Serrano Water District

2020 Urban Water Management Plan & Water Shortage Contingency Plan

June 2021

Karen E. Johnson, Water Resources Planning

Serrano Water District

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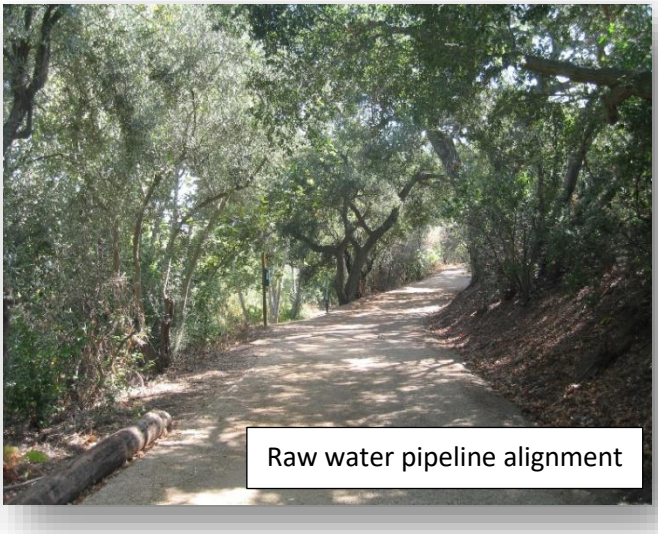
Prepared with assistance from
Karen E. Johnson, Water Resources Planning

Contact Sheet

Report Contact Person:	Jerry Vilander General Manager Phone: 714.538.0079 e-mail: jerryv@serranowater.org
Date of Public Hearing:	June 15, 2021
Plan Adoption Date:	June 15, 2021
Resolution Numbers:	2021-06-02; 2021-06-03; 2021-06-04
Plan Submitted to Department of Water Resources:	by July 1, 2021
The water supplier is a:	Special District – retailer and wholesaler; Small Water Supplier
Utility services provided by the water supplier include:	Water
Public Water System Number:	3010082
Is the agency a Bureau of Reclamation Contractor?	No
Is the agency a State Water Project Contractor?	No
Plan Preparer:	Karen E. Johnson, Water Resources Planning kejwater@aol.com



Raw water pipeline alignment

Serrano Water District

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Jerry Vilander	General Manager
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Serrano Water District

2020 Urban Water Management Plan & Water Shortage Contingency Plan
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Acronyms and Abbreviations

Act	Urban Water Management Planning Act
afy	acre-feet per year
Basin	Orange County Groundwater Basin
Bay-Delta	San Francisco Bay – Sacramento River-San Joaquin River Delta
BEA	Basin Equity Assessment
BMP	Best Management Practices
BPP	Basin Production Percentage
CalWEP	California Water Efficiency Partnership
CDR	Center for Demographic Research, Cal State University Fullerton
CVP	Federal Central Valley Project
Delta	Sacramento River-San Joaquin River Delta
District	Serrano Water District
DMM	Demand Management Measures
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
ERP	Emergency Response Plan
ESA	Endangered Species Act
FY	fiscal year
gpcd	gallons per capita per day
gpm	gallons per minute
GWRS	Groundwater Replenishment System
HMP	Hazard Mitigation Plan
IRWMP	Integrated Regional Water Management Plan
IRWD	Irvine Ranch Water District
mgd	million gallons per day
MWDOC	Municipal Water District of Orange County
MOU	Memorandum of Understanding
MWD	Metropolitan Water District of Southern California
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
Orange	City of Orange, a retail customer
PFAS	per- and polyfluoroalkyl substances
RA	Replenishment Assessment
SB X7-7	State Water Conservation Act of 2009
SCADA	Supervisory Control and Data Acquisition System
SWD	Serrano Water District
SWP	State Water Project
SWRCB	California State Water Resources Control Board
UWMP	Urban Water Management Plan
WSAP	MWD's Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM	MWD's Water Surplus and Drought Management Plan
WTP	water treatment plant
WUE	water use efficiency

SERRANO WATER DISTRICT

URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN

Executive Summary

Background and Purpose

The Urban Water Management Planning Act (UWMP Act) requires water suppliers that provide over 3,000 acre-feet per year or have over 3,000 connections to prepare and submit to the State Department of Water Resources (DWR) an Urban Water Management Plan (UWMP) every five years. Serrano Water District's (SWD or District) UWMP has been prepared in accordance with the UWMP Act, as defined by the California Water Code Sections 10610 through 10656, and the Water Conservation Act of 2009. There are very specific requirements for the UWMP and Water Shortage Contingency Plan (WSCP) provided in DWR's *Urban Water Management Plan Guidebook 2020* (Guidebook); this report has been structured for compliance with the UWMP Act and Guidebook.

