MID-PENINSULA
WATER DISTRICT

2020 Urban Water Management Plan

FINAL

IN ASSOCIATION WITH:

ManageWater Consulting, Inc.

Maddaus Water Management Inc.

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LIST OF ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
Act	Urban Water Management Planning Act
ACWA	Association of California Water Agencies
AF	acre-foot/acre-feet, (1 AF = 325,851 gallons)
AFY	acre-feet per year
AMI	Advanced Metering Infrastructure, smart metering
AMR	Automatic Meter Reading
Annual Assessment	Annual water supply demand assessment
AWIA	America's Water Infrastructure Act (AWIA) of 2018
AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation
AWSP	Alternative Water Supply Planning Program
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BDP	Bay Delta Plan Amendment
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CCF	Hundred Cubic Feet (1CCF = 748 gallons)
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CPI	Consumer Price Index
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
Delta	Sacramento-San Joaquin Delta
DMM	Demand Management Measure
DOF	California Department of Finance
DRA	Drought Risk Assessment
DRIP	Drought Implementation Plan
DWR	California Department of Water Resources
DSS	Decision Support System Model
eAR	Electronic Annual Reporting System
EOC	Emergency Operations Center
ERP	Emergency Response Plan
Eto	Evapotranspiration rate

GIS	Geographic Information Systems
GPCD, gpcd	Gallons Per Capita Per Day
GPF	Gallons per flush
GSA	Groundwater Sustainability Agency
HCF unit	A billing unit of 100 cubic feet or CCF, 748 gallons
HHLSM	Hetch Hetchy Local Simulation Model
HOA	Homeowners' Associations
ILI	Infrastructure Leakage Index
ISA	Interim Supply Allocation
ISG	Individual Supply Guarantee
Legislature	State of California Legislature
LAFCO	Local Agency Formation Commission
MF	Multi-family
MG	Million gallons
MGD	Million Gallons per Day
MPWD	Mid-Peninsula Water District
NOAA	National Oceanographic and Atmospheric Administration
PWSID	Public Water System Identification Number
RWS	Regional Water System (also Hetch Hetchy System)
SB	Senate Bill
SBSA	South Bay Systems Authority
SB X7-7	Senate Bill Extraordinary Session 7-7
SCADA	Supervisory Control and Data Acquisition
SF	Single Family
SFPUC	San Francisco Public Utilities Commission
State Water Board, SWRCB	State Water Resources Control Board
Supplier, retail supplier	urban water supplier, retail supplier
SVCW	Silicon Valley Clean Water
Water Code	California Water Code
UWMP	Urban Water Management Plan
WCIP	Water Conservation Implementation Plan
WSA	Water Supply Agreement
WSAP	Water Shortage Allocation Plan
WSIP	Water System Improvement Program
WSA	Water Supply Agreement
WSAP	Water Shortage Allocation Plan
WSIP	Water System Improvement Program
WUE Data Portal	Water Use Efficiency Data Portal, DWR database

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1. URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW

Lay Description

An Urban Water Management Plan (UWMP) is the legal and technical water management foundation for suppliers throughout California. The Mid-Peninsula Water District's (MPWD's) UWMP provides its staff, the public, and elected officials with an understanding of past, current, and future water conditions and management. This UWMP integrates local and regional land-use planning, regional water supply, infrastructure, and demand management projects, as well as statewide issues of concern like climate change and regulatory revisions. For its 2020 UWMP, the MPWD gathered, characterized, and synthesized water-related information, using local, regional, and statewide data sources.

Chapter 1 introduces the UWMP, its legislative history, legal requirements and amendments, focus, importance, and purpose. Additionally, in this chapter MPWD describes its process for integrating information from other documents and coordination with local and regional agencies. The intent of UWMPs is to provide the California Department of Water Resources (DWR) and the public with information on present and future water sources and demands and to provide an assessment of MPWD's water resource needs.

The UWMP Act (Act) was adopted by the California Legislature as Assembly Bill 797 during the 1983-84 session and signed into law by Governor Deukmejian on January 1, 1984. The original Act also required the DWR to provide a report to the California Legislature on the status of water supply planning in California.

The Act requires an urban water supplier (supplier), providing water for municipal purposes to more than 3,000 customers or serving more than 3,000 acre-feet annually[1], to adopt an Urban Water Management Plan (UWMP) every five years demonstrating water supply reliability in normal, single dry, and multiple dry years for a 20-year planning period. It also must identify and quantify the adequacy of water supplies for existing and future demands during normal, dry and drought years, and assure efficient use of urban water supplies. The Act also requires water shortage contingency planning and identifying drought response actions.

The UWMP Act requires urban water suppliers to report, describe, and evaluate:

- Water deliveries and uses.
- Water supply sources.
- Efficient water uses.
- Demand Management Measures (Conservation Measures).
- Water shortage contingency planning.

[1] Urban Water Management Planning. http://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=WAT&division=6.&title=&part=2.6.&chapter=&article=

A significant amendment was added in 2009, after the drought of 2007-2009, and because of the governor's call for a statewide 20% reduction in urban water use by the year 2020. This amendment is the Water Conservation Act of 2009, also known as SB X7-7. SB X7-7 requires agencies to establish water use targets for 2015 and 2020 that would result in statewide savings of 20% by the year 2020. It also requires urban water suppliers to report in their UWMPs, base daily per capita water use (baseline), urban water use target, interim urban water use target, and compliance daily per capita water use. Beginning in 2016, retail water suppliers are required to comply with the water conservation requirements in SB X7-7 to be eligible for State water grants or loans. In Chapter 5 MPWD discusses 2020 compliance with SB X7-7.

The 2020 UWMP has undergone significant expansion and revision, as seen in Appendix A of the DWR's 2020 UWMP Guidebook[2]. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions not only affect a supplier's water reliability determinations, but also the broad picture of statewide water reliability overseen by the DWR, the State Water Resources Control Board (State Water Board), and the State of California Legislature (Legislature).

Current Water Code requires suppliers to develop urban water use objectives for certain sectors, to meet their target water use calculated in the previous plan. The water use objectives will not be developed until 2023, and the first report will require information on what demand management measures (water conservation measures) suppliers will implement to meet their stated objectives. In anticipation of new requirements, the MPWD's 2020 UWMP discusses the implementation or planned implementation of demand management measures in Chapter 9. Additional new requirements, since 2015, are presented in the section below on "New Requirements".

New Requirements

Numerous additional requirements were added by the Legislature for 2020 UWMPs since 2015. The key new requirements include:

- **Five Consecutive Dry-Year Water Reliability Assessment.** The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires that MPWD analyzes the reliability of its water supply from SFPUC to meet its water use over an extended drought period. MPWD addresses this new requirement in three chapters: Water Use assessment presented in Chapter 4, Water Supply analysis presented in Chapter 6, and Water Reliability determinations in Chapter 7.

- **Drought Risk Assessment.** The Legislature created a new UWMP requirement for drought planning in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change. The Drought Risk Assessment (DRA) requires MPWD to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years. MPWD discusses the DRA based on the Water Use information in Chapter 4, Water Supply analysis in Chapter 6, and the Water Reliability determinations in Chapter 7.

[2] Final DWR 2020 Guidebook. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans/Final-2020-UWMP-Guidebook/UWMP-Guidebook-2020---Final-032921.pdf

- **Seismic Risk.** MPWD addresses the intersection of water supply infrastructure planning with local hazard mitigation planning specific to Seismic Risk in Chapter 7. In 2016, MPWD conducted seismic studies of 2 oldest tank sites - Hallmark[3] and Dekoven[4]. Additionally, MPWD has identified Jurisdiction-Specific Vulnerabilities and performed Hazard Risk Ranking for these facilities in Hazard Mitigation Action Plan and has developed Evaluation of Recommended Actions in the comprehensive San Mateo County Hazard Mitigation Plan.[5]

- **Water Shortage Contingency Plan.** In 2018, the Legislature modified the UWMP laws to require a stand-alone Water Shortage Contingency Plan (WSCP) with specific elements. In compliance with the new requirements, the MPWD's WSCP (Attachment 1) documents its action plan for a drought or catastrophic water supply shortage. Many of these elements were previously included in MPWD's 2016 WSCP. Attachment 1in MPWD's 2020 UWMP also discusses its standard procedures and response actions. Many of these actions were implemented by MPWD during the last drought and MPWD successfully met the changing local water supply challenges. The MPWD's WSCP along with statewide WSCPs will also be useful for DWR, the State Water Board, and the Legislature in addressing extreme drought conditions or statewide calamities that impact water supply availability.

- **Groundwater Supplies Coordination.** In 2014, the Legislature enacted the Sustainable Groundwater Management Act to address groundwater conditions throughout California. Water Code now requires suppliers' 2020 UWMPs to be consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by Groundwater Sustainability Agencies. The MPWD does not have groundwater available for its water supply.

- **Lay Description.** The "Lay Description" is a new requirement in the 2020 UWMPs (Water Code Section 10630.5). The Legislature included a new statutory requirement for suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks. The Lay Description is the "go-to" synopsis and is presented in the beginning of each chapter in the MPWD's 2020 UWMP.

MPWD's 2020 UWMP

The MPWD[6] is a "Special District"[7] and a public agency directly providing water for municipal purposes. The MPWD serves 27,560[8] customers and has 8116 service connections[9]. As defined in Water Code Section

[3] Hallmark Water Tanks Structural Review and Retrofit Strategy Report, October 12, 2016.
[4] Dekoven Water Tanks Structural Review and Retrofit Strategy Report, March 2, 2016.
[5] Multi-jurisdictional San Mateo County Local Hazard Mitigation Plan, 2016.
https://cmo.smcgov.org/multijurisdictional-local-hazard-mitigation-plan-resources

[6] The name: Mid-Peninsula Water District, "MPWD" was formally changed from the "Belmont County Water District" on June 5, 2000.
[7] Certificate of Incorporation, State of California, Department of State, July 3, 1929.
[8] Bay Area Water Supply & Conservation Agency's Regional Water Demand and Conservation Projections, BAWSCA, June 26, 2020.
http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf
[9] MPWD Springbrook billing database, January 2020.

10617, MPWD qualifies as an "Urban water supplier" and is required to complete an UWMP for 2020 and every five years thereafter.

This is the seventh UWMP prepared by the MPWD under the terms of AB 797 and subsequent amending legislation.

The 2020 UWMP updates MPWD's previous 2015 UWMP[10] that was submitted to DWR on July 1, 2016. MPWD's comprehensive urban water management planning process integrates information about supplies and demands to address short- and long-term water planning. In so doing, the MPWD:

- Assesses changes in natural hydrology, climate, and groundwater conditions.
- Anticipates the implications of regional, state, and federal regulations.
- Understands supply conditions and water use variability.
- Identifies regional constraints on or opportunities for shared water resources.
- Integrates local land-use changes, development, plans, and population growth.
- Prepares for water shortages and unforeseen calamities.
- Anticipates infrastructure vulnerabilities and plans mitigation measures.
- Recognizes project funding needs and opportunities.

For its 2020 UWMP, the MPWD added the most current data to ensure the 2020 UWMP continues to be its "go-to" reference for reliable information about its water system and water management. The MPWD's 2020 UWMP is an important resource for the MPWD staff, management, the Board, and the public. The MPWD's 2020 UWMP addresses all Water Code requirements for an UWMP, as shown on the completed DWR checklist provided in Appendix 1.

The 2020 UWMP is robust, as it addresses the following MPWD's water-planning fundamentals:

1. A detailed review of current and future water use. The MPWD is one of 26 Bay Area Water Supply and Conservation Agency (BAWSCA) members agencies.[11] BAWSCA was created on May 27, 2003, to represent the interests of 16 cities, eight water districts and two private water providers who purchase potable water from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS). BAWSCA has the authority to coordinate water conservation, supply, and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the regional water system; and build facilities jointly with other local public agencies or on its own to carry out the agency's purposes. BAWSCA facilitated the Amended and Restated Water Supply Agreement between the City and County of San Francisco and Wholesale Customers (November 2018).[12]

[10] Mid-Peninsula Water District, 2015 Urban Water Management Plan, adopted June 23, 2016. https://www.midpeninsulawater.org/documents

[11] http://bawsca.org/

[12] Amended and Restated Water Supply Agreement between the City and County of San Francisco and Wholesale Customers, November 2018. https://bawsca.org/water/reliability

2. MPWD Water Service Ordinances – 103 and Attachment A, 111, 112, 113, 115, 120, and 121. [13]

3. BAWSCA agencies use the Demand Side Management Least Cost Planning Decision Support System (DSS) Model that was developed by Maddaus Water Management.[14] (Appendix 3).

   The DSS Model was used to project both long-range water demands and conservation savings, through 2045, for MPWD. To forecast water demands, the DSS Model relies on demographic and employment projections, combined with the effects of natural fixture replacement due to the implementation of plumbing codes to forecast future demands. The total average year water demands in the service area, resulting from the DSS model, include future conservation savings from passive water savings (plumbing and building codes) projected to 2045.

   The DSS Model includes historic actual and projected future water use, accompanying population and employment data sourced from the Association of Bay Area Governments (ABAG), and conservation measures chosen by MPWD. The ABAG population and employment information is an approved data source by DWR. The MPWD's DSS Model was recently updated in July 2020 and uses ABAG population and employment projections for MPWD's service area. Other key resources used for MPWD's 2020 UWMP include the Final DWR 2020 UWMP Guidebook, the 2019-20 BAWSCA Annual Survey[15], the 2020 BAWSCA Demand Study that also uses the same ABAG data, MPWD and local Ordinances, including MPWD Water Service Ordinances – 103 and Attachment A, 111, 112, 113, 115, 120, and 121, and other published reports.

4. Evaluation of potable and potential non-potable water supplies. The SFPUC, that supplies 100% of MPWD's potable water, provided an assessment of its forecast for water deliveries and identified restrictions on water availability under certain regulatory and hydrological conditions for SFPUC water supplies.[16]

5. Analysis of water supply reliability by the SFPUC for BAWSCA agencies to present the water service reliability under normal conditions, single dry- year conditions, and five consecutive dry years through at least 2040. (See Appendices 6 and 7).

6. A realistic Drought Risk Assessment (DRA) by including the water supply and projected water use in a hypothetical five-year drought.

7. An effective and practical Water Shortage Contingency Plan that specifies opportunities to reduce demand and augment supplies under various and unpredictable water shortage conditions.

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[13]MPWD Water Service Ordinances – 103 and Attachment A, 111, 112, 113, 115, 120, and 121).
https://www.midpeninsulawater.org/legislation
https://storage.googleapis.com/midpeninsulawater-org/uploads/Approved_Ordinance_No0.115_WELO_B2.pdf
https://storage.googleapis.com/midpeninsulawater-org/uploads/ORDINANCE%20No.%20113%20Amend%20Ord%20111%20WSCP%20Stage%2022.pdf

[14] Demand Side Management Least Cost Planning Decision Support System (DSS) Model that was developed by Maddaus Water Management. http://maddauswatermanagement.com/wda.html

[15] BAWSCA Annual Survey, FY 2019-20. https://bawsca.org/water/supply/survey

[16] SFPUC, Additional Supply Reliability modeling results, March 30, 2021. (See Appendix 7).

To meet statutory reporting requirements, MPWD's 2020 UWMP also reflects short-term and long-term land-use planning assumptions and goals, accounts for known or projected plans and infill development projects for the next five years and presents MPWD's water-shortage contingency planning efforts to manage the dynamic nature of water supplies and demands. MPWD ensures an integrated approach between land use planning and water supply planning.

MPWD is well aware of global environmental changes due to a changing climate. Various models, local plans in San Mateo County, and other resources are available to develop strategies for potential local impacts from a changing climate. MPWD has also worked with the County of San Mateo and other local jurisdictions to identify key impacts and mitigation measures from various emergencies. Similar impacts and mitigation measures are applicable to potential impacts from climate change.

The SFPUC, which supplies 100% of MPWD's potable water, is updating its Climate Action Plan to address risks to its supply from a changing climate. MPWD stays informed about evolving short- and long-term environmental impacts on its water system, including climate change. MPWD identifies its practical strategy to address climate change impacts on its water system in Chapters 4, 6, and 7.

For its Climate Action Plan MPWD is integrating information and strategies from other existing resources such as: MPWD's Emergency Operation Plan[17], the County of San Mateo Sea Level Rise Vulnerability Assessment[18] that discusses sea level rise impacts on the cities of Belmont and San Carlos, the San Mateo County Local Hazard mitigation Plan, and MPWD's seismic structural reviews of its oldest tanks. MPWD is developing a climate action plan by analyzing risks to their facilities and operations that will require mitigation actions.

This 2020 UWMP is MPWD's primary document for local planning and action, as well as adding to the statewide water supply-reliability data. Where relevant, the MPWD includes additional information about its water system. MPWD's progressive management through use of technology such as their advanced metering infrastructure (AMI), Supervisory Control and Data Acquisition (SCADA), and geographic information systems (GIS) for developing maps enhances the accuracy of overall system data and management.

In its 2020 UWMP, MPWD discusses the unusual and persisting conditions caused by the COVID-19 pandemic. The COVID-19 pandemic caused unprecedented changes to social behaviors that also impact water systems. MPWD presents information based on its metering results about actual short-term changes and potential longer-term impacts. MPWD also presents its actions related to water reliability, drought risk, and local and regional water planning and management.

1.1 MPWD's 2020 UWMP Organization

The MPWD's 2020 UWMP follows the DWR's 2020 UWMP Guidebook and recommended organization as outlined below. A "**Lay Description**", as required in the 2020 UWMP, is added at the beginning of each chapter.

[17] Mid-Peninsula Water District Draft Emergency Operations Plan, September 2020.

[18] County of San Mateo Sea Level Rise Vulnerability Assessment, 2018. https://seachangesmc.org/wp-content/uploads/2018/03/2018-03-12_SLR_VA_Report_2.2018_WEB_FINAL.pdf

Chapter 1 – UWMP Introduction and Overview. This chapter provides a discussion about fundamentals of the UWMP and its contents.

Chapter 2 – Plan Preparation. This chapter provides information on the processes used to develop the MPWD's 2020 UWMP, including efforts in coordination and outreach.

Chapter 3 – System Description. Chapter 3 includes detailed information about the MPWD's water system, including an overview of its organizational structure and history, maps of the service area, and its climate.

Chapter 4 – Customer Water Use. This chapter describes and quantifies the current and projected water uses within the MPWD's service area.

Chapter 5 – Conservation Target Compliance as required by SBX7-7. In this chapter, MPWD discusses its 2020 per-capita water target value that was adopted in their 2015 UWMP, describes its compliance with the 2020 per-capita water conservation mandate, and its 2020 compliance value based upon actual 2020 customer water use.

Chapter 6 – System Supplies. In this chapter, MPWD describes and quantifies its current and projected potable and non-potable water supplies. The MPWD also provides a narrative description of its sole SFPUC potable water supply source and quantifies the supply availability. Currently, the MPWD does not have a recycled water supply.

Chapter 7 – Water System Reliability. In this chapter, MPWD describes its water system reliability for the next 25 years, through 2045. This description is included for normal, single dry year, and five consecutive dry years. This chapter also includes the Drought Risk Assessment (DRA). The difference between the water system reliability analysis and the DRA is what the DWR allows as a basis for characterizing the five consecutive dry years in the DRA.

Chapter 8 – Water Shortage Contingency Planning (WSCP) is a separate report, included with MPWD's 2020 UWMP compliance documents as "Attachment 1". In its WSCP, MPWD provides a structured plan to address water shortages. The WSCP incorporates information required by DWR and six (6) standardized action levels, along with implementation actions in the event of a catastrophic supply interruption.

Chapter 9 – Demand Management Measures (DMMs). In this chapter, the MPWD communicates its efforts to promote conservation and to reduce demand on its water supply. The goal of the chapter on DMMs is to provide a comprehensive description of the water conservation programs that MPWD has implemented, is currently implementing, and plans to implement to meet its urban water use reduction targets.

Chapter 10 – Plan Adoption, Submittal, and Implementation. In this chapter, MPWD describes and documents the steps it took to make its 2020 UWMP publicly available and its process for adopting and submitting the UWMP in accordance with the Water Code. In addition, the MPWD specifies its plan to implement the UWMP.

In addition to Chapters 1 through 10, Acronyms, References, and Appendices are included in MPWD's 2020 UWMP.

Acronyms – Applicable acronyms within this UWMP are noted in this section.

References – Applicable references within this UWMP are noted in this section.

Appendices – As shown in the Table of Contents, several appendices are included consisting of documents related to this UWMP Plan Preparation.

1.2 UWMPs in Relation to Other Efforts

The 2020 UWMP provides in-depth and practical information about MPWD's water system. The fundamental focus of this UWMP is the system operations, customers, supplies, and service area. MPWD meets with the City of Belmont to coordinate planning and other projects. As a member of BAWSCA, MPWD staff meets with the other BAWSCA agencies monthly and regularly participates in technical and water resource management committees.

MPWD uses local planning documents and has also developed several important ordinances and references to manage its system and minimize risks from hazards and emergencies. The key resource documents are referenced, and relevant parts are integrated with this 2020 UWMP.

Conversely, local planning agencies rely on the information in the MPWD UWMP regarding future water supply reliability within their jurisdictions. The UWMP analyses a wide range of water supply availability conditions, using information available at the time of submission to the DWR.

MPWD requests that users of the water supply and cutback data presented in its 2020 UWMP and WSCP contact MPWD staff for potential updates before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

MPWD anticipates updates from SFPUC for its water supply reliability and the DRA.

1.3 UWMPs and Grant or Loan Eligibility

For California water agencies to be eligible for any water grant or loan administered by DWR, they must have a current UWMP on file that has been determined by DWR to address the requirements of the Water Code. As with the previously submitted 2015 UWMP, MPWD has fully complied with the requirements of the Water Code in its 2020 UWMP. As required, the current UWMP will be maintained throughout the term of any grant or loan administered by DWR, should MPWD pursue such funding. Other state funding, depending on the conditions that are specified in the funding guidelines, may also require a current UWMP.

1.4 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

The MPWD purchases 100% of its potable water from the SFPUC. MPWD does not currently anticipate participating in or receiving water supply benefits from a proposed project that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta. Accordingly, MPWD is not required to provide information in its 2015 and 2020 UWMPs to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance. Similarly, SFPUC has not provided information in its 2015 and 2020 UWMPs to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance.

2. PLAN PREPARATION

Lay Description

The Water Code specifies several requirements for preparing UWMPs, including who is required to prepare an UWMP and how to prepare it. Suppliers can choose to participate in regional or individual planning efforts; select the year-type period (fiscal or calendar) for reporting; and develop their own coordination, notification, and outreach process. Chapter 2 documents MPWD's processes for preparing this individual UWMP and its compliance with the 2020 UWMP preparation requirements. Since 2015, there are no new preparation requirements for the 2020 UWMP.

During the 2020 UWMP preparation, the MPWD published public notices to encourage participation and extend public engagement. Due to MPWD's supplier's (SFPUC) unprecedented forecast for supply reductions, as further discussed in Chapter 7, MPWD's Board of Directors determined additional time was necessary for public outreach, review, and comment beyond the July 1, 2021, DWR deadline.

An informational brochure about the MPWD's 2020 UWMP and WSCP was developed and distributed by mail to each customer. It included a schedule of the public hearings and an extended public comment period, from June 10 to July 22, 2021. Two public hearings were held on June 24 and July 22, 2021, and notices were sent out weekly, two weeks prior to each meeting. Information about the meetings were posted on MPWD's website to encourage the diverse community, interested parties, the public, and other stakeholders to submit comments, suggestions, or revisions.

MPWD's public notices are in Appendix 4. The MPWD's 2020 UWMP preparation also involved coordination with local and regional agencies.

The units of measure that are used throughout the MPWD's 2020 UWMP are specified in this chapter.

2.1 Plan Preparation

The following sections are included:

- Basis for Preparing a Plan
- Regional Planning
- Individual or Regional Planning and Compliance
- Calendar Year and Units of Measure, and
- Coordination and Outreach.

2.2 Basis for Preparing a Plan

In accordance with the Water Code Section 10617, urban water suppliers with 3,000 or more service connections or supplying 3,000 or more acre-feet of water per year are required to prepare an UWMP every five years. An "urban water supplier" is defined as "a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers." An urban water supplier is required to adopt an UWMP within one year it becomes an urban water supplier (Water Code Section 10620).

Water Code Section 10621 requires that each urban water supplier shall update its UWMP 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.

2.2.1 Public Water Systems

Water Code Section 10644 requires that UWMP, or amendments to it, submitted to the DWR shall include any standardized forms, tables, or displays specified by the department.

Public Water Systems (PWSs) are the systems that provide drinking water for human consumption. These systems are regulated by the California State Water Resources Control Board (State Water Board), Division of Drinking Water. The California Health and Safety Code 116275 (h) defines a "Public Water System" as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

Public water systems submit information about their system to the State Water Board. The data is used by the State Water Board to determine whether a retail supplier has reached the UWMP reporting threshold of 3,000 or more connections or 3,000 acre-feet of provided water, per the public water system definition. This determination is done by reviewing the number of connections and volume of water supplied by each public water system.

The MPWD's water system has 8116 connections, therefore it meets the definition of a public water system that is required to submit an UWMP.

Table 2-1 lists MPWD's public water system identification number, number of municipal connections, and volume of water supplied in 2020.

Table 2-1. MPWD's Public Water System.

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
4110001	Mid-Peninsula Water District	8,116	974
TOTAL		8,116	974

Source: Units: MG. MPWD, Number of connections, billing system, January 2020. Volume of SFPUC water supplied to MPWD is based on SFPUC AMI production meters for 2020, except estimate for an SFPUC meter that failed in December 2020.

2.2.2 Suppliers Serving Multiple Service Areas/Public Water Systems

This section is not applicable to the MPWD, since the MPWD has only one public water system within its service area.

2.3 Regional Planning

Before developing the UWMP, water agencies may become involved in regional planning processes. Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. Some of the other possible benefits, depending on the level of regional cooperation, can include:

- More reliable water supplies.

- Increased regional self-reliance.
- Improved water quality.
- Better flood management.
- Increased economic stability.
- Restored and enhanced ecosystems.
- Reduced conflict over resources.

BAWSCA is a regional agency and MPWD is one of its 26 member agencies. BAWSCA was created on May 27, 2003, to represent the interests of 16 cities, eight water districts, and two private water providers. Currently, BAWSCA agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial, and institutional accounts. The 26 BAWSCA agency members are in Alameda, Santa Clara and San Mateo counties[19] and purchase water on a wholesale basis from the SFPUC RWS.[20] Collectively the BAWSCA agencies are referred to as the "Wholesale Customers".

BAWSCA also represents the collective interests of the wholesale water customers (BAWSCA agencies) on all significant technical, financial and policy matters related to the operation and improvement of the SFPUC's RWS. BAWSCA works with SFPUC to provide common information about the SFPUC RWS for its member agencies, and to ensure consistent information for the 2020 UWMP updates. Additional information about BAWSCA is presented in Chapter 6.

MPWD is an active participant in BAWSCA committees and planning activities. MPWD attends monthly BAWSCA Water Representative's meetings that review regional and local water news, BAWSCA's work with SFPUC on behalf of water agencies, long-term planning for water conservation, shortages, and various projects in which MPWD and other agencies participate. MPWD also participates in BAWSCA Water Resources Committee meetings that are held quarterly and SFPUC Wholesaler meetings that are held once or twice per year.

2.4 Individual or Regional Planning and Compliance

The MPWD developed an individual UWMP that reports solely on its service area for the 2020 reporting period. Individual UWMPs address all requirements of the Water Code including water use targets and baselines (for SBX7-7 Water Conservation Act of 2009 reporting). The MPWD notified and coordinated with appropriate regional agencies and constituents. The notification list is included in Chapter 10, Section 10.2.1. (Copies of notices are in Appendix 4).

[19] BAWSCA website. http://bawsca.org/

[20] In this report, the terms "Regional Water System, "RWS" and "Hetch Hetchy System," are used interchangeably and refer to the overall SFPUC water supply system.

Table 2-2. Plan Identification Type

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable dropdown list*
X	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a RegionalAlliance	
	RegionalUrbanWaterManagement Plan (RUWMP)		
NOTES: MPWD prepared an individual UWMP, as it did in 2015.			

2.4.1 Regional UWMP

The MPWD has prepared an individual UWMP, therefore this section is not applicable to the MPWD.

2.4.2 Regional Alliance

The MPWD has prepared an individual UWMP, therefore this section is not applicable to the MPWD.

2.5 Fiscal or Calendar Year and Units of Measure

2.5.1 Fiscal or Calendar Year

Water Code Section 10608.20 states that:
(a)(1) Urban retail water suppliers…may determine the targets on a fiscal year or calendar year basis.

MPWD is a retail agency (Table 2-3). Although MPWD's budget is based on a fiscal year, MPWD reports to agencies on a calendar year basis. All annual data included in this 2020 UWMP is from January 1 through December 31.

Table 2-3. Supplier Identification.

Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year (select one)	
X	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (select from drop down)	
Unit	MG
Note: unit used is MG, million gallons, throughout.	

2.5.2 Reporting Complete 2020 Data

For its 2020 UWMP, the MPWD is reporting annual data on a calendar year basis, from January 1 to December 31, as indicated in Table 2-3. Please note 2020 was a leap year (366 days).

2.5.3 Units of Measure

Suppliers may use various units of measure when reporting water volumes, such as acre-feet, million gallons, or hundred cubic feet. Suppliers may report volumes of water in any of these units, but they must maintain consistency throughout the UWMP.

Throughout its 2020 UWMP, MPWD reports its water volumes in units of million gallons (MG), as shown in Table 2-3.

2.6 Coordination and Outreach

According to Water Code Section 10631(h), when a water supplier relies upon a wholesale agency for a water supply, both suppliers are required to provide each other with information regarding projected water supply and demand. Retail agencies that receive a water supply from one or more wholesalers are required to provide their wholesaler(s) with the retail agency's projected water demand from that source, in five-year increments for 20 years, or as far as data is available.

2.6.1 Wholesale and Retail Coordination

MPWD's 2020 UWMP preparation included coordination with its wholesale supplier, the SFPUC (Table 2-4), and various levels of coordination with local and regional land use planning and water agencies. MPWD's annual coordination related to its water demand and supply is explained in MPWD's WSCP, Section 3.2, Annual water supply and demand assessment process.

As a member of BAWSCA, MPWD participates in various regional water planning and conservation initiatives coordinated by BAWSCA and/or SFPUC for projected water demands and expected supplies. BAWSCA recently published its updated "Bay Area Water Supply and Conservation Agency's Regional Water Demand and Conservation Projections". This report is an example of the continued coordination and collaboration between BAWSCA and its agencies to develop individual and cumulative supply and demand plans and strategies through 2045.

BAWSCA has the authority to coordinate water conservation, supply, and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the regional water system; and build facilities jointly with other local public agencies or on its own to carry out the agency's purposes.

When MPWD participates in water exchanges with neighboring systems, typically, the exchanges are considered temporary and not a current nor planned source of water supply for the MPWD. The interconnections are used to manage existing supplies and provide potential emergency back-up sources of water.

Table 2-4. Water Supplier Information Exchange.

Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS).
NOTES: The SFPUC supplies 100% of MPWD's water supply. The SFPUC RWS, including Hetch-Hetchy and local San Francisco Bay Area watersheds, is currently the MPWD's only viable supply source. MPWD communicated its projected water demand to the SFPUC in 5-year increments through the year 2045 as part of BAWSCA's regional demand report in June 2020. BAWSCA has the authority to coordinate water conservation, supply, and recycling activities for its member agencies.

2.6.2 Coordination with Other Agencies and the Community

Water suppliers must coordinate the preparation of their UWMP with other appropriate agencies in the area, to the extent practical. To verify that agencies have fulfilled the Water Code Section 10620(d)(2) and Section 10642 provisions, agencies have to include a description of their outreach and coordination activities to other agencies and the community.

Most land use planning and development approvals within the MPWD's service area are the responsibility of the City of Belmont. The City of Belmont's website provides information on several of the large construction projects being planned.[21] MPWD meets with the City of Belmont regarding new development plans. The City of San Carlos and San Mateo County also have planning authority over small portions of the service area.[22] Wastewater treatment for the MPWD service area is provided by Silicon Valley Clean Water (SVCW, formerly the: "South Bayside System Authority") in Redwood City and fire suppression services are provided by San Mateo Fire Consolidated Department.

MPWD collaborates with the City of Belmont to coordinate planning and ensure consistency in reporting.

2.6.3 Notice to Cities and Counties

Water Code Section 10621(b) requires water suppliers to notify cities and counties to which they serve water at least 60 days prior to the public hearing that discusses that the UWMP is being updated and reviewed. MPWD completed notifications in compliance with the stated requirements.

On January 27, 2021, MPWD sent notices within its service area to the: Cities of Belmont and San Carlos and San Mateo County, so that they would have an opportunity to provide input regarding the MPWD's 2020 UWMP. The notification date and the addressees are listed in Chapter 10, Table 10-1, and Appendix

[21] City of Belmont website, community development, projects planned.
https://www.belmont.gov/Home/Components/FacilityDirectory/FacilityDirectory/26/333
https://www.belmont.gov/departments/community-development/belmont-village-specific-plan/final-belmont-village-specific-plan-documents

[22] The MPWD has a single irrigation connection in the City of Redwood City and a single irrigation connection in the City of San Mateo. (MPWD, 2020).

4. The dates below identify key public meetings where the MPWD's 2020 UWMP was discussed. A copy of the public outreach materials, including website postings and invitation letters, are included in Appendix 4.

Date	Subject	Action
June 24, 2021	First Public Hearing	Presentation and public discussion.
July 22, 2021	Second Public Hearing	Presentation and public discussion.
September 23, 2021	Adoption of UWMP	Board adoption of 2020 UWMP per Resolution.
September 23, 2021	Adoption of WSCP	Board adoption of 2020 WSCP per Resolution.
October 1, 2021	Final UWMP	Final UWMP and WSCP submittal to DWR.
October 15, 2021	Final UWMP	Final UWMP and WSCP submittal to State Libraries. City of Belmont, City of San Carlos. San Mateo County and posted on MPWD's website.

3. SYSTEM DESCRIPTION

Lay Description

Chapter 3 discusses the MPWD water system, its compliance with Water Code Section 10631 that specifies suppliers describe their service area, including current and projected population, climate, and other social, economic, and demographic factors affecting water management planning. This chapter also contains information about the MPWD's history, organizational structure, and the current and projected land uses affecting MPWD's water management.

As a retail customer of the SFPUC RWS, the MPWD is directly connected at two points to the SFPUC system. One connection is a low elevation connection in Redwood City and the second connection is a high elevation connection in the vicinity of the Pulgas Water Temple. The MPWD currently supplies water to consumers in an area slightly larger than the city limits of the City of Belmont.

DWR acknowledges in their 2020 UWMP Guidebook that changes in societal and cultural trends, such as "telecommuting" and the stay-at-home, 'shelter-in-place", and 2020-21 COVID-19 pandemic-related Orders, may alter urban water use patterns and affect current and future water conservation accounting and analysis. Therefore, DWR states that current water data may reflect a temporary or long-term change in water use and could affect evaluation of near-term and long- term management considerations.

As is widely known, in 2020 the COVID-19 pandemic has significantly affected the daily activities of populations around the world. In the San Francisco Bay Area, due to "shelter in place" official health Orders and "remote workplace" requirements, the population and employment have also been significantly affected by this pandemic.

Figures 3-1 and 3-2 illustrate the actual water use changes in the Single Family (SF) and Multi-family (MF) Residential and CII sectors during 2020. The change in water use in the Residential (SF and MF) sector ranged from less than +5% in January, to almost +30% in March, and about +10% in November and December. Conversely, the CII Sector decrease peaked in May at -22% and was -8% in December. Potential implications for future water use patterns and changes due to long-term shifts in lifestyle and workplace caused by the COVID-19 pandemic are uncertain. These use patterns are being monitored by MPWD.

Figure 3-1. Percent change in water use in the Single- and Multi-Family sectors during the 2020 COVID-19 pandemic.

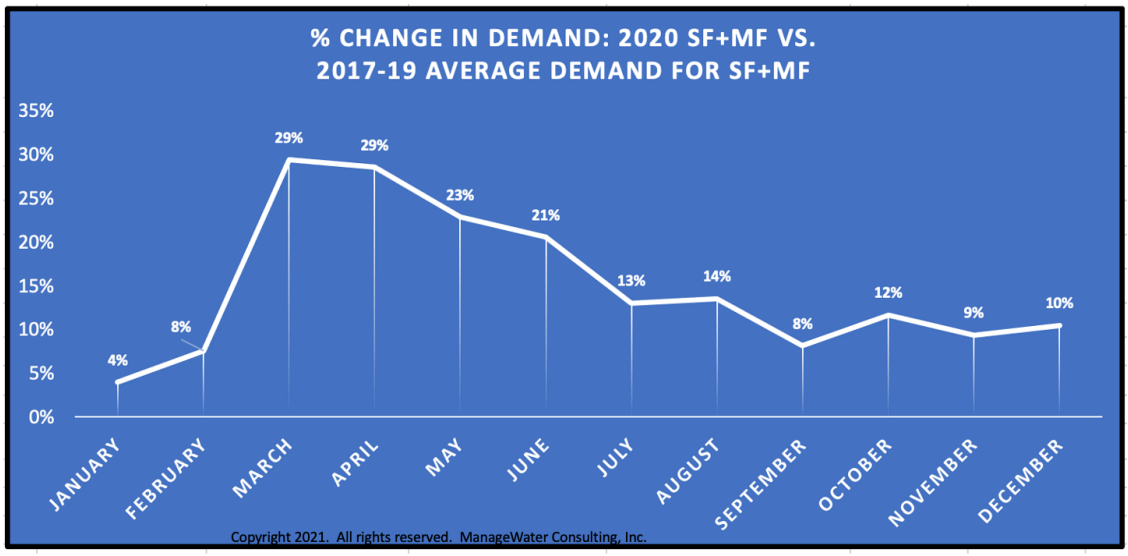


Figure 3-2. Percent change in water use in the CII sector during the 2020 COVID-19 pandemic.

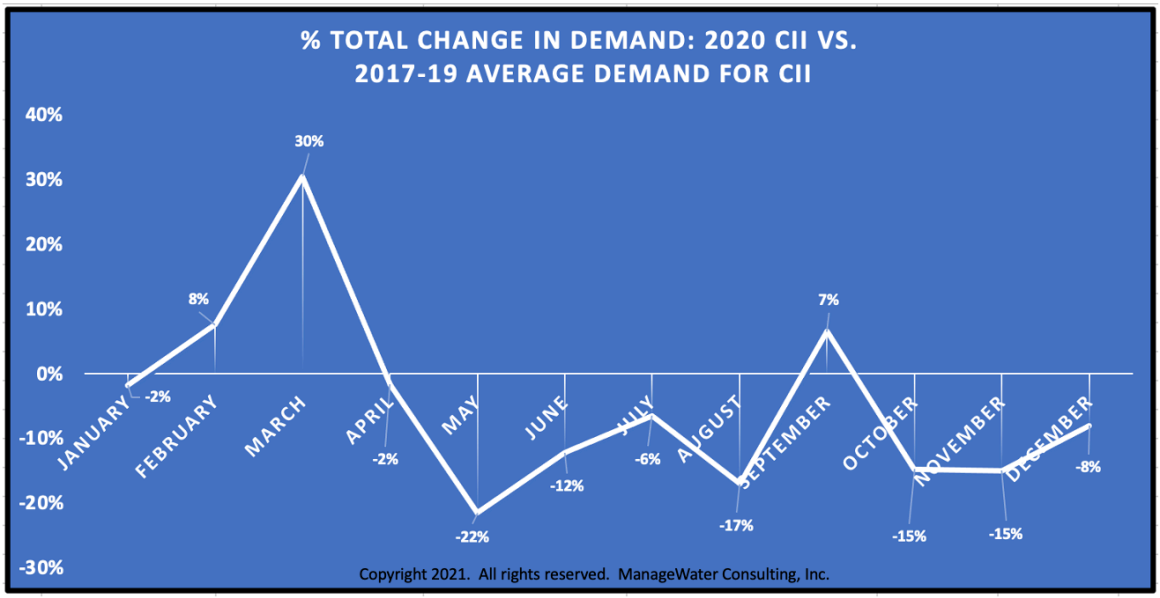
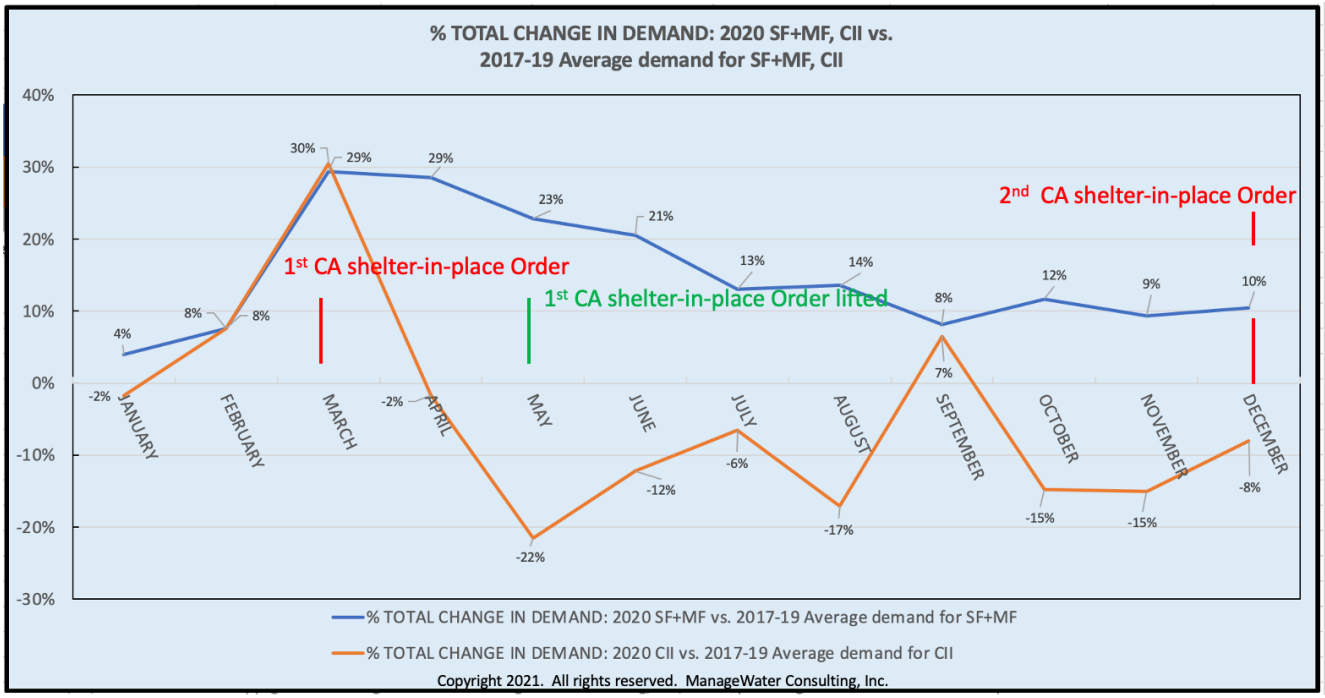


Figure 3-3. Percent change in water use in the Single-, Multi-Family, and CII sectors during the official California State Orders for the 2020 COVID-19 pandemic.



