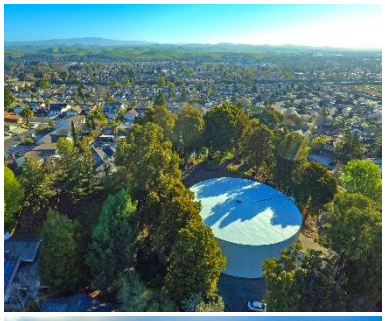
FINAL REPORT | JUNE 2021

2020 Urban Water Management Plan



PREPARED FOR

Dublin San Ramon Services District

Water, wastewater, recycled water

PREPARED BY

WEST YOST

Water. Engineered.

2020 Urban Water Management Plan

Prepared for

Dublin San Ramon Services District

Project No. 406-60-20-77

June 15, 2021

Project Manager: Elizabeth Drayer, PE — Date

June 15, 2021

QA/QC Review: Jim Connell, PE — Date

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LIST OF ACRONYMS AND ABBREVIATIONS

2018 LHMP	2018 Tri-Valley Local Hazard Mitigation Plan
AB	Assembly Bill
ABAG	Association of Bay Area Governments
Act	Urban Water Management Planning Act
ACWA	Association of California Water Agencies
ACWD	Alameda County Water District
ADWF	Average Dry Weather Flow

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AF	Acre-Feet
AFY	Acre-Feet of Water Annually
Alternative GSP	Alternative Groundwater Sustainability Plan
AMI	Advanced Metering Infrastructure
Authority	Sites Project Authority
AWIA	America's Water Infrastructure Act
AWSS	Alternative Water Supply Study
AWWA	American Water Works Association
BACWA	Bay Area Clean Water Agencies
BARDP	Bay Area Regional Desalination Project
BARR	Bay Area Regional Reliability
BAWSCA	Bay Area Water Supply and Conservation Agency
Cal Water	California Water Service – Livermore District
CalWEP	California Water Efficiency Partnership
CASA	California Association of Sanitation Agencies
CASGEM	California Statewide Groundwater Elevation Monitoring
CCCSD	Central Contra Costa Sanitary District
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	Cubic Feet Per Second
CII	Commercial, Industrial and Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
COA	Coordinated Operations Agreement
Cr(VI)	Hexavalent Chromium
CUWCC	California Urban Water Conservation Council
DBP	Disinfectant Byproducts
DCP	Delta Conveyance Project
Delta	Sacramento-San Joaquin Delta
DERWA	DSRSD-EBMUD Recycled Water Authority
DLD	Dedicated Land Disposal
DMM	Demand Management Measures
DOF	California Department of Finance
DRA	Drought Risk Assessment
DSRSD	Dublin San Ramon Services Water District
Dublin	City of Dublin
DVWTP	Del Valle Water Treatment Plant
DWR	Department of Water Resources

DWR Guidebook	2020 Urban Water Management Plans Guidebook for Urban Water Suppliers
EBDA	East Bay Discharges Authority
EBMUD	East Bay Municipal Utility District
EDSP	Eastern Dublin Specific Plan
EIR	Environmental Impact Report
ET_o	Evapotranspiration
FCI	Federal Correctional Institution
FDC	Flow Duration Controls
FEMA	Federal Emergency Management Agency
General Order 2016	General Water Reuse Order No. WQ 2016-0068-DDW
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GMP	Groundwater Management Plan
GPCD	Gallons Per Capita Per Day
GPQ	Groundwater Pumping Quota
GSA	Groundwater Sustainability Agency
InSAR	Interferometric Synthetic Aperture Radar
JPA	Joint Powers Authority
LAVWMA	Livermore-Amador Valley Water Management Agency
Livermore	City of Livermore
LVE	Los Vaqueros Reservoir Expansion
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
MFUV	Microfiltration and Ultraviolet
MGD	Million Gallons Per Day
MGDP	Mocho Groundwater Demineralization Plant
MMWD	Marin Municipal Water District
MTC	Metropolitan Transportation Commission
NAICS	North American Industry Classification System
NMP	Nutrient Management Plan
NOP	Notice of Preparation
Parks RFTA	U.S. Army Reserve's Parks Reserve Forces Training Area
PFAS	Polyfluoroalkyl Substances
Pleasanton	City of Pleasanton
RRA	Risk and Resilience Assessment
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
RWTF	Recycled Water Treatment Facility
San Ramon	City of San Ramon

SB X7-7	Senate's Seventh Extraordinary Session of 2009
SBA	South Bay Aqueduct
SFPUC	Francisco Public Utilities Commission
SFUV	Sand Filtration and Ultraviolet
SGMA	Sustainable Groundwater Management Act
SMP	Salt Management Plan
SNMP	Salt and Nutrient Management Plan
SRVRWP	San Ramon Valley Recycled Water Program
SWP	State Water Project
T&O	Taste and Odor
TAF	Thousand Acre-Feet
target	2020 Urban Water Use Target
TDS	Total Dissolved Solids
TOC/DOC	Total and Dissolved Organic Carbon
TRE	TRE Altamira
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VW	Valley Water (formerly known as Santa Clara Valley Water District)
WSCP	Water Shortage Contingency Plan
WSE	Water Supply Evaluation
WUE	Water Use Efficiency
WWTP	Wastewater Treatment Plant
Yuba Accord	Lower Yuba River Accord
Zone 7	Zone 7 Water Agency

EXECUTIVE SUMMARY

An Urban Water Management Plan (UWMP) helps water suppliers assess the availability and reliability of their water supplies and current and projected water use to help ensure reliable water service under different conditions. This water supply planning is especially critical for California currently, as climate change alters rainfall and snowfall (impacting water supply availability) and development occurs statewide (increasing the need for reliable water supplies). The Urban Water Management Planning Act (Act) requires larger water suppliers that provide water to urban users (whether directly or indirectly) to develop UWMPs every five years. UWMPs evaluate conditions for the next 20 years, so these regular updates ensure continued, long-term planning.

Dublin San Ramon Services Water District (DSRSD) is a water retailer (also referred to as a retail water agency), meaning it sells water directly to individual water users (e.g., residents and businesses). DSRSD purchases most of its water supplies from Zone 7 Water Agency (Zone 7). Besides DSRSD, Zone 7's retailers consist of the California Water Service-Livermore District, the City of Livermore, and the City of Pleasanton. Because DSRSD provides water to more than 3,000 users, it is required to prepare a UWMP.

This Executive Summary serves as a Lay Description of DSRSD's UWMP, as required by California Water Code §10630.5.

CALIFORNIA WATER CODE REQUIREMENTS

The California Water Code documents specific requirements for California water suppliers. The Act is included in the California Water Code and specifies the required elements of a UWMP, including discussing an agency's water system and facilities, calculating how much water its customers use (i.e., water demand) and how much it can supply, and detailing how it would respond during a drought or other water supply shortage. Also, a UWMP must describe what specific coordination steps were taken to prepare, review, and adopt the plan.

The Act has been revised over the years. The Water Conservation Act of 2009 (also known as SB X7-7) required retail water agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. In 2020, retail water agencies are required to report on their compliance with SB X7-7.

The 2012 to 2016 drought led to further revisions to the Act to improve water supply planning for long-term reliability and resilience to drought and climate change. These revisions were formalized in the 2018 Water Conservation Legislation and include:

- Five Consecutive Dry-Year Water Reliability Assessment: Analyze water supply reliability for five consecutive dry years over the planning period of this UWMP (see Chapter 7).
- Drought Risk Assessment: Assess water supply reliability from 2021 to 2025 assuming that the next five years are dry years (see Chapter 7).
- Seismic Risk: Identify the seismic risk to the agency's water facilities and have a plan to address identified risks; the region's Local Hazard Mitigation Plan may address this requirement (see Chapter 8).
- Energy Use Information: If data is available, include reporting on the amount of electricity used to obtain, treat, and distribute water (see Chapter 6).

- Water Shortage Contingency Plan (WSCP): Update the agency's plan to include an annual process for assessing potential gaps between planned water supply and demands; conform with the State's standard water shortage levels (including a shortage level greater than 50 percent) for consistent messaging and reporting; and provide water shortage responses that are locally appropriate (see Chapter 8).
- Lay Description: Provide a lay description of the findings of the UWMP; this Executive Summary serves as the "Lay Description" for this 2020 UWMP.

Major components and findings of DSRSD's 2020 UWMP are summarized below.

DSRSD WATER SYSTEM

DSRSD's water facilities store, and deliver drinking (i.e., potable) water to its customers in the City of Dublin and the Dougherty Valley in the City of San Ramon, California, which include DSRSD residents and commercial customers. DSRSD purchases treated potable water from Zone 7. DSRSD also owns and operates an extensive network of storage, pumping, and pipeline facilities to deliver drinking water to its customers.

Besides drinking water, DSRSD also has separate facilities to produce and deliver recycled water to a portion of customers within its service area, mainly for landscape irrigation. Recycled water is highly treated wastewater that can be used for non-potable purposes like landscape irrigation, toilet flushing, and cooling. DSRSD owns and operates a recycled water treatment plant, and an extensive network of storage, pumping and pipeline facilities to distribute recycled water.

WATER USE BY DSRSD CUSTOMERS

DSRSD anticipates growth in the next 10 years, which would increase its demand for water and expected to reach buildout by 2035. Thorough and accurate accounting of current and future water demands is critical for DSRSD's planning efforts. To continue delivering safe and reliable drinking water, DSRSD must know how much water its customers currently use and how much they expect to use in the future.

DSRSD coordinated closely with Zone 7 to estimate water demands through the year 2045. This process involved reviewing DSRSD's development and planning documents. DSRSD's potable demand is expected to increase approximately 23 and 47 percent (from 2020 levels), respectively, by 2035 and then stay almost constant through 2045.

DSRSD WATER SUPPLIES

DSRSD's water supplies consist of potable water purchases from Zone 7 and augmented recycled water produced at DSRSD's Recycled Water Treatment Facilities.

The future reliability of Zone 7's imported water is a concern. Drought, sea level rise, and natural disasters threaten the Sacramento-San Joaquin Delta (Delta), a critical component of the delivery system bringing water to Zone 7. As a result, Zone 7 is participating in and evaluating various projects that would provide alternate water supplies and/or storage, or protect, the existing delivery system against threats. These projects include installing a new diversion or conveyance system for Delta supplies, desalinating brackish water (water with high salt content), reusing highly treated wastewater for potable reuse, participating in the

construction of a new reservoir to capture surplus water from the Sacramento River, expanding an existing reservoir near Zone 7 for additional storage, and adding a new connection to the South Bay Aqueduct.

Based on Zone 7's efforts and DSRSD's continued use of recycled water, DSRSD's future water supplies are expected to keep pace with its water demands.

CONSERVATION TARGET COMPLIANCE

In its 2015 UWMP, DSRSD achieved its interim water use target and confirmed its 2020 water use target based on 2010 Census data. In 2020, DSRSD achieved its 20 percent reduction target in accordance with SB X7-7. This was the result of continued water conservation by its customers following the recent drought. Conservation will continue to play a key role in achieving long-term water supply reliability for DSRSD.

DSRSD WATER SERVICE RELIABILITY

The California Water Code asks agencies to evaluate their water service reliability by examining the impact of drought on their water supplies and comparing those reduced supplies to water demands. Specifically, agencies should calculate their water supplies during a single dry year and five consecutive dry years using historical records. For example, DSRSD can estimate its purchased supply from Zone 7 during a single dry year by looking at how much it purchased during the driest year on record. If that historical "dry year" amount was reduced by 10 percent, then DSRSD can conservatively assume a similar 10 percent reduction in purchased supplies in a future dry year.

DSRSD is positioned to withstand the effects of a single dry year and a five-year drought. DSRSD's drought risk was specifically assessed between 2021 and 2025, assuming that the next five years are dry years. Based on Zone 7's ability to meet all its water demands during dry conditions, DSRSD is expected to have enough water supplies to meet water demands for a five-year drought beginning in 2021. This remains true for five-year droughts beginning in 2025, 2030, 2035, 2040, and 2045.

WATER SHORTAGE CONTINGENCY PLAN

A WSCP describes an agency's plan for preparing for and responding to water shortages. DSRSD updated its WSCP to include its process for assessing potential gaps between planned water supply and demands for the current year and the next potentially dry year. DSRSD aligned its water shortage levels with the State for consistent messaging and planned for locally appropriate water shortage responses. The WSCP may be used for foreseeable and unforeseeable events and is adopted concurrently with this UWMP by separate resolution to allow for updates as conditions change.

UWMP PREPARATION, REVIEW, AND ADOPTION

DSRSD developed this 2020 UWMP in coordination with Zone 7 and the public. While preparing its UWMP, DSRSD notified other stakeholders (e.g., Alameda County, Contra Costa County, California Water Service-Livermore District, City of Livermore, City of Pleasanton) of its preparation, its availability for review, and the public hearing prior to adoption. DSRSD encouraged community participation in the development of the 2020 UWMP using newspaper advertisements and web-based communication. These public notices included the time and place of the public hearing, as well as where the plan would be available for public inspection.

The public hearing provided an opportunity for DSRSD's water users and the general public to become familiar with the 2020 UWMP and ask questions about DSRSD's water supply, its continuing plans for providing a reliable, safe, high-quality water supply, and its plans to address potential water shortages. Following the public hearing, the DSRSD Board of Directors adopted the 2020 UWMP on June 15, 2021. A copy of the adopted Plan was submitted to the Department of Water Resources and is available on the DSRSD website (www.dsrsd.com).

CHAPTER 1
Introduction

This chapter provides an introduction and overview of the Dublin San Ramon Services District (DSRSD), 2020 Urban Water Management Plan (UWMP) including the importance and extent of DSRSD's water management planning efforts, changes since the preparation of DSRSD's 2015 UWMP, and the organization of DSRSD's 2020 UWMP. This 2020 UWMP has been prepared jointly by District staff and West Yost.

1.1 INTRODUCTION

The Urban Water Management Planning Act (Act) was originally established by Assembly Bill (AB) 797 on September 21, 1983. Passage of the Act was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the state. The primary objective of the Act is to direct "urban water suppliers" to develop a UWMP that provides a framework for long-term water supply planning, and documents how urban water suppliers are carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands. A copy of the current version of the Act, as incorporated in Sections 10610 through 10657 of the California Water Code, is provided in Appendix A of this plan.

1.2 IMPORTANCE AND EXTENT OF DISTRICT'S WATER MANAGEMENT PLANNING EFFORTS

The purpose of the UWMP is to provide a planning tool for DSRSD for developing and delivering municipal water supplies to DSRSD's water service area. This UWMP provides DSRSD with a water management action plan for guidance as water supply and demand conditions.

DSRSD has had a long history of providing clean and reliable water to its customers. DSRSD's UWMP is a comprehensive planning guide for a safe and adequate water supply.

1.3 CHANGES FROM 2015 UWMP

The Urban Water Management Planning Act has been modified over the years in response to the State's water shortages, droughts, and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (SB X7-7). This act required agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. The 2014 to 2017 drought has led to further amendments to the California Water Code to improve water supply planning for long-term reliability and resilience to drought and climate change.

Summarized below are the major additions and changes to the California Water Code since DSRSD's 2015 UWMP was prepared.

- **Five Consecutive Dry-Year Water Reliability Assessment [CWC §10635(a)]:** The Legislature modified the dry year water reliability planning from a "multi-year" time period to a "drought lasting five consecutive water years" designation. This statutory change requires the urban water supplier to analyze its water supplies' reliability to meet its water use over

an extended drought period. This requirement is addressed in the water use assessment presented in Chapter 4; the water supply analysis presented in Chapter 6; and the water reliability determinations in Chapter 7 of this plan.

- **Drought Risk Assessment [CWC §10635(b)]:** The California Legislature created a new UWMP requirement for drought planning because of the significant duration of recent California droughts and the predictions about hydrologic variability attributable to climate change. The Drought Risk Assessment (DRA) requires the urban water supplier to assess water supply reliability over five years 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. The DRA is discussed in Chapter 7 based on the water use information in Chapter 4; the water supply analysis is presented in Chapter 6; and the water reliability determinations are discussed in Chapter 7 of this plan.
- **Seismic Risk [CWC §10632.5]:** The Water Code now requires urban water suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan. Water supply infrastructure planning is correlated with the regional hazard mitigation plan associated with the urban water supplier. DSRSD's seismic risk is discussed in Chapter 8 of this plan.
- **Energy Use Information [CWC §10631.2]:** The Water Code now requires Suppliers to include readily obtainable information on estimated amounts of energy for their water supply extraction, treatment, distribution, storage, conveyance, and other water uses. The reporting of this information was voluntary in 2015.
- **Water Loss Reporting for Five Years [CWC §10608.34]:** The Water Code added the requirement to include the past five years of water loss audit reports as part of this UWMP.
- **Water Shortage Contingency Plan [CWC §10632]:** In 2018, the Legislature modified the UWMP laws to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides the urban water supplier with an action plan for a drought or catastrophic water supply shortage. Although the new requirements are more prescriptive than previous versions, many of these elements have long been included in WSCPs, other sections of UWMPs, or as part of the urban water supplier's standard procedures and response actions. Many of these actions were implemented by the urban water suppliers during the last drought to successfully meet changing local water supply challenges. The WSCP is used by DWR, the State Water Board, and the Legislature in addressing extreme drought conditions or statewide calamities that impact water supply availability. DSRSD's WSCP is presented in Chapter 8 and Appendix L of this plan.
- **Groundwater Supplies Coordination [CWC §10631(b)(4)]:** In 2014, the Legislature enacted the Sustainable Groundwater Management Act to address groundwater conditions throughout California. Water Code now requires 2020 UWMPs to be consistent with Groundwater Sustainability Plans in areas where those plans have been completed by Groundwater Sustainability Agencies. This requirement is addressed in Chapter 6 of this plan.
- **Lay Description [CWC §10630.5]:** The Legislature included a new statutory requirement for the urban water supplier 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. This section of the UWMP could be viewed as a go-to synopsis for new staff, new governing members, customers, and the media. It can ensure a consistent representation of the Supplier's detailed analysis. This requirement is addressed in the Executive Summary.

- **Water Loss Management [CWC §10608.34(a)(1)]:** The Legislature included a requirement for urban water suppliers to report on their plan to meet the water loss performance standards in their 2020 UWMPs. This requirement is addressed in the Demand Management Measures presented in Chapter 9 of this plan.

1.4 DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN FOR PARTICIPANTS IN COVERED ACTION

Urban water suppliers that anticipate participating in or receiving water from a proposed project (covered action) such as a multiyear water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 UWMP's that can then be used in the certification of consistency process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit. 23, § 5003). To demonstrate reduced reliance on the Delta and improve regional self-reliance, urban water suppliers are to:

1. Complete an Urban Water Management Plan;
2. Identify, evaluate, and commence implementation of programs and projects included in the UWMP that are locally cost effective and technically feasible in reducing reliance on the Delta; and
3. Include expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance in their UWMPs, commencing in their 2015 UWMPs and continuing in their subsequent UWMPs. The reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply.

DSRSD's wholesale water supplier is Zone 7 Water Agency (Zone 7), who is a contractor of the State Water Project (SWP). Through Zone 7, DSRSD anticipates participating in a covered action and is therefore required to demonstrate reduced Delta reliance. Appendix B of this UWMP demonstrates DSRSD's consistency with Delta Plan Policy WR P1, along with Zone 7 and the region's other water retailers—City of Pleasanton (Pleasanton), City of Livermore (Livermore), and California Water Service – Livermore District (Cal Water).

DSRSD completed and adopted its 2015 UWMP in June 2016. This 2020 UWMP was completed and adopted by DSRSD on June 15, 2021. Chapter 6 (Water Supply) of DSRSD's 2015 and 2020 UWMPs describes and evaluates existing and future projects whose implementation improves regional self-reliance. Chapter 9 (Demand Management Measures) of DSRSD's 2015 and 2020 UWMPs describes demand management measures that DSRSD has implemented as part of its Water Conservation Program.

1.5 PLAN ORGANIZATION

This 2020 UWMP contains the appropriate sections and tables required per CWC Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2020 UWMP, and has been prepared based on guidance provided by the California Department of Water Resources (DWR) in their "2020 Urban Water Management Plans Guidebook for Urban Water Suppliers" (DWR Guidebook).

This 2020 UWMP is organized into the following chapters:

- Chapter 1: Introduction
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: Water Use Characterization
- Chapter 5: SB X7-7 Baselines, Targets, and 2020 Compliance
- Chapter 6: Water System Supply Characterization
- Chapter 7: Water System Reliability and Drought Risk Assessment
- Chapter 8: Water Shortage Contingency Plan
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal and Implementation

This 2020 UWMP also contains the following appendices of supplemental information and data related to DSRSD's 2020 UWMP:

- Appendix A: Legislative Requirements
- Appendix B: Demonstration of Reduced Delta Reliance
- Appendix C: DWR 2020 Urban Water Management Plan Tables
- Appendix D: DWR 2020 Urban Water Management Plan Checklist
- Appendix E: Public Notices
- Appendix F: Distribution System Water Loss Audit Reports
- Appendix G: SB X7-7 Compliance Form
- Appendix H: Water Supply Contract and Amendment
- Appendix I: DSRSD-EBMUD Recycled Water Authority Resolution 19-3
- Appendix J: DSRSD 2021 Alternative Water Supply Study Executive Summary
- Appendix K: DSRSD Water Resiliency Policy
- Appendix L: Zone 7 Water Supply Policy (Resolution No. 13-4230)
- Appendix M: Water Shortage Contingency Plan
- Appendix N: DSRSD Water Waste Prevention Ordinances
- Appendix O: Water Conservation Outreach Materials
- Appendix P: UWMP and WSCP Adoption Resolutions

Furthermore, this 2020 UWMP contains all the tables recommended in the DWR Guidebook, both embedded into the UWMP chapters where appropriate and included in Appendix C.

DWR's Urban Water Management Plan Checklist, as provided in the DWR Guidebook, has been completed by West Yost to demonstrate the plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix D.

CHAPTER 2
Plan Preparation

This chapter describes the preparation of DSRSD's 2020 UWMP and WSCP, including the basis for the preparation of the plan, individual or regional planning, fiscal or calendar year reporting, units of measure, and plan coordination and outreach.

2.1 BASIS FOR PREPARING A PLAN

The Act requires every "urban water supplier" to prepare and adopt a UWMP, to periodically review its UWMP at least once every five years and make any amendments or changes which are indicated by the review. An "urban water supplier" is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually (AFY).

DSRSD is a water retailer and manages Water System CA0110009. As shown in Table 2-1, in 2020, DSRSD provided water to 27,976 customer connections and supplied 10,330 AF of potable water. Therefore, DSRSD is required to prepare a UWMP. DSRSD's last UWMP, the 2015 UWMP, was adopted by DSRSD Board of Directors on June 7, 2016.

Note that the California Environmental Quality Act (CEQA) does not apply to the preparation and adoption of a UWMP as stated in CWC 10652, and therefore did not require the public process associated with CEQA.

Table 2-1. Public Water Systems (DWR Table 2-1 Retail)

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA0110009	Dublin San Ramon Services District	27,976	10,330
	TOTAL	27,976	10,330

NOTES: Units of measure is AF; number of connections and volume of water supplied is for potable water system only.
SOURCE: Dublin San Ramon Services District, Water Usage Report 2020, February 2021.

2.2 REGIONAL PLANNING

As described in Section 2.3 below, DSRSD has prepared this 2020 UWMP on an individual reporting basis, not part of a regional planning process. However, DSRSD routinely coordinates with the Zone 7 (the region's water wholesaler) and the region's other water retailers – Pleasanton, Livermore and Cal Water – on water supply matters and in conjunction with the assessment of the region's available water supply and projected water demands for Zone 7's 2019 Water Supply Evaluation (WSE) Update, 2020 UWMP and WSCP update. Zone 7 also assisted DSRSD in the preparation of this UWMP. Additionally, DSRSD regularly coordinates with East Bay Municipal Utility District (EBMUD) through the DSRSD-EBMUD Recycled Water Authority (DERWA) on recycled water supply matters.

2.3 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

This 2020 UWMP has been prepared on an individual reporting basis covering only DSRSD's service area, see Table 2-2. DSRSD does not participate in a regional alliance, and it has not prepared a Regional Urban Water Management Plan (RUWMP). As described below in Section 2.5, DSRSD has notified and coordinated with appropriate regional agencies and constituents, including Zone 7, Pleasanton, Livermore, Cal Water, EBMUD, and DERWA.

Table 2-2. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.4 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

DSRSD is a water retailer.

DSRSD's 2020 UWMP has been prepared on a calendar year basis, with the calendar year starting on January 1 and ending on December 31 of each year. Water use and planning data for the entire calendar year of 2020 has been included.

The water volumes in this 2020 UWMP are reported in units of acre-feet (AF).

DSRSD's reporting methods for this 2020 UWMP are summarized in Table 2-3.

Table 2-3. Agency Identification (DWR Table 2-3)

Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	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	
Unit	AF

2.5 COORDINATION AND OUTREACH

This section includes a discussion of DSRSD's inter-agency coordination and coordination with the general public. The UWMP Act requires DSRSD to coordinate the preparation of its UWMP and updates to its WSCP with other appropriate agencies and all departments within DSRSD, including other water suppliers that share a common source, water management agencies, and relevant public agencies. DSRSD coordinated the preparation of its Plan with Zone 7, Pleasanton, Livermore, Cal Water, EBMUD, and DERWA. These agencies, as well as the public, participated in the coordination and preparation of this 2020 UWMP, including the WSCP update, and are summarized below.

2.5.1 Wholesale and Retail Coordination

DSRSD is one of four water retailers that purchase water on a wholesale basis from Zone 7. As noted in Table 2-4, DSRSD notified Zone 7 of the development of its 2020 UWMP and provided Zone 7 with a copy of the draft Plan. In addition, DSRSD has participated in the development of Zone 7's UWMP by providing DSRSD's water demand projections and commenting on Zone 7's Draft UWMP. DSRSD, in turn, received information from Zone 7 on its existing and planned sources of water.

Table 2-4. Water Supplier Information Exchange (DWR Table 2-4 Retail)

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
Zone 7 Water Agency (Zone 7)

2.5.2 Coordination with Other Agencies and the Community

DSRSD actively encourages community participation in water management activities and specific water-related projects. DSRSD's public participation program includes both active and passive means of obtaining input from the community, such as mailings, public meetings, and web-based communication. DSRSD's website describes on-going projects and posts announcements of planned rate increases to fund these water projects.

As part of the 2020 UWMP and WSCP update, DSRSD facilitated a public review period. Public noticing, pursuant to Section 6066 of the Government Code, was conducted prior to commencement of a public comment period. Public hearing notices are included in Appendix E of this plan. During the public comment period, the Draft UWMP, which includes the updated WSCP, was made available on DSRSD's website (www.dsrsd.com) and at the DSRSD office, City of Dublin and San Ramon City Halls, and the following local libraries:

- Dublin Library at 200 Civic Plaza, Dublin, CA 94568; and
- Dougherty Station Library at 17017 Bollinger Canyon Road, San Ramon, CA 94583.

DSRSD also coordinated the preparation of this 2020 UWMP with several agencies, including relevant public agencies that utilize the same water supplies. These agencies included the following:

- City of Dublin (Dublin)
- City of San Ramon (San Ramon)
- Alameda County
- Contra Costa County
- Zone 7
- Cal Water
- Livermore
- Pleasanton
- U.S. Army Reserve's Parks Reserve Forces Training Area (Parks RFTA)
- Federal Bureau of Prison's Federal Correctional Institution at Dublin (FCI)
- Alameda County Santa Rita Jail
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- East Bay Discharges Authority (EBDA)
- Livermore-Amador Valley Water Management Agency (LAVWMA)
- DSRSD-EBMUD Recycled Water Authority (DERWA)

The public hearing provided an opportunity for all DSRSD water users and the general public to become familiar with the UWMP and WSCP updates and ask questions about DSRSD's water supply, in addition to DSRSD's continuing plans for providing a reliable, safe, high-quality water supply.

2.5.3 Notice to Cities and Counties

CWC Section 10621(b) requires agencies to notify the cities and counties to which they serve water at least 60 days in advance of the public hearing that the plan is being updated and reviewed. On March 10, 2021, a notice of preparation was sent to the cities and counties and other stakeholders, to inform them of the UWMP update process and schedule, and to solicit input for the 2020 UWMP and updated WSCP. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10.

CHAPTER 3
System Description

This chapter provides a description of DSRSD's water system and service area. This includes a description of the water system facilities, climate, population, and housing within DSRSD's service area.

3.1 GENERAL DESCRIPTION

DSRSD was formed in 1953 under the Community Services District Act, Government Code Sections 61000-61802, and was initially known as the Parks Community Services District. In 1963, the name was changed to Valley Community Services District. The initial water system was constructed by the Volk-McClain Company, which drilled wells for DSRSD along Dublin Boulevard in Dublin . DSRSD originally supplied water to San Ramon until EBMUD took over water service in 1967.

As the need for additional sources of water became apparent, DSRSD first entered into an agreement with Zone 7 in 1963 to acquire additional treated water supplies. DSRSD's most recent contract with Zone 7 went into effect on August 23, 1994 and has a 30-year term (until 2024). Discussion of the terms of the supply contract is provided in Chapter 6 of this UWMP. Other water retailers served by Zone 7 include Livermore, Pleasanton, and Cal Water.

Commercial and residential growth in the region since 1963 has required continuous increases in the capacity of Zone 7's treatment, pumping, storage, and distribution facilities, along with the expansion of DSRSD's water service area and water distribution system. Additional growth is anticipated in the region. DSRSD, in cooperation with Zone 7, has acquired additional water supplies to provide for this growth. These supplies include additional water from Zone 7 (including a water entitlement transfer for Dougherty Valley), groundwater, and recycled water. Current and projected water supplies are described in greater detail in Chapter 6 of this UWMP.

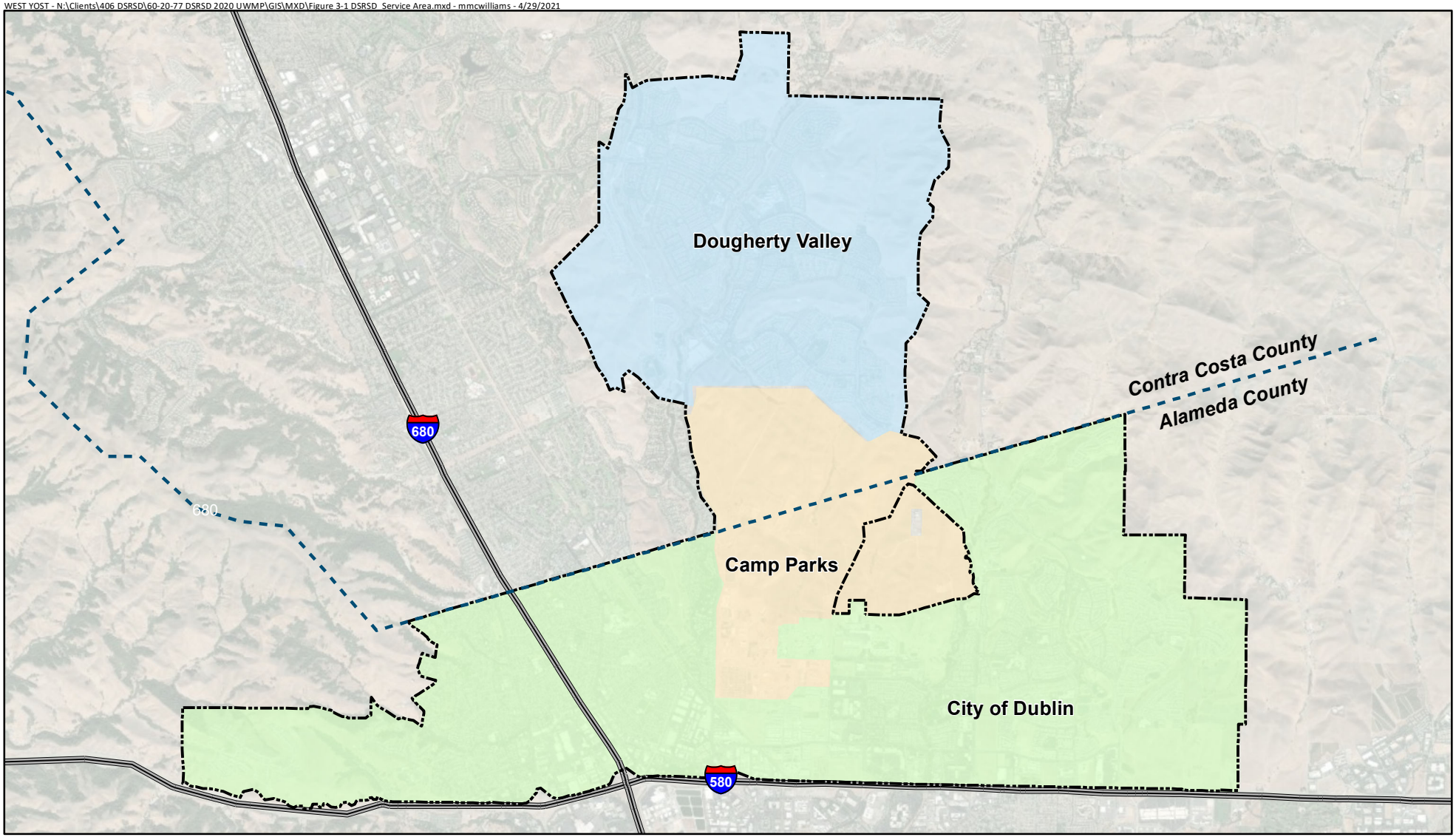
3.2 SERVICE AREA BOUNDARY

DSRSD's service area is located in the East (San Francisco) Bay's Livermore-Amador Valley near the Interstate 580/680 interchange. Currently, DSRSD is responsible for providing both potable and recycled water to its original service area in Dublin, as well as approved development in eastern Dublin, western Dublin, and the Dougherty Valley area of San Ramon in Contra Costa County. DSRSD's water service area also includes the Parks RFTA, which officially became part of the water system in 1999, FCI, and Alameda County's Santa Rita Jail.