Significant legislative changes to the Act since the 2015 UWMP include the addition of or modification to the following requirements.

- Five consecutive dry year water reliability assessment instead of three years
- Drought risk assessment for years 2021 through 2025
- Seismic risk to water system facilities and mitigation plan
- Readily obtainable information on energy use for the water system
- Five years of water loss audit reports
- Water Shortage Contingency Plan with greatly expanded requirements including a new Annual Assessment and the District's ability to respond to six supply shortage levels
- Consistency between the UWMP and the Sustainable Groundwater Management Act
- Provision of a lay description of the UWMP and WSCP which this Executive Summary provides

In addition to compliance with the State mandate, this document can serve as a foundational document and primary source for integrating water and land use planning at the District and the City of Villa Park, within the District. This is accomplished in developing Water Supply Assessments and a Written Verification of Water Supply for new development in compliance with

SB 610 and SB 221. Villa Park can use the UWMP as it updates its general plan just as the District incorporates the general plan in the development of its water demand forecast.

This 2020 UWMP presents a description of historical and projected water use, conservation targets and water use efficiency activities to maintain and further reduce water use, water supply sources, a comparison of water supplies and water demands during normal, single dry, and multiple dry years, contingency planning for water shortages, and UWMP coordination and adoption details.

The WSCP, which is a stand alone product located here as Chapter 8, provides for an Annual Assessment of supply availability. It also identifies shortage response actions the District would take in response to six standard water shortage levels.

Service Area Description

Serrano Water District (District or SWD) is an independent water district established in 1927 under the California Water Code, with a five-member elected Board of Directors. The District serves potable water to a population of 6,263 people in the City of Villa Park and a small area of the City of Orange within a 4.7 square mile area. The service area, presented on Figure ES-1, had 2,269 service connections for its residents and a handful of businesses. The District service area is largely built out with primarily large lot single family homes, one shopping center and an office building, schools, and a City Hall complex for the City of Villa Park. There are very few vacant parcels available for development.

The service area is characterized by gently rolling hills and steeper hillside areas ranging in elevation from 280 feet (mean sea level) to 650 feet. The District enjoys a Mediterranean climate with mild winters, dry, warm summers and moderate rainfall. The service area averages 14 inches of rainfall per year, almost entirely within a six month period of November through April. The usually mild pattern is infrequently varied with periods of extremely hot weather and windstorms called the Santa Ana winds. The average maximum temperature is 77 degrees Fahrenheit and the average minimum temperature is 55 degrees Fahrenheit. Rainfall in the service area impacts water demands and the local water supplies but it does not influence the imported water supplies which originates in northern California. Climate change is anticipated to result in higher temperatures overall in the service area with greater and more extreme weather fluctuations and events such as droughts and heat waves.

