to help make water efficiency upgrades more accessible to low-income customers.

As an example of the program's potential to generate water savings, in a case study with a local affordable housing organization, EBMUD financed 50 high-efficiency toilets and 13 bathroom faucet aerators at a senior housing property in Emeryville, California. After the upgrades, the property's water and wastewater bill decreased by 50replace, saving nearly $10,000 in one year.

Device Distribution Program

EBMUD has been distributing conservation devices to customers since the early 1980s. Residential devices include free low-flow showerheads, faucet aerators, and hose nozzles. The devices are distributed to customers primarily through water use surveys, direct mail, and over the counter at EBMUD offices. For non-residential customers, EBMUD distributes free low-flow showerheads, faucet aerators, pre-rinse dishwashing spray valves, high-efficiency hose nozzles. Devices are primarily provided to customers as an outcome of water use surveys. Over 5,812 water-efficient devices and products were distributed to EBMUD customers during CY16-20.

Restaurants, institutions, and commercial facilities are eligible to receive free water-efficient spray nozzles to replace older, high-water use models. EBMUD provides a free on-site water survey in addition to the water-efficient spray nozzle installation. Spray valve savings can cut the annual water bill cost by over half compared to conventional models.

6.2.3 EDUCATION & OUTREACH

Education and outreach activities increase customer awareness and adoption of conservation best practices. EBMUD has a long history of providing customers with educational services including online resources, publications, newsletters, school curricula, community workshops and events, and programs to support sustainable gardening. To increase the visibility of conservation programs and services, EBMUD also collaborates with other agencies and organizations for local, regional, and statewide conservation partnerships and educational campaigns.

Website and Social Media

EBMUD maintains a strong presence online (***www.ebmud.com/watersmart***) to serve as a hub for up-to-date conservation resources. The EBMUD website provides a centralized location for customers to access information on rebates, conservation tips, a video library of "how to" conservation training tutorials, and links to recommended publications. The website provides a link to EBMUD's online conservation store, where customers can request free conservation devices and self-survey kits. The Customer Pipeline bill inserts that are sent to all customers each billing cycle and featured on EBMUD's website frequently highlight timely conservation programs and news.

Recently EBMUD has begun to increase its use of social media to communicate with customers. Through social media, EBMUD communicates directly with customers to disseminate time-sensitive information and to promote workshops and events to a wide audience. EBMUD social media posts become immediately visible to any person with online access, inviting individuals to engage through online comments, questions, and sharing.

Community Events, Trade Shows, & Presentations

EBMUD sponsors and participates in a variety of community events and trade shows as a means of delivering conservation messages to a broad audience. Events are often on weekends and may include seasonal festivals, Earth Day events, community workshops, and trade shows. Participation

TABLE 6-3 ANNUAL EVENTS & TRADESHOWS

ANNUAL WATER CONSERVATION SHOWCASE
SPONSORED BY EBMUD, PACIFIC GAS AND ELECTRIC (PG&E), AND THE U.S. GREEN BUILDING COUNCIL, THIS ANNUAL EVENT IN SAN FRANCISCO PROVIDES A FORUM ON THE LATEST IDEAS AND INNOVATIONS IN WATER CONSERVATION FOR A VARIETY OF STAKEHOLDERS. IT INCLUDES LECTURES ON WATER- AND ENERGY-EFFICIENCY POLICIES, PROGRAMS, RESEARCH, AND TECHNOLOGY.
COMMUNITY EVENTS
EBMUD PARTICIPATES IN EARTH DAY CELEBRATIONS, ART AND WINE FESTIVALS, CHAMBER OF COMMERCE EVENTS, AND OTHER COMMUNITY EVENTS. THESE EVENTS PROVIDE AN OPPORTUNITY TO SHARE INFORMATION ABOUT CONSERVATION AND EBMUD PROGRAMS WITH A WIDE AUDIENCE.
HOMEOWNERS ASSOCIATIONS
EBMUD STAFF PRESENT AT THE MEETINGS OF HOMEOWNERS ASSOCIATIONS, OFFERING WATER CONSERVATION TIPS AND INFORMATION ON EBMUD PROGRAMS OF SPECIFIC INTEREST TO THESE GROUPS.
GREEN FESTIVALS AND EXPOS
EBMUD PARTICIPATES IN THESE EVENTS, FOCUSED ON CONSERVATION AND SUSTAINABILITY, SPONSORED BY ORGANIZATIONS SUCH AS UC BERKELEY, CITIES AND COUNTIES, AND NON-GOVERNMENTAL ORGANIZATIONS (NGOS).

in such events is evaluated annually to identify the most effective venues for enhancing public relations and delivering conservation messages. EBMUD also gives specialized presentations to groups such as sustainability committees, landscape irrigation managers and contractors, building owners, and property managers to promote water conservation.

Table 6-4 identifies some of the workshops, reoccurring annual events, and trade shows in which EBMUD participates.

School Programs

Since 1974, school-based education programs have been an important component of EBMUD's overall conservation outreach strategy. EBMUD's ongoing school education program includes water science curricula, classroom materials, and field learning. Kindergarten through high school materials are aligned with state standards and are available free to schools in the EBMUD service area and in EBMUD watershed communities in Amador and Calaveras Counties, Lodi, and Linden. Water Treatment Plant tours are available for school groups and EBMUD Ranger-Naturalists host field trips in the watershed for local classrooms to learn about topics such as creek restoration, reforestation, and natural history. In 2015, in response to the drought, EBMUD added a new drought theater program for school assemblies. The performances used a blend of comedy, music, juggling, and storytelling to teach students about EBMUD's drought restrictions, water resources, and conservation. In 2020, EBMUD expanded its school program by updating the kindergarten through high school workbooks and developing an experiential-based water conservation program for classrooms and increasing outreach to students at public events with its Water on Wheels Program. The "Water on Wheels" is a trailer that distributes clean, cool drinking water at events. Staff set up informational booths adjacent to the trailer to provide education and outreach.

WaterSmart Gardener Program

The WaterSmart Gardener Program promotes sustainable landscapes and irrigation practices to reduce outdoor water use across numerous business entities and customer sectors. EBMUD hosts workshops for home gardeners on topics such as sheet mulching and plant selection. It hosts trainings for landscape professionals including the Qualified Water Efficient Landscaper certification, a 20-hour USEPA certified course offered in English and Spanish on irrigation system design, maintenance, and auditing.

EBMUD partners with local plant nurseries, mulch suppliers, and irrigation centers to provide mulch coupons for customers, distribute materials about water-efficient landscape design, and display store copies of EBMUD's award-winning book Plants and Landscapes for Summer Dry Climates. EBMUD plans to expand orientations for nursery staff through online trainings on topics such as plant selection and maintenance.

To support the development of positive attitudes around conservation, EBMUD awards WaterSmart Garden Grants to community groups and organizations for public demonstration gardens modeling water-conservation and sustainable landscaping principles. Demonstration gardens that replace high-water use landscapes, such as irrigated lawns, realize long-term water conservation goals and inspire residents to implement similar projects at their homes. In 2018, EBMUD's first "I Heart my Garden" photo challenge invited customers to submit their own before and after photos of their former lawns transformed into water-efficient gardens. Over 80 customers participated, with awards recognizing outstanding projects.

In 2020, EBMUD launched a fall webinar series to educate customers on topics like water-efficient landscaping, plant selection, efficient irrigation, and greywater use. Scheduled during the lunch hour, these webinars aimed to provide customers with education and resources to use water more efficiently in their home landscaping.

Watershed Approach to Landscaping

An EBMUD study in 2015 found that collecting rainwater from residential rooftops was not a cost-effective water source compared with other supplemental supply alternatives. However, on a small scale, rainwater catchment could still be a good fit based on individual property characteristics.

EBMUD promotes passive rainwater harvesting techniques through education and outreach initiatives as part of its overall water-efficient landscaping program. Passive rainwater catchment also referred to as the watershed approach to landscaping, uses berms, basins, and dry creeks to capture rainwater within the landscaped areas. Home gardens can serve as mini-watersheds, with high points draining to low points, allowing water to slow, spread, and sink, which prevents runoff and pollution from

flowing down storm drains and out to the bay. Passive rainwater catchment also builds healthy soil and attracts essential life into the garden.

Landscape Advisory Committee

The Landscape Advisory Committee (LAC) is a partnership between EBMUD and members of the landscape industry to promote sustainable landscape design, installation, maintenance, and management practices. In order to address the challenges of the severe drought in the 1980s, the EBMUD Board directed staff to work closely with the landscape industry on improving education and water use efficiency. The LAC was formed as a result of this directive and remains actively involved in offering educational opportunities for professionals. EBMUD organizes a Sustainable Landscape Speaker Series, covering topics such as planting for biodiversity, rainwater harvesting, water budgets, and irrigation efficiency. The Sustainable Landscape Speaker Series is approved for continuing education credits with local and national professional landscape organizations. LAC members also serve on project committees to develop new tools and educational resources for professionals and home gardeners.

Water Industry Organizations & Partnerships

Effective partnerships broaden the visibility of conservation programs, create cost-sharing opportunities and potential economies of scale, and expand customer benefits by addressing multiple conservation areas such as water, wastewater, energy, and solid waste. EBMUD sponsors and staff participate in regional, state, and national water conservation organizations that influence policy, research, standards, and codes, and conservation program implementation. Key organizations in which EBMUD participates include the California Water Efficiency Partnership, Alliance for Water Efficiency, the US.EPA's WaterSense Program, and the California Department of Water Resources Urban Stakeholders Committee and Commercial, Industrial, and Institutional Task Force.

EBMUD also partners with other Bay Area water agencies to implement regional conservation projects. In 2020, DWR awarded EBMUD and ten other Bay Area water agencies a $4 million grant for a Regional Water Conservation Project through the Proposition 1 Integrated Regional Water Management Program. EBMUD is the lead on administering this grant which will provide funding for rebate programs, QWEL trainings, and smart meter installation.

6.2.4 WATER SERVICE REGULATIONS

EBMUD applies its own water service regulations and supports the adoption, implementation, and enforcement of water-efficiency standards for new development and redevelopment projects with changes in water use. EBMUD also works with cities and counties within its water service area to support local and state landscape ordinances through landscape plan review requirements for all new water services. All customer applicant plans are reviewed for indoor fixtures and outdoor water use efficiency.

In 2007, EBMUD adopted a new water service regulation, Section 31, which identifies indoor and outdoor water efficiency requirements for water service and specifies a procedure for notifying applicants that water efficiency measures are required. Water service is not provided to new developments or expanded services to existing customers unless all the applicable water efficiency measures described in Section 31 are met. Applicants for expanded service may be required to retrofit existing water service facilities or uses to comply with these requirements. Applicants are required to submit plans and maintain design documents, including construction and installation records, and to furnish a copy 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 updates this regulation as new water use efficiency standards are developed. The most recent update in 2018 requires compliance with California's Model Water Efficient Landscape Ordinance (MWELO) for new construction with more than 500 square feet of landscaped area and rehabilitated landscape projects with more than 2,500 square feet of landscaped area.

EBMUD also has regulations on metering that are intended to encourage conservation. In compliance with EBMUD and California's SB-7 regulations, Section 2 of EBMUD's Regulations states that each unit in a newly-built multi-family or multi-occupancy commercial/industrial premises must be individually metered. In addition, EBMUD also requires a separate irrigation meter for all new nonresidential irrigated landscaping covering an area of 5,000 square feet or more.

6.2.5 SUPPLY-SIDE CONSERVATION

EBMUD's water distribution system includes approximately 4,200 miles of pipeline. EBMUD implements best practices to manage water losses for the supply-side of the distribution and raw water systems. The supply-side management program is integral to operating and maintaining the water system and is critical to ensuring efficient management of EBMUD's water supply.

Distribution & Raw Water System Loss Accounting

Modeled after the American Water Works Association (AWWA)'s Water Audits standards, EBMUD's Procedures 900 and P902 (See Appendix G) provide a protocol for identifying and assessing treated water and raw water losses. EBMUD Procedure 901 is a separate but related procedure for Recycled Water. These standardized procedures account for all losses in the distribution, raw, and recycled water systems to help EBMUD understand the nature of those water losses so that it can take appropriate action to reduce them. The Procedures also identify and make staff accountable for measuring, collecting, assessing, retrieving, validating, and reporting data on EBMUD water supply losses.

The difference between the volume of water produced at the water 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. Real losses are the total physical losses of treated water from storage system overflows or draining, water main and service line breaks, and leakage.

Raw water is all water in EBMUD's network of aqueducts, tunnels, and transmission pipelines before it enters a water treatment plant to be treated and distributed through the water distribution system. Raw water losses consist of apparent losses and real losses in the raw water system. Apparent water losses are the total losses of raw water due to raw water meter errors, unauthorized use from theft, and transmission pipeline blow-offs and flushing. Real water 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 pipelines, or other parts of the raw water distribution system, and water treatment plant losses. Table 6-5 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:

- reduced demand on scarce water supplies and minimizing the need to develop an additional supply;
- reduced water and revenue losses;
- Improved customer service;
- reduced pumping and treatment costs;
- increased knowledge of the distribution system;
- reduced property damage through improved maintenance;
- environmental protection; and
- reduced maintenance costs by located leaks when they are smaller.

Senate Bill 555 (SB 555), passed in October 2015, requires the state's urban retail water suppliers to complete an annual water loss audit report on their water distribution systems and submit a validated water loss audit report to the California Department of Water Resources (DWR) by October 1st of each year, starting in 2017.

EBMUD formed the Water Loss Audit (WLA) Committee, which coordinates EBMUD's WLA activities, roles, and responsibilities; including a review of each component of the EBMUD's WLA as defined by AWWA, and recommends improvements to the process to meet EBMUD and state regulatory requirements.

Beginning in 2017, UWMPs are required to report on distribution system water loss for the most recent 12-month period using the AWWA methodology.

For the UWMP 2020, provisional data on distribution system water loss for the calendar year 2019 is available. For the calendar year 2019, EBMUD supplied 59,841 MG of water. Of this, there was 7,628 MG of water loss, including 5,188 MG of real losses and 2,440 MG of apparent losses.

Real Losses: Active Leakage Control

EBMUD's efforts to control real water losses include detecting leaks in the distribution system

before they surface using satellite leak detection, automated acoustic leak detection, and manual acoustic leak detection methods. EBMUD was the first utility in North America to implement satellite leak detection commercially. Since 2016, EBMUD has collaborated with its satellite leak detection vendor, Utilis, to evaluate the performance of this patented leak detection method. The most recent satellite image of the EBMUD's distribution system was taken on May 28, 2020.

As of 2020, EBMUD has an inventory of over 2,000 automated acoustic leak detection devices operated through cellular networks allowing for near real-time monitoring for leaks. Some of these loggers are permanently installed at fixed locations and others are rotated through the service area or used in response to specific suspected leak events such as seismic activity, landslides, and pipe bursts. In general, automated acoustic leak detection devices are installed on EBMUD's distribution pipelines with high consequences of failure. In addition, EBMUD also utilizes automated acoustic leak detection devices on large diameter pipelines and aqueducts such as monitoring the Mokelumne Aqueducts for leaks at the Concord Fault crossing. Staff use leak detection vehicles equipped with manual acoustic leak detection equipment such as ground microphones, listening devices, and mobile correlators to detect leaks on distribution pipelines.

EBMUD works collaboratively with manufacturers to test and develop new technologies to identify leaks sooner and to identify factors that can predict the formation of leaks. EBMUD has a water loss control organization that pilots new technologies to determine their performance and appropriateness for implementation in EBMUD's distribution system.

Real Losses: Pressure Management

Pressure management is used to reduce water system pressure to optimal levels and reduce pressure transients. Pressure management extends the life of the existing infrastructure, minimizes the environmental and customer impacts associated with pipeline breaks, and reduces water loss. EBMUD's efforts to manage pressure include pressure transient monitoring, pressure reduction, pressure stabilizations, and using District Metered Areas (DMAs) and equipment related to pressure regulating valves.

Real Losses: Infrastructure Management

Leaking pipelines can be a source of supply-side water loss. EBMUD manages its infrastructure with the goal of replacing deteriorated infrastructure and extending the life of existing infrastructure. Water loss reduction is one benefit of infrastructure management. EBMUD's efforts include pipeline replacement, infrastructure rehabilitation (such as pipeline slip lining), and corrosion control for pipelines, services, and other distribution facilities. Many conditions affect the rate of deterioration of pipelines in the distribution system, including pipeline type and size, soil conditions, and ground movement.

EBMUD's average pipeline replacement rate between the late-1990s and the mid-2000s was 8.6 miles per year. In 2015, EBMUD formed a team to increase the

TABLE 6-4 DISTRIBUTION WATER LOSSES AND RAW WATER LOSS ACCOUNTING

DISTRIBUTION WATER LOSSES	
APPARENT LOSSES	**REAL LOSSES**
UNAUTHORIZED CONSUMPTION (e.g. Theft – illegal taps, unauthorized fire hydrant use by unmetered construction crews, illegal hydrant openings)	LEAKAGE ON MAINS (e.g. Transmission and distribution pipeline leakage and breaks)
CUSTOMER METERING INACCURACIES (e.g. Meter error adjustments)	LEAKAGE AND OVERFLOWS AT STORAGES (e.g. Losses from open-cut reservoirs, storage tanks, and terminal storage)
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)	LEAKAGE ON SERVICE CONNECTIONS UP TO CUSTOMER METERING (e.g. Losses on laterals from District main to customer meter)
RAW WATER LOSSES	
APPARENT LOSSES	**REAL LOSSES**
UNAUTHORIZED USE	LEAKAGE ON AQUEDUCTS AND RAW WATER PIPELINES (e.g. Aqueduct leakage and breaks, real losses in the water treatment plants)
METERING INACCURACIES (e.g. meter error adjustments)	LEAKAGE AT WATER TREATMENT PLANTS (e.g. Real losses at the water treatment plants)

pipeline replacement rate. EBMUD is increasing its pipeline replacement in a step-wise manner and is planning to replace up to 20 miles per year by FY21.

EBMUD uses a risk model to prioritize pipelines for replacement and to maximize the benefits of its investment. The risk model considers both the likelihood of failure – based on leak history and proximity to faults, landslide areas, and liquefaction zones – and the consequence of failure – based on location, service to critical customers, redundancy, and potential failure mode.

In 2016, EBMUD began working with a consultant to use machine learning to develop a likelihood of failure model for its pipeline infrastructure. EBMUD is one of the first utilities in the nation to use machine learning to evaluate the likelihood of failure of its entire pipeline inventory. The model is currently being used in conjunction with existing tools to evaluate candidates for pipeline replacement.

The installation and upgrading of cathodic protection systems can extend the useful life of pipelines. EBMUD initiated its corrosion control program in 1923. The program, covering the Mokelumne Aqueducts and distribution pipelines and facilities, effectively reduces corrosion and related deterioration of EBMUD's infrastructure, resulting in substantial leak reduction and reduced loss of water.

The Mokelumne Aqueducts 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 84 impressed current cathodic protection stations and over 4,000 galvanic anode test 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 pipelines.

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. In 2019, EBMUD launched a pilot program to install cathodic protection on copper service connections that were connected to non-metallic mains. EBMUD's research has indicated that copper laterals on non-metallic mains may be more subject to corrosion than those connected to metallic mains which serve as cathodes. As of 2020, over 5,000 devices have been installed. Additional installations may be considered based on the results of this pilot study.

Real Losses: Speed and Quality of Repairs

The goal of speed and quality of repairs is to quickly respond and effectively repair reported and unreported leaks. This strategy extends the life of the existing infrastructure, minimizes the environmental and customer impacts associated with water main breaks, and reduces water loss. Once a leak is identified, interventions must be taken to repair and/or reduce the leakage. The interventions should be timely, reliable, cost-effective, and well-documented.

EBMUD prioritizes leaks from distribution pipes according to five categories with Priority 5 (P5) being the highest priority and Priority 3 (P3) being the lowest priority. Leaks within the P5, P4, and P3 categories are targeted for repair within one day, seven days, and 21 days. Over the last six years, the District has been testing a GIS-based software for mobile devices to support field staff. In 2018, the District entered into a multi-year contract with Sedaru to provide efficient and reliable water distribution system information for field maintenance and office staff. Sedaru provides a fast, real-time, mobile map interface, and provides effective geospatial tools and data for staff. Sedaru allows staff to manage pipeline maps, plan and respond to water outages, and manage leak investigations. The use of the software is anticipated to improve staff responsiveness in the field.

Apparent Losses: Meter Testing

Meter error is the largest component of apparent water loss. While some percentage of meter error is unavoidable, it is important to accurately estimate meter error to properly calculate real water loss and thus cost-effectively target real loss reduction. EBMUD has a program to regularly test and repair meters. In 2019, EBMUD tested over 1,700 small and medium meters and plans to test 300 meters annually for the purposes of tracking meter accuracy.

Data Quality Improvements

In 2020, EBMUD hired a consultant to evaluate the design of EBMUD's water treatment plant flow meters which are the source of EBMUD's treated water. Following the construction of improvements recommended by the consultant, the consultant will perform annual meter testing of EBMUD's water treatment plant flow meters.

Annual testing recommended by AWWA M36 will improve the accuracy of water supply values used in EBMUD's water loss audits. The consultant will also conduct verification testing on EBMUD's largest customer meters.

Water Loss Control Plan

As described above, EBMUD has implemented several strategies to reduce real and apparent water losses. In 2020, EBMUD expanded this effort by hiring a water loss control consultant to prepare a comprehensive Water Loss Control Plan. The Water Loss Control Plan is planned for completion in 2021 and will include an assessment of existing water loss control activities, a calculation of EBMUD's economic level of leakage, and recommended strategies to achieve EBMUD's economic level of leakage and comply with SB 555's regulatory water loss limit. Updates to this plan and evaluations of water loss efforts are planned for 2023 and 2025.

6.2.6 WATER CONSERVATION RESEARCH

EBMUD has a long history of leading and participating in research aimed at finding new ways to conserve water, measuring savings from specific conservation activities, and verifying the effectiveness of conservation programs. Research can help to develop, test, and quantify water savings from new water efficiency technologies. In addition to initiating a number of studies on water conservation, EBMUD also participates in studies led by organizations like the Water Research Foundation (WRF) and the California Water Efficiency Partnership (CalWEP, formerly the California Urban Water Conservation Council). EBMUD has also been successful in seeking state and federal grant funding to support these activities.

Historically, EBMUD has participated in research targeting both demand-side and supply-side conservation. On the demand side, EBMUD received a grant from the California DWR in 2007 to pilot the installation of self-adjusting weather-based irrigation controllers. EBMUD participated in a DWR Prop 50 grant-funded study focused on determining the indoor and outdoor end uses of water in single-family residences in California. Supply-side conservation research has focused on improving metering technology; studies have evaluated individual metering for multi-family units and quantified unmetered flow through traditional meters.

Currently EBMUD is conducting two pilot studies evaluating the water and energy savings associated with Advanced Metering Infrastructure (AMI) technology. EBMUD is partnering with PG&E and the University of California at Davis on a study focused on residential customers. EBMUD also received a $1 million grant from the U.S. Bureau of Reclamation to install 3,000 AMI meters for customers with high water use and to monitor associated water and energy savings.

Using the existing water consumption portal described above, customers with AMI can view their hourly and daily consumption and receive timely notification of potential leaks, higher than expected daily use, or when a bill is on track to be higher than usual. Using this tool, EBMUD has identified numerous large leaks and worked with customers to reduce water demand. The online portal can identify timed irrigation and likely irrigators, so customers who are still operating their irrigation systems during winter rains can be notified. EBMUD is researching using AMI data to conduct District Meter Area (DMA) audits to compare hourly supply and hourly demand in order to identify water loss.

6.3 STATE REPORTING REQUIREMENTS

6.3.1 WATER CONSERVATION ACT OF 2009

The Water Conservation Act of 2009 (SB X7-7, Steinberg, 2009), often referred to as "20x2020," called for a 20 percent reduction in urban per capita water use statewide by the year 2020. As an urban water agency, EBMUD was required to report its baseline per capita water use and finalize its reduction targets under SB X7-7 as part of the 2015 UWMP. At that time, EBMUD reported that it had met its interim target by the end of the calendar year 2015.

This section constitutes EBMUD's final submittal for this law, documenting how EBMUD has met its 2020 reduction target. A full description of EBMUD's compliance, along with the methodology and calculations, are provided in Appendix F. Table 6-5 summarizes the final submittal gallons per capita per day (GPCD) as well as the interim and baseline numbers.

6.3.2 LONG TERM FRAMEWORK

Building on the Water Conservation Act of 2009, the State of California adopted a new set of regulations known as "Making Water Conservation a California Way of Life" in 2018, which were laid out in AB 1668 and SB 606. Together these

two bills form a foundation for conservation and drought planning through four primary goals:

- Use Water More Wisely
- Eliminate Water Waste
- Strengthen Local Drought Resilience
- Improve Agriculture Water Use Efficiency and Drought Planning

These four goals have created a framework for water utilities and end-users throughout the State to achieve water conservation today and to prepare for future droughts. This legislation follows up on the 20 percent reduction in water savings achieved by the Water Conservation Act of 2009, creating a new, budget-based approach to conservation wherein water utilities will be given an aggregate maximum water use target that they are required to meet. The target will be based on four components:

1. Indoor residential use
2. Outdoor residential use
3. Outdoor Commercial, Industrial, and Institutional (CII) use with dedicated irrigation meters
4. Water loss reduction

This legislation requires the State Water Resources Control Board (SWRCB) and Department of Water Resources (DWR) to establish standards for each of these four categories.

For the indoor residential value, the target is based on population and an indoor water use standard expressed in GPCD for EBMUD's Service Area. The initial target is set at 55 GPCD in 2020. In 2025, the target is reduced to 52.5 GPCD or a different standard as recommended by the SWRCB and DWR. In 2030, the target is further reduced to 50 GPCD or a different standard as recommended by the SWRCB and DWR.

The standard for outdoor residential consumption is based on the community's climate and the total amount of landscaped area, using a methodology similar to the "Target Method 2" utilized by EBMUD for demonstrating compliance with the Water Conservation Act of 2009. The standard for outdoor CII landscaped areas with dedicated meters is still under development as of the time of this publication; currently, the State is scheduled to issue that standard in October 2021.

The standard for water loss reduction is also still under development. The SWRCB is developing a volumetric reduction standard for each agency expressed as gallons of water lost per connection.

The timeline for developing and implementing these new regulations is shown in Figure 6-3.

6.4 Water Conservation in the Future

Water conservation is a central component of EBMUD's long-term water supply planning efforts aimed at ensuring the reliability of EBMUD's water supply now and in the future. EBMUD is committed to continued investment in water conservation programs to meet its water conservation goals, to provide a reliable water supply, and to help meet the statewide water use reduction goals. As discussed in Chapter 3, water conservation is expected to account for a 22 percent reduction in demand by the year 2050.

To assure EBMUD achieves its water use targets, EBMUD will incorporate the new State requirements into the WCSP 2021 Update. The 2021 Update, covering the ten-year implementation period of 2021-2030, will show how the agency plans to meet its long-term water conservation goals. The WCSP Update will show a continued emphasis on leveraging information technology to help customers save water. EBMUD will continue its leadership in the research and development of new technologies to conserve water.

Table 6-5 Results of EBMUD SBx7-7 Analysis

Item	GPCD
Ten-Year Baseline	164
Five-Year Baseline	161
Calculated 2020 Target (per Target Method 2)	166
Minimum 5% Reduction Goal for 2020	153
2015 Interim Target	159
2015 Water Use	106

FIGURE 6-3 MILESTONE SCHEDULE

2020

- JAN 1 — DWR UPDATES MODEL WATER-EFFICIENT LANDSCAPE ORDINANCE AND SUBMITS TO BUILDING STANDARDS COMMISSION FOR CONSIDERATION
- DEC 31 — URBAN WATER USE TARGETS CUMULATIVELY RESULT IN A 20-PERCENT REDUCTION FROM THE BASELINE DAILY PER CAPITA WATER USE

2021

- JAN 1 — DWR/STATE BOARD SUBMIT RECOMMENDATION ON INDOOR RESIDENTIAL WATER USE STANDARD TO LEGISLATURE
- JAN 1 — DWR PROVIDES RESIDENTIAL IRRIGABLE LAND AREAS TO URBAN WATER RETAILERS
- JUL 1 — URBAN WATER SUPPLIERS SUBMIT UWMPS TO DWR WITHIN 30 DAYS OF ADOPTION
- OCT 1 — DWR RECOMMENDS STANDARDS FOR OUTDOOR RESIDENTIAL USE, LANDSCAPE IRRIGATION, AND UNIQUE URBAN WATER USE VARIANCES
- OCT 1 — DWR DEVELOPS GUIDELINES AND METHODOLOGIES FOR CALCULATING URBAN WATER USE OBJECTIVES
- OCT 1 — DWR RECOMMENDS PERFORMANCE MEASURES FOR CII WATER USE

2022

- MAY 30 — STATE WATER BOARD IDENTIFIES IONG-TERM STANDARDS FOR EFFICIENT USE OF WATER PROPOSED STANDARDS' EFFECTS
- JUN 30 — STATE WATER BOARD ADOPTS LONG-TERM STANDARDS FOR EFFICIENT USE OF WATER AND RELATED METHODOLOGY AND GUIDANCE
- JUN 30 — STATE WATER BOARD ADOPTS PERFORMANCE MEASURES FOR CII WATER USE
- JUL 1 — DWR SUBMITS UWMPS REPORT TO LEGISLATURE.

2023

- JAN 1 — DWR UPDATES MODEL WATER-EFFICIENT LANDSCAPE ORDINANCE AND SUBMITS TO BUILDING STANDARDS COMMISSION FOR CONSIDERATION
- NOV 1 — URBAN WATER SUPPLIERS SUBMIT ANNUAL WATER USE REPORT TO DWR ON URBAN WATER USE OBJECTIVE, ACTUAL URBAN WATER USE, IMPLEMENTATION OF CII WATER USE PERFORMANCE MEASURES, AND PROGRESS TOWARDS URBAN WATER USE OBJECTIVE
- NOV 1 FORWARD — STATE WATER BOARD MAY ISSUE INFORMATIONAL ORDER TO URBAN RETAIL WATER SUPPLIER

2024

- JAN 1 — URBAN WATER SUPPLIERS ADOPT AND SUBMIT TO DWR SUPPLEMENT TO ADOPTED 2020 UWMPS ON WATER DEMAND MANAGEMENT MEASURES TO BE IMPLEMENTED
- JAN 10 — LEGISLATIVE ANALYST REPORTS TO LEGISLATURE AND PUBLIC ON EVALUATION OF IMPLEMENTATION OF WATER USE EFFICIENCY STANDARDS AND WATER USE REPORTING
- NOV 1 — URBAN WATER SUPPLIERS SUBMIT ANNUAL WATER USE REPORT TO DWR
- NOV 1 FORWARD — STATE WATER BOARD MAY ISSUE A WRITTEN NOTICE (WARNING) TO URBAN RETAIL WATER SUPPLIER THAT IS NOT MEETING ITS WATER USE OBJECTIVE

2025

- JUL 1 FORWARD — STATE WATER BOARD MAY ISSUE CONSERVATION ORDER TO URBAN RETAIL WATER SUPPLIER
- NOV 1 — URBAN WATER SUPPLIERS SUBMIT ANNUAL WATER USE REPORT TO DWRV

Appendix A

The UWMP Act and its Amendments

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 1. General Declaration and Policy [10610 - 10610.4] ***(Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1.)***

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

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, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(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 now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(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.

(Amended by Stats. 2018, Ch. 14, Sec. 18. (SB 606) Effective January 1, 2019.)

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 achieve the efficient use of available supplies and strengthen local drought planning.

(Amended by Stats. 2018, Ch. 14, Sec. 19. (SB 606) Effective January 1, 2019.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 2. Definitions [10611 - 10618] ***(Chapter 2 added by Stats. 1983, Ch. 1009, Sec. 1.)***

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10611.3. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

(Added by renumbering Section 10612 by Stats. 2018, Ch. 14, Sec. 20. (SB 606) Effective January 1, 2019.)

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.

(Amended by Stats. 1995, Ch. 854, Sec. 3. Effective January 1, 1996.)

10612. "Drought risk assessment" means a method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.

(Added by Stats. 2018, Ch. 14, Sec. 21. (SB 606) Effective January 1, 2019.)

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.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

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.

(Amended by Stats. 1995, Ch. 854, Sec. 4. Effective January 1, 1996.)

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10616.5. 'Recycled water" means the reclamation and reuse of wastewater for beneficial use.

(Added by Stats. 1995, Ch. 854, Sec. 5. Effective January 1, 1996.)

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.

(Amended by Stats. 1996, Ch. 1023, Sec. 428. Effective September 29, 1996.)

10617.5. "Water shortage contingency plan" means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

(Added by Stats. 2018, Ch. 14, Sec. 22. (SB 606) Effective January 1, 2019.)

10618. "Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

(Added by Stats. 2018, Ch. 14, Sec. 23. (SB 606) Effective January 1, 2019.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 3. Urban Water Management Plans [10620 - 10645] *(Chapter 3 added by Stats. 1983, Ch. 1009, Sec. 1.)*

ARTICLE 1. General Provisions [10620 - 10621] ***(Article 1 added by Stats. 1983, Ch. 1009, Sec. 1.)***

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, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) 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.

(Amended by Stats. 2018, Ch. 14, Sec. 24. (SB 606) Effective January 1, 2019.)

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before 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) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

(d) 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).

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

(Amended by Stats. 2019, Ch. 239, Sec. 7. (AB 1414) Effective January 1, 2020.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 3. Urban Water Management Plans [10620 - 10645] *(Chapter 3 added by Stats. 1983, Ch. 1009, Sec. 1.)*

ARTICLE 2. Contents of Plans [10630 - 10634] ***(Article 2 added by Stats. 1983, Ch. 1009, Sec. 1.)***

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, while accounting for impacts from climate change.

(Amended by Stats. 2018, Ch. 14, Sec. 26. (SB 606) Effective January 1, 2019.)

10630.5. Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

(Added by Stats. 2018, Ch. 14, Sec. 27. (SB 606) Effective January 1, 2019.)

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 social, economic, and 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. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(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), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), 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 for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that 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 a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin 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 coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) 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.

(D) 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) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (1) For an urban retail water supplier, 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, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(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.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) 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 that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive 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.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(h) An urban water supplier that relies 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 (f). 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 (f).

(Amended by Stats. 2019, Ch. 239, Sec. 8. (AB 1414) Effective January 1, 2020.)

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.

(Added by Stats. 2005, Ch. 727, Sec. 2. Effective January 1, 2006.)

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

(Amended by Stats. 2018, Ch. 14, Sec. 29. (SB 606) Effective January 1, 2019.)

10632. (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decisionmaking process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an 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.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

(Repealed and added by Stats. 2018, Ch. 14, Sec. 32. (SB 606) Effective January 1, 2019.)

10632.1. An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

(Amended by Stats. 2019, Ch. 239, Sec. 9. (AB 1414) Effective January 1, 2020.)

10632.2. An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

(Added by Stats. 2018, Ch. 14, Sec. 34. (SB 606) Effective January 1, 2019.)

10632.3. It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

(Added by Stats. 2018, Ch. 14, Sec. 35. (SB 606) Effective January 1, 2019.)

10632.5. (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

(Added by Stats. 2015, Ch. 681, Sec. 1. (SB 664) Effective January 1, 2016.)

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.

(Amended by Stats. 2009, Ch. 534, Sec. 2. (AB 1465) Effective January 1, 2010.)

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.

(Added by Stats. 2001, Ch. 644, Sec. 3. Effective January 1, 2002.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 3. Urban Water Management Plans [10620 - 10645] *(Chapter 3 added by Stats. 1983, Ch. 1009, Sec. 1.)*

ARTICLE 2.5. Water Service Reliability [10635- 10635.] ***(Article 2.5 added by Stats. 1995, Ch. 854, Sec. 11.)***

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 long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive 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) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(c) 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.

(d) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(e) 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.

(Amended by Stats. 2018, Ch. 14, Sec. 36. (SB 606) Effective January 1, 2019.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 3. Urban Water Management Plans [10620 - 10645] *(Chapter 3 added by Stats. 1983, Ch. 1009, Sec. 1.)*

ARTICLE 3. Adoption and Implementation of Plans [10640 - 10645] ***(Article 3 added by Stats. 1983, Ch. 1009, Sec. 1.)***

10640. (a) 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.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(Amended by Stats. 2018, Ch. 14, Sec. 37. (SB 606) Effective January 1, 2019.)

10641. An urban water supplier required to prepare a plan or a water shortage contingency 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.

(Amended by Stats. 2018, Ch. 14, Sec. 38. (SB 606) Effective January 1, 2019.)

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 both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the 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 a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

(Amended by Stats. 2018, Ch. 14, Sec. 39. (SB 606) Effective January 1, 2019.)

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10644. (a) (1) 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.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

(Amended by Stats. 2018, Ch. 14, Sec. 40. (SB 606) Effective January 1, 2019.)

10645. (a) 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.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(Amended by Stats. 2018, Ch. 14, Sec. 41. (SB 606) Effective January 1, 2019.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec. 1.)*

CHAPTER 4. Miscellaneous Provisions [10650 - 10657] ***(Chapter 4 added by Stats. 1983, Ch. 1009, Sec. 1.)***

10650. Any actions or proceedings, other than actions by the board, 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 or a water shortage contingency 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 water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

(Amended by Stats. 2018, Ch. 14, Sec. 42. (SB 606) Effective January 1, 2019.)

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either 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.

(Amended by Stats. 2018, Ch. 14, Sec. 43. (SB 606) Effective January 1, 2019.)

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.

(Amended by Stats. 1995, Ch. 854, Sec. 16. Effective January 1, 1996.)

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions 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 that complies with analogous 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.

(Amended by Stats. 2018, Ch. 14, Sec. 44. (SB 606) Effective January 1, 2019.)

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

(Amended by Stats. 2018, Ch. 14, Sec. 45. (SB 606) Effective January 1, 2019.)

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.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

(Amended by Stats. 2018, Ch. 14, Sec. 46. (SB 606) Effective January 1, 2019.)

10657. The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

(Added by Stats. 2018, Ch. 14, Sec. 47. (SB 606) Effective January 1, 2019.)

Appendix B

Public Notices

Alameda Journal
1101 Marina Village Parkway
Suite 253
Alameda, CA 94501
510-262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Alameda Journal

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Alameda Journal, a newspaper published in the English language in the City of Alameda, County of Alameda, State of California.

I declare that the Alameda Journal, is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated August 25, 1992, in the action entitled "In the Matter of the Petition of the Alameda Journal to Have the Standing of the Alameda Journal as a Newspaper of General Circulation Ascertained and Established," Case Number 702515-6. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Alameda Journal as a newspaper of general circulation...within the City of Alameda, County of Alameda, State of California, is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Alameda Journal and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

DUE TO COVID-19 THESE MEETINGS WILL BE CONDUCTED REMOTELY VIA ZOOM AND WILL BE ACCESSIBLE BY INTERNET OR TELEPHONE. A PHYSICAL LOCATION WILL NOT BE PROVIDED FOR THESE MEETINGS IN ACCORDANCE WITH STATE EXECUTIVE ORDER N-29-20 AND CURRENT COUNTY PUBLIC HEALTH ORDERS. IF PUBLIC HEALTH DIRECTIVES CHANGE AFTER THIS NOTICE, EBMUD MAY CONDUCT THESE MEETINGS WITH MEMBERS OF THE PUBLIC PHYSICALLY PRESENT IF CONSISTENT WITH LEGAL REQUIREMENTS. THE PUBLIC MAY PARTICIPATE IN THESE MEETINGS VIRTUALLY OR BY TELEPHONE IN ANY EVENT. ANY UPDATE TO THE PUBLIC PARTICIPATION INFORMATION WILL BE POSTED BEFORE THE MEETINGS AT **www.ebmud.com/uwmp** .

PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Meeting ID: 957 8795 6292
  Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Webinar ID: 970 6508 6667
  Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at **https://www.ebmud.com/about-us/board-directors/board-meetings/** .

Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Alameda Journal
1101 Marina Village Parkway
Suite 253
Alameda, CA 94501
510-262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Alameda Journal

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Alameda Journal, a newspaper published in the English language in the City of Alameda, County of Alameda, State of California.

I declare that the Alameda Journal, is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated August 25, 1992, in the action entitled "In the Matter of the Petition of the Alameda Journal to Have the Standing of the Alameda Journal as a Newspaper of General Circulation Ascertained and Established," Case Number 702515-6. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Alameda Journal as a newspaper of general circulation...within the City of Alameda, County of Alameda, State of California, is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Alameda Journal and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

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- By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Alameda Times-Star
1101 Marina Village Pkwy., Ste. 253
Alameda, CA 94501
510-723-2850

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Alameda Times-Star

The Alameda Times-Star

I am a citizen of the United States; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the Legal Advertising Clerk of the printer and publisher of The Alameda Times-Star, a newspaper published in the English language in the City of Alameda, County of Alameda, State of California.

I declare that The Alameda Times-Star is a newspaper of general circulation as defined by the laws of the State of California as determined by this court's order, dated September, 17, 1951, in the action entitled In the Matter of the Ascertainment and Establishment of the Standing of The Alameda Times-Star as a Newspaper of General Circulation, Case Number 236092. Said order states that "The Alameda Times-Star is a newspaper of general circulation within the City of Alameda, and the County of Alameda, and the State of California, within the meaning and intent of Chapter 1, Division 7, Title 1 [§§ 6000 et seq.] of the Government Code of the State of California." Said order has not been revoked, vacated or set aside.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/26/2021, 04/02/2021

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: April 2, 2021

Public Notice Advertising Clerk

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

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PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Meeting ID: 957 8795 6292
  Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Webinar ID: 970 6508 6667
  Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

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Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

4/6/21

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
COUNTY OF AMADOR

I am a citizen of the United States and a resident of the said County. I am over the age of eighteen years; and not a party to or interested in the above matter. I am the principal Clerk of the Printer and Publisher of the Amador Ledger Dispatch. A newspaper of general circulation, published once a week in the City of Jackson, California, County of Amador, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court, of the County of Amador, State of California dated June 19, 1953, Court decree numbers; 5575/5551; that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil) has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates; to wit:

March 26

April 2,

all in the year: 2021

I certify (or declare) under Penalty of perjury that the foregoing is true and correct.

Date at Jackson, California this

2 of April, 2021

Jack Mitchell
SIGNATURE

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD)
Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

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•Virtually: www.ebmud.com/uwmp
•By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
•Virtually: www.ebmud.com/uwmp
•By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

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Rischa S. Cole
Secretary of the District
March 26, 2021
April 2, 2021-V626

Berkeley Voice
510-723-2850

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Berkeley Voice

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Berkeley Voice, a newspaper published in the English language in the City of Berkeley, County of Alameda, State of California.

I declare that the Berkeley Voice is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated September 3, 1991, in the action entitled "In the Matter of the Petition of the Berkeley Voice to Have the Standing of the Berkeley Voice as a Newspaper of General Circulation Ascertained and Established," Case Number 588221-2. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Berkeley Voice as a newspaper of general circulation...within the City of Berkeley, County of Alameda, State of California, is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Berkeley Voice and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

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Webinar ID: 970 6508 6667
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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Berkeley Voice
510-723-2850

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Berkeley Voice

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Berkeley Voice, a newspaper published in the English language in the City of Berkeley, County of Alameda, State of California.

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03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

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  Webinar ID: 970 6508 6667
  Passcode: 238500

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The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at **https://www.ebmud.com/about-us/board-directors/board-meetings/** .

Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Proof of Publication of

(2015-5 C.C.P.)

Public Notice
East Bay Municipal Utility District
Draft Urban Water Management Plan 2020 &
2020 Water Shortage Contingency Plan

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

DUE TO COVID-19 THESE MEETINGS WILL BE CONDUCTED REMOTELY VIA ZOOM AND WILL BE ACCESSIBLE BY INTERNET OR TELEPHONE. A PHYSICAL LOCATION WILL NOT BE PROVIDED FOR THESE MEETINGS IN ACCORDANCE WITH STATE EXECUTIVE ORDER N-29-20 AND CURRENT COUNTY PUBLIC HEALTH ORDERS. IF PUBLIC HEALTH DIRECTIVES CHANGE AFTER THIS NOTICE, EBMUD MAY CONDUCT THESE MEETINGS WITH MEMBERSOFTHEPUBLIC PHYSICALLY PRESENT IF CONSISTENT WITH LEGAL REQUIREMENTS. THE PUBLIC MAY PARTICIPATE IN THESE MEETINGS VIRTUALLY OR BY TELEPHONE IN ANY EVENT. ANY UPDATE TO THE PUBLIC PARTICIPATION INFORMATION WILL BE POSTED BEFORE THE MEETINGS AT www.ebmud.com/uwmp.

PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: www.ebmud.com/uwmp
- By Phone: US +1 (669) 900-6833
Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: www.ebmud.com/uwmp
- By Phone: US +1 (669) 900-6833
Webinar ID: 970 6508 6667
Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hear-

This space is for the County Clerk's Filing Stamp

STATE OF CALIFORNIA,

County of Calaveras.

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 matter. I am the principal clerk of the printer of the Calaveras Enterprise, a newspaper of general circulation, printed weekly, in the City of San Andreas, California, County of Calaveras, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court, of the County of Calaveras, State of California; that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates; to-wit:

March 25, April 1, 2021CE

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated the 1st of April, 2021

CALAVERAS ENTERPRISE
15 North Main Street
P.O. Box 1197, San Andreas, CA 95249-1197
(209) 754-3861 - FAX (209) 754-1805

PROOF OF PUBLICATION

Proof of Publication of **(2015-5 C.C.P.)**

Public Notice
East Bay Municipal Utility District
Draft Urban Water Management Plan 2020 &
2020 Water Shortage Contingency Plan

ing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at *https://www.ebmud.com/uwmp*, or printed copies may be requested by emailing UWMP2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at https://www.ebmud.com/about-us/board-directors/board-meetings/.

Rischa S. Cole
Secretary of the District
Publish: 3/25, 4/1, 2021CE

This space is for the County Clerk's Filing Stamp

STATE OF CALIFORNIA,

County of Calaveras.

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 matter. I am the principal clerk of the printer of the Calaveras Enterprise, a newspaper of general circulation, printed weekly, in the City of San Andreas, California, County of Calaveras, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court, of the County of Calaveras, State of California; that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates; to-wit:

March 25, April 1, 2021CE

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Dated the 1st of April, 2021

CALAVERAS ENTERPRISE
15 North Main Street
P.O. Box 1197, San Andreas, CA 95249-1197
(209) 754-3861 - FAX (209) 754-1805

PROOF OF PUBLICATION

Contra Costa Times
2121 N. California Blvd., Ste. 290
Walnut Creek, CA 94596
925-943-8019

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Contra Costa Times

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Contra Costa Times, a newspaper published in the English language in the City of Walnut Creek, County of Contra Costa, State of California.

I declare that the Contra Costa Times is a newspaper of general circulation as defined by the laws of the State of California as determined by court decree dated October 22, 1934, Case Number 19764. Said decree states that the Contra Costa Times is adjudged to be a newspaper of general circulation for the City of Walnut Creek, County of Contra Costa and State of California. Said order has not been revoked.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

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PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Meeting ID: 957 8795 6292
  Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Webinar ID: 970 6508 6667
  Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at **https://www.ebmud.com/about-us/board-directors/board-meetings/**.

Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Daily Review
c/o Bay Area News Group-East Bay
800-595-9595

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Daily Review

The Daily Review

I am a citizen of the United States; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the Legal Advertising Clerk of the printer and publisher of The Daily Review, a newspaper published in the English language in the City of Hayward, County of Alameda, State of California.

I declare that the Daily Review is a newspaper of general circulation as defined by the laws of the State of California as determined by this court's decree, dated March 2, 1950, in the action entitled In the Matter of the Ascertainment and Establishment of the Standing of The Daily Review as a Newspaper of General Circulation, case number 221938. Said decree states that "'The Daily Review' has been established, printed, and published daily in the City of Hayward, County of Alameda, State of California, for one year or more next preceding the date of the filing of said petition; that it is a newspaper published for the dissemination of local and telegraphic news and intelligence of a general character and has a bona fide subscription list of paying subscribers; … [ ] [and] THEREFORE, … 'The Daily Review' is hereby determined and declared to be a newspaper of general circulation [within the meaning of Government Code §§ 6000 et seq.]" Said decree has not been revoked, vacated or set aside.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/26/2021, 04/02/2021

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: April 2, 2021

Public Notice Advertising Clerk

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

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PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

El Cerrito Journal
1050 Marina Way South
Richmond, CA 94804
510-262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

El Cerrito Journal

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the El Cerrito Journal, a newspaper published in the English language in the Town of El Cerrito, City of Richmond, County of Contra Costa, State of California.