Wastewater collection and treatment services are also provided by DSRSD for Dublin, Pleasanton, Parks RFTA, FCI, Santa Rita Jail, and the southern portion of San Ramon. DSRSD owns and operates a wastewater treatment plant in Pleasanton that has a capacity of 17 million gallons per day (MGD).

DSRSD currently (2020) supplies potable water to 27,976 municipal connections (residential, commercial, construction, fire line, and landscape irrigation customers) in Dublin, California, and the Dougherty Valley in San Ramon, California. DSRSD also supplied recycled water to 474 customers connections in Dublin and Dougherty Valley by the end of 2020.

DSRSD's water service area is shown on Figure 3-1.



- Water Service Area
- Camp Parks
- Dougherty Valley
- City of Dublin

N

0 3,000 6,000

Scale in Feet

Figure 3-1

DSRSD Current Water Service Area

Dublin San Ramon Services District
2020 Urban Water Management Plan

WEST YOST

3.3 WATER SYSTEM DESCRIPTION

DSRSD provides both potable water and recycled water services within its water service area. DSRSD's potable water and recycled water systems are presented in Figures 3-2 and 3-3, respectively.

3.3.1 Potable Water System Facilities and Pressure Zones

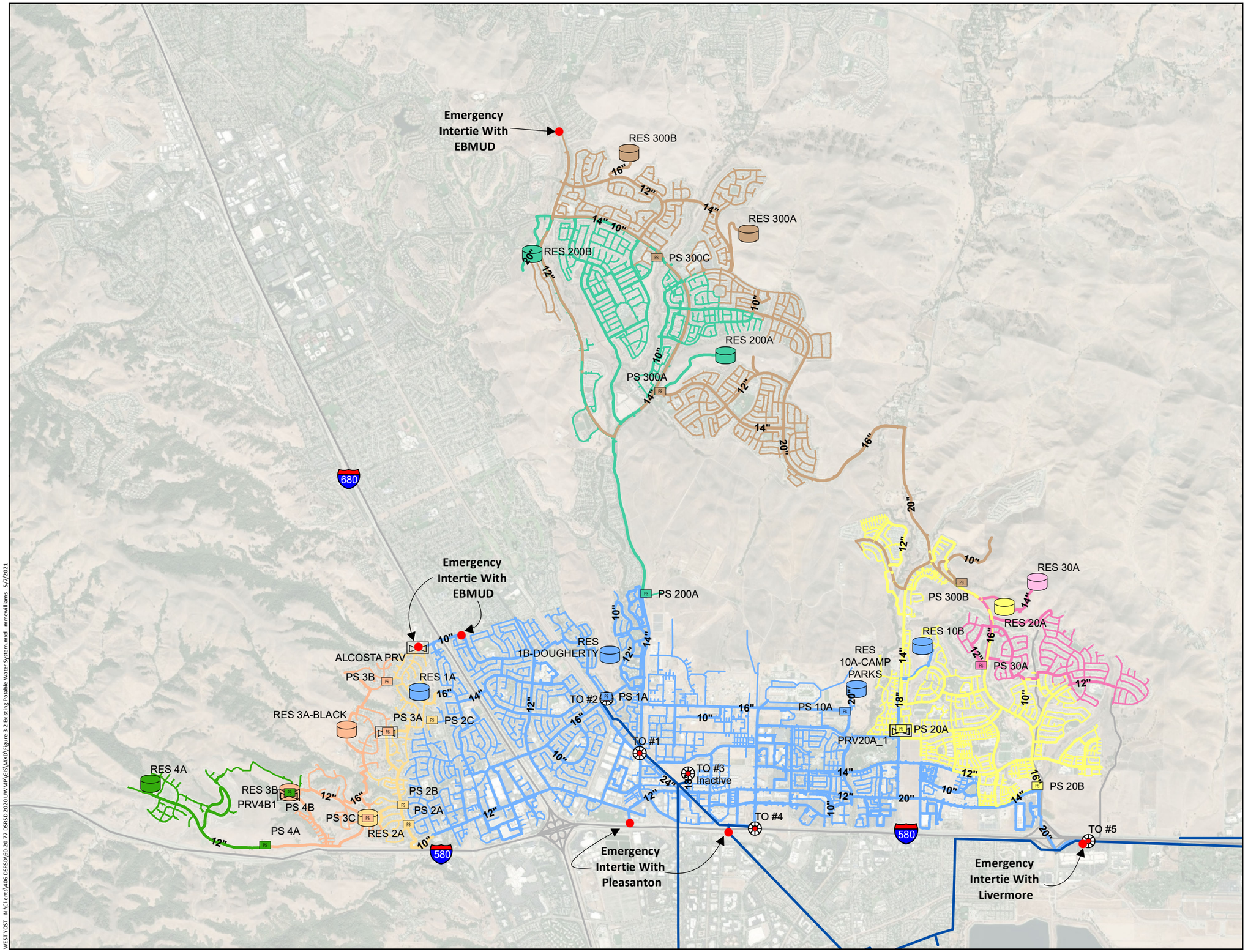
DSRSD has a total of eight pressure zones. The main pressure zone, Zone 1, is supplied directly from the Zone 7 through several turnouts. There are three pressure zones (Zones 2, 3, and 4) in western Dublin, two pressure zones (Zones 20 and 30) in eastern Dublin, and two pressure zones (Zone 200 and 300) in the Dougherty Valley that are supplied from Zone 1 through booster stations. DSRSD's potable water distribution system currently contains approximately 337 miles of potable water pipelines.

3.3.2 Recycled Water System Facilities

DSRSD began constructing its major recycled water infrastructure in 1998. The system was expanded into Eastern Dublin and Dougherty Valley as development in those areas occurred, and in 2015, it was expanded into Western Dublin. DSRSD owns and operates 55.3 miles of recycled water distribution mains, and operates 16.6 miles of DERWA transmission mains.

3.3.3 Emergency Interties

DSRSD currently has six potable water pipeline interties (three with EBMUD, two with Pleasanton and one with the Livermore). Each emergency intertie was added as DSRSD's potable water system expanded to create an opportunity for interconnection with adjacent agencies. The interties are strictly for emergency conditions, such as a major pipeline break, supply contamination, or interruption of deliveries due to earthquake, flood, or other disaster. Each agency participating in an intertie can obtain water from the other during an emergency.



WEST YOST - N:\Client\5406 DSRSD\60-20-77 DSRSD 2020 UWMP\GIS\MXD\Figure 3-2 Existing Potable Water System.mxd - mmcwilliams - 5/7/2021

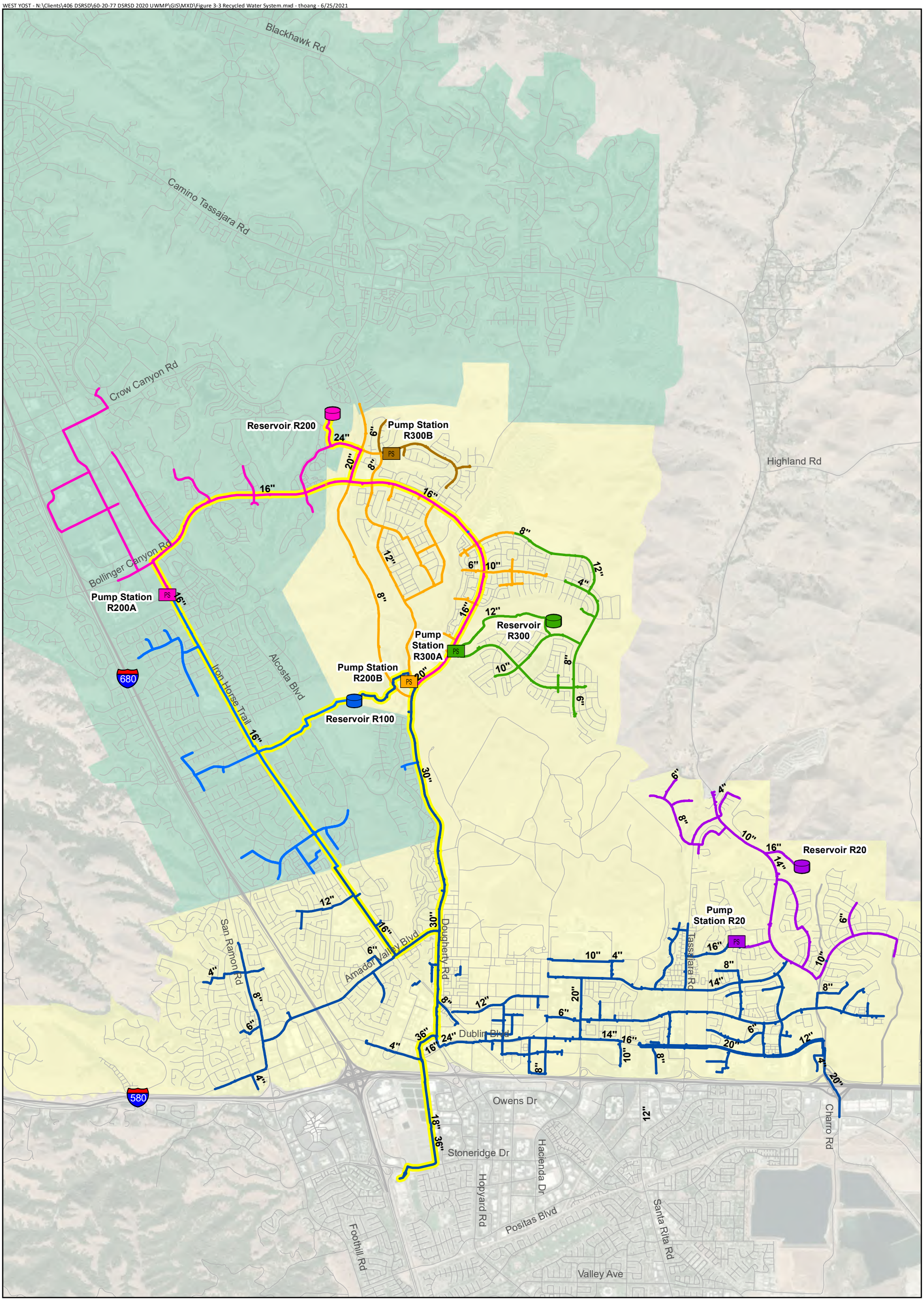
WEST YOST

Figure 3-2

Existing Potable Water System

Dublin San Ramon Services District
2020 Urban Water Management Plan

WEST YOST - N:\Clients\406 DSRSD\60-20-77 DSRSD 2020 UWMP\GIS\MXD\Figure 3-3 Recycled Water System.mxd - thoang - 6/25/2021



- Pump Station
- Reservoir
- Existing Pipeline
- DERWA Recycled Water Transmission Pipeline
- EBMUD Service Area
- DSRSD Service Area

- R1 (DSRSD)
- R1 (EBMUD)
- R20 (DSRSD)
- R200 (DSRSD)
- R200 (EBMUD)
- R300A (DSRSD)
- R300B (DSRSD)
- R3000 (EBMUD)
- R4000 (EBMUD)

N

0 2,000 4,000

Scale in Feet

Figure 3-3

Recycled Water System

Dublin San Ramon Services District
2020 Urban Water Management Plan

3.4 SERVICE AREA CLIMATE

The climate of DSRSD's service area is best described as Mediterranean, characterized by hot, dry summers and cool winters.

3.4.1 Historical Climate

Water use within DSRSD's water service area is dependent on various climate factors such as temperature, precipitation, and evapotranspiration (ET_o). ET_o describes the combined water loss through evaporation from the soil and surface-water bodies and plant transpiration. In general, the ET_o is given for turf grass, and then corrected for a specific crop type. Local ET_o data was obtained from the California Irrigation Management Information System (CIMIS) monitoring station in Pleasanton, California (Station #191), which is located just south of DSRSD's water service area.

The historical climate characteristics affecting water management in DSRSD's service area, including average ET_o, rainfall, and temperature, are shown in Table 3-1. The average annual precipitation is approximately 17.2 inches, while the total evapotranspiration is approximately 51.5 inches. Average monthly temperatures vary from 47 to 70 degrees Fahrenheit throughout the year.

Table 3-1. Monthly Average Climate Data Summary

Month	Standard Monthly Average ET_o[(a)], inches	Average Total Rainfall[(b)], inches	Average Temperature[(b)], degrees Fahrenheit
January	1.51	2.83	47.4
February	2.17	2.70	50.6
March	3.63	2.95	53.8
April	4.94	1.47	56.9
May	6.16	0.57	61.1
June	7.10	0.23	67.0
July	7.53	0.09	70.2
August	6.61	0.09	69.3
September	4.98	0.12	67.2
October	3.50	1.09	61.0
November	1.93	1.66	52.6
December	1.41	3.36	47.1
Total	51.5	17.2	--

(a) Source: California Irrigation Management Information System (CIMIS) data for Station #191: Pleasanton (downloaded November 11, 2020).
(b) Source: CIMIS data for Station #191: Pleasanton (data from October 2004 through October 2020).

3.4.2 Potential Effects of Climate Change

California Water Code now requires water suppliers to account for climate change impacts on water supplies and supply reliability. A discussion of climate change's effects on water demands, supplies, and reliability can be found in Chapter 4, Chapter 6, and Chapter 7 of this UWMP. This section summarizes those discussions.

In general, climate change is expected to increase water demand for irrigation and the year-to-year variability of demands. These increases are the result of increased temperatures (which increases evapotranspiration) and more variability in precipitation (which impacts supply availability and reliability). Natural disasters such as wildfires, droughts, and floods are expected to increase in both frequency and intensity.

Responding to climate change generally takes two forms: mitigation and adaptation. Mitigation is taking steps to reduce the contribution to climate change caused by reducing greenhouse gas (GHG) emissions. Adaptation is the process of responding to the effects of climate change by modifying systems and behaviors to function in a warmer climate.

In the water sector, climate change mitigation is generally achieved by reducing energy use, increasing energy efficiency, and/or replacing fossil fuel-based energy sources with renewable energy sources. Because water requires energy to move, treat, use, and discharge, water conservation results in energy conservation. Adaptation initiatives include diversification of DSRSD's water supply portfolio and expanding recycled water use.

3.5 SERVICE AREA POPULATION AND DEMOGRAPHICS

DSRSD's service area serves a highly desirable area due to its close proximity to major employment centers in the eastern San Francisco Bay Area. Land use planning within DSRSD's water service area is undertaken by Dublin and San Ramon. Land use planning within Dublin is guided by the *City of Dublin General Plan (2017).* Planning in the Dougherty Valley area is guided by the *City of San Ramon General Plan (2035)* and *Dougherty Valley Specific Plan (2014).*

Dublin has experienced strong housing growth since the early 1990's. Dublin's housing stock increased by 126 percent from 1990 to 2010. In 2011 and 2012, growth slowed due to the statewide economic downturn; however, in 2013, Dublin's population increased by over 7 percent, making Dublin one of the fastest-growing cities in California in 2013. From 2010 to 2019, Dublin's population increased from 46,036 to 66,147, a 44 percent increase. Dublin is expected to have an annual population increase of 2.09 percent from 2019 to 2024.

In 2000, Dublin's voters approved Measure M, which established an Urban Limit Line in the Western Extended Planning Area of Dublin's General Plan for a period of 30 years. During this period, Dublin is restricted in approving uses or extensions of city services, facilities, and roads for urban development west of the Urban Limit Line. DSRSD's water service area is coterminous with the Dublin's city limit. The restriction of services to the Western Extended Planning Area will end in 2030. DSRSD shows no water demand for that area for 2035 because Dublin has no planned development after 2030. DSRSD will review the ability to provide water service to the west of the Urban Limit Line when Dublin adopts a General Plan that includes it.

Similar to Dublin, San Ramon experienced housing growth since the early 1990's. DSRSD provides potable water and recycled water services to the Dougherty Valley portion of San Ramon, a master-planned community that commenced development in the early 2000's.

3.5.1 Service Area Population

As described above, DSRSD provides water service to Dublin and the Dougherty Valley in San Ramon, California. Since the early 1980s, the population in DSRSD's service area has roughly tripled and growth is expected to continue. DSRSD has a current (2020) service area population of 92,409. The 2020 City of Dublin population is based on California Department of Finance (DOF) population estimate.[1] The 2020 Dougherty Valley population is based on data obtained from the DWR Population Tool and is included in Appendix G. Additional discussion of DSRSD's historical and 2020 service area population, to determine DSRSD's SB X7-7 baseline and target per capita water use and 2020 compliance, is provided in Chapter 5 Conservation Target Compliance.

Projections of the future population within DSRSD's service area have been made based on the projected number of new housing units within planned new developments and are summarized in Table 3-2. Dublin is projected to continue its growth through 2045, while Dougherty Valley is substantially built out. Population projections from 2025 to 2045 for DSRSD's water service area are estimated based on new housing units. Population projections between 2035 and 2045 include estimated population increases associated with 50 percent of Dublin's household allocations as proposed in the *Draft Regional Housing Needs Allocation (RHNA) Methodology Release* in December 2020 to support Plan Bay Area 2050, which is discussed further in Section 3.6.3. By 2045, DSRSD's water service area population is projected to grow by approximately 20.6 percent to 111,458.

Table 3-2. Population – Current and Projected (DWR Table 3-1 Retail)

Population Served	2020[1]	2025	2030	2035[2]	2040[2]	2045*(opt)* [2]
	92,409	100,686	104,625	107,942	109,700	111,458

NOTES:

[1]Dublin 2020 population estimate is from DOF Table E-1 data. Dougherty Valley 2020 population estimate is from the DWR population tool. (See Appendix G.)

[2]Includes 50 percent of December 2020 Proposed RHNA household allocations at 2.81 persons per dwelling unit, per DOF *Table E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2020 with 2010 Census Benchmark* , distributed from 2032 to 2045.

[1] State of California, Department of Finance, E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2020 and 2021. Sacramento, California, May 2021. (https://www.dof.ca.gov/forecasting/demographics/estimates/e-1/)

3.5.2 Other Social, Economic, and Demographic Factors

The State now requires the inclusion of service area socioeconomic information as part of the system description in UWMPs. However, differences in household water use across sociodemographic groups in DSRSD's water service area have not been studied, nor does DSRSD differentiate water management by sociodemographic factors. To comply with the new regulation, the following social, economic, and demographic information from the US Census Bureau[2,3] is provided. The persons per household information for Dublin and San Ramon was obtained from DOF Table E-5, *Population and Housing Estimates for Cities, Counties, and the State, 2011-2021 with 2010 Census Benchmark*.[4] The following information is for Dublin during the five-year period from 2015 to 2019.

- The average number of people per household was 2.81.
- The median household income was $150,299.
- The owner-occupied housing unit rate was 65.5 percent, with a median home value of $882,200.
- The median gross rent was $2,681 per month.
- Of persons 25 years or older, 94.9 percent had earned at least a high school diploma or equivalent, and 66.3 percent had earned a bachelor's degree or higher.
- By race/ethnicity, 38.9 percent of people were White, 3.7 percent were Black, 0.5 percent were American Indian or Alaska Native, 48.9 percent were Asian, 0.4 percent were Hawaiian Native or Pacific Islander, 5.8 percent were two or more races, and 10.1 percent were Hispanic or Latino.
- 39.0 percent of residents were foreign born.

The following information is for San Ramon during the five-year period from 2015 to 2019.

- The average number of people per household was 2.85.
- The median household income was $160,783.
- The owner-occupied housing unit rate was 72.4 percent, with a median home value of $958,800.
- The median gross rent was $2,391 per month.
- Of persons 25 years or older, 96.4 percent had earned at least a high school diploma or equivalent, and 70.6 percent had earned a bachelor's degree or higher.
- By race/ethnicity, 43.1 percent of people were White, 2.3 percent were Black, 0.4 percent were American Indian or Alaska Native, 46.7 percent were Asian, 0.4 percent were Hawaiian Native or Pacific Islander, 5.8 percent were two or more races, and 7.1 percent were Hispanic or Latino.
- 37.0 percent of residents were foreign born.

[2] United States Census Bureau. American Community Survey, 2015-2019 ACS 5-Year Data Profile for the City of Dublin Census

[3] United States Census Bureau. American Community Survey, 2015-2019 ACS 5-Year Data Profile for the City of San Ramon Census

[4] State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011-2021. Sacramento, California, May 2021. (https://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-5/.)

3.6 LAND USES WITHIN SERVICE AREA

This section describes DSRSD's current and projected land uses in its water service area. It also discusses long-range planning efforts beyond the planning of this UWMP that require consideration in the future.

3.6.1 City of Dublin

DSRSD provides potable water and recycled water services, and wastewater collection and treatment service to Dublin. Land use planning for Dublin consists of four areas: the Primary Planning Area, the Eastern Extended Planning Area, the Western Extended Planning Area, and the Dublin Crossing Planning Area. Most of the Primary Planning Area has been developed, with primary land uses including single-family residential, business park/industrial, open space, and parks. One exception within the Primary Planning Area is the Downtown Dublin Specific Plan Area, which is being redeveloped to focus on higher density, mixed-use (transit-oriented) projects following the opening of the West Dublin Bay Area Rapid Transit (BART) station.

Development opportunities are also limited in the Western Extended Planning Area, where approximately 85 percent of the Western Extended Planning Area's 3,132 acres lies outside Dublin's Urban Limit Line. The Urban Limit Line protects natural resources in Dublin's western hills, and Dublin will not extend services or facilities (e.g., utilities or roads) beyond the Urban Limit Line. Most of the Western Extended Planning Area acreage within the Urban Limit Line has been designated open space, with the remainder reserved for low density residential development.

A significant portion of future development in Dublin will occur within the Eastern Extended Planning Area. This is formalized in the Eastern Dublin Specific Plan (EDSP), which provides a framework for growth and development of approximately 3,300 acres east of the Parks RFTA. While residential designations within the EDSP area range from rural residential/agriculture to high density multi-family, approximately 55 percent of new dwelling units will be single-family residential. Non-residential land uses within the EDSP area include retail, service, office, governmental, research and development, and light industrial.

3.6.2 City of San Ramon-Dougherty Valley

DSRSD provides potable and recycled water services to Dougherty Valley, and wastewater collection and treatment services to the southern San Ramon areas. Dougherty Valley encompasses approximately 5,978 acres of land located in south central Contra Costa County, immediately to the north of the Alameda County line and east of San Ramon. It includes land on both sides of Dougherty Road, from Parks RFTA on the south to near the Crow Canyon/Dougherty Road intersection on the north.

San Ramon is divided into nine planning subareas, four of which overlap DSRSD's wastewater and potable water service areas: Westside, Southern San Ramon, Dougherty Hills, and Dougherty Valley. The Westside subarea is mostly unincorporated open hillsides, though an area along San Ramon Valley Boulevard is designated primarily for residential development and a neighborhood shopping center. In contrast, the Southern San Ramon and Dougherty Hills subareas are suburban communities with primarily residential land uses. Development of Dougherty Valley is detailed in the Dougherty Valley Specific Plan, which includes residential neighborhood clusters served by their own public facilities, a mixed-use activity center (Village Center), and a backdrop of broad open space. The Dougherty Valley area is substantially built out.

3.6.3 Long-Range Land Use Planning

In this section, long-range land use planning that may affect water management planning is discussed. Long-range planning includes years beyond the planning horizon of this UWMP and should be noted for consideration in future UWMP updates.

The Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) is preparing Plan Bay Area 2050, which provides long-range plans to guide the growth of the nine-county region. Plan Bay Area 2050 is expected to be completed in 2021 and integrates strategies for transportation, housing, the environment, and the economy. ABAG published the *Draft RHNA Methodology Release* in December 2020 to support Plan Bay Area 2050; this methodology has been used to develop "illustrative" RHNA allocations for each city and county in the region. Allocations will be finalized in 2021 through the remaining steps of the RHNA process. The proposed housing unit allocations for the cities in DSRSD's water service area are 3,719 units for Dublin and 5,111 units for San Ramon.[5] ABAG is expected to approve a Final Methodology and issue Draft Allocations in Spring 2021. Issuing the Draft Allocations will be followed by an appeal period, with ABAG issuing Final Allocations by the end of 2021. Dublin and San Ramon will then have until January 2023 to update their Housing Element to include an inventory of specific sites or parcels that are available for residential development to meet the RHNA and receive certification by the California Department of Housing and Community Development.

Each of the cities in DSRSD's water service area will need to understand the Final Allocations in the context of their respective general plans and update their Housing Elements, as necessary. As a preliminary estimate, DSRSD incorporated a portion of the City of Dublin's RHNA allocation into the water demand projections from 2032 to 2045.

[5] Association of Bay Area Governments, December 2020. Release of ABAG Draft RHNA Methodology and Final Subregional Shares, Appendix 3.

CHAPTER 4
Water Use Characterization

This chapter describes and quantifies DSRSD's past, current, and projected potable and recycled water use. Water demand projections are based on the projected growth within DSRSD's service area. This chapter also presents DSRSD's water losses for the previous five years, projects future water use for lower income households, and discusses the impact of climate change on water use.

4.1 NON-POTABLE VERSUS POTABLE WATER USE

DSRSD provides both potable water and recycled water to customers within its water service area. Potable water is water that is safe to drink, and which typically has had various levels of treatment and disinfection. DSRSD purchases potable water supplies from the Zone 7 and distributes the water within its water service area.

Recycled water is municipal wastewater that has been treated to a specified quality to enable it to be used again. As discussed in Chapter 6, DSRSD owns and operates a recycled water treatment facility (RWTF) at its wastewater treatment plant and participates with EBMUD in a joint powers authority, DERWA, which operates the San Ramon Valley Recycled Water Program (SRVRWP). The SRVRWP provides recycled water that meets Title 22 disinfected tertiary recycled water requirements to landscape irrigation customers of DSRSD and EBMUD. In 2018, DSRSD commenced delivery of recycled water to Pleasanton.

Raw water is untreated water that is used in its natural state or with minimal treatment. DSRSD does not deliver raw water to any customers in its service area

DSRSD's water supplies are described further in Chapter 6.

4.2 WATER USE BY SECTOR

This section describes DSRSD's past, current, and projected water use by sector through the year 2045 in five-year increments. Water demand projections are estimated based on land use and land use-based water use factors documented in the DSRSD's 2016 Water Master Plan.

This section identifies the usage among water use sectors including single-family residential, multi-family residential, commercial, industrial, institutional/governmental, landscape irrigation, agricultural, and others. These classifications were used to analyze current consumption patterns among various types of customers. DSRSD uses the same definitions for each sector as outlined in the DWR Guidebook:

- **Single-family Residential:** A single-family dwelling unit. A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.
- **Multi-family Residential:** Multiple dwelling units contained within one building or several buildings within one complex.
- **Commercial:** A water user that provides or distributes a product or service (CWC 10608.12(d)).
- **Industrial:** A water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development (CWC 10608.12(h)).

- **Institutional (and Governmental):** A water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions (CWC 10608.12(i)).
- **Landscape:** 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.
- **Agricultural:** Water used for commercial agricultural irrigation.
- **Other:** Any other water demand that is not adequately described by the water sectors defined above. Unlike previous UWMPs, system water losses are not to be reported in the "Other" category.

4.2.1 Historical Water Use

DSRSD's past water use (for 2010 and 2015) by water use sector is reported in Table 4-1. These are the same values reported in DSRSD's 2015 UWMP.

Table 4-1. Historical Water Use by Customer Type

Water Use Type	2010 Actual Volume, AF[(a)]	2015 Actual Volume, AF[(b)]
Single Family	4,566	3,618
Multi-Family	1,226	1,418
Commercial	835	699
Industrial	0	0
Institutional/ Governmental	798	105
Landscape	1,376	482
Agricultural	0	0
Other	0	696
Potable System Losses	463	421
Total Potable Water Use	**9,264**	**7,439**
Recycled Water- Metered	1,264	2,579
Recycled Water- WWTP Use	465	
Total Recycled Water Use[(c)]	**1,729**	**2,579**
Total Water Use	**10,993**	**10,018**

(a) DSRSD 2015 UWMP, Table 4-1
(b) DSRSD 2015 UWMP, Table 4-2
(c) DSRSD 2015 UWMP, Table 6-8

Because DSRSD's WWTP is physically located in Pleasanton, recycled water used at its WWTP is not included in the above table.

4.2.2 Current Water Use

Table 4-2 reports DSRSD's actual water use for the year 2020. DSRSD does not use its water supply for saline barriers, groundwater recharge, and conjunctive use, within its service area.

Table 4-2. Actual Demands for Potable and Non-Potable Water (DWR Table 4-1 Retail)

Use Type	2020 Actual[1]		
Drop down list	Additional Description (as needed)	Level of Treatment When Delivered	Volume[2]
Single Family		Drinking Water	5,784
Multi-Family		Drinking Water	1,869
Commercial		Drinking Water	651
Institutional/Governmental		Drinking Water	492
Landscape		Drinking Water	1,011
Other	Fireline Meters	Drinking Water	1
Other	Ranch Owner	Drinking Water	2
Other	Supplemental water for recycled water demand	Drinking Water	7
Losses		Drinking Water	513
		TOTAL	10,330

NOTES:
[1]Volumes are in AF.
[2]Source: Dublin San Ramon Services District, Water Usage Report Export 2020, February 2021. American Water Works Association, Water Audit Report 2019-2020.

4.2.3 Projected Water Use

This section presents water demand projections for DSRSD's water service area. Water demand projections in this 2020 UWMP are estimated based on future developments within DSRSD's service area, which primarily are located in the Dublin area. This section details water demand projections on a 25-year planning horizon and, for the DRA, a characteristic five-year basis.

4.2.3.1 25-Year Planning Horizon

DSRSD's projected potable water demands through the year 2045 are presented in Table 4-3. Table 4-4 summarizes the actual and projected potable water demands reported in Tables 4-2 and 4-3.

Table 4-3. Demands for Potable and Non-Potable Water – Projected (DWR Table 4-2 Retail)

Use Type	Additional Description (as needed)	Projected Water Use[1,2] *Report To the Extent that Records are Available*				
		2025	2030	2035	2040	2045 (opt)
Single Family		6,236	6,983	7,226	7,342	7,458
Multi-Family		2,043	2,287	2,367	2,405	2,443
Commercial		649	727	752	764	776
Institutional/Governmental		522	584	604	614	624
Landscape		1,329	1,489	1,540	1,565	1,590
Other	Construction	376	376	376	188	188
Other	Fireline meters	1	1	1	2	2
Other	Ranch owner	2	3	3	3	4
Other	Unmetered sales[3]	136	136	136	136	136
Other	Supplemental water for recycled water demand[4]	21	21	21	21	21
Losses	Potable System Water Losses[5]	678	755	780	781	793
	TOTAL	11,993	13,363	13,807	13,820	14,034

NOTES:
1. Volumes are in AF.
2. Projected demands given by DSRSD.
3. Estimated based on the average of 2017-2020 water loss audit billed unmetered data.
4. Average of supplemental potable water from 2015 to 2020.
5. Unaccounted for water at 6 percent.