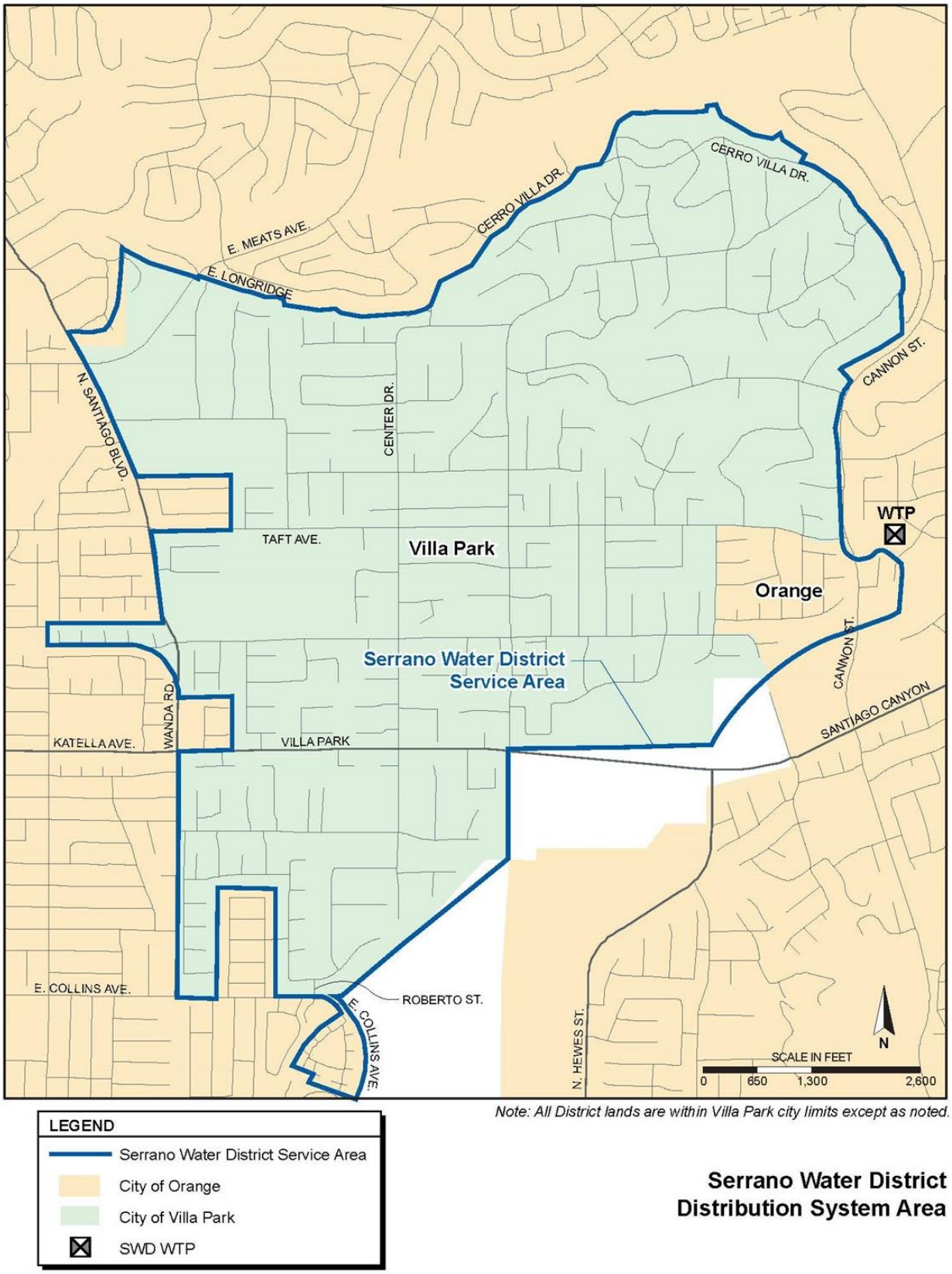


Figure ES-1: District Service Area

Water Demand

Table ES-1 presents water demand projections through 2040 for the District service area and sales to Orange. Projections are based on the most recent Villa Park general plan land uses and demographic data from the Center for Demographic Research at California State University Fullerton. The projected change in population within the District service area between 2020 and 2040 is 140.

Historical annual sales to Orange range from less than 500 acre-feet to almost 2,000 acre-feet; the average amount sold during the previous 10 years was used for Table ES-1. It was assumed that the FY20 system losses of 4.2 percent are maintained. MWDOC has incorporated into its water demand forecast for imported water users an increase of six percent during a dry year to reflect climate change (MWDOC, 2021). During the recent drought of 2012 to 2016, District customers reduced water demands between the years of 2013 and 2016 by 38 percent.

Table ES-1: Water Demand, Existing and Projected

	2020	2025	2030	2035	2040
Serrano Water District	2,519	2,595	2,646	2,699	2,726
Sales to Other Agencies	1,412	1,668	1,668	1,668	1,668
TOTAL	3,931	4,263	4,314	4,367	4,394

NOTE: Data from UWMP Tables 4-1 and 4-2

Conservation Targets

In 2009, the Water Conservation Act (SB X7-7) set a statewide goal of a 20 percent reduction in per capita water use by 2020. To help the State achieve the 20 percent reduction in water use, each urban water retailer adopted an interim per capita water use target for its service area for 2015 and a final target for 2020. The District customers responded positively to the call for conservation, achieving its 2015 and 2020 targets. The baseline per capita and the 2015 and 2020 gallons per capita per day (gpcd) water use targets are as follows.

- 10-year baseline daily per capita water use was 466 gpcd
- 2015 target was 419 gpcd and actual water use was 392 gpcd
- 2020 target was 373 gpcd and actual water use was 359 gpcd

Variable weather, drought conditions, increased cost of imported water, and economic conditions play a role in the year-to-year demand fluctuations, however, the overall decline in water use can largely be attributed to active demand management, water efficiency programs, and customer response to drought. The 2020 water use was significantly less than that required

to meet the target. The District remains committed to its conservation program to maintain and further reduce water use.

Water Supplies

The District provided 2,519 acre-feet of water in its retail service area in fiscal year (FY) 2020. The District's current water needs are met by a combination of local surface water, groundwater, and imported water. Groundwater is pumped from the Orange County Basin under normal conditions using two wells with a total capacity of 3,200 gallons per minute. The five year average (FY16 through FY20) groundwater production was 1,703 acre-feet per year (afy). Due to water quality regulations regarding per- and polyfluoroalkyl substances (PFAS), groundwater production halted starting in early 2020.

The groundwater supply availability is based on a Basin Pumping Percentage (BPP) established by Municipal Water District of Orange County (MWDOC) to ensure a sustainable yield. The BPP is anticipated to be 82 percent of average demands in 2025; it is currently at 77 percent. Groundwater pumping can exceed the BPP, but a higher cost. The 5 year average prior to FY20 was 1,837 acre-feet.