Source for official California State Orders:
https://covid19.ca.gov/stay-home-except-for-essential-needs/#stay-home-order

3.1 General Description

The MPWD[23] is a "Special District", formed in 1929 under the County Water District Act of California. MPWD was incorporated in 1929, and it is in east central San Mateo County on the San Francisco Peninsula, about 30 miles south of San Francisco.

When formed, the MPWD consolidated the operations of seven small water systems serving about 320 customers. In the 1930s, the MPWD contracted with the SFPUC to purchase water from the newly built Hetch-Hetchy water project, eliminating local dependence on small, unreliable wells and gaining a more secure, reliable, and expandable source of supply.

The MPWD is governed by a locally elected Board of Directors that meets monthly, posts its agenda at MPWD offices, and maintains a website (https://www.midpeninsulawater.org/) informing the public of its services and activities including water conservation programs. The Board of Directors adopts a fiscal year budget and approves the MPWD's Capital Plan for replacement of water infrastructure and implements a water conservation program that has successfully reduced per capita water use.

The MPWD's service area is five square miles with 8,116 service connections. The MPWD's sole source of potable water is from the SFPUC RWS. The MPWD system connects to the SFPUC RWS Bay Division pipelines 1 and 2 at two locations. MPWD has nine pressure zones due to varied topography and elevations within its service area. The MPWD is a member of the BAWSCA, which represents the interests of 26 water agencies including two private utilities that purchase water wholesale from the SFPUC RWS. Local groundwater of adequate quantity and quality is not available.

In 2020, MPWD served water to 27,560 people and 93% of MPWD's connections were residential services (while 7% were Commercial, Institutional, and Industrial (CII)[24]. Based on SFPUC AMI meter data from 2020 for purchased water from SFPUC, the average daily demand in the MPWD service area in 2020 was 2.66 million gallons per day, MGD.

As with MPWD's 2015 UWMP, the 2020 and projected population estimates are based on data from the Association of Bay Area Governments (ABAG). The ABAG reference has been accepted by DWR for use in this 2020 UWMP for projecting population in five-year increments for the next 25 years.[25]

The MPWD's 2020 service area population of 27,560 people and water use sectors include: single-family, multi-family, commercial, institutional, industrial, and irrigation. The number of connections in MPWD's service area and sectors are as follows:

- The City of Belmont: 7875 total connections, with: 7189 single-family, 173 multi-family, 338 commercial, 35 industrial, 76 institutional, and 64 large irrigation accounts.

[23] Until July 2000, the Mid-Peninsula Water District was known as the Belmont County Water District.
[24] MPWD purchased water in 2020 from SFPUC, based on SFPUC AMI production meters. Springbrook billing database was used for consumption data from January through December2020. Springbrook was implemented in 2017.
[25] Email communication, from Julie Ekstrom, DWR, October 12, 2020.

- The City of San Carlos: 181 total connections, with: 101 single-family, 30 multi-family, 43 commercial, 2 institutional, 5 irrigation**;** and parts of unincorporated San Mateo County with 60 total connections.[26]

The following are key changes in the service area since the MPWD's 2015 UWMP was completed:

- the population of the MPWD service area has increased from 26,924 to 27,560, by more than 2.3%.[27]
- employment (jobs) in the service area has increased from 14,720 to 15,986, by 8.6% [28]
- total number of service accounts has increased slightly from 7,974 to 8,116, by 1.8%. [29]

The MPWD operates and maintains a complex distribution system that includes 20 pumps, 11 water tanks, 13 regulating valves, 813 hydrants, and 94 miles of water mains. The MPWD's service area includes 8116 service connections and contains nine pressure zones.

The easternmost zone, east of El Camino Real, is gravity fed by the SFPUC RWS lower elevation connection in Redwood City. Water from this lower elevation feed can be pumped to storage reservoirs at higher elevations to feed the remaining pressure zones to the west. The western-most zone is bound by I-280. Water is pumped up from the MPWD Tunnels pump station in proximity to the Pulgas Water Temple to two, 2.5 MG storage tanks (Hallmark site), and water is primarily gravity fed down to the lower zones.

The MPWD also has redundancy built into the entire distribution system, enabling either of the two SFPUC RWS transmission mains to supply water to all its customers. The MPWD can transfer water between pressure zones in either a pump-up or flow-down mode in emergency conditions. The MPWD has 12.5 million gallons of local storage that equates to 4.7 days of water supply (based on 2020 use of 2.66 MGD). All MPWD's zones can meet the eight-hour storage criteria either separately or by pumping from zones with excess capacity.

The MPWD meets regularly with the City of Belmont and county of San Mateo planning departments. In the past five years, since MPWD's 2015 UWMP, the following developments have been completed: [30]

- Mixed use development (residential/commercial), including 73 residential units and 5,000 square feet of commercial/retail space at 490 El Camino Real in Belmont.
- Mixed use development (residential/commercial), including 32 residential units and 11,000 square feet of commercial/retail space at 576-600 El Camino Real in Belmont.
- A commercial building on Industrial Road in San Carlos.
- Marriott Springhill Suites Hotel on Shoreway Road in Belmont; a four-story hotel with 169 rooms.
- Crystal Springs Upland School, 10 Davis Drive in Belmont. Demolition of existing commercial/office building with private middle school.

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[26] Source: Data from MPWD meter map, January 2020.

[27] MPWD DSS Model, 2020.
[28] Ibid.
[29] MPWD Springbrook billing database. Data from January 2020. Springbrook was implemented in 2017.
[30] MPWD 2015 UWMP and communication with MPWD staff in 2020.

- Autobahn Motors at 700 Island Parkway in Belmont. Demolition of existing 51,000 square foot facility and construction of new 56,000 square foot facility.
- A second hotel on Shoreway Road in Belmont.
- The Palo Alto Medical Foundation Clinic in San Carlos on Industrial Road.

In the next five years, the MPWD expects new construction and changes to its service area.[31] The key changes will include:

- Firehouse Square mixed-use project, including residential units and commercial/retail space at 1350 Civic Lane in Belmont.
- Firehouse Square 1300 EL Camino Real, (mixed: commercial/multi-family), 66 units, 0.75 ac-ft of retail.
- 2 Davis Dr., (commercial), GoPro facility.
- 800-803 Belmont Ave (multi-family), 125 units.
- Hill Street at EL Camino Real, (multi-family), 37 units.
- Windy Hill 1325 Old County Road (multi-family), 250 units.
- 815 Old County Road (multi-family), 177 units.
- Merry Moppet pre-school 2400 Merry Moppet Lane (institutional).
- Serendipity pre-school 2820 Ponce Ave., (institutional).
- Palo Alto Medical Foundation Hospital 301 Industrial Rd., (Industrial), 110 beds.
- 425-501 Old County Rd., (multi-family), 94 units.
- 1320 El Camino Real, (multi-family), 15 units.
- 800 Laurel Ave., (multi-family), 16 units.
- 800-803 Belmont Ave., (multi-family), 125 units.
- 1324 Old County Rd., (mixed: commercial, multi-family), 2-3 units.
- 608 Harbor Blvd., (multi-family), 103 units.

3.2 Service Area Boundary Maps

The MPWD is in San Mateo County and the shaded (dark orange) area in Figure 3-1 illustrates the MPWD's location relative to other cities nearby in the San Francisco Bay Area. The MPWD supplies water to consumers in an area slightly larger than the city limits of the City of Belmont. The service area is approximately five square miles, with small parts of the service area within the city limits of the City of San Carlos and in the unincorporated parts of San Mateo. Since 2015, no changes have occurred in the service area boundary.

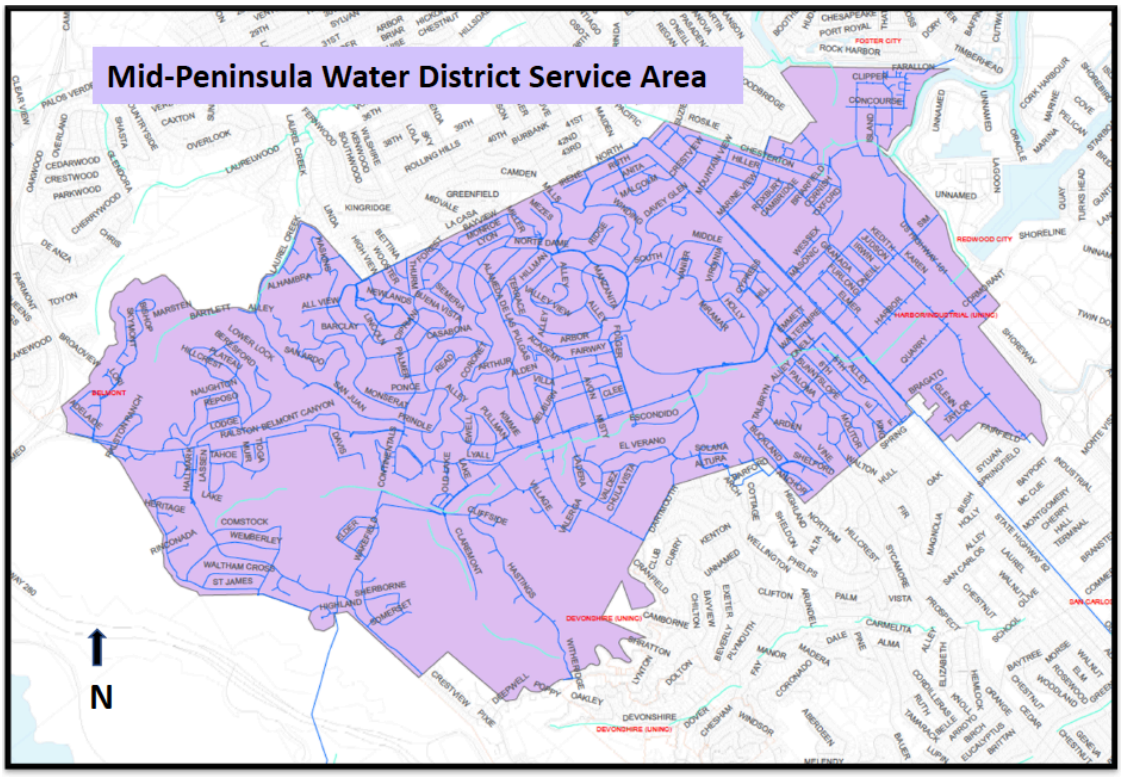
The maps shown in Figures 3-2 and 3-3 illustrate additional detail about MPWD's service area.

[31] City of Belmont Major development projects, 2020. https://www.belmont.gov/departments/community-development/major-development-projects

Figure 3-4. Mid-Peninsula Water District Location and Service Area.

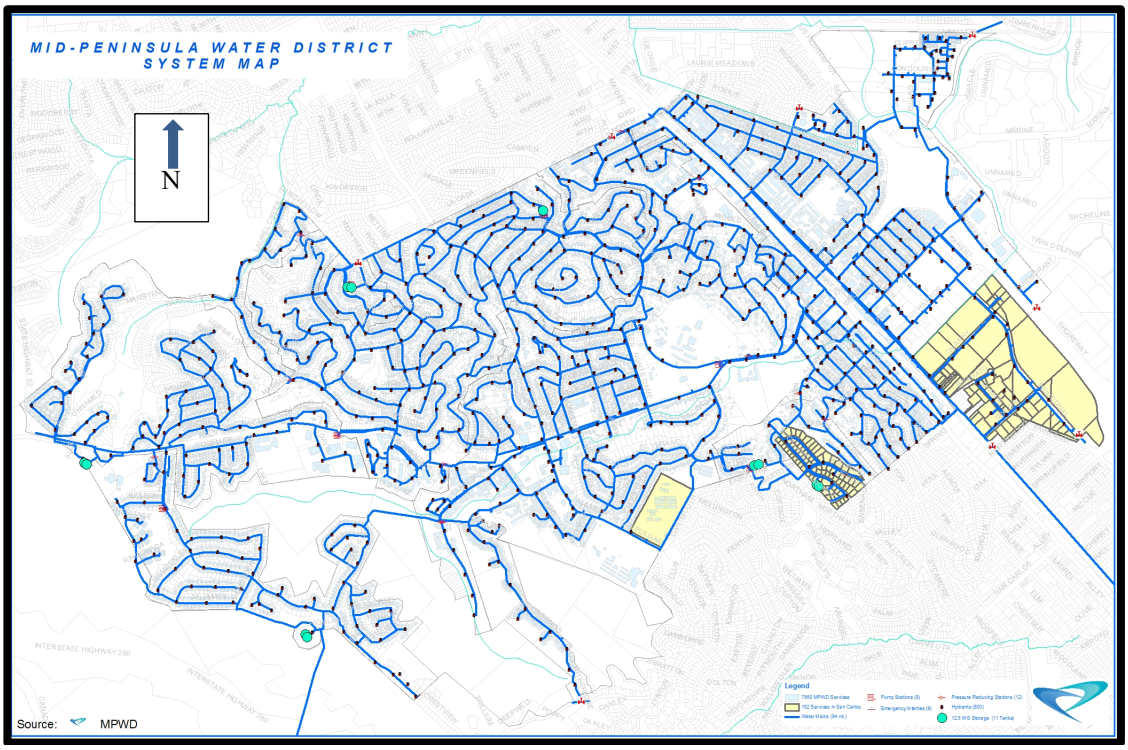
Source: MPWD, 2020.

Figure 3-5. Mid-Peninsula Water District Street Map Showing Service Area Boundaries.



Source: MPWD, 2020.

Figure 3-6. Mid-Peninsula Water District Map Showing the Distribution System.



Source: MPWD, 2020.

3.3 Service Area Climate

This section addresses Water Code Section 10631(a) and Water Code Section 10630, requiring a description of the service area climate.

The MPWD service area has a semi-arid Mediterranean climate typified by moderate to warm summers and mild winters. The warmest months of the year are July through September, and the coldest are December and January. As shown in Table 3-1, the average daily maximum temperature in July is 82.2°F at the nearby Redwood City weather monitoring station. The average minimum temperature in the coolest month (January) is 39.3°F. Annually, on average, MPWD has 255 sunny days and 59 days with any measurable precipitation. The annual average maximum temperature is 71°F and the annual average minimum temperature is 47.1°F. The average annual precipitation is 19.16 inches, virtually all of which is rainfall, with about 90% falling between October and April. Rainfall amounts vary widely from year to year, with a low of 2.63 inches in 2013 and a high of 42.82 inches in 1983.[32]

Table 3-1. Mid-Peninsula Water District Climate Data.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	58.1	61.7	65.4	69.9	74.5	79.5	82.2	81.8	80.6	74.5	65.4	58.7	**71.0**
Average Min. Temperature (F)	39.3	41.8	43.6	45.1	48.7	52.2	54.6	54.4	52.9	49.0	43.4	39.9	**47.1**
Average Total Precipitation (in.)	4.36	3.49	2.71	1.19	0.44	0.14	0.02	0.05	0.17	0.97	2.11	3.51	**19.16**

Notes:
1. Period of Record Monthly Climate Summary: Redwood City, California (047339)
2. Monthly Period of Record: 04/01/1906 to 06/10/2016

The MPWD is located on the eastern slopes of the coastal mountains overlooking San Francisco Bay, and features hilly terrain, with elevations ranging from sea level to almost 900 feet. As a result, the service area is located where two reference evapotranspiration zones blend; the MPWD's winters are warmer than most of the Inland San Francisco Bay zone (Zone 8), while the summers are warmer than typical for the Coastal Valleys and Plains zone (Zone 3). The reference evapotranspiration (ETo) rates are an average of the rates for both zones.[33]

Relative to most other areas in California, the evapotranspiration rate for the MPWD service area is low, particularly during the summer months. Urban water consumption in the San Francisco Bay hydrologic region is among the lowest in the State.

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[32] Western Regional Climate Center. http://www.wrcc.dri.edu/CLIMATEDATA.html, San Mateo, California Period of Record, Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7864, and Redwood City, California Period of Record, Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7339

[33] Reference Evapotranspiration Zones. https://cimis.water.ca.gov/Content/pdf/CimisRefEvapZones.pdf https://wwwcimis.water.ca.gov/App_Themes/images/etozonemap.jpg

A topic of growing concern for water planners and managers is climate change[34] and the potential impacts it could have on California's future water supplies.[35] The water sector is one of the largest generators and consumers of electricity in California and thus plays an important role in reducing energy demand and GHG emissions. In addition, natural gas is used for water heating purposes in the residential, commercial, and industrial sectors.

The California Climate Strategy, led by DWR, is an integrated plan for addressing climate change. In 2009, SB X7-7 was enacted, requiring all water suppliers, both urban and agricultural, to increase water use efficiency. The goal of SB X7-7 for the urban sector was to reduce per capita water use 10% by 2015 and 20% by 2020.

The California Water Scoping Plan Update outlines a comprehensive set of actions that will reduce overall Green House Gas (GHG) emissions in California water use by increasing efficiency, water recycling, water system energy efficiency, urban runoff reuse, and increased renewable energy production.[36] California's climate change research efforts in the water sector have focused on impacts and adaptation. Climate change will affect all stakeholders and therefore coordination with and participation by all entities, especially the public, will be necessary to mitigate the impacts of the water sector on climate and to develop preparedness strategies. MPWD is developing its strategies to evaluate climate change impacts on its facilities and operations.

The DWR has also developed several resource documents about Climate Change and water management.[37] The DWR snow survey measures the amount of water contained in the snowpack, which provides a more accurate forecast of spring runoff. In northern California, water year 2020 was "much below normal" according to the National Oceanic and Atmospheric Administration (NOAA).[38] Notably, February, which is typically one of the wettest months in northern California, in 2020 was documented as the "driest February since 1864".[39]

Due to the ongoing COVID-19 pandemic, DWR started providing videos of results in lieu of conducting a live media event on site. April 2020 measurements from the 130 electronic snow sensors, scattered throughout the state, indicated that the statewide snowpack's water equivalent was 15.2 inches, or 53 % of the April average.[40] The SFPUC that supplies the MPWD, relies on snowpack in the Hetch-Hetchy watershed for most of its water supply. On April 1, 2020, the Snow Course Index[41] for SFPUC Upcountry snowpack measured at 50% of historical April 1, Median Value.

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[34] California Energy Commission. http://www.climatechange.ca.gov/ and Department of Water Resources Climate Action Plan. https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Climate-Action-Plan
[35]Ibid.
[36] California's 2017 Climate Change Scoping Document. https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf
[37]Climate Change Program, DWR. https://water.ca.gov/Programs/All-Programs/Climate-Change-Program
[38] Daily Water Resources Update, NOAA. https://www.cnrfc.noaa.gov/water_resources_update.php
[39]United States Drought Monitor, NOAA. https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA
[40] DWR Precipitation, March 2020. https://water.ca.gov/News/News-Releases/2020/April-20/March-Precipitation-Not-Enough-to-Offset-Dry-Winter

[41] Snow Course Index, April 1, 2020. SFPUC Commission Meeting: "Water Supply Conditions Update", April 14, 2020.

3.4 Service Area Population and Demographics

3.4.1 Service Area Population

This section addresses Water Code Section 10631(a) that specifies that MPWD describes its current and projected service area population. Additionally, MPWD summarizes a brief history of the service area and population growth.

Like most of the San Francisco Bay Area, the MPWD experienced rapid growth following World War II. The 1950s and 1960s saw both population and housing growth and increased water demand. The rate of growth in the area served by the MPWD tapered off dramatically in the 1970s and remained low for the past 30 years. Between the 1980s and 1990s the population growth was about 1%. Between 1990s and 2000 the population growth increased to 3%, while between 2000 and 2010 it reached the highest growth in decades, at 6%.

Between 2010 and 2015, the growth declined back to 1.6%. The national economic recession from 2008 to 2011 also significantly affected the San Francisco Bay Area communities. However, by the spring of 2013, the Bay Area had regained all the jobs lost during the 2007 to 2009 recession. By 2015, the Bay Area and local economy experienced further growth. From 2015 to 2020 the population in the MPWD service area grew by 2.3% to 27,560.[42] In 2023 the population in the service area territory is expected to be 28,851, an increase of almost 4.7% from 2020. From 2020 to 2045 MPWD's service area population is forecasted to increase by approximately 19%.[43]

Approximately 93% of MPWD's service area comprises the residential sector that includes singe- and multi-family residences. The single-family residential sector uses 57% of MPWD's total water. Even though the multi-family residential sector only uses 15% of MPWD's total water, increase in use is expected due to projected increases in development of multi-family residences. About 7% of MPWD's water accounts comprise the CII sector, including commercial, institutional, industrial, and irrigation accounts. The % of accounts and water use in MPWD's water use sectors are discussed in more detail and illustrated in Chapter 4 in Figures 4-1 and 4-2.

While population in the next 20 years is projected to grow by almost 16%, the growth in employment is expected to increase by 30%. Although job formation does not always correlate well with water demand in the CII sector,[44] it is expected that water sales to the CII sector will increase over the next 20 years.

Despite the shortage of easy to develop land, the Association of Bay Area Governments, (ABAG) expects that the population of Belmont will grow over the next 25 years. The population projections for the MPWD service area are summarized in Table 3-2.

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[42] MPWD DSS Model, 2020.
[43] Ibid
[44] This is because there is a wide variation in water demand per employee, especially in the industrial and light industrial sectors.

Table 3-2. MPWD Service Area Population - Current and Projected.

Population Served	2020	2025	2030	2035	2040	2045*(optional)*
	27,560	29,711	30,008	31,010	31,961	32,912

Source: DSS Model, 2020, based on ABAG, 2017. Notes: population is used for SBX7-7.

3.4.2 Other Social, Economic, and Demographic Factors

No other significant demographic factors are specific to the MPWD service area that may affect water management and planning per Water Code 10631.

Recent Global Events Affecting Water Management and Planning – COVID-19 Pandemic

The San Francisco Bay Area was an early United States center of the COVID-19 pandemic, and as a result, officials in San Mateo County instituted some of the first mitigation efforts in the United States. The first mandatory "shelter-in place" in the mainland U.S. took effect throughout the Bay Area on March 16 and 17 and continued until mid-May[45] affecting nearly 6.7 million people.

Closures due to the pandemic resulted in mass unemployment and significant disruptions to the economy. The pandemic accelerated the adoption of distance learning for most schools, colleges, and universities, and telecommuting for most businesses and government offices.[46]

The SWRCB issued guidance related to COVID-19 for California's Public Water Systems (PWSs). The SWRCB stated that "provision of potable water to your customers is an essential function." The SWRCB provided guidance on ways to reduce the impact of COVID-19 on the operation of PWSs and to continue delivery of potable water during the pandemic.

The SWRCB recognized that it is likely that the economy will be challenged during this pandemic impacting both water staff and customers. Further the SWRCB stated that: "Customers may not be able to pay their bills and it is essential for water utilities to plan for how to handle these situations." The SWRCB acknowledged that utilities may also be experiencing financial difficulties and staffing issues due to COVID-19 impacts."[47]

COVID-19 pandemic – Impacts on MPWD Residential and CII Water Consumption

The COVID-19 pandemic resulted in wide-spread business closures, mass unemployment, and significant disruptions to the San Francisco Bay Area economy including the MPWD service area.

We identified two key MPWD water use sectors – residential accounts (92%) and CII accounts (8%) – that could be used as general indicators for short- and potentially longer-term impacts to the MPWD's water

[45] San Mateo County Health Officer's Updates, 2020. https://www.smchealth.org/coronavirus-health-officer-updates

[46] Pandemic in the San Francisco Bay Area, Wikipedia. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_San_Francisco_Bay_Area

[47] Public Water System COVID-19 Considerations, SWRCB, April 2, 2020. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/notices/revised_covid-19_swrcb_guidance_memo_to_pwss.pdf

system. For our general analysis, we used the single-family residential use as the "residential use" sector. For the second, "CII sector", we grouped the Commercial, Institutional, Industrial, and large-landscape irrigation accounts. In early 2019, these two sectors – Residential and CII – comprised almost 100% of the MPWD's service area.

To compare the water use patterns and trends before and after "shelter-in-place" and COVID-19, we reviewed MPWD's water use from 2017 through 2020. We picked 2017 through 2019 as representative, pre- "shelter-in-place", COVID-19 years, because they were relatively unaffected by unusual weather (no droughts, El Nino, or other extreme events) or economic impacts in the San Francisco Bay Area. Our review shows similar patterns and trends for monthly average water use between 2017 – 2019.

The actual water use changes in the Single Family (SF) and Multi-Family (MF) Residential and CII sectors during 2020 are illustrated in the figures 3-1 and 3-2. The change in water use in the Residential (SF and MF) sector ranged from less than +5% in January, to almost +30% in March, and about +10% in November and December. Conversely, the CII Sector decrease peaked in May at -22% and was -8% in December.

Although the "shelter-in-place" mandate was lifted in May 2020, the telecommuting for many businesses continues. The near-term, post- "shelter-in-place" COVID-19 changes in MPWD's residential and CII sectors water consumption patterns indicate a shift: higher SF and MF residential use and conversely lower CII use. It is too early to speculate about the long-term impacts, however the MPWD continues to monitor and review sector water use in their system.

3.5 Land Uses within Service Area

Water Code Section 10631(a) requires that the description of the service area includes the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers are required to 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.

The majority of MPWD's service area territory is under the jurisdiction of the City of Belmont. The largest sector in MPWD's service area is residential and currently it is mostly built out. The service area also includes the CII sector, and open space areas. The remaining undeveloped land available for development is limited. Most development over the next 25 years will likely occur on currently vacant sites or come from expanded development of sites with existing structures both multi-family residential and CII as reviewed by the City of Belmont. In compliance with Water Code Section 10631(a), MPWD meets with the City of Belmont to discuss the water system requirements for planning and development of projects.

4. WATER USE CHARACTERIZATION

Lay Description

In their 2020 UWMP, suppliers must include current and projected water use in five-year increments for a period of at least 20 years. The water use data in UWMPs from all water utilities facilitates the State of California's aggregation of information, which is used to assess statewide urban water use and trends.

Chapter 4 characterizes MPWD's past, present, and projected water use based on metered data used in regional studies coordinated by BAWSCA and information from local planning agencies. Two resources used throughout MPWD's 2020 UWMP are the recently updated DSS Model and the Regional Water Demand and Conservation Projections Project (Demand Study). The DSS Model was discussed in detail in the Lay Description in Chapter 1. The BAWSCA Demand Study was initiated in January 2019 and was completed in June 2020. Using each agency's DSS Model the Demand Study comprehensively characterizes and analyzes the regional and individual past, current, and projected water demands and conservation for all BAWSCA agencies through 2045.

The purpose of the Demand Study is to provide updated information about long-term water demand patterns and conservation savings potential for the BAWSCA agencies to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.[48] Additionally, the Demand Study provides necessary information to support individual agency efforts, such as compliance with the new state water efficiency requirements and completion of the 2020 UWMPs.

Water agencies meter their water uses and the data they collect is the backbone for planning various system management needs, such as, infrastructure improvements, maintenance, and tracking past and current customer consumption to conduct resource planning and forecasts. Much of the content in this 2020 UWMP relies on accurate water meter data.

Metering technology has evolved significantly over the past decade. In the past five years, the MPWD invested in and installed an advanced metering infrastructure system (AMI, also known as smart metering) throughout its service area. MPWD's AMI system installation was completed in January 2020. MPWD's AMI system provides electronic, almost real-time, water metering data. In addition to monthly electronic AMI data collection for customer billing (as opposed to previous manual meter reading), when needed, MPWD can access the electronic metering data to obtain information about water use for specific time periods and locations. Moreover, the AMI system includes powerful analytics to evaluate water use patterns through time. AMI data facilitates identification of water-use trends, such as changes in seasonal water use and those resulting from unique events such as 'shelter-in-place', as discussed in Section 3.4.2.

MPWD uses its AMI data to compare monthly, and annual water use for specific customer groups, known as water-use sectors. MPWD uses its AMI metering data to evaluate water-use sector demand, conservation programs and needs, and appropriately plan for infrastructure investments. Information in this chapter also supports MPWD's assessment of the water system's reliability and enables performing MPWD's Drought Risk Assessments (DRA)—a new requirement for 2020 UWMPs (see Chapter 7). The aggregated information provides a comprehensive projection of customer water use to assess long-term water system reliability, as discussed in Chapter 7.

[48]BAWSCA, Long-term reliable water supply strategy, 2015. https://bawsca.org/water/reliability/strategy

The MPWD's metering data is the backbone for its water demand forecasts developed in the DSS Model through 2045. The MPWD's forecasts also reflect potential effects of a changing climate.

In this chapter, MPWD identifies its main water-use sectors and provides current and projected water use in five-year increments through 2045. Water-use sectors are specific types of customer classes, as defined in the Water Code Section 10631(d). MPWD has six water use sectors (Figures 4.1 and 4.2):

1. Single Family Residential.
2. Multi-family Residential.
3. Commercial.
4. Institutional.
5. Industrial.
6. Irrigation/landscape.

Key sections in Chapter 4 include:

- Non-potable vs potable water use.
- Past, current, and projected water use by sector.
- Worksheets and reporting tables.
- Water use for lower income households.
- Climate change considerations.

4.1 Non-Potable Versus Potable Water Use

The Water Code requires a description and quantification of water uses in the service area. It also requires that if recycled water is used or may potentially be used, it is described and quantified. Information from this chapter and Chapter 6 is used to prepare the reliability assessments in Chapter 7. DWR acknowledges that although a significant amount of demand in a supplier's service area may conceptually qualify as a potential non-potable demand, it may not be practical to deliver a non-potable supply to meet the identified potential non-potable use due to prohibitive costs to serve recycled water.

MPWD does not have an available, cost-effective supply of recycled water. Chapter 6, Section 6.2.5 discusses recycled water and its potential for use in the MPWD service area.

4.2 Past, Current, and Projected Water Use by Sector

Water Code Section 10635(a) requires that every urban water supplier includes 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 compares 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 is based on 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.

To the extent that records are available, suppliers are required to provide information about their water use sectors based on the 10 water use sectors identified in Water Code Section 10631(d).

In its 2020 UWMP, the MPWD uses the analyses of its water data in the BAWSCA Demand Study and its updated 2020 DSS Model. The Demand Study used common methodology to support regional planning as well as individual agency work. In addition, the Demand Study also supports compliance with the new state

water efficiency requirements [Assembly Bill (AB) 1668 and Senate Bill (SB) 606][49] and provides analyses of agency data for 2020 UWMPs.

Each BAWSCA agency's DSS Model in combination with an Econometric Model were used in the Demand Study to determine short-term and long-term demand projections. The Econometric Model projected short-term demands, through 2025, based on historical water use patterns and the projected future water demand associated with forecasts for drought recovery. The DSS Model projected long-term demand, through 2045, based on expected service area growth for both population and employment.

Demand forecasts were developed for each agency to account for conservation from passive (i.e., from codes/standards) and active conservation programs. Based on this analysis, water demands were projected after accounting for the effects of the existing plumbing code, future active conservation savings, and climate change. Each BAWSCA agency selected its own conservation measures. MPWD's conservation measures are discussed in Chapter 9 on Demand Management Measures (DMMs). BAWSCA also evaluated conservation measures for potential future regional implementation.

For the Demand Study, MPWD provided data from metering from 1998 through 2018, its water rates, water use sectors, monthly water consumption and water conservation, and additional information for historical and projected use analyses. Based on the analyses in MPWD's DSS Model and BAWSCA Demand Study, MPWD describes its past, current, and projected water use for its six water use sectors, in five-year increments through 2045. As shown in Table 4-1, in calendar year 2020, the MPWD service area used a total of 974 million gallons (MG) compared to 840 in 2015. The 2020 water consumption is about 16% higher than in 2015.

4.2.1 Water Use Sectors Listed in Water Code

The water use sector definitions are based on Water Code Section 10631(d) and are listed in the subsections below. Suppliers must use the specified sectors to characterize their water use customers to the extent records are available.

Accordingly, following each definition, if the sector is present in the MPWD's service area both it and its water use are identified.

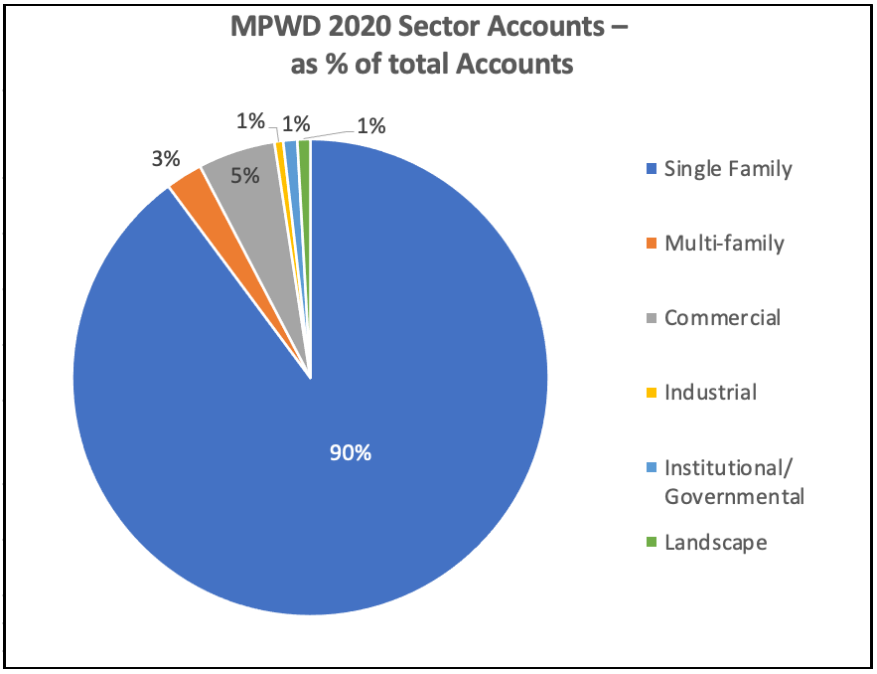
Figure 4-1 illustrates the MPWD's six water use sectors by % of total accounts. The pie chart shows that (based on 2020 data) the SF sector has 90% of all MPWD's accounts, while the multi-family sector is currently only 3% of all accounts. The remaining 7% of the accounts comprise the CII sector, with Commercial, Industrial, Institutional, and Irrigation customers.

Figure 4-2 illustrates the MPWD's six water use sectors' consumption and system water loss by % of total water production. The pie chart shows that (based on 2020 data) the SF consumption is 56% of all MPWD's water, while the multi-family sector consumes 17%. The remaining 7% of the CII accounts consume 23% of MPWD's water.

In 2020, of MPWD's total water use, 56% was in the Single-Family (SF) residential sector, while 17% was in Multi-Family (MF) sector. In the Commercial, Institutional, and Industrial sector (CII), 10% was Commercial, 3% was Industrial, 3% was Institutional, 7% was Irrigation (Landscape), and 4% was from system water losses.

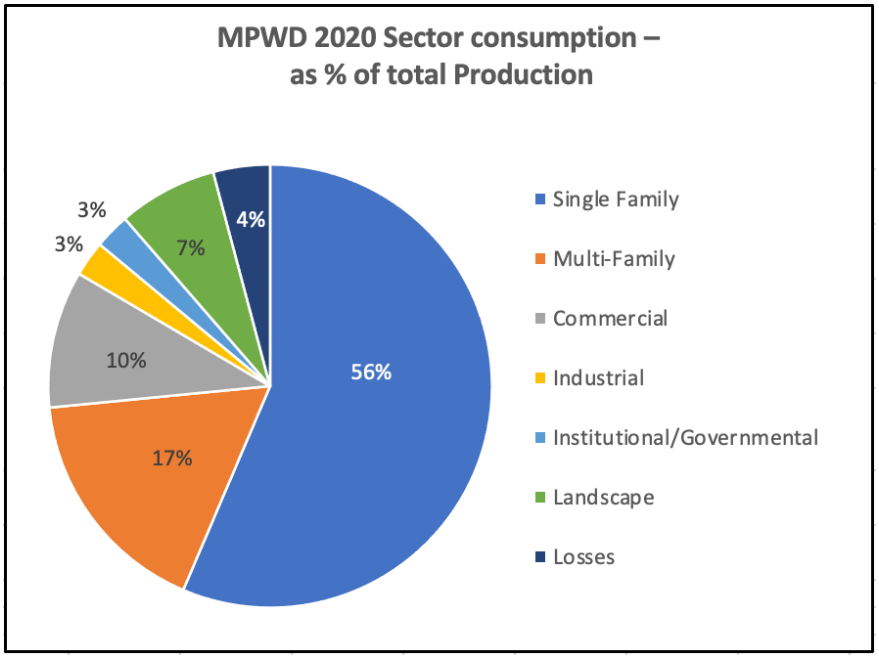
[49] DWR, AB 1668/SB 606 primer document explaining the legislation is available on the DWR website: https://water.ca.gov/Programs/Water-Use-And-Efficiency

Figure 4-1. MPWD's six water use sectors by % of all accounts.



Source: MPWD 2020 Springbrook billing data. Values are rounded.

Figure 4-2. MPWD's six water use sectors' consumption by % of total purchased water.



Source: MPWD 2020 AMI and Springbrook billing data. Values are rounded.

In the sections below, when water use sectors are not applicable to MPWD, a statement is included to this effect.

4.2.1.1 Single Family Residential

Definition: A Single Family (SF) dwelling unit, a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

MPWD's SF residential sector makes up 90% of all MPWD's accounts. The SF sector consumes 56% of MPWD's total water.

4.2.1.2 Multi-Family

Definition: Multiple-Family (MF) dwelling units contained within one building or several buildings within one complex.

MPWD's MF residential sector makes up 3% of all MPWD's accounts. However, the MF sector consumes 17% of MPWD's total water.

4.2.1.3 Commercial

Definition: A water user that provides or distributes a product or service [Water Code 10608.12(d)].

MPWD's commercial sector makes up 5% of all MPWD's accounts. The commercial sector consumes 10% of MPWD's total water. Commercial use in the MPWD service area primarily includes restaurants, hotels, motels, retirement homes, retail stores, and other facilities.

4.2.1.4 Industrial

Definition: A water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS)[50] code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development [Water Code Section 10608.12(h)].

MPWD's industrial sector makes up 1% of all MPWD's accounts. The industrial sector consumes 3% of MPWD's total water. Industrial use in the MPWD service area primarily includes warehouses, auto services, and manufacturing facilities.