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

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*[1]	10,330	11,993	13,363	13,807	13,820	14,034
Recycled Water Demand *From Table 6-4*[1]	3,044	3,044	3,044	3,044	3,044	3,044
Optional Deduction of Recycled Water Put Into Long-Term Storage	0	0	0	0	0	0
TOTAL WATER USE	13,374	15,037	16,407	16,851	16,864	17,078

NOTES: [1]Volumes are in AF. Table references refer to DWR table numbers.

The actual and projected recycled water demands are reported in Chapter 6 , Table 6-6. DSRSD's recycled water program is highly successful and reached maximum capacity to serve recycled water customers during peak months. Due to the limited recycled water supply during peak months, DSRSD is no longer projecting new recycled water connections until the recycled water supply is available. Thus, projected recycled water demands are not anticipated to increase from 2025 to 2045.

4.2.3.2 Characteristic Five-Year Water Use

Water Code Section 10635(b) requires urban suppliers to include a five-year DRA in their UWMP. A key component of the DRA is estimating demands for the next five years (2021-2025) without drought conditions (i.e., unconstrained demand) to account for climate change considerations. Chapter 7 details the DRA, but the five-year demand projections are summarized in Table 4-5. Demand projections for 2021 through 2025 are estimated based on new developments that had submitted a planning application to Dublin.

Table 4-5. Projected Water Demands for Drought Risk Assessment

	2021	2022	2023	2024	2025
Potable Water Demand[(a)], AFY	10,663	10,996	11,328	11,661	11,993

(a) Demand projections were estimated based on new developments that had submitted a planning application to Dublin.

4.3 DISTRIBUTION SYSTEM WATER LOSSES

System losses are the difference between the actual volume of water treated and delivered into the distribution system and the actual metered consumption. Such apparent losses are always present in a water system due to pipe leaks, unauthorized connections or use; faulty meters; unmetered services such as fire protection and training, and system and street flushing.

DSRSD uses the American Water Works Association (AWWA) method to evaluate its distribution system losses annually. For the 2019/2020 fiscal year, DSRSD's water losses were estimated to be approximately 513 AF, or approximately 4.8 percent. A copy of DSRSD's 2020 Water Audit for Fiscal Year 2019/2020 worksheet is provided in Appendix F.

New regulations require retail water suppliers to include potable distribution system water losses for the preceding five years (to the extent records are available). Table 4-6 summarizes system losses for the previous four fiscal years (2015/2016 through 2019/2020). At the time of preparation of this UWMP, DWR and the State Water Board are in the process of adopting water loss standards as discussed further in Chapter 9.

Table 4-6. 12-Month Water Loss Audit Reporting (DWR Table 4-4 Retail)

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
01/2016	167
07/2017	490
07/2018	446
07/2019	513
NOTES: Volume are in AF; a copy of the DSRSD's 2020 Water Audit is provided in Appendix E.	

4.4 ESTIMATING FUTURE WATER SAVINGS

The water use projections presented in Table 4-4 are based on land use projections within DSRSD's water service area of Dublin and Dougherty Valley. Additional water savings from codes, standards, ordinances, or transportation and land use plans, also known as passive savings, can decrease the water use for new and future customers. As indicated in Table 4-7 below, these potential passive savings have not been included in DSRSD's water demand projections to be conservative.

Table 4-7. Inclusion in Water Use Projections (DWR Table 4-5 Retail)

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	No
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

4.5 WATER USE FOR LOWER INCOME HOUSEHOLDS

SB 1087 (2006) requires water providers to develop written policies that prioritize development that includes affordable housing to low-income households. The water demand projections shown in Tables 4-3 and 4-4 include water use for single-family and multi-family residential housing needed for low-income households, as identified in Dublin's and San Ramon's Housing Elements. A low-income household is defined as a household with an income below 80 percent of the Area Median Income, adjusted for family size. According to the Dublin Housing Element (2015-2023) adopted in November 2014, the percent of Dublin households with incomes below 80 percent of the Area Median Income was

17 percent in 2010[6]. According to the San Ramon General Plan 2035 adopted in April 2015, the percent of San Ramon households with incomes below 80 percent of the Area Median Income was 16 percent in 2010[7].

Therefore, based on the housing data for Dublin and San Ramon, approximately 17 percent of DSRSD's water demands are estimated to be attributed to low-income households. Table 4-8 presents these projected water demands for single-family and multi-family households.

Table 4-8. Projected Water Demands for Lower Income Households

Water Use Sector	Water Demands for Low Income Households[(a)], AF				
	2025	2030	2035	2040	2045
Single Family	1,060	1,187	1,228	1,248	1,268
Multi-Family	347	389	402	409	415
Total	**1,407**	**1,576**	**1,631**	**1,657**	**1,683**

(a) Based on data from City of Dublin and City of San Ramon Housing Elements indicating that 16 to 17 percent of households in DSRSD service area are classified as low-income.

As indicated in Table 4-8, the water demands for the lower income households are included in DSRSD's water demand projections.

4.6 CLIMATE CHANGE CONSIDERATIONS

DSRSD's future water demand and use patterns may be impacted by climate change. Warmer temperatures are expected to increase landscaping and irrigation demand and lengthen the growing season. In addition, climate change may increase the frequency and intensity of wildfires, which would increase water demands for firefighting. Expanded use of recycled water could mitigate the effects of climate change on water demands.

DSRSD continues to evaluate methodologies to correlate climate change impacts to water demands within DSRSD's service area and will incorporate climate change impacts on demands in future UWMPs.

The potential impacts of climate change on DSRSD's water supplies are described in Chapter 6.

[6] Appendix C Table C-8: Households by Income Category – 2010, City of Dublin Housing Element 2015-2015, adopted November 18, 2014 (Resolution 197-14).

[7] Chapter 11 Housing, Table 11-5: San Ramon Households by Income Category (2010), City of San Ramon General Plan 2035, adopted by San Ramon City Council April 28, 2015.

CHAPTER 5
SB X7-7 Baselines, Targets, and 2020 Compliance

In November 2009, the Water Conservation Act of 2009, was signed into law as part of a comprehensive water legislation package. Also known as Senate Bill X7-7 (SB X7-7), the Water Conservation Act of 2009 addressed both urban and agricultural water conservation and set a goal of achieving a 20 percent statewide reduction in urban per capita water use by December 31, 2020 (i.e., "20 by 2020").

This chapter demonstrates that DSRSD has achieved its 2020 target reduction by reviewing its population and recent water use.

5.1 OVERVIEW AND BACKGROUND

To meet the urban water use target required by SB X7-7, each retail supplier was required to determine its baseline water use, as well as its target water use for the year 2020. Water use is measured in gallons per capita per day (GPCD).

This chapter provides a review of the methodology DSRSD used to calculate its baseline and its 2020 Urban Water Use Target (target). DSRSD calculated baselines and targets on an individual reporting basis in accordance with SB X7-7 legislation requirements and DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (2016) (DWR's Methodologies).

DSRSD's compliance with SB X7-7 was first addressed in its 2010 UWMP, in which it determined its baseline per capita water use and established and adopted its urban water use targets for 2015 and 2020. SB X7-7 included a provision that an urban water supplier may update its 2020 urban water use target in its 2015 UWMP and may use a different target method than was used in 2010. Also, the SB X7-7 methodologies developed by DWR in 2011 noted that water suppliers may revise population estimates for baseline years when the 2010 Census information became available. The 2010 Census data was not finalized until 2012. In its 2015 UWMP, DSRSD updated its population, baselines, and targets to reflect 2010 Census data. DSRSD demonstrated that it successfully achieved its 2015 interim target and confirmed its 2020 target.

The 2020 Census results were not available for inclusion in this UWMP update. Thus, actual water use data and the California Department of Finance (DOF) and DWR Population Tool population estimates were used for Dublin and San Ramon's Dougherty Valley, respectively, to calculate GPCD water use. DSRSD verifies that it achieved its 2020 target per capita water use. The potential difference between population estimates herein and the eventual final 2020 Census results is not believed to impact the fundamental conclusions of meeting SB X7-7 requirements.

Compliance with the urban water use target requirement is demonstrated in the SB X7-7 Compliance Form, which is included as Appendix G in this plan.

5.2 GENERAL REQUIREMENTS FOR BASELINE AND TARGETS

SB X7-7 required each urban water retailer to determine its baseline daily per capita water use over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also allowed urban water retailers that met at least 10 percent of their 2008 water demand with recycled water to extend their baseline GPCD calculation to a maximum of a continuous 15-year baseline period, ending no earlier than December 31, 2004 and no later than December 31, 2010. In its 2015 UWMP, DSRSD selected

the 10-year baseline period from 1996 through 2005. This is the same 10-year baseline period reported in DSRSD's 2010 UWMP.

SB X7-7 and DWR provided four different methods for calculating an urban water retailer's 2020 target. Three of these methods are defined in Water Code Section 10608.20(a)(1), and the fourth method was developed by DWR. The 2020 water use target may be calculated using one of the following four methods:

- **Method 1**: 80 percent of DSRSD's base daily per capita water use;
- **Method 2**: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses;
- **Method 3**: 95 percent of the applicable State hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan; or
- **Method 4**: An approach that considers the water conservation potential from: 1) indoor residential savings, 2) metering savings, 3) commercial, industrial and institutional savings, and 4) landscape and water loss savings.

DSRSD selected Method 1 to calculate its 2020 target in its 2015 UWMP.

Daily average water use is divided by the service area population to obtain baseline and target GPCD. In 2015, DSRSD adjusted its baseline and target GPCD to reflect its updated population estimates based on 2010 Census data results. To calculate DSRSD's compliance year GPCD and compare it to the 2020 target, the population is updated to reflect population estimates for 2020. Details of determining the 2020 water service area population are provided in Section 5.3.

DSRSD's baselines and targets are summarized in Section 5.5. DSRSD's 2020 compliance water use is provided in Section 5.6.

5.3 SERVICE AREA POPULATION

At the time of preparation of this UWMP, the 2020 Census results were unavailable, and alternative methods were used to correctly calculate DSRSD's GPCD. The method used to estimate the water service area population is shown on Table 5-1 and the resulting 2020 population estimate is provided in Table 5-2.

The DOF uses U.S. Census data from the last completed Census (2010), combined with changes to the housing stock, estimated occupancy of housing units, and the number of persons per household to estimate annual population within jurisdictional boundaries. For the Dublin service area, DSRSD is a Category 1 water provider in accordance with DWR's Methodologies document. DSRSD's current water service area is substantially contiguous with the Dublin boundaries; thus, DOF population data for Dublin is valid for use as the service area population. DOF estimates that Dublin population was 65,161 in 2020. For the Dougherty Valley service area, DSRSD is a Category 2 water provider in accordance with Methodology 3 of DWR's Methodologies document. The DWR Population Tool was used to estimate the population in Dougherty Valley. The DWR Population Tool confirmation information is included in Appendix G, and estimates that Dougherty Valley population is 27,248. Thus, the total estimated population for DSRSD's service area is 92,409.

DSRSD's baseline population estimate is provided in Section 5.5.

Table 5-1. Method for Population Estimates (SB X7-7 Table 2)

Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review

Table 5-2. Service Area Population (SB X7-7 Table 3)

2020 Compliance Year Population	
2020	92,409

NOTES:
1. City of Dublin Population 65,161. State of California, Department of Finance, *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2020 and 2021* . Sacramento, California, May 2021.
2. Dougherty Valley: 7,169 housing units * 3.80 person per housing unit = 27,248 people
3. Total population: 65,161 + 27,248 = 92,409 people

5.4 GROSS WATER USE

As defined in CWC §10608.12 (h), annual gross water use is the water that enters DSRSD's distribution system over 12 months (calendar year) with specific exclusions. This section discusses DSRSD's annual gross water use for each year in the baseline periods, as well as 2020, in accordance with DWR's Methodologies.

Annual gross water use for the baseline periods and 2020 are summarized in Appendix G. The baseline values reported in Appendix G are the same as documented in DSRSD's 2010 and 2015 UWMP. DSRSD's 2020 actual gross water use for Calendar Year 2020 is 10,330 AF as presented in Chapter 4 of this plan.

5.5 BASELINES AND TARGETS SUMMARY

Daily per capita water use is reported in GPCD. Annual gross water use is divided by annual service area population to calculate the annual per capita water use for each year in the baseline periods. As discussed in Section 5.1, DSRSD updated its water service area population data, adjusted its baseline, and confirmed its 2020 target in its 2015 UWMP. DSRSD's 10-year base daily per capita water use is 211 GPCD. Using

Method 1 for 2020 water use target calculation as described in Section 5.2, DSRSD's confirmed 2020 compliance target is 169 GPCD. DSRSD's baseline and target per capita water uses are summarized in Table 5-3.

Table 5-3. Supplier: Baseline and Targets Summary (DWR Table 5-1 Retail)

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1996	2005	211	169
5 Year	2003	2007	199	
NOTES: *DSRSD 2015 UWMP Table 5-1.				

The baseline and 2020 target are included in the SB X7-7 Compliance Form, Appendix G.

5.6 2020 COMPLIANCE DAILY PER CAPITA WATER USE

DSRSD's 2020 population and gross water use are presented in Sections 5.3 and 5.4, respectively. DSRSD calculated its actual 2020 water use for the 2020 calendar year in accordance with DWR's *Methodologies*. As shown in Table 5-4, DSRSD's per capita water use in 2020 was 100 GPCD, which is well below the confirmed 2020 water use target of 169 GPCD. Therefore, DSRSD has met its 2020 final water use target. The complete set of SB X7-7 tables used to document this compliance is included in Appendix G.

Table 5-4. Supplier: 2020 Compliance (DWR Table 5-2 Retail)

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)*		
100	0	100	169	Yes
NOTES: *From SBX7-7 2020 Compliance Form, Appendix G.				

As detailed in DWR's *Methodologies*, adjustments are allowed that can be made to an agency's gross water use in 2020 for unusual weather, land use changes, or extraordinary institutional water use.

DSRSD has elected not to make the adjustments allowed by Water Code Section 10608.24 because these exceptions are not needed to demonstrate compliance with SB X7-7 for 2020. Water use in 2020 in DSRSD's water service area was significantly reduced as compared to baseline years as a result of continued water conservation efforts by DSRSD and its customers, as well as the conversion of potable irrigation to recycled water irrigation.

5.7 REGIONAL ALLIANCE

DSRSD has chosen to comply with the requirements of SB X7-7 on an individual basis. DSRSD has elected not to participate in a regional alliance.

CHAPTER 6
Water Supply Characterization

This chapter describes DSRSD's water supply portfolio, which includes purchased water from Zone 7 and DSRSD's recycled water. These existing supplies, along with the other projected future supplies are described in this chapter. Because Zone 7 provides DSRSD all of its potable water supplies, Zone 7's water supply sources are also discussed in this chapter.

6.1 WATER SUPPLY ANALYSIS OVERVIEW

DSRSD's primary water supply source is purchased potable water from Zone 7, augmented by recycled water produced at DSRSD's RWTF. DSRSD also has a groundwater pumping quota (GPQ) from the local groundwater basin, pumped on its behalf by Zone 7, the local groundwater basin manager. The management of each of DSRSD's supply sources in correlation with each other are provided in this chapter. Because all of DSRSD's potable water supply is from Zone 7, the region's water wholesaler, Zone 7's water supplies, storage operations, and future supply projects are discussed.

DSRSD's water supplies and anticipated availability under normal water years are described in this chapter. The availability of DSRSD's water supplies under a single dry year and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change, are detailed in Chapter 7 of this UWMP.

6.2 WATER SUPPLY CHARACTERIZATION

This section describes the water supplies currently available to DSRSD, as well as future anticipated water supplies. DSRSD currently utilizes water from the following sources:

- Potable water supplies (including imported and local surface water supplies and local groundwater supplies) purchased from Zone 7;
- Recycled water supplies produced at DSRSD's RWTF.

These sources, along with the other projected future supplies, and the potential for desalinated water, indirect or direct potable reuse, and exchanges or transfers are described in this section.

6.2.1 Purchased or Imported Water

DSRSD currently receives its potable water supply from Zone 7. Zone 7 is a multi-purpose agency that oversees water-related issues in the Livermore-Amador Valley. Zone 7 is a State Water Project contractor that wholesales treated water to four retail water agencies, including DSRSD, Livermore, Pleasanton, and Cal Water Livermore District. In addition, Zone 7 retails non-potable water supplies for irrigated agricultural use, retails treated water to several direct customers, provides and maintains flood control facilities, and manages groundwater and surface water supplies in its service area.

6.2.1.1 DSRSD's Water Supply Contract with Zone 7

Zone 7 and DSRSD entered into the current contract for a Municipal and Industrial Water Supply on August 23, 1994. The contract has a 30-year term (expiring in 2024) and is intended to ensure an equitable, reliable, and high-quality water service for DSRSD's customers. It provides the water supply for existing DSRSD customers and sets the stage upon which DSRSD would be able to provide service to future customers. Some of the key provisions of the current contract include the following:

- Service Area: DSRSD has sole discretion to expand its service area. However, Zone 7 water cannot be used outside of the Zone 7 territory unless Zone 7 finds that providing water to such areas is in its best interest.
- Water Supply: DSRSD shall purchase from Zone 7 all water required by DSRSD for use within DSRSD's service area, except that DSRSD may extract groundwater per the contract provisions or obtain water from "Other Sources" as defined in the contract[8].
- Water Quality: Zone 7 will endeavor to provide water that is aesthetically acceptable to all retailers and blend the different sources of water available to it within its operational capabilities to provide water of approximately equal quality to all customers.
- Groundwater Pumping: DSRSD's Groundwater Pumping Quota was maintained at 645 AFY of withdrawals from the Livermore Valley Main Basin. Zone 7 pumps this groundwater from the Main Basin on DSRSD's behalf. Withdrawals from the fringe basin are unlimited (but may have a limitation that can be imposed by Zone 7)[9] and can be used at DSRSD's discretion.
- Carryover of Pumping Quota: The contract provides a limited carryover of unused pumping quota from one year to another.
- Transfer of Pumping Quota: The four retailers served by Zone 7 can voluntarily transfer their pumping quotas between or among themselves.
- Recycled Water: Recycled water is considered to be an "Other Source" of water that DSRSD can use at will.
- Delivery Schedule: DSRSD shall submit in writing to Zone 7 a preliminary water delivery schedule indicating the anticipated quantity of treated water required by DSRSD during each month of the succeeding five calendar years and the anticipated peak day treated demand from Zone 7 for each such year. Zone 7 shall review such schedule, and after consultation with DSRSD, shall approve such schedule in a timely manner or make revisions as necessary to make such deliveries.

[8] Water from "Other Sources" includes: a) water received for fire flow or fire storage requirements or other emergency purposes; b) water necessary to meet DSRSD's treated water needs as a result of Zone 7's non-compliance with state and federal drinking water requirements; c) water necessary to meet DSRSD's requirements should Zone 7 be unable to deliver the quantity of treated water necessary to satisfy the requirements of DSRSD; d) water from other sources even if Zone 7 is able to meet DSRSD's demands if the DSRSD pays Zone 7 "for obligated fixed costs of Zone 7 associated with the quantity of water the Contractor will obtain from other sources"; e) groundwater extracted within Zone 7's boundary, but outside the Main Basin, provided said extraction does not cause an adverse impact on the Main Basin; f) the source water is recycled water from DSRSD's or another contractor's treated wastewater.

[9] Zone 7 Water Agency and Dublin San Ramon Services District for a Municipal & Industrial Water Supply, Section B-5(e).

In February 2000, the contract was amended to expand DSRSD's service area to include the Dougherty Valley area and special provisions were added regarding supplying water to Dougherty Valley. A copy of the water supply contract and amendment is provided in Appendix H.

The term of the current contract between Zone 7 and DSRSD expires in 2024. It is expected to be renewed.

DSRSD coordinates with Zone 7 on an on-going basis to track water use and develop future water supplies.

6.2.1.2 Zone 7 Water Supply Sources

This section details Zone 7's water supplies and their management. Zone 7's water supply has two major components: 1) incoming water supplies available through contracts and water rights each year, and 2) accumulated water supplies in storage derived from previous years. Incoming water supplies typically consist of annually allocated imported surface water supply and local surface water runoff. Accumulated or "banked" water supplies are available in local and non-local storage locations.

To optimize its local resources, Zone 7 practices conjunctive use of the Livermore Valley Groundwater Basin. Zone 7 also stores local runoff from the Arroyo Valle watershed in the local reservoir (Lake Del Valle), which is owned and operated by DWR. Two long-term water storage ("banking") agreements with agencies south of Zone 7's service area in Kern County (Semitropic Water Storage District and Cawelo Water District) provide additional flexibility in managing annual fluctuations in supplies.

To mitigate the risk associated with significant reliance on imported water supply, Zone 7 is continuing to develop local sources of water and diversify its water supply portfolio. In April 2019, Zone 7 completed its 2019 Water Supply Evaluation Update (2019 WSE Update), a follow-up to its 2016 Water Supply Evaluation Update that documents Zone 7's current water supplies based on new information and experience gained since the 2014-2016 drought. The 2019 WSE Update also evaluates various future water supply portfolios, which are discussed in Section 6.2.8.2.

6.2.1.2.1 Imported Water from the State Water Project (SWP)

Imported water from the SWP, which is owned and operated by DWR, is by far Zone 7's largest water source, providing approximately 90 percent of the treated water supplied to its customers on an annual average basis. As described below, SWP water, carryover water, water banked in non-local storage, and transfer water all come through the Delta.

SWP water originates within the Feather River watershed, is captured in and released from Lake Oroville, and flows through the Delta before it is conveyed by the South Bay Aqueduct (SBA) to Zone 7 and two other water agencies (Valley Water [VW, formerly known as Santa Clara Valley Water District] and Alameda County Water District [ACWD]). Much of the SWP water continues to southern California via the California Aqueduct. Lake Del Valle is part of the SWP's SBA system and is used for storage of SWP water, as well as local runoff.

At Zone 7, SWP water is directly used to meet treated water demands from M&I customers—primarily wholesale to water retailers and some direct retail customers—and untreated water demands from agricultural customers. It is also used to recharge the local groundwater basin, as discussed in Section 6.2.2.2.3, and fill non-local groundwater storage in Kern County.

The following sections describe Zone 7's contract with DWR for SWP water and the types of water Zone 7 receives under this contract.

6.2.1.2.1.1 Contract with DWR

DWR provides water supply from the SWP to 29 SWP contractors, including Zone 7, in exchange for contractor payment of all costs associated with providing that supply. DWR and each of the contractors entered into substantially uniform long-term water supply SWP contracts in the 1960s with 75-year terms. The first set of contracts originally terminated in 2035, and most of the remaining contracts terminated within three years after that. Zone 7's original contract was executed in 1961 and was set to expire in 2036. Over the last few years, there have been several key amendments to the SWP contracts, including reaching an agreement in principle to extend SWP contracts, improve water management tools for SWP contractors, and participation in the Delta Conveyance Project. Details regarding Zone 7's contract with DWR are provided in Zone 7's 2020 UWMP.

6.2.1.2.1.2 Table A Allocation

Each SWP contractor is limited to a maximum annual contract amount as specified in Article 6(c) and Table A of the SWP Contract; this amount is therefore commonly referred to as "Table A." As noted above, Zone 7 first entered into the SWP Contract in November 1961; as the SWP was expanded and as Zone 7 demands increased over the years, Zone 7's Table A amount was increased, reaching the amount of 46,000 AFY in 1997. Since then, Zone 7 has increased its supply from the SWP through a series of five permanent transfers. In December 1999, Zone 7 secured Table A SWP allocations from Lost Hills Water District of 15,000 AFY and Berrenda Mesa Water District of 7,000 AFY. Water secured from the Berrenda Mesa Water District serves the Dougherty Valley portion of DSRSD's service area. In December 2000, 10,000 AFY of SWP allocation from Belridge Water Storage District was acquired. An additional 2,219 AFY was obtained from the same source in October 2003. Finally, 400 AFY of water was acquired from the Tulare Lake Basin Water Storage District in 2003. Together, these transfers have raised Zone 7's current Table A allocation to 80,619 AFY.

In practice, the actual amount of SWP water available to Zone 7 under the Table A allocation process (presented as percent Table A) varies from year to year due to hydrologic conditions, water demands of other Contractors, existing SWP stored water, SWP facility capacity, and environmental/regulatory requirements. The Table A allocation is typically less than 100 percent of the Table A amount[10]. SWP reliability is defined based on the long-term average Table A allocation. DWR prepares a biennial report to assist SWP contractors and local planners in assessing the availability of supplies from the SWP. DWR issued its most recent update, the Final 2019 State Water Project Delivery Capability Report (2019 DCR)[11], in August 2020. In this update, DWR provides SWP supply estimates for SWP contractors to use in planning efforts, including the 2020 UWMP. The 2019 DCR includes DWR's estimates of SWP water supply availability under both existing (2020) and future conditions (2040).

DWR's estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and Central Valley Project (CVP) systems. Key inputs to the model include system facilities, hydrologic inflows to the system, regulatory and operational constraints on system operations, and

[11] Department of Water Resources, 2020. State Water Project Delivery Capability Report 2019. https://data.cnra.ca.gov/dataset/state-water-project-delivery-capability-report-dcr-2019/resource/119da5c5-1c47-4142-8896-334628ca61cd?inner_span=True

contractor demands for SWP water. In conducting its model studies, DWR must make assumptions regarding each of these key inputs.

In the 2019 DCR model for existing (2020) conditions, DWR assumed: existing facilities, hydrologic inflows to the model based on 82 years of historical inflows (1922 through 2003), current regulatory and operational constraints, and contractor demands at maximum Table A Amounts. Note that the regulatory and operational constraints include the 2018 Coordinated Operations Agreement (COA) Amendment, 2019 Biological Opinions, and 2020 Incidental Take Permit. The 2018 COA Amendment lays out the terms under which the CVP operates with the SWP. The 2019 Biological Opinions for the Long-Term Operation of the CVP and SWP reflect the federal government's (U.S. Fish and Wildlife Service's) opinion as to whether or not the operation of the CVP and SWP is likely to jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of critical habitat. Finally, the 2020 Incidental Take Permit is a requirement for the SWP's California Endangered Species Act (CESA) compliance with regards to state-protected longfin smelt and state- and federally-protected delta smelt, winter-run Chinook, and spring-run Chinook.

To evaluate SWP supply availability under future conditions, the 2019 DCR included a model study representing hydrologic and sea-level rise conditions at 2040. The future condition study used all of the same model assumptions as the study under existing conditions but reflected changes expected to occur from climate change, specifically, projected temperature and precipitation changes centered around 2035 (2020 to 2049) and a 45 cm sea-level rise.

For Zone 7's Table A supply, the 2019 DCR's existing condition was assumed to represent 2020 (59 percent Table A reliability, 47,600 AFY)[12], and the future condition (54 percent Table A reliability, 43,500 AFY)[12] was applied to 2040; the years in between were interpolated between these two bookends[13]. Note that the effect of the proposed Delta Conveyance Project on SWP water supply yield is still being analyzed and has not been included.

As a SWP contractor, Zone 7 has the option to store unused Table A water from one year to the next in the SWP's San Luis Reservoir, when there is storage capacity available. This "carryover" water is also called Article 12e or 56c water, in reference to the relevant contract terms. Article 12e water must be taken by March 31 of the following year, but Article 56c water may remain as carryover as long as San Luis Reservoir storage is available. The analysis in Zone 7's 2020 UWMP assumes Zone 7 carries over 10,000 AF of water each year on average.

6.2.1.2.1.3 Article 21 Water (Interruptible or Surplus Water)

Under Article 21 of Zone 7's SWP contract, Zone 7 also has access to excess water supply from the SWP that is available only if: 1) it does not interfere with SWP operations or Table A allocations, 2) excess water is available in the Delta, and 3) it will not be stored in the SWP system. As described in the 2019 DCR, Article 21 water deliveries are highly variable. This water becomes available during short time windows in the wet season when there is excess water in the system (due to storms) that DWR cannot store in San Luis Reservoir. When Article 21 water becomes available, SWP contractors can request delivery, and the

[12] Existing condition: Table A-4 of the Technical Addendum to the 2019 DCR. Future condition: Table B-6.

[13] For comparison, Zone 7's 2015 UWMP assumed 62 percent Table A reliability (50,000 AFY). Zone 7's 2019 WSE Update assumed 49 percent Table A reliability (39,500 AF). Table A allocations over the last ten years have ranged between 5 percent and 85 percent, with an average of 48 percent.

available water is distributed generally in proportion to the Table A contract amounts of those contractors requesting delivery. Delivery of Article 21 water requires accessible storage during very wet conditions and/or the ability to use the water directly without impacting Table A deliveries to Zone 7. Historically, these conditions have been difficult to meet for Zone 7 and have resulted in infrequent and low yields. Therefore, Zone 7 is not assuming any water supply yield from Article 21 at this time. As Zone 7 increases its local storage and ability to capture Article 21 water (e.g., via the Chain of Lakes project), Zone 7 will re-evaluate the potential increase in Article 21 yield.

6.2.1.2.1.4 Article 56d Water (Turnback Pool Water) and Multi-Year Pool Demonstration Program

Article 56d is a contract provision that allows SWP contractors with unused Table A water to sell that water to other SWP contractors via a "turnback pool" administered by DWR on an annual basis. Historically, only a few SWP contractors have been able to make turnback pool water available for purchase, particularly in normal or dry years.

With the enhanced ability to directly transfer or exchange SWP water from one SWP contractor to another under the Water Management Tools contract amendment described earlier, it is expected that there will not be much water available under Article 56d in the future. Zone 7 is therefore assuming no supplies are available from this source under normal conditions.

6.2.1.2.1.5 Yuba Accord

In 2008, Zone 7 entered into a contract with DWR to purchase additional water under the Lower Yuba River Accord (Yuba Accord). The original contract expires in 2025, and several amendments have been made to the original agreement over the years, including a new pricing agreement executed in 2020.

There are four different types ("Components") of Yuba Accord water made available as a water purchase or transfer; Zone 7 has the option to purchase Components 1, 2, and 3 water during drought conditions, and Component 4 water when the Yuba County Water Agency has determined that it has water supply available to sell.

Water is primarily available during dry years under the Yuba Accord, and the amount is highly variable: 400 AF in 2014, approximately 300 AF in 2015, and 3,000 AF in 2020. For planning purposes, Zone 7 currently does not assume any water supply yield specifically from the Yuba Accord, although water transfers obtained by Zone 7 (see Section 6.2.7) could potentially include supplies from the Yuba Accord.

6.2.1.2.2 Local Surface Water Runoff

Zone 7, along with ACWD, has a water right (Permit 11319 [Application 17002]) to divert flows from Arroyo Valle. Runoff from the Arroyo Valle watershed above Lake Del Valle is stored in the lake, which is managed by DWR as part of the SWP. Lake Del Valle also stores imported surface water deliveries from the SWP and serves both a flood control function, as well as a recreational one. In late fall, DWR typically lowers lake levels in anticipation of runoff from winter storm events. Water supply in Lake Del Valle is made available to Zone 7 via the SBA through operating agreements with DWR. Inflows to Lake Del Valle, after accounting for permit conditions, are equally divided between ACWD and Zone 7 under their respective permits.

Zone 7's latest modeling forecasts future average yields from Arroyo Valle to Zone 7 at approximately 5,500 AFY, using historical hydrology adjusted for climate change impacts. Previous planning documents, including Zone 7's 2015 UWMP, assumed an average yield of 7,300 AFY, and the ten-year calendar year average (2011-2020) has been 3,500 AFY; local climate change effects on the watershed—specifically a net

average reduction in precipitation—are expected to reduce the yield over time. Construction of the Chain of Lakes Arroyo Valle diversion structure and pipeline will allow Zone 7 to capture more of the storm releases from Lake Del Valle, and likely increase the yield from this water supply in the future. The conservative average yield estimate of 5,500 AFY is consistent with the 2019 WSE Update; it will be re-evaluated as more climate change downscaled information is developed and as the Chain of Lakes projects progress.

6.2.1.2.3 Local Storage

Zone 7 has two existing local storage options: Lake Del Valle and the Main Basin. Lake Del Valle stores both runoff from the Arroyo Valle watershed and imported surface water deliveries from the SWP. Zone 7 can store up to about 7,500 AF of its share of Arroyo Valle runoff in the lake; runoff collected in any given year is required to be delivered to Zone 7 by the end of the following year. The Main Basin is used conjunctively and is artificially recharged with SWP water. Zone 7 relies on the operational storage capacity of 126,000 AF in the Main Basin. Section 6.2.2.1. provides additional information on the Main Basin.