I declare that the El Cerrito Journal is a newspaper of general circulation as defined by the laws of the State of California as determined by court decree dated October 4, 1991, Case Number C91-03084. Said decree states that the El Cerrito Journal is adjudged to be a newspaper of general circulation for the Town of El Cerrito, City of Richmond, County of Contra Costa and State of California. Said order has not been revoked.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

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APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

El Cerrito Journal
1050 Marina Way South
Richmond, CA 94804
510-262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

El Cerrito Journal

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the El Cerrito Journal, a newspaper published in the English language in the Town of El Cerrito, City of Richmond, County of Contra Costa, State of California.

I declare that the El Cerrito Journal is a newspaper of general circulation as defined by the laws of the State of California as determined by court decree dated October 4, 1991, Case Number C91-03084. Said decree states that the El Cerrito Journal is adjudged to be a newspaper of general circulation for the Town of El Cerrito, City of Richmond, County of Contra Costa and State of California. Said order has not been revoked.

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03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
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- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

PROOF OF PUBLICATION

(2015.5 C.C.C.P.)

STATE OF CALIFORNIA

County of San Joaquin

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 principal clerk of the printer of the Lodi News-Sentinel, a newspaper of general circulation, printed and published daily except Sundays, Mondays and holidays, in the City of Lodi, California, County of San Joaquin and which newspaper had been adjudicated a newspaper of general circulation by the Superior Court, Department 3, of the County of San Joaquin, State of California, under the date of May 26th, 1953. Case Number 65990; that the notice of which the annexed is a printed copy (set in type not smaller than non-pareil) has been published in each regular and entire issue of said newspaper and not in any supplement thereto on the following dates to-wit:

March 26 & April 2

all in the year 2021.

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Dated at Lodi, California, United States of America this 2nd day of April, 2021

.....
Signature

Proof of Publicatio
Public Notice

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD)
Draft Urban Water Management Plan (UWMP)
2020 and
2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

DUE TO COVID-19 THESE MEETINGS WILL BE CONDUCTED REMOTELY VIA ZOOM AND WILL BE ACCESSIBLE BY INTERNET OR TELEPHONE. A PHYSICAL LOCATION WILL NOT BE PROVIDED FOR THESE MEETINGS IN ACCORDANCE WITH STATE EXECUTIVE ORDER N-29-20 AND CURRENT COUNTY PUBLIC HEALTH ORDERS. IF PUBLIC HEALTH DIRECTIVES CHANGE AFTER THIS NOTICE, EBMUD MAY CONDUCT THESE MEETINGS WITH MEMBERS OF THE PUBLIC PHYSICALLY PRESENT IF CONSISTENT WITH LEGAL REQUIREMENTS. THE PUBLIC MAY PARTICIPATE IN THESE MEETINGS VIRTUALLY OR BY TELEPHONE IN ANY EVENT. ANY UPDATE TO THE PUBLIC PARTICIPATION INFORMATION WILL BE POSTED BEFORE THE MEETINGS AT *www.ebmud.com/uwmp.*

PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: www.ebmud.com/uwmp
- By Phone: US +1 (669) 900-6833
  Meeting ID: 957 8795 6292
  Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: www.ebmud.com/uwmp
- By Phone: US +1 (669) 900-6833
  Webinar ID: 970 6508 6667
  Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to

Montclarion
600 Grand Ave., #308
Oakland, CA 94610
510-723-2850

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Montclarion

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Montclarion, a newspaper published in the English language in the City of Oakland, Township of Brooklyn, County of Alameda, State of California.

I declare that the Montclarion is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated March 10, 1950 in the action entitled "In the Matter of the Petition of the Montclarion to Have the Standing of the Montclarion as a Newspaper of General Circulation Ascertained and Established," Case Number 224574. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Montclarion as a newspaper of general circulation...within the City of Oakland, Township of Brooklyn, County of Alameda, State of California., is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Montclarion and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

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Webinar ID: 970 6508 6667
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Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at **https://www.ebmud.com/about-us/board-directors/board-meetings/**.

Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Montclarion
600 Grand Ave., #308
Oakland, CA 94610
510-723-2850

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Montclarion

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Montclarion, a newspaper published in the English language in the City of Oakland, Township of Brooklyn, County of Alameda, State of California.

I declare that the Montclarion is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated March 10, 1950 in the action entitled "In the Matter of the Petition of the Montclarion to Have the Standing of the Montclarion as a Newspaper of General Circulation Ascertained and Established," Case Number 224574. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Montclarion as a newspaper of general circulation...within the City of Oakland, Township of Brooklyn, County of Alameda, State of California., is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Montclarion and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

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- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Meeting ID: 957 8795 6292
  Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Webinar ID: 970 6508 6667
  Passcode: 238500

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Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at **https://www.ebmud.com/about-us/board-directors/board-meetings/**.

Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Oakland Tribune
600 Grand Ave., #308
Oakland, CA 94610
510-723-2850

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Oakland Tribune

The Oakland Tribune

I am a citizen of the United States; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the Legal Advertising Clerk of the printer and publisher of The Oakland Tribune, a newspaper published in the English language in the City of Oakland, County of Alameda, State of California.

I declare that The Oakland Tribune is a newspaper of general circulation as defined by the laws of the State of California as determined by this court's order, dated December 6, 1951, in the action entitled In the Matter of the Ascertainment and Establishment of the Standing of The Oakland Tribune as a Newspaper of General Circulation, Case Number 237798. Said order states that "The Oakland Tribune is a newspaper of general circulation within the City of Oakland, and the County of Alameda, and the State of California, within the meaning and intent of Chapter 1, Division 7, Title 1 [§§ 6000 et seq.], of the Government Code of the State of California." Said order has not been revoked, vacated, or set aside.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/26/2021, 04/02/2021

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: April 2, 2021

Public Notice Advertising Clerk

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

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APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

The UWMP brings together important information on water supply and usage, recycled water, and conservation programs at EBMUD. The WSCP provides guidance in responding to water shortages within the service area. EBMUD is updating its 2015 UWMP and WSCP to reflect current conditions and legal requirements. The UWMP and WSCP present EBMUD's effort to promote efficient water use consistent with the California Urban Water Management Planning Act, found in sections 10610-10657 of the California Water Code.

The April 29 comment meeting and the May 11 hearing will provide the public an opportunity to comment on the Draft UWMP and WSCP. EBMUD will review and consider all comments received at the hearing and comment meeting, and all written comments received by May 12, 2021, 4:30pm. All written comments should be submitted by email to UWMP2020@ebmud.com, or by postal mail to Attn: S. Cheng, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.

Copies of the draft UWMP and WSCP are available at the public libraries located within the EBMUD service area, and at the California State Library. The draft UWMP and WSCP may also be downloaded from EBMUD website at **https://www.ebmud.com/uwmp**, or printed copies may be requested by emailing UWMP 2020@ebmud.com.

The UWMP and WSCP will be considered for adoption by the EBMUD Board of Directors during the regularly scheduled Board Meeting, to be held virtually on June 22, 2021, beginning at 1:15pm. Additional information on accessing the virtual Board Meeting will be available on EBMUD's website at **https://www.ebmud.com/about-us/board-directors/board-meetings/**.

Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Piedmonter
510-262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Piedmonter

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Piedmonter, a newspaper published in the English language in the City of Piedmont, County of Alameda, State of California.

I declare that the Piedmonter is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated July 8, 1936, in the action entitled "In the Matter of the Petition of the Piedmonter to Have the Standing of the Piedmonter as a Newspaper of General Circulation Ascertained and Established," Case Number 140711. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Piedmonter as a newspaper of general circulation...within the City of Oakland, County of Alameda, State of California, is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Piedmonter and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

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- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

THE RECORD
PROOF OF PUBLICATION

STATE OF CALIFORNIA
COUNTY OF SAN JOAQUIN

THE UNDERSIGNED SAYS:

I am a citizen of the United States and a resident of San Joaquin County; I am over the age of 18 years and not a part to or interested in the above-entitled matter. I am the principal clerk of the printer of THE RECORD, a newspaper of general publication, printed and published daily in the City of Stockton, County of San Joaquin by the Superior Court of the County of San Joaquin, State of California, under the date of February 26, 1952, File No. 52857, San Joaquin County Records; that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published each regular and entire issue of said newspaper and not in any supplement thereof on the following dates,
To wit,
March 26 2021,
April 02 2021

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 2, 2021 In Stockton California

Delailah Little,
The Record

0000228909

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD)
Draft Urban Water Management Plan (UWMP) 2020 and
2020 Water Shortage Contingency Plan (WSCP)

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Rischa S. Cole
Secretary of the District
#228909 3/26/21, 4/2/21

RN-0000228909-01

Piedmonter
510-262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

Piedmonter

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the Piedmonter, a newspaper published in the English language in the City of Piedmont, County of Alameda, State of California.

I declare that the Piedmonter is a newspaper of general circulation as defined by the laws of the State of California, as determined by the order of the Superior Court of the County of Alameda, dated July 8, 1936, in the action entitled "In the Matter of the Petition of the Piedmonter to Have the Standing of the Piedmonter as a Newspaper of General Circulation Ascertained and Established," Case Number 140711. Said order provides that: "Petitioner's prayer for an order ascertaining and establishing The Piedmonter as a newspaper of general circulation...within the City of Oakland, County of Alameda, State of California, is granted." Said order has not been revoked.

I declare that the notice, a printed copy of which is annexed hereto, has been published in each regular and entire issue of the Piedmonter and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

PUBLIC NOTICE
East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (UWMP) 2020 and 2020 Water Shortage Contingency Plan (WSCP)

EBMUD WILL RELEASE ITS DRAFT UWMP 2020 AND 2020 WSCP FOR PUBLIC REVIEW AND COMMENT BEGINNING ON APRIL 7, 2021 AND ENDING ON MAY 12, 2021. A VIRTUAL PUBLIC COMMENT MEETING ON THE UWMP AND WSCP WILL BE HELD ON APRIL 29, 2021 AT 12:00 PM. IN ADDITION, A VIRTUAL PUBLIC HEARING ON THE UWMP AND WSCP WILL BE HELD DURING A REGULARLY SCHEDULED EBMUD BOARD MEETING, BEGINNING AT 1:15PM ON MAY 11, 2021.

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PLEASE USE THE INFORMATION BELOW TO PARTICIPATE IN THE MEETINGS TELEPHONICALLY OR VIRTUALLY:

APRIL 29, 2021 PUBLIC COMMENT MEETING (12:00 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Meeting ID: 957 8795 6292
Passcode: 895047

MAY 11, 2021 PUBLIC HEARING (1:15 PM)
- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

Webinar ID: 970 6508 6667
Passcode: 238500

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

MCCLATCHY excelerate

Belleville News-Democrat
Bellingham Herald
Bradenton Herald
Centre Daily Times
Charlotte Observer
Columbus Ledger-Enquirer
Fresno Bee
The Herald – Rock Hill
Herald Sun – Durham
Idaho Statesman
Island Packet
Kansas City Star
Lexington Herald-Leader
Merced Sun-Star
Miami Herald/el Nuevo Herald
Modesto Bee
Raleigh News & Observer
The Olympian
Sacramento Bee
Fort Worth Star Telegram
The State - Columbia
Sun Herald – Biloxi
Sun News – Myrtle Beach
The News Tribune – Tacoma
The Telegraph - Macon
San Luis Obispo Tribune
Tri-City Herald
Wichita Eagle

AFFIDAVIT OF PUBLICATION

Account #	Order Number	Identification	Order PO	Amount	Cols	Depth
33201	32117	Print Legal Ad - IPL0016185		$2,277.52	2	8.58

Attention:

EAST BAY MUNICIPAL UTILITY DISTRICT
375 11TH ST
OAKLAND, CA 94607

EBMUD

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Rischa S. Cole
Secretary of the District
IPL0016185
Mar 26,Apr 2 2021

DECLARATION OF PUBLICATION (C.C.P.2015.5)

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:

No. of Insertions: 2

Beginning Issue of: 03/26/2021

Ending Issue of: 04/02/2021

Legals Clerk

COUNTY OF DALLAS
STATE OF TEXAS

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 4/15/2021.

Notary Public in and for the state of Texas, residing in Dallas County

AMANDA DAWN GRISHAM
My Notary ID # 132031326
Expires May 30, 2023

Extra charge for lost or duplicate affidavits.
Legal document please do not destroy!

San Ramon Valley Times

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

San Ramon Valley Times

I am a citizen of the United States. I am over the age of eighteen years and I am not a party to or interested in the above entitled matter. I am the Legal Advertising Clerk of the printer and publisher of the San Ramon Valley Times (formerly Valley Pioneer), a newspaper published in the English language in the Town of Danville, County of Contra Costa, State of California.

I declare that the San Ramon Valley Times (formerly Valley Pioneer) is a newspaper of general circulation as defined by the laws of the State of California as determined by court decree dated April 28, 1947, Case Number 39468. Said decree states that the San Ramon Valley Times is adjudged to be a newspaper of general circulation for the Town of Danville, County of Contra Costa and State of California. Said order has not been revoked.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

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- By Phone: US +1 (669) 900-6833

  Meeting ID: 957 8795 6292
  Passcode: 895047

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- Virtually: **www.ebmud.com/uwmp**
- By Phone: US +1 (669) 900-6833

  Webinar ID: 970 6508 6667
  Passcode: 238500

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

West County Times
1050 Marina Way S
Richmond, CA 94804
(510) 262-2740

2006239

EAST BAY MUD
ATTN: ROBYN JOHNSON
MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

In the matter of

West County Times

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 Principal Legal Clerk of the West County Times, a newspaper of general circulation, printed and published in the City of Walnut Creek, County of Contra Costa, 94598

And which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Contra Costa, State of California, under the date of August 29, 1978. Case Number 188884.

The notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

03/26/2021, 04/02/2021

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Executed at Walnut Creek, California.
On this 2nd day of April, 2021.

Signature

Legal No. **0006563321**

EBMUD

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  Meeting ID: 957 8795 6292
  Passcode: 895047

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  Webinar ID: 970 6508 6667
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Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

West County Times
1050 Marina Way S
Richmond, CA 94804
(510) 262-2740

2006239

EAST BAY MUD
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MS 806
PO BOX 24055
OAKLAND, CA 94623

PROOF OF PUBLICATION

FILE NO. UWMP 2020

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Rischa S. Cole
Secretary of the District
ATS/CCT/WCT/SRVT/OT/DR/AJ/MC/PM/BV/JL
6563321; Mar. 26; Apr. 2, 2021

Appendix C

Comments and Responses

From: Ng, Dorothy
To: uwmp2020
Subject: comments for long term water supply planning
Date: Monday, April 12, 2021 10:56:40 AM

Hi,

It seems like California experiences cycles of drought years and wet years where wet years are harder to come by and drought years can persist for quite a while. We have spent a lot of money into building the Freeport facility and we only have rights to draw 3 times in 5 years, that doesn't help a lot if the drought persists. Desalination is another alternative but it's a very expensive and not very environmental friendly process. I believe to combat this situation, we need to think of increasing storage in the wet years. I know it's really difficult to do any constructions of dams and/or reservoirs without battling with environmental groups. If increasing storage is a monumental effort that may not become fruition after all, maybe we could build aqua ducts to neighboring states where there are plenty of snow/rainfall? Just my two cents input.

Dorothy

ORGANIZATION: General Public
NAME: Dorothy Ng
EMAIL RECEIVED: July 12, 2021

COMMENT 1

"It seems like California experiences cycles of drought years and wet years where wet years are harder to come by and drought years can persist for quite a while...I believe to combat this situation, we need to think of increasing storage in the wet years...maybe we could build aqua ducts to neighboring states where there are plenty of snow/rainfall? Just my two cents input."

EBMUD RESPONSE

Comment Noted.

EBMUD is looking at a number of ways to increase water supply and one of which is investing in groundwater banking projects that help make water available during dry years by storing it in underground aquifers. These projects are discussed in Chapter 4 Section 4.1.

EBMUD will continue to explore and investigate new ways to increase storage, however, building aqueducts to neighboring states would require extensive planning/coordination, significant finances, and meeting complex environmental and multi-jurisdictional regulatory requirements. These factors and many other challenges have made considering aqueduct construction not a viable alternative, especially relative to more promising future sources of water supply such as water conservation and recycled water, and regional water supply projects.

From: Aaron Winer
To: uwmp2020
Subject: Comments on the Draft 2020 UWMP/WSCP
Date: Wednesday, April 14, 2021 1:22:16 PM
Attachments: image002.png

Good day,

I completed a review of EBMUD's UWMP and have just a couple of comments/requests. West County Wastewater District (WCW) has recently undergone somewhat of a rebranding. We no longer use the abbreviation WCWD and instead use WCW as shown at the beginning of this sentence. Is it too late for that change to be made to the WCW references in the UWMP?

The other item is at the top left of page 57 which reads as follows; "In 2016 and 2017, the District's NRWRP experienced interruption of influent supply from West County due to construction shutdowns. Therefore, the District had to supplement Chevron Richmond Refinery with potable water. The NRWRP went back into service in January 2019."

The NRWRP was in fact affected by influent interruptions caused by WCW construction in 2016/2017 but was off line for nearly two more years (until early 2019) due to significant rehabilitation of select process areas at the NRWRP itself. I think that narrative needs clarifying because as currently written, it seems to say that potable water was required for use by the refinery for nearly 4 years due to construction at the WCW plant. Thanks for your consideration.

Aaron Winer

Director of Water Quality & Resource Recovery

WEST COUNTY WASTEWATER

2377 Garden Tract Road
Richmond, CA 94801
awiner@wcwd.org
(510) 812-9586 (Direct)

ORGANIZATION: West County Wastewater
NAME: Aaron Winer
EMAIL RECEIVED: July 14, 2021

COMMENT 2

"We no longer use the abbreviation WCWD and instead use WCW as shown at the beginning of this sentence. Is it too late for that change to be made to the WCW references in the UWMP?"

EBMUD RESPONSE

All references made to WCWD have been replaced with WCW.

COMMENT 3

"The other item is at the top left of page 57 which reads as follows; "In 2016 and 2017, the District's NRWRP experienced interruption of influent supply from West County due to construction shutdowns. Therefore, the District had to supplement Chevron Richmond Refinery with potable water. The NRWRP went back into service in January 2019.

The NRWRP was in fact affected by influent interruptions caused by WCW construction in 2016/2017 but was off line for nearly two more years (until early 2019) due to significant rehabilitation of select process areas at the NRWRP itself. I think that narrative needs clarifying because as currently written, it seems to say that potable water was required for use by the refinery for nearly 4 years due to construction at the WCW plant. Thanks for your consideration."

EBMUD RESPONSE

Text has been revised in the paragraph on top of Page 57 to clarify the out-of-service timeline.

From: Brendan Creedon
To: uwmp2020
Subject: Public comment for UWMP 2020
Date: Monday, May 3, 2021 4:30:22 PM

Hi UWMP 2020 team,

Evaporation from reservoirs

The UWMP 2020 document mentions in several places that evaporation from reservoirs can exceed local runoff in dry years. It seems an obvious question to ask if there has been any activity on EBMUD's part, or at the local or state level, to try to reduce this? Is EBMUD monitoring developments in this field?

Searching on Google for reservoir evaporation throws up some results, but not many. It is a topic I've wondered about over the years, and I can see that the challenge is huge, but with population growth and climate change, it seems like an area worth watching.

Flowmeter rebate program

I used the flowmeter rebate program to purchase a Flume flowmeter in 2020, and was able to immediately detect leaks in two of my drip irrigation circuits. I was also shocked at how much water six drip irrigation circuits could consume, and reduced the watering times right away. It also alerted me to potential leaks several times, which turned out to be faucets not fully turned off.

In past years, seeing my family's daily water usage every two months meant there was no way of knowing what water saving steps worked, or where to try to cut back. I think EBMUD should follow up more aggressively with customers who received the rebate, and should push the program more heavily. The level of detail available with the Flume flowmeter means that customers can identify, essentially in real time, which items in their home have high consumption, and empower them to make informed decisions instead of guessing.

Thank you,
Brendan Creedon

ORGANIZATION: General Public
NAME: Brandon Creedon
EMAIL RECEIVED: May 3, 2021

COMMENT 4

"The UWMP 2020 document mentions in several places that evaporation from reservoirs can exceed local runoff in dry years. It seems an obvious question to ask if there has been any activity on EBMUD's part, or at the local or state level, to try to reduce this? Is EBMUD monitoring developments in this field?"

EBMUD RESPONSE

Comment Noted.

Evaporation is minimized in all distribution reservoirs where a roof covering is in place. EBMUD's raw water reservoirs have large surface areas and there is no viable technology available at this time to reduce reservoir evaporation of this scale. EBMUD continues to follow scholarly articles published on this topic to learn about the current science, continued challenges, and future developments.

COMMENT 5

"I think EBMUD should follow up more aggressively with customers who received the rebate, and should push the program more heavily. The level of detail available with the Flume flowmeter means that customers can identify, essentially in real time, which items in their home have high consumption, and empower them to make informed decisions instead of guessing."

EBMUD RESPONSE

Comment Noted.

Section 6.2 discusses how EBMUD leverages technology to provide customers access to historical and current water consumption, interactive tools to evaluate and understand water use patterns, and customized water use recommendations based on each property's unique characteristics. EBMUD's "My Water Report" and online portal program provides customers with personalized, direct communications on water use, high volume leaks, and water conservation recommendations such as rebates and incentive programs.

EBMUD's Water Conservation department will continue to promote smart flow meters which includes outreach efforts of the available technologies through EBMUD's website as well as working with the manufacturers to continually make advancements and implement these technologies.

City of San Leandro
Civic Center, 835 E. 14th Street
San Leandro, California 94577
www.sanleandro.org

May 11, 2021 *[Emailed to UWMP2020@ebmud.com on 5/11/2021]*

Water Resources Planning Division, Attn: S. Cheng
EBMUD
PO Box 24055, MS 901
Oakland, CA 94623-1055

RE: San Leandro Comments on draft UWMP and WSCP

Dear Ms. Cheng,

Thank you for the opportunity to comment on the draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP).

The City of San Leandro Community Development Department and Sustainability Office offer the following comments and questions on the draft plans:

- *Water Pressure:* Staff has observed that decreasing water pressure has required property owners and applicants to install fire pumps to maintain adequate water pressure for fire sprinkler systems, resulting in added expenses for development projects throughout San Leandro. Please address this issue and whether infrastructure maintenance/replacement can positively impact this condition in the future.
- *Climate Change:* The climate change section should include consideration of cascading impacts, such as drought seasons alternating with shorter heavier storm seasons and dam/storage pond overflow or flooding, or earthquake with any of the events.
- *Public Safety Power Shutoffs:* During PSPS events, how long do the backup tanks and generators last? If there are back-to-back PSPS events, how quickly can EBMUD refill tanks to get ready for the next event? Is there a map of tanks available such that all frontline communities and other vulnerable populations have their needs met?

Again, we thank you for the opportunity to review and respond to the draft 2020 UWMP and WSCP. Please do not hesitate to contact me at aschultz@sanleandro.org if you have any questions about the above feedback.

Sincerely,

Avalon Schultz, AICP
Principal Planner

ORGANIZATION: City of San Leandro
NAME: Avalon Schultz
EMAIL RECEIVED: May 11, 2021

COMMENT 6

"Staff has observed that decreasing water pressure has required property owners and applicants to install fire pumps to maintain adequate water pressure for fire sprinkler systems, resulting in added expenses for development projects throughout San Leandro. Please address this issue."

May 12, 2021 follow up clarification provided upon request:

"Our Planning Manager and Chief Building Official shared that fire flow is measured by applicants, fire sprinkler companies and EBMUD at the time of plan check for new construction. This includes measurements such as pressure checks, volume, flow, distance of travel, and type of fire suppression systems involved. We estimate 90% of the city is now below the minimum 70 to 80 psi required for adequate flow for fire sprinklers. When water pressure is below that number, the City must require applicants to install emergency pumps to maintain adequate fire flow. Most residential neighborhoods in San Leandro are currently at 50 psi. This is critically important because life and property are reliant on EBMUD providing and maintaining adequate water pressure in our community."

EBMUD RESPONSE

Comment Noted.

EBMUD is committed to providing reliable, available pressure and water flow for all customers. EBMUD provides treated drinking water across 125 pressure zones ranging in elevation from sea level to approximately 1,450 feet. The standard pressure range at customer services within a pressure zone can range from approximately 30 pounds per square in (psi) to 130 psi, depending upon the customer's service connection in a particular pressure zone. Most EBMUD customers within the City of San Leandro are served through EBMUD's Central Pressure Zone, which serves customers with elevations ranging from sea level to approximately 100 feet. Major infrastructure projects to improve water service reliability within EBMUD's Central Pressure Zone include the planned Central Reservoir Replacement Project and the recently completed South Reservoir Replacement Project. EBMUD's ongoing pipeline maintenance and replacement activities help to maintain customer level of service, and EBMUD considers fire flow needs when sizing new and replacement pipelines. In addition, EBMUD works with new development and customers to identify pipeline improvements that are necessary to meet water service needs and the fire flow requirements set by the local fire agency. Per EBMUD regulations, the project developer pays the full cost for new water service, pipeline extensions, and existing pipeline upgrades that are necessary to meet the water service needs of their project and the fire flow requirements set by the local fire agency.

COMMENT 7

"The climate change section should include consideration of cascading impacts, such as drought seasons alternating with shorter heavier storm seasons and dam/storage pond overflow or flooding, or earthquake with any of the events."

EBMUD RESPONSE

Comment Noted.

Although impacts of climate change on the environment are well-known, there is limited evidence regarding the extent to which those impacts may cascade, compounding to create multiple impacts to water infrastructure and water supplies. While cascading impacts present a challenge for water managers, EBMUD is mitigating the 'cascade effect' by focusing on disaster risk reduction. EBMUD has plans in place that outline the mitigation measures and responses actions to implement to reduce the community's exposure to the various hazards that may occur. These plans include the Emergency Operations Plan and the Local Hazardous Mitigation Plan. These are all discussed in detail in Chapter 2 of the UWMP.

In addition, to handle catastrophic events that cause water shortages in the service area, EBMUD also has short-term water sharing agreements for emergencies with several neighboring agencies. These agreements provide an alternate source of water for emergency mutual aid situations. Section 4.3 of the Water Shortage Contingency Plan - Attachment 1 (to the UWMP) provides information on interties and agreements for water transfers and exchanges.

COMMENT 8

"During PSPS events, how long do the backup tanks and generators last? If there are back-to-back PSPS events, how quickly can EBMUD refill tanks to get ready for the next event? Is there a map of tanks available such that all frontline communities and other vulnerable populations have their needs met?"

EBMUD RESPONSE

Narrative on the PSPS on Pages 40 – 41 updated to include additional details on the resources available during the PSPS event.

Most generators have fuel tanks sized for 2 – 3 days of operation. EBMUD Fleet staff perform the bulk of the fueling of the portable equipment with vendors providing backup and fueling at stationary sites (large pumping plants and water treatment plants) as needed. During a PSPS event a fueling truck is staged on the west and east of hills to ensure close proximity to the generators further reducing the fueling times. At the end of the event, all generator tanks are topped off to ensure generators are fully fueled for future PSPS events.

California Sportfishing Protection Alliance
"An Advocate for Fisheries, Habitat and Water Quality"
Chris Shutes, Water Rights Advocate
1608 Francisco St., Berkeley, CA 94703
Tel: (510) 421-2405 E-mail: blancapaloma@msn.com
http://calsport.org/news/

May 12, 2021

Ms. Priyanka Jain
Water Resources Planning Division
East Bay Municipal Utility District
uwmp2020@ebmud.com
Via electronic mail

Re: Comments of the California Sportfishing Protection Alliance on the East Bay Municipal Utility District's Draft Urban Water Management Plan

Dear Ms. Jain:

The California Sportfishing Protection Alliance (CSPA) respectfully submits these comments on the East Bay Municipal Utility District's (EBMUD) Draft Urban Water Management Plan (Draft UWMP or Draft Plan).

CSPA is particularly concerned with Table 3-1 of the Draft Plan, reproduced below.

TABLE 3-1 AVERAGE ANNUAL WATER DEMAND FORECAST 2050 DEMAND PROJECTIONS (MGD)

	2020	2025	2030	2035	2040	2045	2050
FORECASTED WATER DEMAND	238	245	254	264	277	287	297
WATER CONSERVATION[1]	-48	-53	-58	-61	-63	-65	-66
RECYCLED WATER[1]	-5	-6	-6	-9	-13	-13	-13
RAW WATER	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
PLANNING LEVEL OF DEMAND (ROUNDED)	181	186	190	194	201	209	218

1. See Chapters 6 and 5 for more specific program details on conservation and water recycling, respectively. The goals reflected in this table take into account uncertainty as described in Section 5.2.3 and Section 6.1.3.

CSPA appreciates and supports the effort of EBMUD to limit demand increase over the next 30 years by aggressive conservation efforts. However, CSPA believes that recent hydrology under a changing climate conclusively demonstrates the need for EBMUD to adopt a policy to *at minimum* keep current levels of overall District-wide demand from showing *any* increase throughout the 30-year planning period.

Overall, EBMUD has done a very good job of diversifying its water supply portfolio with different sources of surface water. The District should build on that record by completing key pieces that will allow further diversification. The first step in the critical path is the completion of the Walnut Creek Water Treatment Pre-Treatment

Facilities. The promise of using storage in Los Vaqueros Reservoir as a drought reserve also need to be fulfilled. EBMUD has been a leader in promoting regional cooperation with diverse sets of water agency partners. The District should build on its past leadership and chart a path to complete these projects for the benefit not only of EBMUD, but also its regional urban water agency partners in the Bay Area Regional Reliability Project.

CSPA believes that EBMUD must conduct more aggressive in planning for alternate water supplies from sources other than surface water, including recycled water and potentially groundwater banking with entities in the Mokelumne River watershed. While existing EBMUD programs are encouraging for their forward-thinking approach, the District's projected increases in supplies available from these sources fall short in terms of both need and potential.

CSPA looks forward to working with EBMUD on a policy to keep demand at or below current levels. CSPA also looks forward to working with EBMUD in further diversifying water supplies.

Thank you very much for the opportunity to comment on the Draft Urban Water Management Plan.

Respectfully submitted,

Chris Shutes
Water Rights Advocate
California Sportfishing Protection Alliance

ORGANIZATION: California Sportfishing Protection Alliance
NAME: Chris Shutes
EMAIL RECEIVED: May 12, 2021

COMMENT 9

"CSPA is particularly concerned with Table 3-1 of the Draft Plan…CSPA appreciates and supports the effort of EBMUD to limit demand increase over the next 30 years by aggressive conservation efforts. However, CSPA believes that recent hydrology under a changing climate conclusively demonstrates the need for EBMUD to adopt a policy to at minimum keep current levels of overall District-wide demand from showing any increase throughout the 30-year planning period."

EBMUD RESPONSE

Comment Noted.

Demand is driven by many factors, including land development, changes in land use over time, and climate, none of which are within EBMUD's control. To minimize increases in water demand resulting from these and other factors, EBMUD implements robust conservation and water recycling programs and water conservation and recycling are key components of its water supply portfolio. EBMUD cannot prevent future increases in demand. However, EBMUD is working to better understand the impacts of climate change on its water supplies, and its water recycling and conservation programs substantially reduce forecasted increases in demand. Further, as discussed in the Water Shortage Contingency Plan found in Attachment 1 to this UWMP, EBMUD has in place drought response actions to address potential water shortages. Chapter 4 to this UWMP also discusses EBMUD's water supply portfolio and various supply projects that will help the District respond to climate change-related impacts on its water supplies.

COMMENT 10

"The District should build on that record by completing key pieces that will allow further diversification. The first step in the critical path is the completion of the Walnut Creek Water Treatment Pre-Treatment Facilities. The promise of using storage in Los Vaqueros Reservoir as a drought reserve also need to be fulfilled."

EBMUD RESPONSE

Comment Noted.

EBMUD continues to develop a reliable and robust supplemental supply portfolio. There are multiple water treatment plant improvement projects that are in the process of getting upgrades and the Walnut Creek Water Treatment Plant Pre-Treatment Project is one of them. EBMUD is actively evaluating potential participation in the planned expansion of the Los Vaqueros Expansion Project. These two projects are discussed in detail in Chapter 4 of the UWMP and updates on the progress of the projects in the portfolio will be provided in future UWMPs.

COMMENT 11

"CSPA believes that EBMUD must conduct more aggressive in planning for alternate water supplies from sources other than surface water, including recycled water and potentially groundwater banking with entities in the Mokelumne River watershed. While existing EBMUD programs are encouraging for their forward-thinking approach, the District's projected increases in supplies available from these sources fall short in terms of both need and potential."

EBMUD RESPONSE

Comment Noted.

Recycled water is an important and necessary component of the District's long-term planning and is reassessed and updated periodically as part of the updates to the District's Recycled Water Master Plan. The District continues to keep abreast of technology and state regulations which would potentially expand the recycled water projects in the future. The District is actively pursuing a conjunction groundwater project in San Joaquin County and working closely with stakeholders to develop and implement pilot testing to improve upon and help make the project come to fruition. Although these projects have their own challenges, the District is working hard to achieve reliable sources of supplemental supply in the future and to continue to be forward-thinking in its approach with these and other projects under consideration; updates on the progress will be shared in each future update of the UWMP.

Appendix D

Board Resolutions

RESOLUTION NO. 35234-21

ADOPTING THE URBAN WATER MANAGEMENT PLAN 2020

Introduced by Director Coleman ; Seconded by Director Patterson

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 2016; 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 2020, and based upon the review, the District has prepared a revised and updated Urban Water Management Plan 2020 (Plan); and

WHEREAS, a draft of the Plan was made available for public inspection beginning on April 7, 2021 and ending on May 12, 2021, and the District held a noticed virtual public comment meeting on April 29, 2021, and a noticed virtual public hearing was conducted by the District's Board of Directors on May 11, 2021; and

WHEREAS, all comments received from the public and from public agencies have been reviewed and considered and the District modified the Plan following the receipt of the comments;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the East Bay Municipal Utility District does hereby adopt the Plan dated June 2021 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 the 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 22nd day of June, 2021 by the following vote:

AYES: Directors Coleman, Katz, McIntosh, Mellon, Patterson, Young and President Linney.

NOES: None.

ABSENT: None.

ABSTAIN: None.

President

ATTEST:

Secretary

APPROVED AS TO FORM AND PROCEDURE:

General Counsel

RESOLUTION NO. 35235-21

ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN 2020 FOR INCLUSION AS ATTACHMENT 1 WITHIN THE EAST BAY MUNICIPAL UTILITY DISTRICT'S URBAN WATER MANAGEMENT PLAN 2020

Introduced by Director McIntosh ; Seconded by Director Young

WHEREAS, in 1992, the Board of Directors (Board) of East Bay Municipal Utility District (District) adopted a Water Shortage Contingency Plan (Contingency Plan) in accordance with the requirements of the California Urban Water Management Planning Act (Act) and has updated the Contingency Plan over time; and

WHEREAS, since the District last updated its Contingency Plan in 2016, amendments to the Act have modified the Water Shortage Contingency Plan requirements, thus necessitating changes in the District's Contingency Plan; and

WHEREAS, lessons learned from the 2014-2016 drought make it necessary to update the Contingency Plan to plan and respond to periods of water shortage; and

WHEREAS, the proposed updated Contingency Plan provides the District with additional flexibility to consider earlier drought actions based upon the District's end-of-September system storage; and

WHEREAS, a draft of the Contingency Plan, which is Attachment 1 of the draft Urban Water Management Plan 2020, was made available for public comment review beginning on April 7, 2021 and ending on May 12, 2021; and

WHEREAS, a noticed virtual public comment was held on April 29, 2021 and a noticed virtual public hearing was conducted by the Board on May 11, 2021, and all comments received from the public and from public agencies have been reviewed and considered and the Contingency Plan updated after receipt of the comments;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the East Bay Municipal Utility District does hereby adopt the Contingency Plan and directs the Secretary to file a copy of the Contingency Plan, as included in the Urban Water Management Plan 2020, with the

California Department of Water Resources within thirty (30) days of adoption of the Urban Water Management Plan 2020. The Secretary is further directed to make the Contingency Plan available for public review during normal District business hours.

ADOPTED this 22nd day of June, 2021 by the following vote:

AYES: Directors Coleman, Katz, McIntosh, Mellon, Patterson, Young and President Linney.

NOES: None.

ABSENT: None.

ABSTAIN: None.

President

ATTEST:

Secretary

APPROVED AS TO FORM AND PROCEDURE:

General Counsel

Appendix E

Detailed description of the East Bay Plain and the Eastern San Joaquin subbasins

APPENDIX E: DESCRIPTION OF APPLICABLE GROUNDWATER BASINS

E.1 EAST BAY PLAIN SUBBASIN

As described in Chapter 1, the District is the GSA for the portion of the East Bay Plain Subbasin underlying its service area, and is currently working with the City of Hayward to complete a Groundwater Sustainability Plan by January 31, 2022. A description of the East Bay Plain Subbasin is provided below.

E.1.1 DESCRIPTION OF THE EAST BAY PLAIN SUBBASIN

The East Bay Plain Subbasin (Basin No. 2-009.04 or Subbasin) is one of four subbasins that comprise the larger Santa Clara groundwater basin. Located along the east side of San Francisco Bay in Alameda and Contra Costa Counties (Figure E-1), it is overlaid by the East Bay Municipal Utility District (EBMUD) service area and the City of Hayward (Hayward). The topography of this Subbasin ranges from about 400 feet above mean sea level in the east to 0 feet in the west where the plain meets San Francisco Bay. As a northwest trending alluvial plain, the Subbasin is bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, and on the south by the Nile Cones Subbasin (Basin No. 2-009.01). It extends beneath San Francisco Bay to the west (DWR, 2003).

Geologically, bedrock is overlain by a complex sequence of unconsolidated marine and continental deposits within the Subbasin. The oldest unconsolidated geologic unit of the Subbasin is the Lower Alameda Formation, which comprises the "Deep Aquifer". The Lower Alameda Formation consists of continental deposits, including alluvial fan deposits interfingered with lake, swamp, river channel, and flood plain deposits. The Lower Alameda Formation ranges in thickness from 10 feet along the eastern boundary of the basin to 450 feet near the center of San Francisco Bay. Overlying the Lower Alameda Formation from youngest to oldest deposits in order are (CH2M HILL, 2000):

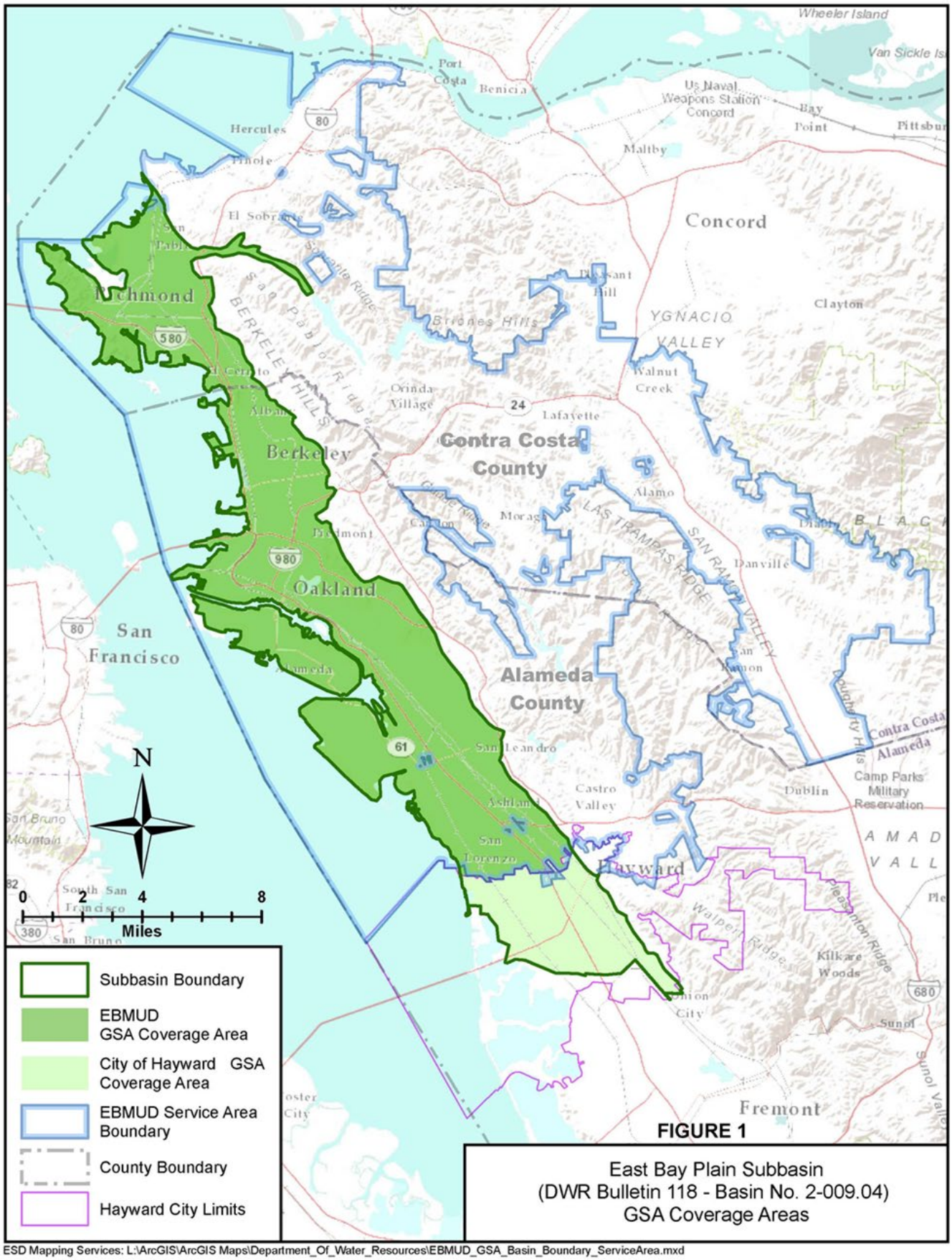
- A series of younger deposits, including marine clay, Young Bay Mud, Merritt Sand, and alluvial silts, sands and gravels; is typically 100 to 125 feet thick and as thick as 300 feet towards the eastern edge of the southern part of the Subbasin;
- Old Bay Mud, also known as Yerba Buena Mud, is an estuarine mud typically about 50 feet thick; and
- Upper Alameda Formation, which consists of marine sediments separated by alluvial fan deposits, approximately 100 to 475 feet thick.

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. It is located over 400 feet below ground surface (bgs). The aquifer is believed to extend toward the middle of the Bay. Fine-grained clays and silts exist below the Deep Aquifer. The deep aquifer thins out to the north and becomes an insignificant source of groundwater as it approaches an area just to the south of downtown Oakland. The confined, deep aquifer is not found in the remaining parts of the Subbasin, although areas to the far north in the Subbasin (within the corporate limits of the Cities of Richmond and San Pablo) have aquifer(s) that are capable of producing water in quantities sufficient to serve the irrigation needs of schools, parks, and a local golf course.

The middle aquifer overlies the deep aquifer and is comprised of deposits at depths of about 130 to 375 feet bgs. Groundwater in this aquifer occurs under confined conditions. The shallow aquifer is above the middle aquifer 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 aquitard that is about 50 feet thick and pinches out to the east towards the Hayward Fault.

The deep aquifer has historically served as a water source to meet the needs of the region in its early days (the 1800s through to the 1920s). Prior to 1950, there were significant areas of agricultural development in the southern portion of the groundwater basin. However, the entire region has since become heavily urbanized with a combination of industrial, commercial, and residential development. Prior to 1930, groundwater was a primary source of water supply (along with development of local surface water

FIGURE E-1 **EAST BAY PLAIN SUBBASIN**



ESD Mapping Services: L:\ArcGIS\ArcGIS Maps\Department_Of_Water_Resources\EBMUD_GSA_Basin_Boundary_ServiceArea.mxd

resources). Subsequently, EBMUD has imported surface water supplies from the Sierras. Similarly, beginning in 1950, San Francisco Public Utilities Commission (SFPUC) imported surface water supplies from the Hetch Hetchy reservoir that provided water supply for the City of Hayward. After 1963, these surface water supplies constituted essentially the entire water supply for Hayward. Groundwater continued to be a major source of water supply for industrial and residential (irrigation) uses after 1930 until at least the 1970s. Groundwater use in the EBP Subbasin has been modest from the 1980s until today.

E.2 Eastern San Joaquin Groundwater Subbasin

As described in Chapter 4, EBMUD and partners in Eastern San Joaquin County are implementing the DREAM Project, a pilot groundwater banking project, to determine whether a larger groundwater banking project is feasible in the Eastern San Joaquin Groundwater (ESJ) Subbasin. The larger groundwater banking project has been identified in the ESJ Groundwater Sustainability Plan as a Potential Project to achieve groundwater sustainability. A description of the Eastern San Joaquin Subbasin and associated groundwater sustainability plan is provided below.

E.2.1 Description of the ESJ Subbasin

The Eastern San Joaquin Subbasin falls within the larger San Joaquin Valley Groundwater Basin and is bordered to the north by the Cosumnes, the South American, and the Solano Subbasins; to the south by the Modesto Subbasin; and to the west by the Tracy and East Contra Costa Subbasins. The ESJ Subbasin is located to the east of the Sacramento-San Joaquin River Delta and is bounded by the Sierra Nevada foothills to the east, the San Joaquin River to the west, Dry Creek to the north, and Stanislaus River to the south. In the eastern portion of the ESJ Subbasin, groundwater flows from east to west and generally mirrors the eastward sloping topography of the geologic formations. In the western portion of the ESJ Subbasin, groundwater flows eastward toward areas with relatively lower groundwater elevation. Surface water generally flows from east to west, with the major river systems traversing the ESJ Subbasin being the Calaveras, Mokelumne, and Stanislaus rivers. Multiple smaller streams flow into the San Joaquin River, which flows from south to north.

E.2.1 ESJ Subbasin Groundwater Sustainability Plan

The ESJ Subbasin is one of 21 basins and subbasins identified by the California Department of Water Resources (DWR) as being in a state of critical overdraft. The Eastern San Joaquin Groundwater Sustainability Plan (ESJ GSP) was developed to meet SGMA regulatory requirements for critically overdrafted basins and was submitted to DWR prior to the January 31, 2020 deadline. The GSP provides a path to achieve and document sustainable groundwater management within 20 years following adoption. The ESJ GSP was developed jointly by the Eastern San Joaquin Groundwater Authority (ESJGWA), which is a joint powers authority formed by the 16 groundwater sustainability agencies within the ESJ Subbasin. The ESJGWA is responsible for implementing the ESJ GSP.

Additional information on the ESJGWA and a copy of the EJS GSP are available at ***www.esjgroundwater.org***.

Appendix F

Detailed Information on EBMUD's Methodology for Complying with SBx7-7 Water Conservation Act of 2009

APPENDIX F: SBX7-7 METHODOLOGY AND BACKGROUND

In 2009 the state legislature adopted Senate Bill x7-7 (SBx7-7), the Water Conservation Act of 2009, which called for a 20 percent statewide reduction in per capita water use by the year 2020 and directed urban retail water suppliers to set a 2015 interim and 2020 final 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 were required to report their per capita water use and reduction targets in their Urban Water Management Plan (UWMP). This appendix provides the conclusion of this bill along with the background data, methodology, and calculations for the reported baseline and target for EBMUD to meet.

As required by the law, EBMUD calculated its 2015 interim and 2020 final targets as part of the 2015 UWMP. EBMUD's interim gallons per capita per day (GPCD) goal for 2015 was 158.5 GPCD. With an actual use of 106 GPCD, EBMUD met and surpassed the 2015 target. The 2020 target calculated in 2015 set a GPCD target for the year 2020 at 153 GPCD. EBMUD's actual use for 2020 was 121 GPCD, again exceeding the water savings goal set by the legislation. For the years 2015 through 2020, EBMUD had approximately 4,000 new single family residential (SFR) parcels developed in the service area, in addition to new multi-family (MF) dwelling units. However, due to insignificant increases in SFR and MF housing stock (less than a 1.5% percent increase), the target calculations were not re-calculated. The increase in new SFR accounts for less than 1.5% of the total SFR served by EBMUD, creating an insignificant value compared to the 2020 goal. In the MF sector, new development has trended toward building sidewalk-to-sidewalk, where the building foot-print covers the entire parcel. As a result, any new landscaping increase in this sector has been minimal and has added little outdoor demand. Similar to the SFR sector, the increase over the 5-year period has been less than 1%.