4.2.1.5 Institutional (and Governmental)

Definition: A water user dedicated to public service. This type of user includes, among other users, higher-education institutions, schools, churches, hospitals, government facilities, and nonprofit research institutions [Water Code Section 10608.12(i)].

MPWD's institutional sector makes up 1% of all MPWD's accounts. The institutional sector consumes 3% of MPWD's total water. Institutional use in the MPWD service area primarily includes healthcare, schools, churches, hospitals, and government facilities.

4.2.1.6 Landscape

Definition: Water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation.

MPWD's landscape/irrigation sector makes up 1% of all MPWD's accounts. The landscape sector consumes 7% of MPWD's total water. Landscape/irrigation use in the MPWD service area includes large landscaping that is part of homeowner associations, parks, athletic fields, and new construction.

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[50] The NAICS website can be accessed at: https://www.census.gov/naics/

MPWD is in the initial process of evaluating potential local sources of groundwater to augment its supply for irrigation.

4.2.1.7 Sales to Other Agencies

Definition: These are water sales made to another agency. This is a wholesale demand.

MPWD is a retailer and does not sell water to other agencies.

4.2.1.8 Conjunctive Use

Definition: A management strategy where surface water is managed in conjunction with an underground aquifer. For purposes of the 2020 UMWP, conjunctive use is seen as a management strategy rather than as a water use.

MPWD does not practice conjunctive use and does not use groundwater as a supply.

4.2.1.9 Groundwater Recharge

Definition: The managed and intentional replenishment of natural groundwater supplies using man-made conveyances such as infiltration basins or injection wells. Water used for groundwater banking or storage may also be reported using this sector. If all, or a portion of, the groundwater recharge water is subsequently pumped out of the basin in the same year, that water will be reported by the supplier as a supply from groundwater.

MPWD does not recharge groundwater and does not use groundwater as a supply.

4.2.1.10 Saline Water Intrusion Barriers

Definition: Injection of water into a freshwater aquifer to prevent the intrusion of saltwater.

MPWD does not inject water into a freshwater aquifer to prevent the intrusion of saltwater.

4.2.1.11 Agricultural

Definitions: Water used for commercial agricultural irrigation.

MPWD does not have commercial agricultural use in its service area.

4.2.1.12 Distribution System Losses

Reporting of distribution system losses is required by the Water Code (Title 23 California Code of Regulations [CCR] Section 638.1 et seq.).

Definition: AWWA defines *apparent* and *real* losses. *Apparent* losses are considered a result of water metering inaccuracies, systematic data handling errors, and unauthorized water consumption. R*eal* losses comprise water loss other than from apparent losses.

MPWD's distribution system losses are discussed in more detail in Section 4.2.4, below.

4.2.2 Water Use Sectors in Addition to Those Listed in Water Code

The water use sectors described below are not specifically listed in, nor required by the Water Code. These sectors may be applicable to some suppliers.

For the 2020 UWMP, MPWD does not have these additional sectors.

4.2.2.1 Exchanges

Suppliers determine as to whether water sent to another Supplier is a sale, transfer, or exchange.

Definition: Water exchanges are typically water delivered by one water user to another water user, with the receiving water user returning the water at a specified time, or when the conditions of the parties' agreement are met. Water exchanges can be strictly a return of water on a basis agreed upon by the participants or can include payment and the return of water. The water returned may or may not be an *even* exchange.

MPWD is a retail water agency and has not exchanged its water.

4.2.2.2 Surface Water Augmentation

Definition: The planned placement of recycled water into a surface water reservoir that is used as a source of domestic drinking water supply.

MPWD does not augment surface water. MPWD does not have recycled water as an available water supply.

4.2.2.3 Transfers

Definition: The Water Code defines a water transfer as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights. Transfers can be between neighboring Suppliers or across the state, provided there is a means to convey or store the water. A water transfer can be a temporary or permanent sale of water or a water right by the water right holder, a lease of the right to use water from the water right holder, or a sale or lease of a contractual right to water supply. Water transfers can also take the form of long-term contracts of the purpose of improving long-term supply reliability.

MPWD is a retail water agency and has not transferred its water.

4.2.2.4 Wetlands or Wildlife Habitat

Definition: Water used for a managed environmental use to improve an environmental condition.

MPWD does not use potable water for managed environmental uses.

4.2.2.5 Other

Definition: Any water demand that is not adequately described by the water sectors defined above. When using the "*Other"* category as a water use sector, the agency is required to briefly describe the water uses reported in this category (e.g., firefighting).

Fire practice, firefighting, and line flushing to maintain water quality are among MPWD's main uses that are unbilled authorized consumption.

4.2.3 Past Water Use

While not part of the DWR UWMP Reporting Tables, the Water Code requires retail suppliers to *quantify* past water use. MPWD's past water use is part of the data used for the MPWD's DSS Model and for BAWSCA's Demand Study that identify demand and conservation projections through 2045. MPWD's historical data from 1998 through 2018 was analyzed in the DSS Model to assess the impacts of certain factors on water demands, such as water rates, economic conditions, and weather. The metering data and comprehensive analyses from MPWD's DSS Model and the BAWSCA Demand Study are referred to in Section 4.3 and throughout in MPWD's 2020 UWMP.

4.2.4 Distribution System Water Loss

Water retailers are required to monitor, calculate, and report for each of the five years preceding the 2020 UWMP distribution system 'real' and 'apparent' water losses using AWWA Method 36 [(Water Code Sections: 10608.34, 10631(d)(1)].

Water Code Section 10631(d)(1) requires that:

An urban retail water supplier, quantifies, 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 the following…

(J) Distribution system water loss….

Water Code Section 10631(d)(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.

Distribution system water losses result from the physical potable water losses from the pressurized water distribution system and the supplier's storage facilities up to the point of delivery to the customer's meter.

Distribution system water losses (also known as 'real losses') are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of each customer's meter. 'Apparent' losses are defined by the AWWA as losses from meter inaccuracies, billing adjustments, theft, and systemic data errors.

The system losses are calculated using the sum of *real losses* and *apparent losses*. All water systems have *real* and *apparent* losses.

In its 2015 UWMP, MPWD referred to the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMP 1.2: Water Loss Control). The CUWCC BMP 1.2 was drafted in 1991 based on a 10% unaccounted-for water standard of allowable water loss, and it referenced the American Water Works Association (AWWA) M36 Manual as the guidance for completing full system water audits. In 2018, the CUWCC was replaced by the California Water Efficiency Partnership, CalWEP and BMP 1.2 is no longer a standard managed by CalWEP.

MPWD continues to perform an annual analysis of its distribution system losses using the established AWWA Method 36. MPWD's three-year average (2016 - 2018) water loss was 14.8 gallons per connection per day compared to the BAWSCA-wide agency average water loss per connection per day of 26.8 gallons based on validated water audits submitted in 2018.[51] BAWSCA and its agencies are discussed in detail Chapter 6. There is no one size fits all for water loss management and each water utility assesses their threshold for the level of leakage based on the costs of real loss interventions and their cost of water.

[51] Source: MPWD communication with BAWSCA Validation Consultants, Water System Optimization, Inc.

The DWR is developing Urban Water Loss standards, as required by SB 606, adopted in 2018. Based on information from DWR[52] the Water Loss Standard, described in Section 4.3, will be adopted in mid or late 2021.

In 2019, the MPWD validated water loss was 4.4% of the total water demand. The MPWD's low water loss may be attributed to pro-active maintenance and diligent management of its distribution system. Pursuant to California Code of Regulations Section 638.5, using DWR's online submittal tool, an electronic copy of MPWD's audit is submitted to DWR by October 1 of each year. MPWD's water loss data is reported in Submittal Table 4-4. In the past five years (2015 – 2019), MPWD's water losses have ranged from 6.1% to 4.2% of total annual production. MPWD'S validated water loss reports for 2015 through 2019 are included in Appendix 2. The calculated water loss for 2020 is 39 MG or 4.4%.

Projected water losses are required to be reported in five-year increments for at least 20 years. The information is used to effectively evaluate water service reliability, and it is one of the water use sectors [Water Code Section 10631(d)(1)]. As recorded in its 2020 DSS Model, MPWD reports its projected water losses averaging 5.9% through 2045.

In Chapter 9, MPWD discusses its Demand Management Measures (DMMs) to minimize its distribution system losses.

4.2.5 Current Water Use

Current water use is presented in Submittal Table 4-1 to record current gross water use. Other water sources, such as recycled water, if available, are discussed in Chapter 6. As mentioned earlier and shown in Submittal Table 4-3, MPWD does not have an available, cost-effective source of recycled water. In 2020, based on SFPUC's production AMI meters, MPWD's actual total gross water use was 974 MG.

MPWD's 2020 gallons per capita per day (GPCD) analysis uses actual consumption data shown in Table 4-1. MPWD's resulting GPCD shows that MPWD was able to surpass its 2020 Target of 121 GPCD by only using 96.56 GPCD. MPWD's 2020 water use demonstrates its compliance with its 2020 per-capita water use Target of 121 GPCD, adopted in its 2015 UWMP. Additional information about the MPWD's development and adoption of its Interim 2015 and 2020 GPCD Target, pursuant to Water Code Section 10608.24(b) is presented in Chapter 5.

[52] DWR Standards, Methodologies, and Performance Measures Workgroup Webinar, 10/28/20, discussion.

Table 4-1. MPWD's 2020 actual demands by sector for potable water, in MG.

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family		Drinking Water	546
Multi-Family		Drinking Water	165
Commercial		Drinking Water	97
Industrial		Drinking Water	32
Institutional/Governmental		Drinking Water	25
Landscape		Drinking Water	70
Losses		Drinking Water	40
		TOTAL	974
[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. *[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Units: MG. Data source: MPWD's actual AMI metered consumption and MPWD consumption data from MPWD's Springbrook billing database. Total is based on SFPUC AMI production meter data, except estimate for the SFPUC meter that failed in December 2020. The meter was replaced in January 2021. Losses for 2020 are calculated using 2020 actual production and subtracting MPWD actual consumption meter data. MPWD does not have available, cost-effective raw water or recycled water supply, therefore neither raw nor recycled water are included. However, in future these alternate water supplies may be available and potential additional water sources.			

4.2.5.1 Optional Planning Tool – Current Use

For the 2020 UWMP preparation, DWR has created an optional Planning Tool that suppliers can use to record and assess their data. The DWR Planning Tool can be used by water agencies, but it is not required.

As previously stated, MPWD is using their updated 2020 DSS Model and the BAWSCA Demand Study as the key references for current water use.

On April 21, 2020, the State Water Board adopted regulations to make monthly water use reporting mandatory for all water suppliers.[53] The requirement became effective on October 1, 2020.[54]

[53] SWRCB, Executive Order B-37-16 and B-40-17.
https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/emergency_regulation.html
[54] SWRCB, Frequently Asked Questions.
https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/faq.html

4.2.6 Projected Water Use

Every urban water supplier is required to include, as part of its 2020 UWMP, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years [Water Code Section 10635 (a)]. This water supply and demand assessment requires comparison of the total water supply sources available with the long-term total projected water use over the next 20 years, in five-year increments. Also, the assessment is required to include a 'normal' water year, a single dry water year, and a drought lasting five consecutive water years based on information from available data from state, regional, or local agency population projections within the service area (Water Code Section 10631).

Water suppliers that rely on a wholesale agency as a source of water are required to provide the wholesale agency with water use projections for that source of water in five-year increments to 20 years or as far as data is available and in turn, the wholesale agency is required to provide information to the water supplier that identifies and quantifies the existing and planned sources of water for the same five-year increments, and water-year types [Water Code Section 10631(b),(f)].

MPWD's local coordination with the Cities of Belmont and San Carlos, and regional coordination through BAWSCA, with SFPUC, its supplier, were discussed in detail in Chapter 3 (see Section 3.1).

MPWD's projected water use relies on its DSS Model that examines past and current water use trends, along with land use forecasts, information about potential impacts from climate change, and other factors relevant to sector-specific water use. The MPWD's historic and current water use data were analyzed and used as basis for projecting water use in five-year increments, beyond the required 20 years through 2045. The projections for water use for the next five consecutive years are part of MPWD's five-year water supply reliability assessment. Future demands could change, depending on long-term environmental changes, paradigm shifts in residential, and workspace uses, and local economic factors, including commercial and industrial activity, and housing demand.

As discussed in Chapter 3, the impacts of the 2020 COVID-19 pandemic were not known at the time regional and local water use forecasts were developed.

4.2.6.1 20-Year Planning Horizon

In accordance with Water Code Section 10635(a), all suppliers are required to report their projected water use, in five-year increments through 2040 and encouraged to project through 2045, as shown in Submittal Table 4-2 MPWD projects its water use through 2045.

Through BAWSCA, MPWD provides its projected demands to the SFPUC, in five-year increments through 2045. The BAWSCA Demand Study, that is available to the SFPUC, incorporates projected water savings from the plumbing code, standards, ordinances, and projected demands due to growth in MPWD's service area. Additionally, in accordance with Water Code Section 10603(d)(2), MPWD reports its projections in Section 4.3.2.2 for each of the water use sector identified in Section 4.2.1.

4.2.6.2 Water Year Types

For the water service reliability assessment, suppliers are required to characterize the *normal* water use for estimating 'normal' water supply reliability and dependability in the event of a single dry year. Suppliers may choose to characterize the *normal* year water use in whatever manner makes the best planning sense. MPWD is using the *normal* year characterization from its supplier, the SFPUC.

MPWD's *normal year* and *single dry year* data are based on projections by the SFPUC, and drought allocations calculated by BAWSCA. MPWD's *normal year* and *single dry year* data are discussed in Chapter 7, and presented in Submittal Tables 7-1, 7-2, and 7-3.

MPWD is also required to characterize a five-consecutive-year drought, which is discussed in section 4.2.7 and presented in detail in Chapter 7 and Submittal Tables 7-4, and 7-5.

4.2.6.3 Codes and Other Considerations Used in Projections

Water savings from codes, standards, ordinances, and land use plans, are known as *passive savings*, and generally decrease water use for new and future customers compared to existing customers. However, some passive savings may apply to all customers such as plumbing code changes that result in lower water use when existing customers replace fixtures and appliances. Suppliers are required to state the extent to which passive savings are considered in the water use projections and note the information in Submittal Table 4-5.

The water demand projections in Submittal Table 4-2 are based on analysis of historic metering data and projected growth in population, jobs, and development that are presented in the MPWD's 2020 DSS model. The projections in Table 4-2 include reductions due to "plumbing code" (passive savings) changes, reflect on-going replacement of existing plumbing fixtures for more water efficient devices, and the implementation of conservation measures selected by the MPWD.

Projecting Gross Water Use

When projecting water use, MPWD considers the effects of codes, standards, ordinances, and land use plans, as well as the potential effects from climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

As explained in Section 4.2, forecast demands include projected plumbing and building code water savings. Plumbing codes and appliance standards for toilets, urinals, faucets, clothes washers, and showerheads will continue to reduce indoor residential and non-residential water demands in the future. The Plumbing code savings are expected to continue reductions in demand and are accounted for in the 2020 DSS Model used to develop MPWD's demand projections.

MPWD has instituted various Ordinances and Resolutions to manage water demand and consumption. They are summarized below.

- Ordinance 111 – Amending Stage 2 water shortage response of water shortage contingency plan regarding mandatory restrictions on outdoor water use. The purpose of this Ordinance is to provide the legal authority to support and enforce mandatory restrictions on outdoor water use during Stage 2 of MPWD's Water Shortage Contingency Plan (WSCP).
- Ordinance 112 – Amending the Water Service Ordinance No. 103 for the Mid-Peninsula Water District regarding Rates and Charges. The purpose of this Ordinance is to provide the legal authority to support, enforce, and set the schedule of rates and fees.
- Ordinance 113 – Amending Ordinance No. 111 Implementing Stage 2 Water Shortage Response of Water Shortage Contingency Plan Regarding Mandatory Restrictions on Outdoor Use. Adopted May 28, 2015.
- Ordinance 115 – Water Efficient Landscape Ordinance (WELO), "Adopting water-efficient landscaping". The purpose of this Ordinance is to provide the legal authority to support and enforce installation of water-efficient landscaping.
- Ordinance No. 120 – "An Ordinance Amending Attachment "A" Regarding Rates and Charges to The Water Service Ordinance for The Mid-Peninsula Water District". The purpose of this Ordinance is to provide the legal authority to support and enforce MPWD's tiered rates.
- Ordinance No. 121 – "An Ordinance Amending MPWD Water Service Ordinance No. 103
- Regarding Termination of Water Service". The purpose of this Ordinance is to provide the legal authority and procedures to terminate a water service, when needed.

- Resolution No. 2020-01 – Adopting "The Residential Water Service Termination Policy".

Estimating Gross Water Use and Supply for the Next Five Years

The purpose of MPWD's water use projections for 2021 through 2025 is to provide a water use baseline for evaluating the reliability of MPWD's water supplies during a prolonged drought, as part of the reliability assessment and drought risk assessment (DRA) that are discussed in detail in Chapter 7.

MPWD's water use (demand) projections for 2021 through 2025 are based on historic use, conservation implementation, and its forecast growth in its service area. MPWD is using its 2020 DSS Model for its demand projections. MPWD presents the water supply estimates based on supply projections from SFPUC and calculated drought allocations by BAWSCA. The SFPUC supply projections are discussed in detail in Chapter 7.

4.2.6.4 Optional Planning Tool – Projected Use

DWR developed optional "Planning Tool" worksheets for suppliers to facilitate their review of water use data.

In its 2020 UWMP, MPWD is using data from its 2020 DSS Model and BAWSCA Demand Study, because during their development MPWD's past data and demand projections were analyzed in detail. The DSS Model is more detailed than the DWR Planning Tool and all BAWSCA agencies including MPWD have been using the DSS Model since 2000. Additionally, the DSS Model involves robust analysis of historic data since 1995 and incorporates climate change.

Therefore, MPWD is not using the optional Planning Tool worksheets.

4.2.7 Characteristic Five-Year Water Use

A critical component of new statutory language is the requirement to prepare a five-year DRA, as discussed earlier. The DRA is required by Water Code Section 10635(b) and is a new requirement for the 2020 UWMPs. The five-year DRA can also be used to provide the water service reliability assessment for a drought lasting five years.

To develop its DRA, MPWD estimated expected gross water demand for 2021 to 2025, without drought conditions (*unconstrained demand*) and then adjusted the annual demand using modeled projections from SFPUC and associated, calculated drought cutback allocations performed by BAWSCA for the five-years' cumulative drought effects.

4.3 Worksheets and Reporting Tables

The DWR Submittal Tables for customer water use are similar to the tables MPWD completed for its 2015 UWMP. Some modifications are included in the 2020 UWMP Submittal Tables to reflect Water Code changes and the 2020 timeframe.

4.3.1 Optional Planning Tool Use Analysis Worksheet

As previously mentioned, DWR has created an Optional Planning Tool for 2020 UWMP preparation so suppliers can record and assess their data. The DWR Planning Tool is optional and not required.

In its 2020 UWMP, MPWD is using data from its 2020 DSS Model and BAWSCA Demand Study, because MPWD's past data and demand projections were analyzed in more detail during their development, as discussed earlier.

4.3.2 DWR 2020 UWMP Submittal Tables

Submittal Tables 4-1 through 4-5 are part of DWR's electronic reporting system for data input and are used by DWR to evaluate regional and statewide water use information and summarize data for DWR-required Legislative reports. These are the Standardized Tables for MPWD's 2020 UWMP electronic submittal.

Table 4 -1 presents MPWD's actual total 2020 water consumption for its six water-use sectors. Tables 4-2 and 4-3 show projected water demands for MPWD's water use sectors and total gross water use, respectively, through 2045. Table 4-4 also shows MPWD's validated water loss results, showing that the 2019 water loss was 39 MG that translates to 4.2% of the total water production. MPWD's 2020 calculated water loss was 39 MG. Table 4-5 includes future water savings and lower income residential demands in MPWD's water demand projections.

4.3.2.1 Table 4-1: Total Gross Water Use by Sector – 2020

Submittal Table 4-1 reports the MPWD's gross water use by sector for 2020. MPWD does not have available, cost-effective raw water or recycled water supply, therefore neither raw nor recycled water are included. However, in the future these alternate water supplies may be available and potential additional sources of water.

4.3.2.2 Table 4-2: Gross Water Use by Sector – Projected

The data in Table 4-2 illustrates the varying projected rates for water use growth in MPWD's different sectors. For example, in 2030, the DSS Model shows a decrease in water use in the SF sector. This decrease is attributed to multiple factors that interact in the DSS Model, namely the rate of water conservation outpaces the rate in growth of new single-family homes, resulting in more water savings and an overall reduction in water use. Similarly, the MF sector illustrates a reduction in water use through 2035, with growth increasing in 2040 and beyond. The commercial sector is projected to grow, while the industrial sector water use is expected to be lower through 2045. Water use in the institutional and landscape (large, irrigated areas) sectors is expected to grow.

Submittal Table 4-2 reports the MPWD's projected gross water use by sector for 2020 through 2045.

Table 4-2 MPWD's projected drinking water (DW, potable) use through 2045.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUE data online submittal tool		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family	DW	553	542	546	552	559
Multi-Family	DW	147	143	143	143	144
Commercial	DW	137	146	153	151	150
Industrial	DW	35	32	29	27	25
Institutional/Governmental	DW	34	34	36	37	38
Landscape	DW	76	79	84	84	90

Losses	DW	61	61	61	60	64
	TOTAL	1,044	1,037	1,051	1,055	1,069

[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.
[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES: Units: MG per calendar year based on MPWD's projections: from July 2020 to January 2021, and BAWSCA Demand Study, June 2020. Projections include passive savings. MPWD does not have available, cost-effective raw water or recycled water supply, therefore neither raw nor recycled water are included. However, in future these alternate water supplies may be available and potential additional sources of water.

4.3.2.3 Table 4-3. Total Gross Water Use (Potable and Non- Potable)

Total potable and non-potable gross water use is shown in Submittal Table 4-3 using data from Submittal Tables 4-1 and 4-2. MPWD's sole supply is potable water from the SFPUC. MPWD does not have available, cost-effective raw water or recycled water supply, therefore neither raw nor recycled water are included.

The sum of these values represents the MPWD's total customer water uses for all its potable supply. The water service reliability analysis in Chapter 7 evaluates reliability for MPWD's potable uses.

Overall customer water use is presented in Submittal Table 4-3.

Table 4-3 Total gross and projected water use from 2020 through 2045.

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)

	2020	2025	2030	2035	2040	2045 (optional)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2R*	974	1,044	1,037	1,051	1,055	1,069
Recycled Water Demand[1] *From Table 6-4*	0	0	0	0	0	0
Optional Deduction of Recycled Water Put into Long-Term Storage[2]						
TOTAL WATER USE	974	1,044	1,037	1,051	1,055	1,069

[1]Recycled water demand fields will be blank until Table 6-4 is complete
*[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES: Units: MG. Data from BAWSCA, 2/18/21. 2020 Total is based on SFPUC AMI production meter data, except estimate for a SFPUC meter that failed in December 2020. The meter was replaced in January 2021. 2025-2045 per calendar year based on MPWD's 2020 DSS Model. MPWD does not have available, cost-effective raw water or recycled water supply, therefore neither raw nor recycled water are included. However, in future these alternate water supplies may be available and potential additional water sources.

4.3.2.4 Table 4-4: Preceding Five-Year Water Loss Audit Reporting

Submittal Table 4-4 shows the water loss value calculated using the AWWA's M36 Water Loss worksheet that was submitted to DWR for each of the prior five years.

Table 4-4 Data from MPWD's Water Loss reports.

Submittal Table 4-4. Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
01/2015	52
01/2016	36
01/2017	52
01/2018	52
01/2019	40
[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. [2] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Units: MG. Source: 2015 - 2019 MPWD AWWA water loss worksheets (See Appendix 11). The MPWD 2016 through 2019 water loss data are from validated water loss audits. MPWD consumption data is from MPWD's Springbrook billing database.	

4.4 Water Use for Lower Income Households

Water Code Section 10631.1 requires water use projections to include projected water use for SF and MF residential housing needed for lower income households. Lower income households are defined in Section 50079.5 of the Health and Safety Code as households having an income below 80 % of area median income, adjusted for family size. Lower income households are identified by city and county governments in their "Housing Element" reports. Retail suppliers are required to include the projected water use for lower income households in their 2020 UWMPs. The MPWD used data from the City of Belmont General Plan Housing Element[55] to characterize the presence of lower income households in the service area.

The Belmont Zoning Code facilitates a range of housing types and prices suitable to economic segments of the community. This includes low income, single-family and multi-family housing. Based on the State criteria for small cities in metropolitan areas, the default density standard for Belmont is 30 units per acre.

Since 2013, the City of Belmont has seen a steady increase in both the number of housing units approved and permitted, and an overall increase in inquiries for multi-family projects. It is expected that housing production will increase significantly from 2020 to 2025 as the housing market continues to grow.

[55] Belmont Housing Element 2015 – 2023, 2015. https://www.belmont.gov/home/showdocument?id=11986

Belmont's Zoning Ordinance allows for a variety of housing types that meet the needs of all economic segments of the community.

Table 4-5 MPWD's water use projections include water savings and lower income residential demands.

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	DSS Model, Appendix 14, Table C-1 MPWD's 2020 DSS Model – Section 4.2.6. BAWSCA 2020 Demand Study – Section 4.0.
Are Lower Income Residential Demands Included in Projections? *Drop down list (y/n)*	Yes
NOTES: MPWD's 2020 DSS model water demand projections include Plumbing code and water conservation savings (passive savings). Information from the Belmont Housing Element report 2015 – 2023 that includes lower income residential data is incorporated for water demand projections. (1) MPWD's 2020 DSS model water demand projections include Plumbing code and water conservation savings. (2) According to the 2015-2023 Belmont Housing Element report, the estimated proportion of households earning a household income below 80 % of the area median income is approximately 30% of all households. These households are distributed between 13% low income, 9% very low income, and 7% extremely low-income households. MPWD's projections for its service area are based on a comprehensive methodology in the DSS Model and account for these low-income households.	

Submittal Table 4-5 summarizes MPWD's consistency with the requirement to include water savings and lower income residential demands.

Based on the 2015-2023 Belmont Housing Element report, the estimated % of households earning a low-income or lower than below is approximately 30% of the single and multi-family households. MPWD's projections for its service area are based on a comprehensive methodology in the DSS Model and account for these low-income households.

4.5 Climate Change Considerations

Every urban water supplier is required to include, as part of its UWMP, a DRA for its water service (Water Code Section 10635(b). All suppliers must now include consideration of climate change in their water use and supply projections for their long-term water service reliability assessments and DRA.

The Intergovernmental Panel on Climate Change (IPCC) develops several future climate change scenarios referred to as Representative Concentration Pathways (RCP). The IPCC recently published a report that identifies temperature changes over two time periods (early-21st century and mid-21st century). For the BAWSCA Demand Study, the time of focus was 2019-2045. Therefore, it was necessary to combine the two time periods to get an overall temperature change. The BAWSCA Demand Study, used the IPPC's predicted annual mean temperature increase in the early 21st century of 1.7 degrees Fahrenheit and this was incorporated into the demand forecast for all scenarios for the time of 2019 to 2045. According to California's Fourth Climate Change Assessment, San Francisco Bay Area Summary Report, the Bay Area's historical temperature increased 1.7 degrees Fahrenheit from 1950 to 2005. It is predicted that annual mean maximum temperatures will increase by 1 to 2 degrees Fahrenheit in the early 21st century from the

years 2006 to 2039, then will increase by an additional 3.3 degrees Fahrenheit in the mid-21st century from 2040 to 2069. This increment for the mid-21st century rises to 4.4 degrees Fahrenheit if the Bay Area remains under the high emissions scenario of "business-as-usual." [56]

The Public Policy Institute of California has predicted that five climate pressures will impact the future of California's water management: warming temperatures, shrinking snowpack, shorter and more intense wet seasons, more variable precipitation, and rising seas. As of 2019, some of these pressures are already apparent. The climate impact on water supply is predicted to be significant and impact water demand.
In the San Francisco Bay Area, annual precipitation is expected to continue to be highly variable, leading to very wet years contrasted with very dry years. The largest winter storms in the Bay Area will likely become more powerful and potentially more damaging. Due to a predicted increase in temperature in the future, California and the Bay Area will likely experience longer and deeper droughts, which could impact the water supply. According to the San Francisco Bay Conservation and Development Commission (BCDC), historical records show that sea level in San Francisco Bay has risen 18-20 cm (7 inches) over the past 150 years.

The "State of California updated 2018 Sea-level Rise Guidance"[57], recommends for projects in the San Francisco area with a lifespan to 2050, under a high-emissions scenario (RCP 8.5), using three risk projections until 2050:

- Low risk aversion projection: 1.1 feet
- Medium-high risk aversion projection: 1.9 feet
- Extreme risk aversion projection: 2.7 feet.

For highly vulnerable or critical assets that have a lifespan beyond 2050 and would result in significant consequences if damaged, the extreme risk aversion projection is recommended for planning analyses. The range of low, medium to high, and extreme risk aversion projections should be evaluated across the range of high and low emissions scenarios (RCP 8.5 and RCP 2.6, respectively). For example, for a project with a lifespan to the year 2100, the recommended range of projections is as follows:

- Low risk aversion projection: 2.4 - 3.4 feet
- Medium-high risk aversion projection: 5.7- 6.9 feet
- Extreme risk aversion projection: 10.2 feet.

The SFPUC, MPWD's supplier, is developing a Climate Action Plan. The goal of the plan is to identify various climate scenarios that could impact the SFPUC RWS. The SFPUC's plan will also address climate change adoption measures to ensure a continued supply of high-quality water for Wholesale BAWSCA customers. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). Additional discussion about droughts and potential impacts and mitigations to long-term climate change by SFPUC is presented in Chapter 6.

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[56] Ackerly, David, Andrew Jones, Mark Stacey, Bruce Riordan (University of California, Berkeley, 2018.) *San Francisco Bay Area Summary Report.* California's Fourth Climate Change Assessment. Publication number: CCCA4-SUM-2018-005. Accessed online May 2021. https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf

[57] State of California Sea-Level Rise Guidance, 2018 Update. http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

SFPUC, views assessment of the effects of climate change requiring regular updates to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Both the SFPUC and BAWSCA participated in the 2013 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which included an assessment of the potential climate change vulnerabilities of the region's water resources and identified climate change adaptation strategies.

Also, the threat to local water system infrastructure due to climate change is being studied under MPWD's overall Risk and Resiliency Assessment currently in development as required by America's Water Infrastructure Act (AWIA) of 2018.[58]

Concurrently, MPWD is developing its Climate Action mitigation strategy. The focus of the strategy is to identify risks from climate change on its facilities and operations. MPWD's initial strategy includes the following:

- Development of Geographic Information System (GIS) maps that identify the geolocation of key facilities and operations,
- Use of MPWD's GIS facility maps to compare the locations of MPWD facilities relative to available maps identifying increased risks from climate change (e.g., sea level rise, groundwater rise, wildfire susceptibility, etc.),
- Development of map layers to identify climate change risk types (e.g., sea level rise, increased fires, etc.) and timeframes (focus on pre-2050) of vulnerabilities,
- Identification of highest near-term vulnerabilities, and
- Identification of mitigation options.

[58] America's Water Infrastructure Act (AWIA) of 2018 https://www.epa.gov/sites/production/files/2019-04/documents/awia_factsheet_04-16-2019_v2-508.pdf

Lay Description

The Water Conservation Act of 2009 (SB X7-7) incorporated new provisions in the California Water Code establishing a program to achieve a 20% reduction in statewide urban water use by 2020.[59] California Water Code (Water Code) Section 10608.16(a) states: "The state shall achieve a 20% reduction in urban per capita water use in California on or before December 31, 2020."

To achieve this statewide objective, the Legislature required each urban retail water supplier subject to the Urban Water Management Plan Act to develop an urban water use target to help the state collectively achieve a 20% reduction. The Legislature stated that the cumulative results of each supplier's reduction would meet the statewide legislative requirement.

To facilitate the requirements in SB X7-7, the 20% reduction in urban per capita water use in California, DWR established procedures for water suppliers to determine their Baseline water use, in gallons per capita per day (GPCD), and allowed water suppliers the choice of complying individually or regionally with other water suppliers. Suppliers used one of four Target Methods to set their water use Target.

MPWD chose to comply as an individual water agency and used Method 3, the Hydrologic Region Method, that relies on data from the San Francisco Hydrologic Region. To develop the urban retail water, use target for its 2015 UWMP, MPWD had to identify two Baseline periods from which the 2015 Interim Target and 2020 Compliance Target were calculated. The steps for calculating the Baselines and Targets are summarized below.

In their 2015 UWMPs, suppliers had to:

- Choose an individual or regional Baseline and Target.

  MPWD chose individual Baselines and Targets.

- Use one of four methods to determine the 2020 urban water use target.

  MPWD chose Target Method 3, the Hydrologic Regional Target Method. MPWD is in the San Francisco Bay Hydrologic Region. The San Francisco Hydrologic Region has a calculated target of 124 GPCD. Method 3 requires the MPWD's 2020 conservation goal to be 95% of its 5-year Baseline, which is 127 GPCD. Consequently, the MPWD 2020 target is 121 GPCD (i.e., 127 GPCD *0.95; SB X7-7 Table 7-F, Appendix 9).

- Define a 10- to 15-year Baseline period for water use and calculate the average water use, in GPCD, over that length of time. The 10- to 15-year period had to be a continuous, ending between December 31, 2004, and December 31, 2010. The 15-year period only applied to suppliers using more than 10% of recycled water in 2008.

[59] SB X7-7 amends Division 6, Section 2.55 of the California Water Code. Entitled *Sustainable Water Use and Demand Reduction*, it was approved by the Governor of California on November 10, 2009.
https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920107SB7
https://water.ca.gov/Programs/Water-Use-And-Efficiency/SB-X7-7

MPWD chose a continuous 10-year Baseline period, because MPWD does not use recycled water.

MPWD defined its continuous 10-year period, starting with 1997 and ending with 2006. This 10-year period complies with the Water Conservation Act of 2009 (SB X7-7) requirement for the 10-year period to end between December 31, 2004, and December 31, 2010. For the 10-year continuous period, MPWD's average was 131 GPCD (Table 5-1; Appendix 9: SB X7-7 Table 8).

- Define a 5-year Baseline period for water use, in GPCD, and calculate over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

  MPWD defined its continuous 5-year period, starting with 2003 and ending with 2007.

  This 5-year period complies with the Water Conservation Act of 2009 (SB X7-7) requirement for the 5-year period to end between December 31, 2007, and December 31, 2010. For the 5-year continuous period, MPWD's average was 127 GPCD (Table 5-1; Appendix 9: SB X7-7 Table 7-F).

- Determine the population that they served for each Baseline year in both Baseline periods.

  MPWD used population data from the Association of Bay Area Governments (ABAG) for the Baseline calculations and updates to the target method.[60]

- For each Baseline year, calculate the GPCD by dividing gross water use by the service area population and calculate the average GPCD for the 10- and for the five-year Baseline.

  Table 5-1 summarizes MPWD's Baseline years and GCPDs for the 10- and for the five-year Baselines.

- Finally, the baseline calculations determined the daily per capita water use in each of the baseline years. These values were averaged for the 10-year and five-year periods. The resulting 10-year and five-year values are the Baseline GPCD and Target Confirmation values.

  Based on results from Method 3 and MPWD's five-year Baseline of 127 GPCD reduced by 5% (required by Method 3), the MPWD's 2020 Urban Water Use Target (target) is 121 GPCD (127 GPCD *0.95).[61]

  Table 5-2 summarizes MPWD's compliance with the 2020 GCPD Target.

- In their 2020 UWMPs, suppliers may update their Baseline GPCD in certain situations associated with changes in distribution area, however, they may not change the years they selected for their baseline periods from what they used in their 2015 UWMP.

  In compliance with SB X7-7, MPWD prepared its Baselines and Targets in 2015 and presented them in its 2015 UWMP. The calculations and process for defining Baselines and Targets are shown in Figures 5-1 and 5-2.[62] MPWD did not have changes in its distribution area, therefore, in the 2020 UWMP MPWD is not updating its Baseline GPCD.

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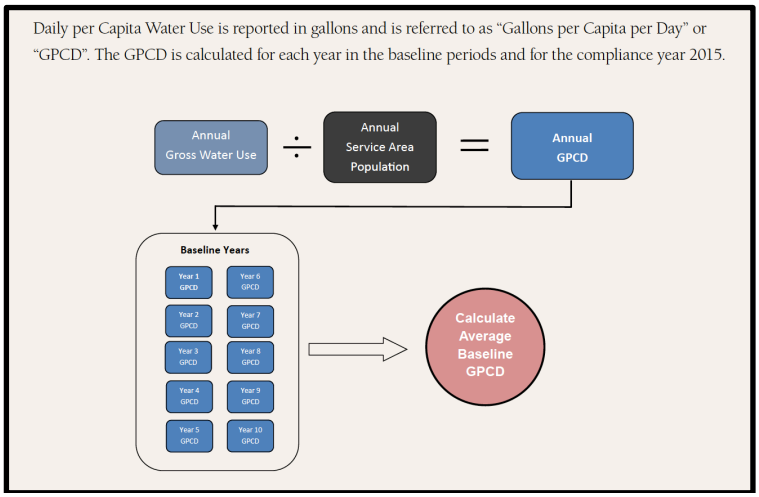
[60] Source: Bay Area Water Supply and Conservation Agency (BAWSCA) Regional Water Demand and Conservation Projections Report, Association of Bay Area Governments (ABAG) population data and Maddaus Water Management (MWM) analysis (MWM, September 2014). The BAWSCA Population methodology that used ABAG population data was thorough and addresses all the requirements of the Water Code. This method was approved by the Department of Water Resources (DWR), per email from: G. Huff, DWR, dated February 26, 2016, to M. Maddaus, MWM, and for 2020, per email from: Julia Ekstrom, DWR, dated October 12, 2020, to M. Laporte, ManageWater Consulting, Inc.

[61] MPWD 2015 UWMP, June 23, 2016.

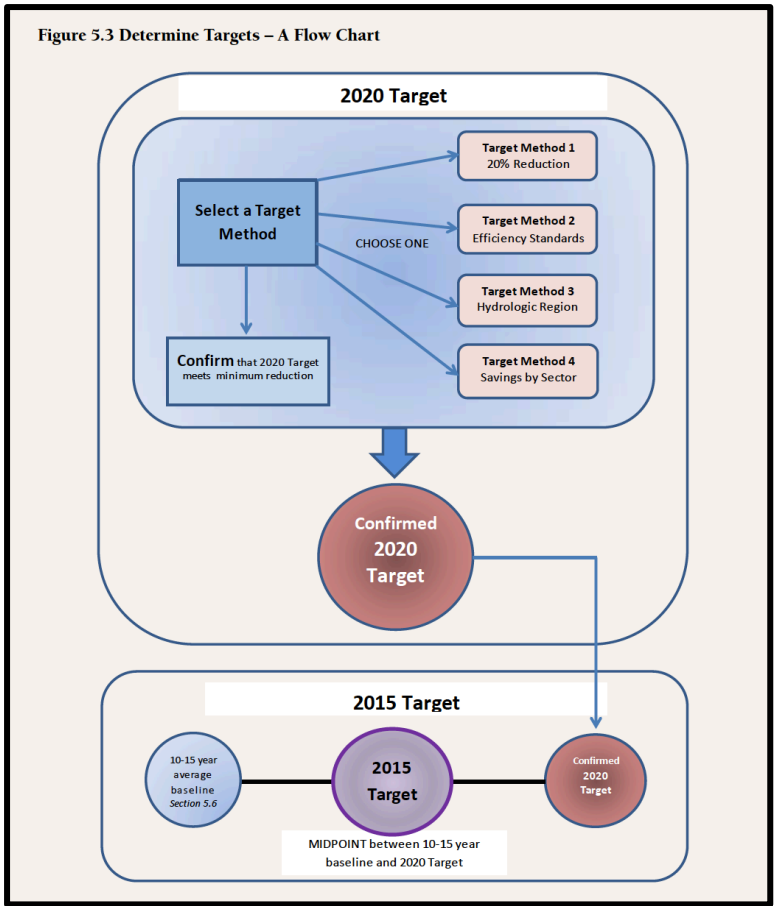
[62] Source: Final DWR 2015 UWMP Guidebook.

Figure 5-1. Steps used to calculate annual and average Baseline GPCDs.



Source: Final DWR 2015 UWMP Guidebook.

Figure 5-2. Steps used to calculate the interim 2015 and confirmed 2020 Targets.



Source: Final DWR 2015 UWMP Guidebook.

Based on MPWD's 2015 metering data, the per capita use in its service area was 85 GPCD. Therefore, in 2015, MPWD was compliant with its Interim Target.