Surface water (local Santiago Creek water rights and imported MWD supply) is conveyed from Santiago Reservoir and treated at the District's Walter E. Howiler, Jr. Water Filtration Plant (Howiler WTP). The treatment facilities produced 2,482 afy or about 2.2 million gallons per day (mgd) under average day conditions for a five year period of FY16 through FY20. The WTP has a capacity of 4 mgd to accommodate maximum day conditions. The District uses this supply first whenever possible.

SWD also relies on imported water provided by Metropolitan Water District of Southern California (MWD) through MWDOC. MWD's water supply originates from two principal sources - the Colorado River via the Colorado River Aqueduct and the Feather River stored at Oroville Reservoir in Northern California and transported through the State Water Project (SWP) which travels through the Sacramento River–San Joaquin River Delta (Delta). Imported water from MWDOC/MWD purchased by SWD is treated at its Howiler WTP. Although the majority of imported water is from the Colorado River, there is some Delta water in MWD's supply.

The District has a contract with the City of Orange specifying that it will make available a minimum of 1,000 afy of treated surface water (from SWD Santiago Creek water rights or imported from MWD), as available. The District does not always have surplus surface water from Santiago Creek to sell to Orange; if interested, imported water can be purchased for Orange from MWD and stored, treated, and delivered by the District. Over the previous five years, the District

sold an average of 1,689 afy to Orange through two interconnections. Table ES-2 presents the water supplies available to the District.

Table ES-2: Water Supply Availability	
Supply	**Reasonably Available Volume**
Groundwater	2,128
Local Surface Water	1,542
Purchased Surface Water from MWD	4,681
Total	8,351
NOTES: Groundwater reflects 82% BPP applied to 2025 demands. Local surface water based on average availability. Purchases of MWDOC/MWD supply based on the highest annual purchase during the previous 10 years.	

Water Supply Reliability and Drought Risk Assessment

Constraints on water sources and expected water service reliability for a normal year, single dry year, and five consecutive dry years projected for 2025 through 2045, were analyzed to determine the reliability of the District's water supplies. The newly required Drought Risk Assessment (DRA) offers an opportunity to test the District's near term supply reliability by assuming the next five consecutive years are dry.

Supply Reliability

The District imports water from Lake Mathews which is primarily Colorado River water.

Although the District's supplies are very reliable, various factors have the potential to affect the availability and reliability of the imported supplies such as Delta challenges and hydrological water supply conditions. About 30 percent of Southern California's water supply moves from Northern California through the Delta to pumps in the south Delta. Endangered species protection and conveyance needs in the Delta have resulted in operational constraints to pumping. The Delta's declining ecosystem and the difficulties operating the SWP system has led to factors that can result in export reductions from the Delta, releases of additional water from storage, other operational changes associated with endangered species, or water quality requirements. In addition, new litigation, listings of additional species under the Endangered Species Act, or new regulatory requirements imposed by the State Water Resources Control Board could adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations.

Dramatic swings in annual hydrologic conditions have been evident recently with its impacts being felt most severely on the SWP supply. The Colorado River swings in variability are buffered by its extensive storage capabilities, however the river basin appears to be experiencing declining amounts of precipitation in its watershed over the last 21 years (MWD, 2021). Climate change is expected to shift precipitation patterns and affect reliability of water supplies, which will make water supply planning even more challenging. The general trend with climate change is of less water-storing snowpack and greater precipitation in the Sierras, more precipitation earlier in the year when it cannot be readily utilized, and more extreme and more frequent drought and flooding events. Rising sea levels resulting in impacts to coastal groundwater basins and levee failure in the Delta due to seawater intrusion, and increased risk of damage from storms, high-tide events, and the erosion of levees; and potential pumping cutbacks on the SWP due to salinity levels at the pumps.

To analyze the reliability of the different sources of supply due to climate, hydrologic conditions for imported and local supplies were identified that define three year types: average, single dry year, and multiple dry years. MWD has determined and stated in its 2020 UWMP that it is able to meet the current and projected full service demands of its member agencies under all three hydrologic conditions through 2045 by developing and implementing water resources programs and activities through its preferred resource mix. As presented in Table ES-3, water supplies will be available to meet District demands during a normal water year.

Table ES-3: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040
Supply totals (*autofill from Table 6-9)*	8,351	8,393	8,437	8,459
Demand totals *(autofill from Table 4-3)*	4,263	4,314	4,367	4,394
Difference	4,088	4,079	4,070	4,065
NOTES: Data from Table 7-2				

For reliability planning, an increase in District demands associated with a single dry year was calculated. Water demands typically increase during the first dry year before it is apparent that it will be a dry year and before demand management outreach is implemented. Although additional supplies are available, supplies in Table ES-4 were matched to demands. The District can provide reliable water supplies under the single driest year hydrology with reduced supplies to meet dry year demands.