The following section is a re-cap of the work performed in 2015 that describes the legislation, requirements, methodology, and calculations that EBMUD used to determine its goal for 2020.

F.1 DISCUSSION OF THE METHODOLOGY AND THE SETTING OF THE 2020 TARGET

SBX7-7 provided four methodologies that agencies could use to establish their SBX7-7 targets, based on a baseline per capita daily water use for a ten to fifteen year period ending between December 31, 2004 and December 31, 2010:

- Eighty percent of the urban retail water supplier's baseline per capita daily water use (Method 1).
- The per capita daily water use that is estimated using: 55 gallons per capita per day (GPCD) for indoor residential water use; outdoor water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance for landscape irrigated through dedicated or residential meters; and a 10 percent reduction in baseline water use for commercial, industrial, and institutional uses (Method 2).
- Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (Method 3).
- A method identified by the Department of Water Resources that identifies per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use (Method 4).

It is also worth noting that, notwithstanding the target calculated by any of the methodologies described above, the Water Code requires that an urban retail water supplier's per capita daily water use reduction must be no less than five percent of a five-year baseline per capita daily water use ending no earlier than December 31, 2007 and no later than December 31, 2010, unless the water supplier has a base daily per capita water use of 100 GPCD or less.

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. EBMUD has developed an extensive water recycling program that further reduces the need for fresh water. Figure F-1 shows that EBMUD has made significant strides in decreasing historical daily per capita water demand as a result of its aggressive water conservation and recycling efforts and other

FIGURE F-1 EBMUD HISTORIC GPCD

factors. Gross overall water demand has remained relatively consistent as the number of accounts and service area population has grown steadily. This continuous effort has resulted in more than a 40% reduction in daily per capita water use since the 1970s and goes beyond the short-term focus on consumption reduction as required through SBx7-7.

At the beginning of this new legislation, EBMUD researched each of the four target methodologies, with a particular interest in identifying a method that would allow it to be credited for its long standing existing conservation and recycled water savings. As a result, EBMUD selected a methodology that would allow it to implement demand management program water budgets that are appropriately tailored to customer usage. EBMUD also considered the need to anticipate the post-drought and economic rebound and to account for anticipated demand hardening in consumption behavior.

Ultimately, EBMUD selected Target Method 2 to calculate its water use target. The three methods that were not selected were not be suitable to EBMUD's service area, given that EBMUD's previous investments in conservation and water recycling have led to significant demand reduction and hardening in multiple customer sectors.

F.2 EBMUD BASELINE WATER USE

F.2.1 CALCULATION OF BASELINE WATER USE

Base daily per capita water use is defined by SBx7-7 as average gross water use, expressed in gallons per capita per day (GPCD) for a continuous period. GPCD is calculated by dividing the gross water use by the estimated population.

"Gross water use" is defined by the California Water Code Section 10608.12(h) 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:

Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier;

The net volume of water that the urban retail water supplier places into long-term storage;

The volume of water the urban retail water supplier conveys for use by another urban water supplier; and

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.

EBMUD gross water use includes both treated and untreated water for residential and non- residential uses and fire safety.

F.2.2 EBMUD BASELINES

Under SBX7-7, agencies were to calculate a baseline against which to demonstrate their reduction in water use. The baseline water use is the average GPCD over a ten-year period ending between December 31, 2004 and December 31, 2010. If an agency met at least 10 percent of its 2008 measured retail water demand through recycled water, that agency may extend its baseline period to fifteen years. Since EBMUD did not meet 10 percent of its retail demand with recycled water in 2010, a ten-year period was selected. Table F-1 shows the GPCD calculation for EBMUD's selected ten-year period, from 1995 to 2004. It includes gross water production, estimated population, and calculated GPCD for each of the ten years. EBMUD prepared estimates of its service area population based on data from the Association of Bay Area Governments, the U.S. Census, and previous UWMPs. Where data was not available for individual years, it was interpolated using published projections. The ten-year average baseline is 164 GPCD.

TABLE F-1 EBMUD 10-YEAR BASELINE DAILY PER CAPITA WATER USE CALCULATION

CALENDAR YEAR	ANNUAL WATER PRODUCTION (MG)	POPULATION ESTIMATE	ANNUAL WATER CONSUMPTION (GPCD)
1995	69,663	1,232,000	155
1996	71,533	1,244,000	158
1997	77,189	1,255,000	169
1998	74,258	1,267,000	161
1999	77,058	1,278,000	165
2000	78,719	1,289,000	167
2001	78,871	1,294,000	167
2002	78,637	1,298,000	166
2003	78,360	1,302,000	165
2004	80,180	1,307,000	168
		10-YEAR AVERAGE BASELINE	164

SBx7-7 also establishes that, regardless of which method is selected, the target water use must show at least a five percent reduction from a five-year baseline period. Agencies therefore also calculate GCPD for a five-year baseline period ending no earlier than December 31, 2007 and no later than December 31, 2010. Table F-2 shows the calculated GPCD for the years 2003 through 2007. The average five-year baseline is 161 GPCD and minimum five percent reduction target is 153 GPCD.

F.3 TARGET 2020 DAILY PER CAPITA WATER USE

An urban retail water supplier was to set a 2020 water use target and a 2015 interim water use target based on one of the methodologies described above. If the 2020 target, as calculated by the chosen methodology, is higher than the minimum reduction goal of 95% of the five-year baseline

TABLE F-2 EBMUD 5-YEAR BASELINE DAILY PER CAPITA WATER USE CALCULATION

CALENDAR YEAR	ANNUAL WATER PRODUCTION (MG)	POPULATION ESTIMATE	ANNUAL WATER CONSUMPTION (GPCD)
2003	78,360	1,302,000	165
2004	80,180	1,307,000	168
2005	76,065	1,311,000	159
2006	76,218	1,315,000	159
2007	75,021	1,320,000	156
		5-YEAR AVERAGE BASELINE	161
		5% REDUCTION	8
		MINIMUM 2020 REDUCTION GOAL	153

average, then the minimum reduction goal must be used as the 2020 target instead. The Water Code directs water suppliers to compare their actual use in 2020 against their 2020 target, and to compare their 2015 actual use to their interim target.

EBMUD selected Method 2 to calculate its target. Method 2 uses the following components to calculate the 2020 water use target:

- 55 gallons per capita daily water use for indoor residential use;
- 10% reduction from the baseline for commercial, institutional, and industrial (CII) use;
- For landscaped area water use for residential and irrigation accounts, 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.

Following is additional information on how EBMUD calculated each of the three components above. EBMUD based its analysis on guidance found in the Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (Methodologies) published by the DWR Division of Statewide Integrated Water Management Water Use and Efficiency Branch in February 2011.

F.3.1 INDOOR RESIDENTIAL USE

Target Method 2 allots 55 GPCD for residential indoor use. In 2015 EBMUD projected a population of 1,449,735 in the year 2020. for its service area based on the ABAG 2013 population projections as applied to EBMUD's service area. Using this estimated population, EBMUD calculated a total of approximately 80 MGD for indoor residential use in 2020.

F.3.2 COMMERCIAL, INSTITUTIONAL, & INDUSTRIAL USE

Under Target Method 2, agencies calculate CII water use as a ten percent reduction from the average CII water use over the ten year baseline period. Table F-3 shows the calculation for EBMUD based on the 1995-2004 baseline period. EBMUD's baseline CII water use is 58 GPCD and ten percent reduction target is 52 GPCD.

F.3.3 LANDSCAPE WATER USE

As outlined by DWR, "landscaped areas" for the purpose of calculating the target under Target

TABLE F-3 CALCULATION OF BASELINE AND TARGET COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL (CII) WATER USE COMPONENT

CALENDAR YEAR	ANNUAL WATER USE (MG)	POPULATION ESTIMATE	ANNUAL WATER CONSUMPTION (GPCD)
1995	24,885	1,232,000	55
1996	24,639	1,244,000	54
1997	27,511	1,255,000	60
1998	28,665	1,267,000	62
1999	27,798	1,278,000	60
2000	28,132	1,289,000	60
2001	27,042	1,294,000	57
2002	26,596	1,298,000	56
2003	27,438	1,302,000	58
2004	27,842	1,307,000	58
		10-YEAR AVERAGE BASELINE	58
		10% REDUCTION	6
		2020 TARGET	52

Method 2 mean the water supplier's estimate or measurement of 2020 landscaped areas that are 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.

Target Method 2 calculates water use for outdoor irrigation as water efficiency equivalent to the standards of the MWELO for all landscaped areas.

The following five steps are used to calculate Landscaped Area Water Use:

1. Identify applicable MWELO (1992 or 2010) by parcel;
2. Estimate irrigated (and irrigable) landscaped area for each parcel;
3. Determine reference evapotranspiration for each parcel;
4. Use the Maximum Applied Water Allowance (MAWA) from the applicable MWELO to calculate annual volume of landscaped area water use; and
5. Convert annual volume to GPCD.

The first step is to determine which MWELO ordinance applies to specific parcels. There are two versions of the MWELO ordinance that can be applied, depending on the date that the landscaping was installed. For landscaped areas installed on or after January 1, 2010, the 2009 version of the ordinance should be used. For landscaped areas installed before January 1, 2010, the 1992 version of the ordinance is applied. For the current 2020 landscape water use estimate, >99% of the landscapes were determined to have been installed prior to January 1, 2010, and all applicable criteria from the 1992 version of the MWELO were applied. These criteria are:

- The landscaped area must be measured, estimated, or projected for all parcels served by a residential or dedicated landscape water meter or connection in the water supplier's service area;
- Only irrigated (or evidence of irrigated or irrigable) estimated landscaped area served by residential or dedicated landscape water meter or connection is included in the calculation of Landscaped Area Water Use; and
- Landscape served by CII connections and non-irrigated landscape is excluded

Note in 2015, the Governor's Executive Order B-29-15 called for revising the Model Water Efficiency Landscape Ordinance (MWELO) to increase water use efficiency standards for new and retrofitted landscapes. The new MWELO became effective on December 1, 2015. Though MWELO was updated, it did not require revising the methodology to calculate Target Method 2.

The purpose of this landscape measurement is to estimate the irrigation efficiency water budget of EBMUD customer parcels. It requires a measurement (or estimate) of projected landscaped area and water use per unit area based on a reference evapotranspiration (ET). All landscape served by dedicated or residential meters must be included, including multi-family residential parcels irrigated through dedicated or residential meters or connections.

It can be challenging to determine a parcel's irrigable area, as only a portion of each parcel is landscaped, and there are more than 360,000 parcels in EBMUD's service area. To do this, EBMUD used a statistical process to estimate the landscaped area for all customer parcels. All customer parcels were categorized by size, geographic location, and use type. EBMUD then used a combination of remote sensing, software tools, and manual computer and field verification to develop estimates of irrigable areas for a statistically random subset of parcels within each grouping. These results could then be extrapolated to the rest of the parcel stratas in EBMUD's service area. Following is a more detailed description of how this statistical methodology was implemented.

Measuring with Remote Sensing

The landscaped area was determined through a combination of measurements using remote sensing (aerial or satellite imaging), automated optimization using software tools, manual GIS imagery analysis, manual analyses, and field site visits to identify the landscaped (and irrigable) areas in conjunction with a GIS representation of the parcels in service area.

DWR established the following rules for the use of remote sensing data in calculating landscaped area water use, as described in the February 2011 Methodologies, which EBMUD followed:

- The remote-sensing information must be overlaid onto a GIS representation of each parcel boundary to estimate the existing and potential irrigated landscaped area and the associated landscape water budget or Maximum Applied Water Allowance (MAWA) calculated for each parcel.
- The remote-sensing imagery must have a resolution of one 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.

Estimating Parcel Landscaped Areas

To calculate the landscaped area for smaller-sized parcels, EBMUD grouped the parcels according to size, geographic region, and use type. EBMUD then selected a subset of parcels for each group and measured the percentage

of total parcel area that is landscaped and applied that percentage to the remaining parcels in the group. This technique was used for parcels with a total land area of 24,000 square feet or less. Parcels greater than 24,000 square feet were measured separately, with individual landscape water budget calculations for more than 23,000 parcels.

EBMUD maintains a sophisticated GIS database. Images for the analysis were taken at a resolution of between 4 and 6 inches per pixel. Alameda and

Contra Costa County records, including parcel and building footprint statistics, were overlayed on the aerial photos. These county shape files were merged together and pared against EBMUD's service area boundary, creating a single shape file that includes all the parcels within EBMUD's service area.

The parcels were first categorized according to geographic region. The geographic region was assigned based on where the centroid of the parcel polygon was located. The six geographic regions are:

- West of Hills (WOH) North: Crockett, El Sobrante, Richmond, El Cerrito, Hercules, Pinole
- WOH Central: Albany, Berkeley, Alameda, Emeryville, Oakland, Piedmont
- WOH South: San Leandro, Hayward, San Lorenzo, Castro Valley
- East of Hills (EOH) North: Pleasant Hill, Walnut Creek, Alamo
- EOH Central: Lafayette, Moraga, Orinda
- EOH South: Danville, San Ramon

The area (in square feet) of each parcel was then calculated, and individual parcels within each geographic region were separated into groups, or strata, based on parcel size increments of 4,000 square feet or less. Six parcel strata were established:

- 0 - 4,000 square feet
- 4001 – 8000 square feet
- 8001 – 12000 square feet
- 12001 – 16000 square feet
- 16001 – 20000 square feet
- 20001 – 24000 square feet

A seventh strata with individual parcel budgets was also created for all the parcels that were greater than 24,0000 square feet and therefore were not subject to this statistical sampling methodology.

The parcels were also divided into three use types: single family residential, multi-family residential, and irrigation - as listed in Table F-4 under EBMUD's Business Classification Code (BCC) descriptions. Table F-5 shows the total number of parcels for each size strata and use type.

Field-based measurement and remote sensing were used to calculate the landscaped area for a subset of parcels, sampled at random, in each parcel size group, geographic region, and use type. The percentage of landscaped area to total land area for the sampled parcels was then extrapolated to all other parcels in the group. The number of parcels selected per strata was based on an a priori assumption of strata variability. Parcels were chosen using the random selection tool in ArcGIS. This methodology was tested for accuracy by comparing the results of satellite, manual, and field-based measurements for a random subset of parcels. The percent error between the calculations of landscaped area produced by the selected satellite technique and those produced by manual and 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 tiers.

Following are more details on how EBMUD analyzed the parcel samples and extrapolated the data to the entire parcel set.

TABLE F-4 EBMUD BCC CODES AND DESCRIPTIONS

BCC CODE	BCC DESCRIPTION	USE TYPE
8800	PRIVATE RESIDENCE	SINGLE FAMILY RESIDENTIAL
6513	APARTMENT BUILDING	MULTI-FAMILY RESIDENTIAL
6514	MULTIPLE DWELLING (2 TO 4 UNITS)	MULTI-FAMILY RESIDENTIAL
7900	AMUSEMENT SERVICES	IRRIGATION
6500	CEMETERIES	IRRIGATION
7950	IRRIGATION USE ONLY	IRRIGATION
7990	PARKS & GARDENS	IRRIGATION

Data Collection

For the parcels selected for analysis, a combination of census data, water account data, field visits, GIS mapping tools, aerial photography, and infrared imagery was used to collect the following information:

- Parcel size (county records and polygon of parcel).
- Square footage of property on County Records.

TABLE F-5 PARCEL STRATA DISTRIBUTION

PARCEL SIZE (SQFT)	SINGLE FAMILY PARCELS	MULTI-FAMILY PARCELS	IRRIGATION PARCELS	TOTAL # PARCELS FOR STRATA
<4,000	73,213	6,413	2,672	82,298
4,001-8000	152,661	15,380	3,113	171,154
8,001-12,000	40,625	3,393	1,428	45,446
12,001-16,000	16,729	1,493	755	18,977
16,001-20,000	9,201	761	491	10,453
20,001-24,000	8,046	544	390	8,980
>24,000	15,173	3,651	4,396	23,220
TOTAL	315,648	31,635	13,245	360,528

- 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 defined as the ground area where plants could be grown, but which does not necessarily have plants or intentional irrigation currently. 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 believed to be irrigated currently or potentially at some time previously or in the future based on land use and landscaped area.
- Total Irrigated Area. This is the sum of turf and non-turf areas that appear to be irrigated or potentially irrigated (includes evidence of irrigable area).
- Non-irrigated area. This is the remainder of parcel area that falls outside of irrigated or irrigable area such as wild lands and open space.
- Outdoor water use based on monthly consumption.

Calculating Footprint

Polygons were drawn around the footprint of obvious structures (see Figure F-2). Obvious structures include any structure which a person can enter, including buildings, garages or carports, sheds, and covered gazebos.

Measuring – Polygons-Hardscape

Hardscape is defined as any grade level area which cannot 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 Figure F-4).

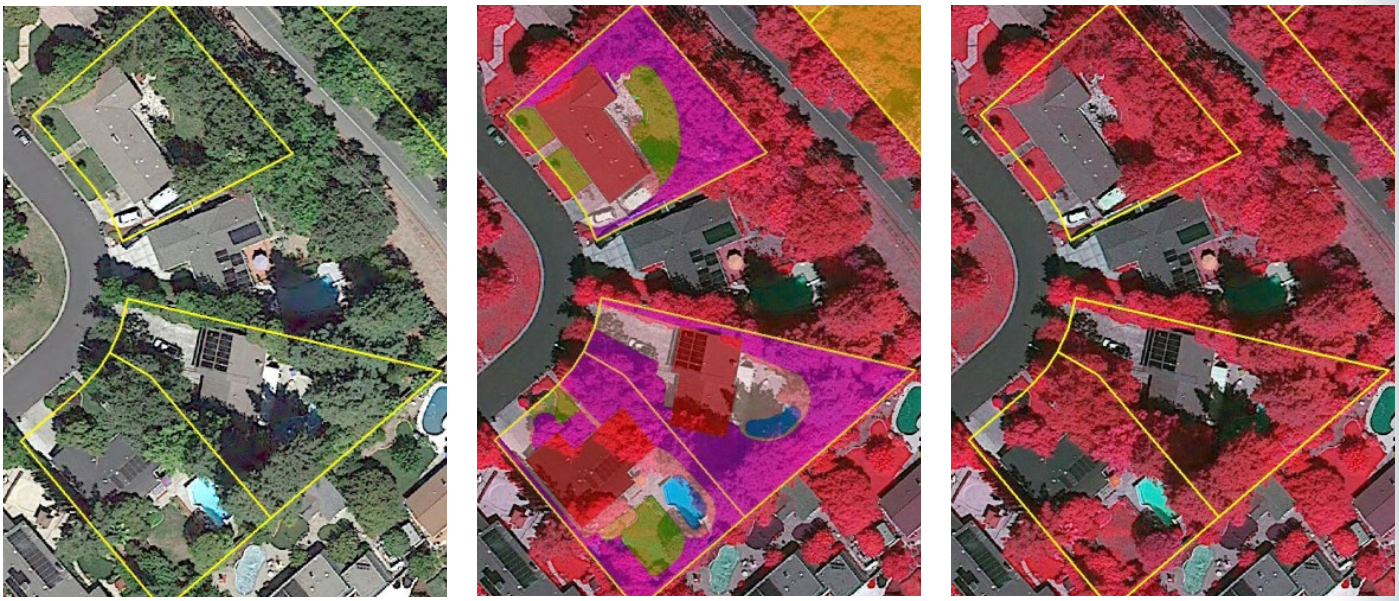
Measuring – Landscape Area-Irrigable

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 the sum of the hardscape and footprint. It includes any vegetated area or non-vegetated area that demonstrates a previously irrigated or manicured area is not otherwise covered. For example Figure F-3 illustrates true color images taken at two different times for the same parcel with evidence of an irrigated lawn.

Measuring – Special Landscaped Areas

Special Landscaped Areas (SLAs) (in square feet) are defined as "an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface." An additional Water Allowance of 0.3 ETAF is applied for an SLA, resulting in an effective

FIGURE F-2 **PARCEL IMAGE CLASSIFICATION**



TRUE COLOR | FALSE COLOR | LANDSCAPE CLASS

ETAF for SLA of 1.0. SLAs with artificial turf are also classified as non-irrigable area and removed from the landscape water use calculations. An example of a SLA parcel is shown in Figure F-4.

Measuring – Irrigated Areas-Turf & Non-Turf

Determining whether landscape is being actively irrigated from photographs is an inexact science. However, certain techniques help make the work more accurate. The first is looking at different imagery to see if the landscape is manicured/mowed or brown during different seasons, which would indicate that it may not be irrigated. Another technique is to look at the water use for a property to see if the usage is reasonably higher in summer vs. winter for the size of the estimated landscape.

For example, in Figure F-5, the parcels displayed appear to have both front and rear lawns as well as manicured shrubs in the front and larger trees in the back. The trees on some parcels appear to be shared or overlapping with neighbors. In this case, the trees are not likely to be separately watered but probably obtain some water from the surrounding irrigated turf, so the assumption is that the area of lawn hidden by the tree canopy is used for the water budget as the highest plant use and typically receives the applied irrigation water due to having more shallow roots than the trees. In the image, the green polygon represents the irrigated turf areas. The irrigated non-turf areas are separately classified in relation to the surrounding house and hardscape and parcel lines.

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, and determine if more field visits were necessary. Sites were selected at random.

EBMUD contacted the customer of record and obtained their approval to visit the site and collected information on the type of landscape there. EBMUD staff then visited the site, bringing an aerial photograph marked up with polygons indicating the presumed irrigated area. During the site visit, staff marked up the photograph with any corrections and collected additional information.

Evapotranspiration Calculation

Once the relevant data had been collected for each parcel, its average daily evaporation rate was estimated using the equations provided below.

FIGURE F-3 **IRRIGABLE LANDSCAPE AREA CLASSIFICATION**

AUGUST 2014 SEPTEMBER 2015

FIGURE F-4 **IRRIGABLE LANDSCAPE AREA CLASSIFICATION**

TRUE COLOR SLA CLASS

FIGURE F-5 **LANDSCAPED AREA AERIAL IMAGE AND PLANT CLASSIFICATION**

TRUE COLOR IRRIGATED AREAS CLASSIFIED

Outdoor water allocations used the MAWA equation as applied using the definitions under the MWELO. This equation requires reference evapotranspiration (ETO) data, landscape area, and special landscape area data. The ETO data was obtained from the Spatial California Irrigation Management Information System (CIMIS) across the project area for the years 2012, 2013 and 2014 (note the imagery was from year 2012). All areas that had an irrigated class were assumed to be irrigated. Water allocation for each parcel was estimated using the MAWA equation. Then the mean and variance for each stratum was calculated, followed by the 95% confidence intervals. Table F-6 shows the average as well as the lower and upper bound GPCD for each customer sector.

The summary landscape water use measurements for 2013 for the combined parcels, as well as for single-family residential, multi-family residential and irrigation parcels, are included at the end of this Appendix in Tables F-9 through 12.

Calculation of 2020 Target

Table F-7 shows the calculation of EBMUD's 2020 target, based on the methodologies discussed above for each different customer class.

The target of 166 GPCD calculated in Table F-7 exceeds the minimum reduction goal of 153 GPCD shown in Table F-2 above based on a 95% of the five-year baseline. Therefore, EBMUD must use the lower minimum reduction goal of 153 GPCD.

F.4 THE 2020 TARGET

Table F-8 presents the ten year baseline from 1995 through 2004, the interim target in 2015, and the final 2020 target, in addition to actual water consumption. EBMUD's actual consumption in 2020 was 121 GPCD, which meets the 2020 target in spite of growth in the service area.

EBMUD's success in meeting the 2020 target is a result of EBMUD's long history of working to advance water use efficiency and conservation in its service area. EBMUD's water recycling and conservation programs (discussed in more detail in Chapters 6 and 7, respectively) have helped to hold average daily demand steady since the 1970s, even as the number of customer accounts has risen. Since the adoption of EBMUD's first Water Conservation Master Plan in 1994 through 2020, EBMUD has achieved an estimated conservation program savings of 46 MGD. Water recycling has also helped to reduce the demand for fresh water supplies, and in 2020, EBMUD provided over 7.3 billion gallons of recycled water to customers for irrigation, commercial, and industrial uses.

TABLE F-6 2012-2014 LANDSCAPED AREA WATER USE, AVERAGE GPCD

		95% CONFIDENCE INTERVAL	
BY LAND USE	AVERAGE	LOWER	UPPER
SINGLE FAMILY	41.57	36.98	46.16
MULTI-FAMILY	5.46	4.52	6.41
IRRIGATION	10.33	9.76	10.76
TOTAL	57.36	51.25	63.33

TABLE F-7 CALCULATION OF EBMUD TM2 2020 DAILY PER CAPITA WATER USE

CUSTOMER SECTOR	MGD	GPCD[1]
RESIDENTIAL INDOOR	80	55
COMMERCIAL, INDUSTRIAL, & INSTITUTIONAL[2]	74	52
LANDSCAPE (IRRIGATION & RESIDENTIAL OUTDOOR)[3]	86	59
TOTAL[3]	240	166

Notes:
1 Based on 2020 projected population of 1,449,735 Population derived from ABAG Projections 2013.
2 Institutional uses include EBMUD uses and other non-revenue water uses.
3 Includes estimate of 2 MGD and 1.4 GPCD growth in outdoor water use for period 2015 to 2020.

TABLE F-8 EBMUD 2015 INTERIM TARGET

	MGD	TARGET GPCD	ACTUAL GPCD
1995-2004 TEN-YEAR BASELINE		164	
2015 INTERIM TARGET	220	159	106
2020 MIN. REDUCTION TARGET	240	153	121

TABLE F-9 SUMMARY TARGET METHOD 2 LANDSCAPE WATER USE FINDINGS (ALL PARCELS)

SERVICE AREA REGION	TOTAL # PARCELS FOR STRATA	PARCELS IN SAMPLE	AVERAGE PARCEL AREA (SQFT)	SUM PARCEL AREA (SQFT)	AVERAGE IRRIGABLE AREA PER PARCEL	SUM OF IRRIGABLE AREA	% OF IRRIGABLE AREA	MAXIMUM APPLIED WATER ALLOWANCE (GAL/DAY)	TOTAL VOLUME FOR STRATA (GAL/DAY)	CONFIDENCE INTERVAL @ 95%
< 4,000	82,298	3,003	7,487	222,324,208	2,064	65,080,729	29%	307	3,928,679	40.21
4,001-8,000	171,154	1,088	17,934	958,192,805	5,855	375,757,398	39%	1,154	22,738,699	162.59
8,001-12,000	45,446	237	28,657	442,111,445	8,867	201,682,524	46%	2,028	12,504,302	456.09
12,001-16,000	18,977	891	41,449	264,172,413	11,722	138,178,678	52%	3,184	8,648,563	315.84
16,001-20,000	10,453	766	54,027	186,872,192	10,229	57,644,576	31%	2,239	3,644,459	394.22
20,001-24,000	8,980	748	65,316	194,911,021	12,804	61,813,162	32%	2,698	3,920,773	455.89
> 24,000	23,220	23,175	1,267,331	6,024,622,453	77,238	429,317,948	7%	8,358	29,103,411	—
TOTAL	360,528	29,908	—	8,293,206,536	—	1,329,475,016	16%	19,969	84,488,885	—

TABLE F-10 SUMMARY TARGET METHOD 2 LANDSCAPE WATER USE FINDINGS (SINGLE-FAMILY RESIDENTIAL PARCELS)

SERVICE AREA REGION	TOTAL # PARCELS FOR STRATA	PARCELS IN SAMPLE	AVERAGE PARCEL AREA (SQFT)	SUM PARCEL AREA (SQFT)	AVERAGE IRRIGABLE AREA PER PARCEL	SUM OF IRRIGABLE AREA	% OF IRRIGABLE AREA	MAXIMUM APPLIED WATER ALLOWANCE (GAL/DAY)	TOTAL VOLUME FOR STRATA (GAL/DAY)	CONFIDENCE INTERVAL @ 95%
< 4,000	73,213	2,811	2,321	198,296,013	584	58,153,402	29%	214	3,490,089	17.50
4,001-8,000	152,661	992	5,935	847,887,919	2,545	345,198,892	41%	951	20,860,186	97.98
8,001-12,000	40,625	222	9,867	397,185,635	4,757	191,881,218	48%	1,778	11,901,608	272.93
12,001-16,000	16,729	804	13,883	233,250,343	7,901	133,708,750	57%	2,953	8,377,587	214.63
16,001-20,000	9,201	660	17,823	164,285,907	5,118	54,460,508	33%	1,924	3,448,632	264.87
20,001-24,000	8,046	612	21,747	174,601,161	6,074	58,700,391	34%	2,287	3,730,746	336.25
> 24,000	15,173	15,169	103,064	1,237,311,030	9,488	147,970,390	12%	3,632	9,415,951	—
TOTAL	315,648	21,270	—	3,252,818,007	—	990,073,550	30%	13,740	61,224,798	—

TABLE F-11 SUMMARY TARGET METHOD 2 LANDSCAPE WATER USE FINDINGS (MULTI-FAMILY RESIDENTIAL PARCELS)

SERVICE AREA REGION	TOTAL # PARCELS FOR STRATA	PARCELS IN SAMPLE	AVERAGE PARCEL AREA (SQFT)	SUM PARCEL AREA (SQFT)	AVERAGE IRRIGABLE AREA PER PARCEL	SUM OF IRRIGABLE AREA	% OF IRRIGABLE AREA	MAXIMUM APPLIED WATER ALLOWANCE (GAL/DAY)	TOTAL VOLUME FOR STRATA (GAL/DAY)	CONFIDENCE INTERVAL @ 95%
< 4,000	6,413	143	2,733	17,527,597	795	5,096,540	29%	51	325,491	9.65
4,001-8,000	15,380	74	5,947	91,463,153	1,651	25,393,176	28%	102	1,563,984	20.42
8,001-12,000	3,393	9	9,208	31,244,237	2,001	6,791,008	22%	125	424,708	85.17
12,001-16,000	1,493	56	13,699	20,451,956	2,148	3,207,216	16%	130	194,519	39.01
16,001-20,000	761	66	17,815	13,557,403	2,497	1,900,578	14%	153	116,068	39.07
20,001-24,000	544	78	21,544	11,719,735	3,171	1,725,044	15%	193	105,095	45.96
> 24,000	3,651	3,651	444,039	1,621,184,634	22,126	80,780,301	5%	1,455	5,313,814	—
TOTAL	31,635	4,077	—	1,807,148,716	—	124,893,864	7%	2,209	8,043,679	—

TABLE F-12 SUMMARY TARGET METHOD 2 LANDSCAPE WATER USE FINDINGS (IRRIGATION PARCELS)

SERVICE AREA REGION	TOTAL # PARCELS FOR STRATA	PARCELS IN SAMPLE	AVERAGE PARCEL AREA (SQFT)	SUM PARCEL AREA (SQFT)	AVERAGE IRRIGABLE AREA PER PARCEL	SUM OF IRRIGABLE AREA	% OF IRRIGABLE AREA	MAXIMUM APPLIED WATER ALLOWANCE (GAL/DAY)	TOTAL VOLUME FOR STRATA (GAL/DAY)	CONFIDENCE INTERVAL @ 95%
< 4,000	2,672	49	2,433	6,500,597	685	1,830,788	28%	42	113,099	13.07
4,001-8,000	3,113	22	6,053	18,841,733	1,659	5,165,330	27%	101	314,529	44.20
8,001-12,000	1,428	6	9,581	13,681,573	2,108	3,010,297	22%	125	177,986	97.99
12,001-16,000	755	31	13,868	10,470,114	1,672	1,262,713	12%	101	76,458	62.20
16,001-20,000	491	40	18,389	9,028,882	2,614	1,283,490	14%	162	79,759	90.29
20,001-24,000	390	58	22,026	8,590,125	3,558	1,387,727	16%	218	84,932	73.68
> 24,000	4,396	4,355	720,229	3,166,126,789	45,625	200,567,257	6%	3,270	14,373,646	—
TOTAL	13,245	4,561	—	3,233,239,813	—	214,507,602	7%	4,019	15,220,408	—

Appendix G

EBMUD Regulations and the Rate Structures for Water and Wastewater Service

EBMUD

Policy 3.07

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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 allocated first to existing customers within the service area, then to new developments that include housing units affordable to lower-income households, then to other new customers in the service area.

Discussion

The availability of water to meet EBMUD's customers' demands will vary over time due to various factors including: Mokelumne River flow commitments to senior and riparian water right holders; in-stream flow requirements to protect fish and wildlife; variability in watershed precipitation and runoff; state and federal regulatory agencies' orders and decisions; and the availability of current and future dry year and supplemental supplies.

EBMUD is responsible for planning to meet the needs of their customers through periods of water shortage with minimal disruption by minimizing the need for extreme rationing within the service area.

Water Service Responsibility

EBMUD recognizes that when there is an actual or projected water shortage, EBMUD's responsibility to serve its customers and service area is prioritized as follows:

- First, serve existing customers within the District's service area.
- Second, serve expected new customers within the District's service area, if this does not unacceptably impair EBMUD's ability to serve its existing customers.
- Third, consider serving new customers outside of the District's service area, 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, subject to income limits specified in the California Code of Regulations. Applicants granted such priority shall comply with EBMUD's Regulations Governing Water Service and pay all requisite fees.

EBMUD shall not deny or condition the approval of an application for services to, or reduce the amount of services applied for by, a proposed development that includes housing units affordable to lower income households unless the Board of Directors makes specific written findings that the denial, condition, or reduction is necessary due to the existence of one or more of the following:

- EBMUD is operating under a declared water shortage emergency condition under California Water Code, Section 350, et seq.
- Sufficient water supply is not available to support the granting of all requests for

new service, based upon a consideration of all factors provided by California Government Code, Section 66473.7.

- EBMUD does not have sufficient water treatment or distribution capacity to serve the needs of proposed development, as demonstrated by a written engineering analysis and report.
- EBMUD is subject to a compliance order by a designated state agency that prohibits new water connections.
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of service generally applicable to development projects seeking water service from EBMUD, including, but not limited to, the requirements of local, state, or federal laws and regulations or payment of applicable fees or charges.

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
As amended by Resolution No. 33871-12, April 24, 2012
As amended by Resolution No. 33993-14, August 12, 2014
As amended by Resolution No. 34094-16, July 26, 2016
As amended by Resolution No. 35120-18, November 27, 2018

Reference

California Government Code, Section 66473.7
California Government Code, Section 65589.7
California Code of Regulations, Title 25, Section 6932 [income limit for “lower income households”]
Procedure 109 – Water Mains: Water Service Estimates
Policy 3.01 – Annexations
Policy 7.05 – Sustainability and Resilience
Policy 9.03 – Water Supply Availability and Deficiency
Policy 9.05 – Non-Potable Water
EBMUD 2015 Urban Water Management Plan, Chapter 3 – Water Shortage Contingency Plan

EBMUD

Policy 7.03

EFFECTIVE 24 MAR 20

SUPERSEDES 24 SEP 19

EMERGENCY PREPAREDNESS/BUSINESS CONTINUITY

IT IS THE POLICY OF EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Ensure the District can respond to and recover from emergencies and disruptive incidents. The District will 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 operations during any emergency and protect people, property, and the environment. The District will coordinate the emergency planning 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 (BCPP) to minimize impacts to critical business functions and enhance its capability to recover operations expediently and successfully following a disruptive incident.

The EOP and BCPP will include provisions to:

- Make employee and community life safety the highest priority.
- Anticipate, prevent, protect against, and mitigate the greatest risks to the extent practicable.
- Periodically review the plans and incorporate lessons learned from exercises, incidents, and industry.
- Comply with all applicable legal requirements and be consistent with state and federal guidance.

Emergency

An emergency includes actual or threatened existence of conditions of disaster or extreme peril to critical District operations, its infrastructure, 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, storm event, and other conditions that may be beyond the capability of District forces and may require support from other government agencies, non-profit organizations, or the private sector.

An exigency is something that is necessary in a particular situation that requires or demands immediate aid or action. An emergency is an unexpected and unusually dangerous situation that calls for immediate action or urgent need for assistance or relief.

A key distinction between “emergency” and “exigency” is an emergency will typically involve a threat to life, public health or safety, improved property, and/or some other form of dangerous situation whereas an exigency in not necessarily so limited. The Federal Emergency Management Agency’s (FEMA’s) determination of whether an emergency or exigency exists is not based on whether the Board declared an emergency, only the facts surrounding the situation.

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 five areas of readiness: prevention, protection, mitigation, response, and recovery. The EOP will describe the District’s emergency response organization based on NIMS; include guidelines for identifying and training District staff in 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.

Authorization of Contracts During District Emergency Response and Reporting of Emergency Contracts

When an emergency condition arises that necessitates immediate action to minimize damage and inconvenience resulting from such condition, the General Manager or his or her designee, in consultation with the President of the Board of Directors or their designee, may declare a District emergency. The Board may also declare a District emergency under the Municipal Utilities District Act (Public Utilities Code) Section 12753. The General Manager or his or her designee is authorized, after a District-declared emergency, to enter into emergency contracts not to exceed $500,000, per contract, without bids or notice during the emergency response period. The Board shall meet to ratify the declaration of emergency by the General Manager as soon as possible after the declaration, but no later than 14 days following such declaration.

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 contracts executed in response to said emergency. Periodic reports on the status of response and additional contracts shall be provided to the Board of Directors until the emergency is concluded. The emergency declaration will remain in effect until formal Board action is taken to conclude the emergency.

Note that under federal law (2 C.F.R, 200.320(f)(2)) for procurement that may be reimbursed by the federal government, procurement by noncompetitive proposals through solicitation of a proposal from only one source may be used only when a public exigency or emergency will not permit a delay resulting from competitive solicitation.

Emergency Operations Director

The District's EOP will identify a District Director or member of the Senior Management Team (SMT) to serve as the Emergency Operations Director (EOD) who will have the authority for developing plans, training staff and managing the District's response to an emergency through the Emergency Operations Team (EOT). The EOT will be structured consistent with the NIMS in sections managed by Section Chiefs. 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. In an emergency, the EOD may delegate approval authority to the EOT Section Chiefs up to $80,000 for material purchases and up to $30,000 for services.

The General Manager or his or her designee may engage EBMUD retirees to provide staffing support for operations and activities deemed critical, necessary, or essential during a District declared emergency consistent with the California Public Employees' Pension Reform Act (PEPRA) or any executive order issued by the Governor of the State of California to suspend the requirements of PEPRA.

The EOD or his or her designee is authorized to take all necessary action to apply for incoming state or federal resources and to represent the District in requesting/negotiating for the needed resources.

Mutual Aid/ Assistance

The General Manager, EOD, and their designees, in accordance with the EOP, may either request mutual aid/assistance from other local government agencies, including public and private water and wastewater utilities, 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

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 District will maintain a BCPP consistent with federal, state, and industry guidance that provides the overall framework for the program and outlines the basic priorities for recovery of business functions in individual departmental or division Business Continuity Plans (BCPs). The Regulatory Compliance Office will manage the program and maintain the BCPP. Individual BCPs outline the critical functions that must be performed before, during, and after an event; identify the personnel responsible for completing the necessary actions; and list the vital records, equipment, supplies, tools and systems required to accomplish the identified tasks. The departments are responsible for ensuring 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 that if lost, would place significant financial, operational, or legal restrictions on the continuation of District services.

Continuity of Management

All of the District's BCPs, including that of the Office of the General Manager, will designate up to three successors to serve in the event there is an activation of the EOT so day-to-day operations may continue. In the event the primary critical staff person is unable to respond to an emergency, the designee, in the order listed, may assume all the duties and powers of the primary critical staff person.

Status Reports

The General Manager will provide periodic Emergency Preparedness Program and Business Continuity Program progress reports to the Board of Directors, as necessary, and the District's response to a declared District emergency, when applicable.

Board of Directors Succession Plan

Each Board Member shall designate no more than three Standby Officers to serve in his or her place in the event of the Board Member's unavailability in an emergency, as defined by the California Emergency Services Act (CESA). Upon appointment by the Board through a Board Resolution, the Standby Officer shall take the oath of office, remain informed of the duties, District business, and be prepared to immediately report for duty during an emergency. The General Manager will determine the availability of the Board Members in an emergency. The Board will fill the vacancies in accordance with the Municipal Utility District Act and CESA within 60 days of the effective date of the vacancy. Details of this process will be documented in the General Manager's BCP. The list of Standby Officers shall be approved by Board Resolution and reviewed on an annual basis.

Emergency Preparedness/Business Continuity

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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
As amended by Resolution No. 33904-12, November 27, 2012
As amended by Resolution No. 33941-13, September 24, 2013
As amended by Resolution No. 34052-15, September 22, 2015
As amended by Resolution No. 34094-16, July 26, 2016
As amended by Resolution No. 35037-17, May 23, 2017
As amended by Resolution No. 35098-18, June 26, 2018
As amended by Resolution No. 35156-19, September 24, 2019
As amended by Resolution No. 35168-20, March 24, 2020

References

Business Continuity Program Plan
California Emergency Services Act (CESA), Government Code 8635 *et seq*.
District Emergency Operations Plan
FEMA Procurement Guidance
Municipal Utility District Act – Section 12753
National Incident Management System
National Preparedness Goal
National Response Framework
Policy 7.13 – Security
Procedure 415 – Emergency Purchases
Standardized Emergency Management System

EBMUD

Policy 9.03

EFFECTIVE 27 NOV 18

SUPERSEDES 26 APR 16

WATER SUPPLY AVAILABILITY AND DEFICIENCY

IT IS THE POLICY OF THE EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Evaluate the adequacy of the District's water supplies for the District's service area, based on the District's current and projected water supply and demand for inclusion in the Water Supply Availability and Deficiency Reports (WSADR) to be filed with the Board of Directors.

Annual WSADR

An assessment for the Preliminary WSADR shall be made by March 1 of each year in which hydrologic conditions may trigger a need for dry year and/or other supplemental supplies. The Preliminary WSADR will be in the form of an informational memo that may include the following: an early assessment of the current year's water supply and demand, a discussion of any new or ongoing state actions related to water supply, and a summary of the results of any drought management programs or acquisition of dry year or other supplemental supplies in the previous year.

A Final WSADR shall be made by May 1 of each year. The report may include the following components: projected customer demand, projected runoff from Department of Water Resources, downstream release requirements, projected EBMUD End of September Total System Storage, and determination of deficient or surplus water supply conditions. If deficient water supply conditions are determined, the WSADR will also include steps to implement the Drought Management Program, an estimate of dry year and/or supplemental water supply need, and, if applicable, adaptive management measures including discussion of gainsharing. If surplus water supply conditions are determined, the report will discuss the Surplus Water Notification.

This report will also refer to and, if applicable, provide updates to the water supply reliability analysis reported in the most current Urban Water Management Plan (UWMP).

Drought Management Program

In the Final WSADR, when a determination of deficient water supply is made, the Board of Directors will consider the implementation of a Drought Management Program (DMP).

The Final WSADR, supplemented by other Board actions, will identify the various components of the DMP as outlined in the UWMP that will need to be implemented. The components include water-use restrictions (pursuant to District policy or state regulation), use (including timing and availability) of supplemental supplies, and financing for these supplies.

Supplemental Supplies

The District will pursue supplemental supplies when existing supplies are found to be inadequate. Supplemental supply options shall be preliminarily identified and assessed in the Final WSADR to provide a basis for future decision making. The water supply options are outlined in the District's current UWMP.

Surplus Water Notification

When a determination of surplus Mokelumne River water is made, the District will notify the Resources Agencies of the availability for sale of surplus Mokelumne River water, in accordance with the 1998 Joint Settlement Agreement. This notification will occur within two weeks after the filing of the Final WSADR.

Water Supply Availability and Deficiency

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Downstream Release Requirements

Pursuant to a series of agreements with users of the Mokelumne River, the District is obligated to release water for downstream water users and for fishery purposes. The District will provide an estimate of total annual projected releases by May 1 and a final estimate by July 1. The actual water availability and schedule of releases (daily and/or monthly) for each of the users will be dependent upon the current conditions.

Definitions

Resource Agencies – The United States Fish and Wildlife Services and the California Department of Fish and Wildlife

Gainsharing – Increase in instream flows that the District agrees to implement as part of its Joint Settlement Agreement, equal to 20% of the actual yield of additional water supplies developed by the District from new facilities until reaching a maximum quantity of 20 TAF.

Downstream Release Requirements – Includes releases for Woodbridge Irrigation District, Jackson Valley Irrigation District, North San Joaquin Water Conservation District, Riparian and Senior Appropriators, and fishery releases pursuant to the JSA and water rights requirements.

Water Year – The term defined as the 12-month period from October 1 through September 30, of the following year. The water year is designated by the calendar year in which it ends. Thus, the year ending September 30, 2018 is called the "2018" water year.

*Central Valley Project (*CVP) Contract Year – The term defined as the 12 month period from March 1 through the end of February of the following year.

Authority

Amended by Resolution No. 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
Amended by Resolution No. 33950-13, November 12, 2013
Amended by Resolution No. 34080-16, April 26, 2016
Amended by Resolution No. 35120-18, November 27, 2018

References

Policy 3.01 – Annexations
Policy 3.05 – Considerations for Extension of Water Beyond the Ultimate Service Boundary
Policy 3.07 – Responsibility to Serve Water Customers
Procedure 146 – Water Conservation Accounting and Reporting
Procedure 900 – Water Supply and Consumption Accounting and Reporting
Procedure 901 – Recycled Water Accounting and Reporting
Procedure 903 – Use of USBR Long Term Renewal Contract for Delivery of CVP Water
EBMUD's Urban Water Management Plan
FERC Project 2916 Lower Mokelumne River – Joint Settlement Agreement
Relevant Water Rights Permits, Licenses & Agreements - http://ebmudnet/resources-planning/water_rights/default.htm

EBMUD

Policy 9.05

EFFECTIVE 24 MAR 20

SUPERSEDES 22 SEP 15

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 non-potable water satisfying these conditions is made available to the customer, the use of potable water for non-domestic 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 potable water supplies alone 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, and other alternative water sources that could provide a safe and effective alternative water supply for certain non-potable purposes, increase the availability of the limited water supplies of EBMUD, generally 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 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, and meets the appropriate level of treatment (Water Code Section 13550 et seq. and the Water Quality Control Policy for Recycled Water by the State Water Resources Control Board).

Definitions

Non-potable Water - All reclaimed, recycled, reused, untreated, or alternative 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. Non-domestic uses include irrigation of food crops intended for human consumption, which is an allowable recycled water use with appropriate treatment to meet water quality standards.

Mandated Uses Of Non-potable Water

Customers may be required to use non-potable water consistent with non-potable water service regulations and non-potable/recycled water rate schedule for their non-domestic uses which may include, but are not limited to, the following:

- Irrigation of cemeteries, golf courses, playing fields, parks, residential and nonresidential landscaped areas, and food crops;
- Commercial and industrial process uses including but not limited to vehicle, window, and sidewalk washing, construction activities, 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.
- Whether the non-potable water is of adequate quantity for the intended use.
- 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 and rates governing non-potable water service, including recycled water, 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 applicable provisions governing responsibilities for planning, design and construction, and facilities operation and maintenance. Upon termination or expiration of an agreement, customers receiving non-potable water service, including recycled water, pursuant to that agreement shall be governed by the non-potable water service regulations and non-potable/recycled water rate schedule, unless a new agreement is established.

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
As amended by Resolution No. 33919-13, March 26, 2013
As amended by Resolution No. 34052-15, September 22, 2015
As amended by Resolution No. 35168-20, March 24, 2020

References

Regulations Governing Water Service and Schedule of Rates and Charges for Customers of East Bay Municipal Utility District
Policy 7.05 – Sustainability and Resilience

EBMUD

Policy 9.07

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SUPERSEDES 26 JUL 16

DAM SAFETY PROGRAM

IT IS THE POLICY OF THE EAST BAY MUNICIPAL UTILITY DISTRICT TO:

Manage District-owned dams and associated facilities to ensure dam safety, structural integrity, and operational security for the protection of life, property and the environment.