MPWD's 2015 Interim and 2020 water use Targets are shown in Figure 5-3.

Figure 5-3. MPWD's 2015 Interim Target and 2020 Confirmed Target.

2015 Interim Target (GPCD)	2020 Confirmed Target (GPCD)
126	121

The key sections in Chapter 5 include:

- SB X7-7 Verification Form.
- Gross Water Use.
- 2020 Compliance Daily Per-Capita Water Use (GPCD).

GPCD terminology

When determining water use, two terms are often used interchangeably in UWMPs:

- Daily Per-Capita Water Use – the amount of water used per person per day. In the UWMP calculations, this is total water use within a service area, divided by population, and it is measured in gallons.
- GPCD – This is the "daily per-capita water use" measured in gallons. Therefore, the term commonly used when referring to "daily per-capita water use" is "gallons per capita per day" or *GPCD.*
- It is important to distinguish GPCD (as used in UWMPs) from the Residential GPCD (R-GPCD) that is used in some reporting to the State Water Resources Control Board (State Water Board). R-GPCD is only a part of the GPCD; it is the estimated residential water use in a service area divided by population.
- GPCD used in UWMPs is the total water use from all sectors within a service area (residential, commercial, institutional, institutional, industrial and irrigation) minus allowable exclusions, then divided by the population.

SB X7-7 Verification Form

Actual 2020 data from MPWD's AMI metering system confirms that MPWD is in compliance. In 2020, MPWD' GPCD was 97 GPCD, therefore MPWD met its target of 121 GPCD by December 31, 2020. Compliance with MPWD's urban water use target requirement is verified in the SB X7-7 Verification Form. The SB X7-7 Verification Form is in Appendix 9 and summarized in Tables 5-1 and 5-2 in this chapter.

The tables in the SB X7-7 Verification Form are separate and in addition to the 2020 UWMP Standard Tables. All tables in the SB X7-7 Verification Form have the prefix SB X7-7, followed by the table number.

The Water Code also requires suppliers to develop urban water use objectives for certain sectors, to meet their target water use calculated in the previous UWMP. These water use objectives will not be developed until 2023, and the first report will require information on what Demand Management Measures (DMMs) suppliers will implement to meet their objectives. The MPWD's current and planned DMMs are presented in Chapter 9.

No New Baseline and Target Requirements for 2020 UWMPs

The 2020 UWMP requirements for water use Targets and Baselines are the same as the 2015 requirements and are summarized below:

- In the 2015 UWMP, Retail Suppliers had to demonstrate progress towards compliance with their established 2015 interim water use Target.

  In its 2015 UWMP, MPWD presented its compliance with its 2015 interim water use Target of 126

GPCD. In 2015, MPWD's GPCD was 85, therefore MPWD was in compliance with its Interim Target.

- In the 2020 UWMP, each supplier is required to demonstrate compliance with its established 2020 Target.

  MPWD is in compliance with its 2020 Target water use of 121 GPCD, as described in subsequent sections. In 2020, MPWD's GPCD was 97.

- New suppliers, and suppliers with a distribution area that changed between 2015 and 2020, must establish the water use Baseline GPCD and 2020 Target, and demonstrate compliance with their 2020 Target in the 2020 UWMP.

  This requirement is not applicable to MPWD, since it is not a new supplier, and its distribution area has not changed.

5.1 Guidance for Wholesale Suppliers

This section is not applicable to MPWD, since it is a retail supplier and not a wholesale supplier.

5.2 SB X7-7 Forms and Summary Tables

Water Suppliers must calculate their actual 2020 water use to determine whether they have met their per-capita 2020 Target water use (as GPCD). All Retail Suppliers are required to complete SB X7-7 Table 9: 2020 Compliance. MPWD completed SB X7-7 Table 9 confirming MPWD's compliance with its 2020 Target.

5.2.1 SB X7-7 Verification Form (Baselines and Targets)

All Retail Suppliers are required to submit the standardized tables in the SB X7-7 Verification Form with their 2020 UWMPs. These standardized tables were required in 2015 and again are required in 2020 to demonstrate compliance with the Water Conservation Act of 2009. The tables in the SB X7-7 Verification Form are distinguished from the other standardized tables by their name that begins with the prefix SB X7-7, followed by the table number. DWR recommends that suppliers relying on the SB X7-7 Verification Form submitted in the 2015 UWMP include the 2015 Verification Form as a reference document in the 2020 UWMP.

MPWD's standardized tables in the SB X7-7 Verification Form and the 2015 SB X7-7 Verification Form (for reference) are included in Appendix 9.

5.2.2 SB X7-7 2020 Compliance Form

The SB X7-7 Compliance Form is new for the 2020 round of UWMPs. This is an abbreviated version of the SB X7-7 Verification Form that is solely for 2020 compliance calculations. All Retail Suppliers will demonstrate 2020 compliance with SB X7-7 by submitting the SB X7-7 2020 Compliance Form.

MPWD's SB X7-7 Compliance Form is included in Appendix 10.

5.2.3 Submittal Tables 5-1 and 5-2

Summary information from the SB X7-7 Verification Form and SB X7-7 2020 Compliance Form is reported in Submittal Table 5-1 (Baseline and Target summary) and Table 5-2 (2020 Compliance Summary).

Table 5-1, summarizes the applicable water use Targets, compared to average Baseline water use for MPWD, in GPCD.

Table 5-1. Baselines and Targets: start and end years, average GPCD, and Confirmed Target.

Table 5-1 Baselines and Targets Summary *Retail Supplier or Regional Alliance Only*				
Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1997	2006	131	121
5 Year	2003	2007	127	121
*All values are in Gallons per Capita per Day (GPCD)				
NOTES: 10-, 5-year Baseline: start year, end year; see: SB X7-7 Table 1. Average Baseline GPCD, see: SB X7-7 Table 5. Confirmed 2020 Target*, see: SB X7-7 Table 7F. Baseline and Target values in this table were developed and presented in MPWD's 2015 UWMP. MPWD is using the same Baseline and Target values for the Confirmed 2020 Target.				

As can be seen from the data in Table 5-2, based on MPWD's actual metered water production for 2020, the GCPD use was 97 GPCD, significantly lower than its 2020 Target of 121 GPCD. The MPWD is in compliance with its 2020 Target.

Table 5-2. MPWD's 2020 Compliance.

Submittal Table 5-2: 2020 Compliance from SB X7-7 2020 Compliance Form *Retail Supplier or Regional Alliance Only*				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
97	*0*	*97*	*121*	*Yes*
**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*				
NOTES: MPWD's 2020 actual GPCD is in compliance with MPWD's 2020 Target of 121 GPCD. Additional information is available in Appendix 10. MPWD production data is from SFPUC AMI Production meters, BAWSCA 2/18/21. The COVID-19 pandemic affected water use in MPWD's 2020 residential and CII sectors. The impacts of COVID-19 were discussed in Chapter 3.				

5.2.4 Regional UWMP /Regional Alliance

Suppliers who choose to comply with SB X7-7 requirements through a Regional Alliance must report the information from this chapter in the Regional Alliance Report.

MPWD is complying with SB X7-7 as an individual retail agency, not as part of a Regional Alliance.

5.3 Baseline and Target Calculations for 2020 UWMPs

Suppliers must use the same target method in their 2020 UWMP that they used in their 2015 UWMP, if they need to update values. Section 5.3 only applies to suppliers that need to update their 2020 Target and/or Baseline because of changes to their distribution area [Water Code Section 10608.20 (g)]. Adjustments are permitted based on specific changes in the supplier's distribution area.

In 2015, MPWD used Target Method 3. MPWD is not updating its Target Method and is using the same Baseline and Target GPCD in 2020 as it developed in its 2015 UWMP.

5.3.1 Supplier Submitted 2015 UWMP, No Change to Service Area

MPWD does not need to update its Target or Baseline, since its distribution system and service area boundary have not changed.

MPWD is using the same Baseline and Target GPCD that it developed in its 2015 UWMP.

5.3.2 Supplier Did Not Submit 2015 UWMP

MPWD submitted a 2015 UWMP.

5.3.3 Supplier Newly Subject to UWMP Requirements

New Suppliers that did not submit a 2015 UWMP are required to calculate their Baseline GPCD and establish their 2020 Targets using the same methodology that apply to other Suppliers.

MPWD is not a new supplier, so this section does not apply to MPWD.

5.3.4 Distribution Area Expansion

MPWD service area boundary is the same as in the 2015 UWMP.

5.3.5 Distribution Area Contraction

MPWD service area boundary is the same as in the 2015 UWMP.

5.3.6 Large Partial Customers Become Whole Customers

No MPWD large customers who also use non-MPWD supplies have switched to using only the MPWD supply.

5.4 Methods for Calculating Population and Gross Water Use

The requirements for developing MPWD's Baseline and Target were presented in the beginning of this chapter, in the Lay Description.

5.4.1 Service Area Population

To correctly calculate the compliance year GPCD, Retail Suppliers must determine the population that they served in 2020. (Water Code Section 10644).

DWR permits suppliers to use the best available information for their service area. DWR recommends the U.S. Census 2020 (which was not available at the time of the 2020 UWMP preparation), California

Department of Finance (DOF) data, or American Community Survey 2018 or 2019 data, or other sources, if available and appropriate for population data.

As it did in its 2015 UWMP, and as previously noted, MPWD is using ABAG population data for this 2020 UWMP. Use of ABAG data was discussed with DWR in 2015 and in 2020.[63] The use of ABAG population data is most appropriate, because the boundary of MPWD's service area does not coincide with municipal boundaries, and ABAG population is used in MPWD's 2015 and 2020 DSS Model updates, and the 2020 BAWSCA Demand Study. In 2020, the MPWD service area population was 27,560.

Alternate methods to determine the service area population are listed below.

5.4.1.1 Department of Finance

MPWD did not use the California Department of Finance population calculation method.

5.4.1.2 U.S. Census Bureau American Community Survey

MPWD did not use the U.S. Census Bureau American Community Survey population calculation method.

5.4.1.3 Persons-per-Connection

MPWD did not use the Persons-per-Connection population calculation method.

5.4.1.4 DWR Population Tool

MPWD did not use the DWR Population Tool calculation method and instead used the ABAG population data for this 2020 UWMP.

5.4.1.5 Other Population Methods

Suppliers may estimate their population using other methods developed in-house, by a wholesaler, Association of Governments, consultant, university, or other entity. However, DWR must determine that the alternate method complies with the requirements of Methodology 9 of the *Methodologies* document and is at least as accurate as the methods recommended by DWR. The Supplier must provide a description of the method that provides enough detail for DWR to make this evaluation. DWR recommends that the Supplier seek a pre-review from DWR to assess the adequacy of any proposed alternate population methodologies.

The MPWD used population data from the ABAG for the 10-year and 5-year baseline calculations. The ABAG data was analyzed and verified by Maddaus Water Management for the MPWD service area and approved by DWR for MPWD's 2015 and 2020 UWMPs.

All Retail Suppliers are required to complete SB X7-7 Table 2: Method for Population Estimates and SB X7-7 Table 3: Service Area Population. MPWD's SB X7-7 Table 2, and Table 3 are in Appendix 10.

5.4.2 Gross Water Use

'Gross Water Use' is defined as the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all the following (Water Code Section 10608.12):

- Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

[63] Communications with DWR: Julia Ekstrom, 2020; Gwen Huff, 2015.

- The net volume of water that the water supplier places into long term storage.
- The volume of water the water supplier conveys for use by another urban water supplier.
- The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24. Additionally, a water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.

5.4.2.1 Calculation of Gross Water Use

MPWD's 'gross water use' is the total volume of water (metered using MPWD's AMI metering system) that enters its distribution system from its supplier, the SFPUC. 'Gross water use' must be reported for each year in the Baseline periods as well as for 2020, the compliance year (MPWD uses a calendar year).

5.4.2.2 Exclusions and Deductions to Gross Water

Within a retail supplier's service area, gross water use is measured from the point of connection where the water enters the retail distribution system over a 12-month period with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area. Recycled water use has been excluded from all calculation of gross water, as reflected in the SB X7-7 tables. Water Suppliers are not required to report their recycled water use, nor demonstrate any reduction in recycled water use for purposes of SB X7-7.
- Indirect potable use.
- Water placed into long-term storage (surface or groundwater).
- Water conveyed to another urban Supplier.
- Water delivered for agricultural use.
- Industrial process water.

The MPWD does not use other sources of water, such as groundwater, surface water, recycled water, or desalinized water, and does not have other exclusions for industrial water.

Gross water purchases from SFPUC are reported in the SB X7-7 Tables (Appendix 10) for each year in the Baseline periods as well as in 2015, the Interim Target compliance year and the 2020 Target.

There are several tables from the SB X7-7 Verification Form that are related to gross water calculations.

Suppliers that deduct indirect recycled water and/or process water from their gross water will complete additional tables, as found in the subsections below.

- **Indirect Recycled Water Use Deduction**. If the Supplier uses indirect recycled water and will deduct it from their gross water use, they must complete SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction.

  MPWD does not use indirect recycled water, therefore SB X7-7 Table 4-B is not applicable to MPWD.

- **Process Water Use Deduction.** Suppliers that will be subtracting process water from their gross water use must submit additional tables SB X7-7 Table 4-C and one associated sub-table (SB X7-7 Table 4-C.1, SB X7-7 Table 4-C.2, SB X7-7 Table 4-C.3, or SB X7-7 Table 4-C.4), as well as SB X7-7 Table 4-D.

  MPWD does not subtract process water from its gross water, therefore the additional tables listed above area not applicable to MPWD.

5.5 2020 Compliance Daily Per-Capita Water Use (GPCD)

According to Water Code Section 10608.20, "Compliance daily per-capita water use" means the gross water use during the final year of the reporting period.

As can be seen from the data in Table 5-2, based on MPWD's actual metered water consumption for 2020, the GCPD use was 97 GPCD, significantly lower than its 2020 Target of 121 GPCD. The MPWD is in compliance with its 2020 Target.

5.5.1 2020 Adjustments for Factors Outside of Supplier's Control

When determining compliance with daily per capita water use Targets, an urban retail water supplier may consider the following factors:

- Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
- Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
- Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

If the urban retail water supplier elects to adjust its estimate of compliance daily per-capita water use due to one or more of the factors described it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

MPWD has not adjusted its 2020 gross water use.

5.5.1.1 Extraordinary Institutional Water Use

MPWD has not adjusted the calculated compliance per-capita water use for one-time extraordinary events.

5.5.1.2 Economic Adjustment (CII)

MPWD has not adjusted the calculated compliance daily per-capita water use for substantial changes to institutional, commercial, or industrial water uses that have occurred during the reporting period.

5.5.1.3 Weather Normalization

MPWD has not adjusted the calculated compliance daily per-capita water use for differing weather conditions between the compliance year and the baseline period.

5.5.1.4 No Adjustment for COVID-19

DWR recognizes that studies are indicating that the unprecedented shelter-in-place requirements in California, because of COVID-19 precautions beginning in March 2020, have affected urban water use (Cooley et al. 2020). The effects of 'shelter in place' and 'work from home' on MPWD's service area water use was discussed in Chapter 3 (see Section 3.4.2).

However, DWR has specifically noted that Suppliers may not include an adjustment to their 2020 GPCD in the SB X7-7 2020 Compliance Form for abnormal residential water use due to COVID-19. Although MPWD has noted water use changes due to COVID-19 management measures, no adjustments were made to its calculation of actual 2020 GPCD. MPWD continues to track its water-use sectors to identify if changes in sector water use patterns are short term or continuing.

5.5.2 Special Situations

There are certain circumstances, listed below, that require or allow a Supplier to recalculate their baselines and 2020 Target in the 2020 UWMP.

- Distribution Area Expansion (Merger or Annexation).
- Distribution Area Contraction.
- Existing Large Partial Customers Become Whole Customers.
- Optional Recalculation of Baselines and Targets because of access to more reliable data than was available in 2015.

Any recalculation of the 2020 Target, as allowed or required in these situations, will affect the determination of 2020 compliance.

MPWD did not re-calculate its 2020 Target. As stated earlier, (Section 5.2.3, Table 5-2.), MPWD is in compliance with its 2020 Target.

5.5.3 If Supplier Does Not Meet 2020 Target

Water Code Section 10608.56 (a) states that on and after July 1, 2016, if a Retail Supplier does not achieve its 2020 Target, the Retail Supplier is not eligible to receive a water grant or loan from the State of California. Additionally, if a Retail Supplier does not achieve its 2020 Target, the supplier has not complied with requirements stated in the Water Code. Two exceptions to this are allowed.

Section 10608.56 (c) states that a water supplier shall be eligible for a water loan or grant if it "has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions."

Section 10608.56 (e) states that a water supplier can also be eligible for a water loan or grant if it "has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community."

This section is not applicable to MPWD because it met its 2020 Target.

5.6 Regional Alliance

Suppliers who choose to comply with SB X7-7 requirements through a Regional Alliance must report the information from this chapter in the Regional Alliance Report.

MPWD is complying with SB X7-7 as an individual retail agency, not as part of a Regional Alliance.

Lay Description

This chapter focuses on the characterization and analysis of MPWD's water supply from SFPUC. As previously discussed, since the SFPUC is MPWD's sole water provider, the reliability assessment under various hydrological and regulatory conditions relate to the SFPUC supply. The analysis is based on MPWD's Individual Supply Guarantee (ISG) and contract with SFPUC (administered through BAWSCA). Chapter 6 reviews the SFPUC water supply in the context of the SFPUC conveyance infrastructure and delivery to the MPWD service area.

SFPUC's main source of water is from the Hetch Hetchy watershed, an area located in Yosemite National Park. During the winter much of the source water is stored in the watershed as snow. The spring snowmelt drains to the Tuolumne River and fills the Hetch Hetchy Reservoir, the largest reservoir in the Hetch Hetchy water system. SFPUC also has additional local water sources in the San Francisco Bay Area. The Alameda and Peninsula watersheds located in Alameda, Santa Clara, and San Mateo counties comprise the local sources.[64]

Figure 6-1 illustrates the SFPUC regional water conveyance system (RWS). Including MPWD, the SFPUC supplies 26 BAWSCA agencies and the City and County of San Francisco. Figure 6-2 illustrates the BAWSCA agencies that purchase some or all their water supply from the SFPUC's RWS.

The SFPUC RWS is a 167-mile, gravity-driven network of dams, reservoirs, tunnels, pump stations, aqueducts, and pipelines that collects Tuolumne River runoff on federal land near the Yosemite Valley and transports it to the San Francisco Bay Area. The SFPUC operates the RWS, which is the major source of supply for BAWSCA member agencies. In FY 2019-20, the BAWSCA member agencies reported SFPUC RWS purchases of 132.2 million gallons per day (mgd).[65]

In May 2002, the SFPUC adopted a capital improvement program (CIP), later called the Water System Improvement Program (WSIP), to rebuild and retrofit the regional water system to improve system reliability, especially to ensure seismic safety. Significant parts of the SFPUC system have been upgraded to meet modern seismic codes.

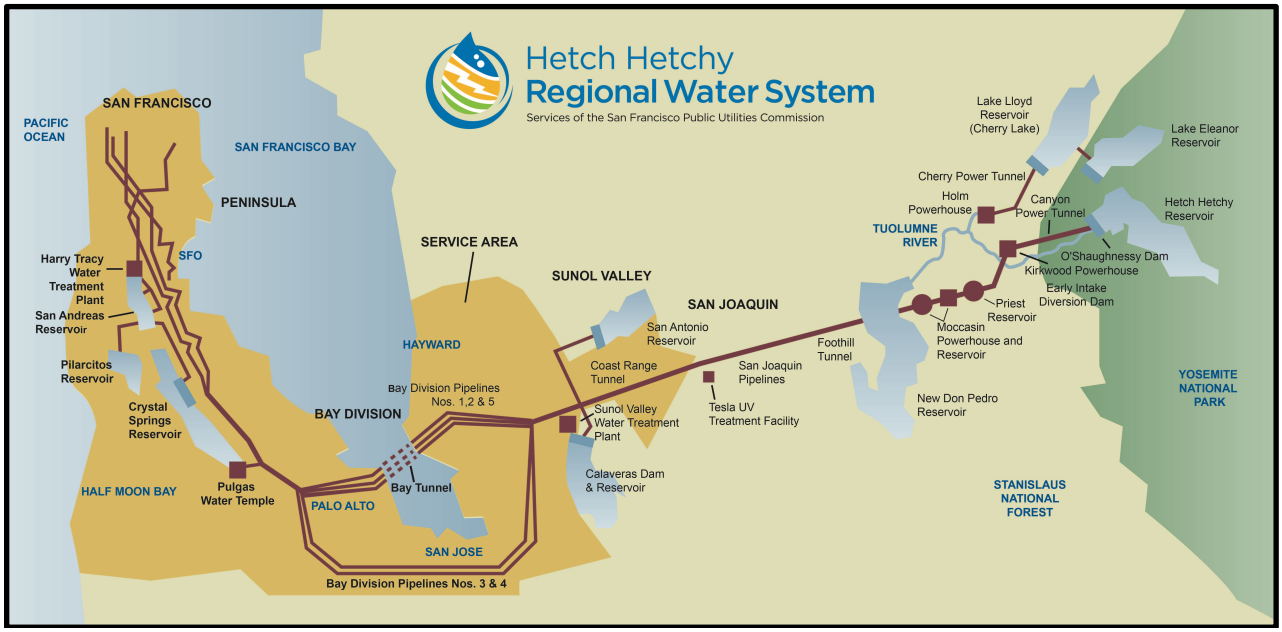
The WSIP cost $4.8 billion and is a multi-year capital program to upgrade the SFPUC's regional and local water systems. The WSIP program delivers capital improvements that enhance the SFPUC's ability to provide reliable, high quality drinking water in an environmentally sustainable manner to 2.7 million people in the greater Bay Area.

The WSIP program consists of 87 projects - 35 local projects located within San Francisco and 52 regional projects, spread over seven counties from the Sierra foothills to San Francisco. The current forecasted date to complete the overall WSIP is May 2023. As of December 31, 2020, the WSIP was more than 98% complete. For the regional projects, six are in construction and 43 projects are in close-out or have been completed. The only major regional project that remains is the Alameda Creek Recapture Project currently in the bid and award phase.

[64] SFPUC website. https://sfwater.org/index.aspx?page=355
[65] BAWSCA 2019-2020 Annual Survey, page ES-3, March 2021. https://bawsca.org/water/supply/survey

The WSIP program is funded by a bond measure that was approved by San Francisco voters in November 2002 and will be paid for by both retail customers in San Francisco and the 26 BAWSCA member agencies that serve Alameda, San Mateo, and Santa Clara counties. The WSIP is one of the largest water infrastructure programs in the nation and the largest infrastructure program ever undertaken by the City of San Francisco.[66]

Figure 6-1. SFPUC Regional Water System Map.



Source: SFPUC, 2020.

There are many uncertainties for SFPUC's water supply, such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the SFPUC Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they are being considered in SFPUC's water supply planning.

To address planning challenges, SFPUC uses a vulnerability-based planning approach to explore a range of future conditions, identify vulnerabilities, and assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

The SFPUC water supply projections provide specific information and scenarios about supply reliability and risks to facilitate planning for water shortages. These scenarios are discussed in detail in Chapter 7.

Since the MPWD solely relies on the SFPUC water supply, it is using the SFPUC projections to characterize its water supply availability during a normal year, a single dry year, a drought period lasting five consecutive years, and future projections through 2045.

[66] SFPUC website: State Mandated Reports, WSIP. https://sfwater.org/index.aspx?page=306

Bay Area Water Supply and Conservation Agency (BAWSCA)

BAWSCA was enabled by a special act of the California Legislature and was formed by its member agencies in 2003. BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase (wholesale) water from SFPUC - 16 cities, 8 water districts, 1 university, and 1 private water company.

Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 Commercial, Industrial, and Institutional (CII) accounts in Alameda, San Mateo, and Santa Clara Counties. BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's RWS.

BAWSCA Conservation Programs[67]

BAWSCA manages a Regional Water Conservation Program composed of several individual programs and initiatives that support and augment member agencies and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

The implementation of BAWSCA's Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.[68]

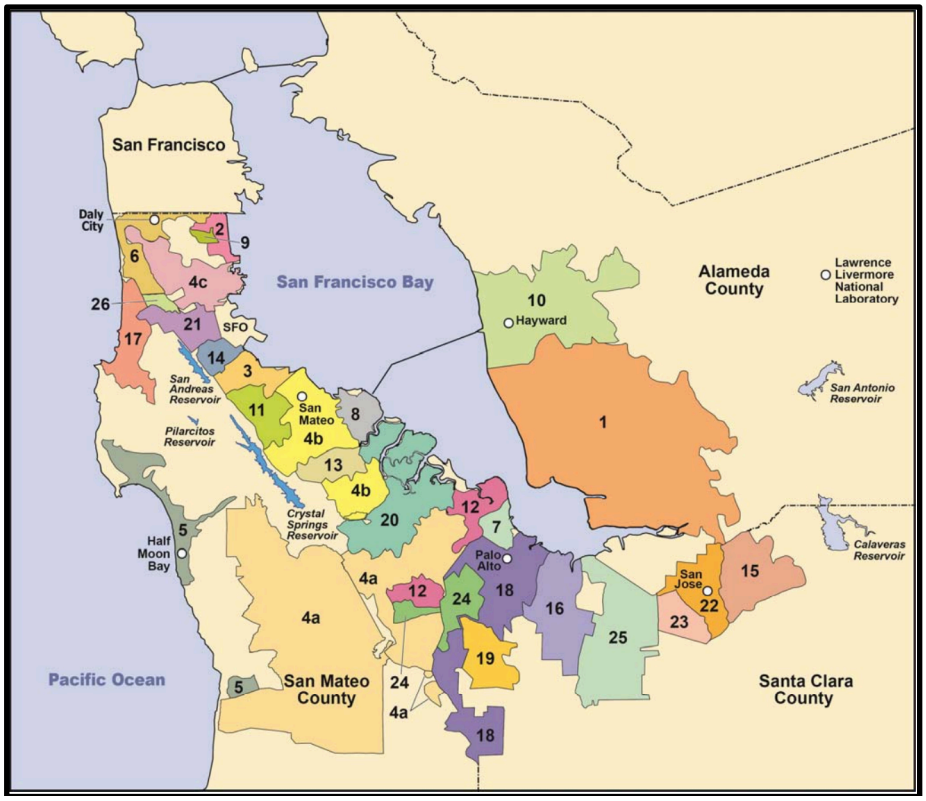
Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs (see MPWD's 2020 Water Shortage Contingency Plan, WSCP, Attachment 1). Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation actions, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045[69].

MPWD's Water Service Reliability/Drought Risk Assessment (Chapter 7) and its WSCP (WSCP, Attachment 1) incorporates this information, including longer-term issues like impacts from climate change and

[67] BAWSCA common language, February 11, 2021. (Also see Appendix 6.)
[68] BAWSCA Regional Water Demand and Conservation Projections, June 26, 2020.
[69] IBID.

potential regulatory requirements. Accordingly, the goal of the MPWD's water supply analysis is to provide a reliability and risk assessment for its water supply over the short- and long-term planning horizons. The conclusions drawn about supply availability under potential various hydrological and regulatory conditions are used in other components of MPWD's 2020 UWMP.

Figure 6-2. BAWSCA Members Map.



Note: MPWD is number 13 on this map. Source: BAWSCA, 2020.

New Requirements

The new requirements in the 2020 UWMP include a water supply analysis for the new Drought Risk Assessment (DRA), WSCP, and consideration of climate change in future projections. The conclusions drawn from MPWD's water supply characterization are integrated into the DRA. Additionally, MPWD coordinates with land use and planning authorities for future projections about management and mitigation actions to address MPWD's updated 2020 Water Shortage Contingency Plan (WSCP).

6.1 Water Supply Analysis Overview

An urban water supplier that relies on a wholesale agency for a source of water is required to provide the wholesale agency with projections for water demands in five-year increments to 20 years or as far as data is available. In turn, the wholesale agency is required to provide the urban water supplier information about its water supply availability over the same five-year increments, and during various water-year types.

MPWD's Individual Supply Guarantee from SFPUC

SFPUC has a perpetual commitment or "Supply Assurance" to deliver 184 mgd annually to the 24 permanent BAWSCA wholesale customers (collectively the BAWSCA agencies are referred to as the "wholesale customers"). The Supply Assurance is allocated among the 24 permanent wholesale customers

through Individual Supply Guarantees (ISGs) that represent each wholesale agency's allocation of the 184 mgd. Two BAWSCA agencies do not have ISGs.

The MPWD relies 100% on SFPUC for its water supply. MPWD is a permanent customer of SFPUC and has an ISG from SFPUC. MPWD's long-term contract with SFPUC does not limit daily or monthly water purchases and use. The SFPUC contract specifies an average day use and a total annual purchase. MPWD's contractual ISG allocation from SFPUC is 3.891 mgd for an average day or 1,420.22 MG per year.[70]

SFPUC's Efforts to Develop Alternative Water Supplies

With the adoption of the Bay Delta Plan Amendment, Phase 1 (Bay Delta Plan, BDP) by the State Water Resources Control Board (SWRCB) in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow specification for the Tuolumne River required by the BDP, BAWSCA redoubled its efforts to encourage the SFPUC to take necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply from the implementation of the BDP. Additionally, the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held many meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the SFPUC Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the WSIP. BAWSCA urged the SFPUC to develop a new water supply program, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS. Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update to BAWSCA, SFPUC has budgeted $264 million for the next ten years to fund water supply projects. BAWSCA is engaged with the SFPUC on its AWSP efforts.

MPWD's water supply analysis is required, to the extent practical, to identify and quantify the anticipated supply availability, including changes in supply due to climate change, under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe droughts, as described in MPWD's DRA. DWR does not provide prescriptive definitions for a 'normal/average water year', 'single dry year', and 'droughts lasting at least five years', so it is up to the water supplier to define these. See California Water Code (Water Code) Section 10631(b)(f). SFPUC has provided BAWSCA agencies with their quantification and characterization of these water supply levels using two scenarios – (1) with the BDP and (2) without the BDP.[71]

[70] The terms "perpetual commitment," "Supply Assurance," "Individual Supply Guarantees," and "ISG allocation" all refer to the same perpetual commitment from SFPUC to its Wholesale customers.
[71] SFPUC, Additional supply reliability modeling results conducted by SFPUC, March 30, 2021.

6.1.1 Specific Analysis Applicable to All Water Supply Sources

To the extent practical, all suppliers are required to:

- Identify existing and planned sources of water.
- Quantify these supplies over five-year increments through 2040.
- Describe, in detail, anticipated availability under normal, single dry, five-year droughts, and any other water year conditions described in the DRA.
- Describe the management of each supply in correlation with other identified supplies.
- Consider information pertinent to the reliability analysis, including climate change effects.

While the 2020 UWMP requires water supply projections for 20 years, MPWD's assessment extends for 25 years. MPWD is using SFPUC's water supply availability analyses.[72]

SFPUC's analyses consider the historical drought hydrology, plausible changes in projected supplies under climate change (Section 6.9), potential regulatory changes, and other locally applicable criteria.

Currently, MPWD relies 100% on its SFPUC supply. MPWD is in the initial stages of assessing additional water sources to augment its SFPUC supply and is exploring other local partnerships.

6.1.2 Other Characterization Considerations Recommended by DWR

DWR encourages suppliers to include maps of the water supply conveyance and distribution area. Figure 6-1 illustrates the SFPUC water delivery and conveyance infrastructure, and Figure 6-2 illustrates the BAWSCA service area. Figure 6-2 shows the location of MPWD (number 13 on the map) relative to other BAWSCA agencies and the SFPUC RWS conveyance system. MPWD's service area and infrastructure were also discussed in detail in Chapter 3.

6.1.3 Optional Planning Tool All Suppliers - Optional

The optional Planning Tool Supply Worksheet is available from DWR. The Optional Planning Tool is helpful for agencies that have not performed a detailed characterization of their water supplies.

MPWD has performed a detailed characterization of its water supply. As previously stated, in its DSS Model, MPWD has performed a detailed assessment of projected water demands and is using its updated 2020 DSS Model and the BAWSCA Demand Study as the key references for past and projected water demand.

MPWD is not using the optional Planning Tool and tables.

6.1.3.1 Parts and Layout – Optional Planning Tool Supply Worksheet

MPWD is not using the Optional Planning Tool and tables.

6.1.3.2 2020 Actual Use of Supply – Optional Planning Tool Supply Worksheet

MPWD is not using the Optional Planning Tool and tables.

6.1.3.3 Water Year Types– Optional Planning Tool Supply Worksheet

MPWD is not using the optional Planning Tool and tables.

[72] IBID

6.1.3.4 Projections– Optional Planning Tool Supply Worksheet

MPWD is not using the optional Planning Tool and tables.

Climate change and potential regulatory changes are addressed in Section 6.2.10.1 of this chapter.

6.2 Narrative Sections for Supplier's UWMP Water Supply Characterization

The following sections provide further information about MPWD's water supply availability, as required by the Water Code. As previously stated, MPWD purchases 100% of its water from SFPUC. Although MPWD does not currently have supplies of groundwater, surface water, stormwater, recycled water, or desalinated water, MPWD includes these sections to follow the DWR guidebook format for preparation of its 2020 UWMP. MPWD's comments about the supplies identified by DWR are indicated in each section.

MPWD participates in alternative and regional water supply evaluations as part of regional collaborations through BAWSCA and the SFPUC. These are substantial efforts and the MPWD service area would benefit from the future implementation of cost-effective and feasible regional projects that result in increased supply reliability. Additional information about specific projects SFPUC is studying are included in Appendix 6.[73]

6.2.1 Purchased or Imported Water

In this chapter, MPWD describes its purchased imported water from SFPUC and reports the purchased volumes in Submittal Table 6-8, Water Supplies – Actual, and Submittal Table 6-9 Water Supplies – Projected.

6.2.2 Groundwater

Groundwater reporting requirements for the 2020 UWMP apply to any groundwater that a supplier pumps from any groundwater source.

MPWD does not have an existing groundwater supply. MPWD does not use and currently does not plan to use groundwater as part of its supply. The availability of local groundwater in the San Mateo Plain Groundwater Basin is very limited.[74]

6.2.2.1 Basin Description

Water Code Section 10631(b)(4) requires suppliers using groundwater or planning to use groundwater as a source of supply to provide additional information on the nature and extent of each groundwater basin and the water supply availability from that basin.

MPWD does not use and currently does not plan to use groundwater as part of its supply.

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[73] SFPUC, "Future SFPUC Water Supply Projects", February 3, 2021, included SFPUC Common Language and 2/11/21 BAWSCA Common Language documents.

[74] EKI Environment and Water, Todd Groundwater, Hydrofocus, San Mateo Plain Groundwater Basin, 2018. https://cawaterlibrary.net/document/san-mateo-plain-groundwater-basin-assessment/ https://smcmaps.maps.arcgis.com/apps/webappviewer/index.html?id=21cf01e1b16f486db705e4d2ccb1582a

6.2.2.2 Multiple Groundwater Basins

For Suppliers that pump water from more than one defined groundwater basin, basin descriptions are required for each groundwater basin.

MPWD does not use groundwater.

6.2.2.3 Other Considerations - Groundwater

Groundwater supplies may also present other unique conditions that are different from surface water supplies. Considerations such as the number and physical capacity of wells, well system integration and operations, sustainable yield, and interaction of groundwater systems with surface water supplies may provide insight for reliability assessments.

MPWD does not use groundwater.

6.2.2.4 Past Five Years - Groundwater

MPWD does not use groundwater.

Table 6-1. Groundwater Volume Pumped.

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
TOTAL		0	0	0	0	0
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: MPWD does not use groundwater.						

6.2.3 Surface Water

Water from streams, lakes, and reservoirs is considered a surface water supply for the purposes of the UWMP. If a supplier uses, or plans to use, self-supplied surface water as part of its water supply, the volume of that supply is required to be reported in Submittal Table 6-8, Water Supplies – Actual, Submittal Table 6-9, Water Supplies – Projected, and Submittal Table 7-1, Basis of Water Year Data.

MPWD does not self-supply surface water.

6.2.4 Stormwater

Communities are increasingly implementing opportunities to beneficially use stormwater to meet local water supply demands. These actions are motivated by constrained local water resources, new regulations, and relieving strain on overburdened stormwater infrastructure. Beneficial uses can include blending with other waters supplies for groundwater recharge, redirecting it into constructed wetlands or landscaping, and diverting it to a treatment facility for subsequent reuse.

MPWD does not use stormwater as a supply.

6.2.5 Wastewater and Recycled Water

Wastewater

In 2013, the former South Bayside System Authority (SBSA) facility, where MPWD's service area wastewater is treated, was renamed to "Silicon Valley Clean Water" (SVCW). As required, MPWD discusses below the SVCW wastewater collection and treatment from its service area and recycled water use of treated SVCW wastewater.

Recycled Water

There have been no legislative changes to the Water Code regarding recycled water in the UWMP since the preparation of the 2015 UWMPs. Suppliers are required to include information on recycled water and its potential for use as a water source in their service area. (Water Code Section 10633).

Municipal recycled water is municipal wastewater that has been treated to a specified quality to enable it to be used again for a beneficial purpose. The term recycled water is defined in the Water Code more broadly than municipal recycled water. For purposes of the UWMPs, recycled water means only municipal recycled water, that is, water that has been treated and discharged from a municipal wastewater facility.

MPWD does not have an available conveyance system for accessing recycled water. In the past, MPWD had discussed the feasibility of a water recycling pipeline project to deliver recycled water to the City of Belmont's Sports Complex, located at 550 Island Parkway in Belmont. At the time, the City of Belmont's analysis showed that the project was prohibitively expensive, with no available funding, and the cost recovery was shown to take more than 100 years.[75] Also, the City of Belmont's Sports Complex location is no longer viable, because the City of Belmont has installed artificial turf at this facility to conserve water.

Currently, MPWD is at an initial stage of assessing the potential for using recycled water in its service area. Potentially, MPWD's Zone 1, located between 101 and El Camino Real may be an area for future recycled water use. However, Redwood City's recycled water treatment plant is located across a major highway, State Route Highway 101, several miles to the southeast from Belmont and the potential Zone 1 site.

6.2.5.1 Recycled Water Coordination

MPWD's 2020 UWMP is prepared in coordination with SVCW, the wastewater and planning agency that operate within the MPWD's service area. (Water Code Section 10633).

A portion of the wastewater generated within the MPWD's boundaries is recycled by SVCW for use in Redwood City. Currently, MPWD has no funding to develop a distribution system for recycled water.

6.2.5.2 Wastewater Collection, Treatment, and Disposal

Suppliers are required to provide a general description of wastewater collection, treatment, and disposal within the service area [Water Code Section 10633(a)]. This information is reflected in Figure 6-3 and MPWD's Submittal Tables 6-2 and 6-3.

[75] City of Belmont Staff Report, Council Agenda #4C, Meeting of November 13, 2007.

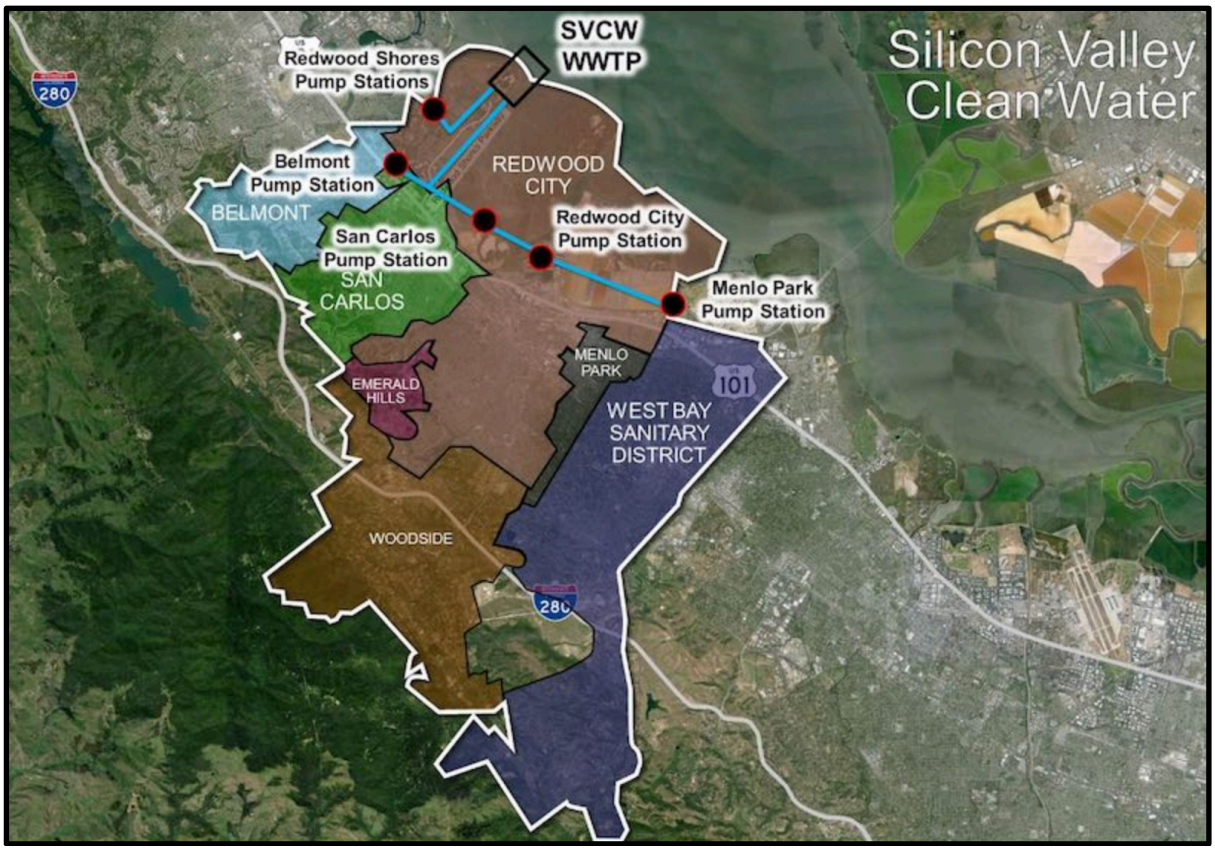
The MPWD does not engage in wastewater collection, treatment, or disposal.