Table ES-4: Single Dry Year Supply and Demand Comparison				
	2025	2030	2035	2040
Supply totals	4,442	4,497	4,553	4,582
Demand totals	4,442	4,497	4,553	4,582
Difference	0	0	0	0
NOTES: Single dry year includes 6.9% increase in demands. Supplies reflect availability of all supplies to meet demands. Sales to Orange of 1688 AF included. Data from Table 7-3.				

Water demands were also analyzed for the multiple dry year scenario. Projected water demands were increased during the first two years to reflect dry years before conservation outreach is expanded. Table ES-5 presents projected multiple dry year water supply availability over the next 20 years compared to increased water demands. This analysis demonstrates that the region can provide reliable water supplies under the multiple dry year hydrology with reduced supplies to meet increased demands. This was evident during the recent drought of 2012 through 2016 with year 2013 being one of the driest years on record; the District was able to meet its water demands with an adequate supply. MWD and MWDOC have also determined that the region will be able to meet water demands during all hydrologic year types.

Drought Risk Assessment

A Drought Risk Assessment was performed based on the assumption that the five driest consecutive years on record for the water supplier will occur over the next five years. This hydrologic sequence reflects the availability of MWD supplies during the 1988 to 1992 drought. Water demands were compared to supply availability, and prior to determining if implementation of any shortage actions is needed to reduce these demands.

Table ES-6 demonstrates supply reliability during a hypothetical five year drought beginning in 2021. The imported supply was 100 percent reliable during the previous two multiple year droughts and can compensate for reduced local surface water supplies or reduced pumping until PFAS treatment is in place. MWD has stated that its supplies will be fully reliable during the next multiple year drought under most if not all conditions. This includes MWD's emergency supplies that have been accessed in the past and are a part of the supply portfolio.

Table ES-5: Multiple Dry Years Supply and Demand Comparison					
		2025	2030	2035	2040
First year	Supply totals	4,442	4,497	4,553	4,582
	Demand totals	4,442	4,497	4,553	4,582
	Difference	0	0	0	0
Second year	Supply totals	4,362	4,415	4,464	4,487
	Demand totals	4,362	4,415	4,464	4,487
	Difference	0	0	0	0
Third year	Supply totals	4,283	4,335	4,378	4,394
	Demand totals	4,283	4,335	4,378	4,394
	Difference	0	0	0	0
Fourth year	Supply totals	4,294	4,346	4,383	4,394
	Demand totals	4,294	4,346	4,383	4,394
	Difference	0	0	0	0
Fifth year	Supply totals	4,248	4,304	4,356	4,389
	Demand totals	4,248	4,304	4,356	4,389
	Difference	0	0	0	0
NOTES: Projected demand were increased 6.9% in 1st year and 3.4% in 2nd year to reflect first dry years. Sales to Orange 1,688 added to all years. Data from Table 7-4.					

Table ES-6: Five-Year Drought Risk Assessment Tables	
2021	**Total**
Gross Water Use	4,377
Total Supplies	4,377
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)	
Resulting % Use Reduction from WSCP action	0

2022	**Total**
Gross Water Use [Use Worksheet]	4,304
Total Supplies [Supply Worksheet]	4,304
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)	
Resulting % Use Reduction from WSCP action	0

2023	**Total**
Gross Water Use [Use Worksheet]	4,233
Total Supplies [Supply Worksheet]	4,233
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)	
Resulting % Use Reduction from WSCP action	0%

2024	**Total**
Gross Water Use [Use Worksheet]	4,248
Total Supplies [Supply Worksheet]	4,248
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)	
Resulting % Use Reduction from WSCP action	0%

2025	**Total**
Gross Water Use [Use Worksheet]	4,263
Total Supplies [Supply Worksheet]	4,263
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)	
Resulting % Use Reduction from WSCP action	0%
NOTE: Includes sales to Orange of 1,688 AF. Source: Table 7-5	

Water Shortage Contingency Planning

The District has adopted a Water Shortage Contingency Plan as a separate stand-alone document. It addresses a newly required Annual Assessment, six mandatory shortage levels with response actions for each level, as well as many other shortage considerations such as communications, compliance, enforcement, legal authorities, financial consequences, monitoring and reporting, and refinement procedures.

Annual Assessment

Urban water suppliers are required to submit an annual water supply and demand assessment report (called Annual Assessment) to DWR, in compliance with Water Code Section 10632(a). The District's Annual Assessment is a written decision-making process used to determine an anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions in the current calendar years of 2021 and 2022, while assuming 2022 will be a dry year.