Overview of the District's Dam Safety Program

The District will:

- Maintain an organizational structure that monitors, reviews, and oversees dam safety practices at all District-owned dams; and designate a Chief Dam Safety Engineer and an alternate designee to oversee dam safety activities within the District
- Monitor, inspect and document operational and structural conditions of dams and associated facilities, including spillways, outlet works, etc., on a regular basis
- Investigate, document, mitigate, and repair unusual conditions at any dam
- Maintain, upgrade, and update dam safety instrumentation and records
- Maintain and update dam drawings, correspondence files, and electronic instrumentation databases
- Encourage employees to report to supervisors any condition or practice that appears to compromise dam safety currently or in the future
- Require supervisors to record and investigate all reports of unsafe conditions
- Maintain and update emergency action plans and emergency operations procedures for dams
- Regularly conduct exercises to familiarize staff with evaluation, notification, and response procedures for an emergency affecting the safety of District dams as outlined in the emergency action plans and emergency operations plan
- Meet or exceed the requirements of dam safety regulatory agencies:
  - California Department of Water Resources, Division of Safety of Dams (DSOD)
  - Federal Energy Regulatory Commission (FERC)
- Communicate dam and reservoir conditions effectively with internal Departments, regulatory agencies, local government agencies, emergency management agencies, and the public as necessary
- Maintain a dam safety training program for all designated project personnel
- Budget and allocate sufficient funds to investigate and repair known and suspected dam safety problems
- Prioritize implementation among dam safety related projects according to the degree of risk reduction benefits

Dam Safety Program

Dam Safety Regulatory Agencies

The California Department of Water Resources' DSOD is the state agency with safety responsibility over dams in the State of California. DSOD regulations apply to any dam that is of jurisdictional size. The Geotechnical Engineering Section is the District liaison with DSOD.

The FERC is the federal agency with safety responsibility over dams at FERC-licensed hydropower projects. Water Resource Projects Section is the District liaison with FERC.

Authority

Resolution No. 33968-14, March 25, 2014
Amended by Resolution No. 34094-16, July 26, 2016
Amended by Resolution No. 35120-18, November 27, 2018

References

Policy 7.03 – Emergency Preparedness/Business Continuity
Policy 7.05 – Sustainability and Resilience
Policy 7.13 – Security
Policy 9.04 – Watershed Management and Use
Procedure 705 – Reporting, Site Control, and Establishing Temporary Service in Emergency and Hazardous Conditions
Procedure 706 – Facilities: Inspection, Maintenance, and Repair
EBMUD Dam Safety Program Guide
FERC License for the Lower Mokelumne River Project (FERC Project No. 2916)

EBMUD

Procedure 145

WASTEFUL USE OF WATER

EFFECTIVE	25 MAY 17
SUPERSEDES	15 JUN 15
LEAD DEPARTMENT	CCS

PURPOSE – To provide a reporting and follow-up procedure for investigating the unreasonable or wasteful use of water to conserve the public water supply to meet critical needs.

Definitions

Unreasonable and wasteful use of water is prohibited in Section 29 "Prohibiting Wasteful Use of Water" and Section 28, "Water Use During Water Shortage Emergency Condition" of the District's Regulations Governing Water Service to customers. The term "wasteful use of water" shall be used in this procedure to cover all instances of unreasonable and wasteful use of water as prohibited by District regulations.

Note: This procedure does not apply to the use of water at District facilities or within the District's distribution system.

Investigation Procedure

Wasteful use of water investigations are managed by the Customer and Community Services (C&CS) Department/Water Conservation Division (WCD). Wasteful use of water information is reported through various channels including, but not limited to, the District website, Water Waste Hotline, the Contact Center through a Subject Matter Expert (SME) handoff; email, social media, written correspondence and employees.

Generally, wasteful use of water reports are processed and investigated by WCD staff. In the event demand is high and additional staff is needed to assist with processing wasteful use of water reports, other staff from C&CS and the Operations and Maintenance Department (OMD) may assist. Wasteful use of water reports, response, and findings will be tracked and logged in Customer Watch. For reports not associated with a District customer of record or a specific service address, a master file will be maintained by WCD.

Processing

First Occurrence – Courtesy Call

Upon receiving the first report of wasteful use of water and if a premise is identified and a valid contact number is available, WCD staff will contact and inform the customer of the report. The customer's water use will be reviewed in Customer Watch and WCD staff will inform the customer of:

1) The District's regulations prohibiting wasteful use of water;
2) The customer's actions which may be in violation of District regulations;
3) Information on how to curtail or correct wasteful use of water; and
4) Potential District enforcement actions for violations of the District regulations and associated fees and charges assessed.

Educational water conservation materials including tips on the efficient use of water, how to read a water meter, and how to check and repair leaks may be delivered to the premise. All contacts and correspondence with the customer will be documented in the Customer Watch account.

Note: Attempts to contact the customer during a field inspection at the first occurrence will only be made if a premise can be linked to the wasteful use of water and a valid contact number is available. A courtesy door hanger will be left at the premise with recommendations to correct the wasteful use of water if no field contact is made with the customer.

Wasteful Use of Water

Second Occurrence – Written Notice Delivered Certified U.S. Mail

Upon a second report of a wasteful use of water, WCD staff will inform the customer in writing that if continued water waste occurs, enforcement action may be taken and fees assessed by the District. The report will be noted in the Customer Watch account including any findings or action taken. If not already provided in response to the first reported occurrence, educational water conservation materials on the efficient use of water will be provided to the premise.

Note: Attempts to contact the customer during a field inspection at the second occurrence will only be made if a premise can be linked to the wasteful use of water and a valid contact number is available. A courtesy door hanger will be left at the premise with recommendations to correct the wasteful use of water if no field contact is made with the customer.

Third Occurrence – Field Inspection & Warning Letter (Sent Certified and Regular Mail)

A third report of a wasteful use of water occurrence will trigger WCD staff to issue a field inspection request to Field Services staff. The field inspection will determine whether the continuing use of water is in violation of Section 28 or Section 29 of the District's regulations. If the service is found to be in violation, staff will document the violation(s) and attempt to contact the customer to discuss the violations and the possible future actions that may be taken by the District for continued failure to curtail the water waste.

The account will continue to be monitored to determine and document if the customer has taken corrective action or if a "wasteful use of water charge" should be assessed in accordance with the District's regulations. A warning letter will be sent to both the premise and billing address (when the occupant is not the customer of record) that specifies a date when the wasteful use of water must be curtailed to avoid further enforcement action, along with information about the charges that will be assessed to the customer and the appeal process and the grounds for requesting an exemption. Continued wasteful use of water may result in the installation of a flow restrictor or discontinuation of water service in accordance with District regulations. The Customer Watch account will be documented to reflect the findings of the field inspection and the actions taken, and the account will be charged the applicable fee(s).

If the field inspection determines that the violation(s) of Section 28 or Section 29 have been corrected, no further action will be taken.

Fourth Occurrence – Final Notice and Intent to Restrict Flow Letter (Sent Certified and Regular Mail) – Final Finding of Violation of District Regulations

Upon a fourth report of wasteful use of water, a field inspection by C&CS staff will occur. The field inspection will determine if the violation(s) to Section 28 or Section 29 of the District's regulations are continuing. If so, C&CS staff will attempt to contact the customer to discuss the continuing violations and the possible future enforcement actions that may be taken by the District for failure to curtail the water waste.

In accordance with Regulations 28 and 29, C&CS staff may order that a special meter reading(s) be made in order to ascertain whether wasteful use of water is continuing. Charges for such a meter reading or readings or for follow-up visits by District staff will be charged to the customer in accordance with District regulations.

Wasteful Use of Water

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In the event that apparent wasteful water use is occurring at a customer's premise, the Manager of Customer and Community Services may, after a written warning to the customer, authorize the installation of a flow-restricting device on the service line for any customer observed by District staff to be willfully violating any of the District's regulations and restrictions on water use.

The Notice of Intent to Restrict Flow will be sent to both the premise and billing address (when the occupant is not the customer of record) where the wasteful use of water is occurring. The notice will specify (a) that a flow restrictor will be installed seven calendar days from the date of the Notice of Intent to Restrict Flow unless the customer immediately curtails the wasteful use of water; (b) the amount of the flow restrictor installation charge that will be charged to the customer as well as other charges and fees that may be assessed in accordance with District regulations; (c) the potential discontinuation of water service in the event of tampering with the restrictor and/or further non-compliance with the District's regulations; (d) the appeals process and the grounds for requesting an exemption; and (e) notification that the District's determination of a wasteful use of water violation is subject to mandatory disclosure requirements of the California Public Records Act, including release of the customer's name, account information, address, violation and enforcement action taken.

After the seven day period has passed, a field inspection will be conducted to determine if the customer has complied with the mandate to curtail the wasteful use of water by the date specified in the Notice of Intent to Restrict Flow.

If the customer has not complied with the mandate, a flow restrictor will be installed by the Meter Reading and Maintenance Division (MRM) staff. A service order will be prepared by C&CS staff for the installation of the flow restrictor.

Note: An account which is wasting water may also be directly charged an excessive use penalty as set forth in the Excessive Water Use Penalty Ordinance #364-15. The District Board of Directors suspended implementation of the Excessive Water Use Penalty Ordinance on April 26, 2016. Before assessing penalties pursuant to the Ordinance, staff must determine whether the Board has reinitiated its implementation.

Flow Restrictor Installation

Field staff will check the meter number, house number, and the numbers on the service order to ensure that the flow restrictor is installed at the correct premise. Flow restrictors will not be installed on services supplying fire sprinklers. A flow restrictor may be sized to allow use of only one fixture at a time. MRM will install the appropriately-sized flow restrictor. The flow restrictor will be installed at least two business days before a weekend or holiday period and left in place for a minimum of fourteen calendar days and, until such time that the customer provides sufficient evidence that the wasteful use of water violation has been sufficiently curtailed or eliminated. The customer will be charged the appropriate wasteful use and flow restriction installation charges in accordance with District regulations.

Flow Restrictor Removal

After the fourteen days have elapsed and there is no evidence of additional occurrences of wasteful use of water, the flow restrictor will be scheduled for removal. The customer will be charged the appropriate service trip charge and flow restriction removal charges in accordance with District's regulations.

If after the flow restrictor is removed and further field inspections confirm that the violation(s) of Section 28 or Section 29 have been corrected, no further enforcement action will be taken.

However, in the event that a further willful violation is observed by District staff, the District may discontinue service in accordance with District regulations.

Violation of Flow Restrictor/ Tampering Discontinue Service

Tampering or Illegal Removal of the Flow Restrictor – Notice to Discontinue Service

Upon illegal tampering and/or removal of the flow restrictor by the customer, a 48-hour notice of Intent to Discontinue Water Service will be left at the premise and the customer's service will be turned-off after 48 hours if the violation continues. The customer may also be subject to a water theft penalty, as set forth in Water Theft Penalty Ordinance #365-15, and will be reviewed by the Manager of Customer & Community Services and Customer Services Manager. The Customer Watch account will be updated accordingly. Service will be restored upon the receipt of an acceptable agreement from the customer to comply with all District water service regulations as determined by the Manager of Customer and Community Services. A service restoration charge per the District regulations will be assessed to the customer to restore service.

Approval of the Manager of Customer and Community Services is required prior to issuing turn-off as a result of tampering.

Responsibilities

Customer and Community Services Department

- Provide customer outreach, education, and notifications (WCD)
- Track and monitor waste reports (WCD)
- Assess fee(s) (Customer Services)
- Discontinue service and monitor use (Field Services)

Operations and Maintenance Department

- Provide special meter reading services when needed
- Assist with field inspections if necessary
- Supply Flow Restrictor devices and determine specifications concerning pressure and flow
- Install and remove flow restrictor (MRM)

Exemptions

Exemptions to the installation of a Flow Restrictor or Discontinuation of Water Service as a means to enforce a wasteful use of water violation shall exist when (a) the failure to grant the application 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) there are provable risks to the health, safety, and/or welfare of the water user. An exemption also shall be made for water meters which provide "dual service" for fire protection and premises serving two or more multi-family dwelling units or mixed used, where the water use is provided via a master meter. Written applications for exceptions shall be accepted, and may be granted by the Manager of Customer and Community Services.

Water leaks from District facilities are not covered under this procedure.

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Dispute Resolution/ Appeals

A customer may appeal a warning or notice of violation of the District regulation prohibiting the wasteful use of water by filing a written appeal with the Manager of Customer and Community Services within ten business days of the date of the written warning or notice of wasteful use of water from the District. The written request for the appeal must clearly state any factual error in the District's written warning or notice that may constitute grounds for appeal. Any written appeal submitted later than ten business days from the date of the written warning or notice from which the appeal is taken will be dismissed as untimely and no further appeal will be granted. The Manager of Customer and Community Services may grant or deny the appeal based solely on the information provided in the appeal or within the sole discretion of the Manager of Customer and Community Services, before making a final decision on the customer's appeal. The Manager of Customer and Community Services' decision granting or denying the customer's appeal is final. No further appeal will be granted.

Review

This procedure is to be reviewed biennially or upon a Board declared Water Shortage Emergency condition.

Reference

Procedure 112, Unauthorized Use of Water
Procedure 466, Data Risk Management
Procedure 608, Public Access to District Records
Procedure 900, Water Supply and Consumption Accounting and Reporting
Regulations Governing Water Service:
- *Section 15, Discontinuance of Service*
- *Section 19, Use and Resale of Water*
- *Section 28, Water Use During Water Shortage Emergency Condition*
- *Section 29, Prohibiting Wasteful Use of Water*

Rates and Fees Schedules:
- *Schedule C – Charges for Special Services:*
  - *Section E, Wasteful Use Charge*
  - *Section F, Flow Restrictor Installation Charge*
  - *Section G, Notice of Wasteful Use and Flow-Restrictor Charges*
  - *Section M, Service Trip Charge*

Ordinance #364-15 – Excessive Water Use Penalty
Ordinance #365-15 – Water Theft Penalty

EBMUD

Procedure 900

EFFECTIVE	24 MAR 21
SUPERSEDES	17 MAY 18
LEAD DEPARTMENT	WNR

WATER CONSUMPTION ACCOUNTING AND REPORTING

PURPOSE – To establish a consistent District-wide protocol for storing, retrieving, reporting and publishing consumption data for internal and regulatory purposes.

General Provisions

This procedure applies to all District employees directly or indirectly engaged in measuring, collecting, storing, retrieving, validating, reporting, or publishing District raw water use, treated water production, water consumption, and water demand projections data.

Limitations

This procedure provides only a general overview of water consumption accounting and reporting procedures. Operating manuals developed by departments for their internal use provide details on methodologies; however, they do not constitute District policy or adopted procedures.

Definitions

Customer Account

Account - Accounts can be classified into seven major use types, as defined by Business Classification Code (BCC) Categories[1]. One customer can have multiple accounts. BCC Categories include Single-Family, Multi-Family, Commercial, Industrial, Petroleum, Institutional, and Irrigation. For a complete list of BCC Categories or BCC Types (which is the grouping of BCCs into similar type of end users and it is more granular than the BCC Categories) visit http://waterconsumptiondata/glossary.php.

Account Status - For billing purposes, accounts can have one of the following statuses:

- *Active* - a customer is currently responsible for service at a premise[2].
  - Charged – a price/rate has been applied to an account component, i.e., water flow, wastewater flow, and meter size; the account is "statemented" after being "charged".
  - Billed/Statemented – after the account is "charged", the statement or bill is generated.
- *Closed* - an off order has been completed and the account has been charged; the statement may or may not have been generated at this point. The official closed date is the last day the customer is responsible for service.
- *Inactive* - an order has been created for a customer who will be responsible for service at a premise.
- *Landlord* - Active - customers having Intervening Water Service Agreement become responsible for service when a tenant moves out.
- *Landlord* - Inactive - customers having Intervening Water Service Agreements but the tenant is responsible for service.

[1] BCC Categories are mapped to "Dwelling Description" within Customer Watch. For billing purposes accounts can also be differentiated into Revenue Classes which include Residential, Commercial, Industrial and Public. Note that Revenue Classes do not necessarily correspond to BCC Categories.
[2] A premise is the physical location/address where the water use is taking place.

Account Type[3] - There are six types of water service available:

- Standard (Water) = Standard Water Service including irrigation services; potable (treated) drinking water and does not include Fire Services and Hydrant uses.
- Fire Service[4] = Private Fire Service.
- Hydrant = Hydrant Meter Service; Hydrant meters borrowed by contractors are accounted for in the Water Consumption Data Hub (WCD Hub).
- Wastewater = No Water (Wastewater only).
- Untreated (Water Non-Potable) = Non-Potable Water Service; untreated – raw water used by such accounts as golf courses.
- Water Recycled = Recycled Water Service
  Recycle Secondary
  Recycle Tertiary

Metered Consumption Data: Storage

The District stores metered water consumption data in two databases - Customer Watch and Water Consumption Data Warehouse.

Customer Watch (CW) - A utility billing and customer information application used to manage customer contacts, meter readings, charge calculations, statements and correspondence, equipment inventory, service orders, etc.

Most meters are read bimonthly except meters for large commercial and industrial customers which are read monthly. The majority of meters are read manually and entered into handheld units. The reads are then transferred to CW to calculate the Water Flow Charge.

In CW, the data remain in a billing cycle format. CW stores what was charged to individual customers. Because of cancel rebills or delayed reads, the billing period on a statement could be less or much more than the standard billing cycle.

Managed by the Customer Information System (CIS) Control Group, CW replaced the CIS in 2011, which replaced the Customer Billing System in 1987. Data in CW is only available from September 2011 to the present.

Water Consumption Data Warehouse (WCDW) - The database stores water consumption data in monthly, seasonally adjusted monthly, and billing cycle formats, for accounts that have been charged in CW. Metered accounts, both billed and unbilled, are transferred and/or converted from CW to the WCDW on the second Tuesday of every month.

[3] Intertie meter data are not accounted for in the WCD Hub.
[4] It is not feasible for the District to accurately estimate a potentially significant portion of fire service consumption as fire departments are not required to report their usage to the District.

Monthly Normalized Aggregate

Within the WCDW, the billing data is converted into a monthly format and archived. WCDW contains data from 1975 to present. Due to the differences in timing of the billing cycles, data in WCDW is available about two months prior to the current month. This ensures that the data presented for a given month represents all of the District's active accounts.

Since 1975, the District has utilized an algorithm to redistribute billing cycle data into monthly data - equally distributing the data across each month. The algorithm for the conversion can be found via the WCD Hub's Glossary page (http://waterconsumptiondata/glossary.php).

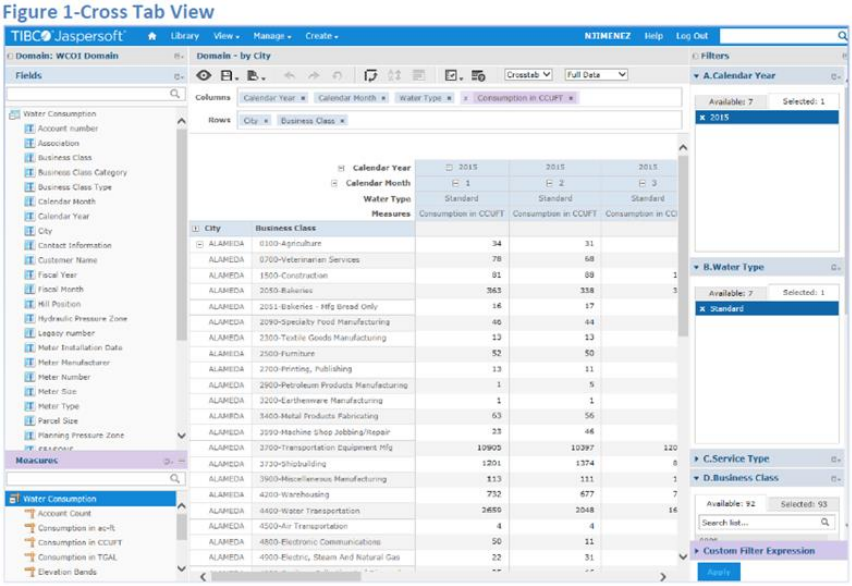
Seasonally Indexed Monthly Format Algorithm

In January 2014, the District began keeping water consumption data based on a seasonally adjusted algorithm. This data is available for calendar year 2013 to the present. For publishing purposes, if the Seasonally Adjusted Monthly Aggregate data is used, that needs to be clearly indicated on any report, chart, or table created.

The seasonally indexed monthly format algorithm refines the monthly format algorithm by accounting for the seasonal nature of water consumption, attributed to irrigation in the warmer months. The refinement improves the accuracy of the monthly consumption calculation by prorating consumption based on historical monthly water consumption trends by BCC Category. The Seasonal Indices (SI) that are used in the algorithm will be updated approximately every 10 years by the Water Distribution Planning Division.

The algorithm for the conversion can be found via the WCD Hub's Glossary page (http://waterconsumptiondata/glossary.php).

Figure 1-Cross Tab View



Water Consumption Accounting and Reporting

Metered Consumption Data: Retrieval/ Reporting

Historical and reproducible metered water consumption data can be retrieved and reported using the following:

- Water Consumption Data Hub
  - Jasper Reports
  - Jasper Analytics Tool
  - Data Query Request
- Customer Watch

Water Consumption Data Hub - CW water use data is translated into normalized monthly aggregate consumption values when it is loaded into the WCD hub. This is a portal in which District staff can query and view water consumption data, obtain a reference for standardized consumption related terms, and access relevant policies and procedures in reporting data. The WCD Hub helps to ensure consistent, accurate, reproducible water consumption data is used throughout the District. The WCD Hub can be accessed via http://waterconsumptiondata. Definitions of BCC and corresponding types and categories, and seasonal indices for west and east of hills by BCC category are published on the WCD Hub's Glossary page. These can be accessed at http://waterconsumptiondata/glossary.php.

Metered Consumption Data: QA/ QC

The accuracy and integrity of water consumption data are maintained through a Quality Assurance/ Quality Control (QA/ QC) process in CW.

In CW, to assure correct billing, exceptions reports are produced daily as "Special Handling" when anomalies are noted in the data. Some of the criteria for triggering an exception flag in CW include:

- High/Low - Consumption values calculated from meter reads uploaded by the Meter Reading & Maintenance Division are compared with historical data. Customer Services Support Division, Field Services, Water Conservation Division and Meter Reading & Maintenance Division staff review consumption values that are higher or lower than the historical range, and take appropriate actions such as requesting service order, confirming the read, etc., before the consumption is released for charge calculation.

- High Charge - a type of service (water, wastewater, or fire service) and the corresponding revenue class has a dollar amount assigned to it that triggers a high charge flag. Customer Services Support Division reviews all accounts that exceed the high dollar amount before releasing the account for statement.

Accuracy of the meter reads provided to the CW application is maintained by the Meter Reading & Maintenance Division.

Department and Committee Responsibilities

Departments are responsible for assisting and supporting other groups and committees to assure that reporting of water supply and use information is consistent with this procedure. Attachment A provides a list of standard publications that report the information produced by the District.

Water and Natural Resources Department (WNR)

The Water Resources Planning Division (WRPD) of the WNR is responsible for assessing and reporting District water supplies and use, including historical, current, and future assessments as required by District policy; California State Water Code; water rights, contracts, and agreements; state and regional planning agencies; legislative initiatives; and legal matters. WRPD is also responsible for calculating the water savings estimates for inclusion in the State Water Regional Control Board (SWRCB) Annual Report. WRPD reports/publishes water consumption data in the District's Urban Water Management Plan to meet the State's and Federal regulatory requirements. WRPD oversees the WCD Hub and Procedure 900.

The Office of Water Recycling of the Water Supply Improvements Division, which is located within the WNR, is responsible for assessing recycled water production and use from wastewater sources, as well as potable supplement and customer raw water use. The District recycled water use is reported annually with the potable supplement and other non-potable values to be retrieval through the Hub. The District's recycled water accounting terms and reporting responsibilities are defined in Procedure 901.

Operations and Maintenance Department (OMD)

OMD is responsible for measuring, collecting, retrieving, recording, validating, reporting, and making available metered water supply production and use data from the District's water treatment facilities.

Customer and Community Services Department (CUS)

The Customer Services Support Division of the CUS is responsible for storing metered water readings, calculating usage and charges from metered water readings, as well as accuracy of CW data, as described in the Data QA/QC section of this procedure. The Customer Services Support Division is also under contract to bill for other public agencies.

The Water Conservation Division (WCD) of the CUS is responsible for water conservation service, assessment and reporting current and projected water conservation savings by customer type and land use. The District's water conservation accounting terms and reporting responsibilities are defined in Procedure 902.

Information Systems Department (ISD)

The Applications Division (AD) of ISD is responsible for developing and maintaining the repositories of the water consumption data. The AD development the WCD Hub that centralizes and meets water consumption query needs of District staff.
AD is also responsible for implementing quality control procedures on the data. To ensure accuracy and consistency, all metered water consumption data to be released to the public should be retrieved via the sources listed in this Procedure. (See Metered Consumption Data: Retrieval/ Reporting section of this procedure).

Finance Department (FIN)

Treasury Operations in the FIN is responsible for tracking billed water use and revenue, including classification by customer and service area region for use in the District's financial planning and reporting. The water use reported by FIN is taken directly from CW and reflects the billed metered water consumption that was printed for customer statements during the reporting period. These consumption reports do not correspond to the monthly water consumption in the WCDW. Treasury Operations develops their short-term water consumption projections data that is reviewed by the Demand Projections Committee (DPC). FIN reports on water consumption and revenue to the Board of Directors on a monthly basis.

The Controller's Office of the FIN gathers information about water production for the District Annual Report "comparative highlights" section.

Wastewater Department (WWD)

The Environmental Services Division of the WWD is responsible for developing and assessing capacity fees, rates, and charges associated with wastewater services. The Environmental Services Division is responsible for determining wastewater flow for billing and verifying wastewater flows for facility planning and billing purposes. The WWD is also responsible for coordinating with the Office of Water Recycling to ensure non-potable and potable water served within the District's recycled water systems is properly reviewed and stored.

Engineering and Construction Department (ENG)

The Water Distribution Planning Division (WDPD) of the ENG is responsible for preparing the District's Demand Study Updates that forecast water use over a 30-year planning horizon by land use categories and census tracts; and for preparing Water Supply Assessments and Written Verifications of Sufficient Water Supply as required by the State Water Code. The WDPD chairs the DPC that is responsible for reviewing and approving demand projections that are reported by District staff.

Office of the General Manager (OGM)

The Communications Office of the OGM is responsible for ensuring consistent data on current and past water use that is provided to the media, and used in publications and at community events attended by the District's Board of Directors, management and staff. Consistent data helps maintain customer and stakeholder confidence in the District; therefore the Communications Office should coordinate with the Project Management Office of the ADD on all metered water consumption data released to the public.

Demand Projections Committee (DPC)

The DPC members are representatives from each Department in the District described above. The DPC is chaired by WDPD. It is an inter-departmental committee that reviews and provides oversight of any short-term or long-term demand projections as well as providing feedback and guidance to Departments that are performing water use analysis.

Water Consumption Accounting and Reporting

Acronyms

AD – Applications Division
BCC – Business Classification Code
CIS – Customer Information System
CUS – Customer and Community Services Department
CW – Customer Watch
DPC – Demand Projections Committee
EBMUD – East Bay Municipal Utility District
ENG – Engineering and Construction Department
FIN – Finance Department
ISD – Information Systems Department
OGM – Office of the General Manager
OMD – Operations and Maintenance Department
QA/QC – Quality Assurance/ Quality Control
SI – Seasonal Index
SWRCB – State Water Resources Control Board
USBR – United States Bureau of Reclamation
WCD – Water Conservation Division
WCDW – Water Consumption Data Warehouse
WNR – Water and Natural Resources Department
WRPD – Water Resources Planning Division
WWD – Wastewater Department

References

Procedure 146 – Water Conservation Accounting and Reporting
Procedure 708 – Facilities: Metering Water Consumption
Procedure 901 – Recycled Water Accounting and Reporting
EBMUD Urban Water Management Plan (2015)
EBMUD Water Management Plan (2018)
EBMUD Water Conservation Master Plan (2011)
EBMUD Recycled Water Master Plan (2020)

Water Consumption Accounting and Reporting

NUMBER: 900
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Attachment A
STANDARD REPORTS AND PUBLICATION DATES

Dept	Report	Board Action	External Action	Frequency	Month	FY[1]	CY[2]
	Water Rights Reports *Annual reports submitted to the SWRCB summarizing the District's water use characteristics.*		Submitted to SWRCB	Annually	June		●
	Urban Water Management Plan *A comprehensive report of water supply sources, production, usage, wastewater, recycled water and conservation. It is submitted to the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation.*	Adoption with a Resolution	Submitted to DWR	Every 5 years	July	●	●
	Monthly Volumes Delivered *As a requirement of the District's CVP Contract, the District shall inform the USBR and the DWR in writing by April 30 of each year of the monthly volume of surface water delivered within the District's service area during the previous contract year (February-March).* *A report that provides current information on the District's service area, supply and usage. It is submitted to the USBR as a requirement of the District's Central Valley Project (CVP) Contract.*		Submitted to USBR	Annually	April	●	
	Municipal & Irrigation Use *As a requirement of the District's CVP Contract the District shall inform USBR on or before the 20th of each month of the quantity of CVP water taken during the previous month.*		Submitted to USBR	Monthly (after CVP water takes only)	All		●
	Monthly Consumption/Production Values *As a requirement of the SWRCB, monthly values are required to be submitted by the 15th of each month for the water use in the prior month. Information on DMP measures implemented are required during drought periods*						
OMD	**Water Loss Audit Report** *As a requirement of SB-555, the District produces a validated annual report on water use that must be certified by the GM. OMD compiles and produces the report, and WNR submits it.*		Submitted to DWR	Annually	Oct		●

Water Consumption Accounting and Reporting

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Dept	Report	Board Action	External Action	Frequency	Month	FY[1]	CY[2]
	Water Supply Operations Plan *The Plan describes the actual and projected water supply operations for the water year from October 1 to September 30 for the Mokelumne and the East Bay systems.*			Annually	May		●
	Water Supply Engineering Statistical Report *The Report provides an annual record of operation for the water supply system.*			Annually	Nov	●	
ENG	**Demand Study Update** *A study using a land-use based methodology to forecast water distribution system demand for a 30-year planning horizon.*			Every 5-10 years	Varies		●
FIN	**Financial and Statistical Report** *A Blue Book that provides separate financial statements, flux analyses and water consumption for Water and Wastewater.*			Semi-Annually	Dec		●
	Comprehensive Annual Financial Report *The report represents the District's financial position and results of operations, and demographic and statistical information.*			Annually	Jun	●	
OGM (Public Affairs)	**EBMUD Report on the Biennial Budget** *External report representing District-wide activities and focus for two fiscal years. The report provides a summary of water programs and projects that are completed and underway.*		Public Distribution	Annually	Dec-Jan	●	
	All About EBMUD *A report describing EBMUD's system.*		Public Distribution	Biennially (last update 2018-2019)	Dec	●	
	Reponses to Media Inquiries *Disseminates fiscal and calendar year information about water use in response to media inquiries, which are sometimes very time-sensitive and require prompt response.*		Public Distribution	Annually	Varies		

[1]/ Fiscal Year
[2]/ Calendar Year

EBMUD

Procedure 904

EFFECTIVE 24 MAR 21
SUPERSEDES NEW
LEAD DEPARTMENT WNR

WATER LOSS AUDIT ACCOUNTING AND REPORTING

PURPOSE - To establish procedures for collecting and validating data related to the District's annual water loss audit report and to describe the associated Departmental responsibilities.

Regulatory Requirements

Senate Bill 555 (SB 555), passed in October 2015, requires the state's urban retail water suppliers to complete an annual water loss audit report on their water distribution systems and submit a validated water loss audit report to the California Department of Water Resources (DWR) by October 1st of each year, starting in 2017. SB 555 requires water audits to be conducted according to American Water Works Association (AWWA), Water Audits and Loss Control Programs, M36 Manual (AWWA M36) and AWWA's free Water Audit software which can be accessed via AWWA's website: http://www.awwa.org. (Data source: AWWA).

The water loss audit report must be validated by a certified expert attested by the utility executive and include steps taken to increase data validity, reduce apparent loss volume, and reduce real loss volume. Senate Bill 1420 established that urban water suppliers submit a report that quantifies water system losses with their urban water management plans.

By July of the 2021 calendar year, the State Water Resources Control Board (SWRCB) plans to adopt rules requiring urban retail suppliers to meet performance standards for the volume of real water losses. The District will comply with these rules when they are adopted.

Water Audit Terms and Definitions

<table>
<tr><td rowspan="8">Water Sources</td><td rowspan="8">Distribution System Input (i.e. production)</td><td rowspan="4">Authorized Consumption (e.g. customer demand)</td><td rowspan="2">Billed Authorized Consumption</td><td>Billed Water Exported</td><td rowspan="2">Revenue Water</td></tr>
<tr><td>Billed Metered Consumption</td></tr>
<tr><td rowspan="2">UnBilled Authorized Consumption</td><td>Unbilled Metered Consumption</td><td rowspan="6">Non-Revenue Water</td></tr>
<tr><td>Unbilled Unmetered Consumption</td></tr>
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Distribution system Input component terms, adopted from AWWA International Water Association Audit Components, provide an overview of the connection between the components and how they are defined. For specific definitions of each term shown in the table above, a comprehensive list is available through DOCS at https://docs/doc/2847286.

Water Loss Audit Accounting and Reporting

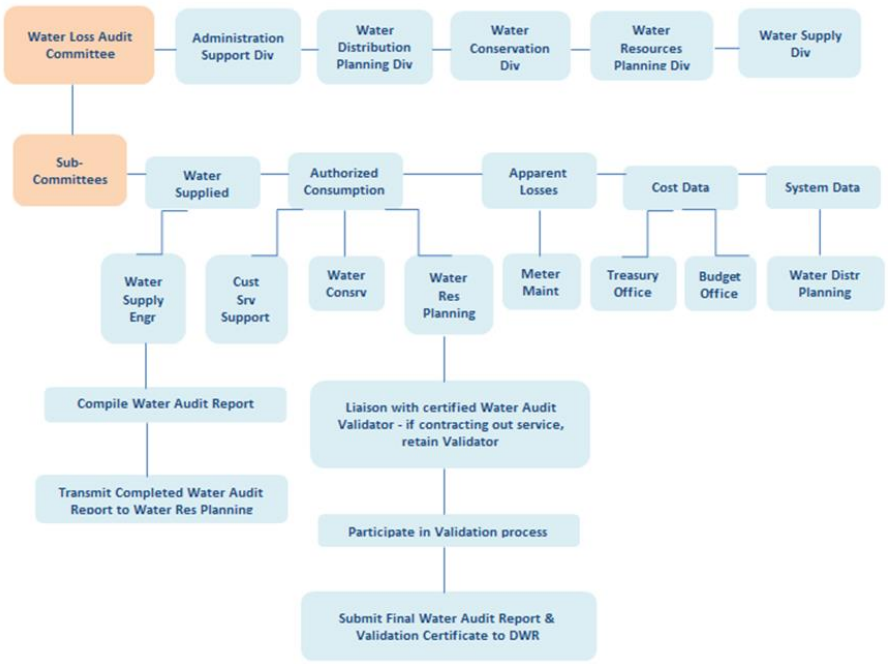
Responsibilities

District divisions with primary responsibility for providing data to complete the water loss audit report are Administration and Support, Water Resources Planning, Water Supply Engineering, Water Conservation, Treasury Office, Budget Office, Water Distribution Planning, Facilities Maintenance and Construction, and Maintenance Support.

The water loss audit report is presented in the form of a worksheet that details the variety of consumption and losses that exist in a public water system. The District is required to enter water system information into the water loss audit worksheet to calculate water balance and determine the apparent and real losses that occurred in the previous calendar year.

Past water loss audit reports are accessible at http://wiki/water_ops/index.php5/Water_Supply_Engineering_Reports_%26_Graphics#Water_Audit_Reports.

Figure 1 below provides a visual representation of the District's organizational Chart for water audit coordination.



The Water Loss Audit (WLA) Committee coordinates the District WLA activities, roles and responsibilities; including a review of each component of the District's WLA as defined by AWWA, and recommends improvements to the process to meet District and state regulatory requirements.

The subcommittees are comprised of stakeholders that support the WLA Committee to perform tasks related to water loss audit and make contributions based on each subcommittee's subject matter expertise to complete the annual water audit report. The subcommittees were established based on the required Water Loss Audit components as defined in AWWA's guidance (Reference: AWWA Free Water Audit Software v5.0 Definitions).

Water Loss Audit Accounting and Reporting

Water Loss Audit Timeline

- In March, sub-committees began to meet to compile data, discuss new developments and progress of implemented recommendations, and establish recommended grades per the AWWA grading matrix.
- In mid-June, each sub-committee prepares a memo that contains the water loss audit components' data and submits it to Water Supply Engineering (WSE) work unit. WSE compiles the data and produces the Water Loss Audit Report and transmits it to the Water Resources Planning (WRP) work unit.
- In July, WRP coordinates with internal certified validator (currently residing in Water Distribution Planning Division), or if contracting out service, WRP retains the service of a certified validator to validate the water audit report.
- By September, WRP completes the validation process and submits the validated water audit report together with the validation certificate through the WLA committee to request General Manager's approval and signature on the validation certificate.
- By October 1, WRP uploads the validated water audit report and the signed validation certificate onto DWR's web portal.

References

American Water Works Association Manual 36 - Water Audits and Loss Control Programs (Fourth Edition)
American Water Works Association Free Water Audit Software (Version 5)
EBMUD Urban Water Management Plan (2015)

Procedure 900 – Water Consumption Accounting and Reporting

EBMUD

SCHEDULE A – RATE SCHEDULE FOR WATER SERVICE

EFFECTIVE 07/01/20

A. ONE MONTH BILLING

Bills for all metered services shall consist of:

FIRST – A WATER SERVICE CHARGE based on the size of a standard meter:

METER SIZE	SERVICE CHARGE AMOUNT
5/8 and 3/4 inch	$27.87
1 inch	42.10
1-1/2 inch	77.68
2 inch	120.35
3 inch	234.19
4 inch	362.25
6 inch	717.90
8 inch	1,144.74
10 inch	1,642.68
12 inch	2,282.95
14 inch	2,923.16
16 inch	3,705.68
18 inch	4,488.18

The service charge 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.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer to maintain adequate water pressure, the maximum service charge amount shall be set at the 4-inch meter level.

SCHEDULE A – RATE SCHEDULE FOR WATER SERVICE

EFFECTIVE 07/01/20

SECOND – A WATER FLOW CHARGE FOR WATER DELIVERED based on one month meter readings for all water delivered per unit of water (1 unit = 100 cu. ft. = 748 gallons):

Potable Water Service	WATER FLOW CHARGE PER UNIT
Single Family Residential Accounts:	
For the first 172 gpd	$4.25
For all water used in excess of 172 gpd, up to 393 gpd	5.85
For all water used in excess of 393 gpd	7.72
Multiple Family Residential Accounts:	
For all water used	6.01
All Other Water Use:	
For all water used	5.98

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.

Nonpotable/Recycled Water Service	WATER FLOW CHARGE PER UNIT
For all water used	$4.66

EBMUD

SCHEDULE A – RATE SCHEDULE FOR WATER SERVICE

EFFECTIVE 07/01/20

B. TWO MONTH BILLING

Bills for all metered services shall consist of:

FIRST – A WATER SERVICE CHARGE based on the size of a standard meter:

METER SIZE	SERVICE CHARGE AMOUNT
5/8 and 3/4 inch	$55.74
1 inch	84.20
1-1/2 inch	155.36
2 inch	240.70
3 inch	468.38
4 inch	724.50
6 inch	1,435.80
8 inch	2,289.48
10 inch	3,285.36
12 inch	4,565.90
14 inch	5,846.32
16 inch	7,411.36
18 inch	8,976.36

The water service charge 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.

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer to maintain adequate water pressure, the maximum service charge amount shall be set at the 4-inch meter level.

EBMUD

SCHEDULE A – RATE SCHEDULE FOR WATER SERVICE

EFFECTIVE 07/01/20

SECOND – A WATER FLOW CHARGE FOR WATER DELIVERED based on two month meter readings for all water delivered per 1 unit of water (1 unit = 100 cu. ft. = 748 gallons):

Potable Water Service	WATER FLOW CHARGE PER UNIT
Single Family Residential Accounts:	
For the first 172 gpd	$4.25
For all water used in excess of 172 gpd, up to 393 gpd	5.85
For all water used in excess of 393 gpd	7.72
Multiple Family Residential Accounts:	
For all water used	6.01
All Other Water Use:	
For all water used	5.98

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.

Nonpotable/Recycled Water Service	WATER FLOW CHARGE PER UNIT
For all water used	$4.66

C. EXCEPTIONS TO TWO MONTH BILLING

Except as provided below, customer accounts shall be subject to bi-monthly meter reading and customer billing schedules

- Accounts for which the average monthly bill is estimated to exceed $1,500; such accounts 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 $1,500, and the customer service manager recommends monthly billing based on an evaluation of credit and/or collection problems.

EBMUD

SCHEDULE A – RATE SCHEDULE FOR WATER SERVICE

EFFECTIVE 07/01/20

D. PRIVATE FIRE SERVICES

Effective July 1, 2005, the rates for Private Fire Services shall consist of:

FIRST – A MONTHLY SERVICE CHARGE based on the size of a standard meter:

METER SIZE	SERVICE CHARGE AMOUNT
5/8 and 3/4 inch	$14.83
1 inch	20.38
1-1/2 inch	34.17
2 inch	50.73
3 inch	94.96
4 inch	144.67
6 inch	282.80
8 inch	448.55
10 inch	641.90
12 inch	890.50
14 inch	1,139.13
16 inch	1,443.02
18 inch	1,746.89

Effective July 1, 1997, when a meter larger than 4 inches is required for a single-family residential customer to maintain adequate water pressure, the maximum service charge amount shall be set at the 4-inch meter level.

SECOND – A WATER FLOW CHARGE FOR WATER DELIVERED based on two-month meter readings for all water delivered per unit:

There shall be no charge for water through such services extinguishing accidental fires, but any water lost through leakage or used in violation of the District's Regulations shall be paid at the rate for general use and may be subject to a penalty as may be established by the District.

EBMUD

SCHEDULE A – RATE SCHEDULE FOR WATER SERVICE

EFFECTIVE 07/01/20

E. ELEVATION SURCHARGE

Elevation Designator	AMOUNT PER UNIT
Pressure Zone 1: Elevation Designator 0 and 1	$0.00
Pressure Zone 2: Elevation Designator 2 through 5	0.86
Pressure Zone 3: Elevation Designator 6 and greater	1.79

The elevation surcharge is determined by the pressure zone in which the service connection is located. Pressure zones are identified by designations that include an elevation designator.

SECTION 28

WATER USE DURING WATER SHORTAGE EMERGENCY CONDITION

Drought conditions require that all customers reduce their use of EBMUD water supplies until further notice to ensure availability of the public water supply for critical uses. This regulation specifies the water uses that are prohibited during the drought and provides guidelines on effective water use practices to help customers conserve. It also defines the exceptions and enforcement provisions should customers fail to comply with the prohibitions.

A. EMERGENCY REGULATIONS AND RESTRICTIONS ON WATER USE

During the water shortage emergency condition declared by the Board of Directors, all customers must comply with prohibitions on water uses described below to conserve the public water supply to meet critical needs. In addition, customers are asked to follow the water saving guidelines below.

1. Potable Water Uses Prohibited During the Water Shortage Emergency

   a. Using potable water for decorative ponds, fountains and other water features that do not recirculate water is prohibited.

   b. Washing cars, boats, trailers, aircraft or other vehicles with potable water by hose without a shutoff nozzle is prohibited.

   c. Washing sidewalks, driveways or hard surfaces with potable water, or applying potable water to any surface or material that results in excessive use and runoff is prohibited.

   d. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures is prohibited.

   e. Irrigating turf and ornamental landscape is only permitted no more than two days each week, not on consecutive days, and before 9 a.m. and after 6 p.m., except for potted plants.

   f. Irrigating turf and ornamental landscaping with potable water during and within 48 hours following measurable precipitation is prohibited.

   g. Using potable water for irrigating ornamental turf on public street medians is prohibited.

   h. Flushing sewers or hydrants with potable water are prohibited, except in cases of emergency and for essential operations.

   i. Use of potable water for construction, street cleaning, soil compaction and dust control is prohibited if a feasible alternative source of water is available. All water use for construction, soil compaction and dust control will require a permit issued by EBMUD.

j. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased is prohibited.

k. Operators of hotels and motels are required to offer patrons the option of not having their towels and linens washed daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.

l. Use of hydrant water outside the EBMUD service area is prohibited.

2. Water Savings Guidelines

a. Conserve water indoors. Efficient indoor water use is 45 gallons and super-efficient indoor use is 35 gallons per person daily. Most customers can achieve this by shortening showers and using less bath water, running only full loads of laundry and dishes, and keeping a close eye on faucet use. Additionally, customers are encouraged to reduce use of kitchen garbage disposals through composting or curbside green waste collection and not to use toilets as wastebaskets. Customers also may want to consider upgrading to more water-efficient plumbing fixtures and appliances.

b. Promptly repair leaks indoors and outside. Measureable leaks should not be turned on until repairs have been completed.

c. Use covers on swimming pools and home spas (hot tubs) and avoid draining, refilling and topping off.

d. Encourage gyms, spas and similar facilities to ask patrons to conserve water while showering and using wash basins.

e. Encourage all food preparation establishments, such as restaurants and cafeterias, to install and use high-efficiency pre-rinse spray nozzles in their kitchens.

f. Irrigate less outdoors. Most customers can cut outdoor watering 30% without affecting long-term plant health by irrigating before dawn or at dusk, no more than two days per week.

B. EXCEPTIONS

1. Written applications for exceptions from the regulations and restrictions on water use set forth in this Section shall be accepted, and may be granted, by the Customer & Community Services Department.

2. 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.

3. Denials of applications may be appealed as set forth in subdivision D, below.

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 are fixed by the Board from time to time and shall be paid by the customer.

2. In the event that the District observes that apparent excessive water use is occurring at a customer's premises, the Manager of Customer and Community Services 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 staff to be willfully violating any of the regulations and restrictions on water use set forth in this section. Charges for installation of flow-restricting devices may be fixed by the Board from time to time and shall be paid by the customer.

3. In the event that a further willful violation is observed by District staff, the District may discontinue service. Charges for restoring service may be fixed by the Board from time to time and shall be paid by the customer.

4. The District may immediately revoke a permit to use water from an EBMUD hydrant when water is observed being used in violation of the emergency regulations or restrictions on water use.

D. APPEALS

Consideration of written applications for appeals regarding exceptions from the regulations and restrictions on water use set forth in this Section, and regarding application of the enforcement actions set forth in subdivision C, above, shall be as follows:

1. Written applications for appeals shall be accepted, and may be granted, by the Customer & Community Services Department.

2. Denials of applications may be appealed in writing to the Manager of Customer and Community Services.

SECTION 29

WATER USE RESTRICTIONS

A. REGULATIONS AND RESTRICTIONS ON WATER USE

The Board of Directors declares that in order to conserve the District's water supply for the greatest public benefit and to reduce the quantity of water used District customers shall observe the following regulations and restrictions on water use except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency.

1. The following potable water uses are prohibited:

   a. The application of potable water to outdoor landscapes in a manner that causes more than incidental runoff such that water flows onto adjacent property, non-irrigated areas, or hardscapes (private and public walkways, roadways, parking lots, or structures);

   b. The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;

   c. The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with the irrigation requirements set forth in Section 31 of these Regulations Governing Water Service to Customers or other requirements established by local ordinances and/or state regulations.

   d. The application of potable water to sidewalks and driveways; or applying potable water to other hard surfaces or materials that results in excessive use and runoff;

   e. The use of a hose that dispenses potable water to wash a motor vehicle, boat, trailer, aircraft or other vehicles except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;

   f. The use of potable water in an ornamental fountain or other decorative water feature, except where the water is part of a recirculating system; and

   g. Use of potable water for construction, street cleaning, soil compaction and dust control is prohibited if a feasible alternative source of water is available. All water use for construction, soil compaction and dust control will require a permit issued by EBMUD.

SECTION 29

WATER USE RESTRICTIONS
(Continued)

2. All Customers shall:

   a. Reduce other interior or exterior uses of water to minimize or eliminate excessive runoff; and

   b. Repair leaks wherever feasible. Irrigation or plumbing with measureable leaks such that water flows onto adjacent property, non-irrigated areas, or hardscapes (private and public walkways, roadways, parking lots, or structures) shall not be turned on or restored to service until repairs have been completed.