6.2.1.2.4 Non-Local Storage

In addition to local storage, Zone 7 also participates in the two non-local (also called "out-of-basin") groundwater banking programs described below; both banks are located in Kern County. Note that while these banking programs provide a water source during drought years, they represent water previously-stored from Zone 7's surface water supplies during wet years. Therefore, they do not have a net contribution to Zone 7's water supply over the long-term and in fact result in some operational losses as described below. While the out-of-basin groundwater banks significantly enhance system reliability, this banked water supply requires Banks Pumping Plant in the Delta and the SBA to be operational; low SWP Table A allocations (and generally low levels of water movement in the SWP system) can limit the delivery of these banked supplies via exchange. Figure 6-1 shows the historical operation of the Kern County banks—note the successful use of the groundwater banks to augment water supplies during the recent drought, and the recovery in the following years.

Point of Delivery Agreements with DWR and Kern County Water Agency, a SWP contractor, allow Zone 7 to store SWP water in and recover water from Semitropic Water Storage District (Semitropic) and Cawelo Water District (Cawelo). Semitropic and Cawelo are member units of Kern County Water Agency, which manages water deliveries to these agencies. Zone 7 has been storing water in the water banks operated by Semitropic since 1998 and by Cawelo since 2006. In November 2020, the Zone 7 Board of Directors (Zone 7 Board) authorized the execution of amendments to existing Point of Delivery Agreements that would extend water delivery terms for storage in Semitropic and Cawelo through 2030 and recovery of banked water through 2035.

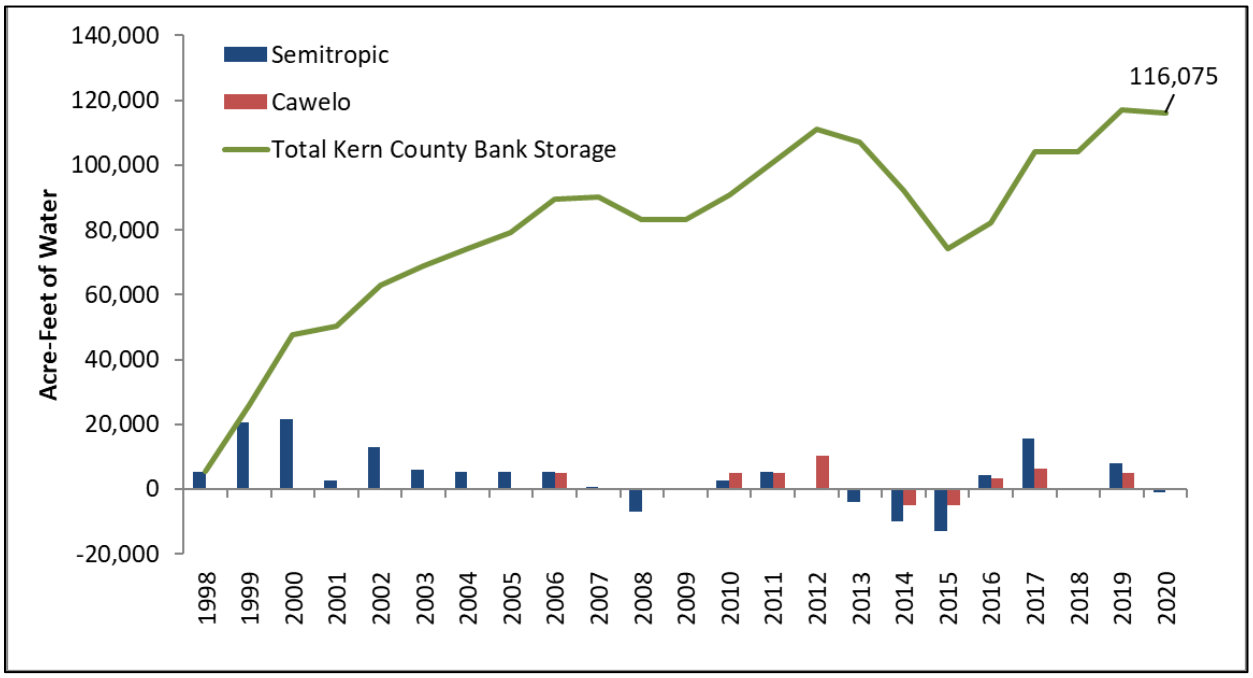


Figure 6-1. Kern County Groundwater Banks Operations

6.2.1.2.4.1 Semitropic Water Storage District

Zone 7 originally acquired a storage capacity of 65,000 AF in the Semitropic groundwater banking program in 1998. Subsequently, Zone 7 agreed to participate in Semitropic's Stored Water Recovery Unit, which increased pumpback capacity and allowed Zone 7 to contractually store an additional 13,000 AF. Zone 7 currently has a total of 78,000 AF of groundwater banking storage capacity available to augment water supplies during drought and emergency conditions and as needed. Zone 7 can store up to 5,883 AFY in the Semitropic groundwater bank. Note that a 10 percent loss is associated with water stored in Semitropic.

Under the contract terms, Zone 7 can request up to 9,100 AF of pumpback and up to 8,645 AF of exchange water. Pumpback is water that is pumped out of the Semitropic aquifer and into the SWP system. Exchange water is water that is transferred between Zone 7 and Semitropic by adjusting the amounts of Table A water delivered to Zone 7 and Semitropic; the availability of this type of water depends on the SWP allocation. During the recent drought, Zone 7 was able to recover 9,900 AF in 2014 and about 12,800 AF in 2015. Zone 7 has largely been storing water in Semitropic over the past few years but did recover 324 AF in 2016 and 1,000 AF in 2020.

6.2.1.2.4.2 Cawelo Water District

Similar to the arrangements with Semitropic, Zone 7 has 120,000 AF of groundwater banking storage capacity available with Cawelo, as executed in a 2006 agreement. Zone 7 can store up to 5,000 AFY in the bank. Zone 7 can request up to 10,000 AFY of pumpback (or SWP exchange water) from Cawelo. During the recent drought, Zone 7 was able to recover 10,000 AF, delivered evenly over 2014 and 2015. Most of this water was used directly, while the rest was stored in San Luis Reservoir for use the following year. Zone 7 only accumulates 50 percent of the water sent to storage in Cawelo; the other 50 percent goes towards water loss and compensation to Cawelo.

6.2.2 Groundwater

This section describes the Livermore Valley Groundwater Basin and Zone 7's Groundwater Management Plan[14] that is used to manage the basin. Each year, Zone 7 prepares an Annual Report for the Groundwater Management Program. The associated Annual Report for the 2020 Water Year[15] is available online, www.zone7water.com/library/reports-planning-documents, and is incorporated herein by reference.

DSRSD does not itself extract groundwater as a water supply. By contract, Zone 7 conducts this groundwater pumping operation to provide water supply services to DSRSD. This groundwater supply is then blended with water from Zone 7's other water supply sources and delivered to DSRSD. In accordance with their water supply agreement, Zone 7 pumps DSRSD's groundwater supply from local storage. Zone 7 does not have a groundwater pumping quota and it can only pump groundwater it has recharged from its other supplies.

DSRSD's groundwater resource is described below.

6.2.2.1 Groundwater Basin Description

Zone 7 has managed local surface water and groundwater resources for beneficial uses in the Livermore Valley Groundwater Basin for more than 50 years. Consistent with its management responsibilities, duties, and powers, Zone 7 is designated in the 2014 Sustainable Groundwater Management Act (SGMA) as the exclusive Groundwater Sustainability Agency (GSA) within its jurisdictional boundaries.

As defined in DWR Bulletin 118 Update 2003 (California's Groundwater), the Basin (DWR Basin 2-10, shown on Figure 6-2) covers 69,600 acres (109 square miles), extending from the Pleasanton Ridge east to the Altamont Hills and from the Livermore Uplands north to the Tassajara Uplands. The Basin is not adjudicated, and DWR has identified it as medium priority—Basin 2-10 is not identified as either in overdraft or expected to be in overdraft. Surface drainage features include Arroyo Valle, Arroyo Mocho, and Arroyo Las Positas as principal streams, with Alamo Creek, South San Ramon Creek and Tassajara Creek as minor streams. All streams converge on the west side of the basin to form Arroyo de la Laguna, which flows south and joins Alameda Creek in Sunol Valley and ultimately drains to the San Francisco Bay. Some geologic structures restrict the lateral movement of groundwater, but the general groundwater gradient is from east to west, towards Arroyo de la Laguna, and from north to south along South San Ramon Creek and Arroyo del la Laguna.

The entire floor of the Livermore Valley and portions of the upland areas on all sides of the valley overlie groundwater-bearing materials. The materials are primarily continental deposits from alluvial fans, outwash plains, and lakes. They include valley-fill materials, the Livermore Formation, and the Tassajara Formation. Under most conditions, the valley-fill and Livermore Formation yield adequate to large quantities of groundwater to all types of wells, with the larger supply wells being in the Main Basin. The Main Basin is composed of the Castle, Bernal, Amador, and Mocho II sub-basins, with an estimated total storage capacity of 254,000 AF.

[14] Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin, prepared for Zone 7 Water Agency, prepared by Jones & Stokes, September 2005. (http://www.water.ca.gov/urbanwatermanagement/2005uwmps/AlamedaZone7/GMP%202005%20Submittal%20-%20Complete.pdf)

[15] Zone 7 Water Agency, 2020. Annual Report for the Groundwater Management Program 2020 Water Year.

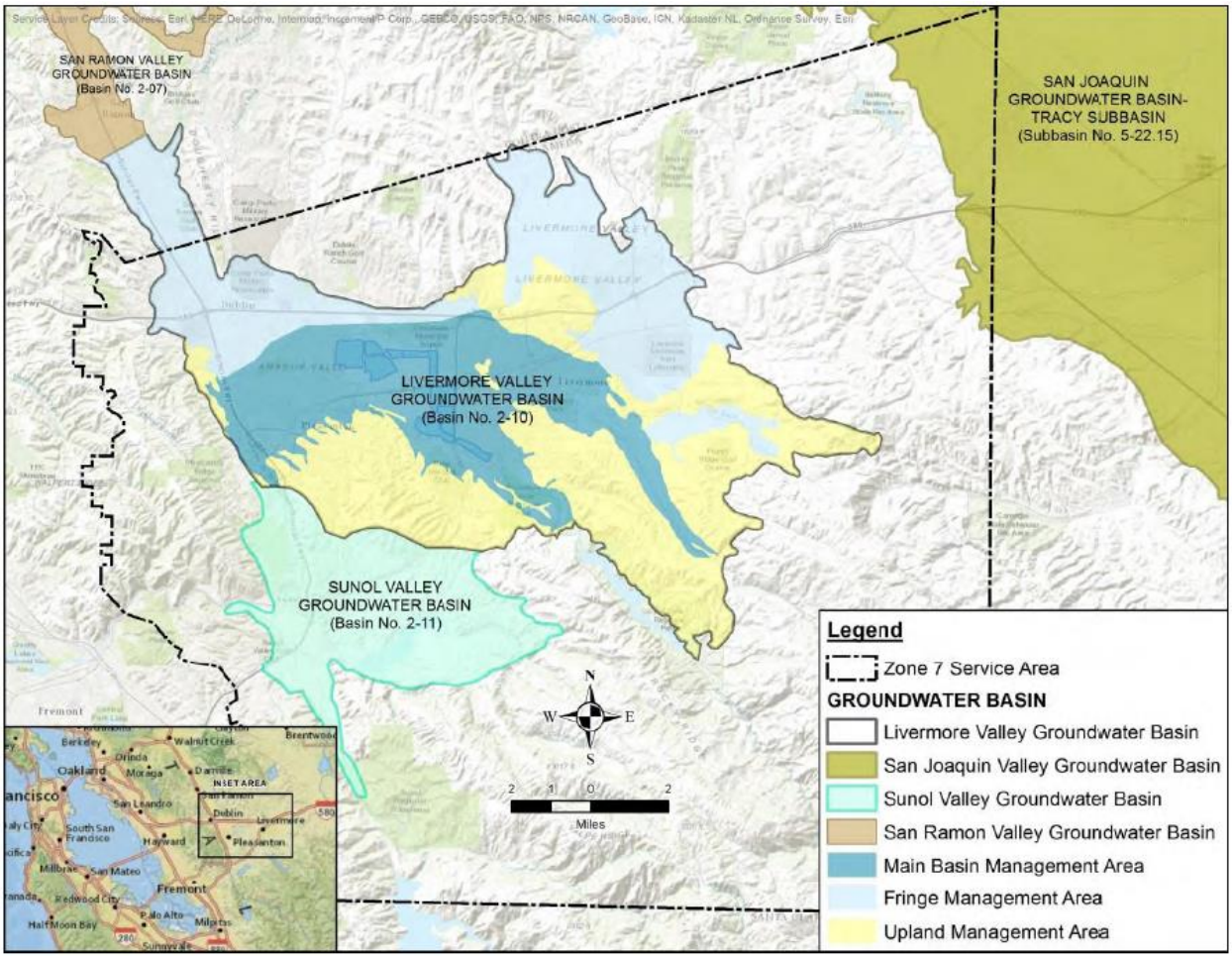


Figure 6-2. Livermore Valley Groundwater Basin and Subbasins

6.2.2.2 Groundwater Management

Zone 7's GMP documented all of Zone 7's then-current groundwater management policies and programs and was developed to satisfy the requirements set forth in the California Groundwater Management Planning Act (Water Code Sections 10750, *et seq*.). More recently, a Salt and Nutrient Management Plan has been incorporated into the GMP. Zone 7 prepares annual reports that summarize the results of the groundwater monitoring, evaluation, and management efforts by water year; the most recent version of the annual report is for the 2019 water year (October 1, 2018 through September 30, 2019). In addition to the annual reports completed over the years, Zone 7 completed the Alternative Groundwater Sustainability Plan for the Livermore Valley Groundwater Basin (Alternative GSP) in 2016 as required under SGMA.

For Zone 7's operations, the Main Basin is considered a storage facility and not a long-term water supply, because Zone 7 does not have access to naturally recharged water ("sustainable yield"). Zone 7 only pumps groundwater that has been artificially recharged with surface water supplies. As part of this conjunctive use program, Zone 7's policy maintains groundwater levels above historic lows in the Main Basin to minimize the risk of inducing land subsidence. Currently, this is accomplished by releasing SWP water to the arroyos for percolation and replenishment of the aquifers and by managing pumping activities.

Zone 7 established historic lows based on the lowest measured groundwater elevations in various wells in the Main Basin. The difference between water surface elevations when the Main Basin is full and water surface elevations when the Main Basin is at historic lows defines Zone 7's operational storage. Of the estimated total storage capacity of 254,000 AF, operational storage is about 126,000 AF based on Zone 7's experience operating the Main Basin, with the remaining 128,000 AF considered emergency reserve storage.

6.2.2.2.1 Groundwater Level Monitoring and Storage Estimates

Zone 7 routinely monitors groundwater levels within the Main Basin. Some of the data collected is submitted to DWR under the California Statewide Groundwater Elevation Monitoring (CASGEM) program. All the data is reflected in the annual reporting on the Groundwater Management Program.

Two independent methods are used to estimate groundwater storage: 1) Hydrologic Inventory, and 2) Nodal Groundwater Elevation. The Hydrologic Inventory method computes storage change each quarter from basin supply and demand data; this method can also be used to forecast future water storage conditions. The Nodal Groundwater Elevation method computes storage from hundreds of water level measurements. Zone 7 continues to refine the calculation methods; the average of the two results is generally used as the estimate of total groundwater storage volume.

Figure 6-3 depicts Main Basin storage levels calculated using the average of these two methods in thousand acre-feet (TAF). Note the declines in storage due to drought, particularly between 1987 and 1992 and more recently between 2012 and 2015. Stored groundwater at the end of the 2020 water year (October 1, 2019 through September 30, 2020) was approximately 240,000 AF, with 112,000 AF of groundwater available as operational storage.

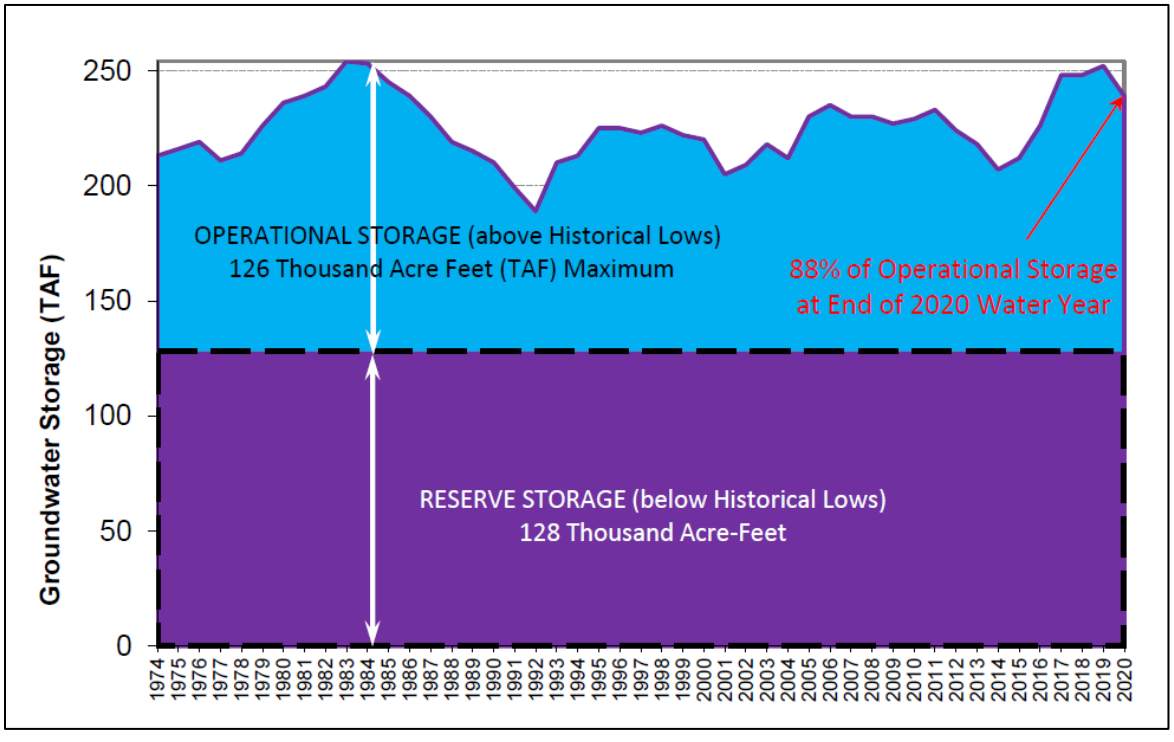


Figure 6-3. Main Basin Groundwater Storage

6.2.2.2.2 Current Sustainable Yield and Groundwater Pumping Quotas

Long-term natural sustainable yield is contractually defined as the average amount of groundwater annually replenished by natural recharge in the Main Basin—through percolation of rainfall, natural stream flow, and irrigation waters, and inflow of subsurface waters—and which can therefore be pumped without lowering the long-term average groundwater volume in storage. In contrast, "artificial recharge" is the aquifer replenishment that occurs from artificially induced or enhanced stream flow. With artificial recharge, more groundwater can be sustainably extracted from the Main Basin each year. Zone 7 only uses groundwater that has been artificially recharged by Zone 7.

The natural sustainable yield of the Main Basin has been determined to be about 13,400 AFY, which is about 11 percent of the operational storage. This long-term natural sustainable yield is based on over a century of hydrologic records and projections of future recharge conditions.

Each Zone 7 retailer has an established GPQ, formerly referred to as the "Independent Quota" in the original Municipal and Industrial water supply contract between Zone 7 and each retailer. GPQs are 3,069 AFY for Cal Water, 645 AFY for DSRSD, and 3,500 AFY for Pleasanton. Pleasanton and Cal Water pump their own GPQ, while Zone 7 pumps DSRSD's GPQ. Livermore has not had any groundwater pumping capability for many years and has therefore not been using their GPQ. Averages are maintained by the allowance of "carryover"—limited to 20 percent of the GPQ—when less than the GPQ is used in a given year. A retailer must pay a "recharge fee" for all groundwater pumped exceeding their GPQ and any carryover. This practice helps avoid a repeat of historical over-drafting of the basin by the larger municipal users. The fee covers the cost of importing and recharging additional water into the Main Basin. The balance of the natural sustainable yield is pumped for other municipal, agricultural, and gravel mining uses.

Zone 7's groundwater extraction for its treated water system does not use the natural sustainable yield from the Main Basin; instead, Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its available surface water supplies. During high-demand periods, groundwater is used to supplement the surface water supply delivered via the SBA. Groundwater is also used when the SBA is out of service due to maintenance and improvements or when Zone 7's surface water treatment plants are operating under reduced capacity due to construction, repairs, etc. Finally, Zone 7 taps into its stored groundwater under emergency or drought conditions, when there may be insufficient surface water supply available.

Zone 7 also pumps groundwater out of the Main Basin during normal water years to help reduce the salt loading in the Main Basin in accordance with the Salt Management Plan [16] (SMP). The Mocho Groundwater Demineralization Plant (MGDP) has been in operation since 2009 to achieve additional salt removal. During emergency or drought conditions, MGDP operations may be reduced to maximize available water supply and avoid water loss due to brine disposal from the MGDP.

On average, Zone 7 plans to recharge about 9,200 AFY in the future, which means that Zone 7 can pump an equivalent 9,200 AFY from the Main Basin on average.

[16] Zone 7 Water Agency, 2004. Salt Management Plan. http://www.zone7water.com/publications-reports/reports-planning-documents/158-salt-management-plan-2004

6.2.2.2.3 Artificial Recharge and Groundwater Extraction by Zone 7

Before the construction of the SWP in the early 1960s, groundwater was the sole water source for the Livermore-Amador Valley. This resource has gone through several periods of extended withdrawal and subsequent recovery. The Main Basin was over-drafted in the 1960s when approximately 110,000 AF of groundwater was extracted. The Main Basin was allowed to recover from 1962 to 1983. It was during this era that Zone 7 first conducted a program of groundwater replenishment by recharging imported surface water via its streams or arroyos ("in-stream recharge" or "artificial recharge") for storage in the Main Basin, began supplying treated surface water to customers to augment groundwater supplies, and regulating municipal pumping by other users.

Figure 6-4 shows Zone 7's total annual artificial recharge amounts, pumping amounts, and their cumulative net impacts to operational storage from the 1974 water year to the 2020 water year. Zone 7's operational policy is to maintain the balance between the combination of natural and artificial recharge and withdrawal or pumping to maintain groundwater levels above the emergency reserve storage. Zone 7 has generally been able to pump as much groundwater as it has needed to over the last five years; however, during the recent drought, decreases in groundwater elevation did noticeably affect the production of certain wells. Zone 7 is continuing to study the groundwater basin and developing new tools (such as an improved groundwater model) to better understand the levels of groundwater extraction possible under various conditions and contributing factors such as groundwater connectivity, spatial distribution of groundwater in the Main Basin, and others.

Since 1974, Zone 7 has artificially recharged over 67,000 AF more water than it has pumped, helping to offset demands and keeping the Main Basin's groundwater levels above the historical lows. Between 1974 and 2007 Zone 7 had artificially recharged approximately 70,000 AF more than it had pumped during that same time; however, since 2007, Zone 7 has artificially recharged about 3,000 AF less than it has pumped, primarily due to construction work on the SBA, recent drought conditions, and lower-than-average SWP allocations over that same time period. Overall net groundwater storage remains significantly above historical lows, as shown in Figure 6-3.

Zone 7 plans to augment its current groundwater in-stream recharge capacity with off-stream recharge using the future Chain of Lakes.

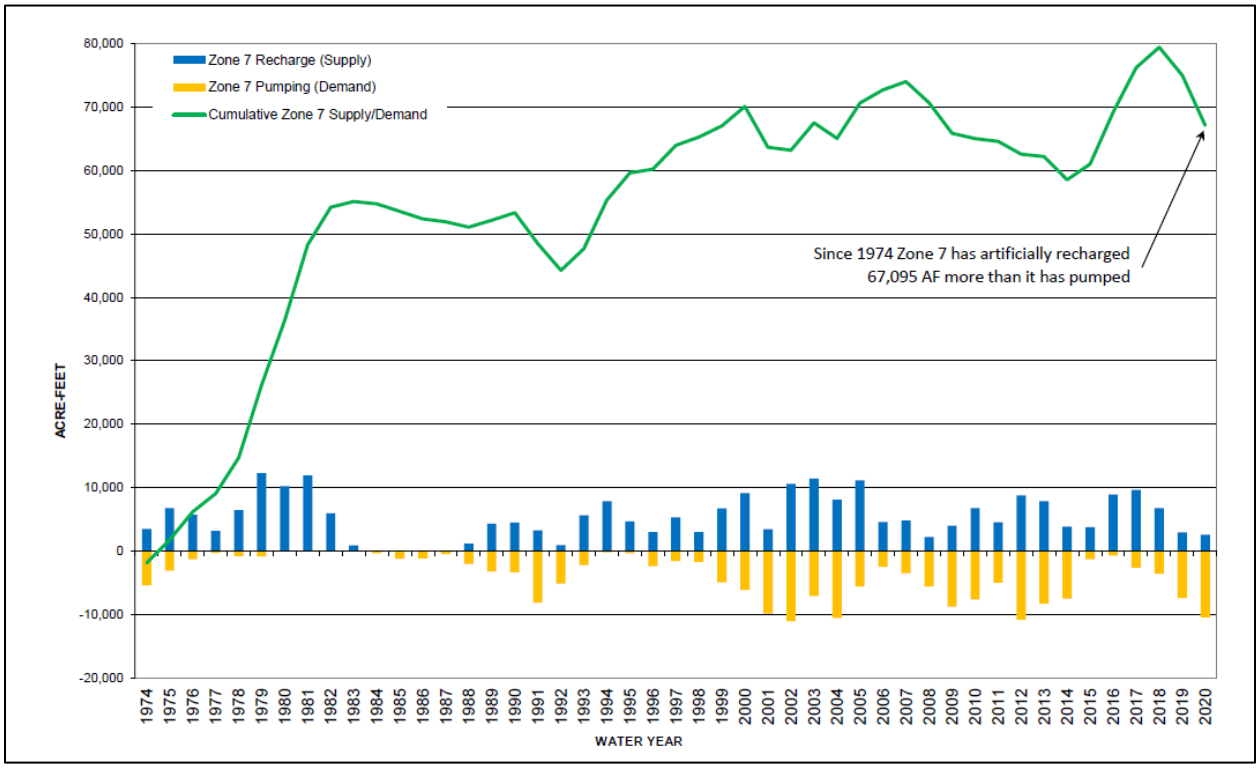


Figure 6-4. Artificial Recharge, Pumping, and Net Cumulative Impacts to Operational Storage

6.2.2.2.4 Groundwater Quality Monitoring and Protection

In general, the Main Basin contains good-quality groundwater that meets all state and federal drinking water standards; groundwater is chloraminated to match the disinfectant residual in the transmission system. Zone 7 has several groundwater wells with naturally-occurring hexavalent chromium (Cr(VI)) concentrations near the Maximum Contaminant Level (MCL) and per- and polyfluoroalkyl substances (PFAS) above the notification limit. In response, Zone 7 is actively managing flows from the affected wells. For example, Cr(VI) levels at the Stoneridge well are being managed through system blending and/or blending with other wells. Also, the PFAS levels in groundwater from the Mocho 2 well currently require blending with groundwater from other wells in that wellfield and/or are being sent through the MGDP. These conditions are being monitored and may change in the future.

Over the last few decades, there has been a slow degradation of groundwater quality as evidenced by rising total dissolved solids (TDS) and hardness levels. To address this problem, Zone 7 developed a SMP, which was approved by the Regional Water Quality Control Board (RWQCB) in 2004, satisfying a condition of the Master Water Recycling Permit. The SMP was incorporated into Zone 7's Groundwater Management Plan (GMP) in 2005. Salinity levels are being addressed primarily through groundwater pumping and demineralization[17]. Zone 7 completed construction of the 6.1-MGD MGDP in 2009 in the Mocho wellfield. The facility simultaneously allows for the removal and export of concentrated minerals

[17] The brine concentrate resulting from the treatment system is exported to the San Francisco Bay via a regional wastewater export pipeline.

or salts from the Main Basin and the delivery of treated water with reduced TDS and hardness levels to Zone 7's customers. Table 6-1 lists the average TDS and hardness for each year from 2016 through 2020.

Table 6-1. Groundwater Quality: TDS and Hardness (2016-2020)

Year	Total Dissolved Solids (TDS), mg/L	Hardness, mg/L
2016	685	416
2017	673	395
2018	673	409
2019	687	417
2020	683	433

Zone 7 implements a wastewater and recycled water monitoring program as part of the GMP. In the 2020 water year, about 14 percent (1,036 AF) of the recycled water produced in the Tri-Valley area was applied to landscapes over the Main Basin; the remainder was applied on areas outside of the Main Basin, primarily on areas overlying the Dublin and Camp fringe basins and the Tassajara uplands. There is also a small amount of untreated wastewater (681 AF in the 2020 water year) that is discharged to the Main Basin as leachate from wastewater treatment ponds located in southern Livermore, from onsite domestic wastewater systems (septic systems), and from leaking wastewater and recycled water pipelines that run throughout the Basin.

Nitrates and salinity have historically been the primary water quality constituents-of-concern in wastewater and recycled water, but nitrates have become less of a concern since 1995, when the Livermore Water Reclamation Plant and DSRSD's Wastewater Treatment Plant, the regions' two wastewater treatment facilities and producers of recycled water, reduced nitrates in their effluent. Salinity is addressed by the SMP, as discussed above. In 2015, Zone 7 completed a Nutrient Management Plan (NMP)[18], which provides an assessment of the existing and future groundwater nutrient concentrations relative to the current and planned expansion of recycled water projects and future development in the Livermore Valley. The NMP also presents planned actions for addressing positive nutrient loads and high groundwater nitrate concentrations in localized Areas of Concern where septic systems are the predominant method for sewage disposal. The NMP was prepared as a supplement to the SMP; together, they are a Salt and Nutrient Management Plan (SNMP), which has been incorporated into the GMP and Alternative GSP.

Under the Toxic Sites Surveillance Program, Zone 7 documents and tracks polluted sites across the groundwater basin that pose a potential threat to drinking water and interfaces with lead agencies to ensure that the Main Basin is protected. Information is gathered from state, county, and local agencies, as well as from Zone 7's well permitting program and the State Water Resources Control Board's GeoTracker website and compiled in a geographic information systems (GIS) database. In general, there are two types of spills potentially threatening the Livermore Valley Groundwater Basin: petroleum-based fuel products and industrial chemical contaminants. In the 2020 water year, Zone 7 tracked the progress

[18] Zone 7 Water Agency, 2015. Nutrient Management Plan – Livermore Valley Groundwater Basin. http://www.zone7water.com/images/pdf_docs/groundwater/nmp-2015_final.pdf

of 38 active sites where contamination has been detected in groundwater or is threatening groundwater. More details on the affected sites and their remediation can be found in the annual report.[19]

6.2.2.2.5 Land Surface Elevation Monitoring Program

Previously, Zone 7's Land Surface Elevation Monitoring Program involved contracting with a licensed land surveyor to measure land surface elevations within the Main Basin boundary twice per year. The program included a network of approximately 40 elevation benchmarks encompassing Zone 7's production wellfields and spanning the Bernal and Amador Subareas within the Main Basin.

In the 2016 water year, Zone 7 contracted with TRE Altamira (TRE) to evaluate Interferometric Synthetic Aperture Radar (InSAR) as an alternative to land surveying for subsidence monitoring. TRE analyzed InSAR data from three different satellites 24 years (from 1992 to 2016), including approximately 120 satellite images with between 415 and 1,202 measuring points per square mile. Each measuring point contains a deformation time series, including cumulative displacement, average deformation rate, acceleration, and seasonal amplitude. The study results correlated well with topographic surface measurements taken by land surveys within the same time period. An added benefit of the InSAR dataset was that it included a larger area (i.e., the entire Main Basin) than the land surveying.

Starting in the 2019 water year, Zone 7 retired the land surveying program and transitioned to InSAR for monitoring land subsidence. In general, observed land surface elevation changes between September 2018 to September 2019 near Zone 7's municipal wells were within the range Zone 7 considers to be "elastic deformation" (i.e., rebounds to their original location when groundwater levels return to previous levels).