Wastewater Collected Within Service Area

The Cities of Belmont and San Carlos are responsible for the collection of sewage in the MPWD's service area. The SVCW, a four-member Joint Powers Authority, undertakes treatment and disposal. The members include the Cities of Belmont, San Carlos, and Redwood City, and parts of Menlo Park.

Figure 6-3 illustrates the SVCW wastewater collection area that includes the MPWD's service area.

Figure 6-3. Map showing the extent of wastewater collection by SVCW.



Source, SVCW, 2020.

SVCW serves more than 220,000 people and businesses in its service area. SVCW treats wastewater at an advanced, two-stage biological treatment facility in Redwood City. Sewage arrives at the treatment facility through a series of pipelines and pump stations. The sewage then passes through physical, chemical, and biological treatment processes, which result in high quality effluent being discharged to the deep-water channel of the San Francisco Bay. The SVCW facility is designed to remove more than 97% of all solids and organic material, and 100% of pathogens from the wastewater. The SVCW facilities include wastewater conveyance, treatment, disposal, and reuse.[76]

[76] Silicon Valley Clean Water website. https://svcw.org/what-we-do/facilities/wastewater-treatment/

Table 6-2. Wastewater Collected Within Area in 2020.

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100%	Percentage of 2020 service area covered by wastewater collection system *(optional)*					
100%	Percentage of 2020 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Belmont	Metered	522	Silicon Valley Clean water (SVCW)	SVCW	No	No
San Carlos	Estimated	18	SVCW	SVCW	No	No
Total Wastewater Collected from		540				
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3* **.**						
NOTES: Units: MG. MPWD does not engage in wastewater collection, treatment or disposal. The cities of Belmont and San Carlos are responsible for the collection of sewage in the MPWD's service area. The Silicon Valley Clean Water (SVCW), a four-member Joint Powers Authority, undertakes treatment and disposal. The members include the Cities of Belmont, San Carlos, and Redwood City, and parts of Menlo Park. Belmont data is from metered data from the wastewater treatment plant Silicon Valley Clean Water (January - December, 2020, SVCW); data for San Carlos and unincorporated San Mateo County is estimated (MPWD, 2020), based on winter water use.						

Submittal Table 6-2 summarizes information on collection of wastewater within the service area. This table is used for all wastewater collected within the service area, based on available information from SVCW.

Regional UWMPS

MPWD is not part of a Regional UWMP.

Wastewater Treatment and Discharge Within the Service Area

No wastewater is treated or disposed of within the MPWD's service area.

Table 6-3. Wastewater Treatment and Discharge Within Service Area in 2020.

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020											
☑	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list*	Treatment Level *Drop down list*	2020 volumes [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total	0	0	0	0	0
[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. [2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility											
NOTES: Source: SVCW, 2020.											

The SVCW treatment plant has a designed capacity of 29 mgd (dry weather flows) and provides tertiary-level treatment. Approximately 7.4% of the treated effluent is recycled and used in Redwood City and the remainder is discharged to the San Francisco Bay. The SVCW monitors flows from its various sub-regional pump stations. The total of all wastewater flows to the SVCW for 2020 (January – December 2020) was 4,619.83 MG (average day: 12.62 mgd). The wastewater from MPWD's service area consists of approximately 97% flow from Belmont and approximately 3% flow from San Carlos.

In 2020, (January through December 2020) based on SVCW's metering results[77], the wastewater from the City of Belmont (97% of total service area wastewater) was 521.8 MG (average day: 1.43 mgd). The wastewater from San Carlos (3% of total MPWD service area wastewater) was 17.5 MG (average day: 0.048 mgd), for a total of about 539.31 MG (1.47 mgd) from the MPWD service area.[78]

SVCW's projections for 2040, total dry weather wastewater flow, is 6,533.5 MG (17.9 mgd). SVCW's projections for future wastewater flows from the City of Belmont, indicate that sewage generation will increase slowly over the next 20 years, from 539.31 MG/year (1.47 mgd) in 2020 to 775.3 MG/year (2.12 mgd) in 2040. The City of Belmont's Sanitary Sewer System Management Plan provides detailed information about the sanitary sewer program.[79]

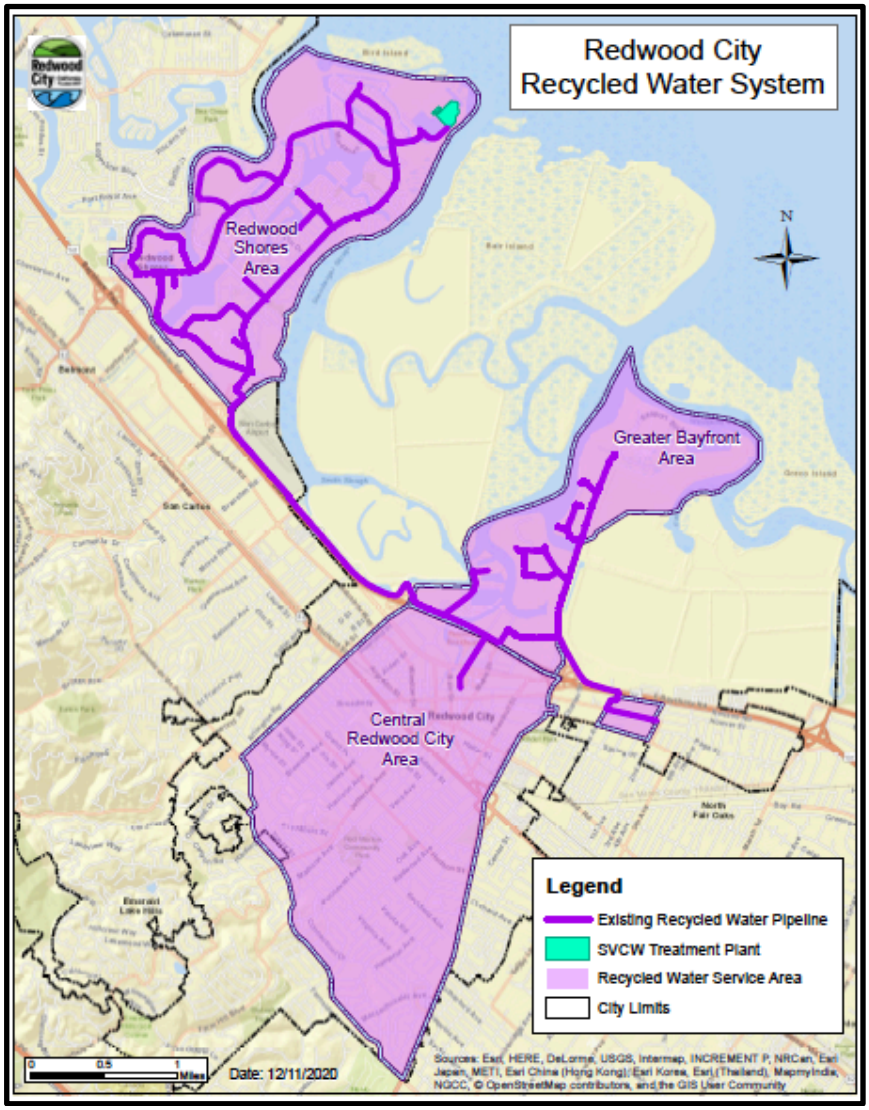
6.2.5.3 Recycled Water System Description

No wastewater is treated or disposed within the MPWD service area.

[77] Communication (EM to M. Laporte) from: Robert Huffstutler, SVCW, 2/2/21.
[78] Source: SVCW, 2020.
[79] City of Belmont Sewer System Management Plan, website, 2020. https://www.belmont.gov/departments/public-works/infrastructure/sewer-system/sewer-system-management-plan

SVCW does not provide recycled water at the SVCW facility. For more detailed information about the recycled water program, please refer to the Redwood City website.[80] Phase 1 of the Redwood City project expanded the recycled water system along the eastern edge of State Route Highway 101, from Redwood Shores to the Greater Bayfront Area. Construction of Phase 1 was completed over a five-year period from 2005 to 2010. It added two tertiary treatment facilities, two 2.2-million-gallon storage tanks, a distribution pump station, and 17 miles of distribution pipelines. Since pumping began in 2007, the Recycled Water Project has helped save hundreds of millions of gallons of drinking water each year.

Figure 6-4. Map showing the extent of the Redwood City recycled water system.



Source: Redwood City, 2020. Note: San Carlos and Belmont, part of the MPWD service area, are shown to the west of the Recycled Water Service Area and State Route Highway 101.

[80] City of Redwood City website and information on Recycled Water, 2020. https://www.redwoodcity.org/departments/public-works/water/recycled-water

6.2.5.4 Potential, Current, and Projected Recycled Water Uses

All Suppliers are required to describe the quantity of current, potential, and projected recycled water uses within their service area. (Water Code Section 10633). Potential uses of recycled water could include, but are not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses. A determination regarding the technical and economic feasibility of serving those uses would be necessary.

Currently, no recycled water use is projected in the MPWD service area because no recycled water distribution system or funding to install a distribution system exist. If recycled water was technically feasible, cost-effective, and available in MPWD's service area, initially it could be used for landscape irrigation in Zone 1.

Regional UWMPS

MPWD is not part of a Regional UWMP.

Submittal Tables

These tables are for all recycled water *used* within a Retail Supplier's service area.

Table 6-4. Current and Projected Recycled Water Direct Beneficial Uses.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area											
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.										
Name of Supplier Producing (Treating) the Recycled Water:											
Name of Supplier Operating the Recycled Water Distribution System:											
Supplemental Water Added in 2020 (volume) *Include units*											
Source of 2020 Supplemental Water											
Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030 [1]	2035 [1]	2040 [1]	2045 [1] (opt)
Agricultural irrigation											
Landscape irrigation (exc golf courses)											
Golf course irrigation											
Commercial use											
Industrial use											
Geothermal and other energy production											
Seawater intrusion barrier											
Recreational impoundment											
Wetlands or wildlife habitat											
Groundwater recharge (IPR)											
Reservoir water augmentation (IPR)											
Direct potable reuse											
Other (Description Required)											
				Total:	0	0	0	0	0	0	0
				2020 Internal Reuse							
[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*											
NOTES: MPWD does not have access to recycled water.											

MPWD does not use or have an identified project to use recycled water within its service area, therefore MPWD is not required to fill out the Recycled Water Submittal Tables (6-4, 6-5, 6-6). Currently, MPWD is at an initial stage of assessing the potential for using recycled water in its service area.

Table 6-5. 2015 Recycled Water Use Projection Compared to 2020 Actual.

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.	
Beneficial Use Type	**2015 Projection for 2020** [1]	**2020 Actual Use** [1]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)		
Golf course irrigation		
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	0	0
[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.		
NOTE: MPWD does not have access to recycled water.		

6.2.5.5 Actions to Encourage and Optimize Future Recycled Water Use

Water suppliers are required to provide information on recycled water and its potential for use as a water source in the service area, to the extent the information is available. (Water Code Section 10633).

Beyond the preliminary analysis by the City of Belmont discussed previously, no detailed information is available about technical and economic feasibility for recycled water in the MPWD service area. MPWD plans to engage with Redwood City and SVCW on future regional master planning for the next phase of expansion of the recycled water system.

Table 6-6. Methods to Expand Future Recycled Water Use.

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.2.5, p. 75	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
		Total	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: MPWD does not have access to recycled water.			

6.2.6 Desalinated Water Opportunities

Suppliers are required to consider the potential for desalinated water as a water supply option. [Water Code Section 10631(g)].

Typically, desalinated water projects are very expensive projects. Therefore, desalination projects are more feasible in areas where no other sources of cost-effective water supplies exist. San Francisco Bay and brackish groundwater adjacent to the Bay are the closest sources for potential desalinated water. MPWD is in an initial phase of investigating local groundwater availability that would not require desalination.

No existing source of desalinated water is available in the proximity to the MPWD service area. Currently there is no information about the technical and economic feasibility of installing a regional desalinated water plant as a direct source of water for MPWD's service area. Desalinated water is not being considered as a potential source in the next five years in the MPWD service area.

6.2.7 Water Exchanges and Transfers

This section describes the opportunities for exchanges or transfers of water on a short-term or long-term basis [Water Code Section 10631(c)].

MPWD has water exchange capability through interties with Estero MID, Redwood City, Cal Water System (CWS) – San Mateo, and CWS – San Carlos. These interties can be used for short-term water supply exchanges or transfers in emergencies.

MPWD does not plan to develop long-term exchanges or transfers of water with other suppliers.

6.2.7.1 Exchanges

Water exchanges are typically water delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreement are met. Water exchanges can be strictly a return of water on a basis agreed upon by the participants or it can include payment and the return of water. The water returned may or may not be an *even* exchange; water can be returned on a one-for-one basis or by another arrangement (e.g., for each acre-foot of water received, two acre-feet are returned).

MPWD has no current and/or planned short- and long-term water exchanges.

6.2.7.2 Transfers

Water transfers are defined as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights.

Temporary water transfers generally have a duration of one year or less while long-term water transfers have a duration of multiple years. Numerous mechanisms exist to execute water transfers.

MPWD has no current and/or planned short- and long-term water transfers as shown in Submittal Tables 6-8 and 6-9.

6.2.7.3 Emergency Interties

MPWD has interties with Estero MID, Redwood City, Cal Water System (CWS) – San Mateo, and CWS – San Carlos. Emergency interties are also discussed in Chapter 7 as part of Water Service Reliability and Drought Risk Assessment. In the past, these interties have been used for short-term water supply when Estero MID and CWS requested assistance due to water needs while they were performing system maintenance and repairs.

6.2.8 Future Water Projects

If future water projects are planned, Water Code Section 10631 (f) requires that the supplier provides detailed information about them and include information in Submittal Table 6-7 Expected Future Water Supply Projects or Programs.

MPWD has no currently planned Water Supply Projects or Programs.

Table 6-7. Expected Future Water Supply Projects or Programs.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: MPWD is in the Initial stages of reviewing availability of local groundwater and recycled water opportunities. No projects have been identified at this time.						

6.2.9 Summary of Existing and Planned Sources of Water

This section requires suppliers to identify, quantify, and describe management of the existing and planned sources of water (Water Code 10631).

6.2.9.1 Description of Supplies

MPWD does not have multiple sources of water and has already discussed its sole SFPUC water supply earlier in Chapter 6.

6.2.9.2 Quantification of Supplies

The actual source and volume of water for the year 2020 is reported in Submittal Table 6-8: Water Supplies - Actual. Projected water supplies are estimated based on historic average deliveries that are modified by special condition considerations (see Section 6.2.10 of this chapter) and known or planned water supply development projects.

Table 6-8. Water Supplies – Actual.

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply		**2020**		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water		974	Drinking Water	1,420
	Total	974		1,420
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*				
NOTES: Units: MG. Total actual purchase data from BAWSCA, Table C, 2/18/21. One of the three SFPUC production meters failed in December 2020. MPWD staff had to estimate the production for December 2020 for the failed meter and added the estimate to the other two functioning SFPUC production meters. The meter was replaced in January 2021.				

Projected supplies for MPWD from its sole supplier, the SFPUC, are listed in Submittal Table 6-9. Projections are based on information from SFPUC.[81]

For the purposes of the UWMP, DWR does not consider water conservation as a supply, but water conservation is reflected in a reduction in water demand as described in Chapter 4.

[81] BAWSCA, Wholesale projection by customer, (Table 2), April 8, 2021. (Also see: Appendix 6.)

Table 6-9. Water Supplies – Projected.[82]

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply		Projected Water Supply * Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online	Additional Detail on Water Supply	2025		2030		2035		2040		2045 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	"RWS Supply Utilized by Wholesale Customers (MG) is equivalent to purchase request projections provided to SFPUC by BAWSCA on January 21, 2021 and includes Cities of San Jose and Santa Clara." Source: SFPUC, March 30, 2021. MPWD has a contractual, Supply Assurance from SFPUC of 1420 MG/year. Cities of San Jose and Santa Clara do not have Supply Assurance (contractual agreements) with SFPUC.	1,044	1,420	1,037	1,420	1,051	1,420	1,055	1,420	1,069	1,420
	Total	1,044	1,420	1,037	1,420	1,051	1,420	1,055	1,420	1,069	1,420
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*											
NOTES: MPWD's SFPUC contractual supply available under normal (Supply assurance) water year conditions, also known as the 'Individual Supply Guarantee' (ISG), is 3.891 MGD, 1420 MG/YR. Reference for data in this (6-9) Table: SFPUC, Table 2, "Projected Total RWS Supply Utilized and Portion of RWS Utilized by Wholesale Customers in Normal Years", March 30, 2021. For BAWSCA updated 2020 UWMP Drought Cutbacks, see: Attachment B, Table H, April 8, 2021.											

6.2.10 Special Conditions

Numerous special conditions may affect water supplies. In its 2020 UWMP, MPWD incorporates reasonable assertions about climatological and potential regulatory impacts based on information from SFPUC, and other local conditions that may affect water supply availability — especially when considering the supply's availability for the service reliability and drought risk assessments during single dry years and drought periods lasting five consecutive years.

The SFPUC RWS's dominant supply is from the Tuolumne River watershed at high elevations in the Sierra Nevada Mountains. This main source of water for the SFPUC RWS is augmented by treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties.

[82] IBID

The amount of imported water available to SFPUC's customers is constrained by climate, hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is dependent on reservoir and snow-pack storage to manage its water supplies.

6.2.10.1 Climate Change Effects

Climate change is a required consideration for suppliers in their water supply analysis. New information is emerging about climate change and how it affects the availability and reliability of water resources. The National Oceanic and Atmospheric Administration (NOAA) climate website provides updated information about local and global climate, drought, maps, and data. [83] The NOAA is an American scientific agency that focuses on the conditions of the oceans, major waterways, and the atmosphere. NOAA is an additional source of timely and authoritative scientific data and information about climate that the MPWD can use for future decisions about its water supply.

Although the extent and precise effects of climate change remain uncertain, there is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Temperature data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources.

Both the SFPUC and BAWSCA participated in the 2020 workshop to update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). They are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update.[84] As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized below, provides the main water planning categories applicable to the region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

- **Water Demand – *Urban and Agricultural Water Demand*** – Changes to hydrology in the region because of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.

[83] NOAA climate website. https://www.climate.gov/

[84] Bay Area Integrated Regional Water Management Plan (BAIRWMP), 2019. http://bayareairwmp.org/

- **Water Supply –**
  - **Imported Water** – Potential impacts on the availability of imported water resulting from climate change directly affect the amount of water supply.
  - **Regional Surface Water** – Although future projections suggest only small changes in total annual precipitation for the region, there may be changes to timing of precipitation.
  - **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
- **Water Quality** –
  - **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment.
  - **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins. Water quality changes in imported water used for recharge could also impact groundwater quality.
- **Sea-Level Rise** – Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion.
- **Flooding –** Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur, leading to more frequent, longer, and deeper flooding.
- **Ecosystem and Habitat –** Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges.

  The Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food, and fiber production. Climate change is expected to substantially change several of these services.

SFPUC Climate Change Studies

For the 2020 UWMP, SFPUC, MPWD's supplier, provided information about climate effects on its RWS water supply.[85] Based on climate change studies, SFPUC states that climate change could result in impacts to SFPUC's water resources and therefore impact MPWD's supply, such as:

[85]SFPUC, "Projected SFPUC Regional Water System Supply Reliability – Climate Change", February 3, 2021.

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year.
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow.
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity.
- Sea level rise and an increase in saltwater intrusion.
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality.
- Increases in evaporation and concomitant increased irrigation need.
- Changes in urban and agricultural water demand.

The SFPUC assesses the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase, and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced, and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

The SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070.

Climate change and other changing conditions may affect the SFPUC RWS's ability to meet the SFPUC level of service goal. SFPUC is in the process of completing its "Long-term vulnerability assessment and adaptation plan for the SFPUC water enterprise – Phase 1".[86] This adaptation plan will provide guidance for specific future water supply development decisions.

[86] Long-term vulnerability assessment and adaptation plan for the SFPUC water enterprise – Phase 1, to be completed in 2021. SFPUC website: https://www.waterrf.org/research/projects/long-term-vulnerability-assessment-and-adaptation-plan-san-francisco-public

6.2.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions and planned future projects may also affect MPWD's analysis of its future water supply availability. Compared to the reliability projections that were provided by SFPUC to BAWSCA agencies for the 2015 UWMP update, the biggest difference in projected future deliveries for the 2020 UWMP update is caused by the uncertainty of the negotiations between SFPUC and specific implementation of the Bay Delta Plan Amendment (BDP).

The following is an explanation from the SFPUC about the 2018 Bay Delta Plan Amendment and the uncertainty of outcome for the SFPUC water supply.

2018 Bay Delta Plan Amendment and effects on the SFPUC Supply[87]

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay Delta Plan Amendment, BDP) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted BDP was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay Delta. The BDP requires the release of 30-50% of the "unimpaired flow"[88] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the BDP is implemented, for normal years, the SFPUC states that its ability to meet the projected water demands to the Wholesale Customers (including MPWD) would be the same as current contract conditions (184 mgd). However, without augmentation from other sources, SFPUC expects it would experience supply shortages in single dry years and multiple dry years. Implementation of the BDP will require rationing in all single dry years and multiple dry years.

The SFPUC has initiated an Alternative Water Supply Planning Program (AWSP, see Appendix 7) to enable SFPUC to meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20% system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay Delta Plan Amendment (BDP) on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the BDP is uncertain for multiple reasons.

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[87] SFPUC, February 3, 2021. 2020 UWMP Common Language. (Also see Appendix 7.)

[88] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

Multiple lawsuits have already been filed in both state and federal court on various aspects of the plan. Also, the other regulatory and/or adjudicatory proceedings required to implement the plan would likely face legal challenges and have lengthy timelines. The final resolution of court actions could quite possibly result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Given the current uncertainty about the implementation of the BDP, SFPUC provided two contrasting versions of projected future supplies both with and without the BDP. Detailed analysis of these scenarios on supply reliability for the MPWD is provided in Chapter 7. The regulatory conditions and negotiations about the BDP are continually evolving, therefore conditions could change from those documented in MPWD's 2020 UWMP and 2020 WSCP. We caution readers and users of this UWMP to first check with MPWD before relying on either of the scenarios provided by SFPUC and presented in MPWD's 2020 UWMP and WSCP to have the current status of Bay Delta Plan implementation and availability of alternative water supplies.

In recognition of the obstacles to implementation of the BDP, SWRCB Resolution No. 2018-0059 adopting the BDP directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay- Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019."

In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing.

Other emerging regulations that could impact MPWD's supply may be part of new or changes in regulatory requirements in the Regional Water Quality Control Plan, such as incorporation of elements in the Bay-Delta Water Quality Control Plan to reduce reliance on the Delta. These developments are emerging in the context of regulatory actions and the negotiation of voluntary settlement agreements with some suppliers. Similarly, development of the Delta Water Conveyance systems project or other similar projects may affect future availability of water supply for MPWD.

6.2.10.3 Other Locally Applicable Criteria

MPWD's water supply is 100% from the SFPUC RWS. Local conditions, such as disruption of MPWD's water supply due to an earthquake or fire, may also affect the MPWD's water supply. However, local disruptive conditions are likely to be temporary.

6.3 Submittal Tables Completion Using the Optional Planning Tool

MPWD did not use the optional Planning Tool Supply Worksheet to complete Submittal Tables 6-1 through 6-9. MPWD is using information from its AMI and Springbrook billing systems, the SFPUC, and BAWSCA to populate the Submittal Tables.

6.3.1 Submittal Table 6-1: Groundwater Volume Pumped

MPWD does not use groundwater as a water supply, so this table is not applicable.

6.3.2 Submittal Table 6-2: Wastewater Collected Within Service Area in 2020

MPWD does not engage in wastewater collection, treatment, or disposal. The cities of Belmont and San

Carlos are responsible for the collection of sewage in the MPWD's service area. The Silicon Valley Clean Water (SVCW), a four-member Joint Powers Authority, undertakes treatment and disposal. The data presented in Submittal Table 6-2 is from the SVCW.

6.3.3 Submittal Table 6-3: Wastewater Treatment and Discharge Within Service Area in 2020

The wastewater collected in MPWD's service area is not discharged within its service area, so this table is not applicable.

6.3.4 Submittal Table 6-4: Recycled Water in Service Area

Currently, recycled water is not available in MPWD's service area, so this table is not applicable.

6.3.5 Submittal Table 6-5: 2015 Recycled Water Use Projection Compared to 2020 Actual

Currently, recycled water is not available in MPWD's service area, so this table is not applicable.

6.3.6 Submittal Table 6-6: Methods to Expand Future Recycled Water Use

Currently, recycled water and funding for it are not available in MPWD's service area, so this table is not applicable.

6.3.7 Submittal Table 6-7: Expected Future Water Supply Projects or Programs

Currently, MPWD is in the initial stage of reviewing potential for using recycled water. No defined future water supply projects or programs are available in MPWD's service area, so this table is not applicable.

6.3.8 Submittal Table 6-8: Water Supplies – Actual

Submittal Table 6-8 shows MPWD's Actual 2020 use of 974 MG.

6.3.9 Submittal Table 6-9: Water Supplies – Projected

Submittal Table 6-9 shows MPWD's projected potable water supplies based on MPWD forecast demands and *Total Right or Safe Yield* values. The stated *Total Right or Safe Yield is MPWD's ISG.*

6.4 Energy Intensity

A new requirement for all suppliers in their 2020 UWMPs [(Water Code 10631.2. (a)] is to provide an estimate for energy intensity, including any of the following information that can be readily obtained:

- The amount of energy used to extract or divert water supplies.
- The amount of energy used to convey water supplies to the water treatment plants or distribution systems.
- The amount of energy used to treat water supplies.
- The amount of energy used to distribute water supplies through its distribution systems.
- The amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
- The amount of energy used to place water into or withdraw from storage.
- Any other energy-related information the urban water supplier deems appropriate.

Since SFPUC is MPWD's wholesaler, SFPUC diverts and delivers pressurized and treated water (SFPUC water is under pressure in the conveyance pipelines and treated with chloramines to prevent pathogens) to MPWD's turnouts. Once the SFPUC supply enters the MPWD system it either flows directly to through the

distribution system to customers or is stored for future use. The MPWD system connects to the SFPUC RWS at two locations (Bay Division Pipelines 1 and 2, Crystal Springs Bypass Tunnel). MPWD has nine pressure zones due to varied topography and elevations of storage tanks and conveyance pipelines within its service area.

Since MPWD purchases treated water from SFPUC, it does not use energy for treatment. MPWD does not have an untreated water supply.

The main uses of energy within the MPWD system are for pumping water from one location to another within the nine pressure zones or to and from its water storage tanks. For its energy intensity calculation, MPWD used data from PG&E monthly bills for eight pump station meters, seven regulator meters, and two tank meters.

For its energy intensity calculations, MPWD used the "Total Utility Approach", as specified in the 2020 DWR Guidebook Appendix O. The calculation uses total energy consumed (kWh) for water management divided by total water production (MG) (total water purchased from SFPUC). MPWD's energy intensity for 2020 is 1,167,269 kWh/974 MG[89], resulting in 1,198 kWh/MG. Submittal Table O-1B illustrates the MPWD's energy intensity result using the "Total Utility Approach".

Table 6-10, O-1B. Recommended Energy Intensity – Total Utility Approach.

Table O-1B: Recommended Energy Reporting - Total Utility Approach				
Enter Start Date for Reporting Period	1/1/20	Urban Water Supplier Operational Control		
End Date	12/31/20			
☐ Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	*MG*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*974*	*0*	*974*
Energy Consumed (kWh)		*1,167,269*	*0*	*1,167,269*
Energy Intensity (kWh/volume)		*1,198*	*0.0*	*1,198*

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

The calculation uses total energy consumed (kWh, metered by MPWD) for water management divided by total water production (MG, total metered water purchased from SFPUC).

Narrative:

For its energy intensity calculations, MPWD used the "Total Utility Approach", as specified in the 2020 DWR Guidebook Appendix O.

MPWD is not including Energy Table O-2, because it does not have recycled water nor engages in wastewater collection, treatment, or disposal.

[89] Source: MPWD, January 31, 2021.

Lay Description

The Lay Description is required in the 2020 UWMPs (Water Code Section 10630.5). This section provides the synopsis of Chapter 7.

Chapter 7 contains information about MPWD's water service reliability and its Drought Risk Assessment (DRA). Assessing water service reliability is the fundamental purpose for water suppliers to prepare an UWMP. Water service reliability reflects the supplier's ability to meet the water needs of its customers under varying conditions. This chapter integrates information from SFPUC, BAWSCA, and MPWD about water reliability and planning for water shortages.

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance), i.e., a contractual obligation, to deliver 184 mgd to the 24 permanent Wholesale Customers (including MPWD) collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment, and each has temporary and interruptible water supply contracts with SFPUC. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customers' allocation of the 184 mgd Supply Assurance.

MPWD's ISG is 3.891mgd or 1420.215 MG per year.

MPWD's ISG is of critical importance to its current and future customers for long-term vitality of its community, economy, and security.

SFPUC's Water Supply Reliability Evaluation[90]

In general, 85% of the Regional Water System (RWS) supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15% comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted Water System Improvement Program (WSIP) retains this mix of water supply for all year types.

To evaluate its supply reliability, SFPUC closely monitors the hydrologic conditions impacting its watersheds in the Sierras and the San Francisco Bay Area. Based on hydrologic conditions, SFPUC routinely provides updates about its water supply that may impact water supply for BAWSCA agencies. Annual weather trends and long-term impacts from a changing climate are part of SFPUC's on-going analyses and are included in long-term planning for a reliable RWS water supply. As discussed in Chapter 6, Section 6.2.10.1, in January and February 2021, SFPUC provided a detailed assessment of the projected water supply and impacts from climate change for BAWSCA agencies through 2045.

Historically, the SFPUC has met demand in its service area from its watersheds in all year types. The "with BDP" scenario incorporates potential extreme impacts to the RWS supply from potential but uncertain regulatory changes. Unlike previous SFPUC water supply reliability forecasts that were mostly focused on hydrologic conditions and projects that impacted infrastructure, in January 2021 SFPUC provided BAWSCA with two scenarios for forecasts: "with Bay Delta Plan", ("with BDP"), and "without BDP" (they were presented by SFPUC as: Scenario 1 and Scenario 2, respectively) for the reliability of its water supply and used the Supply Assurance as the projected wholesale supply for 2025 through 2045.

[90] SFPUC, February 3, 2021. 2020 UWMP Common Language. (Also see Appendix 7.)

For comparison, the SFPUC references the current supply regime ("without BDP").[91] The BDP requires the release of 30-50% of the "unimpaired flow" on the three tributaries from February through June in every year type. In SFPUC modeling of the "with BDP" scenario flow, SFPUC assumed that the BDP will require SFPUC to release 40% of Tuolumne River unimpaired flow.

In late March 2021, SFPUC staff provided a review of its water supply planning approach to its Commission with hope that the information and workshop would engage a deeper discussion of a range of scenarios designed to demonstrate the effects of an array of issues and policy choices the Commission could consider going forward.[92] Also, in March 2021, SFPUC revised its assessment for the projected water supply and replaced it with additional model results that changed the modeling basis from Supply Assurance for BAWSCA agencies to their forecast demands.[93] The SFPUC model simulated an 8.5-year design drought that was used as the basis for the five consecutive dry year analysis (Appendix 7).[94]

As a result, the SFPUC has established an Alternative Water Supply Planning (AWSP) program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

The State Water Resources Control Board (SWRCB) has stated that it intends to implement the BDP on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. In its guidance for 2020 UWMPs, SFPUC assumes the impacts of the BDP will start in 2023, and during drought years after 2023, will reduce its supplies significantly. But implementation of the BDP is uncertain for multiple reasons that are presented in Section 7.2.1, Constraints on Water Sources. As a result, water supply planning projections assuming the implementation of the BPD constitute extremely conservative, worst-case scenario water supply planning that is highly uncertain to reflect actual future water supply conditions.

For the 2020 UWMPs agencies are required to develop a Drought Risk Assessment (DRA) that assumes a single year and multiple years of drought, starting with 2021 through 2025. SFPUC provided data tables with its forecast for the "with BDP" and "without BDP" that show specific water supply data to address the DRA. SFPUC's 2021 forecasts include drastic water supply cutbacks during droughts for BAWSCA wholesale agencies, as discussed in Section 7.2.1.

For prior drought planning for SFPUC Wholesale water shortages of less than 20%, SFPUC and BAWSCA have developed the Water Shortage Allocation Plan (WSAP) to allocate shortages between the SFPUC and the Wholesale Customers collectively. In the two-tier drought allocation plan, Tier 1 applies to SFPUC, and Tier 2 applies to BAWSCA. They are explained in detail in Section 7.2.3, Water Service Reliability.

However, the BAWSCA Tier 2 plan was not intended for shortages of more than 20%. Therefore, for the shortage scenarios that reduce water supply for BAWSCA agencies above 20%, BAWSCA developed an

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[91] Bay Delta Plan Update: Amendments and Substitute Environmental Document (SED) for lower San Joaquin River and Southern Delta– Adoption and approval of plan amendments and final SED. https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2018_sed/

[92] SFPUC Water Supply Planning Introduction and Review, March 26, 2021. (Also see Appendix 7.) https://sfpuc.sharefile.com/share/view/s4ab9a9df92b049238c1957610c6a3de5

[93] SFPUC, Additional Supply reliability Modeling Results, March 30, 2021. (Also see Appendix 7.)

[94] IBID.

alternate drought cutback formula.[95] BAWSCA's alternate drought cutback formula method used for MPWD's 2020 UWMP is explained in Section 7.2.3, Water Service Reliability.

Information Sources for Projected SFPUC RWS and Wholesale Purchases

SFPUC provided its projected water supply availability and reliability based on modeling including hydrologic conditions and regulatory and infrastructure constraints. Wholesale supply allocations are based on projected BAWSCA Wholesale purchases (demand) provided by BAWSCA member agencies. Active conservation by BAWSCA agencies is treated as a source of supply by BAWSCA, therefore projected Wholesale purchases are calculated after passive and active conservation are applied.

Using BAWSCA's Demand Study in June 2020[96], BAWSCA developed a table for each member agency, listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total water demand after passive conservation and entered active conservation, as calculated in the agencies' (Decision Support System) DSS Model.[97]

Each year agencies are offered the opportunity to review and, if needed, to revise their purchase forecasts in January. BAWSCA Agencies have provided BAWSCA with similar updates to projected purchases annually for the past 10 years. On January 15, 2021, BAWSCA transmitted agency purchase requests for SFPUC's use in their 2020 UWMP. This annual reporting is part of the SFPUC's wholesale rate setting process.

In MPWD's 2015 UWMP, the Wholesale supply forecasts from SFPUC used the established Tier 1 drought allocation formula of up to 20% cutbacks. However, a new drought cutback allocation method had to be developed by BAWSCA for the 2020 UWMPs in response to SFPUC's proposed Wholesale customer cutbacks from projected demand during single and multiple consecutive dry years.[98]

For 2020 UWMPs, BAWSCA's new method allocates SFPUC's Wholesale available supply during dry years with equal % reduction shared across all wholesale customers when average wholesale customers' RWS shortages are 10% or less or greater than 20%.[99] BAWSCA's cutback allocations also are based on agency demands at the onset of the drought and remain constant throughout the drought period. This methodology is consistent with the Tier 1 and Tier 2 application of RWS demands and the SFPUC model assumptions.

This allocation method is intended to serve the purposes of the 2020 UWMP supply reliability analysis. It does not imply an agreement by BAWSCA member agencies to the SFPUC supply shortfalls and to the exact allocation methodology. BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional, multiple equity factors if SFPUC is not able to deliver its contractual supply volume, and its cutbacks on RWS exceed 20%.

Key Findings of the Water Service Reliability Analysis

BAWSCA's drought allocation cutbacks for the SFPUC "with BDP" scenario will require MPWD to apply its Water Shortage Contingency Plan (WSCP) Level 5, for water use restrictions up to 47% during a 5-year

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[95] BAWSCA, Attachment B: Updated 2020 UWMP Drought Cutbacks, BAWSCA, April 8, 2021. (Also see Appendix 6.)
[96] BAWSCA, Demand Study, June 2020. http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf
[97] The Least Cost Planning Decision Support System (DSS Model), a proprietary software by Maddaus Water Management. (Also see Appendix-14).
[98] SFPUC, Additional Supply reliability Modeling Results, (Table 3g), March 30, 2021. (Also see Appendix 7.)
[99] BAWSCA, Attachment B Updated 2020 UWMP Drought Cutbacks, April 8, 2021. (Also see Appendix 6.)

consecutive drought. The results of the current water supply reliability assessment affect MPWD's short- and long-term water management decisions. MPWD is working with BAWSCA and its agencies to identify potential regional mitigation measures to improve reliability for regional and local water supplies and to meet its customers' water needs. The clear risk to MPWD is that its sole supplier, the SFPUC, under its "with BDP" scenario and without additional alternate supplies, appears not to be able to meet its contractual obligations for MPWD's forecast demands during droughts.

If conditions for large drought cutbacks to BAWSCA Wholesale agencies persist, such as those presented by SFPUC in "with BDP", until SFPUC provides additional alternate supplies, MPWD will need to implement extensive demand management practices to invoke strict restrictions on potable water use. Multi-year supply cutbacks of 47%, without additional alternate RWS supplies from SFPUC, will necessitate that MPWD accelerates pursuing alternate supplies for its service area. Additional funding will be necessary this work.

Meanwhile, SFPUC is continuing negotiations with the SWRCB on implementation of the BDP, and possible alternative thereto, and its resulting water supply effects, particularly during droughts. SFPUC is also developing a collaborative approach to protect the environment and plan for a reliable and high-quality potable water supply for the future. The implementation of feasible projects developed under the SFPUC's Alternative Water Supply Planning Program (AWSP, discussed in Chapter 6 and Appendix 6) is not yet reflected in SFPUC supply reliability scenarios and may reduce the cutbacks. With this uncertainty and dynamic situation, MPWD could update its DRA (see Section 7.3) prior to the 2025 UWMP update if new information becomes available. The Water Code Section 10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update.

Tuolumne River Voluntary Agreement (TRVA)[100]

In response to the Bay-Delta Plan, in 2016, the SFPUC and the Modesto and Turlock Irrigation Districts proposed the TRVA, a combination of flow and non-flow measures sufficient to improve all life-stages of native fish populations in the lower Tuolumne River. The SFPUC has consistently stated that voluntary agreements are the best path forward for the Bay Delta, as the voluntary agreement strikes the right balance between environmental stewardship and water reliability.

While the long-term voluntary agreement work continues, the SFPUC does not want to wait to restore the Tuolumne River's ecosystem. In 2021, the SFPUC and the Modesto and Turlock Irrigation Districts launched a proactive pilot program with the U.S. Fish and Wildlife Service that provides an immediate $4 million investment for habitat improvements for fisheries in the Tuolumne River. Additional information about the communications on the BDP and TRVA, including its timeline, is included in Appendix 2 and Appendix 6.

Due to the continued uncertainty for the SFPUC water supply during droughts and impacts from the implementation of the BDP on its water supply reliability, in its 2020 UWMP, MPWD presents information for water supply reliability using both SFPUC scenarios: "with BDP" and "without BDP".