3. Nonresidential Customers shall:

   a. Use systems that recycle water where feasible; single pass cooling systems in new connections, and non-recirculating systems in all new conveyer car wash and commercial laundry systems shall be prohibited.

   b. Limit sewer flushing or street washing with potable water as much as possible, consistent with public health and safety needs; and

   c. Operators of hotels and motels are required to offer patrons the option of not having their towels and linens washed daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.

4. Water Savings Guidelines

   a. Conserve water indoors. Efficient indoor water use is approximately 45 gallons and super-efficient indoor use is approximately 35 gallons per person daily. Most customers can achieve this by shortening showers and using less bath water, running only full loads of laundry and dishes, and keeping a close eye on faucet use. Additionally, customers are encouraged to reduce the use of kitchen garbage disposals through composting or curbside green waste collection and not to use toilets as wastebaskets. Customers may also consider upgrading to more water-efficient plumbing fixtures and appliances. Customers are also encouraged to check and watch for potential indoor and outdoor leaks.

   b. Use covers on swimming pools and home spas (hot tubs) and avoid frequent draining, refilling and topping off.

SECTION 29

WATER USE RESTRICTIONS
(Continued)

c. Irrigate less outdoors. Most customers can cut outdoor watering without affecting long-term plant health by irrigating before dawn or at dusk, and not on consecutive days. Customers also may want to consider upgrading to more water-efficient irrigation methods and low-water use plants more appropriate and adaptable to the local summer-dry climate.

d. Gyms, spas and similar facilities should request patrons to conserve water while showering and using wash basins.

e. All food preparation and eating establishments, including restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased are encouraged to install and use high-efficiency pre-rinse spray nozzles in their kitchens where applicable.

f. Ensure existing trees remain healthy and do not present a public safety hazard. Trees and other non-turf vegetation within street medians may continue to be watered efficiently.

B. EXCEPTIONS

Consideration of written applications for exceptions regarding the 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 Water Conservation.

2. Denials of applications may be appealed in writing to the Manager of the Customer and Community Services Department.

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.

SECTION 29

WATER USE RESTRICTIONS
(Continued)

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 use of water in violation of these regulations 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 water use in violation of these regulations is occurring at a customer's premises, the General Manager or the Manager of Customer and Community Services Department 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 the installation of flow-restricting devices or 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. Applicants shall be subject to the most current and most water-efficient requirements in effect on the date the District receives payment for new or upgraded service, whether specified by EBMUD or other local, state, or federal regulations..

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 increased or expanded service shall be required to meet the water-efficiency requirements for all new water service facilities and may be required to retrofit existing water service facilities or uses to comply with all 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 indoor and outdoor water efficiency measures to verify that the items are installed and performing to the required water efficiency 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 increased or expanded service, or for any change in customer classification (such as a change from industrial to commercial, residential to commercial, or the like) that includes new or retrofitted water using equipment, unless all the applicable water-efficiency measures hereinafter described in this Section 31 and required by applicable local, state and/or federal law have been reviewed and approved by the District. All the applicable and required water-efficiency measures shall be installed at Applicant's expense.

C. INDOOR WATER USE

a. All Applicants shall comply with these regulations and those required by applicable local, state and/or federal law including the California Green Building Standards Code (CAL Green).

b. 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)

c. Wall mounted urinals shall have a maximum rated flow of 0.125 gpf or less, or be zero water consumption urinals.

d. Floor mounted urinals shall have a maximum rated flow of 0.5 gpf or less.

e. Single showerheads shall have a maximum flow rate of 1.8 gallons per minute (gpm) at 80 pounds of pressure per square inch (psi).

f. Multiple showerheads serving a single shower enclosure shall have a combined flow rate of not more than 1.8 gpm at 80 psi or shall be designed to allow only a single showerhead to be operated at one time.

g. Residential lavatory faucets shall have aerators or laminar flow control devices (i.e., orifices) with a maximum rated flow of 1.2 gallons per minute or less.

h. Public lavatory faucets shall have aerators or laminar flow control devices with a maximum rated flow of 0.5 gallons per minute or less.

i. Wash fountains shall have a maximum flow rate of not more than 1.8 gpm per wash station.

j. Metering faucets shall not deliver more than 0.20 gallons per cycle.

k. Kitchen faucets shall have aerators or laminar flow control devices (i.e., orifices) with a maximum rated flow of 1.8 gallons per minute or less with optional temporary flow of 2.2 gpm.

l. Clothes washing machines shall be front loading horizontal axis or top loading models with a water factor rating of 4.5 or less. A water factor rating of 4.5 means a maximum average water use of 4.5 gallons per cubic foot of laundry.

m. Residential dishwashers rated as standard size (i.e. 307 kWh/year) shall use less than or equal to 5.0 gallons/cycle. Dishwashers rated as compact size (i.e., 222 kWh/year) shall use less than or equal to 3.5 gallons/cycle.

n. 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.

o. Food steamers in all food service facilities shall be boiler-less or self-contained models using ≤ 3.0 gallons per hour where applicable.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

p. Ice machines shall be air-cooled and use no more than 20 gallons of water per 100 pounds of ice and shall be equipped with a recirculating cooling unit or water-cooled on a closed loop system.

q. Commercial refrigeration shall be air-cooled or if water-cooled, must have a closed looped system. No once through, single pass systems are permitted.

r. Pre-Rinse dishwashing spray valves shall have a maximum rated flow of 1.28 gpm or less.

s. Food disposers shall modulate the use of water to no more than 1 gpm when the disposer is not in use and shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.

t. Commercial dishwashers or ware washing equipment shall be currently labeled an EnergyStar rated water efficient model meeting the maximum water consumption limits as specified in the table below:

Machine Type	High Temp Requirements	Low Temp Requirements
Under Counter	≤ 0.86 GPR	≤ 1.19 GPR
Stationary Single Tank Door	≤ 0.89 GPR	≤ 1.18 GPR
Pot, Pan, and Utensil	≤ 0.58 GPSF	≤ 0.58 GPSF
Single Tank Conveyor	≤ 0.70 GPR	≤ 0.79 GPR
Multiple Tank Conveyor	≤ 0.54 GPR	≤ 0.54 GPR
Single Tank Flight Type	≤ GPH ≤ 2.975x + 55.00	≤ GPH ≤ 2.975x + 55.00
Multiple Tank Flight Type	≤ GPH ≤ 4.96x + 17.00	≤ GPH ≤ 4.96x + 17.00

*GPR (gallons per rack); GPSF (gallons per square foot); GPH (gallons per hour)

u. Conveyor and in-bay vehicle wash facilities shall reuse a minimum of 60% of water from previous vehicle rinses in subsequent washes.

v. Self-service vehicle wash facilities shall use spray nozzles with a flow rate of 3.0 gpm or less.

w. Swimming pools and spas shall be covered when not in use, unless public health and safety concerns exist.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

D. OUTDOOR WATER USE

a. All Applicants shall comply with all District water service regulations and those required by applicable local, state and/or federal law including the Model Water Efficient Landscape Ordinance (MWELO).

b. Applicants shall submit, at a minimum, a scaled site plan that identifies the property address, parcel boundaries, building footprints, hardscape, softscape, meter location, and location of each hose bib. If an application for service is submitted without a detailed landscape plan for the entire premises, the District will estimate the new irrigable landscape area to determine the potential irrigation demand (default demand) for inclusion in the total domestic water demand calculation. Projects subject to MWELO shall also provide a compliant landscape documentation package as required by the ordinance.

c. All premises with 500 square feet or more of new irrigable landscape area shall install a modular weather-based smart controller with rain or soil moisture sensor, an irrigation connection with a manual shutoff valve, a backflow prevention device, a pressure regulator where pressure exceeds the operating range of system components, and sleeves allowing irrigation to extend to all landscape areas.

d. All non-residential premises with 500 square feet or more of new irrigable landscape shall also install a flow sensor with master shutoff valve.

e. All residential premises with more than 5,000 square feet of new irrigable landscape area shall also install a flow sensor with master shutoff valve.

f. As provided in Sections 1 and 3 of the Regulations, unless determined by the District that a District-dedicated irrigation meter is required, a private dedicated irrigation meter shall be required for residential premises with an irrigable landscape area of 5,000 square feet or more.

g. As provided in Sections 1 and 3 of the Regulations, unless determined by the District that a District-dedicated irrigation meter is required, a private dedicated irrigation meter shall be required for non-residential premises with an irrigable landscape area of more than 1,000 square feet but less than 5,000 square feet.

h. As provided in Sections 1 and 3 of the Regulations, a District dedicated irrigation meter shall be required for non-residential premises with an irrigable landscape area of 5,000 square feet or more.

SECTION 31

WATER EFFICIENCY REQUIREMENTS
(continued)

E. NONCOMPLIANCE

The District will review applications for new and expanded services for water efficiency features as described in this Section. If an application does not meet the water efficiency requirements, the District may require the Applicant to resubmit a revised water service application and water efficiency plan at the Applicant's expense. The District may withhold water meter(s) and account activation until the District determines the application complies with the requirements of this Section.

WATER THEFT PENALTY ORDINANCE

WHEREAS, California Penal Code section 498 prohibits the theft of utility services, including water; and

WHEREAS, California Penal Code section 624 prohibits every person from willfully damaging, tampering with, or digging up water pipes or waterworks; and

WHEREAS, California Penal Code section 625 prohibits every person who, with intent to defraud or injure, opens or causes to be opened, or draws water from any disconnected utility connection after having been notified that the same has been closed or shut for specific cause, by order of competent authority; and

WHEREAS, any person who violates Penal Code sections 498, 624, or 625 is guilty of a misdemeanor; and

WHEREAS, California Civil Code section 1882 *et seq*. authorizes the East Bay Municipal Utility District (the "District") to bring a civil action for damages against any person who commits, authorizes, solicits, aids, abets, or attempts any of the following acts:

a. Diverts, or causes to be diverted, utility services by any means whatsoever.

b. Makes, or causes to be made, any connection or reconnection with property owned or used by the utility to provide utility service without the authorization or consent of the utility.

c. Prevents any utility meter, or other device used in determining the charge for utility services, from accurately performing its measuring function by tampering or by any other means.

d. Tampers with any property owned or used by the utility to provide utility services.

e. Uses or receives the direct benefit of all, or a portion, of the utility service with knowledge of, or reason to believe that, the diversion, tampering, or unauthorized connection existed at the time of the use, or that the use or receipt, was without the authorization or consent of the utility; and

WHEREAS, pursuant to California Civil Code section 1882 *et seq*., the District may bring a civil action for the unauthorized use of District water; and

WHEREAS, the District's "Regulations Governing Water Service to Customers of the East Bay Municipal Utility District" (the "Regulations"), including Sections 7, 15, 19, and 23, establish rules and regulations that govern the use of water and prohibit water theft from District facilities; and

EXHIBIT A

WHEREAS, pursuant to California Government Code section 53069.4, the District may, by ordinance, make the violation of any ordinance enacted by its Board of Directors subject to a civil administrative fine or penalty; and

WHEREAS, because water is a vital resource, the District has determined that it is appropriate to impose civil administrative fines for the theft of water to protect this vital resource; and

WHEREAS, water theft from hydrants and/or the improper use of hydrant meters results in greater water loss to the District than water theft resulting from meter tampering, and may involve a more egregious violation, which includes the reselling of water; and

WHEREAS, water theft in the form of lateral diversion poses significant risks and costs to the District and the community because it may result in compromising water quality, adverse public health impacts, loss of revenues from water sales, and damage to District facilities; and

WHEREAS, those engaging in water theft in the form of unauthorized hydrant use and lateral diversions typically involve individuals who avoid obtaining proper service from the District and paying the associated fees, have a more egregious intent of theft, do not have District water service accounts, and thus impose greater costs to the District in identifying and pursuing them for the purposes of this Ordinance;

BE IT ENACTED by the Board of Directors of the East Bay Municipal Utility District as follows:

Section 1. **Recitals.** The District hereby finds and determines that the above recitals are true and correct and are incorporated herein.

Section 2. **Administrative Penalties.**

a. For the purposes of this Ordinance, "water theft" means and includes all of the following:

1. the use, diversion, receipt or taking of District water by any means from any public fire hydrant, blow-off valve, water main, water service lateral or other District facility or connection to a District facility, to which a District authorized metering device has not been installed or has been removed by the District;

2. the use, diversion, receipt, or taking of District water by any means without paying the full and lawful District fees or charges for such water, or by tampering with District property or facilities, such as by removing a lock or plug that has been placed on a customer's service or meter, or unauthorized use, or by tampering with a service connection or bypassing a meter, or by making an unauthorized connection to any District facilities and any public fire hydrant; and

3. For the purposes of this ordinance, "unauthorized use" includes the use of water from a stationary service connection where lawful water service has been discontinued or

from a public fire hydrant to supply water outside of the District service area, regardless of whether payment is provided to the District for the water drawn from the public fire hydrant, or any use of a hydrant meter in violation of the terms and conditions of a hydrant meter permit.

b. Water theft is prohibited. Each act of water theft constitutes a misdemeanor.

c. The District may report any water theft to the appropriate prosecuting agency and press for prosecution of said activity pursuant to the Penal Code. In addition to pursuing criminal penalties, the District, upon discovering water theft or tampering with District property, may also pursue the following remedies or other remedies available at law or equity:

1. require the immediate removal of any equipment, connections or tools used to accomplish the water theft that is attached to District property;

2. require compliance with District regulations and standards for proper water service; and

3. charge the person committing the water theft an administrative penalty based on type of water theft, as set forth below:

A. Water Theft Via Meter Tampering

i. $0 for the first violation;

ii. $200 for a second violation within a twelve-month period; and

iii. $400 for each violation thereafter within a twelve-month period.

B. All Other Forms of Water Theft

i. $1,000 for the first violation;

ii. $2,000 for a second violation within a twelve-month period; and

iii. $3,000 for each violation thereafter within a twelve-month period.

Section 3. **Other Remedies.** In addition to any other remedies provided in this Ordinance or available under applicable law, the District may alternatively seek injunctive relief in the Superior Court or take enforcement action. All remedies provided herein shall be cumulative and not exclusive. If a District customer or any other person turns on water service without District authorization, tampers with any locked water meter, tampers with a service connection or District facilities, bypasses a meter, otherwise makes an unauthorized connection

to District facilities without District permission, or commits water theft, the District may do any, or a combination of any, of the following:

a. turn off the water service and install a lock;

b. estimate, if necessary, the water taken and charge the customer, offender and/or recipient of the stolen water three times the normal rate of the water taken or estimated to be taken from the District facility;

c. charge the customer, offender and/or recipient of the stolen water for the damage to the District lock, meter or other property;

d. remove the meter and plug the service;

e. terminate and remove the service from its connection to the water main;

f. charge the customer a deposit, as required under Regulation 9 of the District's Regulations Governing Water Service, to reestablish service;

g. require the return of any District hydrant meter; and

h. prohibit any person who has committed three violations of this Ordinance within a twelve-month period from obtaining a District hydrant meter permit for a period of three (3) years from the date of the third violation.

Section 4. **Payment and Appeal Procedures.** The District shall calculate the amount of damages and penalty(ies) to be imposed, and shall send a bill to the customer, or if the offender is not a customer of record or the recipient of stolen water, an invoice for payment of the damages or penalty(ies) may be sent to the offender and/or the recipient of the stolen water.

a. All costs relating to the District's processing and handling of the water theft, investigation and enforcement thereof, and potential charges for reestablishment of service, shall be borne by the party having responsibility for the water account at the time of the water theft, or if there is no customer of record, by the offender or recipient of the stolen water. These charges include, but are not limited to, service call charges, water charges, turnoff of service, charges for damage to District facilities and equipment, and plug and/or termination fees. Before the meter will be replaced and service reestablished, the party requesting service, if in any way involved in or related to, or associated with, parties involved in the water theft, shall provide a deposit as required under Regulation 9 of the District's Regulations Governing Water Service, plus the standard meter reinstallation fee, in addition to all service call charges, and an amount representing any damage to District property.

b. All charges relating to the District's processing and handling of the water theft involving the taking of water from a public fire hydrant shall be borne by the offender and/or the recipient of the stolen water, including, but not limited to, the cost of any water, charges for any damage to District facilities and equipment, and costs of investigation and enforcement.

c. Any person (an "appellant") who wishes to appeal the imposition of an administrative penalty imposed by the District pursuant to this Ordinance, or who wishes to appeal the imposition of a three-year prohibition on a hydrant meter permit pursuant to Section 3(h), shall comply with the following procedures:

1. The appellant shall submit an appeal request form to the District's Customer Service Division no later than fifteen (15) calendar days from the date of the bill or invoice sent to the customer or offender.

2. A response to the appeal request shall be provided by the District within thirty (30) calendar days from receipt of the appeal request form.

3. If an appeal request is denied, the appellant may resubmit the appeal request form no later than fifteen (15) calendar days from the date of the denial for review by the District's Customer Service Manager.

4. If an appeal request is denied, the appellant may resubmit the appeal request form for review by the District's Manager of Customer and Community Services Department, or his or her authorized designee. The request form shall be resubmitted no later than fifteen (15) calendar days from the date of the denial of the appeal by the District's Customer Service Manager. The appellant may request to provide evidence in writing or in person in support of his or her appeal to the District's Manager of Customer and Community Services Department, or his or her authorized designee.

5. The decision by the District's Manager of Customer and Community Service, or authorized designee, shall be final.

6. Within ten (10) days after the denial of the appeal is deemed final, the appellant shall pay any disputed penalty(ies) imposed by the District.

7. The provisions of Section 1094.6 of the Code of Civil Procedure of the State of California shall be applicable to judicial review of the decision.

Section 5. **Conflicting Provisions.** If provisions of this Ordinance are in conflict with each other, other provisions of the District's regulations or policies, any other resolution or ordinance of the District, or any State law or regulation, the more restrictive provisions shall apply.

Section 6. **Severability.** If any provision, section, subsection, sentence, clause or phrase or sections of this Ordinance, or the application of same to any person or set of circumstances, is for any reason held to be unconstitutional, void or invalid, the validity of the remaining portions of this Ordinance shall not be affected, it being the intent of the Board of Directors in adopting this Ordinance that no portions, provisions, or regulations contained herein shall become inoperative, or fail by reason of the unconstitutionality of any other provision hereof, and all provisions of this Ordinance are declared to be severable for that purpose.

Section 7. **Effective Date.** This Ordinance shall become effective and in full force at 12:01 a.m. on the thirty-first day after its passage.

The foregoing Ordinance was duly and regularly introduced at a regular meeting of EAST BAY MUNICIPAL UTILITY DISTRICT held on April 14, 2015, at the offices of said District, 375 - 11th Street, Oakland, California, and thereupon, after being read, further action was scheduled for the regular meeting of said Board of Directors held at the same place on April 28, 2015, at which time the Ordinance was finally adopted. An amendment to the foregoing Ordinance was duly and regularly introduced at a regular meeting of EAST BAY MUNICIPAL UTILITY DISTRICT on August 8, 2017, and thereupon, after being read, further action was scheduled for the regular meeting of said Board of Directors on September 12, 2017, at which time the Board of Directors requested additional amendments to the Ordinance. Accordingly, a continued second reading was scheduled for the regular meeting of the Board of Directors on September 26, 2017, at which time the Amended Ordinance was finally adopted to be effective on October 27, 2017.

{00020808}

ORDINANCE NO. 364-15

EXCESSIVE WATER USE PENALTY ORDINANCE FOR DROUGHT STAGES 3 AND 4

Introduced by Director Linney ; Seconded by Director McIntosh

WHEREAS, California Constitution article X, section 2 and California Water Code section 100 provide that because of conditions prevailing in the state of California (the "State"), it is the declared policy of the State that the general welfare requires that the water resources of the State shall be put to beneficial use to the fullest extent of which they are capable, the waste or unreasonable use or unreasonable method of use of water shall be prevented, and the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare; and

WHEREAS, pursuant to California Water Code section 106, it is the declared policy of the State that the use of water for domestic use is the highest use of water and that the next highest use is for irrigation; and

WHEREAS, pursuant to California Water Code section 375, the East Bay Municipal Utility District (the "District") is authorized to adopt and enforce a water conservation program to reduce the quantity of water used by persons within its jurisdiction for the purpose of conserving the water supplies of the District; and

WHEREAS, because of the declared policy of the State, the District hereby finds and determines that it is necessary and appropriate for the District to adopt, implement, and enforce a water conservation program to reduce the quantity of water used by consumers within the District to ensure that there is sufficient water for human consumption, sanitation, and fire protection; and

WHEREAS, pursuant to California Water Code section 350, the Board of Directors is authorized to declare a water shortage emergency to prevail within its jurisdiction when it finds and determines that the District will not be able to or cannot satisfy the ordinary demands and requirements of water consumers without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation, and fire protection; and

WHEREAS, in the event the District determines that it is necessary to declare that a water shortage exists, the District will be authorized pursuant to this Ordinance to implement certain water shortage response measures and a water conservation and regulatory program to regulate water consumption activities within the District and ensure that the water delivered in the District is put to beneficial use for the greatest public benefit, with particular regard to domestic use, including human consumption, sanitation, and fire protection, and that the waste or unreasonable use of water is prevented; and

WHEREAS, the District is authorized to prescribe and define by ordinance restrictions, prohibitions, and exclusions for the use of water during a threatened or existing water shortage and adopt and enforce a water conservation and regulatory program to: (i) prohibit the waste or

the unreasonable use of District water during such periods; (ii) prohibit the use of water during such periods for specific uses which the District may from time to time find to be nonessential, an unreasonable use, an unreasonable method of use, or a waste of water; and (iii) reduce and restrict the quantity of water used by those persons within the District for the purpose of conserving the water supplies of the District; and

WHEREAS, it has been estimated that more than half of residential water use in many parts of California is used to irrigate lawns and outdoor landscaping; and

WHEREAS, the District has determined that during water shortages, the use of outdoor water for irrigating lawns and outdoor landscaping is not essential to public health and safety, and may be an unreasonable use, an unreasonable method of use, or a waste of water; and

WHEREAS, during a water shortage the greatest reductions in water usage may best be achieved by single-family residential customers by reducing the amount of discretionary, nonessential use of potable water to irrigate lawns and landscaping; and

WHEREAS, water use by commercial and industrial customers is generally non-discretionary in that water is almost exclusively used for purposes such as product development, production processes and other market conditions, and as such, penalties are not likely to result in increased conservation for non-essential uses; and

WHEREAS, commercial and industrial customers are not as homogenous in their water use as single-family residential customers; rather their water use varies across all business types and industries; and

WHEREAS, water use by commercial customers and multi-family customers without individual meters is not homogeneous or discretionary, and

WHEREAS, irrigation and mixed use customers participate in other programs that have resulted, and continue to result, in reductions in their use of potable water, including, but not limited to the option of using lower-cost recycled water; and

WHEREAS, to secure compliance with the rules and regulations established during Stages 3 and 4, as such terms are defined herein, and assure important public policy objectives are achieved for the reduction of water usage during severe and critical water shortages, the District is proposing to establish and impose penalties for excessive water usage by single-family residential customers when the District has declared a Stage 3 or a Stage 4 water shortage; and

WHEREAS, for the reasons stated above, the District is not proposing to establish in this Ordinance any mandatory water use restrictions or associated penalties on any commercial or industrial customers, or multi-family customers without individual meters when the District has declared a Stage 3 or a Stage 4 water shortage; and

WHEREAS, pursuant to California Government Code section 53069.4, the District may, by ordinance, make the violation of any ordinance enacted by its Board of Directors subject to a civil administrative fine or penalty; and

WHEREAS, the Board of Directors hereby finds and determines that it is desirable to codify the rules and regulations governing its actions, and the actions of persons using and consuming water within the District, particularly during declared Stage 3 or Stage 4 water shortages to protect the general welfare and the District's water supplies, and to reduce water consumption in accordance with the declared policies and laws of the State; and

WHEREAS, the Board of Directors hereby finds and determines that when the District implements Stage 3 and Stage 4 rules and regulations to conserve and protect the District's water supplies, reduce the quantity of water consumed, and deter and prevent the waste or unreasonable use or unreasonable method of use of valuable water resources, administrative penalties may be imposed upon any person who willfully uses water in excess of the water use restrictions set forth herein;

BE IT ENACTED by the Board of Directors of the East Bay Municipal Utility District as follows:

Section 1. **Recitals.** The District hereby finds and determines that the above recitals are true and correct and are incorporated herein.

Section 2. **Findings.** The Board of Directors finds and determines that because of the prevailing conditions in the State, and the declared policy of the State, it is necessary and appropriate for the District to adopt, implement, and enforce a water conservation program to reduce the quantity of water used by single-family residential customers within the District to ensure that there is sufficient water for human consumption, sanitation, and fire protection. The District further finds and determines that during periods of drought, water shortages, and water shortage emergencies, the general welfare requires that the District maximize the beneficial use of its available water resources to the extent that it is capable, and that the waste or unreasonable use, or unreasonable method of use of water shall be prevented and the conservation of water is to be extended with the view to the reasonable and beneficial use thereof in the interests of the people of the District and for the public health, safety, and welfare.

Section 3. **Water Use Restrictions and Regulations During Stage 3 and Stage 4.** The Board of Directors hereby adopts and authorizes the following water conservation and water shortage rules and regulations governing the use of water by single-family residential customers:

A. DEFINITIONS

For the purposes of this Ordinance, the following words, terms, and phrases shall have the following meanings:

"Appellant" means the person appealing the imposition of a penalty imposed by the District for a violation of this Ordinance.

"Billing cycle" means the billing period in which a single-family residential customer's water use is measured for purposes of calculating the amount of the water service fees that shall be collected for the water service provided.

"CCF" means one hundred cubic feet. EBMUD bills for water use are based on units, with each unit equaling one (1) CCF. Each unit equals 748 gallons.

"Contingency Plan" means the District's water shortage contingency plan, including any supplement or amendment thereto.

"District" means the East Bay Municipal Utility District.

"General Manager" means the General Manager of the District or his or her authorized designee.

"Disaster" means a catastrophic, naturally occurring or man-made event, including, but not limited to, an earthquake, flood, fire, riot, or storm, for which a state of emergency has been declared by the President of the United States, the Governor of California, or the executive officer or legislative body of a local agency that is within the District's service area.

"Person" means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the District, or the manager, lessee, agent, servant, officer or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

"Potable water" means that water furnished to the single-family residential customer that complies with federal and State drinking water regulations and standards, or any other applicable standards, for human consumption.

"Rules and regulations" means the rules and regulations governing the amount of water that may be used by a single-family residential customer during an applicable water shortage stage, and any terms and conditions respecting restrictions on the use, method of use, and consumption of water in effect during an applicable water shortage stage as set forth in this Ordinance.

"Single-family residential customer" means a person who, according to the District's records, has a single-family residential account or a multi-family residential account with a business classification code 8800, and receives water service or recycled water service to a single-family residence or a multi-family residence that is individually metered.

"Stage 3" means the stage at which the District has determined that a severe water supply shortage exists and mandatory reductions in water use are required to achieve a reduction in water usage by amounts as set forth herein and declared by the Board of Directors, or as may be established from time-to-time in accordance with the Contingency Plan.

"Stage 4" means the stage at which the District has determined that a critical water supply shortage exists and mandatory reductions in water use are required to achieve a reduction in water usage by amounts as set forth herein and declared by the Board of Directors, or as may be established from time-to-time in accordance with the Contingency Plan.

"State" means the state of California, including any department or regulatory agency thereof.

"Water shortage stage" or "stage" means a Stage 3 or Stage 4.

B. REDUCTIONS IN WATER SUPPLY

1. **Reductions in Water Supply.** If the rules and regulations set forth in this Ordinance are inadequate to protect the District's potable water supply, the Board of Directors reserves the right to implement further mandatory rules and regulations to reduce the amount of water used within the District. The rules and regulations are necessary to respond to any significant reductions to the District's water supply as a result of drought, natural disasters, regulatory action, and planned or unplanned potable water shortages.

2. **Application.** The provisions of this Ordinance shall apply to all single-family residential customers using potable water within the District.

C. DECLARATION AND NOTICE OF WATER SHORTAGE STAGES

1. **District Water Supply.** The General Manager shall monitor the projected supply and demand for water by the District's customers during periods of a water shortage or drought and shall recommend to the Board of Directors the extent of the conservation measures, including rules and regulations, required through the implementation and/or termination of particular water shortage stages to prudently plan for supplying water to its customers. The General Manager will recommend the appropriate water shortage stage of response to a water shortage based on the best information available at the time.

2. **Declaration of Water Shortage Stages.** The declaration of any water shortage stage and applicable rules and regulations shall be made by the Board of Directors.

a. The declaration shall become effective immediately upon adoption by the Board of Directors.

b. Any penalties authorized to be imposed during the declared water shortage stage, however, shall not be imposed on any single-family residential customer until a declaration of a Stage 3 or Stage 4 water shortage has been made by the Board.

3. **Due and Proper Notice.** Upon the adoption of this Ordinance, due and proper notice shall be deemed to have been given each and every single-family residential customer supplied water within the District of the rules and regulations governing the water shortage stages as described herein, the applicable rules and regulations that will be in effect during the

specified stages, and any penalties that may be imposed for violations of such rules and regulations.

D. IMPLEMENTATION OF WATER SHORTAGE STAGES

1. **Recommendations by the General Manager.** As water supply conditions change, the General Manager may return to the Board of Directors to recommend, as appropriate, revising or terminating the appropriate water shortage stage, and any applicable rules and regulations.

2. **Order of Stages.** It shall not be necessary to implement any water shortage stage prior to another; the water shortage stages may be implemented in any reasonable order and shall continue to be in effect until the Board makes a determination to terminate the applicable water shortage stage.

3. **Water Supply Conditions.** The District will implement an appropriate water shortage stage and rules and regulations based on current and projected water conditions. Higher stages and/or additional rules and regulations may be implemented as water shortages continue and/or if single-family residential customers' responses to the rules and regulations then in effect do not bring about desired water savings.

4. **Cumulative Impacts.** Rules and regulations, penalties and enforcement will build on each other as water shortage stages advance.

5. **Actions or Restrictions by the State.** If the State, through executive action, emergency legislation or other actions, imposes conditions, requirements, or procedures that are not included in this Ordinance, the General Manager is authorized to implement such rules and regulations as are reasonably required to bring the District's actions in each stage into functional conformity with such conditions, requirements, or procedures.

6. **Public Outreach.** When the Board of Directors declares a water shortage stage, any or all of the following public outreach measures may be implemented:

a. The District may notify the general public, stakeholders, elected officials, and other key decision-makers regarding the water shortage stage, actions to be taken, and customer demand reduction goals.

b. The public at large will be informed of the water shortage stage, customer demand reduction rules and regulations, and other actions the District will be taking to reduce the demand for water within the District. Communications may occur through, but are not limited to, any of the following: billing inserts; special mailings; telephone contact; e-mail; roadway signage; billboards; home water reports; telephone on hold messages; water conservation booths and other communication venues in the community; workshops; community association meetings; newsletters; and education programs, etc. Literature appropriate to the water shortage condition and stage, conservation methods, and water-savings devices may be made available to the public.

c. The use of all forms of media may be employed by the District. This includes public service announcements on radio and cable television, social media and earned media, and advertisements in local newspapers.

d. The District's web site, www.ebmud.com, will be the central location for messaging and communications with single-family residential customers regarding the applicable water shortage stage and the rules and regulations governing the use of water then in effect.

E. RULES AND REGULATIONS

1. **Rules and Regulations are Mandatory.** Any rules and regulations adopted during a water shortage stage are mandatory.

2. **Violations of Rules and Regulations.** Violations of any rules and regulations are subject to criminal, civil, and administrative penalties and remedies as provided for in this Ordinance.

3. **Stage 3 Mandatory Water Use Restrictions.** After a Stage 3 has been declared and the District has completed the notice requirements set forth in Section 3.C. of this Ordinance, each single-family residential customer who has had a potable water account with the District shall be limited to using potable water as follows:

a. If the customer's billing cycle is fifty-five (55) to sixty-eight (68) days, the customer shall be limited to using one hundred twenty (120) CCF of potable water per billing cycle for indoor and outdoor water purposes for his or her property.

b. If the customer's billing cycle is twenty-five (25) to thirty-eight (38) days, the customer shall be limited to using sixty (60) CCF of potable water per billing cycle for indoor and outdoor water purposes for his or her property.

4. **Stage 4 Mandatory Water Use Restrictions.** After a Stage 4 has been declared and the District has completed the notice requirements set forth in Section 3.C. of this Ordinance, each single-family residential customer who has had a potable water account with the District shall be limited to using potable water as follows:

a. If the customer's billing cycle is fifty-five (55) to sixty-eight (68) days, the customer shall be limited to using eighty (80) CCF of potable water per billing cycle for indoor and outdoor water purposes for his or her property.

b. If the customer's billing cycle is twenty-five (25) to thirty-eight (38) days, the customer shall be limited to using forty (40) CCF of potable water per billing cycle for indoor and outdoor water purposes for his or her property.

F. VIOLATIONS, PENALTIES, AND OTHER REMEDIES

1. **Administrative Penalties for Exceeding Mandatory Water Use Restrictions During Stage 3.** After a Stage 3 or a Stage 4 has been declared, and the District has completed the notice requirements set forth in Section 3.C. of this Ordinance, any potable water used by a single-family residential customer in excess of the mandatory rules and regulations then effect during a billing cycle as provided in Section 3.E.3 or 3.E.4 shall be:

a. deemed a waste of water;

b. a violation of the District's rules and regulations; and

c. subject to a civil administrative penalty of two dollars ($2.00) per CCF, or portion thereof, of water delivered to the property in excess of the mandatory rules and regulations.

2. **Payment of Penalties.** Any penalty imposed pursuant to Section 3.F.1 shall be:

a. applicable to all potable water used in excess of the water use restrictions imposed by the mandatory rules and regulations after the declaration of the applicable water shortage stage;

b. collected on the single-family residential customer's water bill;

c. due and payable as part of the water bill charges;

d. the responsibility of the single-family residential customer of record for the property where the violation occurred; and

e. paid in addition to the water service fees the District imposes for the potable water delivered to the property where the violation occurred.

3. **Non-payment of Penalty.** Non-payment of any penalty imposed pursuant to this Ordinance shall be subject to the same remedies available to the District as for non-payment of basic water rates.

4. **Notice of Violation.** The receipt of a water bill with any applicable penalty shall serve as notice of violation of the District's rules and regulations herein.

5. **Misdemeanor Violations.** It shall be unlawful for any person to willfully violate any provisions of this Ordinance. A violation of any of these provisions is a misdemeanor in accordance with California Water Code section 377.

6. **Other Remedies.** In addition to any other remedies provided in this Ordinance or available under applicable law, the District may alternatively seek injunctive relief in the Superior Court or take enforcement action, including discontinuing or appropriately limiting

water service to any single-family residential customer, locking a service, or installing a flow restricting device, for violations of this Ordinance and applicable charges. All remedies provided herein shall be cumulative and not exclusive.

7. **Non-liability for Damage.** A single-family residential customer who violates this Ordinance assumes responsibility for injury to the single-family residential customer and/or other residents/occupants receiving service, including emotional distress and/or damage to the single-family residential customer's private water system and/or to other real or personal property owned by the single-family residential customer or by a third party resulting from the installation and operation of a flow restricting device or from termination of service. The single-family residential customer shall thereby be deemed to have:

a. waived any claim for injury or for damage to the single-family residential customer's property which the single-family residential customer may have otherwise have against the District; and

b. agreed to indemnify, defend, and hold the District harmless from claims by third parties for injury or property damage arising or claimed to arise out of the District's installation and/or operation of a flow restricting device or termination of water service.

G. APPEAL PROCEDURES

1. **Filing an Appeal.** Any person (an "appellant") who wishes to appeal the imposition of an administrative penalty imposed by the District pursuant to this Ordinance shall comply with the following procedures:

a. The appellant shall pay all amounts due and owing on his or her water bill, except for any disputed penalty(ies) imposed by the District pursuant to this Ordinance.

b. The appellant shall submit an appeal request form to the District's Customer Service Division no later than fifteen (15) calendar days from the date of the appellant's water bill for the billing cycle in which any penalty(ies) are imposed.

2. **Basis for Granting an Appeal.** An appeal may be granted under the following limited circumstances:

a. The amount of water delivered to the appellant's property did not violate the rules and regulations, as evidenced by a demonstrable malfunction in the meter serving the appellant's property or a billing error by the District.

b. The appellant demonstrates the water use is needed for health and/or safety reasons.

c. The appellant demonstrates a water leak occurred at his or her property during the billing cycle in which the penalty was imposed, resulting in water loss that did not benefit the appellant.

3. **Additional Documentation.** Additional documentation may be requested at the discretion of the District's Customer Service Division.

4. **District Response.** A response to the appeal request shall be provided by the District within thirty (30) calendar days from receipt of the appeal request form.

5. **Review or Denial of Appeal Request.** If an appeal request is denied, the appellant may resubmit the appeal request form for review by the District's designated Customer and Community Service representative.

a. Any denial of an appeal may be submitted for further review by the Customer Services Manager, or his or her authorized designee. Any request for further review shall be submitted no later than fifteen (15) calendar days from the denial of the appeal. The appellant may request to provide evidence in writing or in person in support of his or her appeal to the Manager of Customer and Community Services Department, or his or her authorized designee.

b. The decision by the District's Manager of Customer and Community Service, or his or her authorized designee, shall be final.

c. Within ten (10) days after the denial of an appeal is deemed final, the appellant shall pay any disputed penalty(ies) imposed by the District.

d. The provisions of Section 1094.6 of the Code of Civil Procedure of the State of California shall be applicable to judicial review of the decision.

Section 4. **Conflicting Provisions.** If provisions of this Ordinance are in conflict with each other, other provisions of the District's regulations or policies, any other resolution or ordinance of the District, or any State law or regulation, the more restrictive provisions shall apply.

Section 5. **Severability.** If any provision, section, subsection, sentence, clause or phrase or sections of this Ordinance, or the application of same to any person or set of circumstances, is for any reason held to be unconstitutional, void or invalid, the validity of the remaining portions of this Ordinance shall not be affected, it being the intent of the Board of Directors in adopting this Ordinance that no portions, provisions, or regulations contained herein shall become inoperative, or fail by reason of the unconstitutionality of any other provision hereof, and all provisions of this Ordinance are declared to be severable for that purpose.

Section 6. **Effective Date.** This Ordinance shall become effective and in full force at 12:01 a.m. on the thirty-first day after its passage. However, to allow sufficient time for customer education and outreach, any applicable penalty charges will be reflected on customer bills beginning September 1, 2015 and will apply to water use in July and August of 2015.

Frank Mellon
President

I HEREBY CERTIFY that the foregoing Ordinance was duly and regularly introduced at a regular meeting of EAST BAY MUNICIPAL UTILITY DISTRICT held on April 14, 2015, at the offices of said District, 375 - 11th Street, Oakland, California, and thereupon, after being read, further action was scheduled for the regular meeting of said Board of Directors held at the same place on April 28, 2015, at which time the same was finally adopted by the following vote:

AYES: Directors Katz, Linney, McIntosh, Patterson, Young, and President Mellon.

NOES: Director Coleman

ABSENT: None.

ABSTAIN: None.

ATTEST:

Lynelle M. Lewis
Secretary

APPROVED AS TO FORM AND PROCEDURE:

Craig Spencer
General Counsel

ORDINANCE NO. 365-15

WATER THEFT PENALTY ORDINANCE

Introduced by Director Coleman ; Seconded by Director Patterson

WHEREAS, California Penal Code section 498 prohibits the theft of utility services, including water; and

WHEREAS, California Penal Code section 624 prohibits every person from willfully damaging, tampering with, or digging up water pipes or waterworks; and

WHEREAS, California Penal Code section 625 prohibits every person who, with intent to defraud or injure, opens or causes to be opened, or draws water from any disconnected utility connection after having been notified that the same has been closed or shut for specific cause, by order of competent authority; and

WHEREAS, any person who violates Penal Code sections 498, 624, or 625 is guilty of a misdemeanor; and

WHEREAS, California Civil Code section 1882 *et seq*. authorizes the East Bay Municipal Utility District (the "District") to bring a civil action for damages against any person who commits, authorizes, solicits, aids, abets, or attempts any of the following acts:

a. Diverts, or causes to be diverted, utility services by any means whatsoever.

b. Makes, or causes to be made, any connection or reconnection with property owned or used by the utility to provide utility service without the authorization or consent of the utility.

c. Prevents any utility meter, or other device used in determining the charge for utility services, from accurately performing its measuring function by tampering or by any other means.

d. Tampers with any property owned or used by the utility to provide utility services.

e. Uses or receives the direct benefit of all, or a portion, of the utility service with knowledge of, or reason to believe that, the diversion, tampering, or unauthorized connection existed at the time of the use, or that the use or receipt, was without the authorization or consent of the utility; and

WHEREAS, pursuant to California Civil Code section 1882 *et seq*., the District may bring a civil action for the unauthorized use of District water; and

WHEREAS, the District's "Regulations Governing Water Service to Customers of the East Bay Municipal Utility District" (the "Regulations"), including Sections 7, 15, 19, and 23, establish

rules and regulations that govern the use of water and prohibit water theft from District facilities; and

WHEREAS, pursuant to California Government Code section 53069.4, the District may, by ordinance, make the violation of any ordinance enacted by its Board of Directors subject to a civil administrative fine or penalty; and

WHEREAS, because water is a vital resource, the District has determined that it is appropriate to impose civil administrative fines for the theft of water to protect this vital resource;

BE IT ENACTED by the Board of Directors of the East Bay Municipal Utility District as follows:

Section 1. **Recitals.** The District hereby finds and determines that the above recitals are true and correct and are incorporated herein.

Section 2. **Administrative Penalties.**

a. For the purposes of this Ordinance, "water theft" means and includes all of the following:

1. the use, diversion, receipt or taking of District water by any means from any public fire hydrant, blow-off valve, water main, water service lateral or other District facility or connection to a District facility, to which a District authorized metering device has not been installed or has been removed by the District; and

2. the use, diversion, receipt, or taking of District water by any means without paying the full and lawful District charges for such water, or by tampering with District property or facilities, such as by removing a lock or plug that has been placed on a customer's service or meter, or unauthorized use, or by tampering with a service connection or bypassing a meter, or by making an unauthorized connection to any District facilities and any public fire hydrant.

3. For the purposes of this ordinance, "unauthorized use" includes the use of water from a stationary service connection where lawful water service has been discontinued or from a public fire hydrant to supply water outside of the District service area, regardless of whether payment is provided to the District for the water drawn from the public fire hydrant, or any use of a hydrant meter in violation of the terms and conditions of a hydrant meter permit.

b. Water theft is prohibited. Each act of water theft constitutes a misdemeanor.

c. The District may report any water theft to the appropriate prosecuting agency and press for prosecution of said activity pursuant to the Penal Code. In addition to pursuing criminal penalties, the District, upon discovering water theft or tampering with District property, may also pursue the following remedies or other remedies available at law or equity:

1. require the immediate removal of any equipment, connections or tools used to accomplish the water theft that is attached to District property;

2. charge the customer or perpetrator an administrative penalty of:

A. $1,000 for the first violation;

B. $2,000 for a second violation within a twelve-month period; and

C. $3,000 for each violation thereafter within a twelve-month period.

Section 3. **Other Remedies.** In addition to any other remedies provided in this Ordinance or available under applicable law, the District may alternatively seek injunctive relief in the Superior Court or take enforcement action. All remedies provided herein shall be cumulative and not exclusive. If a customer or any other person turns on water service without District authorization, tampers with any locked water meter, tampers with a service connection or District facilities, bypasses a meter, or otherwise makes an unauthorized connection to District facilities without District permission, commits water theft, the District may:

a. turn off the water service and install a lock;

b. estimate, if necessary, the water taken and charge the customer, offender or water recipient three times the normal rate of the water taken from the District facility;

c. charge the customer, offender or water recipient for the damage to the District lock, meter or other property;

d. remove the meter and plug the service;

e. terminate and remove the service from its connection to the water main;

f. charge a deposit of two times the amount of the average use to reestablish service;

g. require the return of any District hydrant meter; and

h. prohibit any person who has committed three violations of this Ordinance within a twelve-month period from obtaining a District hydrant meter permit for a period of three (3) years from the date of the third violation.

Section 4. **Payment and Appeal Procedures.** The District shall calculate the amount of damages and penalty(ies) to be imposed, and shall send a bill to the customer, or if the offender is not a customer of record, an invoice for payment of the damages or penalty(ies) may be sent to the offender or water user or recipient.

a. All costs relating to the District's processing and handling of the water theft, investigation and enforcement thereof, and potential charges for reestablishment of service, shall be borne by the party having responsibility for the water account at the time of the water theft, or if there is no customer of record, by the offender or water user or recipient. These charges include, but are not limited to, service call charges, water charges, turnoff of service, charges for damage to District facilities and equipment, and plug and/or termination fees. Before the meter will be replaced and service reestablished, the party requesting service, if in any way involved in or related to, or associated with, parties involved in the water theft, shall deposit twice the average bi-monthly water bill, plus the standard meter reinstallation fee, in addition to all service call charges, and an amount representing any damage to District property.

b. All charges relating to the District's processing and handling of the water theft involving the taking of water from a public fire hydrant shall be borne by the offender or water user or recipient, including, but not limited to, the cost of any water, charges for any damage to District facilities and equipment, and costs of investigation and enforcement.

c. Any person (an "appellant") who wishes to appeal the imposition of an administrative penalty imposed by the District pursuant to this Ordinance, or who wishes to appeal the imposition of a three-year prohibition on a hydrant meter permit pursuant to Section 3(h), shall comply with the following procedures:

1. The appellant shall submit an appeal request form to the District's Customer Service Division no later than fifteen (15) calendar days from the date of the bill or invoice sent to the customer or offender.

2. A response to the appeal request shall be provided by the District within thirty (30) calendar days from receipt of the appeal request form.

3. If an appeal request is denied, the appellant may resubmit the appeal request form no later than fifteen (15) calendar days from the date of the denial for review by the District's Customer Service Manager.

4. If an appeal request is denied, the appellant may resubmit the appeal request form for review by the District's Manager of Customer and Community Services Department, or his or her authorized designee. The request form shall be resubmitted no later than fifteen (15) calendar days from the date of the denial of the appeal by the District's Customer Service Manager. The appellant may request to provide evidence in writing or in person in support of his or her appeal to the District's Manager of Customer and Community Services Department, or his or her authorized designee.

5. The decision by the District's Manager of Customer and Community Service, or authorized designee, shall be final.

6. Within ten (10) days after the denial of the appeal is deemed final, the appellant shall pay any disputed penalty(ies) imposed by the District.

7. The provisions of Section 1094.6 of the Code of Civil Procedure of the State of California shall be applicable to judicial review of the decision.

Section 5. **Conflicting Provisions.** If provisions of this Ordinance are in conflict with each other, other provisions of the District's regulations or policies, any other resolution or ordinance of the District, or any State law or regulation, the more restrictive provisions shall apply.

Section 6. **Severability.** If any provision, section, subsection, sentence, clause or phrase or sections of this Ordinance, or the application of same to any person or set of circumstances, is for any reason held to be unconstitutional, void or invalid, the validity of the remaining portions of this Ordinance shall not be affected, it being the intent of the Board of Directors in adopting this Ordinance that no portions, provisions, or regulations contained herein shall become inoperative, or fail by reason of the unconstitutionality of any other provision hereof, and all provisions of this Ordinance are declared to be severable for that purpose.

Section 7. **Effective Date.** This Ordinance shall become effective and in full force at 12:01 a.m. on the thirty-first day after its passage.

Frank Mellon
President

I HEREBY CERTIFY that the foregoing Ordinance was duly and regularly introduced at a regular meeting of EAST BAY MUNICIPAL UTILITY DISTRICT held on April 14, 2015, at the offices of said District, 375 - 11th Street, Oakland, California, and thereupon, after being read, further action was scheduled for the regular meeting of said Board of Directors held at the same place on April 28, 2015, at which time the same was finally adopted by the following vote:

AYES: Directors Coleman, Katz, Linney, McIntosh, Patterson, Young, and President Mellon.

NOES: None.

ABSENT: None.

ABSTAIN: None.