In the Annual Assessment model presented in Table ES-7, average service area unconstrained demands (before demand reduction activities) are assumed for 2021 while increased dry year unconstrained demands are assumed for 2022. For 2022, the dry year assessment scenario evaluation criteria (see second page of Table ES-7) are reviewed to determine if a supply shortage is projected to result. The operations plan identifies the prioritization of supply, if needed, and the quantities likely to be available by applying the evaluation criteria. It is anticipated that there will not be a supply gap for 2021 and 2022. However, in the future, if demands exceed available supplies, the amount of the gap will determine which WSCP supply shortage level is triggered. If a supply gap is anticipated, the water shortage stage would be based on the assessment scenarios presented in the WSCP which will determine the appropriate shortage response level and response actions for the District.

The Annual Assessment will be submitted to DWR by July 1 of each year. The Annual Assessment will document any anticipated shortage, any triggered shortage response actions, associated compliance and enforcement actions, and communication actions.

TABLE ES-7: Serrano Water District Annual Assessment		
ANNUAL ASSESSMENT REPORT SUBMITTED TO DWR:		7/1/2021
CURRENT YEAR		
Current year unconstrained demand (AF)	2021	2,534
Infrastructure constraints		Wells out due to regulatory water quality concern
Current year total available supply (AF)		
Groundwater (77% of demand available if wells were on)		0
Local surface water (average availability)		1,542
Purchased imported water (available to match demand)		992
Supply Availability		2,534
Supply shortage or surplus:		0
Supply Shortage Level expected this year:		None
NEXT YEAR - Assumed Single Dry Year		
Second year unconstrained demands, assuming dry year	2022	2,725
2nd year infrastructure constraints		Wells out due to regulatory water quality concern
Groundwater		0
Local surface water (36% of 1,542 AF in single dry year)	1,542	555
Purchased imported water (available to match demand)		2,170
Supply Availability		2,725
Shortage or surplus supply availability:		0
Supply Shortage Level expected next year:		None
Anticipated Assessment Scenario		#2: Dry Water Year
NOTE: Demand in 2021, and 2022 as the 1st dry year, is from UWMP Table 7-5 minus sales to Orange		

Explanation of information provided above: Although groundwater is temporarily not available due to regulatory constraints, local surface water and purchased imported water are expected to be available for 2021 average year conditions and 2022 dry year conditions. See Assessment Scenario #2, Dry Water Year, for evaluation criteria to utilize to monitor 2022 conditions.

Table ES-7, continued

Assessment Scenario #2: Dry Water Year			
Hydrologic and Regulatory Conditions -Customer demands increase -Reservoir levels and watershed inflows -SWP supply conditions measured in snow surveys -MWD's Colorado River supply availability -Regulatory conditions **Evaluation Criteria** -Monthly production data indicates above monthly average increases for December through March -SWD allocation of Santiago Reservoir supply 25% to 50% of average by April 1 -Santiago Creek (native) flow below average November through April -MWD institutes Water Supply Allocation Plan (WSAP) -MWDOC's monthly Water Supply Condition update report June 1 -OCWD annual determination of BPP lover than anticipated			
Unconstrained Demands: 2022 Single Dry Year, Increased Demand		**2,725**	
Scenario #2 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
	Local Surface Water	0	No supply available
1	Groundwater	1,885	Maximize use of groundwater
2	Imported	840	Augment with imported water as needed
Note: Local surface water historically 0% to 99% available during multiple dry years; 3rd year 0% used here. Purchased imported water meets demand.			

Water Shortage Levels and Response Actions

Six mandatory water shortage levels correspond to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than a 50 percent shortage from the normal levels of supply availability. Each of the shortage levels represent an ever-increasing gap between normally available supplies and normally expected customer water use. On January 22, 2009, the District's Board of Directors adopted the Water Conservation & Water Supply Shortage Program which provides for response actions to a desired reduction in demands. The District will implement the appropriate stage based on assessed water supply and demand conditions determined in the Annual Assessment. Each stage consists of specific demand reduction actions including prohibitions, penalties, and/or rate structure modifications to be used as needed to encourage a

reduction particularly in outdoor water demands. These response actions include public education campaigns, expanded outreach for water efficiency programs, and conservation penalties.

Supply augmentation responses have been integrated into the District's supply planning management for shortage conditions. Maximizing the amount of groundwater pumped in the service area when local surface supplies are limited is standard operations. Purchasing additional supply from MWD fills any gaps between projected water demands and existing local supplies during droughts. Each MWD member agency has a predetermined amount of water that can be purchased at the lower Tier 1 supply rate. Water can be purchased from MWDOC/MWD above a member agency's annual allocation amount but has an allocation surcharge at a Tier 2 supply rate.