6.2.2.3 Historical and Projected Groundwater Use

For the 2019 Water Year, rainfall in the Livermore-Amador Valley was 116 percent of the average. According to Zone 7's 2019 Annual Report for the Groundwater Management Program, the groundwater supplies stored locally in the Main Basin increased by approximately 3,900 AF during the 2019 water year. As a result, the 2019 water year ended with an estimated 249,000 AF of groundwater in total storage and 123,000 AF in operational storage. This represents about 98 percent of the Main Basin's operational storage capacity.

As described above, DSRSD has a GPQ of 645 AFY in the Livermore Valley Main Groundwater Basin (Main Basin), which Zone 7 pumps on DSRSD's behalf as part of its water contract. DSRSD itself does not pump any groundwater, as shown in Table 6-2.

Table 6-2. Groundwater Volume Pumped (DWR Table 6-1 Retail)

☑	Supplier does not pump groundwater. The supplier will not complete the table below.
NOTES: Zone 7 pumped 645 AFY on behalf of DSRSD GPQ.	

[19] Zone 7 Water Agency, 2020. Annual Report for the Sustainable Groundwater Management Program, 2019 Water Year (October 2018-2019), Livermore Valley Groundwater Basin. https://www.zone7water.com/36-public/content/76-groundwater-management-program-annual-report

6.2.3 Surface Water

As described above in Section 6.2.1, DSRSD receives surface water supplies from Zone 7. Zone 7's surface water supplies consist of imported surface water from the SWP and local surface water captured in the Del Valle Reservoir.

6.2.4 Stormwater

DSRSD does not currently use stormwater as part of its water supply source. DSRSD's service area lies within the northern region of the Alameda Creek Watershed. Rainfall not captured by local stormwater retention facilities within the service area is conveyed by minor streams, or by Zone 7 flood control channels to Alameda Creek. The runoff is then captured by Alameda County Water District (ACWD) at the lower portion of the watershed. ACWD captures the runoff behind large inflatable rubber dams which span the width of the Alameda Creek Flood Control Channel. These dams divert water to ponds where the water recharges the Niles Cone Groundwater Basin.

6.2.5 Wastewater and Recycled Water

DSRSD is responsible for treating and discharging treated wastewater for Dublin, South San Ramon, and Pleasanton. In addition, DSRSD owns and operates a RWTF at its regional Wastewater Treatment Plant (WWTP) and participates with EBMUD in a Joint Powers Authority (DERWA) which operates the San Ramon Valley Recycled Water Program (SRVRWP). The SRVRWP provides recycled water that meets Title 22 disinfected tertiary recycled water requirements to landscape irrigation customers of DSRSD and EBMUD, including the San Ramon, Dublin, and Dougherty Valley areas of Alameda and Contra Costa Counties. In 2014, Pleasanton also began using recycled water from DERWA facilities under contract with DERWA.

Wastewater produced from the Dougherty Valley area of San Ramon is conveyed north to Central Contra Costa Sanitary District's (CCCSD) wastewater treatment plant. Wastewater flows are transported via the San Ramon Interceptor located within the Iron Horse Trail corridor.

6.2.5.1 Recycled Water Coordination

In 1995, DSRSD and EBMUD executed an agreement to form DERWA, a Joint Powers Authority (JPA), for the purpose of implementing the SRVRWP. The SRVRWP further treats secondary effluent from the DSRSD Regional Wastewater Treatment Plant to produce disinfected tertiary recycled water suitable for irrigation and other approved uses. Deliveries of recycled water began in 2006.

The DERWA main transmission pipeline connects to DSRSD and EBMUD pipelines that serve recycled water to golf courses, parks, greenbelts, streetscapes, schools, office complexes, and homeowner associations. DSRSD currently supplies recycled water to parts of Dublin and Dougherty Valley, while EBMUD serves recycled water to portions of San Ramon. In future phases, EBMUD also plans to supply recycled water to areas within Blackhawk and Danville.

In 2014, the City of Pleasanton signed agreements for DERWA to produce recycled water for the City. These agreements paved the way for a recycled water program in Pleasanton and expansion of the DERWA water recycling plant. Recycled water deliveries to the City of Pleasanton began in 2015. The City of Pleasanton is not a DERWA member agency and receives recycled water on a wholesale basis from DERWA.

DSRSD is responsible for the operation and maintenance of the DERWA recycled water facilities under a 2005 Operations Agreement with DERWA. DSRSD monitors recycled water uses and files reports with the State Water Resources Control Board Division of Drinking Water and the San Francisco Bay RWQCB, in conformance with DSRSD's General Water Reuse Order No. WQ 2016-0068-DDW (General Order 2016).

6.2.5.2 Wastewater Collection, Treatment, and Disposal

DSRSD owns and operates a regional WWTP, which treats wastewater from Dublin, South San Ramon, and Pleasanton. Wastewater from the Dougherty Valley (San Ramon) portion of DSRSD's water service area is collected and treated at CCCSD's wastewater treatment plant located in Martinez, California. DSRSD treats Pleasanton's wastewater influent by contract.

DSRSD's wastewater treatment plant includes conventional secondary treatment facilities, as well as tertiary and advanced recycled water treatment facilities. DSRSD's conventional secondary wastewater treatment facilities include primary sedimentation, activated sludge secondary treatment, secondary sedimentation, chlorine disinfection, and effluent pumping. The secondary treatment facilities currently have an average dry weather flow (ADWF) capacity of 17.0 MGD.

In DSRSD's RWTF (also known as the Jeffrey G. Hansen Water Recycling Plant), a portion of the secondary effluent from the WWTP is treated further to produce Title 22 disinfected tertiary recycled water. Recycled water is produced using sand filtration and ultraviolet disinfection facilities (SFUV) during the dry season when demands are high. The sand filtration tertiary treatment facility capacity is approved by RWQCB for 16.2 MGD, and the ultraviolet disinfection system has been approved to be operated at up to 17.6 MGD.

DSRSD's RWTF also includes microfiltration and ultraviolet disinfection facilities (MFUV) with a treatment capacity of 3.0 MGD. These facilities currently act as backup facilities for the SFUV facilities and are used during times of low and high demands. The SFUV facilities have less flexible startup and shutdown requirements, whereas the MFUV facilities have a wide turndown range; therefore, they are used during low flow periods. During high-demand periods, the MFUV and SFUV facilities may be operated in parallel to meet demand. The MFUV facilities also provide redundancy, increasing reliability when units in the SFUV facilities are undergoing maintenance, repair, or replacement.

Wastewater that is not recycled is discharged into the San Francisco Bay through a pipeline owned by the LAVWMA, a joint powers agency created in 1974 by DSRSD, Livermore, and Pleasanton. Operations began in September 1979, with an expansion in 2005, for a current design capacity of 41.2 MGD. The wastewater effluent from the Livermore and DSRSD wastewater treatment facilities are conveyed to the LAVWMA pump station in Pleasanton. The wastewater effluent is then pumped out of the Livermore-Amador Valley via a 16-mile pipeline from Pleasanton to San Leandro and enters the East Bay Regional Discharge Authority system for dechlorination and discharge through a deepwater outfall to the San Francisco Bay.

6.2.5.2.1 Wastewater Collected Within Water Service Area

DSRSD's water service area is smaller than its wastewater service area, which includes Pleasanton and the southern portion of San Ramon. In Table 6-3, wastewater volume collected from DSRSD's water service area in 2020 is summarized. The wastewater collected from Dougherty Valley was estimated using

Dougherty Valley's 2020 population and an average daily wastewater flow of 60 gallons per person per day.[20] Wastewater influent from Pleasanton and south San Ramon are excluded.

Table 6-3. Wastewater Collected Within Water Service Area in 2020 (DWR Table 6-2 Retail)

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[1]	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*
DSRSD (City of Dublin)[2]	Metered	9,078	DSRSD	DSRSD WWTP	No	No
DSRSD (Dougherty Valley)[3]	Estimated	1,831	CCCSD	CCCSD WWTP	No	No
Total Wastewater Collected from Service Area in 2020:		10,909				

NOTES:
[1]Volumes are in AF
[2]Dublin San Ramon Services District, DERWA Demand Summary 2020 Revised. April 2021.
[3]Estimated using Dougherty Valley's 2020 population and an average daily wastewater flow of 60 gallons per person per day.

In Table 6-4, the total wastewater treated by DSRSD in 2020 is summarized. Wastewater that originated outside of DSRSD's water service area, is included. The recycled water discharged outside of the water service area includes recycled water delivered by DERWA to EBMUD and Pleasanton, and recycled water used by DSRSD for treatment plant processes and site landscaping.

Table 6-4. DSRSD's 2020 Wastewater Treatment and Discharge, AF[(a,b)]

Discharge Location Name or Identifier	Discharge Location Description	Does this Plant Treat Wastewater Generated Outside of Service Area?	Treatment Level	Wastewater Treated	Discharged Treated Wastewater[(c)]	Recycled Within Service Area	Recycled Outside of Service Area[(d)]
LAVWMA & EBDA	Deepwater outfall to San Francisco Bay	Yes	Tertiary	11,555	6,360	2,888	2,307

(a) Volumes are in AF.
(b) Dublin San Ramon Service District, DERWA Demand Summary 2020 Revised, April 2021.
(c) Discharged treated wastewater equals the wastewater treated (i.e., WWTP influent) minus the total volume recycled (i.e., within service area and outside service area).
(d) DSRSD's WWTP and RWTF are located in Pleasanton, outside of its service area. Volume of recycled water used outside of the DSRSD service area includes recycled water for WWTP and RWTF processes and site landscaping and recycled water delivered to EBMUD and Pleasanton.

[20]West Yost Associates, DSRSD 2017 Collection System Master Plan, Table 3-8, https://www.dsrsd.com/about-us/library/plans-studies.

6.2.5.2.2 Wastewater Treatment and Discharge Within Water Service Area

DSRSD's WWTP is physically located in Pleasanton's water service area. Therefore, as shown in Table 6-5, DWR Table 6-3 has not been completed[21].

Table 6-5. Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3 Retail)

☑	**No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.

6.2.5.3 Recycled Water System Description

As described above, DSRSD owns and operates the RWTF at its WWTP, which produces recycled water that DERWA delivers to DSRSD, EBMUD, and Pleasanton. EBMUD, through its partnership with DERWA, has capacity rights in the DSRSD RWTF. DSRSD's recycled water distribution system extends from the DERWA distribution system and includes 55.3 miles of pipeline; three pump stations, R300A, R300B, and R20; and two reservoirs, R20 and R300. DSRSD's recycled water system map is provided in Figure 3-3.

The DERWA facilities include 16.6 miles of transmission main, Pump Stations R1 (at the WWTP), R200B, and R200A, as well as Reservoirs R100 and R200. EBMUD owns and operates the recycled water distribution pipeline system contained within its service area and will have two pump stations and a reservoir (future facilities). Pleasanton began using recycled water from the recycled water treatment facilities in 2014 and will continue to expand its use in the future. Pleasanton ties into the DERWA system near the corner of DSRSD's Dedicated Land Disposal (DLD) site adjacent to Stoneridge Drive near the WWTP. Under a 2014 agreement, the City of Pleasanton has capacity rights in the DSRSD RWTF.

6.2.5.4 Potential, Current, and Projected Recycled Water Uses

Prior to 1999, recycled water was used in DSRSD's water service area only for compaction, dust control, and sewer cleaning. In 1999, DSRSD began delivering recycled water to the Dublin Sports Grounds for landscape irrigation. Through subsequent connection to the SRVRWP backbone, DSRSD's recycled water distribution system expanded to serve newly developed areas in Dougherty Valley and the eastern portion of Dublin. Recycled water service was extended to large landscape irrigation water users in the established areas of central Dublin between 2013 and 2015 to reduce potable water demand. Where recycled water distribution mains are adjacent to construction sites, DSRSD allows temporary connection to the distribution main so that construction contractors may obtain recycled water for construction use. Further, DSRSD maintains a commercial recycled water fill station at its RWTF and purple hydrants within its water service area to provide recycled water to contractors for grading and compaction, dust control, landscape irrigation, and sewer flushing.

In response to the 2012-2016 drought, DSRSD made recycled water available to the public for residential landscaping. With hundreds of people coming to pick up water daily, DSRSD expanded the original station at the treatment plant and opened a second location in Dublin in June 2015. The program promoted water conservation and demonstrated the value of DSRSD's investments in recycled water to the community. It received recognition in the water and wastewater industry. Recycled water agencies across California

[21] Since DSRSD's WWTP is physically located in Pleasanton, DWR Table 6-3 has not been completed in this 2020 UWMP for DSRSD (as shown in Table 6-5 above). However, DWR Table 6-3 in Pleasanton's 2020 UWMP includes the 2020 wastewater treatment and discharge data for DSRSD's WWTP.

have opened fill stations based on DSRSD model. DSRSD's Residential Recycled Water Fill Station is now closed and may reopen if mandatory water conservation is declared.

Table 6-6 summarizes the amount of recycled water being used in 2020 for each direct beneficial use, as well as projected volumes and uses into the future. The 2020 projected estimates of recycled water use from DSRSD's 2015 UWMP are compared to the actual 2020 recycled water use in Table 6-7.

DSRSD has been extremely successful in the implementation of its recycled water program within its service area, serving 348 sites within its service area. In 2020, over 40 percent of the annual flow to the Regional Wastewater Treatment Plant was recycled for irrigation uses. The demand for recycled water now occasionally exceeds the available supply on peak summer days, resulting in zero discharge of treated secondary effluent from the DSRSD WWTP to San Francisco Bay during these peak periods.

On March 25, 2019, DERWA found that it cannot meet the combined peak demands and projected demands of its member agencies and Pleasanton. DERWA approved Resolution 19-3 (Appendix I) requesting that its member agencies take action to reduce recycled water demands and implement a connection moratorium to the DERWA recycled water system. On July 7, 2020, the DSRSD Board adopted a revised Recycled Water Policy that reflects the reduced availability of wastewater and decreasing reliability of potable water supplies. Under the Recycled Water Policy, DSRSD may not connect new irrigation customers to the recycled water system until such time as there is sufficient wastewater supply to meet DSRSD recycled water demands for a minimum 10-year time horizon.

DSRSD, in partnership with DERWA and EBMUD, has pursued options to secure a permanent supplemental supply source for the DERWA program, including pursuing wastewater effluent from neighboring agencies, supplementing with groundwater, and looking at seasonal storage options. Although some progress has been made, to date, DERWA has not been able to secure a permanent recycled water supply source that would support lifting the moratorium on new recycled water customers. Therefore, DSRSD recycled water demands are expected to remain constant within the planning horizon of this 2020 UWMP and expansion of recycled water is identified in Table 6-8.

Table 6-6. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4 Retail)

☐	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:	DSRSD
Name of Supplier Operating the Recycled Water Distribution System:	DERWA

Beneficial Use Type	**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 [1,2]	2025 [1,2]	2030 [1,2]	2035 [1,2]	2040 [1,2]	2045 [1,2] (opt)
Agricultural irrigation										
Landscape irrigation (exc golf courses)				Tertiary	2,681	2,681	2,681	2,681	2,681	2,681
Golf course irrigation				Tertiary	195	195	195	195	195	195
Commercial use				Tertiary	12	12	12	12	12	12
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)			Facility Processes and Landscaping [3]		156	156	156	156	156	156
				Total:	3,044	3,044	3,044	3,044	3,044	3,044
				2020 Internal Reuse	153					

NOTES:

[1] Volumes are in AF.

[2] Dublin San Ramon Services District, 2020 Billing Data, April 2021.

[3] Includes 153 AF for facilities process water use and 3 AF of landscape irrigation use at DSRSD's WWTP and RWTF in Pleasanton.

Table 6-7. 2015 Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5 Retail)

Beneficial Use Type	2015 Projection for 2020[1,2]	2020 Actual Use[1,2]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)	3,364	2,681
Golf course irrigation	254	195
Commercial use	8	8
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 (Construction)	279	3
Other (Facility Processes and Landscaping)		156
Total	3,905	3,044

NOTE:

[1]Volumes are in AF.

[2]Dublin San Ramon Services District, 2020 Billing Data, April 2021.

Table 6-8. Methods to Expand Future Recycled Water Use (DWR Table 6-6 Retail)

☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
6-23	Provide page location of narrative in UWMP

As described in Section 6.2.8.2, DSRSD completed an Alternative Water Supply Study (AWSS) in June 2021 that evaluated potential supplemental supply sources for the recycled water program. The study recommended working with Zone 7 to further explore the potential to use groundwater as a supplemental supply source. The executive summary of DSRSD's 2021 AWSS is included as Appendix J.

6.2.6 Desalinated Water

Desalination has been identified as a potentially viable additional source of water for several Bay Area water suppliers including the Zone 7. The Bay Area Regional Desalination Project (BARDP) is detailed in Section 6.2.8.2.1.

6.2.7 Water Exchanges and Transfers

Zone 7 periodically supplements existing supplies with short-term transfers when needed and intends to more regularly acquire water transfers over the coming decade until major supply reliability project(s) come online starting around 2030. A transfer agreement with another SWP contractor using the SWP system—which Zone 7 is already invested in—is likely the most expedient and cost-effective transfer option. Transfer water would be conveyed to Zone 7 through the Delta and the SBA; the transfer amount could vary from year-to-year depending on hydrology but could average between 5,000 to 10,000 AFY. For the 2020 UWMP, Zone 7 is assuming 5,000 AFY in water transfers through 2030.

Zone 7 will continue to pursue and evaluate transfer opportunities in the Bay Area and statewide. Through the Bay Area Regional Reliability Partnership, Zone 7 is participating in a reclamation grant-funded project to develop a "Regional Water Market Program," which will identify transfer types and opportunities and develop a road map to facilitate transfers and exchanges in the Bay Area. Zone 7's existing water transfer supply sources and non-local storage options are detailed in Chapter 6 of Zone 7's 2020 UWMP.

6.2.8 Future Water Projects

Zone 7 anticipates future supply deficits as SWP reliability continues to decline and Zone 7's service area population grows. As a result, Zone 7 is pursuing several water supply reliability projects to obtain additional water storage and water supplies, address the need for alternative conveyance in the Delta, and improve access to groundwater and local emergency supplies. The 2019 WSE Update evaluated potential future water projects and their impacts on the reliability of Zone 7's water supply system. Zone 7 expects that a portfolio (likely a subset) of these projects will be needed to address future supply deficits. These projects are presented in Table 6-9 and described in Section 6.2.8.1.

Table 6-9. Zone 7 Expected Future Water Supply Projects or Programs

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*
	Drop Down Menu	*If Yes, Supplier Name*				
Bay Area Regional Desalination Project	*Yes*	Contra Costa Water District, SFPUC, Santa Clara Valley Water District	Brackish water desalination in eastern Contra Costa County	2030	All Year Types	5,600
Delta Conveyance Project	*Yes*	Department of Water Resources and other SWP contractors	Construction of new intakes and tunnel as part of the State Water Project	2040	All Year Types	TBD
Los Vaqueros Reservoir Expansion	*Yes*	Contra Costa Water District, and a number of Bay Area M&I water agencies plus Grassland Water District and San Luis & Delta-Mendota Water Authority.	Expansion of Los Vaqueros Reservoir and construction of the Transfer-Bethany Pipeline, which would connect the reservoir to the South Bay Aqueduct and California Aqueduct	2025 (Pipeline) and 2030 (Reservoir Expansion)	Dry Years	TBD
Potable Reuse	*Yes*	Livermore, DSRSD, Pleasanton, Cal Water	Use of purified water derived from wastewater effluent to supplement potable water supplies	2030	All Year Types	4,000-7,000
Sites Reservoir	*Yes*	Sites Project Authority and Sites Reservoir Project Committee members	Construction of a new 1.5 million AF off-stream reservoir in Colusa County	2030	All Year Types	10,000
SWP Transfers	*Yes*	Other SWP contractor/s	Temporary water transfer agreement/s until major projects are implemented	2021	All Year Types	varies

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

NOTES: Volumes are in AF. These projects are in the conceptual or planning stages. Zone 7 is participating in the planning efforts of these potential future water supply and/or storage projects to evaluate their benefits, including water supply yield. Implementation of these projects has not been approved by the Zone 7 Board but it is expected that a subset of these projects will be needed to meet future water demands and increase the reliability of Zone 7's system. The partners listed above are potential partners; final participation will be determined when the project has been approved by the respective agencies' governing boards. The 'expected increase in water supply...' are estimates at this time and may need to be adjusted when a final project has been approved. The 'planned implementation year' may also vary depending on project progress.

DSRSD completed an AWSS in June 2021 that provides a framework for building a resilient and sustainable water future for DSRSD customers. The results of this study identified potential near-term actions that DSRSD could implement that would be complementary to Zone 7's water supply reliability efforts. DSRSD's water supply efforts are presented in Table 6-10 and described in Section 6.2.8.2.

Table 6-10. DSRSD Expected Future Water Supply Projects or Programs (DWR Table 6-7 Retail)

☑	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.
6-33 to 6-34	Provide page location of narrative in the UWMP

6.2.8.1 Future Zone 7 Water Supply Projects

Zone 7 is currently evaluating several water supply projects to address potential future supply deficits as SWP reliability declines and Zone 7's service area population grows. These projects include reliability improvements for existing supplies and new supplies. Zone 7's "new supply" projects are described below. A complete list of potential programs and projects, along with additional detail, is available in Zone 7's 2019 WSE Update and 2020 UWMP.

6.2.8.1.1 Bay Area Regional Desalination Project (BARDP)

Brackish water desalination for Zone 7 would be accomplished through a joint venture among Bay Area water agencies—CCWD and potentially EBMUD, the San Francisco Public Utilities Commission (SFPUC), Zone 7, and VW—known as the BARDP. This project is shown on Figure 6-5 and would involve constructing a regional brackish water treatment plant in eastern Contra Costa County producing 10-20 MGD. Water would be diverted using CCWD's Mallard Slough Pump Station. Using an existing water right license and permit, both held by CCWD, and/or a new water right, Zone 7 could potentially receive up to 5,600 AFY. Zone 7 could take delivery of this new water supply through a reliability intertie with EBMUD or through the Delta/SBA by exchanging water with CCWD. Furthermore, this project could potentially provide a new water supply component for the Los Vaqueros Reservoir Expansion (LVE) project and make use of LVE's additional storage and new conveyance facilities.

There has been recent renewed interest in desalination as part of the Bay Area Regional Reliability Partnership, and there may be new developments in the near-term. The water yield of the project is being re-evaluated, and the participating agencies may change. The BARDP is still in the planning phase, and there is no formally approved project at this time. If a project is approved over the next few years, it could be in service by 2030.

In Zone 7's 2020 UWMP, 5,000 AFY was assumed as the total potential yield from BARDP and/or potable reuse (described in Section 6.2.8.2.3) with either or both systems operational by 2030. As noted above, BARDP water could potentially be conveyed through a new intertie supplying the west side of Zone 7's transmission system. This mode of delivery provides an alternative conveyance not subject to Delta outages.

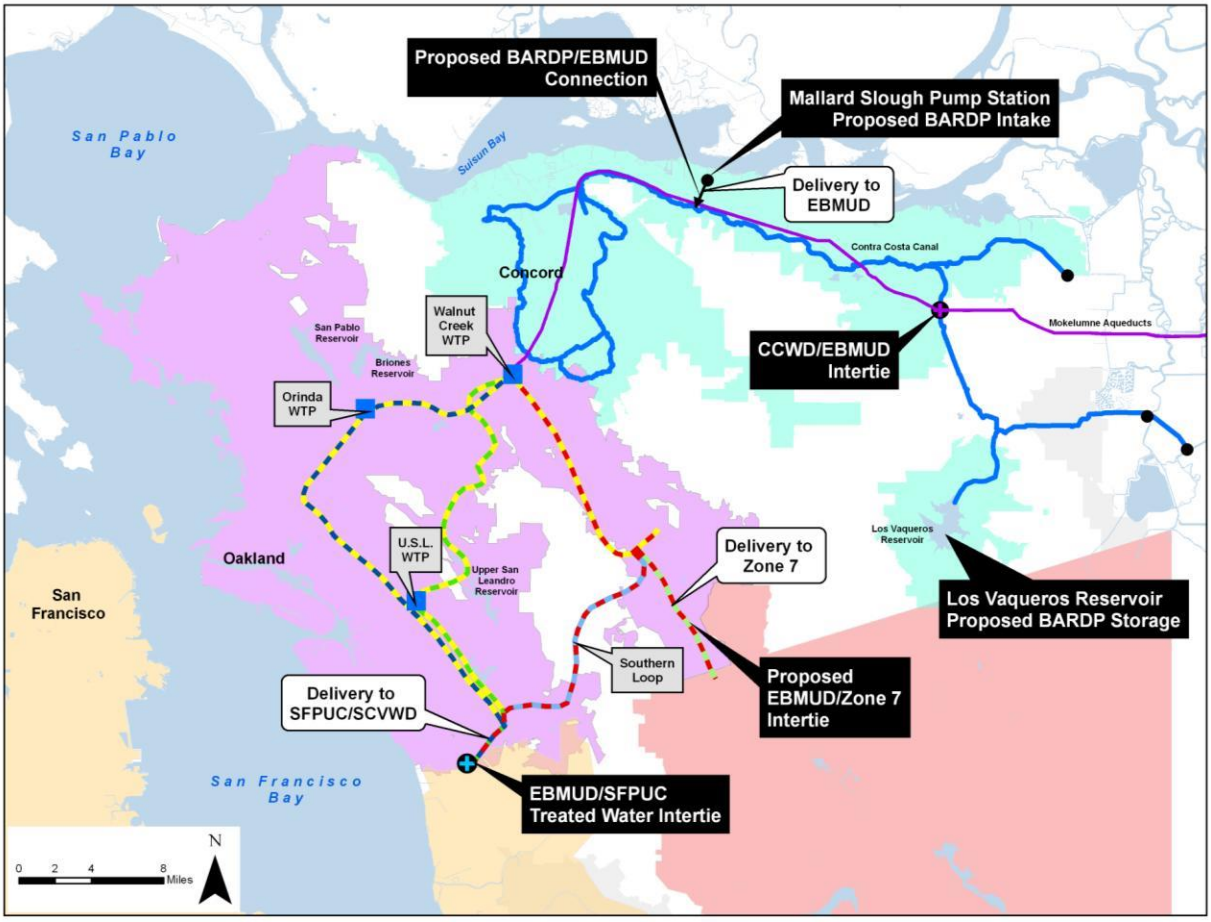


Figure 6-5. Bay Area Regional Desalination Project: Diversion and Conveyance Facilities

6.2.8.1.2 Delta Conveyance Project

Accounting for imported and local surface water, the retailers' GPQs, and recycled water, the Tri-Valley area receives approximately 70 percent of its incoming water supplies through the Delta as delivered by DWR. For Zone 7, the Delta conveys about 90 percent of its existing incoming supplies under normal conditions. SWP water, carryover water, water banked in Kern County and transfer water all come through the Delta.

This key conveyance component of the SWP is increasingly threatened by ecosystem considerations, seismic risk, and climate change/sea level rise, reducing the reliability of the SWP system. DWR's proposed Delta Conveyance Project (DCP) would install a new tunnel to convey freshwater from north of the Delta to a point south of the Delta. The DCP will likely increase SWP reliability and improve water quality, but an alternate conveyance system for the majority of Zone 7's water is the significant benefit as follows:

- A major Northern California earthquake could take out levees in the Delta. Experts suggest that fresh water supply through the Delta could be lost for months, if not a year or two. The DCP would provide an alternative conveyance of freshwater from north of the Delta (near Sacramento) to a point south of the Delta (near Byron) while levee repairs and other work are being completed.

- The South Delta is currently about 3 feet above sea level, while the North Delta is about 15 feet above sea level. Climate change projections call for sea-level rise of 5 to 10 feet. This could render the South Delta unusable for portions of the year due to saltwater intrusion. The DCP would provide an alternative conveyance of freshwater from north of the Delta to a point south of the Delta when the Delta is too saline.

In July 2017, DWR approved the California WaterFix Project, a dual conveyance project involving two new diversion points and two tunnels moving water from the Sacramento River north of the Delta under the Delta to SWP and Central Valley Project water pumping facilities in the South Delta. In the California State of the State address in January 2019, Governor Newsom announced that he did not support WaterFix as configured but he did support a single-tunnel conveyance project. Consistent with this, in May 2019 DWR rescinded its approvals of the WaterFix project and began planning for a single-tunnel option.

In January 2020, DWR released a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) pursuant to CEQA for the DCP. Note that the DCP is part of Governor Newsom's portfolio approach to water management. While the proposed project in the DCP is a single tunnel up to 6,000 cubic feet per second (cfs), DWR is considering alternatives including capacities ranging from 3,000 to 7,500 cfs. Anticipated benefits include: 1) water supply reliability and SWP resiliency (climate change adaptation/stormwater capture, sea-level rise adaptation, seismic resilience), 2) South Delta flow pattern improvements for fisheries, 3) water transfer capacity and carriage water savings, and 4) water quality improvements for SWP deliveries. Potential DCP facilities are shown in Figure 6-6.

As described in Section 6.2.1.2.1.1, Zone 7 has a long-term contract with DWR for a Table A amount of 80,619 AFY from the SWP, but SWP reliability has decreased significantly over the years. Estimates of SWP reliability (i.e., projected long-term average of Table A allocations) have been adjusted over the years as they account for changing regulatory and operational conditions, among other factors. The 2019 DCR estimates SWP reliability will decrease from an average Table A allocation of 59 percent in 2020 to 54 percent Table A in 2040. The potential increase in SWP reliability from the DCP has not been incorporated and will be evaluated once the project and its operational and permitting terms are better defined. Zone 7's 2020 UWMP, therefore, assumes no additional yield from the DCP at this time.

Through mid-2024, DWR will be completing environmental planning efforts on the DCP. In November 2020, the Zone 7 Board approved continued participation in the DCP at a 2.2 percent participation level based on Zone 7's Table A amount of 80,619 AF. The Board also approved Zone 7 funding of these efforts up to $2,800,000 for calendar years 2021 and 2022. A separate future request for Zone 7 Board action would address participation and funding beyond 2022.

Continued participation by Zone 7 in the planning efforts will allow Zone 7 to elect to participate in the DCP implementation in the future based on information developed in the planning process, allow access by Zone 7 to information related to benefits and costs, and provide Zone 7 influence throughout the process. The work over the next two to four years will inform the Zone 7 Board's decision-making as the DCP continues to advance.

As a contractor of the SWP, Zone 7 is working very closely with DWR and other water agencies, environmental groups, regulatory agencies, and natural resource agencies to address the declining reliability of the SWP through the DCP and other efforts.

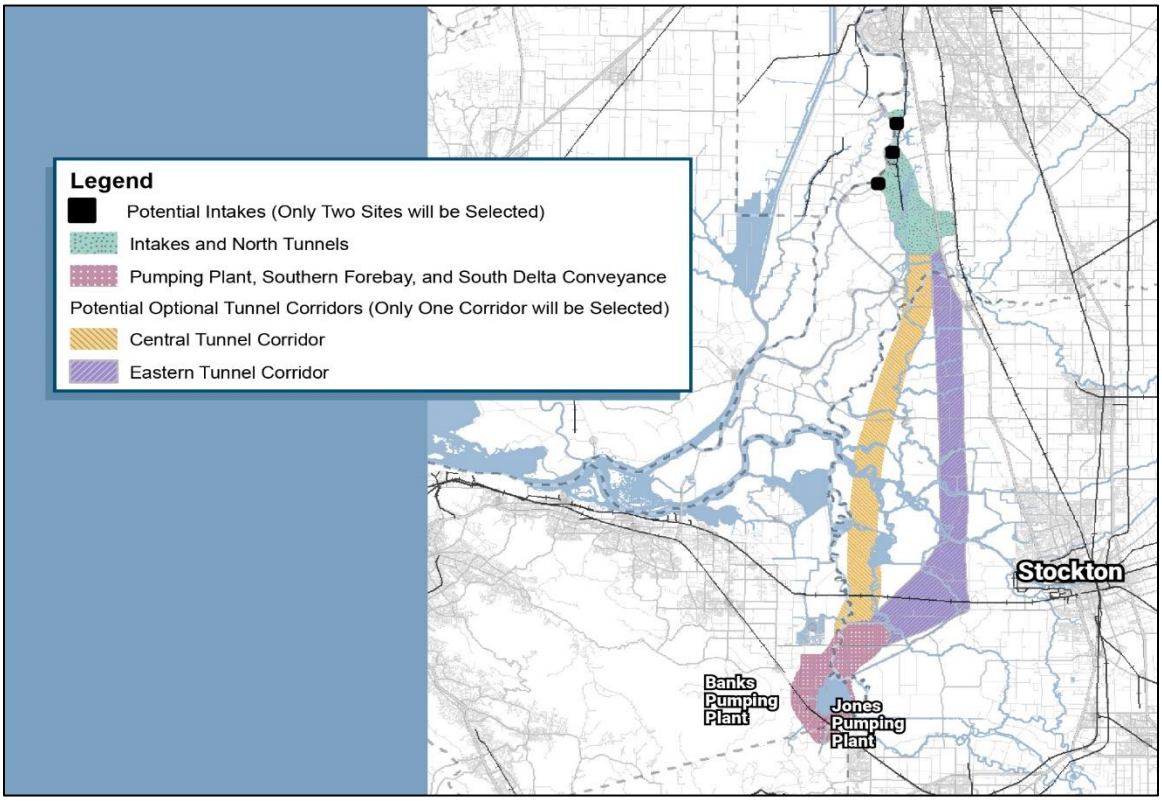


Figure 6-6. Delta Conveyance Project: Potential Facilities

6.2.8.1.3 Potable Reuse

Potable reuse is the use of purified water derived from wastewater effluent to supplement potable water supplies. While recycled water, the use of treated wastewater for non-potable uses such as irrigation, has been available for many years in the Tri-Valley, potable reuse would be a new use of local wastewater resources collected by DSRSD and Livermore. Its main benefits include local production and control, drought resistance, and the use of an existing water resource.