ATTEST:

Lynelle M. Lewis
Secretary

APPROVED AS TO FORM AND PROCEDURE:

General Counsel

5

ORDINANCE NO. 368-17

AN ORDINANCE AMENDING ORDINANCE NO. 365-15 ENTITLED
"WATER THEFT PENALTY ORDINANCE"

Introduced by Director Young ; Seconded by Director Linney

WHEREAS, on April 28, 2015, the Board of Directors of the East Bay Municipal Utility District ("District") adopted the Water Theft Penalty Ordinance No. 365-15 ("Ordinance") to provide the District with authority to impose administrative penalties on any individual who attempts or engages in water theft, including the unauthorized use of water from a public fire hydrant to supply water outside of the District service area, and any use of a hydrant meter in violation of the terms and conditions of a hydrant meter permit, as set forth in the Ordinance; and

WHEREAS, water theft is a misdemeanor under the California Penal Code; and

WHEREAS, the purpose of the Ordinance is to further deter water theft by authorizing the District to impose an administrative penalty on customers who engage in water theft; and

WHEREAS, the Ordinance has been effective in reducing water theft, however the District has received extensive feedback that the associated penalties have disproportionately impacted low income customers and made it more difficult for them to maintain or reestablish water service; and

WHEREAS, on June 27, 2017, the Finance/Administration Committee recommended amending the Ordinance to reduce the applicable penalties for water theft via meter tampering to $200, $400, and $800 for the first, second, and third occurrence, respectively, and to retain the existing penalties of $1,000, $2,000 and $3,000 for the first, second, and third occurrence, respectively, for water theft resulting from lateral diversions and unauthorized hydrant use based on the rationale that water theft in the form of meter tampering results in lower costs and lesser water loss to the District than the other forms of water theft; and

WHEREAS, the Ordinance was amended to incorporate the recommendation of the Finance/ Administration Committee; and

WHEREAS, other minor, non-substantive amendments were made to the Ordinance for clean-up and clarification purposes; and

WHEREAS, the Board of Directors considered a first reading of the proposed amendments to the Ordinance at the public meeting on August 8, 2017; and

WHEREAS, the Board of Directors considered a second reading of the proposed amendments to the Ordinance at the public meeting on September 12, 2017, and further reduced the applicable penalties for water theft via meter tampering to $0, $200, and $400 for the first, second, and third occurrence, respectively, and to retain the existing penalties of $1,000, $2,000 and $3,000 for the first, second,

and third occurrence, respectively, for water theft resulting from lateral diversions and unauthorized hydrant use; and

WHEREAS, the Board of Directors held a continued second reading of the proposed amendments to the Ordinance at the public meeting on September 26, 2017;

NOW, THEREFORE, BE IT ENACTED by the Board of Directors of the East Bay Municipal Utility District that Ordinance No. 365-15 entitled "WATER THEFT PENALTY ORDINANCE" is amended as shown in Exhibit A.

The EFFECTIVE DATE of this Ordinance shall become effective and in full force at 12:01 a.m. on the thirty-first day following its passage (October 27, 2017).

Lesa R McIntosh
President

I HEREBY CERTIFY that the foregoing Ordinance was duly and regularly introduced at a regular meeting of EAST BAY MUNICIPAL UTILITY DISTRICT held on April 14, 2015, at the offices of said District, 375 - 11th Street, Oakland, California, and thereupon, after being read, further action was scheduled for the regular meeting of said Board of Directors held at the same place on April 28, 2015, at which time the Ordinance was finally adopted. An amendment to the foregoing Ordinance was duly and regularly introduced at a regular meeting of EAST BAY MUNICIPAL UTILITY DISTRICT on August 8, 2017, and thereupon, after being read, further action was scheduled for the regular meeting of said Board of Directors on September 12, 2017, at which time the Board of Directors requested additional amendments to the Ordinance. Accordingly, a continued second reading was scheduled for the regular meeting of the Board of Directors on September 26, 2017, at which time the Amended Ordinance was finally adopted to be effective on October 27, 2017, by the following vote.

AYES: Directors Katz, Linney, Mellon, Patterson, Young and President Mellon.

NOES: Director Coleman.

ABSENT: None.

ABSTAIN: None.

Rischa S. Cole
Secretary

APPROVED AS TO FORM AND PROCEDURE:

Craig S. Spencer
General Counsel

Appendix H

Information on Demonstration of Consistency with Delta Plan WR P1

APPENDIX H: DELTA PLAN POLICY WR P1 - REDUCED RELIANCE ON THE DELTA THROUGH IMPROVED REGIONAL WATER SELF-RELIANCE

H.1 THE DELTA REFORM ACT AND THE DELTA PLAN

The Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act), per Water Code Section 85000 et seq, established the coequal goals for the Delta of securing a more reliable water supply and protecting, restoring, and enhancing the Delta ecosystem. The Delta Reform Act also includes a state policy to reduce reliance on the Delta in meeting California's future water supply needs through a strategy of investing in improved regional supplies, conservation and water use efficiency. Water demand management measures do help save water and these measures combined with alternative sources of supply help reduce reliance on water from the Delta.

The Delta Reform Act also created the Delta Stewardship Council (DSC), that is responsible for furthering the coequal goals through the development of a Delta Plan.

The Delta Plan, released in 2013 by the DSC, is a comprehensive, long-term resource management plan for the Delta and contains regulatory policies and recommendations for water suppliers to include in their UWMP.

The Delta Plan Policy WR P1 (WR P1) is relevant to a water supplier who is participating in or carrying out a proposed covered action or received Delta water from a proposed covered action[1]. Examples of covered actions include multi-year water transfers, conveyance facilities, or new diversion that involve transferring water through, from, or using water in the Delta.

The California Code of Regulations, Title 23, Section 5003 (c)(1) provides the requirements by which a water supplier can demonstrate compliance with the Delta Plan Policy. This Appendix H to the UWMP 2020 demonstrates EBMUD's consistency with WR P1 by demonstrating reduced reliance on Delta in its long-term water supply planning.

H.2 EBMUD AND THE DELTA

The majority of EBMUD's water supply comes from the Mokelumne River watershed. EBMUD has water rights that allow for the delivery of up to a maximum of 325 million gallons per day (MGD) from the Mokelumne River, subject to the availability of runoff, senior water rights of other users, downstream fishery flow requirements, and other Mokelumne River water uses. Approximately 90 percent of the water into EBMUD's system comes from the Mokelumne. A smaller portion - about ten percent - comes from local runoff in the East Bay area watersheds that is stored in EBMUD's terminal reservoirs.

However, during dry years the combination of Mokelumne River water and local runoff may not be sufficient to meet customer demand. Through its Long-Term Renewal Contract with the U.S. Bureau of Reclamation (Reclamation), EBMUD has the right to take Central Valley Project (CVP) water from the American River during dry years through its Freeport Facilities[2]. EBMUD has the right to take up to 165,000 acre-feet over three consecutive dry years, and up to 133,000 acre-feet in any given year, subject to the availability of supply.

In addition, during dry years EBMUD may seek water transfers to make up for deficiencies in its supply. Transfer supplies can be moved into EBMUD's system via the Freeport Facilities. For example, in 2015 EBMUD executed a transfer with Placer County Water Agency (PCWA) that allowed EBMUD to bring 11,400 acre-feet of water from PCWA into its service area. Chapter 4 provides more information about EBMUD's water transfers program.

The Delta is critical to EBMUD because its primary conveyance system runs through the Delta. All of EBMUD's water supplies from the Mokelumne and American River are conveyed to its service area via three large aqueducts that run through the Delta. The 82-mile long Mokelumne Aqueducts have a total capacity of 200 MGD by gravity flow or 325 MGD with pumping. EBMUD is sensitive to the potential for Delta flooding that could impact its Aqueducts, and EBMUD's emergency preparedness

[1] As defined in California Code Regs., title 23, Section 5001, subdivision (j).

[2] Chapter 1 Section 1.4.4 of the UWMP describes what Freeport Facilities are comprised of.

planning includes preparing for events in the Delta that could impact the Mokelumne Aqueducts.

H.3 Programs to Reduce Reliance on the Delta

EBMUD has a variety of programs, planned and implemented, that decrease its need for fresh water. Most significantly, EBMUD's recycled water and conservation programs reduce customer demand for potable water during all years. EBMUD has also begun to develop groundwater banking projects that would reduce the need for imported water during dry years. Also, as discussed above, local runoff into EBMUD's service area is an important component of EBMUD's supply. This section provides information on these programs and water supplies.

Recycled Water Program

The use of recycled water decreases the need for potable water and reduces EBMUD's overall demand for fresh water. Recycled water also has the benefit of being a "local supply," thereby increasing regional self- reliance and resilience. In addition, recycled water availability is not strongly affected by differences in hydrology from year to year, making it a drought-resistant supply.

EBMUD began implementing its recycled water program in the early 1970s, and the program has expanded considerably since then. Currently EBMUD operates three recycled water treatment plants and partners with other agencies for the operation of two additional treatment plants. EBMUD's program supplies recycled water for a variety of uses including landscape irrigation, industrial use, building cooling systems, toilet flushing, and construction use.

EBMUD continues to expand its recycled water program. In 2009 EBMUD's Board of Directors set an ambitious goal of increasing recycled water deliveries to 20 million gallons per day (MGD) by the year 2040. To meet that goal, EBMUD plans to implement a variety of projects, including expansions of existing projects and implementation of new ones. In February 2019, EBMUD completed an update to its Recycled Water Master Plan (RWMP) to guide future projects and priorities with a goal of serving 20 MGD of recycled water by 2040. Additional details on EBMUD's recycled water program and specific projects can be found in Chapter 5 of the UWMP 2020.

Conservation Program

EBMUD has also made significant investments in conservation, including programs focused on both supply-side (supplier) and demand-side (customer) conservation. During periods of drought, EBMUD also institutes customer rationing and implements programs to help customers make immediate, short- term reductions in water use. Increasing conservation decreases the need for potable water in all years and rationing decreases the demand for potable water during critically dry years.

EBMUD has been investing in demand-side conservation since the 1970s and formalized the program with the implementation of its first Water Conservation Master Plan (WCMP) in 1994. The 2020 Water Conservation Strategic Plan, an update to the WCMP, is being prepared in parallel with the 2020 UWMP. Conservation program components include outreach and education, distribution of water saving devices, rebates and incentives for water efficient appliances and fixtures, and regulatory requirements.

During periods of declared drought, EBMUD has asked customers to meet voluntary or mandatory rationing goals. During these periods, EBMUD increased customer outreach and expanded conservation programs to help customers meet those goals.

Additional details on conservation measures can be found in Chapter 6 of the UWMP 2020 and Attachment I, EBMUD's Water Shortage Contingency Plan, provides further details on voluntary and mandatory rationing.

Groundwater Conjunctive Use and Banking /Exchanges

EBMUD is exploring several groundwater conjunctive use and banking/exchange programs. The groundwater conjunctive use program is a coordinated use of surface water and groundwater; the banking/exchange programs is the use of aquifers for storage purposes and coordinating with other water users on the use of the banked water.

EBMUD's groundwater storage project within the service area, Bayside Phase 1, completed construction in 2010. This Phase 1 facility allows EBMUD to inject treated water from its distribution system into the South East Bay Plain Groundwater Basin for extraction during dry years. EBMUD is also developing groundwater banking projects outside its service area. EBMUD is in partnership with

San Joaquin County to develop a demonstration project focused on groundwater banking and in-lieu banking. These two projects and other banking/exchange programs being investigated are discussed in Chapter 4 of the UWMP 2020.

Local Surface Water

Local runoff into the terminal reservoirs located within EBMUD's service area makes up a portion of EBMUD's water supply each year. Typically, around 10 percent of EBMUD's water supply is made up of local runoff.

Hydrologic conditions determine the amount of runoff that will be available, and in dry years evaporation can exceed runoff, resulting in no net local supply. In addition, EBMUD's ability to capture runoff is limited by the need to keep enough water in the terminal reservoirs to supply customers in case of emergencies. EBMUD policy is to keep enough water in the terminal reservoirs to meet rationed demands for up to six months; thus, the reservoir water level is sometimes not low enough to allow the capture of additional runoff. Chapter 1 of the UWMP 2020 provides more information on local surface water.

H.4 Quantifying EBMUD's Reduced Reliance on the Delta

Expansion of the water use efficiency and water recycling programs as well as advancing water technologies, conjunctive use projects, and local and regional water supply and storage projects will continue to help meet demands and reduce the frequency and volume of use of waters of the Delta.

EBMUD's use of non-local supplies varies depending on hydrologic conditions. Although Mokelumne River water is used in all years, EBMUD currently uses CVP water and water transfers during dry years.

Documentation and quantification of supplies contributing to reduced reliance on the Delta watershed and improved regional self-reliance are provided to demonstrate consistency with WR P1.

Table H-1 quantifies EBMUD's total water demands during normal years. The data for years 2010, 2015, and 2020 are the actual metered system demand with water use efficiency having been achieved; the projected demand obtained from the recently published EBMUD's 2050 Demand Study, as described in Chapter 3 of the UWMP, incorporates the conservation program measures to be implemented.

Table H-2 quantifies EBMUD's total water supplies contributing to regional self-reliance. Water conservation, water recycling[1], and EBMUD's local supplies all contribute to EBMUD's regional self-reliance. Actual amounts of recycled water delivered by EBMUD are reflected for years 2010-2020; and EBMUD will continue to pursue full development of its 20 MGD recycled water goals, and the recycled water forecast shown in the table reflect the current best estimate of recycled water developments reasonably certain to occur by the year 2040.

Table H-3 quantifies EBMUD's reliance on water supplies from the Delta Watershed. To obtain the projected water supplies, EBMUD used the forecasts from the 2050 Demand Study for the average annual available supply for standard operational use.

EBMUD's primary water supply comes from the Mokelumne River watershed. EBMUD's ability to use its full entitlement of Mokelumne River water is constrained by various regulatory requirements and the terms and conditions set forth in the state-issued water right licenses and permits that grant EBMUD the right to serve its customers from the Mokelumne River. Although EBMUD's water supply system was designed and constructed to deliver 325 MGD, the extent to which EBMUD's water rights can be exercised, especially in dry years, is further constrained by other Mokelumne River water users

[1] Water recycling includes raw water projects for gold course irrigation and reclaimed water produced from filter backwashes at the EBMUD's five water treatment plants. Chapter 5 of the UWMP provides detailed information on raw water projects

Table H-1

Calculation of Service Area Water Demands Without Water Use Efficiency (Acre-Feet)

	Baseline (2010)	2015	2020	2025	2030	2035	2040
Service Area Water Demands with Water Use Efficiency Accounted For	194,000	166,000	189,000	208,000	213,000	217,000	225,000
Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline	36,000	45,000	54,000	59,000	65,000	68,000	71,000
Service Area Water Demands without Water Use Efficiency Accounted For	**230,000**	**211,000**	**243,000**	**267,000**	**278,000**	**285,000**	**296,000**

TABLE H-2

CALCULATION OF SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE (ACRE-FEET)

	BASELINE (2010)	2015	2020	2025	2030	2035	2040
WATER USE EFFICIENCY	36,000	45,000	54,000	59,000	65,000	68,000	71,000
WATER RECYCLING (RECYCLED WATER + RAW WATER PROJECTS)	12,000	12,000	13,000	7,000	7,000	10,000	10,000
STORMWATER CAPTURE AND USE	-	-	-	-	-	-	-
ADVANCED WATER TECHNOLOGIES	-	-	-	-	-	-	-
CONJUNCTIVE USE PROJECTS	-	-	-	-	-	-	-
LOCAL AND REGIONAL WATER SUPPLY AND STORAGE PROJECTS (START OF WATER YEAR)	4,484	-	7,846	20,800	21,300	21,700	22,500
OTHER PROGRAMS AND PROJECTS THE CONTRIBUTE TO REGIONAL SELF-RELIANCE	-	-	-	-	-	-	-
WATER SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE	**52,484**	**57,000**	**74,846**	**86,800**	**93,300**	**99,700**	**103,500**
SERVICE AREA WATER DEMANDS WITHOUT WATER USE EFFICIENCY ACCOUNTED FOR	230,000	211,000	243,000	267,000	278,000	285,000	296,000
CHANGE IN WATER SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE	-	4,516	22,362	34,316	40,816	47,216	51,016
PERCENT OF WATER SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE	**23%**	**27%**	**31%**	**33%**	**34%**	**35%**	**35%**
CHANGE IN PERCENT OF WATER SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE	-	4%	8%	10%	11%	12%	12%

with water entitlements that hold water rights that are senior to those held by EBMUD. In addition, under the FERC license and through an agreement with U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife, referred to as the Joint Settlement Agreement (JSA), EBMUD releases flows to the lower Mokelumne River to improve water quality, flow regimes, and local physical habitat for the benefit of the river's fish populations, riparian zones, associated uplands, and recreational angling. Also, as part of the Camanche Permit Extension (Permit 10478) an additional 2,000 AF was dedicated for release from September through February to improve salmonid migration conditions in below normal and dry year-types.

As discussed in Attachment 1 – Water Shortage Contingency Plan (WSCP), EBMUD holds a water service contract with the United States Bureau of Reclamation (USBR) to receive water from the Central Valley Project (CVP) through the Freeport Regional Water Project in dry years. EBMUD also has a water transfer program that seeks to secure dry-year water supply to help meet customer water demand by developing and implementing water transfer and exchange opportunities. In 2014 and 2015, EBMUD used the Freeport Project to convey transfer water from the Sacramento and American River watersheds to EBMUD's service area.

H.5 EXPANDED RELIABILITY ELEMENT

This section provides an overview of EBMUD's preparations and plans for responding to a catastrophic event in the Delta that affects Delta supply for up to 36 months, in keeping with recommendation WR R4 in the Delta Plan. For detailed information, references are provided in the various elements discussed below.

H.5.1 EBMUD'S VULNERABILITIES IN THE DELTA

EBMUD takes the majority of its water supply from its Mokelumne River water rights. EBMUD also has a contract with USBR that allows it take up to 133,000 acre-feet of CVP water during dry years. Although most of EBMUD's water supply is from the Mokelumne and not the Delta itself, that water supply is vulnerable to catastrophic events in the Delta due to the location of EBMUD's aqueducts. EBMUD's three 82-mile long

TABLE H-3

CALCULATION OF RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED (ACRE-FEET)

	BASELINE (2010)	2015	2020	2025	2030	2035	2040
CVP/SWP CONTRACT SUPPLIES	-	52,000	-	-	-	-	-
DELTA/DELTA TRIBUTARY DIVERSIONS	193,913	108,950	189,691	187,200	191,700	195,300	202,500
TRANSFERS AND EXCHANGES	-	30,000	-	-	-	-	-
OTHER WATER SUPPLIES FROM THE DELTA WATERSHED	-	-	-	-	-	-	-
TOTAL WATER SUPPLIES FROM THE DELTA WATERSHED	193,913	190,950	189,691	187,200	191,700	195,300	202,500
SERVICE AREA WATER DEMANDS WITHOUT WATER USE EFFICIENCY ACCOUNTED FOR	**230,000**	**211,000**	**243,000**	**267,000**	**278,000**	**285,000**	**296,000**
CHANGE IN WATER SUPPLIES FROM THE DELTA WATERSHED	-	(2,963)	(4,222)	(6,713)	(2,213)	1,387	8,587
PERCENT OF WATER SUPPLIES FROM THE DELTA WATERSHED	**84.3%**	**90%**	**78.1%**	**70.1%**	**69.0%**	**68.5%**	**68.4%**
CHANGE IN PERCENT OF WATER SUPPLIES FROM THE DELTA WATERSHED	-	6%	-6.2%	-14.2%	-15.4%	-15.8%	-15.9%

Mokelumne aqueducts convey water from Pardee Reservoir through the Delta to Walnut Creek.

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 Mokelumne Aqueducts are vulnerable to a variety of events in the Delta including earthquakes and flood inducing levee failures. Historically, there have been levee failures that have threatened the Mokelumne Aqueducts, including flooding in the Jones Tract in 1980 and 2004.

As discussed below, EBMUD has made improvements to system reliability and developed plans and agreements to prepare for events in the Delta that threaten the transmission of water from the Mokelumne.

Aqueduct Outage Scenario

EBMUD has developed plans to respond to a catastrophic event in the Delta that severely impacts the ability of the Mokelumne Aqueducts to convey water to EBMUD's service area. The plans are based on a scenario wherein a levee failure, resulting from an extreme flood event or seismic activity, damages the Mokelumne Aqueducts. This scenario is similar to the 1980 Lower Jones Tract flood discussed above.

EBMUD's response plan for this scenario estimates that it would take up to 18 months to resume normal operations. During the first six months that all three aqueducts are out of service, customers would be supplied by water stored in EBMUD's terminal reservoirs; as discussed above, EBMUD policy is to maintain enough water in the terminal reservoirs to meet rationed customer demand for six months. If needed, EBMUD also has intertie agreements with other agencies that could provide short-term emergency water. A customer outreach and communication program would be initiated to inform customers of the situation and timeline and to educate them as to their responsibilities and water use restrictions.

During those six months, EBMUD would prioritize returning Mokelumne Aqueduct No. 3 to service. Mokelumne Aqueduct No. 3 would then be operated alone for up to twelve months, at an approximate rate of 172 MGD under pumped flow, to meet customer demand while EBMUD works to restore Mokelumne Aqueducts No. 1 and 2 to service. Once Aqueducts No. 1 and 2 have been restored, EBMUD would operate the three aqueducts to produce the maximum pumped flow of 325 MGD to meet service area demands and refill terminal storage to normal operating levels.

H5.2 Reliability and Emergency Preparedness

EBMUD has undertaken extensive planning and preparation to allow it to respond to a variety of emergency situations. EBMUD has made capital improvements to increase system reliability and has developed agreements for mutual assistance and emergency supply with other agencies.

Water System Reliability

EBMUD has made numerous significant investments into improving system reliability. In 2005 EBMUD completed the final phase of the Mokelumne Aqueduct Seismic Upgrade project to improve seismic performance of the aqueducts. One goal of the project was to ensure that raw water deliveries could be restored within 180 days after a major earthquake. Chapter 1 provides an in-depth discussion on this project.

EBMUD completed the Mokelumne Aqueduct Interconnection Project to 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. 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.

Within its service area, EBMUD is working on several major projects involving reliability and process upgrades for water treatment plants and construction of new transmission facilities for fiscal year 2020 through 2032. These projects will improve EBMUD resiliency, such as the ability to respond to equipment failures, water quality issues after wildfire events, and water supply shortage due to droughts, and recovering to operational normalcy from these vulnerabilities. Each project is described in Chapter 4 of the UWMP 2020.

Emergency Preparedness Agreements

EBMUD has also developed agreements and interties with other agencies that would allow the transmission of water into EBMUD's service area during emergency conditions. EBMUD has agreements with San Francisco Public Utilities Commission, City of Hayward, Dublin San Ramon Service District, and Contra Costa Water District for the provision of water during short-term emergencies. In coordination with these entities, EBMUD has invested in a number of interties and pumping facilities to allow water to be moved into its service area. These arrangements are discussed in more detail in Attachment 1, as part of the Water Shortage Contingency Plan. Similarly, EBMUD has also secured mutual assistance in case of emergency. EBMUD has an agreement with Los Angeles Department of Water and Power to mutually supply as much requested resources as possible in case of a regional disaster that only impacts one of the agencies. EBMUD is also part of the California Water Agency Response Network (CalWARN), which is an omnibus mutual aid/mutual assistance agreement with water agencies throughout the state.

H.6 Climate Change Vulnerability

Climate change poses many threats to the water and wastewater industry, and coastal agencies in particular face challenges associated with rises in sea level. Although there is still some uncertainty regarding the precise timing and severity of climate change impacts, EBMUD recognizes the importance of considering climate change in its long-term planning. One of the goals in EBMUD's Strategic Plan is to "maintain an updated Climate Change Monitoring and Response Plan to inform the District's planning efforts for future water supply, water quality and infrastructure and support sound water and wastewater infrastructure investment decisions." EBMUD maintains a Climate Change Monitoring and Response Plan (CCMRP), first published in 2011, to inform planning efforts for future water supply, water quality, and infrastructure, and to support water and wastewater infrastructure investment decisions. Chapter 2, Section 2.1.2 of the UWMP provides an overview of the assessments that were made to identify potential impacts to EBMUD in the areas of water supply and demand, water quality and the environment, flood control management, infrastructures, and energy.

The completion of an integrated analysis of climate change impacts on EBMUD's water demand and supply is discussed in detail in Chapter 3 – Water Demand and Attachment 1 – WSCP of the UWMP, respectively. To evaluate the impacts, the water demand and water supply studies looked at two climate variables, rainfall and air temperature, to forecast changes in water consumption. Referencing guidance from the California Climate Change Technical Advisory Group (CCTAG), an ensemble of ten Global Climate Models (GCMs) were used in this analysis in correlation with two specific levels of carbon dioxide emission scenarios, Lower Emissions Scenario and Higher Emissions Scenario. The preliminary studies indicate impacts to timing and availability of water supply and an increase in water demands. EBMUD's response actions build upon the current plan of developing a diversified and resilient portfolio, as outlined in Chapter 4 of the UWMP, to help adaptively manage for long-term water supply planning.

H.7 EBMUD Drought Rate Structure Assessment

The Delta Plan recommendation WR R4 also suggests including an evaluation of the extent to which the supplier's rate structure promotes and sustains efficient water use. EBMUD's rate structure is based on cost of service. EBMUD uses a tiered rate structure for single- family customers which charges more on a per-volume basis as customers use more water. Customers pay a set service charge based on the size of their meter, and a flow charge component which increases as water use increases. EBMUD's fiscal year 2020 volume rates for single family residential customers are shown in Table H-4. This structure has the additional benefit of creating a financial incentive for customers to conserve.

During declared droughts, a surcharge is applied to all volume rates to recoup added costs related to the drought and to account for reduced revenue from water sales. The drought surcharge amount varies from 8 to 25 percent, depending on the severity of the drought. The increased cost of water further incentivizes conservation.

A detailed discussion on EBMUD's drought rate structure assessment is available in Attachment I – WSCP.

Table H-4 FY2020 Rates for Single Family Residential Accounts (per 100 ft^3)

Volume Tier	Rate
First 172 gallons per day	$4.25
173 gpd up to 393 gpd	$5.85
All water used in excess of 393 gpd	$7.72

Appendix I

Local Hazard Mitigation Plan

Local Hazard Mitigation Plan 2018

East Bay Municipal Utility District

Executive Summary

Hazard Mitigation is commonly defined as "sustained action taken to reduce or eliminate long-term risk to human life and property from hazards." A hazard mitigation plan identifies the hazards a community or region faces, assesses their vulnerability to the hazards, and identifies mitigation actions that can be taken to reduce the risk. A hazard mitigation plan is most effective when it is developed before a disaster occurs and formulated through a systematic process centered on the participation of citizens, businesses, public officials, and other community stakeholders.

The East Bay Municipal Utility District's (EBMUD) 2018 Local Hazard Mitigation Plan (2018 LHMP) is an update to its 2011 Local Hazard Mitigation Plan (2011 LHMP) and reflects EBMUD's most current system upgrades, improvements, and mitigation measures to reduce the community's exposure to hazards and to improve the reliability of its services to the public.

The 2018 LHMP is organized as follows:

Chapter 2 – Local Hazard Mitigation Plan Overview – details the process EBMUD used to assess and analyze the hazards to which EBMUD is most vulnerable, including its participation in regional and local meetings and forums for mitigation planning and information sharing. This section identifies how the public and other stakeholders were involved and includes a detailed summary of the key meetings held with associated outcomes.

Chapter 3 – EBMUD Goals and Objectives – provides a brief profile of EBMUD, including its service area, mission, goals, and priorities.

Chapter 4 – EBMUD Facilities – provides an overview of EBMUD's Water Supply and Wastewater Facilities, including its dams, reservoir tanks, pumping plants, transmission/distribution pipelines, water and wastewater treatment facilities, regulators, and rate control stations, Mokelumne Aqueduct, and Pardee and Camanche Reservoirs.

Chapter 5 – The Identified Hazards – builds on available historical data and establishes detailed profiles for each of the primary hazards impacting EBMUD's service area – five related to earthquakes (faulting, shaking, earthquake induced landslides, liquefaction, and tsunami), and four related to weather (flooding, landslides, wildfires, and drought). The 2018 LHMP updates the 2011 LHMP by adding climate change, terrorism, and fires.

Chapter 6 – Vulnerability Assessment – summarizes the risks to each facility type listed in Chapter 4. In particular, it assesses the exposure and vulnerability of the identified hazards and summarizes the impact and estimated loss by facility type. These risk assessments collectively contribute to the development, adoption, and implementation of a meaningful and functional mitigation strategy based on accurate background information.

Chapter 7 – Mitigation Goals, Objectives, and Actions – describes the specific mitigation actions, capital improvements, and other measures EBMUD has undertaken and/or will undertake to address the identified risks for each facility type.

Chapter 8 – 2018 LHMP Maintenance – includes the measures that EBMUD will take to monitor, evaluate, and update the 2018 LHMP to ensure continuous long-term implementation and to regularly evaluate and update the 2018 LHMP to remain a current and meaningful planning document.

Chapter 9 – Mitigation Plan Point of Contact – provides EBMUD staff contact information for the 2018 LHMP.

The comprehensive LHMP is available on EBMUD's website at
https://www.ebmud.com/files/8916/1194/8548/EBMUD_2018_LHMP.PDF

Scan the QR code to view this file with your mobile device:

Appendix J

Reporting of Energy Intensity

APPENDIX J: REPORTING OF ENERGY INTENSITY

Table J-1 provides a breakdown of energy use of the major water supply functions, including pumping for storage, conveyance, water treatment, and distribution. EBMUD maintains a database of all its electric accounts going back to 2006 that includes monthly metered electric use data. This database labels each account as one of fourteen different categories, which allows the categorization of conveyance, treatment, and distribution functions. EBMUD has two water supply reservoirs (Briones and Upper San Leandro) where water storage is supplemented by pumping functions. In FY19 the Briones Pumping Plant operated for two months adding water storage to the Briones Reservoir. Conveyance energy includes pumping and other support activities on EBMUD's Mokelumne Aqueduct and Freeport operations. In FY19 the Walnut Creek Pumping Plant operated for two months, which made up the bulk of the conveyance energy use. EBMUD operates five water treatment plants with an additional one in standby. The two main plants use a direct inline filtration process, which requires relatively low energy use. The three other plants are utilized generally only in higher water demand months, with the two largest using a conventional treatment process with a larger energy use. The water distribution system provides water service through gravity feed and pumping through one or more pumping plants. Approximately 50 percent of EBMUD customers require no pumping while the other customers require pumping through as many as five pump stations. The volume of water entering the distribution process in Table J-1 is the total volume of water that passed through EBMUDs approximately 130 distribution pump stations.

EBMUD has two hydropower plants located at two separate dam structures. The total net production (metered generation exported to the grid) is noted in Table J-1. This value does not include the unmetered generation that is used on site and at the adjacent administrative and maintenance facilities.

Table J-2 includes energy use from all water operations activities.

Table J-3 provides a breakdown of energy use by deliverable product. EBMUD mostly provides retail potable water supply and a small amount of retail non-potable as shown in the table.

TABLE J-1 **RECOMMENDED ENERGY INTENSITY — WATER SUPPLY PROCESS APPROACH**

	URBAN WATER SUPPLIER OPERATIONAL CONTROL							
	WATER MANAGEMENT PROCESS						NON-CONSEQUENTIAL HYDROPOWER (IF APPLICABLE)	
	EXTRACT AND DIVERT	PLACE INTO STORAGE	CONVEYANCE	TREATMENT	DISTRIBUTION	TOTAL UTILITY	HYDROPOWER	NET UTILITY
VOLUME OF WATER ENTERING PROCESS (AF)	0	8,139 [1]	160,667 [2]	189,692	185,541 [3]	185,541 [8]	1,063,981 [4]	185,541
ENERGY CONSUMED (KWH)	0	2,187,931	7,475,069	9,187,170 [5]	51,589,000	70,439,170 [6]	193,903,213 [7]	70,439,170
ENERGY INTENSITY (KWH/AF CONVERTED TO MG)	0.0	825.0	142.8	148.6	853.3	1165.1	559.3	1165.1

NOTES:
1. Includes only volume of water pumped into raw water storage, other waters sources contributions to storage not included, i.e. runoff, wash water, spill from adjacent reservoir, rainfall, gravity supply from conveyance system.
2. Total flow entering the main conveyance system (Mokelumne Aqueduct).
3. Net production from water treatment plants supplying the distribution system.
4. Total volume of water passing through the turbines at two hydropower facilities.
5. Energy use not including the distribution pumps co-located at water treatment plant site and under same electrical service.
6. Energy includes: pumping to storage, conveyance, water treatment, and distribution facilities associated with the water system.
7. Total metered hydropower generation delivered to the electric grid. Only a small unmetered quantity is used on site to support administrative activities (estimated at 1,535,000 kWh in FY 19)
8. Water entering system (distribution system) equal to net production from the combined water treatment plants.

TABLE J-2 **RECOMMENDED ENERGY INTENSITY — TOTAL UTILITY APPROACH**

	URBAN WATER SUPPLIER OPERATIONAL CONTROL		
	SUM OF ALL WATER MANAGEMENT PROCESSES	NON-CONSEQUENTIAL HYDROPOWER	
	TOTAL UTILITY	HYDROPOWER	NET UTILITY
VOLUME OF WATER ENTERING PROCESS (AF)	185,541 [1]	1,063,981 [2]	185,541
ENERGY CONSUMED (KWH)	70,439,170 [3]	193,903,213 [4]	70,439,170
ENERGY INTENSITY (KWH/AF CONVERTED TO MG)	421.2	182.2	1165.1

NOTES:
1. Water entering system (distribution system) equal to net production from the combined water treatment plants.
2. Total volume of water passing through the turbines at two hydropower facilities.
3. Energy includes: pumping to storage, conveyance, water treatment, and distribution facilities associated with the water system.
4. Total metered hydropower generation delivered to the electric grid. Only a small unmetered quantity is used on site to support administrative activities (estimated at 1,535,000 kWh in FY 19).

TABLE J-3 **RECOMMENDED ENERGY INTENSITY — MULTIPLE WATER DELIVERY PRODUCTS**

	URBAN WATER SUPPLIER OPERATIONAL CONTROL							
	WATER MANAGEMENT PROCESS						NON-CONSEQUENTIAL HYDROPOWER (IF APPLICABLE)	
	EXTRACT AND DIVERT	PLACE INTO STORAGE	CONVEYANCE	TREATMENT	DISTRIBUTION	TOTAL UTILITY	HYDROPOWER	NET UTILITY
TOTAL VOLUME OF WATER ENTERING PROCESS (AF)	0	8,139	160,667	189,692	185,541	N/A	1,063,981	N/A
RETAIL POTABLE DELIVERIES (%)	0%	100%	100%	99%	100%		0%	
RETAIL NON-POTABLE DELIVERIES (%)	0%	0%	0%	1%	0%		0%	
WHOLESALE POTABLE DELIVERIES(%)	0%	0%	0%	0%	0%		0%	
WHOLESALE NON-POTABLE DELIVERIES (%)	0%	0%	0%	0%	0%		0%	
AGRICULTURAL DELIVERIES (%)	0%	0%	0%	0%	0%		0%	
ENVIRONMENTAL DELIVERIES (%)	0%	0%	0%	0%	0%		0%	
OTHER (%)	0%	0%	0%	0%	0%		100%	
TOTAL PERCENTAGE (MUST EQUAL 100%)	0%	100%	100%	100%	100%	N/A	100%	N/A
ENERGY CONSUMED (KWH)	-	2,187,931	7,475,069	9,187,170	51,589,000	70,439,170	193,903,213	70,439,170
ENERGY INTENSITY (KWH/AF CONVERTED TO MG)	0.0	825.0	142.8	148.6	853.3	N/A	559.3	N/A

WATER DELIVERY TYPE	PRODUCTION VOLUME (AF)	TOTAL UTILITY (KWH/AF)	NET UTILITY (KWH/AF)
RETAIL POTABLE DELIVERIES	184,222	382.0	382.0
RETAIL NON-POTABLE DELIVERIES	1,319	48.4	48.4
WHOLESALE POTABLE DELIVERIES	-	0.0	0.0
WHOLESALE NON-POTABLE DELIVERIES	-	0.0	0.0
AGRICULTURAL DELIVERIES	-	0.0	0.0
ENVIRONMENTAL DELIVERIES	-	0.0	0.0
OTHER	-	0.0	0.0
ALL WATER DELIVERY TYPES	185,541	379.6	379.6

TABLE J-4 **RECOMMENDED ENERGY INTENSITY — WASTEWATER & RECYCLED WATER**

	URBAN WATER SUPPLIER OPERATIONAL CONTROL			
	WATER MANAGEMENT PROCESS			
	COLLECTION / CONVEYANCE	TREATMENT	DISCHARGE / DISTRIBUTION	TOTAL
VOLUME OF WASTEWATER ENTERING PROCESS (AF)	69,579 [1]	69,579 [2]	0	139,158
WASTEWATER ENERGY CONSUMED (KWH)	2,354,254 [3]	43,815,073	0	46,169,327
WASTEWATER ENERGY INTENSITY (KWH/AF)	104	1,933	–	1,018
VOLUME OF RECYCLED WATER ENTERING PROCESS (AF)	–	1,319	–	1,319
RECYCLED WATER ENERGY CONSUMED (KWH)	–	1,527,170	–	1,527,170
RECYCLED WATER ENERGY INTENSITY (KWH/AF CONVERTED TO MG))	–	3,533	–	3,533

NOTES:
1. Total volume through the collection system is equivalent to the volume treated and includes flows through the 15 EBMUD pump stations and those flows conveyed by gravity.
2. Total influent flow to main wastewater treatment plant and wet weather facilities (some portion of flow to wet weather facilities may be double counted when stored and returned, however it is considered negligible as the total flow to wet weather facilities is approximately 2 percent of the total).
3. Energy consumed for collection/conveyance only includes pumping energy within the EBMUD interceptor system, it does not include any lift stations within the collection systems of the 7 satellite agencies that drain into the EBMUD interceptor system.

Table J-4 provides a breakdown of wastewater energy use and recycled water energy use at EBMUD. EBMUD operates one main wastewater treatment plant and a collection system that receives wastewater from the collection systems of local cities. Additionally, EBMUD's wastewater collection system includes three wet weather facilities that are used during periods of rain to treat and store stormwater infiltration. The wastewater collection system also utilizes 13 pump stations to move wastewater to the main treatment plant. EBMUD operates a water reclamation plant that receives partially treated wastewater from a neighboring wastewater treatment plant, performs additional treatment, and delivers the recycled water to a single large industrial customer.

Appendix K

2020 Water Supply Availability and Deficiency Report

EBMUD

AGENDA NO.
MEETING DATE April 28, 2020

TITLE **2020 WATER SUPPLY AVAILABILITY AND DEFICIENCY REPORT**

☒ MOTION ☐ RESOLUTION ☐ ORDINANCE

RECOMMENDED ACTION

1. File the Water Supply Availability and Deficiency Report in conformance with District Policy 9.03 - Water Supply Availability and Deficiency.
2. Declare the District's water supply is sufficient for meeting customer demands in 2020.

SUMMARY

The annual Water Supply Availability and Deficiency Report is prepared and submitted to the Board of Directors pursuant to Policy 9.03 – Water Supply Availability and Deficiency. The report evaluates the adequacy of the current year's (2020) water supply. In water shortage years, this annual report provides the basis for the Board's consideration of possible demand management and/or supplemental supply measures as part of the District's Drought Management Plan. In years when water supply is more than sufficient, this report provides the basis for the Board's determination of additional availability of water for potential use by others.

For 2020, the end of September total system storage (TSS) is projected to be 610 thousand acre-feet (TAF), resulting in the District's water supply being sufficient to meet customer demands and all required downstream obligations. There will not be additional water available for potential use by others. The 2020 assessment also concludes that projected runoff and water storage require designating "Dry" water year type flows in the lower Mokelumne River under the District's Joint Settlement Agreement (JSA). This determination is based on the State of California Department of Water Resources' (DWR) April Bulletin 120 Forecast. The Mokelumne River April runoff forecast is 54 percent of average.

DISCUSSION

2020 Water Supply and Demand Assessment

Current year water supply availability is determined by forecasting the amount of water that will be stored in District reservoirs on September 30, which marks the end of the "water year." This forecast is a two-step calculation. First, the amount of TSS projected on September 30 is determined by adding projected runoff amounts to existing storage levels. The second step is the subtraction of anticipated customer demands and the volume of water that must be released from the District's storage reservoirs to meet operating criteria and downstream obligations. These

Funds Available: FY	Budget Code:	
DEPARTMENT SUBMITTING Water and Natural Resources	DEPARTMENT MANAGER or DIRECTOR Michael T. Tognolini	APPROVED General Manager

Contact the Office of the District Secretary with questions about completing or submitting this form.

criteria and obligations include minimum flows for fishery requirements, use by senior water right holders, water requirements by other downstream interests, and water releases from terminal reservoirs to maintain reservoir levels within normal operating ranges. If the projected TSS on September 30, 2020 exceeds 500 TAF, the District's water supply is deemed sufficient to meet customer needs. If the projected TSS is less than 500 TAF, the District's water supply is deemed deficient.

After a dry winter, the East Bay has received a below normal amount of rain to date in 2020. Northern California received a bit of help in recent weeks as a series of early April storms brought a considerable amount of snow to the Sierra Nevada, which had been very dry since mid-November. February was the driest on record. The District's Mokelumne Basin snow reference location, Caples Lake, had a snow depth of 72 inches (114 percent of average) as of April 8. The rainfall year total precipitation through April 8 in the Mokelumne watershed was 30.2 inches (72 percent of average) and the total precipitation in the East Bay was 11.1 inches (46 percent of average). The District's median unimpaired runoff projection is 450 TAF, and this corresponds to a projection for TSS at the end of September of 610 TAF.

The water year type is classified as "Dry," based on DWR's April Bulletin 120 Forecast for unimpaired runoff of 405 TAF into Pardee Reservoir. The "Dry" condition will determine the requirements for the releases from Camanche Reservoir and the flow expected below Woodbridge Dam during April 1, 2020 through September 30, 2020, in accordance with the JSA year-type flow schedule. The JSA does not require additional releases from Camanche Reservoir in Dry year types.

Based on current 2020 runoff projections for the remainder of the year, Woodbridge Irrigation District will receive its full base supply of 60,000 acre-feet (AF); Jackson Valley Irrigation District will receive its maximum entitlement of 3,850 AF, but direct diversion may not be available in all months; and North San Joaquin Water Conservation District (NSJWCD), a junior water right holder, will not receive any water.

The JSA provides that the District notify resources agencies when surplus water is available. There will be no surplus water this year based on current projections.

State Regulations

The District continues to comply with the State Water Resources Control Board (SWRCB) regulatory requirements for monthly reporting on water usage. The state is currently developing water conservation reporting regulations, and District staff is working with other water agencies in providing comments and participating in upcoming workshops and hearings.

DREAM Project

The Demonstration Recharge Extraction and Aquifer Management (DREAM) Project is a pilot conjunctive use groundwater replenishment effort of the San Joaquin County (County), the NSJWCD, and the District. The project provides NSJWCD with up to 1,000 acre-feet of District surface water from the Mokelumne River that participating landowners use for irrigation instead

of pumping local groundwater, thereby storing groundwater in the basin for future use. During dry years, the District can recover up to half of the delivered water from the groundwater.

The District released a total of 342 AF of the 1,000 AF of Mokelumne River water to NSJWCD for the DREAM Project in 2018 and 2019. Surplus water is not available to transfer to NSJWCD to complete the DREAM Project in 2020. Of the 1,000 AF committed by the District for the DREAM Project, 648 AF remain to be released during normal or below normal water years when the District declares surplus water is available. Construction of new facilities to deliver groundwater from the DREAM Project into the District's Mokelumne Aqueducts is scheduled in the fall of 2020.

Bayside Groundwater Project – Phase 1

This project is designed to recharge water in the East Bay Plain Groundwater Basin by injecting drinking water during wet years for later extraction during dry years. The District obtained a permit from the SWRCB in 2007 to inject water into the aquifer.

In 2019, the District injected water for 18 days to test the groundwater aquifer's reaction. The test took place from November 18 to December 11, 2019 and a total of 8.39 million gallons were injected. Due to dry year conditions, the District does not have surplus water to inject into the Bayside aquifer this year.

Pulse Flow Operations

Pulse flows are intended to mimic the natural variability found in undammed rivers, and help cue fish migration. The District conducted multiple pulse flow releases in the fall of 2019. Each pulse resulted in an increase in salmon returning to the Mokelumne River.

Pulse flow timing will be coordinated with other fishery resource agencies and downstream Mokelumne River water users and 2020 pulse flows will be determined for the fall.

Appendix L

Glossary of Terms, Acronyms, & Units

APPENDIX L: GLOSSARY OF TERMS, ACRONYMS, & UNITS

SELECTED DEFINED TERMS

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

PLANNING LEVEL OF DEMAND
the adjusted demand 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

RECYCLED WATER
wastewater treated to the secondary or tertiary level that can be used for approved purposes to offset potable water demand

SUPPLEMENTAL SUPPLIES
additional sources of water that EBMUD may seek to develop, outsides its core Mokelumne and CVP supplies, to help meet projected water demands, particularly during dry years

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

ACRONYMS & UNITS

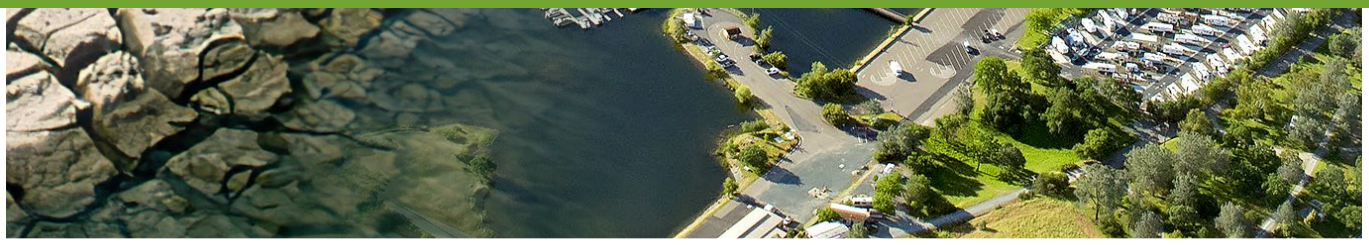
ABAG	Association of Bay Area Governments
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
AMS	Automated Meter Systems
AWWA	American Water Works Association
BARR	Bay Area Regional Reliability
BAWAC	Bay Area Water Agencies Coalition
BMP	Best Management Practice
CalWARN	California Water/Wastewater Agency Response Network
CAP	Customer Assistance Program
CCCSD	Central Contra Costa Sanitary District
CCF	Hundred Cubic Feet
CCMRP	Climate Change Monitoring and Response Plan
CCWD	Contra Costa Water District
CDCP	California Drought Contingency Plan
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CIS	Customer Information System
CVP	Central Valley Project
CY	Calendar Year
DCP	Drought Communication Plan
DEM	Digital Elevation Model

DERWA	DSRSD-EBMUD Recycled Water Authority
DMP	Drought Management Plan
DPR	Direct Potable Reuse
DPS	Drought Planning Sequence
DREAM	Demonstration Recharge Extraction and Aquifer Management
DSRSD	Dublin San Ramon Services District
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
EBMUDSIM	EBMUD's water supply system simulation model
EBRPD	East Bay Regional Park District
EBRWP	East Bayshore Recycled Water Project
EIR	Environmental Impact Report
EOP	Emergency Operations Plan
EOT	Emergency Operations Team
EPA	U.S. Environmental Protection Agency
ET	Evapotranspiration
FRWA	Freeport Regional Water Authority
FRWP	Freeport Regional Water Project
FY	Fiscal Year
GIS	Geographic Information System
GPCD	Gallons Per Capita Per Day
GPD	Gallons Per Day
GPF	Gallons Per Flush
HET	High Efficiency Toilet
HEU	High Efficiency Urinal
ICS	Incident Command System
IRIS	Irrigation Reduction Information System
IRWMP	Integrated Regional Water Management Plan
JSA	Joint Settlement Agreement
LADWP	Los Angeles Department of Water and Power
LAFCO	Local Agency Formation Commissions
LEED	Leadership in Energy and Environmental Design
LTRC	Long-Term Renewal Contract
LVVWD	Las Vegas Valley Water District
MGD	Million Gallons per Day
M&I	Municipal and Industrial
MokeWISE	Mokelumne Watershed Interregional Sustainability Evaluation
MOU	Memorandum of Understanding
MW	Megawatt
MWWTP	Main Wastewater Treatment Plant
NIMS	National Incident Management System
NRWRP	North Richmond Water Recycling Plant
NSJWCD	North San Joaquin Water Conservation District
PCWA	Placer County Water Agency
PHG	Public Health Goal
PHS	Public Health and Safety
R3 Study	Richmond Refinery Recycled Water Study
RARE	Richmond Advanced Recycled Expansion
R-GPCD	Residential Gallons Per Capita Per Day
RWMP	Raw Water Master Plan
RWQCB	Regional Water Quality Control Board
SBx7-7	Senate Bill Number 7 (2009)

SCWA	Sacramento County Water Agency
SD-1	Special District 1
SEBPB	South East Bay Plain Groundwater Basin
SEMS	Standardized Emergency Management System
SFPUC	San Francisco Public Utilities Commission
SFR	Single Family Residential
SLRF	San Leandro Reclamation Facility
SRVRWP	San Ramon Valley Recycled Water Program
SWRCB	State Water Resources Control Board
TAF	Thousand Acre-Feet
TDS	Total Dissolved Solids
UMRWA	Upper Mokelumne River Watershed Authority
USBR	United States Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
UWMP	Urban Water Management Plan
WCSP	Water Conservation Strategic Plan
WCW	West County Wastewater
WFA	Water Forum Agreement
WPCP	Water Pollution Control Plant
WRDA	Water Resource Development Act
WRF	Water Research Foundation
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
YBCA	Yuba County Water Agency

WATER SHORTAGE CONTINGENCY PLAN 2020

EAST BAY MUNICIPAL UTILITY DISTRICT



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ATTACHMENT 1 - WATER SHORTAGE CONTINGENCY PLAN

1. WATER SHORTAGE CONTINGENCY PLAN (WSCP) OVERVIEW

Uncertainty is inherent in any future-oriented planning effort and is a driving factor in long-term water resources planning. Water supplies are constantly subject to uncertainties which directly affect the amount and timing of availability of the sources of water. The Water Shortage Contingency Plan (WSCP) provides a framework to help address water shortages that may occur. As noted in Chapter 2, there are many factors that create a high degree of unpredictability on both the supply and demand side, and with that understanding, EBMUD's WSCP considers a range of possible future scenarios considering both aspects of water resources, demand and supply. This approach is a shift from simply predicting and planning for a singular outcome as it anticipates a wide range of futures which then leads to developing a more resilient portfolio of response actions to manage changing conditions.