MPWD anticipates that by the 2025 UWMP update, SFPUC will provide more specific information about the AWSP, with estimated water supply contributions from such projects. Additionally, MPWD expects that SFPUC will provide more specific information and a refined estimate of the BDP impacts to the SFPUC supply.

[100] Tuolumne River Voluntary Agreement (TRVA), http://www.tuolumnerivermanagementplan.com/

MPWD requests that users of the water supply and cutback data in its 2020 UWMP and WSCP contact MPWD staff for potential updates before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations. MPWD anticipates updates from SFPUC for its water supply reliability and the DRA.

7.1 Introduction

Chapter 7 incorporates information about its supply from SFPUC (described in Chapter 6) and water uses (described in Chapter 4). The resulting evaluation of MPWD's risk under a severe drought period lasting for the next five consecutive years (DRA) is presented as required (California Water Code Section 10635). For its overall reliability assessment, MPWD uses current information from SFPUC and BAWSCA to assess its water service reliability under varying hydrologic and regulatory conditions.[101] This analysis looks beyond MPWD's experience and considers what could be reasonably foreseen in the future.

In the 2015 UWMP, MPWD was required to evaluate its supplies and demands under a drought period lasting for three consecutive years. By comparison, the 2020 UWMP requires MPWD to develop a DRA, that evaluates its risk under a severe drought period lasting for the next five consecutive years. The DRA and Demand Management Measures (DMMs, Chapter 9) are part of MPWD's Water Shortage Contingency Plan (WSCP, is a stand-alone document, Attachment 1).

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay Delta Plan, BDP) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The adopted BDP was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay Delta. The BDP requires the release of 30-50% of the "unimpaired flow" on the three tributaries from February through June in every year type. SFPUC's modeling of the new flow standard using the simulated 8.5-year design drought assumes that the required release is 40% of the Tuolumne River unimpaired flow. The SFPUC model also assumes that the BDP Amendment will be implemented in 2023.

For its long-term management and planning, MPWD has invested significantly to modernize its water system infrastructure and management. MPWD uses advanced technologies such as: Advanced Metering Infrastructure (AMI), Supervisory Control and Data Acquisition (SCADA), and Geographic Information Systems (GIS) for data collection, analysis, and overall effective management of its water system and supplies. Potential impacts from new development and climate change are also long-term variables in MPWD's supply and demand planning.

In its 2020 UWMP, MPWD is using SFPUC's projections for its water supply through 2045. In MPWD's 2020 UWMP and its 2020 WSCP, the revised "with BDP" Amendment scenario is referred to as "with BDP" (formerly named by SFPUC as "Scenario 1") and the revised "without BDP" (formerly named by SFPUC as "Scenario 2"), is referred to as: "without BDP".

In this chapter, MPWD incorporates the current information from SFPUC and BAWSCA to present its supply reliability under the two contrasting scenarios that the SFPUC provided: "with BDP" and "without the BDP". As required, MPWD presents its water supply, potential cutbacks, and its water supply reliability under the following hydrologic conditions:

[101] SFPUC, Additional Water Service Reliability modeling results, March 30, 2021. (Also see Appendix 7.)

- Normal hydrological conditions,
- A single dry year, and
- Five consecutive years of drought.

The analysis is also conducted in five-year increments to project what conditions may look like for the next 25 years.

BAWSCA's updated 2020 UWMP drought cutback allocation tables for near-term, single-year and multi-year droughts[102], are based on SFPUC's data and guidance for "with BDP" and "without BDP"[103]. The SFPUC drought model and BAWSCA's drought cutback allocations for 2021 to 2025 use member agency 2020 actual purchases (including actual 2020 purchase by MPWD). This is consistent with the methodology for BAWSCA's Tier 2 cutback allocations. For 2025 – 2045 SFPUC and BAWSCA use projected purchases by Wholesale BAWSCA agencies (Figure 7-1).

Figure 7-1. BAWSCA Wholesale demand projections for SFPUC Supply Model: 2020 – 2045.

BAWSCA Wholesale Demand Projections for SFPUC Supply Model (MGD)						
	2020	**2025**	**2030**	**2035**	**2040**	**2045**
BAWSCA Wholesale*	132.10	146.01	147.87	151.90	156.31	162.76
*Includes San Jose and Santa Clara, 4.5 MGD each Source of data: SFPUC, April 12, 2021.						

Although it is not possible to predict specific future regulatory and development variables, to the extent they can be addressed, they are discussed in this chapter.

7.2 Water Service Reliability Assessment

Every Supplier is required to provide their expected water service reliability projections for a normal year (without drought cutbacks), a single dry year, and five consecutive dry years.

The RWS's dominant supply (85%) is from the Tuolumne River watershed at high elevations in the Sierra Nevada Mountains. This main source of water for the SFPUC RWS is augmented by treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo counties.

If the BDP is implemented as presented in SFPUC's "with BDP", the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Such implementation of the BDP will require rationing in all single dry years and multiple dry years.

The SFPUC has initiated an Alternative Water Supply Planning program (AWSP) to enable it to meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20% system-wide in accordance with adopted SFPUC policies. This program is in early planning stages. The AWSP is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs, other regulatory changes, earthquakes, disasters, and emergencies, as well as increases in population and employment, and climate change.

[102] BAWSCA, April 1, 2021. (See Appendix 6.)
[103] SFPUC, Additional Supply Reliability Modeling Results, March 30, 2021. (Also see Appendix 7.)

As the region faces future challenges – both known and unknown – the SFPUC is considering a suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045. Assumptions from SFPUC about dry-year water supply projects are included in SFPUC's Water System Improvement Program (WSIP) and considered in SFPUC's Regional Water System supply reliability.[104]

Since the MPWD's water supply relies solely on the SFPUC RWS, impacts from the potential implementation of the BDP, as presented in SFPUC's "with BDP" scenario, will impact MPWD's service reliability. MPWD will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years.

MPWD's expected water service reliability projections for a normal year, single dry year, and five consecutive dry years are presented in:

- Submittal Table 7-1 shows MPWD's water service reliability projections for a normal year, single dry year and five consecutive dry year supply compared to MPWD's normal year supply for 2021 through 2025.
- Submittal Table 7-2 shows a normal year supply and demand comparison through 2045.
- Submittal Table 7-3 shows a single dry year supply and demand comparison through 2045.
- Submittal Table 7-4 shows a multi-dry year supply and demand comparison through 2045.
- Submittal Table 7-5 is the DRA, showing a five-year Drought Risk Assessment to address Water Code Section 10635(b), for a multi-dry year supply and demand comparison from 2021 through 2025.

In its 2020 UWMP report, all MPWD's tables in Chapter 7, except Table 7-3 (Submittal table 7-2 – normal year supply and demand comparison), present two versions: "with BDP" – A and "without BDP" – B, of each table. These versions show the contrasting impacts on MPWD's service area from each SFPUC scenario. Note that MPWD's Tables 7-3 through 7-7 extend to the year 2045, beyond the requirement of 2040 [Water Code Section 10635(a)].

Note that the DWR Water Use Efficiency Data (WUE) Portal for the 2020 UWMP only permits one entry for Submittal tables. Since only one version of tables can be submitted to DWR, and for consistency with MPWD's supplier, all "A" designated tables were used as the "Submittal Tables" to DWR.

7.2.1 Constraints on Water Sources

To the extent practical, DWR requires retail suppliers to include information from their wholesale supplier about constraints on their water supply [Water Code section 10631 (b)(1)].

The amount of water available from SFPUC's RWS for MPWD is constrained by climate, hydrology, infrastructure, and the institutional parameters that allocate the water supply from the Tuolumne River. Constraints on the SFPUC supply due to climate change were also discussed in Chapters 3, 4, and 6.

MPWD's water quality may also be affected if SFPUC's sources of water change significantly. MPWD's current water quality is characterized in its annual (2020) Consumer Confidence Report that is posted on MPWD's website.[105] To meet the appropriate drinking water standards for consumption, the SFPUC RWS

[104] SFPUC Regional Water System supply reliability letter from SFPUC, Table 3, January 22, 2021.

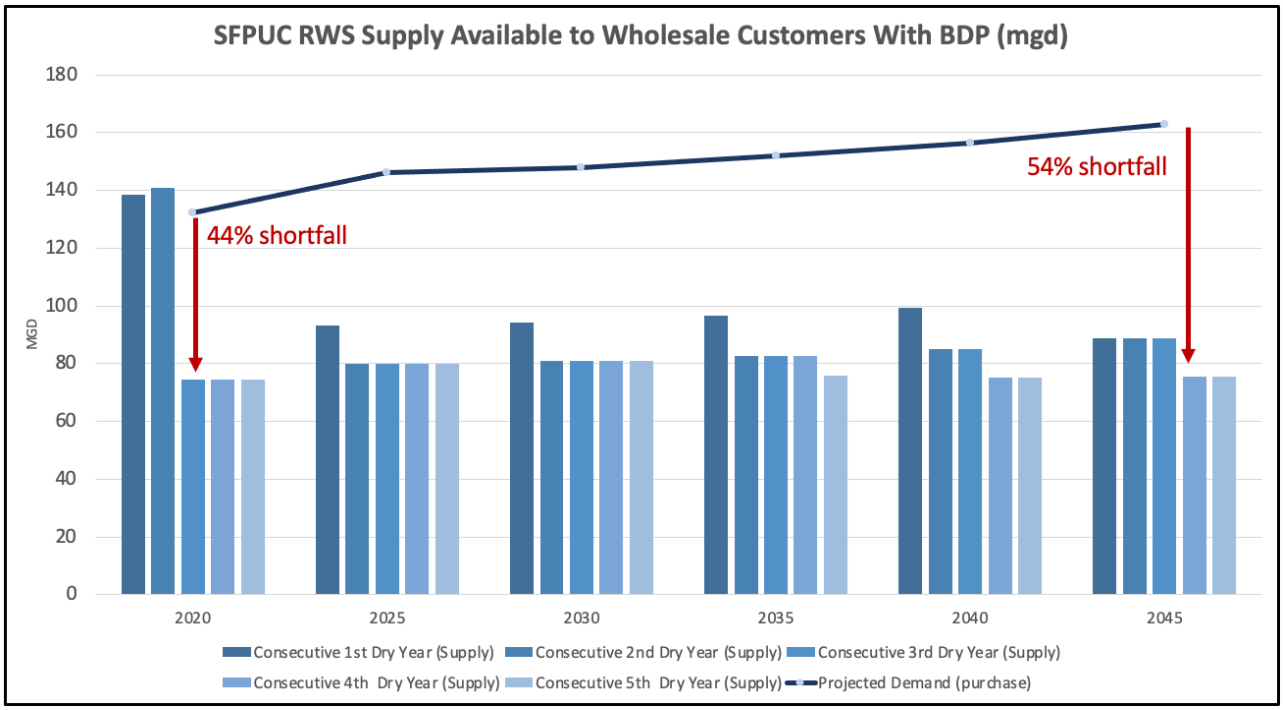
[105] Mid-Peninsula Water District 2019 Consumer Confidence Report

receives treatment consisting of ultraviolet light and chlorine disinfection, pH adjustment for optimum corrosion control, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing the formation of regulated disinfection byproducts.

Specific water quality changes are dependent on the quality of alternative water supplies. The main long-term constraints on the SFPUC supply are due to climate and regulatory changes. Key factors impacting water supply include:

- Changes in precipitation patterns, such as time of snowfall or rain, intensity, and duration.
- Fewer months of continuous below freezing (32F) temperatures in the Sierra Nevada, resulting in less precipitation as snow, shorter duration for snowpack storage.
- Warmer temperatures leading to melt of the snowpack storage.
- Inadequate storage capacity to store the snowmelt water source.
- Changes in water quality because of changes in precipitation patterns and storage.
- Potential regulatory changes affecting the SFPUC water supplies, such as possible but uncertain implementation of the BDP that could reduce Tuolumne River supply water for the SFPUC RWS by 40% in drought years.

Figure 7-2. SFPUC RWS with BDP: Supply available to Wholesale Customers.



The above-noted constraints may affect SFPUC's Hetch-Hetchy watershed and management of the RWS water supply and its distribution. The recent changes to instream flow requirements with the BDP, if implemented, for SFPUC and Wholesale customer demand projections would affect SFPUC's water supply planning and have affected current water supply projections.

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https://storage.googleapis.com/midpeninsulawater-org/uploads/MPWD_CCR_2020.pdf

The recent changes to instream flow requirements with the BDP for SFPUC and Wholesale customer demand projections have affected SFPUC's water supply planning.

The SWRCB has stated that it intends to implement the BDP on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the BDP Amendment is uncertain for multiple reasons.

First, since adoption of the BDP, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the BDP, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date. SFPUC has expressed doubts about the Tuolumne River ecosystem benefits provided by the BDP. In contrast, the TRVA (Tuolumne River Voluntary Agreement, discussed above, has significant technical support to improve the Tuolumne River ecosystem and is a preferable path forward that protects water supplies for the RWS and could avoid this protracted litigation. MPWD has and will continue to encourage SFPUC to prioritize its commitment to and remain vigilant regarding the TRVA negotiations.

Second, the BDP is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the BDP merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the BDP, the SWRCB Resolution No. 2018-0059 adopting the BDP directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the BDP to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. The implementation of the voluntary agreement could provide more predictability, flexibility, and reliability for water supply planning and projections. MPWD supports the Voluntary Agreement and is participating in public meetings and workshops on this topic, as well as, writing letters of support to BAWSCA, SFPUC, and government officials leading the process.

To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of Governor Newsom's administration.[106]

[106] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds. https://files.resources.ca.gov/voluntary-agreements/

Compared to the reliability projections that were provided by the SFPUC for BAWSCA agencies for the 2015 UWMP, for the 2020 UWMP, the biggest difference is in SFPUC's projected future deliveries to BAWSCA agencies because of SFPUC's assumptions about the implementation of the BDP. Given the uncertainty about its implementation, the SFPUC provided BAWSCA agencies the two contrasting scenarios discussed earlier.

Regulatory changes, such as the BDP Amendment, can significantly impact the reliability of MPWD's water supply. Consequently, MPWD through BAWSCA is continuing to participate in discussions about the development of the BDP implementation. Additionally, MPWD is working collaboratively with BAWSCA and its agencies to identify mitigation measures during severe water shortages to improve reliability for local water supplies and meet its customers' water needs.

In its 2020 UWMP, MPWD's goal is to provide the current and consistent information about the supply reliability from its supplier, the SFPUC. The current information from SFPUC includes significant assumptions and uncertainty about its supply reliability and ability to meet contractual obligations. Since the negotiations between SFPUC and the SWRCB are in progress and the situation is dynamic, it is not possible for MPWD to provide certainty about the drought cutbacks under either scenario. Given the uncertainty about the implementation of the BDP, the tables in this chapter show the two scenarios – version "A" with and version "B" without the BDP. Since only one version of tables can be submitted to DWR, for consistency to MPWD's supplier, the SFPUC's use of "with BDP", all "A" designated tables are "Submittal Tables" to DWR.

7.2.2 Year Type Characterization

Water Supply – All Year Types
The SFPUC historically has met demand during normal, single-drought, and multiple-drought years in its service area. SFPUC's projections for meeting the future RWS supply reliability for Wholesale Customers are significantly changed with the BDP Amendment.

7.2.2.1 Types of Years

DWR requires, as part of the water service reliability assessment in the DRA, that water suppliers include three types of years with specific hydrologic conditions.

In its 2020 UWMP Guidebook, DWR uses the terms "normal" and "average" interchangeably when addressing the water year type. DWR defines a "normal" year as "supplies a Supplier considers normal".

MPWD's contractual Supply Assurance from SFPUC is its Individual Supply Guarantee (MPWD's ISG is 3.891 million gallons per day, mgd, or 1,420 million gallons per year, MG/year; as part of Wholesale Supply Assurance of 184 mgd).

Normal Year. In past modeling of its supply reliability (such as for 2015 UWMPs), SFPUC used the Wholesale Supply Assurance (184 MGD) for "normal" non-drought years. Initially, for the 2020 UWMPs, SFPUC provided their modeling results with a 'normal' year defined as a year when Wholesale Supply Assurance (184 MGD) is available.[107] However, SFPUC changed its approach and updated its model for its 2020 UWMP. For 2020 UWMPs, SFPUC defines "normal" as supply meeting Wholesale demands.[108]

MPWD is using 2020 as its base year, because MPWD's demand volume is based on the actual 2020

[107] SFPUC Regional Water System supply reliability letter from SFPUC, Table 3, January 22, 2021.
[108] SFPUC, Additional Supply Reliability Modeling Results, March 30, 2021.

purchase from SFPUC. As recommended by DWR, MPWD uses the same five-year sequence (2021 - 2025) for its water service reliability assessment.

Consistent with its supplier, MPWD presents the 'normal' year available supply from SFPUC as meeting MPWD's actual and projected demands. Submittal Table 7-1A presents a sequence of year types from "normal" to "five-consecutive-year drought between 2020 and 2025. MPWD's actual 2020 use, 974 MG, is presented for the normal year (2020). In 2020, defined as a "normal" year, SFPUC's supply met 100% of MPWD's demand.

Single Dry Year. The single dry year represents the year with the lowest water supply available from SFPUC to the MPWD. MPWD's actual 2020 use, 974 MG, is presented for the single dry year. As can be seen in Submittal Table 7-1A, "with BDP", and Table 7-1B, with and "without BDP", for MPWD, the available water supply in a single-dry year is 974 MG/year or 100% of normal supply (MPWD's demand).

Five-Consecutive-Year Drought. The five-consecutive year drought for the DRA is defined by DWR as the driest five-year historical sequence for the water supply (Water Code Section 10612). For the water service reliability assessment, SFPUC's water supply reliability planning methodology includes simulation of an 8.5-year design drought. The SFPUC model assumes that "with the BDP" scenario requires a 40% reduction in its Tuolumne River supply starting in 2023. Note that the SFPUC derived the five-year consecutive drought based on the driest five-year sequence in the hydrologic record. This supply condition is a requirement of Water Code Section 10612. The SFPUC has provided information about the likelihood of this severe condition (Appendix 7).[109]

As can be seen in Submittal Table 7-1A, with BDP, and Table 7-1B, without BDP, the available water supply for MPWD based on SFPUC modeling results for 2020 through 2025, consecutive multiple dry years, in the first consecutive dry year, 2021, is 967 MG/year or 100% of MPWD's projected demand. In the second consecutive dry year, 2022, SFPUC is also able to meet MPWD's forecast demand of 1022 MG. However, in the third through fifth consecutive dry year, starting in 2023 when the BDP is assumed to be implemented, SFPUC's supply only meets 55% of MPWD's forecast demand.

Table 7-1. Basis of Water Year Data (Reliability Assessment) (Submittal Table 7-1A, with BDP)

Submittal Table 7-1A Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	**Available Supplies if Year Type Repeats**	
			Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**

[109] SFPUC, Annual rationing tables with model results for the likelihood of severe conditions, April 12, 2021. (See Appendix 7.)

Average Year	2020	974	100%
Single-Dry Year	2020	974	100%
Consecutive Dry Years 1st Year	2021	967	100%
Consecutive Dry Years 2nd Year	2022	1022	105%
Consecutive Dry Years 3rd Year	2023	540	55%
Consecutive Dry Years 4th Year	2024	540	55%
Consecutive Dry Years 5th Year	2025	540	55%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Units: MG. Data for "Average Year" is 2020, BAWSCA, Section 1: Basis for calculations. Projected Wholesale RWS purchases through 2045. Tables B: Basis for 5-year Drought Risk Assessment; and F2: Individual Agency Drought Allocations Base Year 2020, With BDP. (BAWSCA, 4/1/21). In 2022, the second consecutive dry year, SFPUC is able to meet MPWD's demand prior to implementation of the BDP in 2023. In 2022, the SFPUC supply compared to the "Average" (2020) is higher by 5%. The SFPUC 45% multi-year cutbacks for Wholesale BAWSCA Customers are unprecedented compared to historic drought cutbacks and especially severe for agencies like MPWD that have contracts for SFPUC to supply their service area 100%. If SFPUC implements such drastic cutbacks, without augmenting its supply to meet demand, SFPUC will not be complying with its contractual obligations to MPWD. See Table 7-1B, SFPUC "without BDP", in MPWD's 2020 UWMP for comparison. MPWD is including "with BDP" projections to be consistent with its wholesale supplier SFPUC, but the implementation of the BDP is highly uncertain and not necessarily reflective of future regulatory constraints and hydrological conditions. These projections constitute an extremely conservative, worst-case scenario planning projection.

Table 7-1B, without BDP, for a normal year, a single dry year, and multiple (five) dry years shows that SFPUC will meet MPWD's demand. It should be noted that the MPWD is not currently utilizing all its contractually available supply (ISG). In 2020 MPWD used 69% of its ISG.

Table 7-2. Basis of Water Year Data (Reliability Assessment) (Table 7-1 B, without BDP).

Table 7-1B Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	**Available Supplies if Year Type Repeats**	
			Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year	2020	974	100%
Single-Dry Year	2020	974	100%

Consecutive Dry Years 1st Year	2021	967	100%
Consecutive Dry Years 2nd Year	2022	1022	105%
Consecutive Dry Years 3rd Year	2023	1022	105%
Consecutive Dry Years 4th Year	2024	1022	105%
Consecutive Dry Years 5th Year	2025	1022	105%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Units: MG. Data for "Average Year" is 2020, BAWSCA Section 1 Basis for calculations. Projected Wholesale RWS purchases through 2025. Tables B: Basis for 5-year Drought Risk Assessment; F2 (for 2021 and 2022 supply) Individual Agency Drought Allocations Base Year 2020, WITH BDP (BAWSCA, 4/1/21). and Table 4a (SFPUC, March 30, 2021). The SFPUC supply meets 100% of MPWD's demand and SFPUC complies with its contractual obligations to MPWD. In 2022 -2025, SFPUC is able to meet MPWD's demand due to the "without BDP" conditions. In 2022-2025, the SFPUC supply compared to the "Average" (2020) is higher by 5%. See Submittal Table 7-1A, SFPUC scenario "with BDP", in MPWD's 2020 UWMP for comparison.			

7.2.2.2 Sources for Water Data

The data sources for all Submittal Tables in this chapter are from:

- SFPUC – SFPUC, letters to BAWSCA, SFPUC RWS Supply Reliability, January 22; February 3, and March 30.
- BAWSCA – BAWSCA Attachment B: Updated 2020 UWMP Drought Cutbacks, BAWSCA, April 1 and April 8, 2021.
- MPWD – historic water purchases from SFPUC (based on MPWD and SFPUC metering data), June 2020 BAWSCA Demand Study for projected demand through 2045, and January 2021 updated forecast purchases for 2021 and 2022.

In its Final 2020 UWMP Guidebook, DWR provided sources of data for weather information since weather is directly linked to water supplies in California. The web links may be useful for MPWD and its stakeholders and can be accessed at the websites below.

- The National Weather Service Website: https://www.weather.gov/
- National Oceanic and Atmospheric Administration (NOAA): https://www.climate.gov/
- California Irrigation Management Information System: https://cimis.water.ca.gov/
- Western Regional Climate Center: https://wrcc.dri.edu/
- Department of Water Resources (CDEC) https://cdec.water.ca.gov/
- U.S. Geological Survey: https://maps.waterdata.usgs.gov/mapper/?state=ca

7.2.3 Water Service Reliability

Every urban water supplier is required to include an assessment of its water service reliability to its customers through at least 2040, in five-year increments, during normal, dry, and multiple dry water years [Water Code Section 10635(a)].

Reliability of the SFPUC Regional Water System

Since the MPWD purchases 100% of its water from the SFPUC, it is highly dependent on the SFPUC RWS infrastructure reliability. The SFPUC's nearly completed Water System Improvement Program (WSIP) provides improvements in reliability for water delivery and supply through the SFPUC RWS. The SFPUC's 2020 Capital Improvement Program (CIP) includes various projects to enhance reliability of the SFPUC RWS.[110]

In addition to SFPUC's infrastructure reliability for the RWS, the imported water available to SFPUC's retail and wholesale customers is constrained by climate, geology, hydrology, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir and snow-pack storage to manage its water supplies. A summary of SFPUC's vulnerability assessment related to climate change is included in Section 6.2.10.1.

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020.[111]
The SFPUC's LOS Goals and Objectives related to water supply are:

SFPUC Program Goal	SFPUC System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	▪ Meet all state and federal regulations to support the proper operation of the water system and related power facilities. ▪ Meet average annual water demand for the regional system of 265 mgd and for wholesale suppliers (BAWSCA agencies) of 184 mgd from the SFPUC watersheds for customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. ▪ Meet dry-year delivery needs while limiting rationing to a maximum 20 % system-wide reduction in water service during extended droughts. ▪ Diversify water supply options during non-drought and drought periods. ▪ Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

These performance objectives serve as the basis for water supply planning by SFPUC for the RWS.

SFPUC Alternative Water Supply Planning Program[112]

[110] SFPUC 2020 Capital Improvement Plan, adopted February 11, 2020. San Francisco Public Utilities Commission : 2020 Agendas-Minutes
[111] SFPUC, Reliability of the Regional Water System, February 3, 2020.

[112] SFPUC, Draft Common Language, February 3, March 30, 2021. (Also see Appendix 7.)

SFPUC's Water System Improvement Program (WSIP) Dry Year Water Supply Projects authorized the SFPUC to undertake several water supply projects to meet dry-year demands with no greater than 20% system-wide rationing in any one year.

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program (AWSP). The drivers for the program include: (1) the adoption of the BDP and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) SFPUC's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service Goals to limit rationing to no more than 20% system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls.

SFPUC's planning priorities for the AWSP are:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers
5. Meet dry-year delivery needs while limiting rationing to a maximum of 20% system-wide reduction in water service during extended droughts.
6. Diversify water supply options during non-drought and drought periods.
7. Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.
8. Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat.
9. Maintain operational flexibility.

Capital projects under consideration to develop additional water supplies include:

- Surface water storage expansion.
- Recycled water expansion.
- Water transfers.
- Desalination.
- Potable reuse.

SFPUC's capital projects would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yields from these projects are not currently incorporated into SFPUC's supply projections. SFPUC plans to pursue state and federal grants and other financing opportunities for eligible projects, to the extent feasible, to offset costs borne by ratepayers. The main regional projects include:

- Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply). [113]

[113] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented. Source: SFPUC, February 3, 2020.

- ACWD-USD Purified Water Partnership (Regional, Normal- and Dry-Year Supply).
- Crystal Springs Purified Water (Regional, Normal- and Dry-Year Supply).
- Los Vaqueros Reservoir Expansion (Regional, Dry Year Supply).
- Bay Area Brackish Water Desalination (Regional, Normal- and Dry-Year Supply).
- Calaveras Reservoir Expansion (Regional, Dry Year Supply).
- Groundwater Banking (Regional, Dry-Year Supply) in the Modesto Irrigation District and Turlock Irrigation District service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts.
- Inter-Basin Collaborations (Regional, Dry-Year Supply) Establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

Additional information about these projects is in Appendix 7.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives, unless the supply risks are significantly reduced or BAWSCA service area needs change significantly, the SFPUC will need to continue to plan, develop, and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited.

Additional BAWSCA Efforts to Facilitate Water Supply Reliability

BAWSCA's role in the development of the 2020 UWMP updates is to work with its member agencies and the SFPUC to facilitate consistency among UWMP documents. Appendix 6 contains data and communications from BAWSCA and SFPUC that are used in MPWD's 2020 UWMP.

BAWSCA, on behalf of its member agencies, facilitates local projects that augment water supply reliability. BAWSCA's key water management objective is to ensure that a reliable, high-quality supply of water is available where and when people within the BAWSCA service area need it. A reliable supply of water is required to support the health, safety, employment, and economic opportunities of the existing and expected future residents in the BAWSCA service area and to supply water to the agencies, businesses, and organizations that serve those communities.

In 2018, BAWSCA began working with SFPUC to amend the 2009 Water Supply Agreement (WSA) between SFPUC and BAWSCA's member agencies. One amendment to the 2009 WSA requires the SFPUC to formally engage with BAWSCA during the SFPUC's development of its 10-year CIP. This element will enhance the CIP development and focus attention on facilities that continue to improve reliability of the SFPUC RWS. An updated and restated WSA (November 2018) was executed by the SFPUC and BAWSCA's member agencies in August 2019.[114]

[114] BAWSCA, August 2019.
https://bawsca.org/water/reliability

In June 2020, BAWSCA completed its Demand Study that presents updated information about the BAWSCA service area demands and demand management as part of its strategy for a long-term reliable supply. The Demand Study identifies demand management measures for the commercial, irrigation, and residential sectors, and system water loss management. In planning for water service reliability during droughts, BAWSCA worked with SFPUC to develop a two-Tier drought allocation plan: Tier 1- for SFPUC retail customers, and Tier 2 – for BAWSCA Wholesale Customers. They are explained below.

SFPUC's Tier 1 Plan for drought allocations

SFPUC's "Tier 1 Plan" applies when the SFPUC determines that a system-wide water shortage exists, and a declaration of a water shortage emergency is issued under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods. The SFPUC's Tier 1 Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier 1 Plan requires SFPUC's Retail Customers to conserve a minimum of 5% during droughts. If SFPUC's Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail, then the excess % would be re-allocated to the Wholesale Customers' share. The additional water conserved by SFPUC Retail Customers up to the minimum 5 % level is deemed to remain in storage for allocation in future successive dry years.

BAWSCA's Tier 2 Drought Allocations

BAWSCA agencies have negotiated and adopted the Tier 2 Plan that applies only to water shortages less than 20%. Once SFPUC identifies a Tier 1 shortage, then BAWSCA allocates the collective Wholesale Customer share from the available SFPUC Tier 1 Plan supply among each of the 26 Wholesale Customers for drought shortages. The Tier 2 allocations are based on a formula that considers multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee (ISG; MPWD's ISG is 3.891 mgd or 1420[115] MG/year).
- Seasonal use of all available water supplies.
- Residential per capita use.

The water made available to the Wholesale Customers collectively is allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the Water Supply Agreement (WSA), and is fixed. [116] The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component

[115] MPWD's ISG (3.891 mgd) value is rounded from 1,420.215 MG year, based on 365 days.
[116] See Water Supply Agreement, Water Shortage Allocation Plan (Revision 2 – Attachment C Revised September 2017) https://bawsca.org/water/reliability

in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier 1 Plan, by the Wholesale Customer's Allocation Factor.

The Tier 2 Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier 2 Plan when adopted for water shortages that are up to 20%. The Tier 2 Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier 2 Plan through the end of 2021.

However, since the SFPUC Tuolumne River supply is projected to be reduced by 40% after 2023, for the 2020 UWMP, BAWSCA had to develop an alternate allocation method.

BAWSCA Updated 2020 UWMP Drought Cutbacks based on SFPUC Water Supply Reliability

As discussed in earlier chapters, BAWSCA's role in representing the interests of its 26 member agencies is to work with SFPUC to ensure that the SFPUC meets its contractual obligations to maintain its infrastructure and provide a reliable, high quality, potable water supply at a fair price.

The updated drought cutback allocations that BAWSCA developed for the 2020 UWMPs are based on SFPUC's scenario with and without the BDP (see Appendix 7).[117] BAWSCA's drought allocation cutback calculations use the SFPUC RWS supply reliability models under extreme hydrologic conditions and on actual historic and forecast MPWD water demands through 2045.

Note that the SFPUC derived the five-year consecutive drought based on the driest five-year sequence in the hydrologic record. This supply condition is a requirement of Water Code Section 10612. The SFPUC has provided information about the likelihood of this severe condition in Appendix 7.

MPWD's Service Reliability

MPWD's water service reliability assessment is based on historic and current information about water use patterns in its service area, SFPUC's RWS water sources, and SFPUC's water supply reliability. In its assessment, MPWD also includes impacts from climate change projections.

MPWD's Submittal Tables 7-2, 7-3A and Table B, and Submittal Table 7-4A and Table B summarize the water supply reliability for a normal (average) year, a single dry year, and five- consecutive dry years, respectively, for 2025, 2030, 2035, 2040, and 2045.

Summary information and specific references used are also included with the Submittal tables in the "Notes" section.

[117] BAWSCA, April 1, 2021. (Also see Appendix 6.)

In its reliability assessment, MPWD considers:

- Expected demand reduction due to increased implementation of Demand Management Measures.
- Potential for increased demands due to increased irrigation use due to low rainfall.
- Implementation of its updated 2020 WSCP with six drought stages.
- Increased drought messaging to sustain multi-year drought reductions.
- Savings from local ordinances and standards.
- Working collaboratively on regional projects to potentially increase regional water supply.
- The potential for acquiring supplemental water supplies.

In Section 7.2.4, Description of Management Tools and Options, MPWD discusses potential management actions that it may take in response to the SFPUC shortages in MPWD's Submittal Table 7-5A and Table 7-5B. These two tables show projected shortages of SFPUC supply with and without the BDP compared with MPWD's projected demand.

DWR's Optional Planning Tool

DWR provided an optional Planning Tool Worksheet for 2020 UWMP preparation. DWR's optional Planning Tool was introduced earlier in Chapter 4.

MPWD is not using the Planning Tool, instead MPWD is using information from SFPUC, BAWSCA, and its demand projections from the 2020 DSS Model, and January 2021 updates. MPWD's planning for drought cutbacks includes historical, current, and forecasts about water use, water sector growth, population, jobs, and conservation.

7.2.3.1 Water Service Reliability – Normal Year

In Submittal Table 7-2, DWR requests suppliers to provide their normal year supply and demand for comparison, in five-year increments through at least 2040. For the 2020 UWMP, the normal year supply for BAWSCA agencies is 100% of Wholesale agency demands, as explained earlier.

Therefore, in MPWD's Submittal Table 7-2, under both with and without BDP scenarios, MPWD's normal SFPUC supply is 100% of its demand. The SFPUC normal year supply will meet MPWD's projected demands for 2025, 2030, 2035, and 2040, and 2045.

MPWD is not part of a RUWMP, therefore Submittal Table 7-2 shows a normal-year supply from SFPUC and demand in the MPWD service area. MPWD does not use non-potable supplies, therefore only its potable supply from SFPUC is included.

Table 7-3. Normal Year Supply and Demand Comparison (Submittal Table 7-2).

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Optional)*
Supply totals *(autofill from Table 6-9)*	1,044	1,037	1,051	1,055	1,069
Demand totals *(autofill from Table 4-3)*	1,044	1,037	1,051	1,055	1,069
Difference	0	0	0	0	0

NOTES: Units: MG per calendar year. For "Normal year" SFPUC supply uses projected Wholesale customer demands. This SFPUC approach is different from prior supply basis (e.g., 2015 UWMPs), that used contractual Supply Assurance values for a "normal year". MPWD's Supply Assurance (ISG) from SFPUC is 3.891 MGD, or 1420 MG per year.

7.2.3.2 Water Service Reliability – Single Dry Year

A single dry year supply and demand are presented in Submittal Table 7-1 (for 2020) and in Submittal Table 7-3 (for 2025 – 2045). DWR requests that suppliers provide their single dry year supply and demand for comparison, and through at least 2040, in five-year increments.

MPWD includes its supply reliability using both SFPUC scenarios: Submittal Table 7-3 (A), with BDP and Table 7-3 (B), without BDP through 2045.

As can be seen in Submittal Table 7-3 (A), with the BDP, for a single dry year Supply and Demand Comparison, MPWD will experience significant water supply cutbacks with SFPUC supply delivery ranging from only 64% (36% cutback) in 2025 to 54% (46% cutback) in 2045 of MPWD's demand. These SFPUC supply shortfalls will invoke MPWD's WSCP Level 4 for 2025 through 2040 and Level 5 for 2045. MPWD will have to work closely with its customers and monitor the effectiveness of its WSCP. Since extended reductions of 36% to 46% are extreme and unprecedented in MPWD's service area, additional measures may be necessary. The reduction measures for all Stages of MPWD's WSCP are discussed in MPWD's 2020 WSCP, Attachment 1.

DWR requires that suppliers only use one scenario to input data into the Water Use efficiency Data (WUE) portal.

MPWD submitted Submittal Table 7-3(A), with BDP, in the WUE portal to comply with the 2020 UWMP requirements and to be consistent with its supplier, SFPUC.

Table 7-4. Single Dry Year Supply and Demand Comparison (Submittal Table 7-3A, with BDP).

Submittal Table 7-3 (A) Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Optional)
Supply totals*	668	661	668	672	580
Demand totals*	1,044	1037	1,051	1,055	1,069
Difference	(376)	(376)	(383)	(383)	(489)
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES: Units: MG. Data for "Supply Totals" is from: SFPUC, March 30, 2021, and BAWSCA Tables, 4/1/21: A, G2, H2, I2, J2, K2 (for first year drought, column 1). The SFPUC model results (SFPUC, March 30, 2021) for "with BDP" project that cutbacks for MPWD will range from 36% for 2025 - 2040 and 46% in 2045. If SFPUC implements such drastic cutbacks, without augmenting its supply to meet demand, SFPUC will not be complying with its contractual obligations to MPWD. See Table 7-3B, SFPUC scenario without the BDP, in MPWD's 2020 UWMP for comparison. MPWD is including "with BDP" projections to be consistent with its wholesale supplier SFPUC, but the implementation of the BDP is highly					

uncertain and not necessarily reflective of future regulatory constraints and hydrological conditions. These projections constitute an extremely conservative, worst-case scenario planning projection.

As can be seen in Table 7-3 (B), without the BDP, for a single dry year supply and demand comparison, MPWD will receive 100% of its demand from 2025 to 2045.

Table 7-5. Single Dry Year Supply and Demand Comparison, (Table 7-3B, without BDP).

Table 7-3 (B) Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	1,044	1,037	1,051	1,055	1,069
Demand totals*	1,044	1037	1,051	1,055	1,069
Difference	0	0	0	0	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES: Units: MG. Data for "Supply Totals" is from: SFPUC, March 30, 2021, Table 4g and BAWSCA Tables A and N, 4/1/21. The SFPUC model results (SFPUC, March 30, 2021) for "without BDP" project that SFPUC will be able to meet MPWD's demand for a single dry year from 2025 - 2045 and meet its contractual obligations. See Submittal Table 7-3A, SFPUC scenario with BDP, in MPWD's 2020 UWMP for comparison.					

MPWD is not part of a Regional UWMP (RUWMP), therefore Submittal Table 7-3 (A), with, and Table 7-3 (B), without BDP, show the single dry-year supply from SFPUC, and projected demand in the MPWD service area. MPWD does not use non-potable supplies, therefore only its potable supply from SFPUC is included.

7.2.3.3 Water Service Reliability – Five Consecutive Dry Years

In Submittal Tables 7-1 and 7-4, DWR requests suppliers to provide their comparison of supply and demand for multiple (five) consecutive dry years: for 7-1 from 2021 to 2025 (near-term) and for 7-4, from 2025 through at least 2040 (long-term).

As can be seen in Submittal Table 7-4 (A), with BDP, for multiple dry years supply and demand comparison, from 2025 through 2045, MPWD will experience significant water supply cutbacks. The SFPUC model results (SFPUC, March 30, 2021) for "With BDP" project that up to 54% cutbacks will result for MPWD. For multi-year droughts SFPUC projects in the first year a 36% for 2025, with escalating cuts up to 54% in the fourth and fifth drought years of 2045.

Such shortfalls will invoke MPWD's WSCP Level 5 in the second year of 2025 and Level 6 starting the fourth year in 2040 and 2045. The demand reduction measures for all Levels of MPWD's 2020 WSCP are discussed in the WSCP, Attachment 1. If SFPUC implements such drastic cutbacks, without augmenting its supply to meet demand, SFPUC will not be complying with its contractual obligations to MPWD. MPWD's potential mitigation actions to reduce water use for multiple years are discussed in in the WSCP, Attachment 1.

Table 7-6. Multiple Dry Years Supply and Demand Comparison, (Submittal Table 7-4A, with BDP).

Submittal Table 7-4A Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Optional)
First year	Supply totals	668	661	668	672	580
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	(376)	(376)	(383)	(383)	(489)
Second year	Supply totals	573	566	573	577	580
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	(471)	(471)	(478)	(478)	(489)
Third year	Supply totals	573	566	573	577	580
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	(471)	(471)	(478)	(478)	(489)
Fourth year	Supply totals	573	566	573	507	496
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	(471)	(471)	(478)	(548)	(573)
Fifth year	Supply totals	573	566	526	507	496
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	(471)	(471)	(526)	(548)	(573)
Sixth year *(optional)*	Supply totals	NA	NA	NA	NA	NA
	Demand totals					
	Difference	NA	NA	NA	NA	NA
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						

NOTES: Units: MG. Data for "Supply Totals" is from: SFPUC, March 30, 2021, and BAWSCA Tables, 4/1/21: A, D, G2, H2, I2, J2, K2 (for multiple-year droughts, all columns). The SFPUC model results (SFPUC, March 30, 2021) for "With BDP" project that up to 54% cutbacks are projected by SFPUC for MPWD. For multi-year droughts SFPUC projects in the first year a 36% for 2025, with escalating cuts up to 54% in the fourth and fifth drought years of 2045. If SFPUC implements such drastic cutbacks, without augmenting its supply to meet demand, SFPUC will not be complying with its contractual obligations to MPWD. See Table 7-4B, SFPUC scenario without BDP, in MPWD's 2020 UWMP for comparison. MPWD is including "with BDP" projections to be consistent with its wholesale supplier SFPUC, but the implementation of the BDP is highly uncertain and not necessarily reflective of future regulatory constraints and hydrological conditions. These projections constitute an extremely conservative, worst-case scenario planning projection.