In 2018, the Tri-Valley Water Agencies completed the Joint Tri-Valley Potable Reuse Technical Feasibility Study[22] (Potable Reuse Study) with these goals: 1) to evaluate the feasibility of a wide range of potable reuse options for the Tri-Valley based on technical, financial, and regulatory considerations, and 2) assuming that potable reuse is found to be technically feasible, to recommend next steps for the agencies. The Potable Reuse Study also refined cost estimates for potable reuse.

The Potable Reuse Study investigated three potential end uses for purified water in detail: 1) groundwater augmentation or recharge via injection wells, 2) groundwater recharge via Chain of Lakes surficial recharge, and 3) raw water augmentation to Zone 7's Del Valle Water Treatment Plant. Looking at annual yields ranging from 5,500 to 10,000 AFY, the Potable Reuse Study concluded that potable reuse is technically feasible for the Tri-Valley, with benefits to reliability and water quality. The lower yield would use only Livermore wastewater supply with year-round operations, while the higher yield would be

[22] Tri-Valley Agencies and Carollo Engineers, 2018. Joint Tri-Valley Potable Reuse Technical Feasibility Study. https://www.dropbox.com/s/pxcyajryga5j61s/potable_reuse_feasibility_study_May-2018.pdf?dl=0

achieved with seasonal availability of DSRSD wastewater supply. Water availability would increase over time as development occurs in the Tri-Valley and more wastewater is generated and collected. In other words, the maximum yield is expected to only be available after a certain point in the future; only a fraction of the maximum yield is available before buildout.

In the 2019 WSE Update, raw water augmentation was modeled with the option for a two-phased project that initially produces a lower yield but increases to the maximum yield in 2035 (following a growth in available wastewater). Reflecting a more conservative estimate of future wastewater availability, the 2019 WSE Update used a reduced yield of 4,000 AFY starting in 2027 and 7,000 AFY after 2035. Conservation regulations have set low indoor water use targets for California, which are expected to reduce future wastewater flows. The estimates in the Potable Reuse Study had not incorporated the recently set statewide indoor water use targets. Future analyses will adjust estimates as necessary based on actual indoor water use trends and updated projections of wastewater availability for potable reuse.

Zone 7, with the support of some of the Tri-Valley's retailers, is completing a number of technical studies over the next few years that will support the continued evaluation of potable reuse options and their costs and benefits. For planning purposes, the Zone 7 2020 UWMP assumes 5,000 AFY of future supply from BARDP (discussed in Section 6.2.8.2.1) and/or potable reuse, with either or both systems online by 2030.

6.2.8.1.4 Sites Reservoir

Sites Reservoir is a proposed new 1,500,000 AF off-stream storage reservoir in northern California near Maxwell. Sacramento River flows will be diverted during excess flow periods and stored in the off-stream reservoir and released for use in the drier periods. As shown in Figure 6-7, Sites Reservoir aims to supplement and optimize use of the State's existing storage and conveyance systems such as the CVP's Shasta Reservoir and the SWP's Oroville Reservoir, which collects much of the water for the SWP system.

The participants in the Sites Reservoir project include 31 entities, including Zone 7 and several other SWP contractors. Sites Reservoir is currently undergoing environmental planning and permitting and is expected to provide approximately 240 TAF per year[23] of additional deliveries on average to participating agencies under existing conditions. Operations modeling will continue to be refined over the next few years to reflect a range of permit and operational conditions, which will define the ultimate yield. For example, it is uncertain at this time whether the delivery of Sites Reservoir releases using SWP facilities in the Delta could result in a "carriage loss," which would reduce the net yield to Zone 7 and other SWP contractors. Full operation of the Sites Reservoir is estimated to start by 2029 following environmental planning, permitting, and construction.

Sites Reservoir is expected to provide water supply and environmental, flood, and recreational benefits. Consequently, Sites Reservoir was conditionally awarded $816 million from the California Water Commission for the ecosystem, recreation, and flood control benefits under Proposition 1. The United States Bureau of Reclamation (Reclamation) may also invest in Sites Reservoir under the Water Infrastructure Improvements for the Nation Act and recently transmitted a final Federal Feasibility Report to Congress for the project.

[23] Sites Project Management Team, 2020. Sites Project Value Planning Alternatives Appraisal Report. https://3hm5en24txyp2e4cxyxaklbs-wpengine.netdna-ssl.com/wp-content/uploads/2020/04/INT-REP-Value-Planning-Appraisal-Report-FinalV2Compressed.pdf

The Sites Project Authority (Authority) was formed on August 26, 2010 as a joint powers authority to pursue the development and construction of Sites Reservoir. The Authority is governed by a 12-member Board of Directors representing Sacramento Valley leadership in government and water management. Water agencies across California—including Zone 7—that are investing in the project are members of the Sites Reservoir Project Committee. The Sites Reservoir Project Committee oversees the planning efforts and provides recommendations to the Authority.

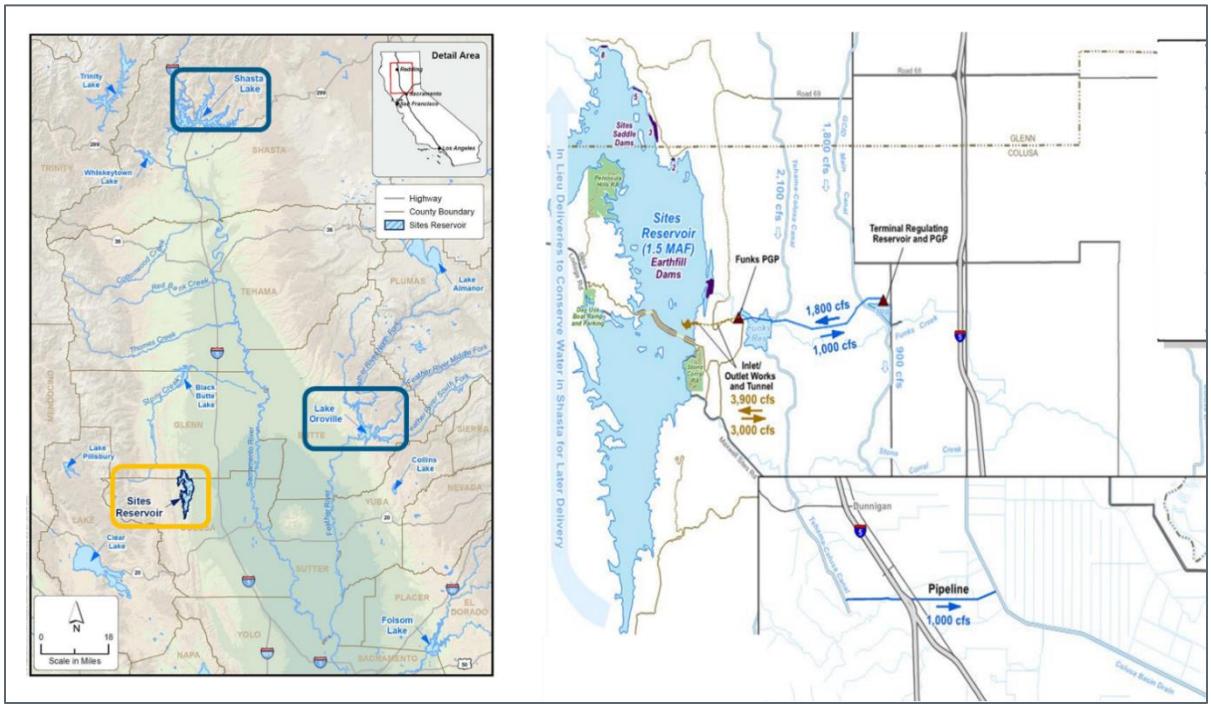


Figure 6-7. Sites Reservoir Project: Location and Facilities

Sites Reservoir could provide both water supply and storage for Zone 7. In December 2016, the Zone 7 Board authorized participation in Phase 1 at a cost of $850,000. In December 2019, the Zone 7 Board authorized participation in Phase 2 (2019 Sites Reservoir Project Agreement) at a cost of $600,000. The Zone 7 Board then approved continued participation in Phase 2 through December 2021 at an amount not-to-exceed $1,000,000 in July 2020. Key work under these two phases include planning, design, financial analysis, and environmental review and permitting.

In the 2019 WSE Update, Zone 7 considered 5,000 to 10,000 AFY of average yield from Sites Reservoir combined with other water supply options. The availability of this supply was varied based on hydrology, with more water delivered to Zone 7 during dry years. At Zone 7's request, water would be released from Sites Reservoir annually to the Sacramento River, then conveyed by the SWP system through the Delta and to the SBA. Based on model results, Sites Reservoir's key benefit is the availability of water during dry years when the shortage risk is greatest. Sites Reservoir is a good complement to the DCP, which could potentially increase SWP yield during wet years. Because Sites Reservoir provides both storage and new supply, it adds flexibility to Zone 7's water supply system; for example, the timing of deliveries from Sites Reservoir could be modified to maximize yields from other water supplies and/or to accommodate delivery timing restrictions of other supplies. For Zone 7, water could be released from Sites Reservoir annually to the Sacramento River, generally during dry and critical years, then conveyed by the SWP system through the Delta and to the SBA. Recently, the Zone 7 Board re-affirmed continued participation

in Sites Reservoir at a 10,000 AFY share. Zone 7's 2020 UWMP therefore assumes an average water supply of 10,000 AFY to Zone 7 from Sites Reservoir.

6.2.8.1.5 Storage Project – Los Vaqueros Reservoir Expansion

Constructed in 1997, Los Vaqueros Reservoir is an off-stream reservoir owned by CCWD and located in southeastern Contra Costa County (see Figure 6-8). It currently has a capacity of 160,000 AF following its expansion (Phase 1) from 100,000 AF in 2012. CCWD is planning to further expand the reservoir to 275,000 AF (Phase 2) and construct the Transfer-Bethany Pipeline, which would connect the reservoir to the SBA and the California Aqueduct. The LVE's key objectives are to: 1) develop water supplies for environmental water management, and 2) increase water supply reliability for Bay Area water agencies. In addition, the LVE would improve water quality for municipal and industrial customers in the San Francisco Bay Area while providing improved habitat and recreation and flood control benefits.

Recognizing LVE's potential benefits as emergency conveyance and storage, the Zone 7 Board approved participation in the LVE Project Planning in September 2016, with a $100,000 cash contribution. In January 2019, the Zone 7 Board approved continued participation in the project's planning activities through execution of the Multi-Party Agreement in an amount not-to-exceed $355,000. In August 2020, the Zone 7 Board approved continued participation in the LVE Multi-Party Agreement through December 2021 at a cost up to $1.014 million.

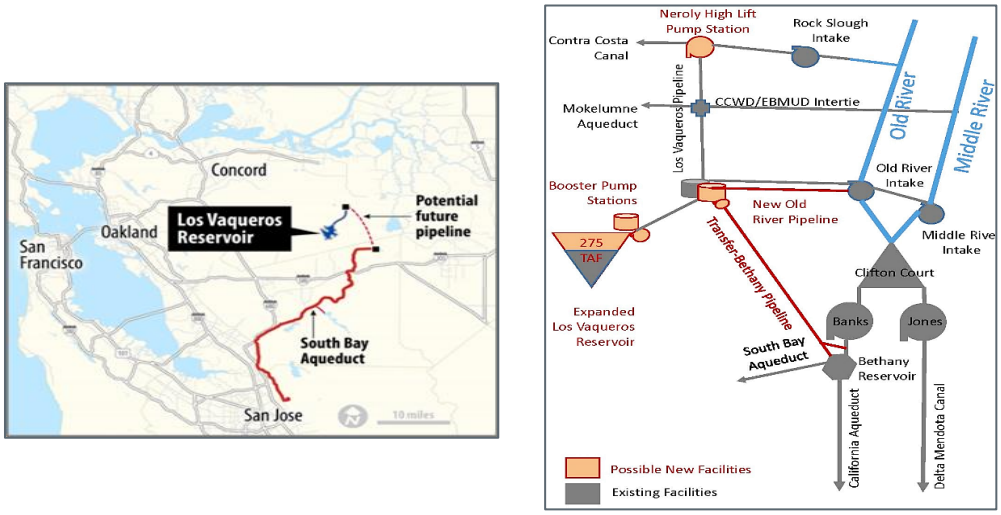


Figure 6-8. Los Vaqueros Reservoir: Location and Facilities (Source: CCWD)

Under the LVE, water would be diverted from the Delta at CCWD's Rock Slough, Old River, and Middle River Intakes, and at the Freeport Intake on the Sacramento River. This water could then be delivered to agencies within CCWD's service area, the Bay Area, the Delta, neighboring regions, and the south-of-Delta wildlife refuges. Under existing and new water right and permit conditions, CCWD would be able to divert different types of water, including: Delta surplus water under CCWD's Los Vaqueros water right, Central Valley Project water, SWP water, Mokelumne River water, and other water acquired by project partners through transfer agreements. Existing and new facilities would be used to store and convey water under the LVE (Figure 6-8).

Water could be stored in Los Vaqueros Reservoir for later use or delivered directly to partners. Potential LVE participants envision different operational schemes for the reservoir and associated facilities, and these various scenarios are continuing to be evaluated through modeling by CCWD staff. While some new water supply may be available from LVE, Zone 7 is primarily evaluating the project as storage due to the uncertainty of the availability of such supplies given increasing Delta restrictions. The 2019 WSE Update assumed emergency storage in Los Vaqueros Reservoir at 10,000 AF.

In 2017, CCWD and Reclamation completed the Draft Supplement to the Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the LVE. The project was successfully selected for funding under the State's Water Storage Investment Program (WSIP) in July 2018 of up to $459 million based on its environmental and other public benefits. Reclamation also contributes to LVE costs, which are estimated to total $1.1 billion. Reclamation and CCWD published final environmental documents for the LVE in February 2020. A JPA is planned to be formed in spring 2021 to oversee project planning, design, and operation. Work is proceeding on the project's design, engineering, environmental and other permitting, financial analysis, and operations planning. The Transfer-Bethany Pipeline is scheduled for completion by around 2025 and the expanded reservoir by around 2030.

6.2.8.1.6 Reliability Intertie with EBMUD

Zone 7 is planning to construct a 30-inch diameter treated water pipeline connection with EBMUD on the west side of Zone 7's transmission system. This reliability would provide an additional or alternative means of delivering water to Zone 7 during Delta and/or SBA outages, and is planned to be in service by around 2030.

6.2.8.2 DSRSD Alternative Water Supply Study

In September 2015, DSRSD completed an Alternative Water Supply Study (2015 AWSS) to identify conceptual alternatives for improving the long-term reliability of the DSRSD's water supplies. The 2015 AWSS was driven by unprecedented drought conditions in 2014 and 2015 and DSRSD's desire to reduce dependence on imported water supplies through the SWP. In 2014, DWR announced an initial State Water Project allocation of 0 percent, which was increased to 5 percent later in the year. The very low 2014 SWP allocation and limitations on when water could be pumped through the Delta exposed vulnerabilities with Zone 7's heavy reliance on the current SWP system for bringing water supplies into the Tri-Valley.

The 2015 Study included a high-level assessment of regional and local supply alternatives that DSRSD could explore collaboratively with other neighboring water and wastewater agencies to diversify the DSRSD's water supplies and reduce reliance on Zone 7 and imported water supplies. The results of the 2015 Study informed and provided the framework for DSRSD's Water Supply, Storage, Conveyance, Quality and Conservation Policy (2015 Water Policy), which was adopted by the Board in October 2015.

In August 2020, DSRSD initiated an effort to update the 2015 AWSS to incorporate new and refined information and serve as the basis for updating the 2015 Water Policy. The *2021 Alternative Water Supply Study: A Framework for a Resilient and Sustainable Water Future* (2021 AWSS) was completed in June 2021. The 2021 AWSS highlights how information has changed or evolved over the past five years and the progress Zone 7 has made towards achieving a more diversified portfolio of supply, storage, and conveyance projects. Zone 7's efforts are described in Section 6.2.8.1.

The AWSS provides a framework for guiding DSRSD's near-term water supply efforts, which include:

- Supporting Zone 7's efforts to pursue additional supply, storage, and conveyance projects and advocating for continued participation in the LVE and Transfer-Bethany Pipeline Project and evaluating Sites Reservoir in combination with Delta Conveyance;
- Exploring potential near-term pilot projects to gather information and inform longer-term water solutions; and
- Continuing to seek supplemental non-potable supplies to expand the recycled water program.

Based on the results of the 2021 AWSS, the DSRSD Board approved the Water Resiliency Policy on April 20, 2021. The Water Resiliency Policy, which replaces the 2015 Water Policy, will guide DSRSD efforts to build a resilient and sustainable water future for DSRSD customers. The Water Resiliency Policy emphasizes the need for collaborative partnerships, advocates for an "all of the above" approach to exploring projects that build water resiliency for the Tri-Valley, and prioritizes local and sustainable water projects that contribute to regional self-reliance.

The executive summary of DSRSD's 2021 AWSS is included as Appendix J and DSRSD's Water Resiliency Policy is included as Appendix K.

6.2.9 Summary of Existing and Planned Sources of Water

Table 6-11 summarizes the actual water supplies for DSRSD. Table 6-12 summarizes the future projected water supplies for DSRSD.

Table 6-11. Water Supplies - Actual (AF) (DWR Table 6-8 Retail)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume[1]	Water Quality	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	Zone 7	10,966	Drinking Water	
Recycled Water[2]	From DSRSD RWTF	2,888	Recycled Water	
	Total	13,854		0

NOTES:

[1]Volumes in AF.

[2]Recycled water volume excludes recycled water used for processing and landscape irrigation at the DSRSD WWTP.

Table 6-12. Water Supplies - Projected (AF) (DWR Table 6-9 Retail)

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply Report To the Extent Practicable									
		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)
Purchased or Imported Water	Zone 7	11,993		13,363		13,807		13,820		14,034	
Recycled Water		3,044		3,044		3,044		3,044		3,044	
Total		15,037	0	16,407	0	16,851	0	16,864	0	17,078	0
NOTES: Volumes in AF.											

6.2.10 Climate Change Impacts

There are concerns that a warming trend that occurred during the latter part of the 20th century will likely continue through the 21st century. Numerous studies have been conducted to evaluate the potential impacts of these changes to water resources. Based on these studies, climate change could impact California's water resources in the following ways:

- 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, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality;
- 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; and
- Changes in urban and agricultural water demand.

As described above, the SWP has been and will continue to be the largest source of Zone 7's, and hence DSRSD's, water supplies. In 2020, for example, the supplies derived from the SWP (existing SWP supplies, groundwater (stored SWP supplies), and SWP carryover) are projected to represent nearly 90 percent of Zone 7's supplies.

The following provides a summary of the potential impacts of climate change to water supply operations in the Delta, as they relate to water supply reliability, water quality and flood control:

- Water Supply Reliability
  - The operation of storage reservoirs could be impacted by shifting runoff and snowmelt patterns, requiring a greater volume of flood control storage, and making it more difficult to refill reservoir flood control storage during late spring or early summer, and potentially reducing the volume of surface water available for use during the summer/fall season.
  - Levee breaks, either as a result of the impacts of rising sea levels, lack of maintenance, earthquake, or some combination, could have adverse effects on Delta water quality (due to the intrusion of salt water into these potable water supplies) and water system operations. Major levee breaks could take months or years to repair, and will impact the availability of water supplies from the Delta.
- Water Quality
  - More intense storms and increased runoff could impact Delta water quality in two ways: 1) Increased sediment load, and 2) Increased contaminants from increased urban and agricultural runoff.

  - Sea level rise could push salt water from the Bay into the Delta, impacting overall water quality and potentially impacting Delta operations.
  - Levee breaks, either as a result of the impacts of climate change or an earthquake, could cause large amounts of salt water from the Bay to enter the Delta and would have adverse effects on Delta water quality and water system operations. The saltwater intrusion could take months to dissipate depending on the severity of the levee break and the amount of saltwater intrusion which occurs.
- Flood Control
  - Reservoir operations, including the need for more flood storage reservoir space, could be impacted by snowpack changes, shifts in snowmelt patterns and changes in rainfall intensity.
  - Deteriorating levees could fail as a result of increased runoff, more intense storms, sea-level rise, or lack of maintenance. Failure of the levees would have catastrophic impacts on the Delta, including its islands and have enormous implications for water supply operations.

Climate change may also impact Zone 7's other operations. Specifically, with respect to groundwater management, the SMP, groundwater recharge operations and COL operations may be impacted by changes in precipitation patterns and intensities. Similarly, the operation of Lake Del Valle could be impacted by the need to maintain more flood control storage capacity to deal with more intense rainfall events. Lastly, flood control operations, in general, may be impacted by more intense and more frequent flooding events.

The scenarios in the 2019 DCR account for climate change impacts based on 2035 emissions levels and 45-centimeter sea-level rise; therefore, these impacts have been incorporated into Zone 7's water supply planning efforts. Zone 7 has also evaluated the impacts of climate change on local water supplies and documented those evaluations in the 2019 WSE Update.

6.3 ENERGY INTENSITY

In accordance with CWC §10631.2(a), the energy intensity to provide water service to DSRSD's customers over a one-year period is presented in this section to the extent that the information is available. The amount of energy to divert, pump, treat, and distribute DSRSD's water supply within the system it owns and operates is included. The amount of energy that Zone 7 requires to treat raw water and deliver potable water to DSRSD is excluded.

Water energy intensity is the total amount of energy, calculated on a whole-system basis, used to deliver water to DSRSD's customers for use. Energy intensity is the total amount of energy in kilowatt-hours (kWh) expended per acre-foot to take water from DSRSD's source to its point of delivery. Understanding the whole-system energy intensity would allow DSRSD to develop the following water supply management and system operation strategies:

- Identifying energy-saving opportunities, as energy consumption is often a large portion of the cost of delivering water;
- Calculating energy savings and GHG emissions reductions associated with water conservation programs;
- Identifying potential opportunities for receiving energy efficiency funding for water conservation programs;
- Informing climate change mitigation strategies; and
- Benchmarking energy use at each water acquisition and delivery step and comparing energy use among similar agencies.

In Table 6-13, the energy intensity of DSRSD's water service is calculated for 2019, as it provides a typical year's energy use. In 2020, shelter-in-place orders and business restrictions related to the COVID-19 pandemic may have altered water use by DSRSD's customers. The total energy intensity for DSRSD's water service is 379 kWh/AF. Note, 2019 energy consumption information is from billing statements received in 2019, which may not exactly reflect energy use from January 1 through December 31.

Table 6-13. Recommended Energy Intensity (DWR Table O-1B)

Enter Start Date for Reporting Period	1/1/2019	**Urban Water Supplier Operational Control**		
End Date	12/31/2019			
☐ Is upstream embedded in the values reported?		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*AF*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit) [1]		*10,152*	*0*	*10,152*
Energy Consumed (kWh) [2]		*3,843,152*	*0*	*3,843,152*
Energy Intensity (kWh/volume)		*379*	*0.0*	*379*

NOTES:
1. Dublin San Ramon Services District, Zone 8 Water Billing 2019, April 2021.
2. Dublin San Ramon Services District, Energy Data Account Usage, April 2021.

Quantity of Self-Generated Renewable Energy

0 kWh

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

Metered Data

Data Quality Narrative:

Data is provided by the District from flow meters in the water distribution system and electric meters at its water facilities.

Narrative:

Water management processes consuming energy include distribution/pumping, storage tank operations, and groundwater pumping and treatment.

As discussed in Section 6.2.5, DSRSD collects and transports wastewater and recycled water. The energy intensity associated with DSRSD's wastewater services and recycled water services for 2019 is provided in Table 6-13. The DSRSD WWTP has includes a cogeneration system that provides electricity and heat for operation of the WWTP and its supporting infrastructure; energy produce by the cogeneration system is included in the table. The total energy intensity for DSRSD's wastewater services and recycled water services is 668 kWh/MG and 299 kWh/MG, respectively.

Table 6-14. Recommended Energy Intensity – Wastewater & Recycled Water (DWR Table O-2)

		Urban Water Supplier Operational Control			
Enter Start Date for Reporting Period	1/1/2019	Water Management Process			
End Date	12/31/2019				
☐ Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used	MG				
Volume of Wastewater Entering Process (volume units selected above) [1]		*1670*	*3796*	*2291*	*7758*
Wastewater Energy Consumed (kWh) [2]		*12086*	*5010137*	*162646*	*5184870*
Wastewater Energy Intensity (kWh/volume)		*7.2*	*1320*	*71*	*668*
Volume of Recycled Water Entering Process (volume units selected above) [1]			*1505*	*1505*	*3010*
Recycled Water Energy Consumed (kWh) [2]			*451239*	*447255*	*898494*
Recycled Water Energy Intensity (kWh/volume)		*0.0*	*300*	*297*	*299*

Notes
1. Dublin San Ramon Services District, DERWA Demand Summary 2020_rvsd 2103.08.xlsx, March 2019.
2. Dublin San Ramon Services District, Energy Data Account Usage, April 2021.

Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operations

9,990,771 kWh

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

Metered Data

Data Quality Narrative:

Influent and effluent at the WWTP and RWTF are metered.

Narrative:

Collection system includes two DSRSD lift stations. DSRSD owns and operates WWTP and RWTF. Wastewater effluent not recycled is pumped out of the Tri-Valley and discharged through LAVWMA and EBDA facilities as described in Section 6.2.5.2

CHAPTER 7
Water Service Reliability and Drought Risk Assessment

This chapter describes DSRSD's water service reliability under various hydrologic conditions, including a severe drought for the next five years. DSRSD's existing and planned water management tools for increasing water supply reliability are also addressed. Responses to actual water shortage conditions are detailed in Chapter 8 of this plan.

The reliability of DSRSD's potable water supply is largely dependent upon its water supply contract with Zone 7 and Zone 7's water supply reliability policy. On October 17, 2012, the Zone 7 Board approved a revised Water Supply Reliability Policy (Resolution No. 13-4230, included as Appendix L), which adopts the following level of service goals to guide the management of Zone 7's treated water (also referred to as municipal and industrial or M&I) supplies and its Capital Improvement Program (CIP):

- **Goal 1**: Zone 7 will meet its treated water customers' water supply needs, in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands as specified in Zone 7's most recent UWMP, during normal, average, and drought conditions, as follows:
  - At least 85 percent of M&I water demands 99 percent of the time
  - 100 percent of M&I water demands 90 percent of the time
- **Goal 2**: Provide sufficient treated water production capacity and infrastructure to meet at least 80 percent of the maximum month M&I contractual demands should any one of Zone 7's major supply, production, or transmission facilities experience an extended unplanned outage of at least one week.

7.1 WATER SERVICE RELIABILITY ASSESSMENT

DSRSD serves both potable and recycled water to its customers. DSRSD's potable water supply is purchased from Zone 7, which is comprised of treated surface water blended with some local groundwater. Approximately 80 percent of Zone 7's water supply comes from surface water, primarily the State Water Project, which is subject to legal and environmental issues surrounding the San Francisco Bay Delta. As discussed in Chapter 6, the groundwater basin is managed by Zone 7, and DSRSD has a 645 AFY GPQ pumped on its behalf by Zone 7. Further, DSRSD produces recycled water at its RWTF and distributes it within its water service area. Approximately 20 percent of the water DSRSD distributes is recycled water. DSRSD's recycled water capacity is constrained by the wastewater influent it collects from its wastewater service area and treats at its WWTP as discussed in Section 6.2.5.4.

DSRSD's exclusive potable water wholesaler is Zone 7. Zone 7's water supply reliability greatly affects DSRSD's potable water supply reliability and vulnerability, which is directly related to a seasonal and climatic shortage that may impact Zone 7's water supplies. Therefore, a significant portion of this section presents the constraints on Zone 7's existing and planned water sources and summarizes the historical basis for projecting available supplies in various hydrologic conditions (i.e., normal year, single dry year, and five consecutive dry years).

DSRSD's water service reliability is presented in five-year increments through 2045 based on earlier analysis of water use in Chapter and water supply in Chapter 6 of this plan. This section also discusses DSRSD's water management tools and options to promote regional supply reliability and minimize the need to import water from other regions.

7.1.1 Constraints on Water Sources

This section discusses the constraints on DSRSD's potable water supply from Zone 7 and the recycled water supply that it produces. Strategies for managing the risks associated with each supply are also discussed.

7.1.1.1 Potable Water Supply from Zone 7

One of the main limitations of Zone 7's water system is the lack of interties. All of Zone 7's imported water supplies are conveyed through the Delta and the SBA; Arroyo Valle water is also conveyed through the SBA. Zone 7 has been working closely with DWR, VW, and ACWD to improve the reliability of the SBA. Between 2003 and 2012, DWR made improvements to the SBA within Zone 7's service area to increase capacity and improve reliability. The work included the construction of a new pump station (180 cfs, inline reservoir [500 AF]) and other improvements to increase the canal carrying capacity to 380 cfs. As part of this project, Zone 7 installed an emergency slide gate to maintain service upstream in the event of a pipeline rupture downstream. Zone 7 will continue coordinating with DWR and SBA Contractors to improve the reliability of the entire SBA system.

In addition, Zone 7 is pursuing the following projects to diversify its conveyance options:

- **Reliability Intertie** – Zone 7 is also planning to construct a reliability intertie with another major water agency that would provide an alternative means of conveying water to Zone 7's service area when the Delta and/or the SBA experience an outage. For example, an intertie with EBMUD could convey the treated water supply to the western portion of Zone 7's service area.
- **Chain of Lakes Pipeline** – This pipeline would allow for access to water stored in the Chain of Lakes as an alternative local water supply; water would be accessible to the Del Valle Water Treatment Plant (DVWTP) via one of the SBA turnouts.

Specific constraints for each of Zone 7's supplies are discussed below.

7.1.1.1.1 Imported Water: State Water Project

Two key constraints on imported water from the SWP are Delta conveyance and water quality. Each constraint is detailed below.

7.1.1.1.1.1 Delta Conveyance

Zone 7's long-term contract with DWR for SWP water provides Zone 7 access to Table A water (and Article 56c water or carryover), Article 21 water, Article 56d water, and Yuba Accord water. As an SWP contractor, Zone 7 is also able to use SWP facilities for conveying water transfers or exchanges of SWP water (from another contractor) or from another water agency outside of the SWP system. SWP water moves through the Delta before it is conveyed by the California Aqueduct and the SBA to Zone 7's water facilities.

The instability of the aging levees in the Delta (including their vulnerability to seismic events and climate change), regulatory uncertainty, water quality issues including saltwater intrusion, and the declining health of the Delta ecosystem all challenge the long-term reliability of the SWP and, more generally, the water conveyance capability of the Delta. These issues directly challenge the Tri-Valley's long-term water supply reliability, since a majority of Zone 7's water supply is and will continue to be tied to the Delta and SWP system.

In 2018, DWR published their Delta Flood Emergency Management Plan, which provides strategies for responding to Delta levee failures. This plan includes a strategy to establish an emergency freshwater pathway from the central Delta along the Middle River and Victoria Canal to the export pumps in the south Delta. The plan also includes the pre-positioning of emergency construction materials at existing and new stockpile and warehouse sites in the Delta. The plan has found that using pre-positioned stockpiles of rock, sheet pile and other materials, multiple earthquake-generated levee breaches and levee slumping along the freshwater pathway can be repaired in less than six months.