Emergency Response Planning and Seismic Risk Assessments

A catastrophic interruption may lead to a proclamation of a water shortage and could be any event (either natural or human induced) that causes a water shortage severe enough to classify as a Stage 4 to 6 water supply shortage. To prepare for catastrophic events, the District prepared an Emergency Operations Plan (EOP) to address a variety of potential emergency situations that could affect the District's system. Procedures were developed for different water supply interruptions including, but not limited to power outages, water contamination, earthquakes, flooding, wildfire, loss of water supply, chemical spills, and terrorist events. The District's EOP provides a framework for an organized response to an emergency.

Given the great distances that imported supplies travel to reach Orange County and within the county, the region is vulnerable to interruptions along hundreds of miles aqueducts, pipelines, and other facilities associated with delivering supplies to the region. The risk of earthquake damage to infrastructure from these active faults is manifested through different seismic hazards, including seismically induced ground shaking, seismically induced ground failure, and surface fault displacement. The District was a participant in the *Orange County Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan* development. The Hazard Mitigation Plan documents mitigation strategies for the District relating to seismic events.

Demand Management

Water conservation is not often thought of as a water supply but reducing one's water use by installing more efficient fixtures, for example, directly offsets the need for the District to purchase expensive imported water. The District's conservation ordinance prescribes water conservation rules and regulations, as well as water conservation best management practices which shall be in effect at all times. The District relies on its ordinance for every day management as well as

during droughts to further manage demands and prevent excessive water use. The WSCP can be enacted in times of drought and water shortage emergencies. Water conservation and demand management are an integral part of the District's water management strategy, integrating numerous and effective activities into long range planning for its supply needs. The District's DMM activities, as well as programs administered by MWDOC's Water Use Efficiency Department to assist in promoting regional water use efficiency, include the following activities.

- 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
- Other demand management measures

One example of an effective Demand Management Measure is the rate structure. Under normal conditions, efficient water use is billed at the lowest price and usage that exceeds the first tier is billed at a higher rate. During the recent drought, the District adopted a drought rate structure in 2015. By emphasizing efficient use, the rate structure motivates customers to partner with the District in its effort to maintain a reliable source of water. The success in District water use efficiency programs is evident from the per capita water use reduction exceeding the District's 2015 and 2020 targets.

Plan Coordination

The UWMP Act requires the coordination of the preparation of this UWMP and WSCP with other appropriate agencies and the public. A public notification was sent out to the City of Villa Park and the County of Orange at least 60 days prior to the public hearing to inform them of the preparation of the plan and the UWMP update process and schedule, and to solicit input for the plan update. A hearing notice was published twice in local public newspapers over the almost 30 days prior to the public hearing. A copy of the UWMP and WSCP were available for review at the District headquarters public counter. The hearing was held to discuss the draft UWMP and WSCP on June 15, 2021. Public hearings provide an opportunity for all District customers to become familiar with the plan and ask questions about the District's water planning efforts.

The Board of Directors adopted this 2020 UWMP and the WSCP on June 15, 2021. Within 30 days following plan adoption, the UWMP and WSCP were submitted to DWR, the California State Library, the County of Orange, and local wholesale and retail water providers. Within 30 days of

submitting the UWMP to DWR, a copy was made available during normal business hours at the District headquarters. It can also be obtained from the District website: www.serranowater.org.

Chapter 1 – Introduction and Overview

1.1 Background

Serrano Water District (District or SWD) is an independent water district established in 1927 under the California Water Code, with a five-member elected Board of Directors. The District serves potable water to a population of 6,263 people in the City of Villa Park and a small area of the City of Orange within a 4.7 square mile area. The District service area is largely built out with primarily large lot single family homes, one shopping center and an office building, schools, and a City Hall complex for the City of Villa Park.

This Urban Water Management Plan (UWMP) was prepared in response to the Urban Water Management Planning Act (Act), Water Code Sections 10610 through 10657, which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. The Act requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt an UWMP and submit the plan to the State Department of Water Resources (DWR) every five years demonstrating water supply reliability in normal, single dry, and multiple dry years. Sections of this UWMP that correspond to the Act are summarized in Appendix A - UWMP Checklist. The UWMP describes and evaluates sources of supply, reasonable and practical efficient water uses, and demand management activities.

Amendments have been added to the Act since its inception. In 2010, a change to the Act included the Water Conservation Act of 2009, also known as SB X7-7. This act required urban suppliers to establish water use targets for 2015 and 2020 for a reduction in per capita daily water consumption by 20 percent by December 31, 2020 and track its progress with an incremental goal of 10 percent by December 31, 2015. The District met and exceeded both the 2015 and 2020 targets.

The Act was significantly expanded since 2015. The major new requirements include the following, as described in DWR's draft UWMP Guidebook 2020.

Five Consecutive Dry-Year Water Reliability Assessment. 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 a supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period.