1.1 WSCP PURPOSE

EBMUD is responsible for providing drinking water to about 1.4 million people and ensuring a reliable supply of potable water is core to EBMUD's mission. As discussed in Chapters 2 and 4, EBMUD has implemented and is planning to implement numerous projects to ensure the reliability of its water supply, including developing supplemental water supplies and strengthening the resilience of critical infrastructure.

In addition to these efforts, EBMUD recognizes the need to have plans and procedures in place to respond to water shortages that may occur. Droughts, earthquakes that damage distribution infrastructure, Delta floods that impact aqueducts, power outages, fire, and other emergencies could impact EBMUD's ability to supply water to its customers. The purpose of the WSCP is to develop a coordinated response to these situations and to guide EBMUD's planning and response through thoughtful assessment and management of the water supply.

The WSCP defines an orderly process for collecting information on water supply availability, assessing conditions, determining fiscal actions, allocating resources, enforcing regulatory water use restrictions, monitoring customer response, and planning and implementing drought communications. The WSCP describes EBMUD's actions 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 planned actions to manage supply and demand before and during a water shortage to ensure a reliable water supply. In an emergency, the primary function of EBMUD's water supply system is to meet essential public health, safety, and firefighting needs.

The WSCP describes emergency readiness and response including efforts to coordinate with local, county, regional, state, and federal agencies. Section 4.7 on Emergency Preparedness describes EBMUD's roles and responsibilities to provide mutual assistance and highlights coordination with state agencies. This coordination aligns with the state's strategy to prepare for, respond to, and recover from droughts and water shortages as discussed in the California Drought Contingency Plan (CDCP) 2016. The goals of the CDCP that align with EBMUD's are to:

- meet essential human health and safety needs, by supplying adequate water supplies throughout a water supplier's service area for drinking, sanitation, and fire suppression, as a first priority;
- provide and maintain adequate protections for State and Federal endangered and threatened species and other fish and wildlife resources; and
- seek and consider water management flexibilities to maximize the benefit of limited water supplies.

The CDCP defines the 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.

Consistent with the Delta Plan, the 2020 UWMP also includes an Enhanced Reliability Element that discusses EBMUD's plan for responding to possible interruption of water supplies resulting from catastrophic events impacting the Delta. This element is discussed in Appendix H.

1.2 WSCP REQUIREMENTS

Section 10632 of the California Water Code requires UWMPs to include an urban water shortage contingency analysis. The relevant section of the Code is provided in Appendix A. As required by the Water Code, in 1992 EBMUD adopted its first WSCP, and the WSCP has continued to evolve since. It was updated in the 2010 UWMP to reflect the 2007-2010 drought period, the completion of the Freeport Regional Water Facility, and numerous other changes. In 2015, EBMUD revised its Drought Management Program (DMP) Guidelines and ordinances on excessive use and water theft to incorporate lessons learned from the recent drought.

In 2018, new legislation required replacing the water shortage analysis under the former law with the creation of a WSCP with several prescriptive elements. With this update in 2020, EBMUD modified its DMP to integrate the requirements of the 2018 legislation as well as incorporating additional lessons learned from the 2014-2016 drought.

2. WATER SUPPLY ANALYSIS

As required by the Urban Water Management Planning Act - Section 10635, a water supply reliability assessment must compare future water demands and verifiable water supplies under multiple hydrologic conditions as both supply and demand can vary seasonally. EBMUD uses a water supply system model to assess the sufficiency and reliability of its long-term water supply by modeling its Mokelumne River and CVP water supplies against projected demands under three potential future scenarios. Consideration of scenarios in its long-term planning provides for a robust water supply portfolio in combination with a comprehensive Drought Management Program which allows for EBMUD to provide reliable water service in all year types.

2.1 MODELING METHODOLOGY

For the 2015 UWMP and prior plans, the supply assessment was performed using EBMUD's water supply system Simulation Model (EBMUDSIM). Since 2018, the EBMUD has transitioned to using the RiverWare software, equipped with state-of-the-art simulation and accounting algorithms, as its tool to perform water supply mass balance modeling for the supply and demand analyses.

Historic hydrology is used to capture the variability of Mokelumne River water supply in the model. For the 2020 UWMP, hydrology from 1921 – 2015 was available for use in the water supply modeling. The water service reliability analysis assumes that any of the historical hydrologic sequences could reoccur in the future. In evaluating its water supply, EBMUD incorporates both upstream and downstream diversions by senior water right holders, existing water rights agreements and contractual obligations, flood control flow releases, and other in-stream flow requirements into the model. EBMUD is required to make in-stream flow releases per the terms of its JSA[1] with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife. The model also allows for rationing levels, demands, and existing dry year supplemental supplies to be varied so as to be able to analyze for different scenarios or projections.

EBMUD uses historical hydrologic data to inform its modeling and planning for future droughts. 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 1976-1977 drought, when runoff was only 25 percent of average and total reservoir storage decreased to 39 percent of normal. In September 1977, with an uncertain precipitation and runoff forecast for the following year, EBMUD continued to require its customers to ration water to avoid depleting system storage. Fortunately, a very wet year in 1978 followed the critically dry year of 1977 and contributed to the water system's rapid recovery.

EBMUD uses a three year "drought planning sequence" (DPS) to assess the adequacy of its water supply for long-term water resources planning. Model simulation of the first and second years of this DPS uses the actual runoff that occurred in 1976 and 1977, the driest recorded two-year period. The simulated runoff in the third year is 185 thousand acre-feet (TAF), which is the average of a number of hydrologic parameters from 1976 and 1977. EBMUD's water supply system model assumes that such a severe drought (1) would not continue beyond the third year of this sequence and (2) would result in all accessible storage being depleted during the third drought year.

EBMUD undertook an analysis to test the adequacy of the DPS for planning purposes. Because of the

[1] EBMUD continues to meet its flow 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, and the California Department of Fish and Wildlife.

persisting extreme dry conditions throughout most of California from 2012 through 2016, EBMUD analyzed the three-year DPS was in fact the most severe credible drought, in terms of significant impacts to available water supply to meet customer demands and other obligations, that should be considered in its planning. The evaluations found that, when the DPS was applied, it was the most severe drought in the historic record.

EBMUD uses a DPS to simulate the effects of a severe, multi-year drought as the basis of EBMUD's long-term water supply planning. New legislation (Senate Bill 606) also now requires the UWMP to include a drought risk assessment that examines water shortage risks for a drought lasting at least five consecutive years. There was a significant drought that occurred from 1987-1992 in the hydrologic period that affected EBMUD and is included in the analysis for this UWMP.

Computer simulations help evaluate the need for additional supplemental supplies in each modeled year. While modeling cannot predict the future, it does provide comparative analysis that can be used to gauge how the water supply system might perform under different scenarios. EBMUD's response to any specific situation will vary depending on the actual water supply and demand conditions and external factors such as regional to state-wide hydrology.

2.2 EXISTING DRY YEAR SUPPLIES

EBMUD's sources for its water supply projections include EBMUD's Mokelumne River flow entitlement, and water from Central Valley Project (CVP) diverted through the Freeport Facilities.

EBMUD uses historic Mokelumne River hydrology with inclusion of the DPS to determine supply availability scenarios from the Mokelumne River.

EBMUD holds a water service contract with the USBR to receive water from the CVP through the Freeport Regional Water Project in years when EBMUD's water supplies are relatively low. Specifically, EBMUD's contract allows it to receive CVP water in years when EBMUD's March 1 projection, as updated monthly through May 1, of its October 1 total stored water is forecast to be below 500 TAF. The contract enables EBMUD to receive up to 133,000 AF of CVP water in a single qualifying year, not to exceed a total of 165,000 AF over three consecutive qualifying years.

When deciding how much CVP water to request, EBMUD considers the following:

- Current projections of customer demand;
- Current projection of end-of-water-year total system storage, with reference to EBMUD's Drought Management Program;
- Likelihood that USBR will have sufficient water in the following year to allow EBMUD to receive the water under its contractual entitlement; and, remaining amount of the 165,000 AF three-year contractual quantity available to EBMUD in the current CVP contract year, based on deliveries taken by EBMUD in the preceding two CVP contract years.

In some dry years, there may not be sufficient water supplies for all CVP contractors to receive their full requested amount, and USBR may limit allocations. In August 2015, USBR released the final version of its Municipal and Industrial (M&I) Water Shortage Policy outlining how it will allocate water during years when there is not enough water to meet all CVP contractor requests. The policy provides for reduced allocations for M&I contractors in comparison to the contractually specified quantity. Whether allocations are reduced, and the extent of any reductions, depends on the quantity of water available to the CVP. The M&I Water Shortage Policy also states that USBR may increase the amount of water that the contractor receives above the reduced allocation to the extent needed to ensure that the contractor has enough supply to maintain a "Public Health and Safety" (PHS) level calculated in the manner described in the M&I Water Shortage Policy Implementation Guidelines and Procedures dated August 2015 and February 1, 2017.

For purposes of EBMUD's analysis in this WSCP, CVP allocations for each hydrologic year are assigned based on model results generated by Department of Water Resources (DWR) using the CalSim model. The DWR results show what the CVP allocation would have been in a particular hydrologic year given future build-out demands, regulations, and levels of development on the system. As a result, these allocations may differ from the historic allocations. For example, during a moderately dry year, the DWR CalSim allocation may be lower than the actual, historic allocation because the DWR CalSim results are based on a higher demand and level of development. In the most recent drought that occurred, EBMUD's CVP allocation

went as low as 25 percent and consequently the assessment analysis in the WSCP also includes a scenario to reflect this actual allocation.

The Bayside Groundwater Project, Phase I, was previously included in the 2015 UWMP as an available dry year supply. EBMUD, however, is currently in the process of developing the Groundwater Sustainability Plan for the East Bay Plain Sub-basin, and when the evaluation and recommendations become available, they will be included in the next update of the UWMP.

2.3 WATER SUPPLY PLANNING AND CLIMATE CHANGE

Climate change could impact EBMUD's ability to reliably provide water to its customers, with current climate change scenarios predicting an increase of the probability of occurrence of extreme weather events. Changes in precipitation and air temperature can impact the timing and quantity of water resources; long-term changes in maximum daily air temperature and rainfall predicted by available climate change models were reviewed to determine any impact to the water supply. Similar to the analysis done to look at climate change impacts on projected water demand (Chapter 3), the approach used for this study is based on guidance from California Department of Water Resources' expert advisory committee, the CCTAG[1], on the use of climate models and associated technical tools for water resources planning.

To be consistent with the 2050 Demand Study climate change analysis, an ensemble of 10 GCMs for planning studies was used, since these models capture the range and uncertainty of future climate projections. The output for all GCMs and associated scenarios are available via Cal-Adopt.org. In selecting the worst-case scenario, RCP 8.5 scenario was considered for analyzing Mokelumne watershed. Chapter 3 of the UWMP provides more detail as to how this scenario was selected.

For air temperature change, the GCM model CanESM2 (Average) with RCP 8.5 (High Emission scenario) and GCM model HadGEM2-ES (Warmer/Drier) with RCP 8.5 (High Emission scenario) were considered. Figure W-1 presents the model output for annual average maximum air temperatures. Overall air temperatures are projected to rise substantially throughout this century. Data for the aforementioned models were downloaded from Cal-Adopt.org website and analysis was then performed in MS Excel. The plotted maximum air temperatures have a spread, or uncertainty band. Polynomial best-fit line was applied to compute the air temperature change between years of interest from 2020 to 2045. The analysis for CanESM2 showed an approximate 2.4°C increase in 2045 from 2020, and an approximate 2.5°C increase for HadGEM2-ES.

The air temperature increases for both CanESM2 and HadGEM2-ES models are within the range of the analysis done by EBMUD and referenced in the 2015 UWMP climate change scenario. In 2015, EBMUD looked at three possible scenarios related to climate change: a 2°C increase in average air temperature; a 4°C increase in average air temperature; and a 20% reduction in precipitation. These scenarios provide an initial framework to understand potential climate change impacts.

An increase in average air temperature is predicted to shift the timing of runoff, as snowpack melts earlier in the year, or as precipitation falls as rain instead of snow. In order to model this effect, EBMUD used result of its Water Supply Management Plan (WSMP) 2040 study[2] on climate change and applied them to updated conditions and assumptions. The WSMP 2040 study used a Mokelumne Watershed Digital Elevation Model (DEM) coupled with a Geographic Information System (GIS) to estimate potential impacts of increased air temperature on precipitation. The DEM data was used to develop an elevation-area relation from which watershed land area above/below specified contour lines were estimated. EBMUD used snow survey data to develop snow water equivalent (SWE) data. The data were used as input for multiple linear regressions calculating a relationship between monthly air temperature, precipitation, and SWE at five snow courses over the historical record. The regression equations were then used to estimate SWE under the scenarios with 2°C and 4°C increases in air temperature.

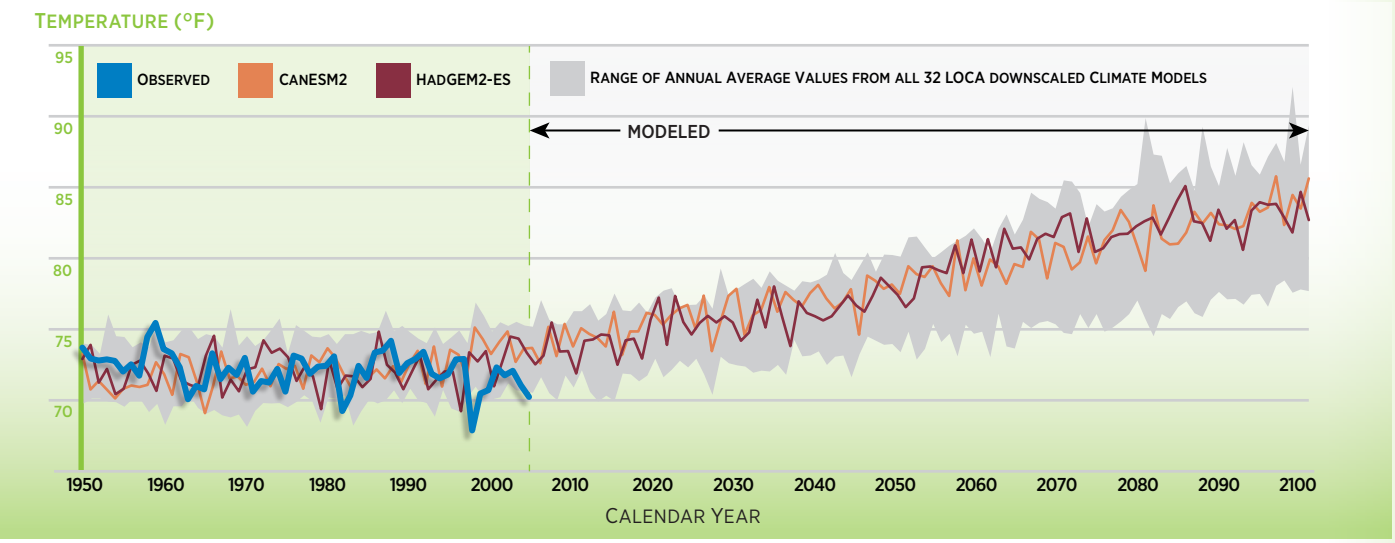
EBMUD also evaluated a 20% reduction in precipitation. A 20% reduction in precipitation was assumed to correspond to a 20% reduction in runoff. EBMUD reduced the runoff in its historic hydrology accordingly.

Each of the climate change scenarios was run through a Visual Basic Script adjusting PG&E operations upstream accordingly. The resulting regulated flows

[1] DWR, CCTAG, August 2015. Perspectives and Guidance for Climate Change Analysis.

[2] The Water Supply Management Program (WSMP) 2040 was a program-level effort that looked at EBMUD's water supply needs over a thirty-year planning horizon and proposed a diverse portfolio of policy initiatives and potential projects to pursue. The final plan was adopted by EBMUD Board of Directors on April 24, 2012.

FIGURE W-1 ANNUAL AVERAGE MAXIMUM TEMPERATURE



were then input into the EBMUDSIM model. Although EBMUD has transitioned to using the Riverware model for its supply and demand assessment, the climate change analysis and evaluation based on the aforementioned hydrologic scenarios that was provided in the 2015 UWMP is still informative.

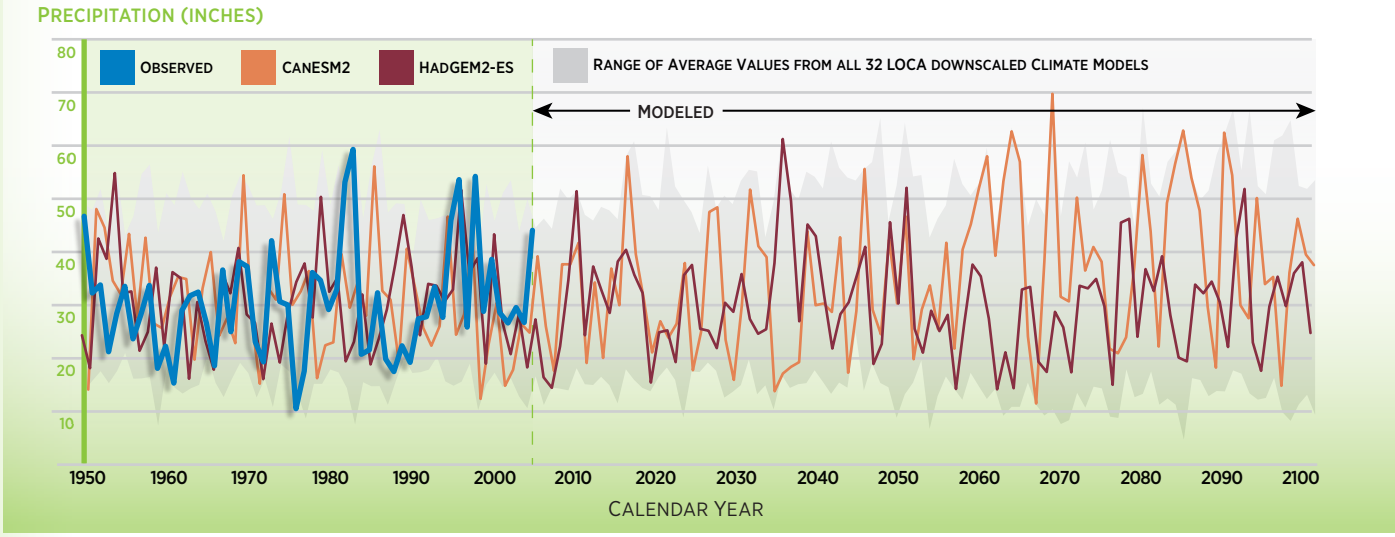
The results from the analysis illustrated potential impacts to EBMUD, depending on how climate change affects EBMUD specific watershed. It is important to note that the modeling of climate change is still an imperfect science, especially at the level of granularity required to study a specific watershed. There is no standard model that is used to quantify the effects of climate change on watershed hydrology. While it is difficult to quantify the exact impacts of climate change, EBMUD's modeling does provide useful information on the potential qualitative impacts.

The scenarios that modeled an increase in average air temperature included a shift in runoff patterns, with some spring snow melt runoff arriving earlier as winter rain runoff. However, the Mokelumne River has storage that helps to attenuate the effects of the change in runoff pattern so as to minimize its effects on EBMUD's customers. For example, there are reservoirs upstream of Pardee and Camanche Reservoirs that would act to regulate runoff. Modeling showed that winter runoff was caught and stored in the upstream reservoirs, then released in the spring and summer in a timeline similar to what EBMUD experiences now. These scenarios do result in small changes in total system storage and rationing, but the need for water was not affected in the time horizon considered. EBMUD will conduct further research and data gathering on runoff forecasting and shifts and operations of reservoirs in the upper Mokelumne watershed and of Pardee and Camanche to better understand the impacts to water supply for the next update of the UWMP.

The other climate change scenario that was evaluated, which focused on a 20% overall reduction in watershed runoff, created more substantial changes than the scenarios focusing on air temperature change. The reduction in runoff scenario showed a significant increase in the need for water as well as an increase in the overall amount of rationing experienced by EBMUD customers. It is important to note that among several models, precipitation projections do not show a consistent trend during the next century. The GCM model output showed high variability in rainfall as well and therefore high uncertainty in the forecasts. Figure W-2 depicts annual average precipitation, and on average, the projections show little change in average annual precipitation.

Due to the high variability and thereby the high uncertainty, more refined analysis, using EBMUD's new water supply system model and improved data science, will be performed with an approach that looks at extreme shifts that may occur within the precipitation range. The results will then be evaluated to understand the potential impacts and how EBMUD will plan to address those potential impacts. These response actions would build upon the current plan of developing a diversified and resilient portfolio to help adaptively manage for long-term water supply planning.

FIGURE W-2 ANNUAL AVERAGE PRECIPITATION



2.4 SCENARIO DEVELOPMENT

For the 2020 UWMP supply-demand analysis, EBMUD evaluated several different scenarios to assess its need for water under potential future conditions. The rationale for developing these scenarios is to capture uncertainty in long-term planning. Traditionally, long-term demand forecasts have been and continue to be used for identifying the timing and magnitude of future water supply needs. However, there is a growing recognition that factors used in making projections are based on assumptions that may be different in the future. Scenarios were developed based on plausible assumptions in both demand and supply availability. Table W-1 shows additional details on how these scenarios were developed and the assumptions that were included in them.

Base Condition

The base condition scenario represents EBMUD's current operations and assumptions. This scenario uses EBMUD's historic hydrology - with the DPS - to assess the historic water supply against each of the future demands projected in the 2050 Demand Study. In addition to the Mokelumne River supply, it is assumed that EBMUD will receive its requested allocation of CVP supply subject to the M&I Shortage Policy using the modeled yearly CVP allocations provided by USBR[1]. For this scenario, CVP supplies began delivery in May of the first year of drought. The triggers to take delivery of CVP water and implement rationing are followed as outlined in DMP Guidelines.

A Normal Water Year is a year that EBMUD does not need to implement any DMP measures. A Single Dry Water Year is determined to be a year that EBMUD would implement DMP elements, which includes obtaining CVP water deliveries and setting voluntary rationing goal between 0 to 10%.

Year 2 being the second consecutive dry year is determined as a year that EBMUD would implement DMP elements, which includes continuing to obtain CVP water deliveries and setting a mandatory rationing between 10 – 15%.

TABLE W-1 SUPPLY-DEMAND SCENARIOS MODELED BY EBMUD

SCENARIO	DROUGHT PLANNING PERIOD	ASSUMPTIONS
UWMP BASE CONDITION	1976-1978 DROUGHT PLANNING SEQUENCE	CVP SUPPLIES ARE AVAILABLE WHEN NEEDED SUBJECT TO M&I WATER SHORTAGE POLICY AS MODELED BY DWR.
HIGH DEMAND	1976-1978 DROUGHT PLANNING SEQUENCE	HIGH WATER DEMAND CONDITION MODELED THE UPPER END OF THE DEMAND PROJECTION.
EXTREME DROUGHT	1976-1978 DROUGHT PLANNING SEQUENCE	CVP ALLOCATION REDUCED TO 25% IN SECOND AND SUBSEQUENT YEARS OF DROUGHT.
FIVE-YEAR HISTORICAL DRY PERIOD	1987-1992 DROUGHT	MEET LEGISLATIVE REQUIREMENT OF LOOKING AT A FIVE YEAR CONSECUTIVE DROUGHT.

[1] The Final State Water Project Delivery Capability Report 2019. August 26, 2020.

Year 3 being the third consecutive dry year is determined as a year that EBMUD would implement DMP elements which includes obtaining CVP water deliveries and implementing mandatory rationing of 15%.

High Water Demand Scenario

The Planning Level of Demand (PLOD) presented in Table W-2 was developed using predictions of changes in land use, climate, and existing customer water demands. However, uncertainty exists in the predictions used to develop the PLOD. To account for this uncertainty in the long-term planning, EBMUD modeled a High Water Demand scenario where the upper end of the demand projection was selected for analysis.

Extreme Drought Scenario

To reflect what can and did occur during the most recent drought, this scenario looks at a reduced allocation of CVP supplies to 25% in drought Year 2 and 3 of the DPS. As discussed earlier, EBMUD's CVP supply is subject to USBR's M&I Shortage Policy. USBR indicated in that policy that, depending on CVP water supply conditions and operational constraints, it is possible for M&I deliveries to be reduced to below 50%. In 2015, EBMUD only received 25% allocation. Therefore, for this scenario, EBMUD takes CVP water when Stage 2 of the DMP is triggered and assumes that only 25% of CVP allocation is received.

Another constraint that occurred in the most recent drought period was curtailments of water diversions. In June 2014 through the Fall of 2014, and then again in May 2015 and through the Fall of 2015, the State Water Resources Control Board curtailed water diversions by EBMUD and all other post-1914 water rights holders.

The additional flow released downstream in the Mokelumne River due to curtailments in 2014 and in 2015 was 10 TAF and 25 TAF, respectively.

Although it occurred, curtailment is not included in the Extreme Drought Scenario analysis due to the complexity of determining how and when curtailments would be mandated in the future. Consequently, the impacts of curtailments on water supply availability cannot be quantified at this time. However, based on the reduced CVP allocation assumption, EBMUD's total available water supply storage is essentially empty near the end of the second year of a drought period and the entire third year of the drought period. Any additional reduction of available water supply would result in a direct change in the amount of water that is delivered to EBMUD customers and would result in an additional need for water.

Five-Year Historical Dry Period

Recent updates to the Urban Water Planning Act now require water agencies to assess water supply and demand during a five-year drought. To meet this new requirement, EBMUD looked at the hydrologic record and focused on the 1987-1992 drought period. Base Condition, High Demand, and Extreme Drought scenarios were analyzed for this five-year drought period.

2.5 SCENARIO ANALYSIS RESULTS

Base Condition Scenario Results

EBMUD modeled its system in the UWMP Base Condition Scenario according to the updated DMP guidelines. The 2020-2050 demand projects were modeled against EBMUD's historic 1921-2015 hydrology to determine

TABLE W-2

AVERAGE ANNUAL DEMAND PROJECTIONS BY CUSTOMER USE CATEGORY (MGD)

	2020	2025	2030	2035	2040	2045	2050
SINGLE-FAMILY RESIDENTIAL	115	117	119	121	125	126	129
MULTI-FAMILY RESIDENTIAL	40	44	48	52	59	63	67
INSTITUTIONAL	17	18	20	21	22	24	26
INDUSTRIAL	33	35	35	36	36	37	37
COMMERCIAL	16	18	19	21	22	24	25
IRRIGATION	13	13	13	13	13	13	13
TOTAL	234	245	254	264	277	287	297
WATER CONSERVATION	-48	-53	-58	-61	-63	-65	-66
NON-POTABLE WATER	-5	-6	-6	-9	-13	-13	-13
PLANNING LEVEL OF DEMAND (ROUNDED)	181	186	190	194	201	209	218

system reliability during normal years, single dry years, and the three-year DPS.

The results of this analysis provided in Table W-3, show that under base condition assumptions, EBMUD can meet customer demand out to 2050 during normal years and single dry years; however, during multi-year droughts, even with customer demand reduction measures in place, EBMUD will need to obtain supplemental supplies to meet customer demands.

2.6 Findings from Other Scenarios

All except the five-year drought scenario shows a need for water in the future, but the magnitude of that need varies.

High Water Demand Scenario Results

With higher water demands, EBMUD's water supplies are reduced more rapidly than in the Base Condition Scenario, and the DMP is triggered sooner, reaching mandatory rationing in Year 2 of the DPS. In Year 3 of the DPS, with the combination of a greater supply deficit and increased demands, there is a significant increase in the need for water. Table W-3 provides the results of the analysis for this scenario, focusing in on Year 3 of the DPS.

Extreme Drought Scenario Results

The extreme drought scenario did not change significantly from Base Condition because CVP diversions, although reduced in years 2 and 3, were available throughout the drought period analyzed. Figure W-3 shows the results of the supply and demand assessment in year 3 of the DPS for each of the three scenarios evaluated.

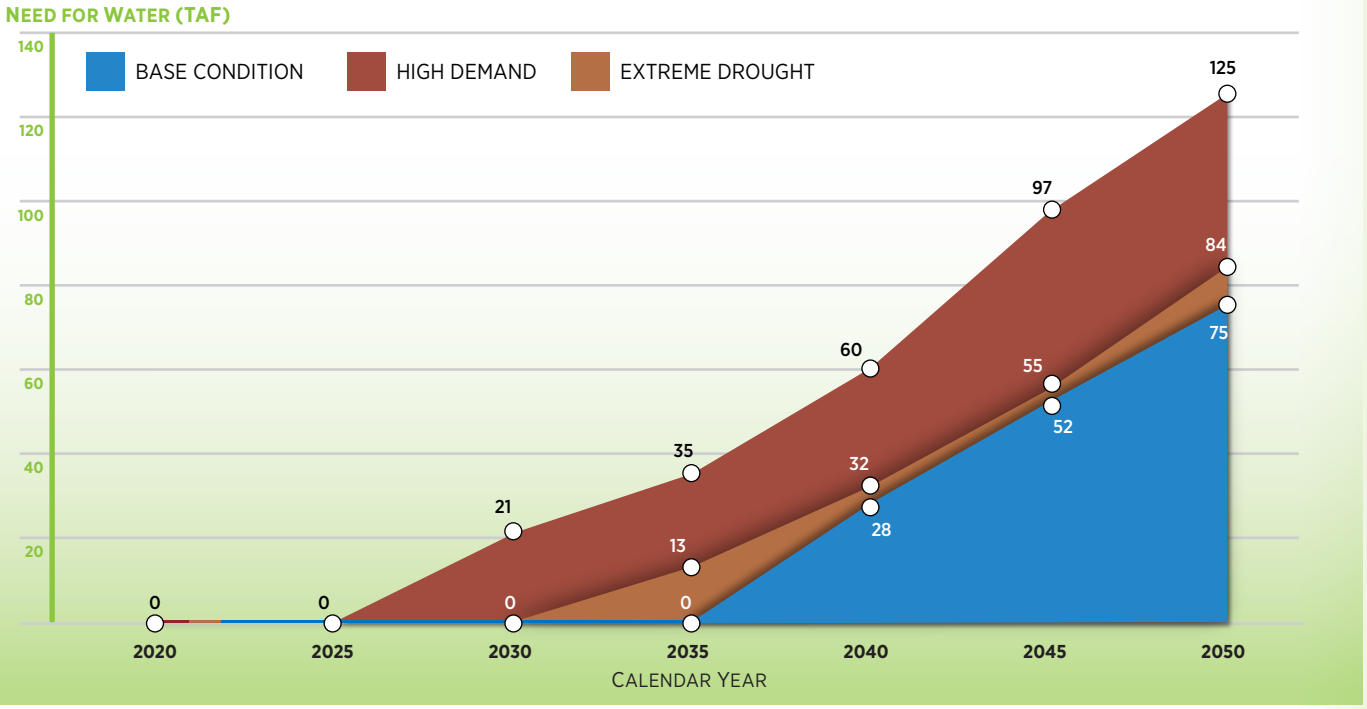
Five-Year Historical Dry Period Scenario Results

The five-year drought period evaluated is longer than the DPS, however it does not have any single year that is as critically dry as what occurs in 1977 in the DPS. The results show overall there are not many changes between scenarios during the five-year drought. The High Demand scenario creates a consistent average

Table W-3 **Supply & Demand Assessment, 2020-2050**

EBMUD Planning Level of Demand (PLOD)		2020	2025	2030	2035	2040	2045	2050
Normal Year	Mokelumne Supply (MGD)	>181	>186	>190	>194	>201	>209	>218
	EBMUD Planning Level of Demand (PLOD) (MGD)	181	186	190	194	201	209	218
	Need For Water (TAF)	0	0	0	0	0	0	0
Single Dry Year	Mokelumne Supply (MGD)	121	126	129	132	138	144	151
	CVP Supplies (MGD)	60	60	60	60	60	60	60
	Total Supplies (MGD)	181	186	189	192	198	204	211
	Voluntary Rationing (%)	0	0	1	1	2	2	3
	Need For Water (TAF)	0	0	0	0	0	0	0
Second Dry Year	Mokelumne Supply (MGD)	82	86	89	92	98	104	111
	CVP Supplies (MGD)	74	74	74	74	74	74	74
	Total Supplies (MGD)	156	161	164	167	172	178	185
	Mandatory Rationing (%)	13	13	13	14	14	14	15
	Need For Water (TAF)	0	0	0	0	0	0	0
Third Dry Year	Mokelumne Supply (MGD)	141	145	146	145	132	118	105
	CVP Supplies (MGD)	12	12	12	12	12	12	12
	Total Supplies (MGD)	153	157	158	157	144	130	117
	Mandatory Rationing (%)	15	15	15	15	15	15	15
	Need For Water - Base Condition (TAF)	0	0	0	0	28	52	75
	Need For Water - High Demand Scenario (TAF)	0	0	21	35	60	97	125
	Need For Water - Extreme Drought Scenario (TAF)	0	0	0	13	32	55	84

FIGURE W-3 DPS WITH THREE SCENARIOS



reduction in storage compared to Base Condition. The Extreme Drought scenario oscillates from matching Base Condition to results that are similar with the High Demand scenario. Overall, EBMUD's storage has sufficient water supply from 1987 through 1992 during all three potential scenarios – Base Condition, High Demand, and Extreme Drought.

3. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

EBMUD has developed a process and policies for monitoring, assessing, and responding to annual water supply availability. EBMUD's Water Supply Availability and Deficiency Policy 9.03 (Appendix G) describes its process for evaluating the adequacy of its water supplies every year. Since the early 1980s, EBMUD has been doing annual water shortage assessments to help make informed decisions on water supply management.

3.1 WATER SUPPLY AVAILABILITY & DEFICIENCY POLICY

Under the Policy, EBMUD's Board of Directors receives a preliminary Water Supply Availability and Deficiency (WSADR) by March 1 of each year evaluating the adequacy of that year's water supply if the year is anticipated to be a Dry or Critically Dry Year. The Board of Directors adopts a final WSADR in April, which updates the water supply projections based on the April 1st snow survey by DWR. These reports inform decisions by EBMUD's Board of Directors regarding whether to declare a water shortage emergency and implement a drought management program, institute mandatory water use reductions, and/or obtain/pursue supplemental supplies. The 2020 WSADR is provided as a sample in Appendix K. The WSADR will be the basis for the annual water shortage assessment report submittal to DWR as required by California Water Code section 10632.1. DWR has indicated it will begin requiring these submittals by 2022.

3.2 DECISION-MAKING TIMELINE & PROCESS

If water supplies are severely depleted, EBMUD's Board of Directors may declare a water shortage emergency and implement the Drought Management Program (DMP), which is designed to provide guidance to minimize drought impacts on its customers while continuing to meet stream flow release requirements and obligations to downstream Mokelumne River water users. Following the declaration of a water shortage emergency, depending on drought stage, EBMUD's Board of Directors may put into effect certain regulations, ordinances, and surcharges. The Board may also

implement the DMP in the absence of a declaration of water shortage emergency if the supplies are moderately depleted or the State mandates water use restrictions. The DMP guided EBMUD in successfully managing water demand during mandatory and voluntary rationing periods in 1976-1978, 1987-1994, 2007-2010, and 2014-2016 when supplies were limited. Table W-4 shows the rationing levels that EBMUD has historically set, starting with the 1976 drought period.

EBMUD begins drought preparations early in the calendar year if there is potential for a water shortage. Figure W-4 shows the timeline of a typical dry year, marking when EBMUD makes key decisions about that year's water supply. As illustrated, EBMUD determines drought actions involving rationing levels, state and federal mandates, and acquiring supplemental supplies based on projections of end of the water year storage. Often EBMUD must make these decisions as hydrologic conditions continue to evolve.

EBMUD monitors water supply conditions and projected runoff into EBMUD reservoirs. Beginning in January, EBMUD assesses the potential for a shortage and, if warranted, convenes EBMUD's Drought Committee. This committee includes senior staff representing key functions that are affected and involved in customer response to drought.

As discussed earlier, the final WSADR is adopted by May 1 of each year. The WSADR is based on EBMUD's projected end of September storage which includes water supplies from local, Pardee and Camanche reservoirs. Based on this report, the Board may declare one of the four stages of drought and activate the DMP depending on the projected end of the water year water storage. The adopted stage of drought helps determine the need for dry year supplemental supplies and customer water use reductions. Depending on the projected level of storage, the Board may also decide to request CVP supplies from USBR and/or secure water transfers. Section 2 above, Water Supply Reliability Analysis, discusses EBMUD's CVP supplies and how these supplies factor into drought planning. EBMUD submits an initial schedule of requested CVP deliveries to USBR by March 1. However, as conditions change, EBMUD may modify the requested quantity or timing of CVP deliveries, up to the maximum quantity allocated by USBR in that particular year or may cancel previously made requests as needed.

Throughout the year, EBMUD continues to monitor the water supply and the impacts on demand of any voluntary or mandatory rationing policy. As warranted by the water supply status and the DMP guidelines, the Drought Committee initiates response activities and sets timelines for these activities. The Drought Committee manages program implementation and monitors and reports on activities and results.

In multi-year droughts, EBMUD begins planning in the fall for the following year's water supply needs in anticipation of continuing dry year conditions. Depending on the level of uncertainty regarding the availability of water transfers and the length of time required to secure permitting and regulatory approvals, EBMUD must begin planning to secure water transfers early if EBMUD anticipates there may be a need the next year. This includes discussions with potential sellers and preparation of necessary environmental reviews that would be required to implement the water transfer.

3.3 DATA AND METHODOLOGIES FOR SHORT-TERM DEMAND FORECAST

EBMUD has developed an annual demand projection methodology that is used for operational planning. Water treatment plants produce water demand data that is then used to make correlations with current water year estimates combined with screening historical demand patterns and trends to make a new

TABLE W-4 HISTORIC RATIONING LEVELS

DATE	RATIONING LEVEL
05/25/1976	VOLUNTARY CONSERVATION, NO LEVEL SET
02/08/1977	25% MANDATORY
04/26/1977	35% MANDATORY
01/24/1978	VOLUNTARY CONSERVATION, NO LEVEL SET
04/14/1987	12% VOLUNTARY
05/09/1989	25% RATIONING
09/12/1989	15% VOLUNTARY
02/26/1991	15% MANDATORY
04/09/1991	15% MANDATORY
04/14/1992	15% MANDATORY
03/09/1993	10% VOLUNTARY
04/26/1994	VOLUNTARY CONSERVATION, NO LEVEL SET
05/01/1994	15% VOLUNTARY
04/24/2007	15% VOLUNTARY
05/13/2008	15% MANDATORY
05/12/2009	10% VOLUNTARY
02/11/2014	10% VOLUNTARY
04/22/2014	10% VOLUNTARY
12/09/2014	15% VOLUNTARY
04/14/2015	20% MANDATORY

demand projection. The annual projection is then partitioned into projected average monthly demands based on the historical monthly distribution. In recent years, the new annual demand projections take into account water conservation. An assessment on availability of supply takes into account projection of runoff based on DWR's snow survey, Mokelumne River diversions based on water rights terms, agreements, as well as the instream environmental flow requirement and expected diversions by riparian and senior water rights holders. The annual assessment, driven by hydrological conditions and analyzed using a stochastic spreadsheet model, is evaluated against the criteria established in the DMP to make a determination of water availability and if necessary, implementation of any potential response actions. The results of the assessment and all relevant operational decisions are captured in the annual water operations plan. This plan is a dynamic document as hydrologic conditions and forecasts can change significantly through the winter and spring months.

3.4 WATER OPERATIONS DURING DROUGHT

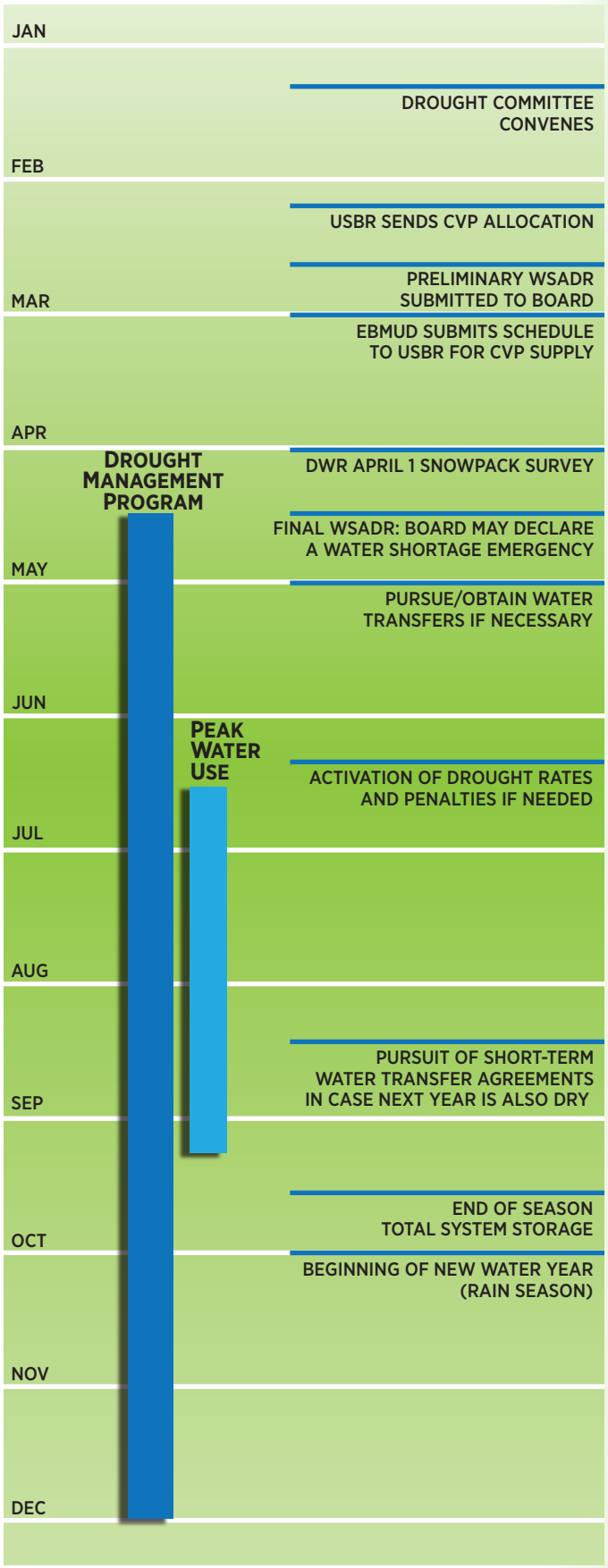
The 2014-2016 drought was the first time the EBMUD delivered water from the Freeport facilities, and valuable lessons were learned regarding water operations. The key findings from the 2016 Freeport Regional Water Project (FRWP) operation are: (1) take delivery of the supply as early as possible in the drought sequence to maximize delivery of the lower-cost drought supply, (2) maximize production at the West of Hills water treatment plants, and (3) manage the terminal reservoirs to maximize available space for storage. These lessons were incorporated into the DMP and operational decision-making processes moving forward.

Obtaining Dry Year Supply Early

EBMUD's CVP allocation was reduced by 50 percent in the contract year 2014 and by 75 percent in contract year 2015 as the CVP was faced with increasing demands and reduced supplies as the drought continued. EBMUD made up for the reduced allocation by purchasing transfer water in 2015 and by securing options to purchase transfer water for 2016. The transfer water was more expensive than the CVP water and may not have been necessary had CVP water been available. Therefore, EBMUD will maximize delivery of lower-cost drought supply at the start of the drought.

FIGURE W-4

TYPICAL DRY YEAR DECISION MAKING TIMELINE



Maximize Production at West of Hills (WHO) Water Treatment Plants

The delivery quantity of dry year supply water can be maximized when the treatment rate of this water matches the delivery rate. When dry year water was delivered at a greater rate than it could be treated, it increased the storage levels in USL and San Pablo reservoirs within the service area. This limited the reservoirs' ability to store runoff and increased the risk of spill.

In 2016, the treatment rates at conventional WTPs could not be maximized, because in-line Orinda WTP needed to operate at a lower rate, which would allow more dry year supply water to be treated at the conventional WTPs. Improvements at Orinda WTP will be completed as a part of the WTP infrastructure improvements project so Orinda WTP can operate at a lower rate so more dry year supply water can be treated at the West of Hills plants. Chapter 4 of the UWMP discusses in more detail the infrastructure improvements project.

Terminal Reservoir Management

At the start of the 2015 FRWP operation, the dry year supply could only be delivered to USL and San Pablo reservoirs and treated at the associated conventional WTPs. Because the rate of FRWP delivery exceeded the rate of treatment at the conventional plants, terminal reservoir capacity needed to be made available to maximize delivery rates. This was accomplished by operating the Sobrante and USL WTPs in advance of the FRWP delivery so that San Pablo and USL reservoirs began the FRWP operation at the lower end of their operating ranges. This practice will be continued in future FRWP operations.

4. WATER SHORTAGE LEVELS AND SHORTAGE RESPONSE ACTIONS

EBMUD's Drought Management Program provides a framework to manage customer demand and pursue a diversified portfolio to reach a goal of providing 85 percent reliability for customers in EBMUD's service area while continuing to meet all stream flow obligations on the lower Mokelumne River. The DMP guided EBMUD in managing demand and supply during the 2014-16 drought when mandatory and voluntary rationing was imposed, and water supplies were limited. During that recent drought, EBMUD faced unanticipated constraints and updated and implemented measures to assist with demand and supply management. The DMP was revised to reflect lessons learned and actions that were taken.

EBMUD performed modeling to better understand the effects of various actions on operations, in-stream flow requirements, and customer rationing. The results provided a basis to develop the revised drought stages and associated response actions as outlined in Figure W-5.

EBMUD declares different drought stages based upon projected end-of-September total system storage with the Normal Stage corresponding to a normal water year condition in which no demand or supply management measures need to be implemented. Each stage thereafter is associated with recommendations for requesting CVP water or additional dry year water supplies that could be obtained in combination with the level of customer demand reduction that may be requested.

Table W-5 shows the link between the drought stages and rates, penalties, and regulations in effect. Beginning in Stage 2, EBMUD may apply a drought surcharge to help recover costs, as discussed in more detail in the Financial Consequences of WSCP. In Stages 3 and 4, the Excessive Use Penalty Ordinance and Section 28 of EBMUD's Regulations Governing Water Services may come into effect.