The DWR Delta Levees Subventions and Special Projects Programs have prioritized, funded, and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta. These efforts are complementary to the Delta Flood Emergency Management Plan, which, along with pre-positioned emergency flood-fighting materials, ensures the reasonable seismic performance of levees and timely pathway restoration after a severe earthquake.

Furthermore, Zone 7 and other SWP contractors are currently working with DWR and other key stakeholders to address the many complex issues undermining the Delta through the proposed DCP. The proposed new diversion structure in the northern Delta provides alternative intakes in case the Delta is affected by an earthquake, levee failure, or some other catastrophic event that impacts water quality and prevents pumping from the Delta. The DCP would also provide alternative intakes that could be used to minimize harm to endangered and threatened species in the Delta. DWR is working closely with regulatory and natural resource agencies to address regulatory uncertainty and protect the Delta ecosystem under an adaptive management framework based on the best available science. With these benefits, the DCP is expected to significantly alleviate constraints on SWP operation and provide more water supply reliability.

Zone 7 is also participating in the Los Vaqueros Reservoir Expansion project, which includes the construction of the Transfer-Bethany Pipeline. This pipeline would provide an alternative means of conveying water supply to Zone 7 when the Delta is inaccessible. More details can be found in Chapter 6 of Zone 7's 2020 UWMP.

7.1.1.1.1.2 Water Quality

There are water quality concerns associated with transport through the Delta. In 1982, DWR formed the Interagency Delta Health Aspects Monitoring Program to monitor water quality in the Delta and protect human health. The program was renamed the Municipal Water Quality Investigations Program in 1990. From a municipal water supply perspective, water quality issues in the Delta are associated with salinity from seawater intrusion, wastewater effluent discharges, agricultural drainage from the islands, and recreational activities. Water quality issues of specific concern to Zone 7 are:

- *Algal byproducts* – Parameters of concern include compounds that cause taste and odor (T&O) and algal toxins. T&O is primarily a problem in the warmer months when algal blooms may be present. It can affect supplies from the Delta and from Lake Del Valle (which stores SWP water). Algae produce geosmin and 2-methylisoborneol, which are key T&O-causing compounds in the surface water supply. Algal toxins derived from blue-green algae can also be a concern. Zone 7's new ozonation facilities (recently installed at the Del Valle WTP and scheduled for completion at the Patterson Pass WTP in 2022) effectively treat algal byproducts. Without ozonation, high levels of algal byproducts in both Delta and Lake Del Valle supplies may necessitate temporarily switching to groundwater supplies; blending of sources is also an option depending on the source of algal byproducts and severity.

- *Total and dissolved organic carbon (TOC/DOC)* – Zone 7 treats organic carbon with coagulant and disinfectant chemicals; therefore higher levels of organic carbon increase costs. In addition, TOC/DOC helps form disinfectant byproducts (DBPs), which are regulated compounds in drinking water. Historically, Zone 7's WTPs have managed high TOC/DOC by increasing coagulant dosages. However, this operational change results in greater sludge production and limits plant production. The use of ozone reduces coagulant and chlorine demands, resulting in reduced chlorination DBPs. However, the use of ozone forms ozonation DBPs, such as bromate. The formation of ozonation DBPs will need to be controlled.
- *Turbidity* – like TOC/DOC, turbidity affects the amount of chemicals used in treatment and Zone 7's ability to meet drinking water standards. It also can reduce the production capacities of Zone 7's WTPs, requiring increased groundwater production under high demands. Coagulant dosages can be adjusted to address high turbidity (which can happen after big storms), but if filters require more frequent backwashing, production may decrease.
- *Salinity or TDS* – salinity has significant impacts on SWP operations and the availability of water. To meet the salinity objectives in the Delta, water exports from the Delta may be restricted, reducing the amount of water supply available during certain times of the year. Salinity intrusion can be a problem during dry years, when there is insufficient freshwater to repel salinity. Sea level rise due to climate change is also expected to increase salinity in Delta. Finally, levee breaks—due to earthquakes and other factors—would result in significant saltwater intrusion from the Bay as water floods affected islands in the Delta that are below sea level.
- *Algal blooms* – in addition to T&O and the threat of algal toxins, algal blooms can significantly degrade filter performance through clogging. This reduces plant production capacities and could require supplemental groundwater use.

As noted above, Zone 7 will have state-of-the-art ozonation facilities at both of its WTPs in 2022, improving the treatment of T&O, TOC/DOC, turbidity, and algal blooms and significantly increasing the surface water system's reliability.

In 2008, the SBA contractors (ACWD, VW, and Zone 7) developed the SBA Watershed Protection Program to protect water quality once the water from the Delta reaches the SBA. The primary objectives of the SBA Watershed Protection Program include developing a Watershed Management Program for the SBA system, including Lake Del Valle and Bethany Reservoir, and protecting local drinking water and water resources from identified contaminant sources (e.g., septic tanks) for urban, agricultural, recreational, and environmental uses.

7.1.1.1.2 Arroyo Valle and Lake Del Valle

ACWD and Zone 7 both have water rights to divert water from the Arroyo Valle. This water is captured and stored in Lake Del Valle, which is owned and operated by DWR. Since Lake Del Valle is used for water supply storage, flood control, and recreation, access to water from the lake needs to be coordinated with the lake's other uses. Typically, DWR lowers the lake elevation each year after Labor Day for flood control purposes, allowing Zone 7 and ACWD to put runoff from the Arroyo Valle to beneficial use. In the summer months, lake elevations are raised for recreational purposes. Historically, access to Zone 7's stored water in Lake Del Valle has not been problematic, unless there is an outage on the Del Valle Branch pipeline. Zone 7 closely coordinates the use of Arroyo Valle water with both ACWD and DWR.

Water collected from the local watershed is protected under the SBA Watershed Protection Program Plan. In general, the water quality of Arroyo Valle runoff is good and does not affect the reliability of this water supply; however, as noted above, T&O can also affect supplies from Lake Del Valle. Zone 7 treats T&O using ozonation, although a switch to groundwater supplies is sometimes necessary under excessive levels of T&O compounds. Algal blooms in the lake can also reduce production capacities, though new ozonation facilities at the Del Valle WTP have significantly reduced the impact.

7.1.1.1.3 Chain of Lakes

The future Chain of Lakes will provide significant local storage, but uncertainty surrounds its complete transfer to Zone 7. Favorable economic conditions could extend gravel mining operations, and even after mining ceases, reclamation must occur. This could delay a full transition of the Chain of Lakes to Zone 7 to about 2060. Zone 7 continues to work closely with the mining companies and quarry operators so planning efforts can be coordinated.

With future completion of the Chain of Lakes Pipeline around 2025, Zone 7 can begin to use the available lakes to store imported or local surface water. This will also enhance groundwater recharge in the Main Basin.

7.1.1.1.4 Non-Local Storage

Access to banked water in Semitropic and Cawelo—both located downstream of Zone 7—requires exchange(s) with other SWP contractors located south of Kern County (e.g., Metropolitan Water District). There must be sufficient water flowing through the Delta and California Aqueduct system to facilitate these exchanges, which could be challenging during a drought. Furthermore, the banked water must be conveyed through the Delta, rendering this supply susceptible to the Delta disruptions described in Section 7.1.1.1.

During the recent drought, access to banked water became uncertain because of the historically low Table A allocation (leading to minimal amounts of water moving through the SWP) and the potential cessation of pumping in the Delta to control salinity intrusion. DWR was able to manage salinity so that Delta pumping could continue, and, with coordination among stakeholders including Zone 7, DWR prioritized the delivery of banked water to Zone 7 and other SBA contractors. Ultimately, even during the serious drought conditions in 2014 and the minimal 5 percent SWP allocation, Zone 7 was able to successfully recover almost 15,000 AF, or approximately 78 percent of the maximum recovery requested by Zone 7. In 2015, Zone 7 recovered approximately 18,000 AF from non-local storage.

Zone 7 will continue to coordinate closely with DWR, other SWP contractors, Semitropic, and Cawelo to ensure the future reliability of the banked water supplies.

Some of Semitropic's wells are affected by arsenic. This condition is currently being managed through treatment before the affected groundwater water is pumped into the California Aqueduct. Arsenic criteria have been established for this "pump-in" by the DWR Facilitation Group to mitigate any impacts to the downstream SWP contractors. Semitropic and the banking partners have developed a coordination process for discussing arsenic treatment. While the presence of arsenic in the Semitropic groundwater bank is likely to increase the cost of this water storage option, it is not likely to affect its overall reliability.

7.1.1.2 Groundwater

Chapter 6 of this plan details the issues affecting DSRSD and Zone 7's use of the Main Basin, specifically water quality management and prevention of overdraft.

Zone 7 is actively implementing its Salt and Nutrient Management Plan. Salinity levels are being addressed primarily through groundwater pumping and demineralization using the MGDP in the Mocho wellfield. The facility simultaneously allows for the export of concentrated minerals or salts from the Main Basin while improving the water quality of treated water.

Zone 7 has several groundwater wells with naturally-occurring Cr(VI) concentrations near the MCL and PFAS above the notification limit. In response, Zone 7 is actively managing flows from the affected wells. Conditions are regularly monitored, and management actions may change in the future. A PFAS treatment facility is under consideration for construction based on pending regulations.

Zone 7 continues to study the groundwater basin and develop new tools (e.g., an improved groundwater model) to better understand the levels of groundwater extraction possible under various conditions while maintaining levels above the historical levels that have been reached in certain portions of the Main Basin ("historic lows"). Zone 7 also plans to augment its ability to recharge the Main Basin (e.g., through the Chain of Lakes) to increase local storage and allow for more pumping when necessary, which will improve both water supply reliability and salt management. Zone 7 plans to build an additional demineralization facility to continue to decrease the salt content of the Main Basin.

Finally, Zone 7 plans to build additional wells to allow for improved management of groundwater levels and to increase groundwater production capacity during droughts and surface water-related outages. A new booster pump station will improve Zone 7's ability to convey groundwater throughout Zone 7's service area and increase production capacity.

7.1.1.3 Recycled Water

The recycled water that DSRSD distributes comes from DSRSD's RWTF, which is described in Section 6.2.5 (Wastewater and Recycled Water). Wastewater effluent from DSRSD's regional wastewater treatment plant is treated to produce Title 22 disinfected tertiary recycled water. DSRSD anticipates no significant changes to the land uses in DSRSD's wastewater service area; therefore, it does not anticipate any changes to the quality of the wastewater effluent that it treats to recycled water quality. DSRSD's water service area is over the Livermore-Amador Valley's fringe basin, which is not used for potable water supplies; thus, its recycled water distribution is not constrained by its impact on groundwater supplies. For all of these reasons, DSRSD does not expect recycled water quality issues to impact its ability to reliably deliver recycled water to its customers.

On March 25, 2019, DERWA found that it cannot meet the combined peak demands and projected demands of its member agencies (DSRSD and EBMUD) and its retailer, Pleasanton. DERWA approved Resolution No. 19-3 (Appendix I) requesting that its member agencies take action to reduce recycled water demands and implement a connection moratorium due to limited recycled water supply during the peak months. Under this resolution, DSRSD implemented a connection moratorium for new recycled water connections starting March 25, 2019.

7.1.2 Year Type Characterization

DSRSD's potable water supply reliability and vulnerability are directly related to seasonal and climatic shortages that impact Zone 7's water supplies. DSRSD's projected supply and demand for Normal Years, Single Dry Years, and Multiple Dry Years are quantified and discussed below.

7.1.2.1 Types of Years

The quantity available from different supply sources varies annually depending on hydrologic conditions. Consequently, Zone 7 reviewed historical data and developed a projected yield for each water supply source (including the Main Basin) under three conditions: (1) normal water year, (2) single dry year, and (3) five-consecutive-year drought. Under all scenarios, Zone 7 assumes that Delta conveyance is operational. Each condition is defined as follows:

- *Normal Water Year*: The year in the historical sequence most closely representing average runoff or allocation levels and patterns.
- *Single Dry Year*: The year in the historical sequence with the lowest annual runoff or allocation.
- *Five-Consecutive-Year Drought*: The driest five-year historical sequence.

Zone 7's water supply reliability is used to represent DSRSD's available supplies during the above hydrologic conditions. The projected yield of Zone 7's water sources under these three scenarios, as reported in detail in Zone 7's 2020 UWMP, are summarized below.

In its 2020 UWMP, Zone 7 provides a basis of the water year data table (DWR Table 7-1) for each of its water supply sources. For simplicity, this plan leaves DWR Table 7-1 blank and summarizes Zone 7's base year information and water supply availability in Table 7-2 and Table 7-3, respectively.

DWR Table 7-1 is not compatible with Zone 7's bases of water year data because different water sources have different base years and volumes. As referred to in Table 7-1, Zone 7's bases of water year data are shown in Tables 7-2 and 7-3.

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1 Retail)

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: Table 7-2 and 7-3
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.

Table 7-2. Basis of Water Year Data for Zone 7 Supplies

Water Source	Normal Year	Single Dry Year	Five-Year Drought				
			Year 1	Year 2	Year 3	Year 4	Year 5
SWP – Table A	1965	2014	1987	1988	1989	1990	1991
SWP – Carryover	1965	2014	1987	1988	1989	1990	1991
Water Transfers	1965	2014	1987	1988	1989	1990	1991
Arroyo Valle	1919	1977	1987	1988	1989	1990	1991
Sites Reservoir	1965	2014	1987	1988	1989	1990	1991
BARDP and/or Potable Reuse	1965	2014	1987	1988	1989	1990	1991
From Storage							
Main Basin	1965	2014	1987	1988	1989	1990	1991
Semitropic	1965	2014	1987	1988	1989	1990	1991
Cawelo	1965	2014	1987	1988	1989	1990	1991
Chain of Lakes	1965	2014	1987	1988	1989	1990	1991

Source: Zone 7 2020 UWMP, Table 7-1 through Table 7-9

Table 7-3. Zone 7's Water Supply Volume Available[a]

Water Source	Normal Year	Single Dry Year	Five-Year Drought				
			Year 1	Year 2	Year 3	Year 4	Year 5
SWP – Table A[b]	43,500	4,000	16,900	8,100	54,000	10,500	16,100
SWP – Carryover[c]	10,000	15,500	15,500	2,800	1,800	1,800	1,800
Water Transfers[d]	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Arroyo Valle	5,500	0	1,700	1,500	1,500	1,500	1,500
Sites Reservoir[e]	10,000	15,300	16,800	17,700	16,300	15,900	15,800
BARDP and/or Potable Reuse[f]	5,000	5,000	5,000	5,000	5,000	5,000	5,000
From Storage							
Main Basin[g]	29,200	27,600	27,600	25,100	20,600	15,100	9,700
Semitropic[h]	13,000	6,500	10,000	10,000	10,000	10,100	10,100
Cawelo[h]	9,700	7,100	9,700	9,700	9,700	9,700	9,700
Chain of Lakes[i]	10,100	8,300	8,800	7,900	6,900	6,000	5,200
Total	**141,000**	**94,300**	**117,000**	**92,800**	**130,800**	**80,600**	**79,900**
Percent of Normal	**100%**	**66.9%**	**83.0%**	**65.8%**	**92.8%**	**57.2%**	**56.7%**

Source: Zone 7 2020 UWMP, Table 7-1 through Table 7-9

(a) Volumes are shown in AFY.
(b) Based on 2040 future SWP reliability Table A allocations.
(c) Zone 7's operational target is typically 10,000 AFY for normal years.
(d) Zone 7 is pursuing water transfer agreements for the period through 2030. Amounts may vary from year-to-year, but variability has not been quantified.
(e) Supplies from Sites Reservoir are assumed to be available by 2030.
(f) Supplies from these sources are assumed to be available by 2030.
(g) These are estimated available supplies, not necessarily what would be pumped. Zone 7's typical operational target is around 9,200 AFY for normal years.
(h) Semitropic and Cawelo available supplies are typically not used during normal years.
(i) The Chain of Lakes Pipeline, which provides access to water stored in the Chain of Lakes, is assumed to be completed around 2025. Water stored in the Chain of Lakes is assumed to be available by 2030 and would not be used during normal years.

7.1.3 Water Service Reliability

This section presents comparisons of projected water supplies and demands from 2025 through 2045 under the following hydrologic conditions: normal year, single dry year, and five consecutive dry years. DSRSD's projected demands are presented in Chapter 4, while supply sources are described in Chapter 6. Unless otherwise noted, it is assumed demand projections will not change with hydrologic conditions. In other words, demands are assumed to be unconstrained unless they are limited by available supplies.

7.1.3.1 Water Service Reliability – Normal Year

DSRSD's normal year supplies include:

- Purchased supplies from Zone 7
- Between 2,500 and 3,000 AFY of recycled water

Table 7-4 shows that in normal years, DSRSD's supplies are adequate to meet projected demands.

Table 7-4. Normal Year Supply and Demand Comparison (DWR Table 7-2 Retail)

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	15,037	16,407	16,851	16,864	17,078
Demand totals *(autofill from Table 4-3)*	15,037	16,407	16,851	16,864	17,078
Difference	0	0	0	0	0
NOTES: Units of measure is AF.					

7.1.3.2 Water Service Reliability – Single Dry Year

In Chapter 7 of its 2020 UWMP, Zone 7 has indicated it can meet retailer demands during single dry years through 2045. Therefore, Zone 7 supplies to DSRSD are assumed to equal DSRSD's projected potable water demands. Recycled water supply is assumed to be unaffected by the dry condition. Table 7-5 shows that DSRSD's supplies are adequate to meet projected demands during single dry years.

Table 7-5. Single Dry Year Supply and Demand Comparison (DWR Table 7-3 Retail)

	2025	2030	2035	2040	2045 (Opt)
Supplies					
Zone 7	11,993	13,363	13,807	13,820	14,034
Recycled Water	3,044	3,044	3,044	3,044	3,044
Supply totals*	15,037	16,407	16,851	16,864	17,078
Demands					
Portable Water	11,993	13,363	13,807	13,820	14,034
Recycled Water	3,044	3,044	3,044	3,044	3,044
Demand totals*	15,037	16,407	16,851	16,864	17,078
Difference	0	0	0	0	0
NOTES: Units of measure is AF.					

7.1.3.3 Water Service Reliability – Five Consecutive Dry Years

In Chapter 7 of its 2020 UWMP, Zone 7 has indicated it can meet retailer demands during five-year droughts beginning in 2025, 2030, 2035, 2040, and 2045. Therefore, Zone 7 supplies to DSRSD are assumed to equal DSRSD's projected potable water demands. Recycled water supplies are also assumed to be unaffected by dry conditions.

Table 7-6 shows that DSRSD's supplies are adequate to meet projected demands during five-year droughts through the planning period. For interim years (e.g., 2021-2024, 2026-2029), potable and recycled water demands are linearly interpolated between the values shown in Table 7-5.

Table 7-6. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4 Retail)

		2025	2030	2035	2040	2045 (Opt)
First year	Supply totals	15,037	16,407	16,851	16,864	17,078
	Demand totals	15,037	16,407	16,851	16,864	17,078
	Difference	0	0	0	0	0
Second year	Supply totals	15,311	16,496	16,854	16,907	17,078
	Demand totals	15,311	16,496	16,854	16,907	17,078
	Difference	0	0	0	0	0
Third year	Supply totals	15,585	16,585	16,856	16,950	17,078
	Demand totals	15,585	16,585	16,856	16,950	17,078
	Difference	0	0	0	0	0
Fourth year	Supply totals	15,859	16,673	16,859	16,992	17,078
	Demand totals	15,859	16,673	16,859	16,992	17,078
	Difference	0	0	0	0	0
Fifth year	Supply totals	16,133	16,762	16,862	17,035	17,078
	Demand totals	16,133	16,762	16,862	17,035	17,078
	Difference	0	0	0	0	0
NOTES: Units of measure is AF.						

7.2 WATER MANAGEMENT TOOLS AND OPTIONS

DSRSD and Zone 7 coordinate on regional efforts to improve long-term water supply reliability and reduce reliance on imported water.

7.2.1 Zone 7 Water Management Options

Zone 7 is evaluating new supply options (including potable reuse and brackish water desalination) and optimizing and expanding local storage. Zone 7 is a member of the Bay Area Regional Reliability (BARR) partnership, which brings together eight Bay Area water agencies to improve regional water supply reliability. Besides Zone 7, these agencies include ACWD, SFPUC, the Bay Area Water Supply and Conservation Agency (BAWSCA), CCWD, EBMUD, Marin Municipal Water District (MMWD), and VW. The BARR partners have agreed to work cooperatively to address water supply reliability concerns and drought preparedness on a mutually beneficial and regionally focused basis. Near- and long-term joint water supply reliability projects may be evaluated through BARR, such as use of the capacity of existing facilities, changes to infrastructure (including new interties, recycled water, water conservation, expanded treatment, regional desalination, and water transfers and exchanges), and other projects or institutional arrangements that encourage a regional approach to achieving water supply reliability in the Bay Area.

As part of its existing CIP, Zone 7 is planning to construct a reliability intertie with another major water agency (e.g., EBMUD or SFPUC) to help mitigate some of the risk during a major water supply interruption from the Delta and to create opportunities for transfers/exchanges. This intertie could allow Zone 7 to acquire emergency water supplies to help meet minimum health and safety water supply needs during a major Delta outage, assuming the partnering agency has available supply and the transmission capacity available during the emergency period. A conceptual 24- to 30-inch diameter intertie with EBMUD could connect to the west side of Zone 7's transmission system and convey up to 10 to 15 MGD of supply. Additional wells would also increase access to local groundwater and improve its management, while a new booster pump station would improve conveyance of groundwater across the Tri-Valley. The new Chain of Lakes Pipeline would allow for access to water stored locally in the Chain of Lakes.

7.2.2 DSRSD 2021 Alternative Water Supply Study

DSRSD completed an Alternative Water Supply Study in June 2021 that provides a framework for building a resilient and sustainable water future for DSRSD customers. As discussed in Section 6.2.8.2, the results of this study identified potential near-term actions that DSRSD could implement that would be complementary to Zone 7's water management options.

7.3 DROUGHT RISK ASSESSMENT

In accordance with CWC Section 10612, urban water suppliers must conduct a DRA, which evaluates the risk of a severe drought occurring for the next five consecutive years (2021-2025). Supply conditions for the DRA are based on the five driest consecutive years on record, with adjustments to consider plausible changes in climate, regulations, and other locally applicable criteria.

This section reviews the data and methods used to define the DRA water shortage condition and evaluates each water source's reliability under the proposed drought condition. Finally, total water supplies during the five-year drought are compared to projected demands, accounting for any applicable supply augmentation or demand reduction measures available to DSRSD.

7.3.1 Data, Methods, and Basis for Water Shortage Condition

The water shortage condition for the DRA is the same as the five-year drought presented in Section 7.1.2.1. Since the DRA can be updated outside of the five-year UWMP cycle, a summary of the data and basis for the water shortage condition is provided in this section.

As presented in Chapter 7 of Zone 7's 2020 UWMP, the DRA assumes 5, 11, 60, 13, and 25 percent Table A allocations for 2021-2025, respectively. Data for 2021 reflect current projected available supplies, while the last four years reflect the last four years of the multiple-dry year scenario previously discussed. Zone 7's supply projections are based on existing facilities and the expected availability of supplies from various sources given the constraints previously described.

DSRSD projected demands between 2021 and 2025 are as presented in Section 4.2.3.2.

7.3.2 DRA Water Source Reliability

Table 7-7 summarizes Zone 7's available supplies for each year of the DRA. For the DRA, recycled water supplies are assumed to be sufficient to meet recycled water demands.

Table 7-7. Projected Zone 7 Supplies for Drought Risk Assessment

Supply Source	Available Supply, AFY				
	2021	2022	2023	2024	2025
SWP Table A[(a)]	4,000	8,900	48,400	10,500	20,200
SWP Carryover	8,900	10,300	9,600	12,800	9,900
Water Transfers[(b)]	10,000	6,000	5,000	6,000	8,000
Arroyo Valle[(c)]	700	700	6,900	6,900	2,700
Main Basin	13,200	13,200	11,000	10,000	11,000
Semitropic	9,100	9,100	0	9,100	9,100
Cawelo	10,000	10,000	0	5,000	1,900
Total	**55,900**	**58,200**	**80,900**	**60,300**	**62,800**

(a) Assumes 5, 11, 60, 13, and 25 percent Table A allocations from 2021 through 2025, respectively. 2021 reflects current projected available supplies, while 2022 through 2025 reflect the last four years of a multiple-dry year scenario.
(b) Includes Yuba Accord transfers.
(c) Includes carryover and current year's yield.

7.3.3 Total Water Supply and Use Comparison

In Chapter 7 of its 2020 UWMP, Zone 7 has indicated it can meet retailer demands during a five-year drought beginning in 2021. Therefore, Zone 7 supplies are assumed to equal DSRSD's projected potable water demands. Recycled water demands remain constant from actual 2020 use and to projected demands for 2025 due to moratorium on new connections.

As shown in Table 7-8, during a five-year drought beginning in 2021, DSRSD's supplies are adequate to meet projected demands through 2025, even without water conservation assuming no Delta conveyance outage. However, DSRSD may still prioritize water conservation under such drought conditions to reduce demand and conserve supply for potentially future dry years.

Table 7-8. Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) (DWR Table 7-5)

2021	Total
Total Water Use	13,707
Total Supplies	13,707
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	14,039
Total Supplies	14,039
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	14,372
Total Supplies	14,372
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%

2024	Total
Total Water Use	14,704
Total Supplies	14,704
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%

2025	Total
Total Water Use	15,037
Total Supplies	15,037
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%
NOTES: Units of measure is AF.	

CHAPTER 8
Water Shortage Contingency Plan

This chapter summarizes DSRSD's Water Shortage Contingency Plan (WSCP), seismic risk to DSRSD facilities, and WSCP adoption procedures. To allow for WSCP updates to be made outside of the UWMP preparation process, DSRSD's WSCP is included in this plan as Appendix M.

8.1 WATER SHORTAGE CONTINGENCY PLANNING BACKGROUND

Water shortages occur whenever the available water supply cannot meet the normally expected customer water use due to several reasons, including population growth, climate change, drought, and catastrophic events. Drought, regulatory actions, and natural and manmade disasters may occur at any time. DSRSD's WSCP outlines its strategic urban water supplier plans to respond to a water shortage condition and helps prevent catastrophic service disruptions.

The 2018 Water Conservation Legislation set new requirements for water shortage contingency planning; DSRSD's WSCP has been updated to be consistent with these requirements.

8.2 DSRSD WATER SHORTAGE CONTINGENCY PLAN

DSRSD's WSCP includes water shortage stages and associated shortage response actions, as well as DSRSD's legal authorities, communication protocols, compliance and enforcement, and monitoring and reporting.

DSRSD's WSCP is included in this plan as Appendix M to allow for updates outside of the UWMP preparation process. DSRSD intends for its WSCP to be dynamic, so that it may assess response action effectiveness and adapt to foreseeable and unforeseeable events. When an update to the WSCP is proposed, the revised WSCP will undergo the process described in Section 8.4.

8.3 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC §10632.5(a) requires that UWMPs include a seismic risk assessment and mitigation plan to assess and mitigate a water system's seismic vulnerabilities. In coordination with Pleasanton, Livermore and Dublin, DSRSD developed a regional LHMP, which, among other hazards, addresses seismic risks. The *2018 Tri-Valley Local Hazard Mitigation Plan* (2018 LHMP) was adopted by Livermore, Dublin, Pleasanton and DSRSD during the summer of 2018. The Federal Emergency Management Agency (FEMA) found the 2018 LHMP in conformance with Title 44 Code of Federal Regulations Part 201.6 Local Mitigation Plans. The 2018 LHMP is available on DSRSD's website[24], and is incorporated into this UWMP by reference. The 2018 LHMP is also available on each of the collaborating city's websites:

- Dublin (dublin.ca.gov) – under the "Government" menu, click on the "Disaster Preparedness" department. Links to the 2018 LHMP is provided under "Additional Resources."
- Livermore: (www.cityoflivermore.net) – under the "City Government" menu, hover over "LPFD Home" and then "About Our Department." Click on "Disaster Preparedness," and then click on "City Preparation" under the navigation menu.

[24] Tetra Tech, 2018. *Tri-Valley Local Hazard Mitigation Plan*. https://www.dsrsd.com/about-us/library/plans-studies

- Pleasanton (www.cityofpleasantonca.gov) – under the "Government" menu, click on the "Community Development" department. On the "Community Development" page, click the "Planning Division" link. Under the navigation menu, hover over "Plans & Programs" and click on "Tri-Valley Hazard Mitigation Plan."

Earthquakes are common, relatively well-tracked, and studied in California. While California experiences hundreds of earthquakes each year, most are below 3.0 on the Richter Scale (i.e., magnitude 3.0) and cause minimal damage. The United States Geological Survey (USGS) roughly defines strong earthquakes (which can cause moderate damage to structures) as measuring greater than 5.0 on the Richter Scale, while major earthquakes measure more than 7.0 on the Richter Scale. In California, strong earthquakes occur every two to three years, and major earthquakes occur once a decade.

The Calaveras, Greenville, Hayward, and Mt. Diablo faults are in the vicinity of the Tri-Valley region. A 2016 report[25] by the USGS estimated the probabilities for magnitude-6.7 (or larger) earthquakes on major fault lines in the San Francisco Bay Area by 2043. The Hayward Fault has a 33 percent chance of one or more earthquakes of magnitude-6.7 or larger by 2043, while the Calaveras Fault has a 26 percent chance of one or more such earthquakes in that timeframe. The Greenville and Mt. Diablo faults each have a 16 percent chance of one or more earthquakes of magnitude-6.7 or larger by 2043.

The 2018 LHMP evaluated the impact of earthquakes on critical facilities and infrastructure using a Hazus analysis. Results for utilities infrastructure (including water system facilities) are presented in terms of level of damage and time to return to functionality. There are five damage levels (no damage, slight damage, moderate damage, extensive damage, and complete damage) and six time increments (1, 3, 7, 14, 30, and 90 days). Results are categorized by earthquake location; there are separate scenarios for earthquakes on each of the Calaveras, Greenville, Hayward, Mt. Diablo, and San Andreas faults.

According to the 2018 LHMP, earthquakes on the Hayward and Calaveras faults would be most significant. In its earthquake analysis, the 2018 LHMP identified 120 critical utility facilities (i.e., providing water, electricity, and communications service) in the Tri-Valley region. Over 80 percent of critical utility facilities would experience at least moderate damage for an earthquake on the Hayward Fault, while approximately 44 percent would be at least moderately damaged by a Calaveras Fault earthquake. For earthquakes on the other faults analyzed (Greenville, Mt. Diablo, San Andreas), this number is below 15 percent. Seven days after an earthquake on the Hayward Fault, a critical utility facility has an approximately 52 percent chance of being fully functional. This increases to approximately 84 percent for an earthquake on the Calaveras Fault and above 92 percent for earthquakes on the Greenville, Mt. Diablo, and San Andreas faults.[26]

Table 18-3 of the 2018 LHMP summarizes alternatives for mitigating the earthquake hazard on personal, corporate, and government scales. Mitigation options potentially applicable to DSRSD include the following:

- Locate critical facilities outside hazard area where possible
- Harden infrastructure
- Provide redundancy for critical functions

[25] U.S. Geological Survey (USGS), 2016. *Earthquake Outlook for the San Francisco Bay Region 2014-2043*. https://pubs.usgs.gov/fs/2016/3020/fs20163020.pdf

[26] TetraTech, *2018 Tri-Valley Local Hazard Mitigation Plan*, Section 8.5.3, Tables 8-15 to 8-24.

- Include retrofitting and replacement of critical system elements in capital improvement plan
- Warehouse critical infrastructure components such as pipe materials
- Develop and adopt a continuity of operations plan

DSRSD's has implemented efforts in addressing its facilities' seismic vulnerabilities. In accordance with America's Water Infrastructure Act (AWIA), DSRSD completed a Risk and Resilience Assessment (RRA) of its water system in December 2020. The RRA systematically evaluated DSRSD's assets, threats, and risks, as well as countermeasures that might be implemented to minimize overall risk to the system. To ensure the security of DSRSD's water system, the RRA is retained by DSRSD as a confidential document.