As can be seen in the table below, for multiple dry years, the SFPUC model results for "Without BDP" project that SFPUC will meet demand for dry years 1 through 5 until 2045. In 2045, shortages are forecast in the fourth and fifth years at 10%.

DWR requires that suppliers only use one scenario to input data into the Water Use efficiency Data (WUE) portal. MPWD submitted Submittal Table 7-4 (Submittal Table 7-4 A), with Bay Delta Plan in the WUE portal to comply with the 2020 UWMP requirements and to be consistent with its supplier, SFPUC.

Table 7-7. Multiple Dry Years Supply and Demand Comparison, (Table 7-4B, without BDP).

Table 7-4B Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Optional)
First year	Supply totals	1,044	1,037	1,051	1,055	1,069
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	0	0	0	0	0
Second year	Supply totals	1,044	1,037	1,051	1,055	1,069
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	0	0	0	0	0
Third year	Supply totals	1,044	1,037	1,051	1,055	1,069
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	0	0	0	0	0
Fourth year	Supply totals	1,044	1,037	1,051	1,055	960
	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	0	0	0	0	(110)
Fifth year	Supply totals	1,044	1,037	1,051	1,055	960

	Demand totals	1,044	1,037	1,051	1,055	1,069
	Difference	0	0	0	0	(110)
Sixth year *(optional)*	Supply totals	NA	NA	NA	NA	NA
	Demand totals					
	Difference	NA	NA	NA	NA	NA
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: Units: MG. Data for "Supply Totals" is from: SFPUC, March 30, 2021, and BAWSCA Tables A and M, Table N, 4/1/21 for years 2025 through 2040, and Table O2 for 2045. The SFPUC model results for "Without BDP" project that SFPUC will meet demand for dry years 1 through 5 until 2045. In 2045, shortages are forecast with the first, second and third years at 0% and 10% in the fourth and fifth years. See Submittal Table 7-4A, SFPUC scenario with BDP, in MPWD's 2020 UWMP for comparison.						

SFPUC Rate Impacts for Wholesale Customers During Water Shortages[118]

The SFPUC includes a variable component to water rates for most customer classes. As a result, as sales decrease, revenues are lost on a per unit basis. Because the marginal cost of water production is relatively small, as production is reduced, the cost of service remains the same. For both retail and wholesale customers, a reduction in water purchases, whether voluntary or mandated, would require the SFPUC to raise rates, cut costs, or use existing fund balance reserves to cover its expenses. The financial planning and rate-setting process is complex and iterative. While major impacts of a water shortage on rates are described below, the full process, especially for large water shortages, would incorporate significant stakeholder discussion about tradeoffs and financial impacts.

The SFPUC's current retail water rates have a provision for a "drought surcharge" that automatically increases adopted rates in the event of a declared water shortage. The drought surcharge is calculated so that, accounting for the expected reduction in retail water usage, total revenues are equal to what they would have been without the reduction. The drought surcharge protects the SFPUC's financial stability during water shortages and provides customers an incentive to meet conservation targets.

For Wholesale Customers, the rate-setting process is governed by the terms of the WSA, which provides that, in the event of a water shortage emergency, the Commission may adjust wholesale rates in an expedited way concurrently with the imposition of drought surcharges on retail customers. Beyond drought rate setting and emergency rate setting, rates are set annually in coordination with the SFPUC annual budget process and are based on the forecasted wholesale share of regional water system expenditures and total purchases. If Wholesale Customer usage is expected to decrease, either voluntarily, or due to shortages, this would be incorporated into the wholesale rate forecast, and rates may increase.

[118] SFPUC, 2020 UWMP Rate Impacts of Water Shortages Common Language, Final, March 4, 2021. (Also see Appendix 7.)

7.2.4 Description of Management Tools and Options

According to Water Code Section 10620(f), urban water suppliers are required to describe management tools and options used that will maximize resources and minimize the need to import water from other regions.

BAWSCA agencies have long-term contracts with SFPUC to purchase water. The 26 BAWSCA agencies rely on SFPUC imported water as a significant source of high-quality potable water that is not pumped from groundwater basins or directly diverted from the Sacramento Bay Delta. Several of the BAWSCA agencies, including MPWD, do not have alternate water supplies and solely rely on their contract with SFPUC to supply water for their service area.

Over the past decade, MPWD has taken significant demand management measures to reduce its water demand. MPWD's GPCD, 97 Gallons Per Capita Per Day (GPCD, Chapter 5, Table 5-2), is significantly lower than its 2020 Target of 121 GPCD and is evidence that MPWD's demand management tools are successful. MPWD continues to implement advanced technology and other measures to reduce its demand. Below is a summary of MPWD's water management tools that are being implemented and planned to minimize the need for imported SFPUC water.

MPWD has invested significant resources to add modern technologies and implement management measures, including:

- Installation of 100% of Advanced Metering Infrastructure (AMI) meters for near real-time metering of water use. In the past 10 years, MPWD has invested more than $3.5 million in this advanced technology to:
    - Continuously track all meters and water use.
    - Engage with customers about their water use and identify potential leaks through an email and text alert 'ping' within hours, rather than through a monthly bill with potentially abnormally high consumption and cost to customers.
    - Provide almost real-time water consumption data for its customers through MPWD's AMI customer portal.
- Installation of Supervisory Control and Data Acquisition (SCADA) for:
    - Pressure zone management.
    - Spatial identification for maintenance areas to improve visibility of service areas requiring a higher level of maintenance.
    - Spatial identification of line breaks and break frequency to prioritize line replacement.
    - System alarms for drop in water pressure, potentially indicative of water leaks.
- Requesting customers to conserve 10% water use – alerts customers to be vigilant water stewards.
- Local Ordinances that target water efficiency:
    - Prohibition on water waste
    - Tiered water rates.
    - Drought water rates.
- Geographic Information Systems (GIS) is being used for system mapping and to review and confirm the data from DWR for single family residential landscaped areas in its service area.
- Increased implementation of Demand Management Measures (DMMs).

MPWD is in early planning stages to:

- Investigate the use of groundwater and recycled water.
- Coordinate with other water agencies to share regional water resources.

MPWD will have to work closely and continuously with its customers when implementing the Levels 4 through 6 WSCP measures. Since extended emergency reductions of more than 40% are unprecedented and will be very difficult to sustain. Additional alternate supplies and measures may be necessary.

BAWSCA Water Conservation Programs

BAWSCA implements two programs intended to promote water efficiency: (1) the Core program and (2) the Subscription Program, as discussed below.[119]

The Core Program is funded through the annual BAWSCA budget and contains those conservation measures that benefit from regional implementation and that provide regional benefits, irrespective of individual agency jurisdictions. The Subscription Program is fully funded by the individual agency that elects to participate in the program. The extent of funding is based on agency participation level and includes conservation measures whose benefits can be realized in individual water agency service areas.

MPWD is participating in all three of the Core Program and nine of the 10 subscription Program elements. MPWD is not participating in *(2) High-efficiency Clothes Washer Rebates.

BAWSCA Core Water Conservation Program

1. Landscape education classes – Core
2. Waterwise garden online tool – Core
3. Public Outreach – Core

BAWSCA Subscription Water Conservation Program:

1. High efficiency toilet (HET) Rebates.
2. High-efficiency Clothes Washer Rebates. *
3. School Education – Water-wise kits.
4. School Education – Earth-capades Assemblies.
5. School Education – Tuolumne River Trust.
6. Large landscape audits.
7. Rain barrel rebates.
8. Lawn-be-gone landscape rebates.
9. Smart irrigation controller rebate program.
10. Water loss management program.

7.3 Drought Risk Assessment (DRA)

The 2020 UWMP requires that every urban water supplier includes a DRA, Demand Management Measures (DMMs), and water supply projects [Water Code Section 10635(b)]. In Submittal Table 7-5, the DRA, DWR requires suppliers to provide their five-year drought sequence, supply, and demand for comparison, from 2021 through 2025, including planned Water Shortage Contingency Plan (WSCP) actions.

The Water Code Section 10635(b) permits urban water suppliers to conduct an interim update or updates to this DRA within the five-year cycle of its urban water management plan update. This allows Suppliers to modify the DRA as more information becomes available, supplies, or uses change, and in the event of unforeseen circumstances.

[119] BAWSCA Annual Conservation Program Report for FY 2018-19.
https://bawsca.org/uploads/pdf/BAWSCA_Annual_Conservation_Programs_Report_FY2018-19_FINAL.pdf

The DRA is required to include:

- Data and methods used.
- Basis for the supply shortage conditions.
- Determination of the reliability of each water source.
- Comparison of total water supplies and demands during the drought.

In accordance with Water Code Section 10612, the DRA evaluation is based on the five driest consecutive years on record. Water Code Section 10635 also requires that the analysis includes plausible changes in climate, regulations, and other locally applicable criteria.

For the DRA, the SFPUC provided their model results of a five-year consecutive drought. The SFPUC model used the driest five-year sequence in the hydrologic record based on an 8.5-year simulated drought and provided the two scenarios (with and without BDP) discussed in detail earlier in Section 7.2.1 (Appendix 6). SFPUC specified that BAWSCA agencies could choose to use either scenario.

However, for its 2020 UWMP and DRA, SFPUC used the "with BDP" scenario. Given that SFPUC, MPWD's supplier, is using the "with BDP" scenario with unprecedented supply reductions, MPWD also uses the "with BDP" scenario for its DRA and Submittal tables. The supply conditions provided by SFPUC in both scenarios are analyzed in this section.

MPWD includes its supply reliability using both SFPUC scenarios: Submittal Table 7-5 (A), with BDP and Table 7-5B, without the BDP. The SFPUC model shows that with the BDP, in multiple dry years between 2021 and 2025, the supply will range from 100% of MPWD's demand in the first year (2021) and second year (2022), but starting the third year, in 2023, when the BDP Amendment is assumed to be implemented, a 47% reduction in supply is projected through 2025[120]

MPWD will experience significant water supply shortfalls with the BDP in multiple dry years. These shortfalls will invoke MPWD's WSCP Level 5 in the third year (2023) through fifth year (2025) of a multi-year drought. To reduce the need for continued extreme demand reductions, additional regional water supplies and recycled water will need to be available for MPWD.

The SFPUC's projections for available supplies for Wholesale agencies translate to significant cutback allocations for all BAWSCA agencies.

Table 7-8. Five-year Drought Risk Assessment – (Submittal Table 7-5A, with BDP).

Submittal Table 7-5: (A) Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	967
Total Supplies	967
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	

[120] SFPUC: Regional Water Supply Reliability, Table 7, March 30, 2021.

Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	1,022
Total Supplies	1,022
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	1,022
Total Supplies	540
Surplus/Shortfall w/o WSCP Action	(482)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	482
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%
2024	**Total**
Total Water Use	1,022
Total Supplies	540
Surplus/Shortfall w/o WSCP Action	(482)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	482
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%
2025	**Total**
Total Water Use	1,022
Total Supplies	540
Surplus/Shortfall w/o WSCP Action	(482)
Planned WSCP Actions (use reduction and supply augmentation)	

WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	482
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%
NOTES: Units: MG. Data for "Supply Totals" is from: SFPUC, March 30, 2021, and BAWSCA Tables, 4/1/21: B for "Total water use" for "Total Supplies with BDP" Table F2 (for multiple-year droughts, all columns). The SFPUC model results (SFPUC, March 30, 2021) for "With BDP" up to 47% shortfalls are projected for MPWD. Since MPWD does not have alternate supplies currently, the SFPUC shortfalls will necessitate that MPWD reduces its demand by 47% starting in 2023. If SFPUC implements such drastic cutbacks, without augmenting its supply to meet demand, SFPUC will not be complying with its contractual obligations to MPWD. See Table 7-5B, SFPUC scenario without BDP, in MPWD's 2020 UWMP for comparison. MPWD is including "with BDP" projections to be consistent with its wholesale supplier SFPUC, but the implementation of the BDP is highly uncertain and not necessarily reflective of future regulatory constraints and hydrological conditions. These projections constitute an extremely conservative, worst-case scenario planning projection.	

DWR requires that suppliers only use one scenario to input data into the Water Use efficiency Data (WUE) portal.

Table 7-9. Five-year Drought Risk Assessment – (Table 7-5B, without BDP).

Table 7-5: (B) Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	967
Total Supplies	967
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	1,022
Total Supplies	1,022
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	1,022
Total Supplies	1,022
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	

2024	Total
Total Water Use	1,022
Total Supplies	1,022
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	

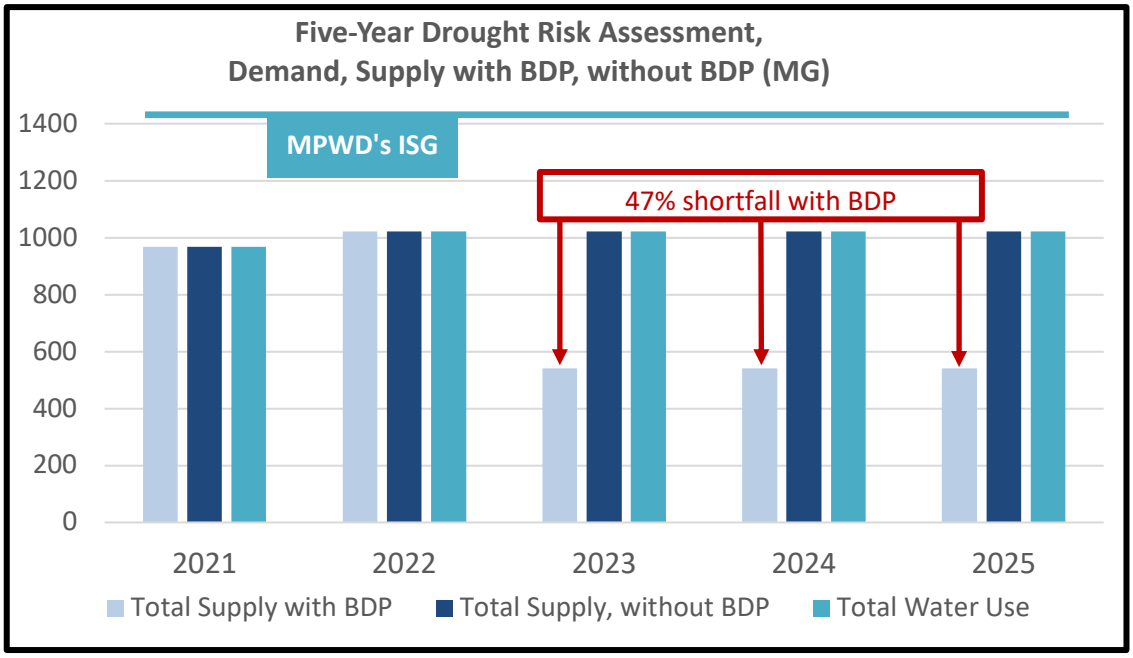
2025	Total
Total Water Use	1,022
Total Supplies	1,022
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	

NOTES: Units: MG. Data for "without BDP": "Supply Totals" is from: SFPUC, March 30, 2021, for "Total Supplies without BDP" Table 8. "Total water use" is from Table B (BAWSCA, April1, 2021). The SFPUC letter states (SFPUC, March 30, 2021) "the supply projections for 2021 to 2025 are based on meeting 2020 levels of demand. However, in years when the Bay-Delta Plan Amendment is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests." See Submittal Table 7-5 (A), SFPUC scenario with BDP, in MPWD's 2020 UWMP for comparison.

MPWD submitted Submittal Table 7-5 (A), with BDP in the WUE portal to follow the 2020 UWMP requirements and for consistency with its supplier, the SFPUC. MPWD may revise its DRA, as permitted by DWR, outside of its 2020 UWMP.

Figure 7-2 illustrates MPWD's contractual Supply Assurance from SFPUC (MPWD's ISG, 1420 MG), MPWD's forecast demand, SFPUC's projected supply for a single dry year for 2021 through 2025, and the resulting shortfall of 47% due to SFPUC model results for supply reductions with the BDP.

Figure 7-3. MPWD's ISG, forecast demand, SFPUC supply with and without BDP.



Water Shortage Contingency Plan (WSCP) Actions, to address Water Code Section 10635(b)

To achieve sustained multi-year water reductions, up to 47% during SFPUC supply shortages will necessitate that MPWD implements significant demand reduction measures from its WSCP Level 5.

MPWD's measures could include, but not be limited to:

- Extreme restrictions of its domestic water supply.
- Mandatory reductions on indoor water uses.
- Per capita allocations for indoor water use for health and safety.
- Prioritize water use for essential domestic sanitation and other critical needs.
- Prohibit irrigation with domestic water.
- Prohibit outdoor domestic water use, except for fire-fighting and critical needs.
- Implement drought water rates and penalties for exceeding allocations.
- Increase water shortage emergency rates using MPWD's legal authorities. (E.g., Ordinance 112, Attachment 103A, Schedule of Rates and Fees with Ordinances 111 and 113.)
- Strict enforcement of waste prohibitions.

During the 2012 through 2016 drought, MPWD sustained up to 27% in its water reductions. The demand reductions necessitated MPWD to implement multiple measures, including diverse and continued public notifications, rebates for water-efficient fixtures, indoor and outdoor water use restrictions, and drought water rates. The measures were used in combination and staff could not attribute specific water savings to specific measures. Clearly outdoor water use restrictions contributed significantly to water demand reductions. Additionally, since MPWD has invested in AMI technology, it has almost real-time consumption data that can help with water management by pressure zones and through close monitoring of water-use sector consumption.

The key means by which MPWD will be able to sustain more than 40% reductions for extended periods of time without additional supplies, will require severe restrictions of potable use outdoors and lowering its (already low) water losses.

MPWD could theoretically achieve water demand reductions up to approximately 41%. The theoretical demand reductions are based on calculating MPWD's 2020 domestic water production and wastewater discharge volume:

- MPWD's production: 974 MG/year.
- Wastewater to SVCW: - 539 MG/year.
- Non-sewer (identified as non-domestic) use including Irrigation water = Production (974) – [wastewater (539) + water loss (39)] = 396 MG/year.

Therefore, non-domestic use in 2020 was approximately 396 MG/year, or almost 41% of MPWD's 2020 water demand. Although water savings of 41% from non-sewer uses are highly unlikely, the potential for the highest potable water savings are from outdoor and other non-potable uses.

For the "without BDP" scenario, MPWD has no projected supply reductions. As can be seen in the DRA, Table 7-5 (B), without the BDP, for five consecutive dry years, 2021 through 2025, MPWD will experience no water supply shortfalls.

The SFPUC projects that in multiple dry years, without the BDP, the Wholesale Customer supply will meet demands.[121]

7.3.1 Data, Methods, and Basis for Water Shortage Condition

DWR requires that suppliers provide a description of the data used for the DRA. Although the SFPUC and BAWSCA data are described earlier in this chapter because the DRA can be updated separately from the UWMP five-year plan cycle, a summary description is presented below.

In its DRA, MPWD includes data and information from the SFPUC and BAWSCA. The SFPUC developed hydrologic models based on the DWR-required scenarios for a multi-year drought. All documentation received from the SFPUC and BAWSCA for decisions to determine supply shortage conditions, used fin MPWD DRA is provided in Appendix 6. Details about SFPUC's RWS models are included in SFPUC's Draft 2020 UWMP.[122]

All the "with BDP" Submittal Tables presented earlier in this chapter include SFPUC's assumption and modelling results for full implementation by the SWRCB of the BDP Amendment beginning in 2023. All BAWSCA tables assume that the cutbacks for Wholesale Customers are from their purchase forecasts the RWS through 2045. When 184 mgd, 100% of SFPUC's water supply assurance, is available to the Wholesale Customers, 100% of MPWD's ISG is available to MPWD, 3.891 mgd, or 1420 MG per year.

[121] SFPUC: Additional Regional Water Supply Reliability Modeling Results, Table 8, March 30, 2021. (Also see Appendix 7.)
[122] SFPUC 2020 UWMP, June 2021. https://sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf

Assumptions about the status of the dry-year water supply projects included in SFPUC's Water System Improvement Program (WSIP) are provided in the table 'WSIP Project Assumptions'.[123] The tables reflect SFPUC's instream flow requirements at San Mateo and Alameda Creeks in SFPUC's San Francisco Bay Area local watersheds.

7.3.2 DRA Individual Water Source Reliability

DWR requires suppliers to include an assessment of the reliability of each water source over the five-consecutive-year drought under a variety of water shortage conditions in the DRA. In contrast, the water service reliability assessment only requires an assessment of total water supply.

Since MPWD' total water supply relies 100% on SFPUC's water supply, for MPWD's DRA, it relies entirely on information from the SFPUC about its service reliability. The current information from SFPUC includes significant assumptions and uncertainty about its supply reliability and ability to meet its contractual obligations.

In its DRA, MPWD presents the potential challenges to its normal year supplies. Unlike drought cutbacks in prior years, if the BDP is implemented as SFPUC presents in its 2020 UWMP, with extreme supply reductions during multi-year droughts, severe demand cutbacks for MPWD are projected. SFPUC forecasts reductions in their Tuolumne River supply of up to 40%. The RWS-wide supply reductions translate to the most severe cutbacks of 47% during multi-year droughts for MPWD, as shown in Submittal Table 7-5 (A).

The regulatory conditions and negotiations about the Bay Delta Plan are continually evolving, therefore conditions could change from those documented in SFPUC's and MPWD's 2020 UWMPs. The SFPUC's two scenarios present contrasting results. Based on the current negotiations between SFPUC and the State Water Board, as well as other stakeholders, neither of the two scenarios appears to be final.

With this uncertainty, the MPWD may consider an update to its DRA (see Section 7.3) prior to the 2025 UWMP update if significant new information becomes available. The Water Code Section 10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update.

Even implementation of the strongest mitigation measures in Level 5 of MPWD's 2020 WSCP, will likely necessitate augmentation with alternate water supplies. For example, availability of a cost-effective recycled water supply would benefit non-potable use in MPWD's service area. Funding will need to be available to develop such alternate supplies.

Separate Potable and Non-Potable

MPWD does not have a non-potable source of water, therefore its DRA is for its SFPUC potable water supply.

Monthly or Other Time-Step

DWR recommends that suppliers conduct their DRA on a time-step that best identifies water supply and use constraints that may affect water shortages.

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[123] SFPUC Regional Water System supply reliability letter from SFPUC, Table 1, January 22, 2021, and March 30, 2021. (Also see Appendix 7.)

For its DRA, MPWD uses an annual 'time-step' for its DRA, because MPWD's SFPUC supply is based on an annual allocation, rather than a monthly allocation. Due to the Mediterranean climate in MPWD's service area, variability in seasonal temperatures and rainfall are normal, therefore monthly, and seasonal variability in water use is typical for its service area. MPWD tracks monthly and annual water supply and use based on SFPUC AMI production meters and its AMI consumption meters. MPWD's AMI meter monthly and annual consumption data are also tracked for all water use sectors.

7.3.3 Optional Planning Tool Workbook

MPWD is not using the Optional Planning Tool Workbook.

7.3.3.1 Instructions for Using the Optional Planning Tool

MPWD is not using the optional Planning Tool DRA Worksheet for reasons already stated.

7.3.3.2 Figures 7-1 through 7-5. Optional Tool Supply Worksheets for the DRA.

MPWD is not using the optional Planning Tool DRA Worksheet for reasons already stated.

MPWD requests that users of the water supply and cutback data in its 2020 UWMP and WSCP contact MPWD staff for potential updates before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations. MPWD anticipates updates from SFPUC for its water supply reliability and the DRA.

8. WATER SHORTAGE CONTINGENCY PLAN – SEE ATTACHMENT 1

Lay Description

The purpose of a Water Shortage Contingency Plan (WSCP) is to provide direction on specific actions to be taken by staff and customers in response to increasingly severe water supply shortage conditions. Water shortage conditions can arise due to various environmental and human-caused conditions, such as earthquakes, fires, power outages, water quality impairment, droughts, or contamination from hazardous material spills. MPWD's 2020 WSCP may be used to address water shortages and conditions requiring voluntary and mandatory water use reductions or restrictions.

MPWD's WSCP addresses all the requirements of Section 10632 of the California Water Code that state that the Urban Water Management Plan (UWMP) shall provide an urban water shortage contingency analysis that includes information on the estimated five-year water supply, actions in the event of a water shortage, water waste prohibitions, non-essential water uses during a water shortage, mechanisms for determining water use reductions, revenue and expenditure impacts and the emergency preparedness and plans for catastrophic events.

The MPWD's WSCP is a document that stands alone — therefore it is separate from the UWMP and can be amended, as needed, without amending the corresponding UWMP. MPWD's 2020 WSCP is in Attachment 1. The DWR requires that MPWD's 2020 WSCP is submitted at the same time as MPWD's 2020 UWMP.

The submittal date to DWR of MPWD's 2020 UWMP and WSCP was July 1, 2021. However, due to unprecedented circumstances and modeling results from its supplier, the SFPUC, indicating drastic supply reductions during droughts, MPWD determined it needed to provide an appropriate amount of time for its public review period. MPWD submitted a letter to DWR before the July 1st deadline explaining the unprecedented situation and the need to extend the public outreach and review period. (See Appendix 2.)

New requirements for MPWD's 2020 UWMP impact the 2020 WSCP. These requirements include a water supply analysis for the new Drought Risk Assessment (DRA) and consideration of climate change in future projections. The conclusions drawn from MPWD's water supply characterization are integrated into the DRA (Chapter 7, MPWD 2020 UWMP). MPWD coordinates with land use and planning authorities for future projections about management and mitigation actions to address in its updated 2020 WSCP.

The goal of MPWD's WSCP is to provide transparency about MPWD's decision process for water shortages, include practical and necessary actions, and add flexibility for future shortage conditions that require additional specialized solutions. The MPWD staff provided extremely valuable input from their experience with voluntary and mandatory measures employed during the recent drought and regulatory conditions between 2012 through 2016.

The MPWD's WSCP presents a systematic approach to implement the actions for the six Shortage Levels in the case of water shortage conditions from its sole supplier, the SFPUC. This plan is part of MPWD's drought policy, as it specifies preparedness actions for droughts and other impacts on its water supply. The WSCP anticipates water supply shortages and provides pre-planned guidance for managing and mitigating a Supplier's shortage. MPWD's WSCP allows for adjustments to manage water shortage conditions based on the annual supply availability from SFPUC. In severe drought conditions, MPWD's WSCP provides guidance for planning and implementing actions to address extreme emergencies and shortage levels.

In its WSCP, MPWD also refers to actions in its Draft Emergency Response Plan (ERP)[124] and its Hazard Mitigation Plan for its evaluation of Seismic risk that is part of the Local San Mateo County Hazard Mitigation Plan (SMC LHMP).[125] MPWD's 2020 WSCP is its operating manual for its staff, management, Board, and the public to manage water shortages and prevent catastrophic service disruptions through proactive steps. Other entities, such as cities, counties, state, and federal agency water managers, regulators, and decision makers; local media; and business community groups; may also need to refer to the key elements of MPWD's WSCP.

MPWD requests that users of the water supply and cutback data in its 2020 UWMP and WSCP contact MPWD staff for potential updates about MPWD's water supply reliability and the DRA, before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

MPWD's WSCP is in Attachment 1.

[124] MPWD Draft Emergency Response Plan, 2020.
[125] San Mateo County Local Hazard Mitigation Plan, Volume 2, Section 3, Part 2, Chapter 4, 2016. (Also see Appendix 12.)
https://cmo.smcgov.org/multijurisdictional-local-hazard-mitigation-plan-resources. The SMC LHMP is in the process of being updated.

9. DEMAND MANAGEMENT MEASURES

Lay Description

Water demand management is an integral part of sustainably managing water resources. Implementing water use Demand Management Measures (DMMs) that help lower demands can improve the water service reliability and help meet local, regional, and California's water conservation goals.

The goal of this chapter is to provide a comprehensive description of the water conservation programs that a supplier has implemented, is currently implementing, and plans to implement to meet its urban water use reduction targets.

There are no new requirements regarding DMMs since the 2015 UWMP.

Since MPWD is a Retail Supplier (as defined in Section 10608.12), the sections in this chapter focus only on retail requirements and information. The following sections are included:

9.1 Existing Demand Management Measures for Retail Suppliers.
9.2 Implementation to Achieve Water Use Targets.
9.3 Water Use Objectives (Future Requirements).

In addition to participating in BAWSCA's three Core and nine Subscription conservation programs (discussed in Chapter 7, Section 7.2.4 and WSCP), in 2020, MPWD updated its DSS Model to include the updated water conservation measures it is and plans to continue implementing.[126]

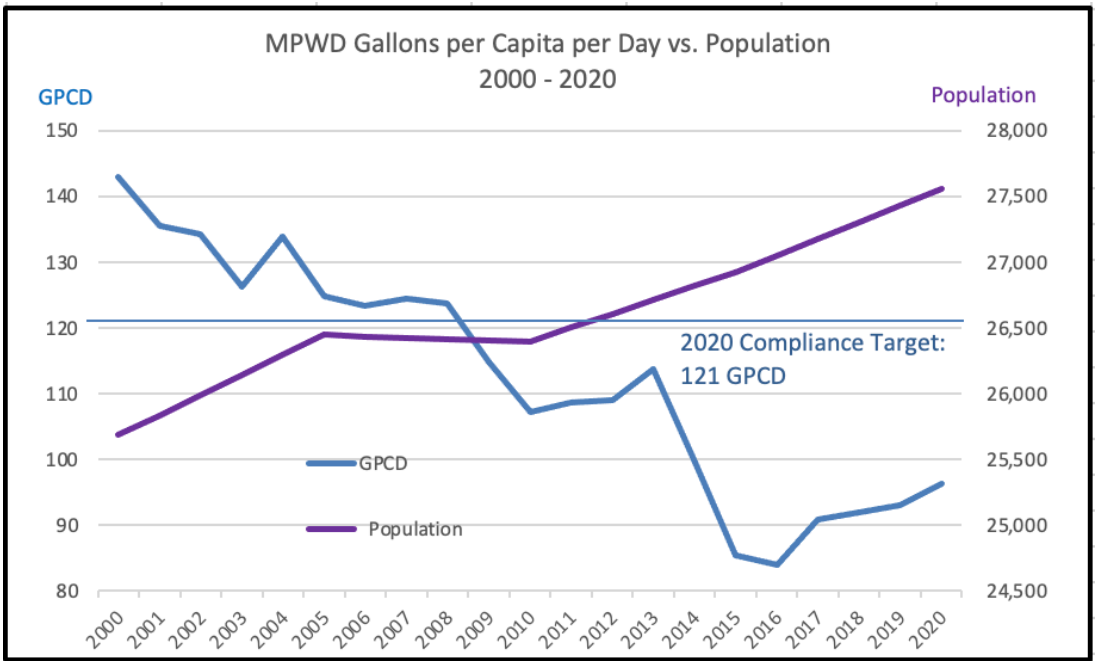
MPWD's DMM categories include:

1. Water waste prevention.
2. Metering.
3. Conservation pricing.
4. Public education and outreach.
5. Programs to assess and manage distribution system real loss.
6. Other DMMs, such as conservation promotion and rebates to implement innovative conservation technologies.

MPWD has systematically implemented its water conservation measures over the years and despite a 7% increase in population since 2000, MPWD has reduced its Gallons per Capita per Day (C) by 33% or 47 GPCD. Figure 9-1 illustrates MPWD's GPCD decline and population growth from 2000 to 2020.

[126] MPWD updated 2020 DSS Model, June 2020.

Figure 9-1. Mid-peninsula Water District's GPCD decline compared to population growth.



9.1 Existing Demand Management Measures for Retail Suppliers

Water Code Section 10631(e) requires that retail suppliers describe their water DMMs and include the nature and extent that each water DMM was implemented over the past five years [10631(e) (1)(A)]. Additionally, a discussion about planned DMMs to achieve its water use targets is also required.

MPWD provides a description of their DMMs in the subsections below.

MPWD also discusses its demand reduction measures specific to water supply shortfall conditions in its WSCP, Section 3.4.1, and lists its WSCP Levels in Table 3.3 (Submittal Table 8.2).

9.1.1 Water Waste Prevention Ordinances

Water Code Section 10631 (e) requires that retail suppliers describe their water DMM(s) for water waste prevention.

MPWD's Ordinance 103 addresses water waste prevention and it is always in place and is not dependent on a water shortage for implementation.[127]

[127] Ordinance 103.
https://storage.googleapis.com/midpeninsulawaterorg/uploads/Ordinance_Current_Water_Service2.pdf

MPWD's water waste prevention Ordinance 113 explicitly states that the waste of water is to be prohibited. The ordinance also prohibits specific actions that waste water, such as excessive runoff from landscape irrigation or use of a hose outdoors without a shut off nozzle.[128]

Requirements from the California Model Water Efficient Landscape Ordinance (MWELO), "Adopting water-efficient landscaping" are part of PWD's Ordinance 115, Water Efficient Landscape Ordinance (WELO). MPWD's Ordinance 115, implemented and established specific outdoor water efficiency requirements for new accounts and existing accounts undergoing site renovations.[129] The purpose of Ordinance 115 is to provide the legal authority to support and enforce installation of water-efficient landscaping.

MPWD restricts the following uses of water:

1. Application of potable water to outdoor landscapes in a manner that causes runoff.
2. Use of hoses for any purpose without a positive shut off valve.
3. Use of potable water to wash sidewalks, driveways, plazas, and other outdoor hardscapes for reasons other than health and safety.
4. Use of single pass cooling systems, fountains, decorative water features, and commercial car washes.
5. Application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall.
6. To promote conservation, hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily and display notice of this option in guestrooms.
7. Members of the public are encouraged to report incidents of water waste online or by phone to MPWD and staff investigate and respond to all reports. MPWD also has step-by-step instructions on its website for customers to follow explaining how to detect leaks.[130]

9.1.2 Metering

All 8,116 of MPWD's service accounts are fully metered and billed by volume and meter size. MPWD has been fully metered for decades.

MPWD's AMI metering program

MPWD maintains its metering system through testing, calibration, and replacement. As part of its water system maintenance procedures, MPWD tests and calibrates its meters every two years. Faulty meters are either calibrated, fixed, or replaced.

MPWD started implementing an Advanced Metering Infrastructure (AMI) system in 2012 to upgrade customer water meters with automated, advanced metering technology. MPWD completed the

[128] Ordinance 113. https://storage.googleapis.com/midpeninsulawater-org/uploads/ORDINANCE%20No.%20113%20Amend%20Ord%20111%20WSCP%20Stage%2022.pdf

[129] Ordinance 115. https://storage.googleapis.com/midpeninsulawater-org/uploads/Approved_Ordinance_No0.115_WELO_B2.pdf

[130] MPWD website, leak detection assistance for customers. https://www.midpeninsulawater.org/leakdetect

installation of its AMI system in January 2020. In the past 10 years, MPWD has invested more than $3.5 million in this advanced technology. Since January 2020 all meters are part of MPWD's AMI system.

The AMI meters collect data frequently as opposed to manual monthly meter reading. The AMI hourly data enable fast leak detection to reduce water waste and customer costs. Additionally, MPWD's AMI system has a customer interface portal that may help to increase awareness of water use and encourage water conservation practices.

MPWD's AMI system enables additional tools for managing water, such as monitoring of use trends in aggregate, by sector, or for individual customers. The AMI system collects hourly water consumption data through the automated reading system. The data are analyzed for excessive and continuous usage that may be indicative of leaks. Using AMI hourly data, MPWD can identify potential unusual and continuous consumption. MPWD's customer web portal is available to all customers to view their water use. The customer "Home Water Report" portal was launched in 2019. Using the "Home Water Report" portal customers can view their hourly, daily, weekly, monthly, and annual water use.[131] MPWD's AMI system is discussed in more detail in Chapter 4 and in MPWD's WSCP.

In 2016, California passed Senate Bill 7 (SB 7) that requires new multi-family residential buildings in California constructed after January 1, 2018, to include a submeter for each dwelling unit and to bill tenants in apartment buildings accordingly for their water use.[132]

As of January 23, 2015, MPWD requires submetering for new developments. This requirement is included in Ordinance 112 and requires the metering of individual units in new multifamily, condos, townhouses. Landscape irrigation for multi-family residences is also metered separately.

MPWD's Water Efficient Landscape Ordinance 115, requires dedicated irrigation meters for new CII construction more than 500 sq ft.

For large, institutional, landscaped areas, MPWD has installed 71 dedicated landscape meters. These dedicated AMI landscape meters can be used for compliance with future water use standards for large, landscaped areas as well as for calculating MPWD's future water use objectives.

9.1.3 Conservation Pricing

MPWD discusses its conservation pricing in its WSCP, Section 3.7 – Legal Authorities. MPWD's tiered pricing structure is always in place and is not dependent on a water shortage for implementation. MPWD's tiered rate structure is an example of conservation pricing where efficient water use is billed at a lower price and higher water use is billed at progressively higher prices.

MPWD's Ordinance 112 amends the Water Service Ordinance No. 103 for the MPWD Rates and Charges. The purpose of this Ordinance is to provide the legal authority to support, enforce, and set the schedule of rates and fees. MPWD's Ordinance No. 120 – "An Ordinance Amending Attachment "A" Regarding Rates

[131]MPWD website, Home water report setup instructions for customers. https://www.midpeninsulawater.org/home-report

[132] SB7. Wolk. Housing: water meters: multiunit structures (September 25, 2016).

and Charges to The Water Service Ordinance for The Mid-Peninsula Water District". The purpose of this Ordinance is to provide the legal authority to support and enforce MPWD's tiered rates.

Additionally, MPWD has a conservation rate structure that includes drought rates. MPWD's conservation pricing uses to the cost of service (per California Constitution, Article 13C added Nov. 5, 1996), as required by Proposition 218. MPWD's drought rate structures and surcharges are also discussed in its WSCP.

During shortages, SFPUC, MPWD's supplier, may also change its rate structure, which could affect MPWD's rates.

9.1.4 Public Education and Outreach

Throughout the year, MPWD promotes conservation through education using various means, including social media, digital and print newsletters, bill inserts, email, direct mailings, local media, and its website.

MPWD's public education and outreach program includes in-person and online outreach to residential customers, school and all CII customers, landscapers, and contractors.

For several decades, the Mid-Peninsula Water District (MPWD) has been involved in outreach to local community schools to promote awareness of water resources. All MPWD School programs are free to participants.

Annually, MPWD, in collaboration with local elementary schools, hosts the "Water Awareness Calendar" poster contest for 3rd to 5th Grade students. The contest promotes: "If Everyone Saves a Little, We Can All Save a Lot". It also encourages early participation in water conservation measures. Winning entries are chosen and featured in MPWD's annual calendar that is available to customers, local schools, and community groups and businesses.

MPWD also hosts field trips from local schools for an interactive, educational experience at its facilities. The curriculum includes: an educational hour where a water conservation video is shown, presentation about a scale model of the water system. The presentation includes exploration of the water cycle, followed by a second hour of hands-on demonstrations and craft activity.

The Water Wise Resources Action program for Grade school children includes a classroom curriculum about water and energy for teachers with program support and free home water and energy saving devices. Incentives and awards are also available to participating teachers and students.

The Earthcapades Assembly Program is a water science, conservation, and appreciation show specifically designed for grades K-8. Earthcapades performers demonstrate the water cycle, water's role and vitality in our lives, and need for our actions to respect, protect, and conserve it. Educational content and theatrical displays are designed to engage, challenge, and inspire students.

The Tuolumne River Trust Classroom Presentation program, "That's the Tuolumne in My Tap!", is an interactive presentation and a hands-on water activity for schools. The classroom presentation by Tuolumne River Trust staff provides students with a virtual tour of the Tuolumne River highlighting the Hetch Hetchy watershed, wildlife, history, and ways to protect and conserve water.

During the COVID-19 pandemic MPWD's in-classroom and in-person presentations were temporarily suspended in compliance with public health and safety requirements. These programs are expected to resume in 2022.