Table W-6 shows the types of programs and actions that EBMUD might undertake at each stage of drought. The triggers to implement water shortage response action are defined by the TSS.

The availability of water to EBMUD may be impacted depending on the nature of an emergency. In such cases, EBMUD would determine the applicable shortage response actions as outlined in this WSCP.

TABLE W-5 DROUGHT MANAGEMENT PROGRAM GUIDELINES

STAGE	RATE/PENALTY IMPACTS	REGULATIONS IN EFFECT OR POTENTIALLY ENACTED
0 NORMAL	NORMAL RATES	SECTION 29
1 MODERATE	NORMAL RATES	SECTION 29
2 SIGNIFICANT	NORMAL RATES DROUGHT SURCHARGE	SECTION 29
3 SEVERE	NORMAL RATES DROUGHT SURCHARGE EXCESSIVE USE PENALTY	SECTION 28 SECTION 29 EXCESSIVE USE ORDINANCE
4 CRITICAL	NORMAL RATES DROUGHT SURCHARGE EXCESSIVE USE PENALTY	SECTION 28 SECTION 29 EXCESSIVE USE ORDINANCE

Notes:
a Drought Surcharges will reflect the most recently adopted Proposition 218 rates.
b Under Stages 3 or 4, the Board would declare a water shortage emergency and enact Section 28 to implement water conservation measures. Penalties under the Excessive Use Ordinace would apply.

Water Code Section 10632 requires water shortage contingency plans to provide water supply shortage levels at 10, 20, 30, 40, 50, >50 percent thresholds. Urban water suppliers with existing water shortage contingency plans may meet this requirement by cross referencing the water utility's existing water shortage stages to the State's six standard water shortage levels.

In general, EBMUD begins to bring in supplemental supply water and requests customers to reduce demand when the total operational storage is reduced by almost one-third.

Table W-7 presents EBMUD's water shortage levels cross referenced with the State's new standardized water shortage levels. EBMUD's water shortage levels for this cross-referencing is determined by the total operational storage[1] that is available.

It is difficult to quantify the reduction in gap between supplies and demand due to the implementation of the response actions as outlined in Table W-6. The response actions would be adjusted based on the level of rationing that is achieved and to meet EBMUD's policy of providing 85% reliability to its customers. At each stage, EBMUD will consider augmenting its supplies as outlined in Figure W-5 with the quantities determined based on antecedent conditions and projected demand. The response actions to close the gap between supply and demand as well as the augmented supplies needed that year are outlined in the annual water supply availability assessments.

[1] EBMUD's Total System Storage (TSS) is defined in the contract with U.S. Bureau of Reclamation as the total reservoir capacity for the upcountry and terminal reservoirs, which is approximately 771 Thousand Acre-Feet (TAF). The Total Operational Storage (TOS) is defined as the accessible water supply volume in the upcountry and three terminal reservoirs, thereby excluding: dead storage in all reservoirs, 20 TAF of water (referred to as "gainsharing" water per the FERC license) allocated for environmental use only, and Chabot & Lafayette Reservoirs which are currently disconnected from the distribution system. The TOS results in total accessible water supply volume of approximately 697 TAF.

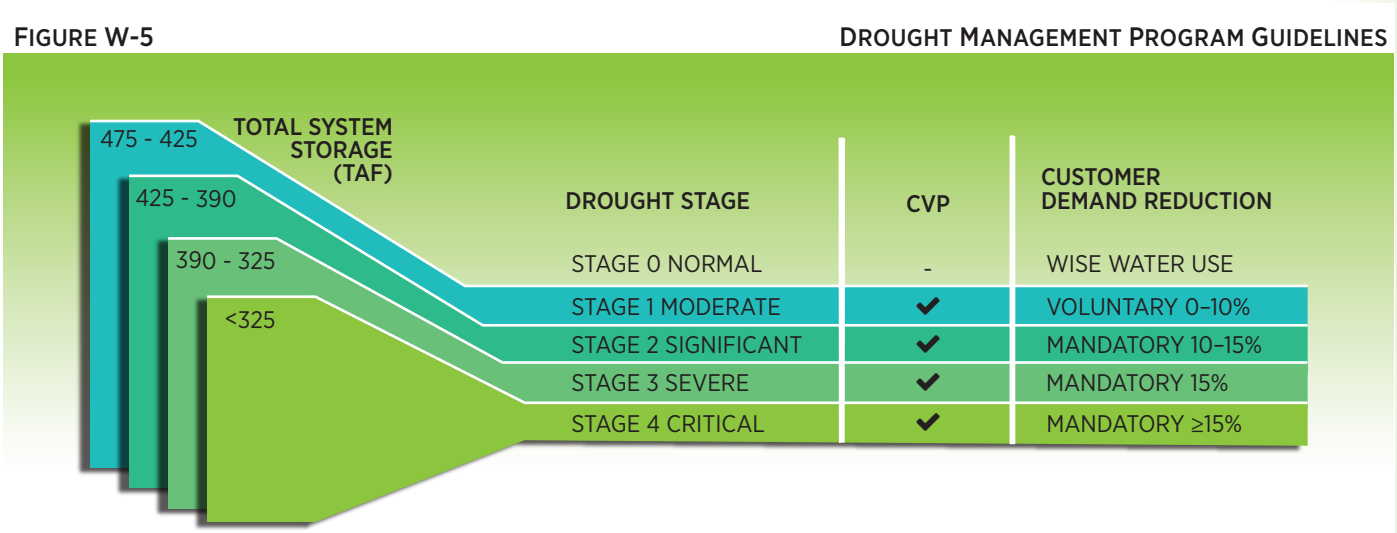
4.1 WATER SUPPLY SHORTAGE MITIGATION

EBMUD has invested extensively in preparations for water supply shortages. In addition to encouraging conservation as discussed in Chapter 6, EBMUD has developed a portfolio of water supply projects to help supplement any shortage in its water supply. These projects, described in Chapter 4, will not only provide customers with relief from frequent and severe water rationing during multi-year droughts, but will also help EBMUD respond to other adverse situations that lead to water shortages.

EBMUD has also invested in projects to provide operational flexibility and improve its ability to recover following an emergency. However, during extreme and catastrophic water shortage conditions, EBMUD may need to explore short-term, temporary options to augment its supply. Temporary dry year supplemental water supply options include:

- trucking recycled water for customers for approved uses;
- drawing from reserve supplies (terminal reservoir standby storage);
- pursuing emergency transfers or exchanges.

FIGURE W-5 **DROUGHT MANAGEMENT PROGRAM GUIDELINES**



TOTAL SYSTEM STORAGE includes Pardee, Camanche, Upper San Leandro, Briones, Lafayette, Chabot, and San Pablo Reservoirs

CVP - Central Valley Project

TABLE W-6 DROUGHT MANAGEMENT PROGRAM ELEMENTS BY STAGE FOR TSS SCENARIO

DROUGHT STAGE	DROUGHT PROGRAM ELEMENTS CONSIDERED
STAGE 1 MODERATE VOLUNTARY 0 – 10% RATIONING	ESTABLISH VOLUNTARY WATER USE REDUCTION GOALS AND DETERMINE USE RESTRICTIONS
	INITIATE A PUBLIC INFORMATION CAMPAIGN TO EXPLAIN THE WATER SUPPLY SITUATION AND CUSTOMER RESPONSIBILITIES
	OUTREACH AND EDUCATION MAY INCLUDE EBMUD'S WEBSITE, SOCIAL MEDIA, MEDIA OUTREACH, ADVERTISING, WORKSHOPS AND EVENTS, BILL INSERTS AND BILL MESSAGING
	INITIATE COMMUNITY WATER WASTE HOTLINE AND ONLINE WATER WASTE REPORTING
	ISSUE UP TO 50,000 SINGLE FAMILY RESIDENTIAL (SFR) HOME WATER REPORTS
	PROVIDE COMMERCIAL AND RESIDENTIAL LANDSCAPE WATER BUDGETS TO UP TO 5,000 ACCOUNTS
	PROVIDE CONSERVATION AUDITS AND WATERSMART HOME SURVEY KITS
	ISSUE UP TO 5,000 INDOOR PLUMBING FIXTURE AND APPLIANCE REBATES
	ISSUE UP TO 5,000 OUTDOOR LANDSCAPE & IRRIGATION REBATES
	CONDUCT WATER AUDITS
	PROVIDE UP TO 5,000 FREE WATER SAVING DEVICES
	EXPAND WATER LOSS CONTROL PROGRAM (E.G., ACOUSTIC LOGGERS, LEAK DETECTION CREWS)
STAGE 2 SIGNIFICANT MANDATORY 10 – 15% RATIONING	IN ADDITION TO ELEMENTS OF STAGE 1:
	APPLY STAGE 2 DROUGHT SURCHARGE
	CONTINUED OUTREACH AND EDUCATION
	PROVIDE ONLINE EBMUD STORE ORDERING (RESTAURANT AND HOTEL TENT CARDS, STICKERS)
	INCREASE SFR HOME REPORTS TO 75,000 HOUSEHOLDS
	INCREASE COMMERCIAL AND RESIDENTIAL LANDSCAPE WATER BUDGETS TO 25,000 ACCOUNTS
	ISSUE UP TO 10,000 FREE WATER SAVINGS DEVICES
STAGE 3 SEVERE MANDATORY 15% RATIONING	IN ADDITION TO ELEMENTS IN STAGE 2:
	APPLY STAGE 3 DROUGHT SURCHARGE
	ADVANCED MEDIA OUTREACH / RESPONSE
	ADVANCED CUSTOMER OUTREACH & EDUCATION
	CONSIDER WATER SAVING CAMPAIGNS, CHALLENGES
	CONSIDER SUPPLEMENTING EDUCATION AND OUTREACH WITH WEBSITE TOOLS AND INFORMATION; OUTDOOR, RADIO, PUBLICATIONS, AND ONLINE ADVERTISING; DROUGHT THEATERS OR OTHER EDUCATION FOR CHILDREN; CONTESTS AND PLEDGES; PROMOTIONAL ITEMS, SIGNS, DROUGHT NEWSLETTERS, CUSTOMER OUTDIAL MESSAGES, POSTCARD MAILINGS, ETC.
	INSTITUTE EXCESSIVE USE PENALTY FOR SFR CUSTOMER WITH USE > 60 CCF/MONTH
	INITIATE SUPERSAVER RECOGNITION PROGRAM
	INCREASE SFR HOME REPORTS TO 100,000 HOUSEHOLDS
	INCREASE COMMERCIAL AND RESIDENTIAL LANDSCAPE WATER BUDGETS TO 50,000 ACCOUNTS
	ISSUE UP TO 7,000 INDOOR PLUMBING FIXTURE AND APPLIANCE REBATES
	ISSUE UP TO 8,000 OUTDOOR LANDSCAPE & IRRIGATION REBATES
	ISSUE UP TO 15,000 FREE WATER SAVINGS DEVICES
	PROVIDE FIELD ENFORCEMENT OF REGULATIONS AND WATER USE RESTRICTIONS
STAGE 4 CRITICAL MANDATORY ≥15% RATIONING	IN ADDITION TO ELEMENTS IN STAGE 3:
	APPLY STAGE 4 DROUGHT SURCHARGE
	INSTITUTE EXCESSIVE USE PENALTY FOR SFR CUSTOMER WITH USE > 40 CCF/MONTH
	INCREASE SFR HOME REPORTS TO 325,000 HOUSEHOLDS
	INCREASE COMMERCIAL AND RESIDENTIAL LANDSCAPE WATER BUDGETS TO 150,000 ACCOUNTS
	ISSUE UP TO 20,000 FREE WATER SAVINGS DEVICES

TABLE W-7 SHORTAGE LEVELS CROSS-REFERENCE WITH STATE'S SHORTAGE STAGES

EBMUD DROUGHT STAGE	EBMUD SUPPLY SHORTAGE	STATE SHORTAGE LEVELS
0	NORMAL	1–4
1	MODERATE (43%)	5
2	SIGNIFICANT (50%)	5
3	SEVERE (55%)	6
4	CRITICAL (64%)	6

4.2 WATER RESERVE DRAWDOWN

It is EBMUD's policy to operate its terminal reservoirs to maintain enough standby storage to meet rationed customer demand for 180 days, in case the Mokelumne River supply is disrupted. After the emergency ends, the Mokelumne River supply is returned to service soon as practicable and within the regulatory framework to refill terminal reservoirs to meet minimum standby storage levels while also supplying inline plants. 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) can be used during an emergency to reduce demand on the local reservoirs or used following an emergency to help EBMUD's recovery in re-establishing storage levels.

4.3 INTERTIES & AGREEMENTS FOR TRANSFERS & EXCHANGES

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. Transfers/exchanges would be made under these agreements only for a short-term period of one year or less. These agreements provide an alternate source of water during planned facility outages and for emergency mutual aid to the parties but would not be used in situations involving a shortage of water due to high demand or drought. Figure W-6 presents a map of these emergency interties for transfers/exchanges in EBMUD's service area 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 Valley Water as part of the negotiated settlement of the Freeport Regional Water Project (FRWP) EIR/ EIS. These agreements are also discussed in more detail below.

In the future the Freeport facility may also provide regional reliability benefits, as EBMUD could partner with other Bay Area water agencies to help them receive water that may otherwise be inaccessible to them given their own system constraints. To accomplish this, EBMUD could temporarily use the Freeport Project to deliver water to its treatment and distribution system in the East Bay, when capacity is available, on behalf of other local agencies, and existing interagency interties could be used to deliver the water to its ultimate destination.

SFPUC-Hayward-EBMUD Agreement for Emergency Water Services

In 2002, EBMUD formed a regional partnership with SFPUC and Hayward to construct the SFPUC-Hayward-EBMUD 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 project included a new pump station and 1.5 miles of pipeline in Hayward, with minor improvements in EBMUD's and SFPUC's water systems. Construction was completed in 2007.

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

A 1990 agreement with DSRSD identified two locations available for transferring treated water between the two agencies, at up to 1.4 MGD at one location and up to 0.7 MGD at the second location. A 2007 amendment to the 1990 agreement with the DSRSD added a third 1.4 MGD DSRSD intertie on Dougherty Road connected in 2007. The three intertie locations are shown in Figure W-6. The process and billing are outlined in an agreement similar to that with Hayward.

Agreements with CCWD

In 2002, EBMUD executed an agreement with Contra Costa Water District (CCWD) for emergency services. Per the agreement, 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 with SCVWD

In 2003, Freeport Regional Water Authority and SCVWD (now Valley Water) signed a settlement agreement in which EBMUD would make available to Valley Water 6500 AF of its CVP allocation during the first year of its 3-year consecutive drought cycle. In exchange, Valley Water would return to EBMUD the equivalent amount of water in the second or third consecutive year of drought. To date there is no implementation agreement.

4.4 Demand Reduction Method

During Water shortage emergencies, many of the programs and projects described in EBMUD's water conservation program (see Chapter 6) are expanded to reduce demand. Implementation of a drought surcharge and excessive use penalties and application of water use restrictions also help EBMUD reduce demand during declared droughts. All of these are discussed in Compliance and Enforcement section.

EBMUD has also developed water efficiency requirements for new water service. Section 31 of EBMUD's Regulations Governing Water Service to Customers (Appendix G) outlines the water efficiency measures required for new and expanded service. Applications for standard service require approval from EBMUD's Water Conservation Division. Section 31 sets water efficiency requirements for indoor fixtures including toilets and urinals, showerheads, faucets, and appliances. For outdoor water use, Section 31 includes requirements for the design and installation of landscaping and irrigation systems. Section 31 requires that ornamental turf areas shall be limited to no more than 25% of the total landscaped area, and that non-turf areas shall be native or climate- appropriate species. It also sets efficiency requirements for irrigation systems. Applicants are required to meet the requirements of local and State regulations including the Model Water Efficient Landscape Ordinance (MWELO). In addition, EBMUD requires weather-based controllers for all premises with 500 square feet or more of new irrigable landscape area. Depending on the size of the area to be irrigated, a dedicated irrigation meter may be required.

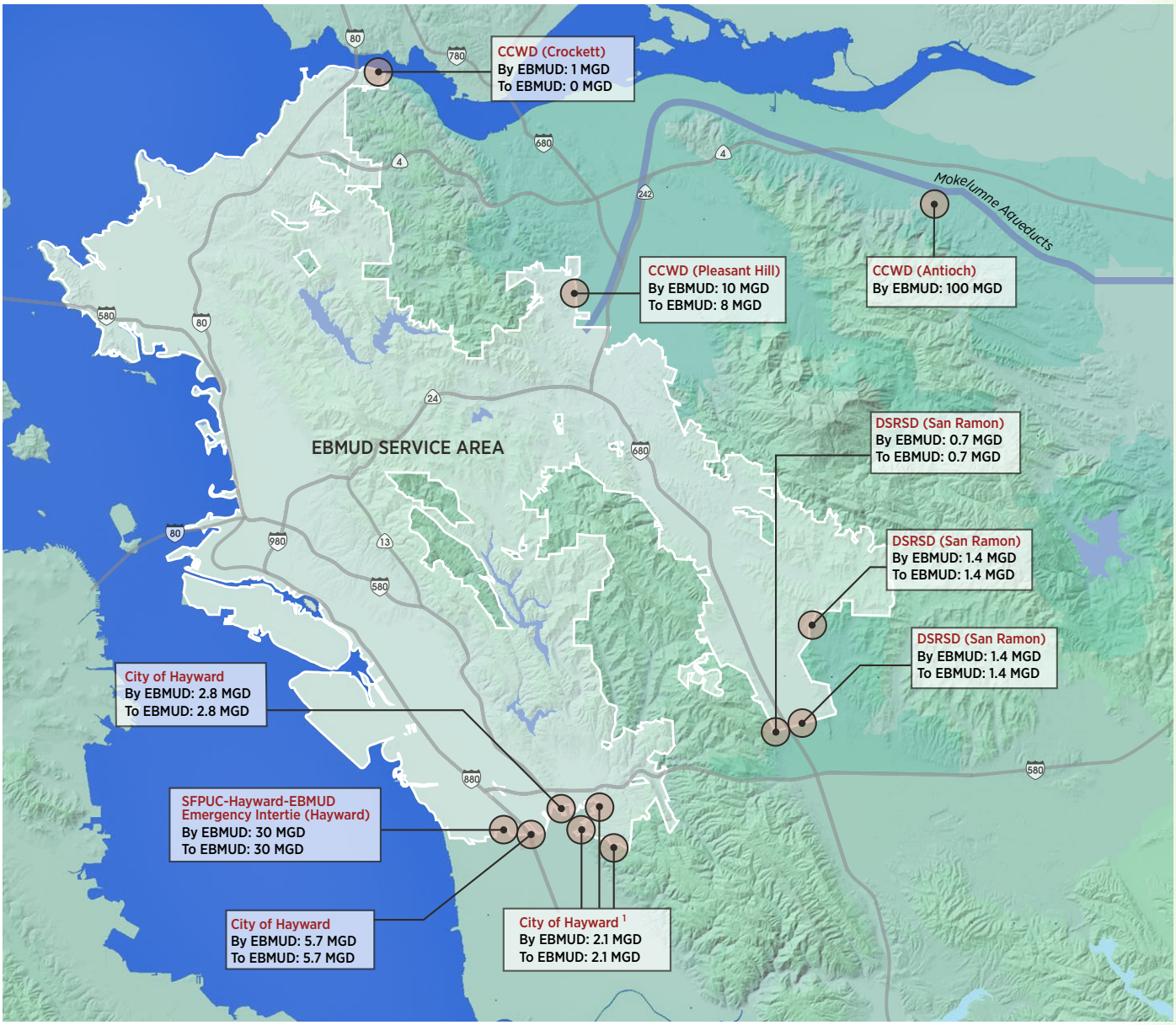
Water Consumption Reduction

EBMUD partners with its customers to cut back water use in significant and sustained ways during water shortage emergencies. EBMUD's new system of drought surcharges, combined with the existing tiered-volume rate structure for single family residential customers, provides a financial incentive for reducing water consumption. In past droughts, EBMUD has expanded incentive and rebate programs to encourage greater water use efficiency. EBMUD's website has also become increasingly important for educating customers about methods for conserving and providing tools to assist them in meeting their water savings goals.

During the 2008-2010 drought, EBMUD developed a system whereby customers were given a particular allotment of water based on their past use. Customers who exceeded this allotment were charged an additional surcharge. In the 2014-2015 drought, EBMUD focused its efforts on education, public outreach, and providing information and tools to help customers conserve and did not implement water rationing with water allotments. In the future, EBMUD will consider community input and outreach approaches that align with the specific needs during that drought.

FIGURE W-6

EMERGENCY INTERTIES FOR SHORT-TERM TRANSFERS & 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.

Water Use Reduction Targets

EBMUD's DMP recommends specific levels of voluntary or mandatory rationing based on the projected end of year total system storage. EBMUD's goal is to provide 85% reliability to customers.

EBMUD's ability to limit mandatory water use reductions to 15 percent depends upon the extent to which supplemental supplies are available and whether/how much USBR reduces CVP allocations in a given year. Supplemental supplies and CVP supplies may not always be available when needed as indicated by recent events. In 2014, USBR limited EBMUD to 50 percent of its CVP allocation, and in 2015 USBR was only able to provide EBMUD with a 25 percent CVP allocation. In extraordinary circumstances, such as when CVP or other supplies are minimally available or unavailable during an extreme drought, EBMUD may need to increase the rationing level above 15 percent in order to ensure adequate supplies the current and next year. For example, in 2015, EBMUD's Board declared a mandatory 20% water use reduction target due to extraordinary circumstances at the time and to meet the State's imposed water use reduction mandate.

A 15 percent reduction overall can be achieved by applying different levels of conservation for each

customer category. Table W-8 lists example customer category reduction goals that EBMUD estimates would be required to achieve the district-wide rationing target.

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. 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
   - maintaining equity in 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.

TABLE W-8 EXAMPLE OF CUSTOMER CATEGORY REDUCTION GOALS

CUSTOMER CATEGORY	REDUCTION GOAL[1]
SINGLE-FAMILY RESIDENTIAL	19%
MULTI-FAMILY RESIDENTIAL	11%
COMMERCIAL	12%
INSTITUTIONAL	8%
INDUSTRIAL	5%
IRRIGATION	30%
TOTAL CUSTOMER DEMAND RATIONING GOAL	15%

1 Annual average goals estimated to achieve 15% reduction of year 2040 total demand.

4.5 EMERGENCY RESPONSE PLAN

In addition to maintaining its own emergency preparedness program, EBMUD coordinates with local, regional, state, and federal partners to ensure readiness in the event of an emergency.

Consistent with EBMUD Policy 7.03 (Appendix G), EBMUD maintains an active emergency preparedness and business continuity 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 describes the internal organizational structure used in the response to all emergencies, including regional power outages and earthquakes. EBMUD reviewed and updated the EOP in 2019. An update to the Emergency Response Plan for EBMUD's FERC regulated dams was done in early 2020 to include, among other revisions, the FERC Emergency Action Plan Support Team in the EBMUD Emergency Operations Team (EOT). The EOP was also updated to formally designate the Director of Engineering and Construction as the Chief Dam Safety Officer, along with an alternate. EBMUD's EOP ensures effective coordination with local and state emergency management agencies in response to emergency conditions. EBMUD 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 District personnel assigned to the EOT will carry out the five SEMS functions (management, operations, planning, logistics, and finance; plus a public communication function added by EBMUD in 2014). Operating under the EOP, the Emergency Operations Director and

Section Chiefs establish response priorities based on the nature of the emergency, focusing on actions to address life safety concerns first, then incident stabilization, and finally protection of property and restoration of normal operations. The Operations Section Chief also works 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.

In October 2018, the America's Water Infrastructure Act (AWIA) Section 2013 (A-H) was signed into law. AWIA requires community drinking water systems to develop or update risk and resilience assessments (RRAs) and emergency response plans (ERPs). AWIA specifies the components each of the plans must address and establishes deadlines by which water systems must certify to EPA completion of the plans. Based on the number of District customers, EBMUD complete its initial RRA in September 2020. These plans will need to be re-certified every 5 years. AWIA does not specify any standards for the RRA or the ERP, but recommends the use of standards, such as the AWWA J100-10, to facilitate preparation of the RRA and ERP.

4.6 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 recognizes, as do the other agencies, that in the event of a regional catastrophe, assistance from other local agencies is not guaranteed. To mitigate the risk of limited access to local mutual aid, EBMUD entered into a Multi-Agency Mutual Assistance Agreement with the Los Angeles Department of Water and Power (LADWP) and with the Las Vegas Valley Water District (LVVWD) to mutually supply as much of the requested resources as possible to the other agency, if possible, if a disaster impacts only one of the agencies. EBMUD is also a member of the California Water Agency Response Network (CalWARN), which serves as a central point of coordination through the Omnibus Mutual Aid/Assistance Agreement with water agencies throughout the state. The signatories may be called upon during an emergency to provide available resources.

4.7 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 serve as an interface with their local Operational Area Offices of Emergency Services. In California, each county is responsible for maintaining these operational area offices. The state is divided into six regions, each of which is responsible for maintaining a Regional Emergency Operations Center (REOC). The State of California, which regulates SEMS, maintains the State Office of Emergency Services that oversees these REOCs and the Operational Areas, working out of the State Operations Center in Mather, California.

SEMS was mandated by Government Code section 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 Principal Coordination Official assigned by the federal government to coordinate planning and response under the Emergency Support Functions 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. In 1996, this California Potable Water Task Force published a 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 allows 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. The Emergency Drinking Water Procurement document was last updated

in 2014. This helps water agencies that sustain heavy damage to focus on rebuilding and returning their system to a dependable level of service.

4.8 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

New Water Code Section 10632.5 requires the 2020 UWMP to include a seismic risk assessment of the vulnerability of the water system facilities. Section 10632.5 also allows an urban water supplier to comply with this requirement by submitting a copy of its most recently adopted local hazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390), if that plan addresses seismic risk. In 2018, consistent with the Disaster Mitigation Act of 2000, EBMUD adopted its Local Hazardous Mitigation Plan (LHMP). The chapter on Identified Hazards builds on available historical data and establishes detailed profiles for each of the primary hazards impacting EBMUD's service area: five related to earthquakes (faulting, shaking, earthquake induced landslides, liquefaction, and tsunami), and four related to weather (flooding, landslides, wildfires, and drought).

The Vulnerability Assessment chapter summarizes the risks to each facility type. In particular, it assesses the exposure and vulnerability of the identified hazards and summarizes the impact and estimated loss by facility type. These risk assessments collectively contribute to the development, adoption, and implementation of a meaningful and functional mitigation strategy based on accurate background information.

The Mitigation Goals, Objectives, and Actions chapter describes the specific mitigation actions, capital improvements, and other measures EBMUD has undertaken and/or will undertake to address the identified risks for each facility type.

The 2018 LHMP executive summary is located in Appendix I. The comprehensive LHMP is available on EBMUD's website at ***www.ebmud.com/files/8916/1194/8548/EBMUD_2018_LHMP.PDF***

5. COMMUNICATION PROTOCOLS

During a water shortage emergency, EBMUD implements a public education program to inform the public and uses various methods and tactics to promote water use reductions and improved efficiencies. The campaign explains the potential impacts of a water shortage, the water supply status, methods to reduce water consumption, potential excessive use penalties, EBMUD actions, and customer responsibilities. The campaign typically highlights specific EBMUD programs and services to help customers reduce their water use.

At the onset of a water shortage emergency, EBMUD develops a detailed Drought Communication Plan (DCP) to provide information to customers, public officials, and other stakeholders. The specific details and messages are tailored to the particular drought situation. 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 education campaign with broad reach, while targeted communication methods focus on particular customers or sectors. General communication methods include media outreach, creating outdoor and other advertising, expanding stakeholder outreach, providing information on the web, producing bill inserts and messages, sending direct mail to public officials, briefing key community leaders and officials, and providing information through the customer contact center. Targeted communication methods can include 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 and customer engagement about their water use. In some previous, statewide droughts, EBMUD has also benefited from "earned" media when statewide messaging and advertising reaches EBMUD customers.

Following are additional details on some of the general and targeted communications methods that EBMUD has employed in previous droughts.

- Advertising campaigns throughout the EBMUD service area broadcast conservation messages on radio and cable television, local newspapers and magazines, bus exteriors, transit shelters and EBMUD billboards. EBMUD has also participated in regional advertising campaigns on radio and television when the messages were consistent with EBMUD's and donated billboard space for the statewide campaign. Campaign messages included appreciation for customer conservation, continued encouragement to save water by fixing leaks and installing efficient outdoor landscape irrigation and using online tools to understand and curb water use.
- EBMUD invests in resources and tools to support customer contacts and customer billing functions to ensure a continuous level

of quality customer service during a water shortage. Drought periods increase the volume of calls to EBMUD's customer Contact Center, Field Services, Water Conservation, Customer Services Support, and Public Affairs divisions. EBMUD ensures adequate staffing to respond to customers' questions and requests for assistance.

- EBMUD's website has become an increasingly important tool for disseminating information to customers and the media during drought periods and EBMUD's social media presence provides another tool to communicate to customers about drought.
- EBMUD initiates significantly more direct customer contacts and responds to significantly more inquiries from customers. Water conservation and field services staff distribute drought messages and water savings devices, encourage water savings, assist customers in changing their water use, inform customers about voluntary program requirements, and enforce mandatory requirements.
- EBMUD has used "out-dial" calls and direct mail to alert customers to the start of the drought program and to request curtailed water use during especially prolonged hot weather.
- EBMUD reaches out to civic, community, nongovernmental and business groups, homeowner associations, nurseries, schools, trade organizations, and local officials and also conducts workshops on water conservation topics, as discussed in Chapter 6. This work expands during droughts. EBMUD informs local stakeholder groups and seeks their assistance in communicating with their constituents, which generates a multiplier effect as they share the information with additional customers.

6. CUSTOMER COMPLIANCE AND ENFORCEMENT

6.1 WATER USE RESTRICTIONS

EBMUD's Regulations Governing Water Service to Customers, included in Appendix G, include various restrictions on water use and prohibitions on the waste of water. Section 29, "Water Use Restrictions," is continuously enforced. Section 28, "Water Use During Water Shortage Emergency Condition," is enacted when the EBMUD Board of Directors declares a Water Shortage Emergency. In addition, Section 28 may be added in response to state mandated water use reductions designed to address short-term statewide water shortages.

Section 29 details on-going requirements that residential and nonresidential customers must observe. For example, residential customers are required to irrigate their property in a manner that does not result in excessive flooding or runoff, and all customers are required to repair leaks wherever it is feasible to do so. Under normal conditions, EBMUD relies on customer education to ensure that these requirements are met. When customers and field staff report of overwatering or water waste, EBMUD responds by contacting the customer and may send water conservation and field services personnel to apprise the customer of the wasteful conditions and make recommendations on 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 restrictions in Section 29 are supplemented temporarily with additional restrictions when the Board declares a Water Shortage Emergency and enacts Section 28.

Section 28 sets water use rules and provides guidance to customers about reducing water use during a declared Water Shortage Emergency or when necessary to comply with state mandated water use reductions. The rules and guidance in Section 28 are tailored to the specific drought stage. Enforcement actions can include extra meter readings, written warnings, installation of flow-restriction devices, and even discontinuance of water service. However, EBMUD would not discontinue water service during a pandemic. EBMUD updated Section 28 in 2014 and 2015 to reflect the state mandated restrictions on outdoor water use.

Section 28 prohibits certain uses of potable water during a water shortage emergency, including:

- Using potable water for decorative ponds, fountains, and other water features that do not recirculate water (this does not include swimming pools or spas);
- Washing cars, boats, trailers, aircraft, and other vehicles by hose without a shutoff nozzle;
- Washing sidewalks, driveways, or hard surfaces;
- Irrigating ornamental turf on public street medians; and
- Flushing sewers or hydrants with potable water.

Section 28 also states that irrigating turf and ornamental landscape with potable water is permitted no more than two days each week, not on consecutive days, and only before 9 AM and after 6 PM. Irrigation of turf and ornamental landscape with potable water is also prohibited during and within 48 hours following measurable precipitation.

During a water shortage situation, enforcement of water waste restrictions becomes particularly important and EBMUD may choose to devote additional resources to this effort. EBMUD staff monitors the service area to encourage water savings, help customers change their water use habits, and enforce regulatory requirements and water waste prohibition rules. EBMUD developed a Water Savings Team that patrolled the service area to respond to reports of water waste, place warning hangers on doors, and educate customers about wise water use. The team also assisted customers with conservation activities like identifying leaks and installing water-efficient fixtures and appliances.

During water shortages, EBMUD typically receives a higher volume of water waste reports from members of the community who report the waste via the EBMUD website or by calling the Water Waste Hotline or Contact Center. Customers can also report water waste for EBMUD through the State Water Resources Control Board's online water waste portal. EBMUD staff investigates the reports and takes appropriate actions. In most cases, EBMUD only needs to report the situation to the responsible party, who then takes action to address the problem. If necessary, EBMUD can also proceed with enforcement.

EBMUD also developed two separate ordinances to control water use: an Excessive Water Use Penalty Ordinance (Ordinance No. 364-15) and a Water Theft Penalty Ordinance (Ordinance No. 368-17). The Excessive Water Use Penalty Ordinance only applies during Stage 3 or 4 droughts, whereas the Water Theft Penalty Ordinance is in place at all times. Copies of these ordinances are provided in Appendix G.

The Excessive Water Use Penalty Ordinance sets penalties for single-family residential (SFR) customers who use large volumes of water during declared droughts. If the Board declares a Stage 3 drought, SFR customers must not consume more than 120 hundred cubic feet (CCF) of water over a two-month billing cycle, or 60 CCF per month. Customers using in excess of this amount are charged a penalty of $2 per CCF above the allotted amount. During Stage 4 droughts, the maximum amount of water allowed before incurring a penalty drops to 80 CCF over a two-month billing cycle, or 40 CCF per month. The purpose of the ordinance is to prohibit excessive water use when the Board has declared a Stage 3 or Stage 4 drought and to authorize EBMUD to impose a financial penalty on customers who violate the Ordinance.

The Water Theft Penalty Ordinance prohibits the theft or unauthorized use of water. Although this ordinance was established during a drought period, it is enforceable throughout the year and not directly tied to drought declarations. This ordinance builds on existing EBMUD regulations related to water theft and give EBMUD the authority to impose administrative penalties on any person who violates the Ordinance's prohibitions.

Per water code Section 10632.2, EBMUD has procedures and ordinances that have exemptions and appeals processes in effect during water shortage emergencies. The Excessive Use Penalty Ordinance for Drought Stages 3 and 4 has an appeals process. Appeals can be granted due to meter error, if the water is needed for health and safety reasons, or due to leaks. Section 28 of the Regulations, "Water Use During Water Shortage Emergency Conditions," says that customers may apply for an exemption to the water use restrictions in the regulation. EBMUD can grant an exemption to prevent undue hardship or to avoid conditions affecting health, sanitation, fire protection, or safety.

There are also regulations, procedures, and ordinances that are in effect at all times, not just during droughts. Procedure 145, "Wasteful Use of Water," has exemptions for hardship and potential public health risks. Similarly, the Water Theft Penalty Ordinance has an appeals process and Section 29 of Regulations, "Water Use Restrictions," offers exemptions for undue hardship or to avoid conditions affecting health, sanitation, fire protection or safety.

EBMUD also has policies related to the approval of water connections for new developments during drought. EBMUD Policy 3.07, "Responsibility to Serve Water Customers," sets out the agency's priorities during a water shortage. EBMUD's first priority is to serve existing customers within its existing service area. EBMUD then serves expected new customers within its service area, but only if this does not unacceptably impair its ability to serve existing customers. Lastly, EBMUD will consider customers outside its existing service area only if this does not impair its ability to serve existing and expected new customers within its service area.

6.2 DROUGHT RATES

Water sales typically account for over 80 percent of EBMUD's operating revenues. The balance includes revenues from a variety of sources such as fees and charges, taxes, hydropower sales, and interest. EBMUD also sells bonds to assist with funding capital activities. EBMUD maintains cash reserves and has a policy of maintaining a debt service coverage ratio of at least 1.6 times coverage.

EBMUD rates and charges are designed to meet its revenue requirements for its water and wastewater systems, to recover the expenditures identified in its operating and capital budgets, and to meet Board policy goals. To determine the appropriate rates needed to recover its expenditures, EBMUD engaged an independent rate consultant in 2015 and in 2019 to perform cost of service (COS) studies on the water and wastewater systems. Based on its COS studies, EBMUD sets its rates based on capital investments, operating expenses, payment of debt service, and maintenance of sufficient reserves. Capital investments are typically large, multi-year projects that can involve significant construction. Capital projects including water system reliability improvements, seismic upgrades, and investments in supplemental supply can help EBMUD prepare for emergencies and droughts. Short-term costs associated with drought management and conservation program activities are also covered.

In 2014, the EBMUD Board and staff participated in a series of workshops exploring long-term financial stability for the organization. The goal of the workshops was to consider and discuss elements of the long range financial plan and cost of service study including underlying assumptions, financial risks, and financial policies aimed at mitigating risks. The results of these efforts laid the groundwork for the development of EBMUD's current budget and rates.

One of the main challenges identified was the need to develop a strategy for dealing with the financial impacts of drought. Drought leads to increased costs such as public outreach, conservation programs, additional staff resources, and the purchase, delivery, and treatment of supplemental supplies. In addition, reduced customer water use can decrease revenues.

As an outcome of the workshops, EBMUD developed a staged system of drought rates which have been developed in tandem with EBMUD's regular rates since fiscal year 2016. Following are additional details on the financial impacts of droughts and how the new rate structure helps EBMUD to mitigate those impacts.

Specific drought surcharges were adopted along with EBMUD's regular rates and charges in 2015, following a process which complied with the requirements of Proposition 218 and other applicable laws. The drought surcharge provides funds to cover EBMUD's water shortage related costs, including the costs of purchasing and delivering supplemental supplies, increased treatment costs, increased conservation and public outreach messaging, increased customer account management services, and revenue loss due to reduction in water use. EBMUD developed drought surcharges of up to 8 percent, 20 percent and 25 percent on the volumetric charges during water shortage Stages 2, 3 and 4, respectively. The drought surcharges correspond to increasingly severe stages of water shortages and are charged on each unit of water used during the billing period. The amount of the drought surcharges in each stage was developed to recover the anticipated drought costs at each stage, including the cost of supplemental supplies (purchase, treatment and delivery), costs of water shortage-related customer service, drought management activities, and lost revenue from reduced water sales. The drought surcharge may be imposed by the Board of Directors at the time or after a specific drought stage has been declared in accordance with EBMUD's Drought Management Program Guidelines.

The board approved drought surcharges do not impose a drought surcharge for Stage 1 when only voluntary customer demand reductions are being implemented. EBMUD's DMP as described in this WSCP allows for supplemental supplies to be acquired during Stage 1; the additional costs of the supplemental supplies delivered will be funded from EBMUD's operating revenues, reserves or rate stabilization fund.

In tandem with the new drought rates, EBMUD also adopted an excessive use penalty for single family residential (SFR) customers who use excessive amounts of water when EBMUD has declared a stage three or stage four drought. This penalty was discussed in the previous section.

EBMUD also established a non-monetary supersaver recognition program for the SFR customer class starting at stage three to recognize customers who use 4ccf or less per month (e.g., 100 gpd or less). The bill insert thanks customers for reducing their use and encourages sustained efforts.

7. LEGAL AUTHORITIES

This section provides a description of the legal authorities that empower EBMUD to implement and enforce its shortage response actions as discussed in this WSCP.

Municipal Utility District (MUD) Act

Among other things, the MUD Act authorizes and empowers EBMUD to fix rates and charges, and make and enforce rules, regulations, and practices in connection with its provision of water service within its service area.

Local Emergencies

California Government Code section 8558 defines the types of emergencies that can be proclaimed under the California Emergency Services Act. The Act allows for the proclamation of a local emergency based upon the existence of drought conditions. In a Stage 3 or Stage 4 drought, EBMUD will coordinate with cities and counties within its service area regarding the possible proclamation of a local drought emergency.

Water Shortage Emergencies

Water Code section 350 calls for water agencies like EBMUD to declare a water shortage emergency when the "ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection." EBMUD would declare a water shortage emergency as described under the DMP Guidelines set forth in the WSCP. Among other things, Water Code sections 351 through 359 require a water agency to hold a properly noticed public hearing prior to declaring a water shortage emergency, to adopt regulations and water use restrictions that will conserve water supplies, and to maintain those regulations and restrictions in full force and effect until the water shortage emergency has ended.

Water Conservation Programs

Water Code section 375 et seq. allows water agencies like EBMUD to adopt and enforce water conservation programs to reduce the quantity of water used by its customers. Water conservation programs adopted pursuant to section 375 may be enacted by ordinance or resolution and must be published and/or posted according to section 376. Following publication or posting, violation of any requirement of a water conservation program is a misdemeanor, and a violator may be held criminally or civilly liable. (See Water Code section 377.) In specific DMP stages, EBMUD may choose to adopt a water conservation program pursuant to section 375 et seq.

Excessive Use Penalty Ordinance

Water Code sections 365-367 require water agencies like EBMUD to identify and discourage excessive residential water use in times of drought. EBMUD complies with this requirement through its excessive use penalty ordinance as discussed in Section 6.1.

CVP Contract

EBMUD executed a contract with United States Bureau of Reclamation for delivery of Central Valley Project water. Chapter 1 Section 1.4.3 of the UWMP provides in-depth discussion of this contract.

8. FINANCIAL CONSEQUENCES OF WSCP

Specific drought surcharges were adopted along with EBMUD's regular rates and charges in 2015, following a process which complied with the requirements of Proposition 218 and other applicable laws. The drought surcharge provides funds to cover EBMUD's implementation and compliance with its water shortage program components, including the costs of purchasing and delivering supplemental supplies, increased treatment costs, increased conservation and public outreach messaging, increased customer account management services, and revenue loss due to reduction in water use. Section 6.2 above provided detail information pertaining to drought surcharges.

8.1 IMPACT OF REDUCED SALES ON REVENUES & EXPENDITURES

Implementation of a DMP entails added costs for EBMUD. Costs include paying for additional temporary personnel and equipment resources, supplemental water purchases, increased outreach to customers, expansion of water conservation rebate and device distribution programs, and development and execution of educational and marketing programs.

In previous droughts, EBMUD hired temporary staff to help implement the DMP. These workers provided administrative support to respond to customer and media inquiries, provided field support to perform water use audits, assisted customers in identifying leaks, provided information technology support for bill adjustments, provided community outreach, responded to water waste calls/emails,

and assisted with mass media outreach efforts. Employing temporary staff increases EBMUD's labor costs. EBMUD also hired an advertising agency to create drought campaigns to encourage customers to cut back their water use.

Outreach to customers is intensified during a drought. There are costs to create and place ads, resources needed for website updates and tools, costs to develop and print publications, production costs to create informative videos, expenses to place automated "out-dial" phone calls, and special mailings costs. Additional media response also requires added resources to gather and vet information, respond to calls, and set up and do onsite interviews. EBMUD may also offer free conservation- related devices to customers or participate in/organize seminars and workshops aimed at teaching customers how to conserve water. These efforts help to educate customers about the drought, highlight water use prohibitions, and emphasize each customer's role and responsibility in responding to the drought.

As part of the DMP, EBMUD may also intensify some of its conservation programs, such as the distribution of water-saving devices and home water audit kits, which also add costs. Additional costs are also incurred for rebate programs that target improving water efficiency; for example, EBMUD offers rebates to encourage customers to remove turf, to install flow meters, to upgrade irrigation equipment to purchase and install low-flush toilets, and to upgrade to water-efficient commercial equipment.

In addition to costs related to implementation of the DMP, EBMUD may face additional costs for the purchase, delivery, and treatment of supplemental supplies. These costs can include the purchase of transfer water, permitting, administrative and environmental work related to transfers, increased treatment costs related to the transfer water, and the operations costs associated with activating and using projects like the Freeport Project or the Bayside Groundwater project.

Table W-9 provides estimates of the costs associated with stage 2 through 4 droughts. For each stage, there are costs for the purchase, transmission, treatment, and storage of additional water, added staff to implement the DMP, and lost revenue due to rationing.

8.2 EBMUD DROUGHT RATE STRUCTURE

As said in Section 6.2, EBMUD held a series of public workshops on Long-Term Financial Stability. In June 2015, EBMUD's Board of Directors adopted a staged system of drought rates and the Excessive Water Use Penalty Ordinance. The specific drought surcharges are adopted along with EBMUD's regular rates and charges, following a process which fully complies with the requirements of Proposition 218 and other applicable laws. On April 26, 2016, the Board suspended the implementation of the Excessive Water Use Penalty Ordinance based on a reduction in potable water use and EBMUD's improved water supply projections.

The drought surcharge raises funds necessary to cover EBMUD's water-shortage related costs, including revenue to cover the costs of purchasing and delivering supplemental supplies, increased treatment costs, increased conservation and public outreach messaging, increased customer account management services, and revenue loss due to conservation.

Table W-5 in Section 4 shows when the drought surcharge would first be applied and the corresponding percent increases throughout the various drought stages.

Proposition 218 notification requirements control the schedule for selecting and implementing drought

TABLE W-9 **DROUGHT COST IMPACTS**

ITEM	STAGE 2 SIGNIFICANT	STAGE 3 SEVERE	STAGE 4 CRITICAL
PURCHASE, TRANSMISSION, & TREATMENT OF ADDITIONAL WATER	$15,750,000	$42,412,500	$55,800,000
STORAGE COSTS	$6,100,000	$6,100,000	$6,100,000
CUSTOMER RELATED COSTS (ADDITIONAL STAFF, PUBLIC INFORMATION)	$2,300,000	$3,250,000	$3,250,000
REVENUE LOSS	0-15% OF BASELINE VOLUME REVENUE	15% OF BASELINE VOLUME REVENUE	20% OF BASELINE VOLUME REVENUE
CUSTOMER SURCHARGE	UP TO 8%	UP TO 20%	UP TO 25%

NOTES
Costs derived from EBMUD Water and Wastewater Cost of Service Study, April 2015.
Costs shown are based on FY2016. Costs are developed for each budget cycle and actual costs and revenue loss are based in market and customer behaviors.

rates and charges. Consequently, EBMUD must consider options for drought rate structures prior to the anticipated start of a drought program. EBMUD's goal in developing the drought surcharges was to increase its ability to successfully manage water supplies by having a set of drought surcharges that, having already gone through the Proposition 218 process, could be implemented quickly.

9. MONITORING AND REPORTING

During droughts, EBMUD monitors customer demand closely to ensure that its DMP is effective in reducing demand to the required level. Data gathered from monitoring can help EBMUD to make decisions on priorities for customer outreach and conservation programs.

EBMUD evaluates both billed consumption and daily water production data relative to reduction goals. Using this data, staff gauges EBMUD's effectiveness in managing overall demand and customers' responsiveness to requests 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.

Customer accounts are metered, providing bi-monthly and monthly (for large water use accounts) 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. Air 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 to the Board. 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.

The success of a DMP depends on customers reducing their water use. Experience shows that providing clear feedback on consumption relative to goals and water use reduction expectations, benchmarking efficient water use among customer sectors, clearly stating the financial penalties for overuse, clearly stating the consequences for violating water use regulations and ordinances, and acknowledging all customers' efforts to save water all reinforce prudent behavior. EBMUD uses Home Water Reports for enrolled customers and uses its Customer Information System (CIS) to inform all customers of their current and past water uses and routinely updates printed messages on customer water bills. This information helps customers monitor their individual rationing efforts and encourages adjustments to usage.

10. WSCP REFINEMENT PROCEDURES

EBMUD prepares internal lessons learned reports from various departments after consecutive drought events; these reports document the challenges and successes to understand causes of difficulties and to make improvements in handling future droughts/water shortages. The benefits of looking back at past experience include process improvement, risk management, identifying constraints and uncertainties. This reflection and evaluation facilitate EBMUD to make continuous improvement in refining response actions.

EBMUD also has a Drought Committee made up of managers and senior management who convene as necessary to address drought related problems and responses. Under the direction of the Drought Committee, the DMP guidelines were updated in 2015 and 2016. For this update of the UWMP, the Drought Committee recommended reviewing the DMP guidelines once again as discussed in Section 4 to refine based on the recent drought as well as to reflect new legislation. This evaluation and assessment support the refinement process that EBMUD takes to ensure WSCP is prepared adequately and implemented as an adaptive management plan to provide guidance leading up to and during a water shortage situation.

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