8.4 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

DSRSD's WSCP (Appendix M) was adopted concurrently with DSRSD's 2020 UWMP, by separate resolution. A copy of the resolution is included in Appendix P. Prior to adoption, a duly noticed public hearing was conducted. A hard copy of the WSCP will be submitted to DWR within 30 days of adoption, along with an electronic copy.

No later than 30 days after adoption, copies of the WSCP will be available at DSRSD's offices. Copies will also be provided to Alameda County and Contra Costa County. An electronic copy of the WSCP will also be available for public review and download on DSRSD's website.

DSRSD's WSCP is an adaptive management plan. It is subject to refinements as needed to ensure that DSRSD's shortage response actions and mitigation strategies are effective and produce the desired results. When a revised WSCP is proposed, the revised WSCP will undergo the process described in this section for adoption by DSRSD Board of Directors and distribution to Alameda County, Contra Costa County, its customers, and the general public.

CHAPTER 9
Demand Management Measures

DSRSD implements demand management measures to sustainably manage its water resources. The implementation of demand management measures help improve DSRSD's water service reliability and help meet DSRSD and State water conservation goals. This chapter describes DSRSD's historical and existing water conservation program, status of implementation of Demand Management Measures (DMMs), and projected future implementation of water conservation measures.

9.1 WATER CONSERVATION PROGRAM OVERVIEW

DSRSD has long been committed to reducing the demand for potable water through conservation and have implemented a recycled water program since the 2000's to offset potable water demands. DSRSD has continued to be a leader in developing and promoting water conservation programs and DSRSD's customers have responded positively. In this chapter, narrative descriptions addressing the nature and extent of each DMM implemented over the past five years, from 2016 through 2020, are provided. Planned or continued implementation of each of the DMMs are also discussed.

DSRSD's SB X7-7 per capita water use target for 2020 was confirmed to be 169 GPCD in its 2015 UWMP. The DMMs that DSRSD has implemented have allowed it to exceed its target. As shown in Chapter 5, DSRSD's overall per capita water use in 2020 was 110 GPCD.

9.2 EXISTING DEMAND MANAGEMENT MEASURES

DSRSD is required to provide a description of the DMM's associated with the following:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support

DSRSD is also required to describe any other DMMs it has implemented that have had significant impact on water use.

This section describes existing water conservation programs and those planned to be implemented in the future. For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and future implementation plans.

DSRSD anticipates continuing and expanding its water conservation program to meet new legislative and upcoming regulatory requirements that may require water efficiency objectives less than the SB X7-7 target.

9.2.1 Water Waste Prevention Ordinances

9.2.1.1 DMM Description

In June 1991, DSRSD instituted Ordinance No. 242 to prevent water waste by establishing regulations and restrictions on the delivery and consumption of water, and penalties for violations. Since that time, DSRSD's ordinances regarding water waste prevention and conservation have been updated. DSRSD's latest update, Ordinance No. 323 (June 2009), established an updated water conservation program and a program for management of its water supplies during any water shortage condition declared by DSRSD's Board of Directors, and established regulations and restrictions on the delivery and consumption of water and penalties for ordinance violations during a declared water shortage condition. A copy of Ordinance No. 329 is provided in Appendix N.

Further, District Code §4.10.030.G provides regulation for water usage and prohibits waste of water.

9.2.1.2 Implementation over the Past Five Years to Achieve Water Use Targets

The drought that commenced in 2012 prevailed into 2016, and DSRSD was under a State of Community Drought Emergency declaration. In March 2016, DSRSD's Board of Directors adopted Ordinance No. 338 (Appendix N) to authorize water use limitations to curtail system-wide water use in DSRSD by 12 percent in conformance with State mandated water conservation requirements. Ordinance No. 338 remained in effect until the State of Community Drought Emergency declaration ended. In June 2016, DSRSD Board of Directors rescinded mandatory limits on water use terminated the State of Community Drought Emergency that had been in effect since February 2014. DSRSD remained cautious about the future of the water supply condition and maintained Stage 1 Water Supply Shortage Rates, and adopted a 10 percent voluntary conservation goal. DSRSD Board rescinded Stage 1 Water Shortage rates and 10 percent voluntary conservation on June 1, 2017. Standard water consumption rates under normal conditions has since remained in effect. Outside of the State Community Drought Emergency declaration, Ordinance No. 323 and District Code §4.10.030.G remained in full effect.

9.2.1.3 Plans for Continued Implementation

Ordinance No. 323 remains in effect, and its provisions support DSRSD's water conservation program. This DMM is on-going and expected to help DSRSD achieve its water use targets by minimizing the nonessential uses of water so that water is available to be used for human consumption, sanitation, and fire protection.

9.2.2 Metering

9.2.2.1 DMM Description

All connections within DSRSD are metered and all customer sectors are billed based on metered consumption. When DSRSD declares a water shortage, potable water rates increase for all customers in stages to encourage water conservation and recover the revenue needed to operate the water system with declining water sales. For additional information on DSRSD's water rate structure, see Section 9.2.3 Conservation Pricing below.

In 2014, DSRSD implemented an advanced metering infrastructure (AMI) system, including a new customer portal on its website called AquaHawk Alerting. AquaHawk is a free service that enables customers to view their hourly consumption data in near real-time and set their own leak alerts and water consumption thresholds. The system also analyzes a customer's water consumption and provides monthly

comparisons from the previous year. If usage indicates a water leak or other issue, the customer is notified, allowing them to take timely actions in managing their water consumption.

9.2.2.2 Implementation over the Past Five Years to Achieve Water Use Targets

More than 67 percent of DSRSD's water customers subscribe to AquaHawk, where they can monitor their real-time use and adjust their notifications accordingly. AquaHawk sends notifications through text or email to registered customers when high consumption alerts are triggered and sends notices through mail to non-registered customers. DSRSD continuously works with its customers to address abnormal water use patterns, which usually indicate leaks or broken valves.

9.2.2.3 Plans for Continued Implementation

DSRSD continues implementing this DMM which is expected to help achieve its water use targets by providing accurate water use information to the customer and DSRSD. It also provides a means for customers to assess and address wasteful water use in a timely manner.

9.2.3 Conservation Pricing

9.2.3.1 DMM Description

DSRSD has practiced conservation pricing since 1992. As discussed above, all potable water customer sectors are billed for water service based on a volumetric charge from both DSRSD and Zone 7, in addition to the fixed meter charge and a power charge as applicable. Consequently, water usage reductions directly reduce the cost to the metered customer, while excessive water use results in increased costs. In addition, DSRSD has an established drought rate pricing for its potable water users to maintain sufficient operating revenues while consumption declines due to mandated conservation. DSRSD updates its water rates annually.

DSRSD also established a volumetric charge for its recycled water users. Because Zone 7 volumetric charges do not apply, recycled water use rates are lower than potable water rates. In 2020, the recycled water rates were approximately fifteen percent less than the potable water irrigation rate[27].

9.2.3.2 Implementation over the Past Five Years to Achieve Water Use Targets

DSRSD adopted multi-year water rates on October 17, 2018. DSRSD's current water rates are available on its website[28]. The consumption charges increase with the declared water shortage stage. Normal rates are in effect when no water shortage has been declared. When DSRSD declares a water shortage emergency, consumption charges increase in accordance with the water shortage stage determined by the Board.

Wastewater service for single-family residences is based on an annual rate (billed annually with property taxes) and multi-unit dwellings are based on a bimonthly rate per dwelling unit (billed bimonthly with water service charges). Commercial (businesses) and institutional customers are billed for wastewater service on a uniform rate structure based on business type and units of water usage, which further

[27] 2020 potable irrigation rate was $5.51 ($3.85 per unit for Zone 7 Cost of Water plus $1.66 per unit for potable irrigation). Recycled water irrigation rate was $4.38 per unit.

[28] https://www.dsrsd.com/your-account/rates-fees/water-rates

promotes water conservation by these customers. DSRSD's current wastewater rates and charges are also available on its website, www.dsrsd.com.

DSRSD evaluates the effectiveness of conservation rates by tracking changes in unit water use resulting from rate increases.

9.2.3.3 Plans for Continued Implementation

DSRSD plans to continue implementing this DMM to achieve its water use targets by ensuring water customers pay the true cost of water and to adequately fund water system operations and maintenance, including repair and replacement programs, and water conservation programs.

9.2.4 Public Education and Outreach

9.2.4.1 DMM Description

In promoting water conservation, DSRSD seeks to foster sustainable changes in behavior, not just temporary responses to drought. An annual outreach plan identifies key messages pertaining to wise water use and the value of recycled water in conserving potable water. The plan specifies strategies designed to reach residential, commercial, industrial and institutional (CII), and media audiences. Examples of public education and outreach materials are included in Appendix O.

9.2.4.2 Implementation over the Past Five Years to Achieve Water Use Targets

Bimonthly bills provide historical data on consumption for customer review. Bill inserts and customer newsletters often feature water conservation topics and encourage customers to visit DSRSD's website for information on current conditions and progress toward conservation goals (the latter is updated on the first of each month). The web site also features information about rebates, free water-saving devices, tips for efficient water use, instructions for optimizing irrigation, and an interactive landscape planning tool, *Water-Wise Gardening in the Tri-Valley*.

As discussed in Section 9.2.2, DSRSD maintains a webpage that encourages customers to sign up and participate in the AquaHawk Customer Portal. Participation in AquaHawk allows customers to make informed decisions in managing their water consumption.

9.2.4.2.1 Online Resources

DSRSD's website offers a water conservation section with information on gardening and irrigation, rebates for water-saving programs and devices, tips for using less water, how to check for leaks, and links to outside resources (including the Tri-Valley Water-Wise website).

DSRSD uses the social media platforms of Nextdoor, Facebook, and Twitter to reach the public with education efforts related to wise water use. The website and social media platforms also serve as a place to share profiles of DSRSD staff to help encourage others to pursue careers in water and wastewater.

9.2.4.2.2 Educational Efforts

In 2018, DSRSD started the Citizens Water Academy, a program offered to the community and open to DSRSD's water and wastewater customers. The goals of the program are as follows:

- understand the critical issues on water supply and water quality;
- engage with experts and other citizens who care about water;
- equip residences to lead the discussion as our community builds a more resilient water supply, adapts to a changing environment, and invests in vital infrastructure; and
- learn what it's like to serve on DSRSD's Board of Directors.

DSRSD holds a biennial Citizens Water Academy, a multi-session course (held virtually during the COVID-19 pandemic in 2020) focusing on the community's water, wastewater, and recycled water. Customers are encouraged to participate in this free program. The Citizen Water Academy also provides information about serving on the Board of Directors. Since the commencement of the program, an annual average of 20 customers participated in the Citizens Water Academy.

DSRSD coordinates with water wholesaler Zone 7 Water Agency to offer a water-wise gardening workshop each year where attendees can hear from experts in the field about gardening with drought-tolerant plants, converting lawns to native gardens, and irrigation tips.

Staff also hold quarterly tours of the Regional Wastewater Treatment Facility, which includes the Jeffrey G. Hansen Water Recycling Plant. Tour participants learn how treated wastewater is further processed to become recycled water used for irrigation in community parks, school grounds, roadway medians, and golf courses. During the pandemic, in-person tours were put on hold, with DSRSD offering short video tours via YouTube.

DSRSD's website has free lesson plans for grades K-6, which include *The Amazing Watershed* for third grade and *Every Drop Counts* for fifth-grade. DSRSD also distributes a *Give Water a Second Chance…Recycled It* activity booklet to fifth grade classrooms. In addition, Zone 7 does classroom programs in DSRSD's service area covering subjects such as *Creek and Stream Environments* for second grade and *The Wonder Down Under*, a groundwater lesson for middle schools.

DSRSD also sponsors Excellence in Water Research Awards at the Alameda County and Contra Costa County Science and Engineering fairs, which awards monetary prizes to middle and high school students with winning projects in water and wastewater research.

DSRSD participates in the Bay Area Consortium of Water and Wastewater Education in an effort to train new skilled workers for water and wastewater utilities. Sponsoring agencies cover students' tuition and books and provide working professionals as instructors.

DSRSD Staff Participation

Employees, both new and long-term, are included in outreach programs. DSRSD holds Employee Academies for staff from all departments to learn more about reliable water supply, wastewater treatment, recycled water, and water distribution.

Media Outreach

DSRSD extends key conservation messages through contact with the media (news releases, proactive contact with reporters) and opinion leaders (via DSRSD today and Why it Matters social media posts). Staff meets regularly with DSRSD's wholesale supplier and neighboring retailers to coordinate regional outreach efforts regarding wise water use.

Industry Groups

DSRSD staff actively participate in various industry groups to advance water conservation efforts.

Staff serve on the Bay Area Clean Water Agencies (BACWA), Recycled Water Committee, which is responsible for promoting and developing water recycling for environmental protection and improving water supply reliability for communities in this region.

Staff also serves on committees for industry groups, including the California Association of Sanitation Agencies (CASA) Communication Committee, California Water Efficiency Partnership (CalWEP), Association of California Water Agencies (ACWA), and WaterReuse Communications Committee.

9.2.4.3 Plans for Continued Implementation

DSRSD conducts public outreach to encourage water conservation and wise water use year-round. This public outreach helps educate water users about the importance of improving water use efficiency and avoiding water waste.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

9.2.5.1 DMM Description

DSRSD conducts a continuous water audit and maintains a Water Loss Program to minimize water loss in DSRSD's water distribution system. The Water Loss Program includes leak detection and water meter replacement.

A water audit is a process of accounting for water use throughout a water system in order to quantify the unaccounted-for water. Unaccounted-for water is the difference between metered production and metered consumption on a system-wide basis. DSRSD completed its first water system audit in 1994 and has implemented ongoing water audits since 2005. DSRSD engineering staff calculates and tracks unaccounted-for water on a monthly basis by comparing total potable water purchases with potable water sales. DSRSD uses the standard water audit technique developed by the AWWA to identify real losses and apparent losses in DSRSD's potable water system.

DSRSD's leak detection program typically consists of both visual inspection as well as audible inspection. Visual inspection includes the inspection of distribution system appurtenances (e.g., fire hydrants, valves, meters, etc.) to identify obvious signs of leakage. To perform audible leak detection, specialized electronic listening equipment is used to detect the sounds associated with distribution system leakage. This process allows the agency to pinpoint the location of suspected leaks. Water losses associated with pipeline leaks accounted for only 0.5 percent of total water use in the system. Since 1994, annual water losses due to leaks, have on average, been less than one percent of the annual water use.

9.2.5.2 Implementation over the Past Five Years to Achieve Water Use Targets

DSRSD's water meter replacement program was implemented to ensure that its meters read accurately. Meter replacement is an ongoing process where DSRSD tracks the cumulative throughput of water through the meters and the age of the meters. DSRSD replaces approximately 234 meters per year due to meter failure or meters reaching their operational limit. DSRSD monitors the effectiveness of its meter replacement program by tracking the number of meters replaced per year.

Between 2016 and 2020, 1,170 water meters were replaced under DSRSD's meter replacement program. During this period, DSRSD's average annual water loss is 6.9 percent. This percentage has remained steady from previous years (6.9 percent in 2015) and is relatively low compared to other water utilities.

9.2.5.3 Plans for Continued Implementation

DSRSD plans to continue performing water system audits, the accounting of water losses vs. system input, and leak detection programs. The water system audit, leak detection activities, and meter replacements will be performed on an on-going, year-round basis. DSRSD tracks the effectiveness of this program based on minimizing water loss throughout the system.

DSRSD plans to explore the acoustic leak detection devices for the system-wide program to identify sources of water loss so repairs can be made promptly, and losses are minimized.

9.2.6 Water Conservation Program Coordination and Staffing Support

9.2.6.1 DMM Description

DSRSD has a full-time Water Conservation Coordinator[29]. Staff in several divisions within DSRSD, including Planning, Public Information, and Customer Services, work collaboratively to coordinate and implement DSRSD's DMMs. DSRSD's Water Conservation Coordinator obtains periodic updates from each stakeholder in order to monitor DMM implementation.

Together, the staff from the Tri-Valley water agencies, Zone 7, DSRSD, Pleasanton, California Water Company, and Livermore, form the Tri-Valley Water Conservation Coordination Committee. The committee aims to coordinate conservation rebate programs, outreach efforts, and deliberate future conservation projects. Collaborating with other agencies enables DSRSD to reach a broader audience. Consistent messages and coordinated outreach are essential when handling larger-scale issues such as drought and water reliability.

DSRSD coordinates with Zone 7 to implement wholesale agency water conservation assistance programs. DSRSD, along with the other retailers in the Tri-Valley, work closely with Zone 7 in developing water demand projections and understanding water supply availability and reliability. DSRSD also participates and supports Zone 7's rebate programs discussed in Section 9.2.7.

Further, DSRSD partners with the EBMUD to provide recycled water for irrigation and other non-potable uses for the Cities of Dublin and San Ramon, with the City of Pleasanton as a customer. DSRSD and EBMUD coordinate to operate the San Ramon Valley Recycled Water Program.

[29] The water conservation coordinator at DSRSD is also referred as the Clean Water Program Administrator.

DSRSD evaluates the effectiveness of this program by developing and maintaining effective working relationships between DSRSD and Zone 7 and with the other retailers in the Tri-Valley area.

9.2.6.2 Implementation over the Past Five Years to Achieve Water Use Targets

As part of the Tri-Valley Conservation Coordination efforts, DSRSD customers have received 853 high-efficiency washing machine rebates and 283 weather-based irrigation controller rebates.

Through collaboration and coordination, DSRSD and the other Tri-Valley Water Agencies provided consistent messaging associated with the 2014-2016 drought. The effort resulted in DSRSD exceeding its water conservation goals during the drought.

9.2.6.3 Plans for Continued Implementation

Implementation of this DMM is on-going and is expected to help DSRSD achieve its water use targets by making water conservation and implementation of DSRSD's water conservation program a priority among its staff. It also provides the means for DSRSD to collaborate with Zone 7 and the other Tri-Valley Water retailers to consistently implement DMMs through the Tri-Valley.

9.2.7 Other Demand Management Measures

In addition to the six DMMs described above, DSRSD also implements the following programs:

- Direct conservation assistance;
- Enhanced rebate programs; and
- Expanded recycled water use.

These programs are described below.

9.2.7.1 Direct Conservation Assistance

DSRSD provides the following services to its customers to promote water conservation:

- Small device giveaway programs (including kitchen/bathroom faucet aerators, low-flow showerheads, toilet leak detection tablets, and hose nozzles);
- Landscape water audits; and
- Home water audit kits (Water Hero packets).

9.2.7.1.1 Implementation over the Past Five Years to Achieve Water Use Targets

Between 2016-2020, DSRSD maintained an average annual budget of $1,400 to distribute the above-listed water savings devices. DSRSD's average annual distribution of water-efficient devices are shown on Table 9-1.

Table 9-1. Water Efficient Device Distribution (2016-2020)	
Device	Average Annual Distribution
Low Flow Showerheads	19
Kitchen Faucet Aerators	14
Bathroom Faucet Aerators	23
Toilet Flappers	1
Leak Detection Tablets	53
Flow Meter Bags	11
Garden Hose Nozzles	19

9.2.7.1.2 Plans for Continued Implementation

DSRSD intends to continue this program to encourage its customers to use water efficiently. The devices distributed result in immediate water savings when used. The water audits help customers become more aware of their water use.

9.2.7.2 Rebate Programs

DSRSD offers the following water conservation rebates in collaboration with Zone 7:

- Converting lawn to a water-efficient landscape--residential projects may qualify for up to $750 for a single-family home and $4,500 for a multi-family or non-residential property from Zone 7;
- Weather-based ("smart") irrigation controllers – rebates for up to $75 for single-family homes and $100 for multi-family properties, and $3,000 for commercial properties; and,
- High-efficiency clothes washers – rebates up to $75 for purchase of a qualifying ENERGY STAR Most Efficient labeled high-efficiency clothes washer.

During the 2014-2016 mandatory drought years, DSRSD offered an enhanced rebate program that added money to existing rebates and a rebate for pool covers. Additionally, DSRSD added a residential landscape contractor assistance program, which provided professional irrigation assistance and repair to qualifying homeowners. DSRSD's enhanced rebates were as follows:

- Converting lawn to water-efficient landscape – $0.50/square foot up to a maximum of $500 (residential) or $3,000 (multi-family or non-residential). DSRSD rebates front, side, and backyard conversions, full rock/mulch (no replanting), which Zone 7's rebates only front yard conversions, not the rest of the listed conditions.
- Weather-based ("smart) irrigation controllers – $75 for residential, $100 for multi-family and non-residential
- High-efficiency clothes washers – $25
- Pool covers – $50

The enhanced rebates and residential irrigation assistance program ended June 21, 2016, when the local drought emergency was rescinded. In 2016, the following enhanced programs were distributed as follows:

- High-efficiency washing machines – 159
- Pool Covers – 1
- Lawn conversions – 2
- Weather-based controllers – 15
- Residential landscape irrigation assistance - 1

Information on active, available rebate programs is posted on DSRSD's website.

9.2.7.2.1 Implementation over the Past Five Years to Achieve Water Use Targets

Customer participation for these rebate programs is summarized in Table 9-2 between 2016 and 2020.

Table 9-2. DSRSD Rebate Program Participation (2016-2020)

Program	Average Annual Participation
Water Efficient Landscaping	23
Weather-based "smart" irrigation controllers	283
High-efficiency clothes washers	853

9.2.7.2.2 Plans for Continued Implementation

DSRSD intends to continue providing rebates to its customers in collaboration with Zone 7 in the future.

9.2.7.3 Recycled Water Fill Station and Hydrants

DSRSD encourages commercial users to use recycled water instead of potable water for acceptable uses listed in Title 22, such as for dust control, soil compaction, street sweeping, surface washing, and landscape irrigation. Thus, DSRSD installed a commercial recycled water fill station located at the recycled water treatment facility that has been operational since 2007. Additionally, DSRSD has installed 17 recycled water fire hydrants throughout Dublin and Dougherty Valley areas since 2008. Commercial users submit a permit application to DSRSD to obtain permission to use the recycled water fill station and/or hydrants. The permit allows users to use recycled water providing all regulations are followed.

Furthermore, in response to the drought, DSRSD opened the state's first Residential Recycled Water Fill Station at its Jeffrey G. Hansen Water Recycling Plant in 2014. DSRSD made recycled water available to the public for residential landscaping. DSRSD's Residential Recycled Water Fill Station provided 2.3 MG of free recycled water to 500 residents in 2014. In 2015, 28 MG of free recycled water was distributed to 3,600 residents.

9.2.7.3.1 Implementation over the Past Five Years to Achieve Water Use Targets

In 2014 and 2015, in the middle of the previous drought, the commercial recycled water fill station and fire hydrants had significant demand. In 2016, 74 permitted fill station users and 75 hydrant users utilized 39.24 MG of recycled water. By 2020, the commercial fill station activity decreased. DSRSD distributed 1.34 MG of recycled water to 4 permitted commercial fill station users, and 18 hydrant users.

In 2016, residential fill station use decreased by 50 percent due to the ease of potable water use restrictions, to where 14.26 MG of recycled water was distributed to 3,964 registered residential users. At the end of September 2016, DSRSD closed the residential recycled water fill station located in Dublin. On December 28, 2016, DSRSD decided to close its residential recycled water fill station at its WWTP to start a major construction project and avoid public safety hazards and traffic congestion. The improved water supplies enabled DSRSD to move to voluntary conservation measures in June of 2016, adding another factor for closing the residential fill station.

9.2.7.3.2 Plans for Continued Implementation

The commercial recycled water fill station and hydrant programs will remain in place and available for customer use.

The Residential Recycled Water Fill Station is currently closed due to the high operational cost and users coming from outside of DSRSD's service area to utilize the program. After the extreme drought ended in 2016, DSRSD service area residents received only 25 percent of the benefits of the Residential Recycled Water Fill Station. Additionally, several construction projects at the Regional Wastewater Plant have commenced since early 2017 that created construction zone traffic conflicts with the operation of the Residential Recycled Water Fill Station. In December 2016, DSRSD's Board directed staff to close the Residential Recycled Water Fill Station, with the provision that it may be reopened if mandatory conservation is reinstated. This direction was confirmed by the DSRSD's amendment of the DSRSD's Water Recycling Policy which was approved in July of 2020.

9.3 WATER USE OBJECTIVES (FUTURE REQUIREMENTS)

In 2018, the State Legislature enacted two policy bills, (SB 606 (Hertzberg) and AB 1668 (Friedman)), to establish long-term water conservation and drought planning to adapt to climate change and the associated longer and more intense droughts in California. These two policy bills build on SB X7-7 and sets authorities and requirements for urban water use efficiency. The legislation sets standards for indoor residential use. The legislation also requires the State Water Board to coordinate with DWR to adopt efficiency standards for outdoor residential use, water losses, and CII outdoor landscape areas with dedicated irrigation meters. At the time of preparation of this UWMP, DWR and the State Water Board are in the process of developing new standards for water loss and indoor and outdoor residential water use. These standards will require urban water retailers to develop agency-wide water use objectives, provide annual reports and update their UWMP.

The State Legislature established indoor residential water use standards as 55 GPCD until January 2025, 52.5 GPCD from 2025 to 2029, and 50 GPCD in January 2030, or a greater standard recommended by DWR and the State Water Board. By June 30, 2022, the State Water Board is anticipated to adopt an outdoor residential use standard, a standard for CII outdoor landscape area with dedicated irrigation meters, and performance measures for CII water use. At that time, the State Water Board will adopt guidelines and methodologies for calculating the water use objectives. In accordance with CWC §10609.20(c), the water use objective for urban water retailers will be based on the estimated efficient indoor and outdoor residential water use, efficient outdoor irrigation of CII landscaped areas, estimated water losses, and estimated water use for variances approved by the State Water Board aggregated across the population in its water service area.

By November 1, 2023, and November 1 of every year thereafter, DSRSD will calculate its urban water use objective and actual water use and provide an annual report to the State. By January 1, 2024, DSRSD will prepare an UWMP supplemental incorporating DMMs and other water efficiency standards that it plans to implement to achieve its water use objective by January 1, 2027.

9.4 CALIFORNIA WATER EFFICIENCY PARTNERSHIP

DSRSD is a participating member of the CalWEP, which was established in 2018 to combine expertise on California water issues, challenges, and opportunities and advance water efficiency both on the agency-wide and statewide level. CalWEP evolved from the California Urban Water Conservation Council (CUWCC), which administered an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement best water management practices for reducing consumption of California's water resources. DSRSD was a participating member of CUWCC.

CalWEP also provides opportunities for networking and partnerships to improve water efficiency and conservation. Members are voluntarily organized into two main committees. The Research and Evaluation Committee collaboratively identifies and pursues research projects to benefit CalWEP members. The Program Committee shares needs, successes, and challenges, and identifies actionable steps for addressing water conservation program needs.

CHAPTER 10
Plan Adoption, Submittal, and Implementation

This chapter provides information regarding the notification, public hearing, adoption, and submittal of DSRSD's 2020 UWMP and updated WSCP. It also includes discussion on plan implementation and the process of amending the UWMP and the WSCP.

10.1 INCLUSION OF ALL 2020 DATA

Because 2020 is the final compliance year for SB X7-7, the 2020 UWMPs must contain data through the end of 2020. If a water supplier bases its accounting on a fiscal year (July through June) the data must be through the end of the 2020 fiscal year (June 2020). If the water supplier bases its accounting on a calendar year, the data must be through the end of the 2020 calendar year (December 2020).

As indicated in Section 2.4 of this UWMP, DSRSD uses a calendar year for water supply and demand accounting; therefore, this 2020 UWMP includes data through December 2020.

10.2 NOTICE OF PUBLIC HEARING

In accordance with the UWMP Act, DSRSD must provide an opportunity for the public to provide input on this 2020 UWMP and the WSCP. DSRSD must consider all public input prior to its adoption. There are two audiences to be notified for the public hearing: cities and counties, and the public.

10.2.1 Notices to Cities and Counties

DSRSD provided greater than a 60-day notice regarding the preparation of its 2020 UWMP and WSCP to cities and counties in its service area, including Dublin, San Ramon, Alameda County, and Contra Costa County, as discussed in Section 2.5 of this plan. The notices of preparation are included as Appendix E. In addition, DSRSD provided notices to the following agencies:

- Zone 7 Water Agency (Zone 7)
- California Water Service - Livermore District (Cal Water)
- City of Livermore (Livermore)
- City of Pleasanton (Pleasanton)
- U.S. Army Reserve's Parks Reserve Forces Training Area (Parks RFTA)
- Federal Bureau of Prison's Federal Correctional Institution at Dublin (FCI)
- Alameda County Santa Rita Jail
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- East Bay Discharges Authority (EBDA)
- Livermore-Amador Valley Water Management Agency (LAVWMA)
- DSRSD-EBMUD Recycled Water Authority (DERWA)

DSRSD coordinated the preparation of its UWMP and WSCP internally, with the cities and counties listed in its service area, and with the above listed agencies. Upon substantial completion of this 2020 UWMP, DSRSD provided the agencies listed above, including internally within DSRSD, a notice of availability and public hearing (Appendix E.).

Notifications to cities and counties in accordance with the UWMP Act, are summarized in Table 10-1.

Table 10-1. Notification to Cities and Counties (DWR Table 10-1 Retail)

City Name	60 Day Notice	Notice of Public Hearing
City of Dublin	Yes	Yes
City of San Ramon	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Alameda County	Yes	Yes
Contra Costa County	Yes	Yes

10.2.2 Notice to the Public

DSRSD issued Notices of Public Hearing to the public and provided a public review period following the notice, and prior to adoption, to allow ample time for public comments to be prepared and received.

Notices of Public Hearing were issued in accordance with Government Code Section 6066 and were published in the local newspaper (East Bay Times) to notify all customers and local governments of the public hearing. In addition, the notice was posted on DSRSD's website, www.dsrsd.com. Copies of the published Notice of Public Hearing is included in Appendix E.

10.3 PUBLIC HEARING AND ADOPTION

DSRSD encouraged community participation in the development of this 2020 UWMP, including its WSCP, using public notices and web-based communication. The public notices included the time and place of the public hearing, as well as the location where the plan is available for public inspection.

The public hearing provided an opportunity for DSRSD water users and the general public to become familiar with the 2020 UWMP, and ask questions about its water supply, DSRSD's continuing plans for providing a reliable, safe, high-quality water supply, and its plans to mitigate various potential water shortage conditions. Copies of the draft UWMP, including the WSCP, were made available for public inspection at DSRSD's offices, local public libraries, and on DSRSD website, www.dsrsd.com.

10.3.1 Public Hearing

A public hearing was held on June 1, 2021 and June 15, 2021 during which DSRSD received and considered input from the public before adopting the 2020 UWMP and updated WSCP. As part of the public hearing, DSRSD provided a report on DSRSD's compliance with the Water Conservation Act of 2009. The report included information on DSRSD's baseline, water use targets, compliance, and implementation, as discussed previously in Chapter 5 of this plan.

10.3.2 Adoption

Subsequent to the public hearing, this 2020 UWMP was adopted by DSRSD's Board of Directors on June 15, 2021. The City adopted the updated WSCP separately so that it may be updated as necessary. Copies of the adopted resolutions are included in Appendix O.

10.4 PLAN SUBMITTAL

This 2020 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted 2020 UWMP will be submitted electronically to DWR using the Water Use Efficiency (WUE) data submittal tool. A copy of the adopted 2020 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2020 UWMP, including the WSCP, will be provided to the City of Dublin, City of San Ramon, Alameda County, and Contra Costa County to which DSRSD provides water.

10.5 PUBLIC AVAILABILITY

No later than 30 days after the submittal to DWR, copies of this Plan, including the adopted WSCP, will be available at the following locations for public review during normal business hours:

- DSRSD office at 7051 Dublin Boulevard, Dublin, California;
- City of Dublin City Hall at 100 Civic Plaza, Dublin, California; and
- City of San Ramon City Hall at 7000 Bollinger Canyon Road, San Ramon, California.

A copy of this 2020 UWMP will also be available for review and download on DSRSD's website, www.dsrsd.com.

10.6 AMENDING AN ADOPTED UWMP OR WATER SHORTAGE CONTINGENCY PLAN

DSRSD may amend its 2020 UWMP and WSCP jointly or separately. If DSRSD amends one or both documents, DSRSD will follow the notification, public hearing, adoption, and submittal process described in Sections 10.2 through 10.4 above. In addition to submitting amendments to DWR through the WUE data portal, copies of amendments or changes to the plans will be submitted to the California State Library, Dublin, San Ramon, Alameda County, and Contra Costa County within 30 days after adoption.