MPWD's outreach program includes:

1. Free water conservation items on an ongoing basis (e.g., retrofit kits, efficient aerators for faucets, toilet flapper valves, showerheads).
2. Host BAWSCA Water Efficient Landscape Classes (spring and fall).
3. Informational conservation (water only served upon request) table "tents" for restaurants.
4. Annual theme campaigns (e.g., in 2015 a call to action: 20 Ways to Save 20%, In 2020-21, a call to action to voluntarily reduce outdoor water use by 10%).
5. Water conservation articles published in local newspapers and community newsletters (e.g., Chamber, City of Belmont, HOAs).
6. Monthly conservation tips in customer monthly billing statements.
7. Bi-annual "Waterline" newsletter to customers.
8. Annual Water Conservation report to customers.
9. Conservation page on MPWD's website with a video about saving water, residential seasonal watering schedule, and water waste prevention.
10. Conservation information using links to water websites (e.g., BAWSCA, SFPUC, DWR, ACWA).
11. Water conservation inquiry form, for customers to submit questions.
12. Offer Belmont Redwood Shores School District Field Trips Grades 3-5.
13. Water awareness calendar annual contest for grades 3-5.
14. Regional School Education Programs (part of BAWSCA's Subscription program: e.g., WaterWise, Earthcapades, Tuolumne River Trust classroom presentations).
15. Community events participation (e.g., booth for City Events: earth day, public works week, national night out).
16. Various educational materials about water as a resource (e.g., pamphlets, activity sheets).
17. Community conservation banner displays twice a year in MPWD's service area.

Other outreach tools include resources specific to outdoor water use efficiency (e.g., WaterWise gardening tool and landscape water savings calculator) as well as general information on water conservation through community events, websites, and social media.

In the next two years, MPWD plans to develop additional education materials about water, for example:

- Customer Open House – Water conservation education program with demonstrations, water games and other educational materials promoting water awareness and efficiency.
- High School – Contests promoting water awareness using different formats, such as: film, articles, poems, songs.
- Efficient landscaping educational guide for local Homeowners Associations (HOAs).

Residential Outdoor Water Surveys

Outdoor water surveys are offered for existing customers. Normally those with high water use are targeted and provided a customized report on how to save water. These surveys can be combined with indoor surveys or focused on certain customer classes. Residential customers are eligible for free landscape water surveys upon request.

Typically, during the surveys, the surveyor will check for leaks, provide direction on appropriate irrigation scheduling, demonstrate how to set irrigation controllers, provide guidance on plant selection, and offer additional ways to increase outdoor efficiencies (car washing, pool covers, mulch etc.). If needed, low-cost, general-use, outdoor efficiency fixtures are handed out during the survey.

Large Landscape Outdoor Water Surveys and Waterfluence Program

The Waterfluence program is a Subscription program through BAWSCA, and it is for large landscapes. This program includes a customized monthly water budget for customers with substantial landscaping. Customers can view their water use through an interactive portal that shows actual water use compared to a budget benchmark for each site. The budget is based on real-time weather and site-specific conditions.

MPWD's website provides additional educational and public outreach materials, such as: Water Conservation reports, Tips and Tricks for conservation, step-by-step information for detecting water leaks, and public notices, such as MPWD's 2020 UWMP preparation.

For fiscal year 2020-21, using its web site and billing inserts, MPWD is requesting that customers voluntarily reduce their outdoor water use by 10%.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

Programs to assess and manage distribution system real loss.

Water losses were discussed in detail in Chapter 4, Section 4.2.4. In compliance with SB 555 requirements, MPWD maintains a thorough annual accounting of its water losses – apparent and real – using AWWA water system audit software.[133] The water loss reports are submitted to DWR annually and the validated reports for 2015 - 2019 are included in Appendix 11.

Real losses are physical water losses resulting from a leak, a burst or overflow. Real losses can be an indicator of inefficiency on a distribution network, or in under-invested, aging infrastructure. The data MPWD reviews to analyze its real water Includes water production (purchased water from SFPUC), consumption (sales to MPWD customers), and quantity of water produced but not sold (non-revenue water). Non-revenue water may be water used for system maintenance, fire-fighting, or other legitimate uses, or it may also include water losses due to leaks in MPWD's distribution system. As a result of MPWD's infrastructure management and monitoring, and maintenance, calibration, and replacement of its meters, MPWD has consistently had low water losses, as shown in Table 4-4.

In addition to MPWD's proactive routine maintenance, consumption tracking and leak surveys, MPWD's five-year Capital Improvement Program (CIP), MPWD includes dozens of retrofits to upgrade aging infrastructure and improve pressure regulation that can also reduce leakage. For example, MPWD is implementing various line replacement projects to upgrade existing aging pipelines. Additionally, the Hillcrest Pressure Regulating Station project will add a new pressure regulating station for the Zone 1 connection to the SFPUC supply line to eliminate Zone 1 pressure fluctuations.

MPWD will review the new draft distribution system loss standard when it is developed by the State Water Board.[134]

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[133] AWWA water loss software. https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control

[134]SWRCB water loss control web site:
https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/water_loss_control.html#resources

California Water Code Section 10608.34 requires *urban retail water suppliers* to conduct and submit validated water loss audit reports to the Department of Water Resources on October 1, annually.

9.1.6 Water Conservation Program Coordination and Staffing Support

As discussed in Chapter 7, Section 7.2.4 and MPWD's WSCP, MPWD participates in all BAWSCA Core program elements and nine out of 10 Subscription elements.

To manage its Water Conservation program effectively, MPWD staff from administration, operations, and engineering work together and analyze the water supply and demand data. The Conservation staff person tracks water consumption monthly by sector using the AMI and Springbrook billing systems. Staff analyze annual water use trends and communicate with customers about their water use and MPWD's conservation program. In addition to water conservation information on its website, MPWD developed an annual Conservation Report that it posts on its website.[135]

Additionally, for its five-year CIP, MPWD staff collaborate to prioritize and implement CIP projects. In the recent CIP development, Operations staff, the District Engineer, and management systematically reviewed the MPWD's infrastructure and developed a water hydraulic model to identify system deficiencies and rehabilitation areas. This was an 18-month process and one in which institutional knowledge of the MPWD system blended with engineering know-how and management experience resulting in the development of a comprehensive roster of needed capital projects.

9.1.7 Other Demand Management Measures

MPWD implements additional demand management measures, such as rebates for innovative conservation technologies and practices. MPWD promotes its rebate program on its website.[136] Through its "Adopting water-efficient landscaping", Ordinance 115, Water Efficient Landscape Ordinance (WELO), MPWD has the legal authority to support and enforce installation of water-efficient landscaping.

Additional actions MPWD has implemented include:

- In 2010, MPWD started implementing California's Indoor Model Water Use Efficiency Ordinance.
- In 2014, MPWD implemented a plan check and review process for new and rehabilitated landscape projects (thresholds: for new CII projects – 500 sq ft, for renovation projects – 1,000 sq ft).
- In 2015, MPWD adopted its own Outdoor Water Use Efficiency Ordinance (WELO).[137]

Rebates offered by MPWD

MPWD offers financial Incentives for its residential and commercial customers to upgrade their irrigation equipment, use local alternate water sources (rainwater, graywater), and improve landscaped areas to increase efficiency. MPWD offers rebates for climate-appropriate plants, adding compost and mulch to retain soil moisture, and water-efficient irrigation systems.

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[135] MPWD's Water Conservation web page. https://www.midpeninsulawater.org/documents#tabs-3
[136] MPWD rebates for water efficiency. https://www.midpeninsulawater.org/rebates
[137] Ordinance 115, Amended in 2015. https://storage.googleapis.com/midpeninsulawater-org/uploads/Approved_Ordinance_No0.115_WELO_B2.pdf

MPWD offers rebates for "smart watering" using rotating sprinkler nozzles and weather-based Irrigation Controllers (WBICs) to promote efficient irrigation. WBICs use current local weather data to adapt landscape irrigation schedules, only watering plants when they need it. MPWD's lawn replacement, "Lawn Be Gone!", program provides a per-square-foot incentive for customers to remove turf and replace it with water-efficient plants or permeable hardscape.

Rebates for capturing rainwater provide financial support to install containers (barrels and cisterns) for collecting rainwater. MPWD also offers rebates for graywater retrofits.

9.2 Reporting Implementation

MPWD provides a description of how their DMMs were implemented in the subsections below.

9.2.1 Implementation Over the Past Five Years

Water Code Section 10631(e)(1)(A) requires retail water suppliers to describe the nature and extent of each water demand management measure implemented over the past five years, from 2016 through 2020 [Water Code Section 10631 (1)(A)].

Note that during the COVID-19 pandemic (2020 - 21), in compliance with public health requirements, all in-person events were temporarily suspended.

MPWD's DMMs that were implemented for the five past years or more include:

1. Water Waste Prevention Ordinances. Both Ordinance 103 and Ordinance 113 address MPWD's mandated water waste prohibitions. For the past five years, MPWD continued to prohibit water waste and promote water leak detection.[138] MPWD also tracks and analyzes its system water losses using the standardized AWWA water loss evaluation protocols.[139] MPWD's Ordinances are further discussed in its WSCP, Section 3.7, Legal Authorities.

2. Metering, AMI. MPWD started its installation of the AMI system in 2012 and completed its installation in January 2020. The AMI system is discussed in more detail in Section 9.1.2 – Metering. In the past two years, MPWD has implemented a customer portal where customers can sign up, input their household information, view their hourly, daily, monthly, and annual water use reports online, and receive notifications about potential water leaks.

3. Conservation Pricing. MPWD has used conservation pricing, by employing tiered rates via its Ordinances 112 and 120 since 2015. For the past five years, MPWD continued to bill its customers using tiered rates. Conservation pricing is discussed in Section 9.1.3. MPWD is in the process of updating these Ordinances.

4. Public Education and Outreach. Annually and in the past five years, MPWD sponsors a variety of educational programs for schools, public outreach events, and through various other media, including MPWD's website, as described in Section 9.1.4.

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[138] MPWD's Water Leak detection information, website. https://www.midpeninsulawater.org/leakdetect

[139] AWWA water loss evaluation protocols. https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control.

5. Programs to Assess and Manage Distribution System Real Loss. Since 2014, annually MPWD uses AWWA software to monitor and analyze its system's water loss using data from its AMI and Springbrook billing systems. For the past five years, MPWD has continued to use AWWA software and water loss evaluation protocols.[140] Annually, MPWD submits its validated water loss data to DWR, and the water loss reports are included in Appendix 11.

The metering data that are used for water loss analysis include accounting for production – purchases from SFPUC, MPWD service area consumption – sales by customer sectors, water used but not sold (non-revenue water), and total metered production vs. total consumption. Billing data are reviewed monthly for errors and mis-registering meters. MPWD's water loss program is discussed in Section 4.2.4.

6. Other Demand Management Measures. MPWD's Water Conservation program has offered rebates for water-saving devices and practices since 2008. In the past five years, MPWD has focused its rebate program to increase efficiency for landscape irrigation. Towards this goal, MPWD has offered in-classroom and hands-on landscape education classes, and to set an example for its community, at the district office, MPWD converted its landscaping to climate-appropriate plants.

7. Water Conservation Program Promotion. Annually and in the past five years, MPWD sponsors a variety of conservation promotion programs for schools and its customers, including free water conservation kits and rebates as advertised through various other media, including MPWD's website and described in Sections 9.1.4 and 9.1.7.

8. Water Conservation Program Coordination and Staffing Support. The MPWD's Water Conservation program Coordinator collaborates internally and externally to support the program. Collaboration within MPWD includes staff from Administration, Operations, Engineering, and Management, including the General Manager to ensure that water efficiency is integrated within MPWD's operations and projects.

The MPWD's Water Conservation Program Coordinator also participates in BAWSCA's Conservation Group meetings and regional Core and Subscription water efficiency programs, as discussed in Chapter 7, Section 7.2.4. For CII landscaping, MPWD participates in the Waterfluence program (a BAWSCA subscription program) and for the past five years, 44 of the large landscape accounts were assigned a water budget. Other water efficiency measures that MPWD implemented during the past five years include:

1. Water Audits; proactive and customer-initiated service for leak checks.
2. Hotel Water Audits.
3. Business (Commercial) Water Audit Program.
4. Green Business Certification Inspections at San Mateo County's Request.
5. The MPWD was a signatory of the California Urban Water Conservation Council's (CUWCC's) Memorandum of Understanding (MOU) for the duration of its existence from 1991 to 2016, agreeing to voluntarily meet and report on conservation BMPs. During that time, the MPWD implemented conservation measures in accordance with CUWCC BMP compliance goals and met requirements for biannual BMP reporting.

   Until 2016, MPWD participated in the CUWCC BMP Reporting Program. However, the CUWCC and its BMP program ended in 2016. The replacement organization, the California Water Efficiency

[140] IBID.

Partnership (CalWEP), currently does not have a BMP program. The MPWD is a member of CalWEP.

9.2.2 Implementation to Achieve Water Use Targets

Using the list of DMMs, the Water Code Section 10631(e)(1)(A) requires urban retail water suppliers to describe the nature and extent of each water demand management measure that the supplier has used and plans to implement to achieve its water use targets pursuant to Section 10608.20.

MPWD's 2020 Compliance Target is 121 GPCD. In 2020, MPWD's total gallons per capita per day (GPCD) is 97 GPCD, while its indoor GPCD is 53 GPCD. MPWD's implementation of its DMMs and water efficiency program support the sustainability of its compliance with the 2020 Compliance Target and to comply with future requirements. As can be seen in Figure 9-1, MPWD has met its compliance Target. The DMMs were discussed in detail in sub-sections of Section 9.1.

MPWD expects to continue implementing all the DMMs presented in this chapter to continue achieving its water use targets.

9.3 Water Use Objectives (Future Requirements)

In 2018, California Governor Brown Jr., signed Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman). These bills provide a framework for implementing new standards to establish "Conservation as a California Way of Life".

Conservation as a California Way of Life

The goal of "Conservation as a California Way of Life" is to prepare the state for droughts and climate change. The new standards are being developed by DWR and must be adopted by the SWRCB by July 2022 and retail suppliers like MPWD must start annual reporting on compliance with the water use objective by November 2023.

SB 606 and AB 1668 add requirements beyond the SB X7-7 legislation to increase California's resiliency in future droughts, by establishing standards for the following:

- Residential indoor water use with an initial per person water use of 55 gallons per day until 2025, 52.5 gallons per day from 2025 to 2030, and 50 gallons per day beginning in 2030.
- Outdoor irrigation (residential and dedicated landscape water meters).
- Performance measures for Commercial, Institutional, and Industrial (CII) water use.
- Water loss standards.

DWR expects to complete these requirements in 2023. In the first report from retail suppliers, DWR will require information on what DMMs suppliers will implement to meet their objectives.

MPWD is implementing its Water Efficiency Program in alignment with the "California Conservation Way of Life" framework. Mandatory monthly state reporting took effect October 1, 2020, and MPWD is in compliance with the conservation reporting.

10. PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Lay Description

This chapter provides guidance for addressing the Water Code requirements for a public hearing, the UWMP and WSCP adoption process, submitting an adopted UWMP and WSCP and making these plans available to the public, plan implementation, and the process for amending an adopted UWMP and WSCP. Since 2015, the public processes for completing the UWMP have not been revised. However, the WSCP is a new component of the 2020 UWMP that can be amended separately from the UWMP (Attachment 1).

MPWD's UWMP and WSCP will be adopted separately to allow for the WSCP to be revised and re-adopted on a shorter timeline than the rest of MPWD's UWMP.

MPWD's 2020 UWMP and WSCP contain significant changes from the 2015 plans. As presented in detail in Chapter 7 and in MPWD's WSCP, new UWMP requirements and unprecedented reductions in water supply were provided in SFPUC's forecasts for droughts. These changes make the current UWMP and WSCP public process even more important than in previous cycles.

To support the public process, MPWD notified DWR that it is extending its public comment period beyond the July 1 submittal date, to July 22, 2021 (Appendix 2). MPWD's Board of Directors and its General Manager considered the extension for the public comment period to ensure sufficient time for its public input process, important.

To facilitate awareness about the UWMP and WSCP, initially MPWD sent out notices to cities, San Mateo County, its customers, SFPUC, BAWSCA and member agencies, and others on January 27, 2021. Information about MPWD's 2020 UWMP Update was included on MPWD's web page on April 14, 2021. To notify the public about its public hearings, MPWD also published notices in the local newspaper and on its website on June 10, June 17, July 8, and July 15, 2021.

MPWD held two public hearings with presentations on June 24 and July 22, 2021. The additional time provided more opportunity for the public to participate in the process and to ensure engagement throughout its service area about the draft UWMP and WSCP preparation. Also, this extended schedule provided ample opportunity for community involvement in the UWMP and WSCP process.

As required, in this chapter, MPWD records the process it followed to adopt and implement its UWMP and WSCP.

Chapter 10 includes the following sections:

10.1 Inclusion of all 2020 Data.
10.2 Notice of Public Hearing.
10.3 Public Hearing and Adoption.
10.4 Plan Submittal.
10.5 Public Availability.
10.6 Notification to Public Utilities Commission.
10.7 Amending an Adopted UWMP and/or WSCP.

The specific UWMP requirements and MPWD's compliance actions are presented in the following sections.

10.1 Inclusion of All 2020 Data

In its 2020 UWMP, MPWD is reporting on a calendar year, therefore, as required, 2020 data are included.

10.2 Notice of Public Hearing

The public hearing provides an opportunity for the public to provide input to the plan before it is adopted. The MPWD's Board of Directors shall consider all public input.

There are two audiences to be notified for the public hearing: cities and counties and the general public.

10.2.1 Notice to Cities and Counties

Water Code Section 10621(b) requires that suppliers notify cities, counties, and the public prior to a public hearing that they are planning to review the UWMP and consider changes or amendments to it. Suppliers are only required to hold one public hearing.

MPWD held two public hearing meetings prior to adopting its 2020 UWMP and WSCP.

The following subsections describe the process MPWD uses for the required notices.

10.2.1.1 60-Day Notification

The Water Code states that cities and counties must be notified that the Supplier will be reviewing the UWMP and considering amendments to the UWMP. This notice must be sent at least 60 days prior to the public hearing.

On January 27, 2021, well in advance of the 60-day requirement, MPWD sent notifications about its intent to review and update its 2015 UWMP and WSCP to:

- The City of Belmont.
- The City of San Carlos.
- San Mateo County.

An additional notice and promotional card were sent to customers notifying them about MPWD's 2020 UWMP and WSCP public review and meeting process on MPWD's website. All copies of notices are included in Appendix 4.

Due to the importance of changes in its 2020 UWMP and WSCP, MPWD held two public hearings on June 24 and July 22, 2021, separately from the adoption meeting on September 23, 2021. Also, to encourage active involvement from MPWD's diverse social, cultural, and economic elements of its population within its service area, MPWD extended its public review and comment period from June 10 to July 22, 2021.

Suppliers are required to provide notice of the time and place of the public hearing to any city or county within which they provide water. This applies to both public and private water suppliers. Per Government Code Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1, the Supplier holding the public hearing must do so consistent with the Dymally-Alatorre Bilingual Services Act. This law requires the following:

Government Code Section 7291

…every local public agency… serving a substantial number of non-English-Speaking people, shall employ a sufficient number of qualified bilingual persons in public contact positions or as interpreters to assist those in such positions, to ensure provision of information and services in the language of the non-English-speaking person."

This means that if the Supplier's audience for the UWMP and/or WSCP hearing includes a substantial number of the population that are not able to speak or understand English, the Supplier should provide interpreters. The determination of whether this language assistance is needed is based on the discretion of the Supplier (per Government Code Section 7293).

MPWD reviewed its service area audience and determined that based on an analysis of the service area demographics, interpretive services were not required.

10.2.1.2 Submittal TABLES

Submittal Table 10-1 presents MPWD's notification to the cities of Belmont and San Carlos and San Mateo County.

Table 10-1. Retail. Notification to Cities and Counties.

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Belmont	Yes	Yes
City of San Carlos	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
San Mateo County	Yes	Yes
NOTES: MPWD sent initial notices about planning to review its UWMP and WSCP and consider changes or amendments to it on January 27, 2021, to the Cities of Belmont and San Carlos, as well as San Mateo County. See Appendix 4 for copies of notices.		

Table 10-2 presents additional notifications MPWD sent to water and other public agencies, including SFPUC, BAWSCA and its member agencies.

Table 10-2. Additional notifications to public agencies.

Additional Notifications	
Additional Notifications: BAWSCA, BAWSCA Member Agencies.	60 Day Notice
Bay Area Water Supply and Conservation Agency	Yes
City of Foster City	Yes
Purissima Hills Water District	Yes
Coastside County water District	Yes
North Coast County Water District	Yes
City of San Bruno	Yes
City of Mountain View	Yes
City of Millbrae	Yes
California Water Service Company	Yes
City of Brisbane	Yes
Water Resources, Stanford University	Yes
Alameda County Water District	Yes
City of Hayward	Yes
City of Sunnyvale	Yes
City of Menlo Park	Yes
Town of Hillsborough	Yes
City of Palo Alto	Yes
City of Daly City	Yes
City of Redwood City	Yes
City of Santa Clara	Yes
City of Milpitas	Yes
City of Burlingame	Yes
City of East Palo Alto	Yes
Westborough Water District	Yes
Additional Notifications: Other Public Agencies	
San Mateo Consolidated Fire Department	Yes
San Mateo County Manager's Office	Yes
Chief of Police, City of Belmont	Yes
Parks and Recreation, City of Belmont	Yes
Community Development, City of Belmont	Yes
Public Works, City of Belmont	Yes
San Mateo LAFCo	Yes
San Francisco Public Utilities Commission	Yes
Silicon Valley Clean Water	Yes

NOTES: MPWD sent initial notices to all the above agencies about planning to review and consider changes or amendments to its 2020 UWMP and WSCP on January 27, 2021. See Appendix 4 for copies of notices.

10.2.2 Notice to the Public

Water Code Section 10642 requires that prior to adopting either the UWMP or the WSCP, suppliers shall make both documents available for public review and shall hold one or more public hearings.

As required by Section 6066 of the Government Code, prior to the public hearings, MPWD published Notices in the local newspaper, the Daily Journal once a week for two successive weeks (with at least five days intervening between the respective publication dates) not counting such publication. The Notices included the dates, times, and place of the hearings, as well as the web location where the draft documents were available.

The Notices were published on June 10 and June 17, in advance of the first public hearing on June 24 and again on July 8 and July 15, in advance of the second public hearing on July 22, 2021. Copies of MPWD's public notices are in Appendix 4.

Due to the COVID-19 State of Emergency and pursuant to the Brown Act waiver provided under the Governor's Executive Order, the hearings were held by web and teleconference only.

10.3 Public Hearing and Adoption

Water Code Section 10642 requires that:

…Prior to adopting either, the [plan or water shortage contingency plan], 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.

According to Water Code Section 10608.26, an urban retail water supplier is required to conduct at least one public hearing to accomplish all the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20 for determining its urban water use target.

10.3.1 Public Hearing

The public hearing for either or both the UWMP and the WSCP may take place at the same meeting as the adoption hearing of a governing board. Suppliers can choose to combine these meetings and the agenda must include the public hearing as an agenda item.

As part of the public hearing, MPWD is required to provide information on its baseline values, water use targets and compliance, and implementation plan required in the Water Conservation Act of 2009. MPWD

explained its baseline values, water use targets and compliance, and implementation in Chapter 5 SBX7-7 Baselines, Targets, and 2020 Compliance. The minutes from each of the public hearings are posted on the MPWD website. These minutes document the presentation topics and the comments from the MPWD Board and the public.

10.3.2 Adoption

Water Code Section 10642 requires that following the public hearing(s), the UWMP and WSCP shall be adopted as prepared or as modified after the hearing or hearings. For the UWMP and the WSCP, the adoption hearings of the governing body may be combined with the public hearing; however, the public hearing portion must take place before the adoption portion.

MPWD held two public hearings in advance of its Board of Directors' formal Adoption Meeting. This process allowed sufficient time for public review and comments prior to the formal adoption on September 23, 2021.

A copy of the separate adoption resolutions for MPWD's 2020 UWMP and 2020 WSCP are in Appendix 8.

10.4 Plan Submittal

Water Code Section 10621(e) requires urban water suppliers to update and submit their 2020 UWMP and WSCP to the DWR by July 1, 2021. Furthermore, Water Code Section 10644(a)(1) requires that suppliers also submit to the California State Library, and any city or county within which the supplier provides water supplies a copy of the 2020 UWMP and WSCP no later than 30 days after adoption.

Water Code Section 10635(c) requires suppliers to provide that portion of its UWMP 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 to DWR.

The sections below discuss the process for submitting initial and subsequent updates of UWMPs and WSCPs to DWR, the State Library, and cities and counties.

10.4.1 Submitting a UWMP and Water Shortage Contingency Plan to DWR

The 2020 UWMP (including the WSCP) is required to be submitted to DWR within 30 days of adoption and by July 1, 2021.

As discussed in Section 10.2.1, due to the significance of the unprecedented changes in SFPUC's supply projections for drought years, MPWD submitted its 2020 UWMP and WSCP after July 1, 2021. MPWD's Board of Directors determined that the unprecedented changes from SFPUC required additional time for the public review period in its service area. MPWD held two public hearings on June 24 and July 22, 2021, separately from the adoption meeting on September 23, 2021.

As required by DWR, MPWD is submitting its 2020 UWMP and WSCP electronically through DWR's WUE Data Portal.

Following MPWD's submittal, DWR will review the UWMP and WSCP using the DWR checklist (Appendix 1). Based on its review, DWR will determine whether MPWD's UWMP addresses the requirements of the Water Code. The DWR reviewer will contact MPWD as needed during the review process. Upon completion of MPWD's UWMP and WSCP review, DWR will issue a letter to MPWD with the results of the review.

10.4.2 Electronic Data Submittal

Water Code Section 10644(a)(2) requires that the UWMP and WSCP, and any amendments shall be submitted electronically to DWR and include any standardized forms, tables, or displays specified by DWR.

For the submittal tables and data, DWR developed an online submittal tool (i.e., WUE Data Portal) for data and planning documents for the 2020 UWMP. The tool accepts complete UWMPs and tabular data from all the data tables.

The WUE data online submittal tool (i.e., WUE Data Portal) is available online at:

https://wuedata.water.ca.gov/

10.4.3 Submitting an UWMP, including WSCP, to the California State Library

MPWD will submit its adopted UWMP and WSCP on a CD no later than 30 days after MPWD's adoption of the plans to the California State Library at:

California State Library Government Publications Section Attention: Coordinator, Urban Water Management Plans P.O. Box 942837 Sacramento, CA 94237-0001

10.4.4 Submitting an UWMP to Cities and Counties

MPWD will submit its adopted UWMP and WSCP (electronic format is approved by DWR) no later than 30 days after adoption to the City of Belmont, City of San Carlos, and San Mateo County, since MPWD provides water to these jurisdictions. This will also satisfy Water Code Section 10635(b).

10.5 Public Availability

Water Code Section 10645 requires that:

(a) Not later than 30 days after filing a copy of its UWMP plan with DWR, MPWD and DWR shall make the MPWD's 2020 UWMP available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its WSCP plan with DWR, MPWD and DWR shall make the MPWD's 2020 WSCP available for public review during normal business hours.

As with its 2015 UWMP and WSCP, not later than 30 days after filing a copy of its plan with DWR, MPWD will make its 2020 UWMP and WSCP publicly available electronically on its website.

10.6 Notification to Public Utilities Commission

Per Water Code Section 10621(c), those Suppliers that are regulated by the California Public Utilities Commission (CPUC) must submit their UWMP and WSCP to the CPUC as part of its general rate case filings.

This section does not apply to MPWD, since it is a public water agency and it is not regulated by the CPUC.

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

Water Code Section 10621 requires that:

(d) The amendments to, or changes in, MPWD's UWMP and WSCP shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Water Code Section 10644 requires that:

(a)(1) Copies of amendments or changes to UWMP, shall be submitted within 30 days after adoption to DWR, the California State Library, the City of Belmont, the City of San Carlos, and San Mateo County, because MPWD provides water to these jurisdictions.

10.7.1 Amending an UWMP

If MPWD amends its adopted UWMP, it is required to follow each of the steps for notification, public hearing, adoption, and submittal, as with its initial 2020 UWMP and WSCP.

10.7.2 Amending a Water Shortage Contingency Plan

Water Code Section 10644(b) requires that if an urban water supplier revises its water shortage contingency plan, the supplier shall submit to DWR a copy of its water shortage contingency plan prepared… no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

Water Suppliers that revise their WSCP after DWR has approved the 2020 UWMP, must submit to DWR an electronic copy through the WUE Data Portal of its revised WSCP within 30 days of its adoption.

11. REFERENCES

Association of Bay Area Governments (ABAG), 2017. Association of Bay Area Governments (ABAG) Projections Plan Bay Area 2040. "Projections 2040 is the most recent in the Association of Bay Area Governments' series of statistical compendia on demographic, economic, and land-use changes in coming decades. The current version covers the period between 2010 and 2040. The projections illustrate how the region will accommodate growth if local jurisdictions adopt a set of policies consistent with the vision of Plan Bay Area. We make reasonable assumptions about the Bay Area's share of national economic growth informed by an understanding of the region's changing demographic characteristics. The distribution of growth within the region among counties, cities, and PDAs is built around expected local policies and infrastructure investment as well as historic economic behavior." http://projections.planbayarea.org/

American Water Works Association (AWWA). G480 Standard and AWE Leaderboard web page. https://www.allianceforwaterefficiency.org/resources/topic/g480-standard-and-awe-leaderboard

American Water Works Association (AWWA)., 2017. *M52 Water Conservation Programs – A Planning Manual*, *2nd Edition*. https://www.awwa.org/Store/Product-Details/productId/61841578

American Water Works Association (AWWA)., 2021. Water Loss Audit software. https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control

Bay Area Integrated Regional Water Management Plan (BAIRWMP), 2019. http://bayareairwmp.org/

Belmont Housing Element 2015 – 2023, 2015. https://www.belmont.gov/home/showdocument?id=11986

BAWSCA., 2017. Water Supply Agreement, Water Shortage Allocation Plan (Revision 2 – Attachment C Revised September 2017) https://bawsca.org/water/reliability

BAWSCA., 2018. *Tier 2 Drought Implementation Plan (DRIP).*

BAWSCA., August 2019. Amendment to the 2009 Water Supply Agreement (WSA) between SFPUC and BAWSCA's member agencies. https://bawsca.org/water/reliability

BAWSCA, June 26, 2020. Regional Water Demand and Conservation Projections, June 26, 2020. http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

BAWSCA., February 10, 2021. Common Language for BAWSCA Member Agencies' 2020 UWMPs. (Also, see Appendix 6).

BAWSCA., March 1, 2021. Attachment B: Updated 2020 UWMP Drought Cutbacks, BAWSCA.

BAWSCA, March 19, 2021. Common Language for BAWSCA Member Agencies' 2020 UWMPs.

BAWSCA., April 1, 2021. Updated drought allocations based on revised SFPUC reliability. (Also, see Appendix 6)

April 2021. BAWSCA Annual Survey, 2019-2020. http://bawsca.org/uploads/userfiles/files/Annual%20Survey%20FY%2019-20_FINAL(1).pdf

California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds. https://files.resources.ca.gov/voluntary-agreements/

California Department of Water Resources, 2015. *Model Water Efficient Landscape Ordinance*. https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance

California Department of Water Resources, 2017. *Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*. http://www.water.ca.gov/wateruseefficiency/conservation/docs/20170407_EO_B-37-16_Final_Report.pdf

DWR Final 2020 UWMP Guidebook. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans/Final-2020-UWMP-Guidebook/UWMP-Guidebook-2020---Final-032921.pdf

California Green (CALGreen) Building Standards 2019 Code, effective January 1, 2020. https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#@ViewBag.JumpTo

California Legislature, Urban Water Management Planning. http://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=WAT&division=6.&title=&part=2.6.&chapter=&article=

California Legislature, 1983. Water Code Section 10617, amended 1996. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10617

California Legislature, 1983. Water Code Section 10621. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10621

California Legislature, November 10, 2009. SB X7-7 amends Division 6, Section 2.55 of the California Water Code. Entitled *Sustainable Water Use and Demand Reduction*, it was approved by the Governor of California on November 10, 2009. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920107SB7

California Legislature, October 11, 2009. Senate Bill 407 (Padilla). https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB407

California Legislature, May 31, 2018. Assembly Bill 1668 (Friedman. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB1668

California Legislature, 1949. Government Code Section 6066. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=6066

California Legislature, (1995). Health and Safety Code Section 116275. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=HSC&sectionNum=116275.

California Legislature, Senate Bill 555 (Wolk), October 9, 2015. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB555

California Legislature, September 25, 2016. SB7. Wolk. Housing: water meters: multiunit structures

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB7

California Legislature, July 1, 2011. Senate Bill 837 (Blakeslee). http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB837

California Legislature, Water Code Section 1058.5.
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=1058.5

California Legislature, 1983. Water Code Section 10632.1.
http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=10632.1&lawCode=WAT

California Legislature, 1983. Water Code Section 10632.5.
http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=10632.5&lawCode=WAT

City of Belmont, November 13, 2007. Staff Report, Council Agenda #4C.

City of Redwood City, 2020. Website and information on Recycled Water.
https://www.redwoodcity.org/departments/public-works/water/recycled-water

Consortium for Efficient Energy website. www.cee1.org

DeOreo, W.B. (2016). *Residential End Uses of Water, Version 2 - 4309.* Denver, Colorado: AWWA Research Foundation. https://www.waterrf.org/research/projects/residential-end-uses-water-version-2

DeOreo, W.B., P.W. Mayer, Leslie Martien, Matthew Hayden, Andrew Funk, Michael Kramer-Duffield, Renee Davis, James Henderson, Bob Raucher, Peter Gleick and Matt Heberger. (2011). *California Single Family Water Use Efficiency Study*. Sacramento, California: Department of Water Resources.
http://water.cityofdavis.org/Media/PublicWorks/Documents/PDF/PW/Water/Documents/California-Single-Family-Home-Water-Use-Efficiency-Study-20110420.pdf

Dilling, L. et al. 2019. Drought in Urban Systems: Learning lessons for climate adaptive capacity. Climate Risk Management 23, 32-42. https://www.preventionweb.net/publications/view/67222

DWR Communication re: ABAG population data, Julie Ekstrom, DWR, emails to M. Laporte, ManageWater Consulting, Inc.: October 12, 2020.

Dziegielewski, B., J. C. Kiefer, W. DeOreo, P. Mayer, E. M. Opitz, G. A. Porter, G. L. Lantz and J. O. Nelson. (2000). *Commercial and Institutional End Uses of Water*. Denver, Colorado: AWWA, Research Foundation and American Water Works Association with Cooperation of the U.S. Bureau of Reclamation. Catalog No.90806. 264 pp. ISBN 1-58321-035-0. http://ufdc.ufl.edu/WC13511002/00001

EKI Environment and Water, Todd Groundwater, Hydrofocus, San Mateo Plain Groundwater Basin, 2018.
https://cawaterlibrary.net/document/san-mateo-plain-groundwater-basin-assessment/

MPWD website: https://www.midpeninsulawater.org/

MPWD, 2015. SB X7-7 Verification Form submitted in MPWD's 2015 UWMP. (See Appendix 9, 2015 Verification Form).

MPWD, 2020. SB X7-7 Compliance Form submitted in MPWD's 2015 UWMP. (See Appendix 10, 2020 Compliance Form).

MPWD, Website: Level 1 Water Alert in effect for fiscal year 2020 – 21.
https://www.midpeninsulawater.org/water-conservation-overview.php

MPWD, Mid-Peninsula Legislation: https://www.midpeninsulawater.org/legislation

MPWD, June 2020, MPWD DSS Model update. The Least Cost Planning Decision Support System (DSS Model), a proprietary software by Maddaus Water Management. (Also see Appendix 14).

MPWD, Draft Emergency Operations and Response Plan, 2020.

MPWD, Water Service Ordinance 103 Section 4.2 discusses water waste. Water Service Ordinance 103, Establishing, Updating and Re-codifying the Rules Regulations and Fees for Water Service by Mid-Peninsula Water District and Superseding all Prior District Ordinances and Amendments Thereto.
https://www.midpeninsulawater.org/legislation

MPWD, Ordinance 111 implemented Level 2 water shortage response to the MPWD's WSCP regarding mandatory restrictions on outdoor water use. https://www.midpeninsulawater.org/legislation

MPWD, Ordinance 112 amends sections in Ordinance 103. Ibid., Water Service Ordinance 112, Attachment "103A", Schedule of Rates and Fees, June 25, 2015. https://www.midpeninsulawater.org/legislation

MPWD, Ordinance 113 amended sections in Ordinance 111. https://www.midpeninsulawater.org/legislation

MPWD, Ordinance 115, "Water Efficient Landscape Ordinance," effective as of February 1, 2016. https://www.midpeninsulawater.org/legislation

MPWD, Ordinance 121 Amending MPWD Water Service Ordinance No. 103 Regarding Termination of Water service.
https://www.midpeninsulawater.org/legislation

MPWD, October 12, 2016. Hallmark Water Tanks Structural Review and Retrofit Strategy Report.

MPWD, March 2, 2016. Dekoven Water Tanks Structural Review and Retrofit Strategy Report.

NOAA Climate website. https://www.climate.gov/

San Mateo County Local Hazard Mitigation Plan, 2016. The SMC LHMP is in the process of being updated.
https://cmo.smcgov.org/multijurisdictional-local-hazard-mitigation-plan-resources

SFPUC, January 22, 2021, SFPUC Regional Water System supply reliability letter from SFPUC.

SFPUC, February 3, 2021. Reliability of the Regional Water System.

SFPUC, February 3, 2021. Future SFPUC Water Supply Projects. (Also, see Appendix7.)

SFPUC, February 3, 2021, and March 30, 2021. Draft UWMP Common Language. (Also, see Appendix 7.)

SFPUC, February 3, 2021. "Projected SFPUC Regional Water System Supply Reliability – Climate Change". (Also, see Appendix 7.)

SFPUC, February 11, 2021. SFPUC 2020 Capital Improvement Plan, adopted February 11, 2020. San Francisco Public Utilities Commission : 2020 Agendas-Minutes
Ibid., March 4, 2021. Common Language about: Rate Impacts of Water Shortages Common Language, Final. (Also, see Appendix 7.)

SFPUC, March 18, 2021. "Shift of Presentation Approach for SFPUC 2020 Urban Water Management Plan", Appendix 7.)

SFPUC, March 19, 2021. Water Supply Reliability with RWS purchase projections.

SFPUC, March 24, 2021. SFPUC DRAFT Water Supply and Demand Assessment Procedures. (Also, see Appendix 7.)

SFPUC, March 24, 2021. SFPUC DRAFT Emergency Preparedness Procedures (Also, see Appendix 7.)

SFPUC, Water Supply Planning Introduction and Review, March 26, 2021. (Also, see Appendix 7.)
https://sfpuc.sharefile.com/share/view/s4ab9a9df92b049238c1957610c6a3de5

SFPUC, March 30, 2021. Additional Supply Reliability Modeling Results. (Also, see Appendix 7.)

SFPUC, April 12, 2021. Annual rationing tables with model results for the likelihood of severe conditions. (Also, see Appendix 7.)

SFPUC, June 2, 2021. Regional Water System Supply Reliability and UWMP 2020.

SFPUC, June 2021. SFPUC 2020 UWMP, https://www.sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf

Silicon Valley Clean Water website. https://svcw.org/what-we-do/facilities/wastewater-treatment/

State Water Resources Control Board. California Statues web page (defining "Making Conservation a California Way of Life"). https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/california_statutes.html

SWRCB, Executive Order B-37-16 and B-40-17.
https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/emergency_regulation.html

SWRCB, Frequently Asked Questions.
https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/faq.html

Ibid., 2018. "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, Dec. 12, 2018, p.17, fn. 14.
https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)
Ibid., 2018. Bay Delta Plan Update: Amendments and Substitute Environmental Document (SED) for lower San Joaquin River and Southern Delta– Adoption and approval of plan amendments and final SED.

https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2018_sed/

SWRCB water loss control web site:
https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/water_loss_control.html#resources

California Water Code Section 10608.34 requires *urban retail water suppliers* to conduct and submit validated water loss audit reports to the Department of Water Resources on October 1, annually.

U.S. Congress. Energy Policy Act of 1992; amended in 2005. https://www.congress.gov/bill/102nd-congress/house-bill/776/text/enr; https://www.epa.gov/laws-regulations/summary-energy-policy-act;
https://www.gpo.gov/fdsys/pkg/BILLS-109hr6enr/pdf/BILLS-109hr6enr.pdf

U.S. EPA, 2018. America's Water Infrastructure Act (AWIA) of 2018
https://www.epa.gov/sites/production/files/2019-04/documents/awia_factsheet_04-16-2019_v2-508.pdf

For Additional References – Please see MPWD 2020 WSCP References

12. APPENDICES – ALL APPENDICES ARE IN A SEPARATE VOLUME

13. ATTACHMENT 1 – WATER SHORTAGE CONTINGENCY PLAN

MPWD's 2020 WSCP is a separate document.