Drought Risk Assessment. The California Legislature created a new UWMP requirement for drought planning in part because of the significant duration of recent California droughts and the

predictions about hydrological variability attributable to climate change. The Drought Risk Assessment (DRA) requires a supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

Seismic Risk. The Water Code now requires suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan. An important aspect of this provision is the intersection of water supply infrastructure planning with a county or regional hazard mitigation plan.

Water Shortage Contingency Plan. 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 an action plan for a drought or catastrophic water supply shortage. The new requirements are more prescriptive than previous versions. Many of these actions were implemented during the last drought, to successfully meet changing local water supply challenges. This is the most significant addition to the UWMP. This document, although presented here as Chapter 8, must be separately adopted by the Board of Directors and maintained in practice as a separate document which can be modified or updated at any time. Within it, the District's water shortage levels are now required to correspond to six standard water shortage levels in ten percent increments up to 50 percent water shortage, plus a shortage level over 50 percent shortage. Also now required in the WSCP is a water supply and demand assessment (Annual Assessment) with prescribed elements to be submitted annually to DWR starting with this WSCP.

Groundwater Supplies Coordination. In 2014, the Legislature enacted the Sustainable Groundwater Management Act to address groundwater conditions throughout California. Water Code now requires suppliers' 2020 UWMPs to be consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by Groundwater Sustainability Agencies.

Lay Description. The Legislature included a new statutory requirement for suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks. This section of the UWMP, provided here as an Executive Summary, could be viewed as a go-to synopsis for new staff, new governing members, customers, and the media, and it can ensure a consistent representation of the supplier's detailed analysis.

Energy Intensity. The legislature created a new requirement for suppliers to include readily obtainable information on estimated amounts of energy for water supply production and distribution.

1.2 Utilization of Other Planning Documents

This 2020 UWMP was prepared by utilizing relevant planning documents prepared by the District and other entities within the service area and region. These include documents such as the Orange County Water District groundwater management plan, the Municipal Water District of Orange County (MWDOC) draft 2020 UWMP, Metropolitan Water District of Southern California (MWD) final draft 2020 UWMP, among others. District staff, with the assistance of a consultant – Karen E. Johnson, Water Resources Planning – prepared the 2020 UWMP. In preparing the UWMP, DWR's 2020 *Guidebook for Urban Water Suppliers*, released in March 2021, and related required tables were utilized, along with other references listed in Appendix B.

Chapter 2 – Plan Preparation

2.1 District Public Water System

SWD is a public water system regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water. As mentioned in Chapter 1, Section 10617 of the Act requires that every urban water supplier providing water for municipal purposes directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP. The District has 2,269 customers. The District served 2,519 acre-feet of water in its retail service area in FY20 as presented in Table 2-1.

The District is a Small Water Supplier, not an Urban Water Supplier. This is based on the number of District connections being under 3,000 and the retail or wholesale quantity of water supplied being under 3,000 afy. There are several State requirements for Urban Water Suppliers, outside of UWMP requirements, that are not applicable to a Small Water Supplier such as preparing audited system loss reports. The District provided other sources of information in these instances to meet the spirit of the requirement and to ensure a complete document.

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
3010082	Serrano Water District	2,269	2,519
	TOTAL	2,269	2,519
NOTES:			

2.2 Coordination

The District is a member of MWDOC. MWDOC is a member agency of MWD, the regional wholesaler of imported water. MWDOC serves all of Orange County except for the cities of Anaheim, Fullerton, and Santa Ana, which are member agencies of MWD. MWDOC purchases imported water from MWD and distributes the water to its member agencies, which provide retail and wholesale water services to the public. The District coordinated the development of this UWMP with MWDOC and the groundwater manager: Orange County Water District (OCWD). In accordance with the Act, the District provided its imported water needs to MWDOC. MWDOC

and MWD documented available quantities of supplies, including the reliability of those supplies for suppliers in their respective regional UWMPs. References are made to these documents throughout this UWMP.

As a wholesale water supplier to 28 member agencies, MWDOC prepared an UWMP for its service area and developed a Regional Alliance to address the requirements of the SB X7-7 reporting requirements for the 2020 water use targets. Targets are discussed in Chapter 5. The District, as a retail agency, is also participating in MWDOC's Regional Alliance, as presented in Table 2-2.

The District works closely with OCWD, the manager of the Orange County Groundwater Basin, and the cities of Villa Park and Orange. Most of the service area is within Villa Park, with a small portion in the City of Orange. In addition, the City of Orange purchases surplus water supplies from the District. When discussing the City of Orange water sales in this document, the city is referred to as "Orange".

Submittal Table 2-2: Plan Identification

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

As presented in Table 2-3, the District is both a retail agency and a wholesaler to the City of Orange. The 2020 UWMP is being prepared for the District as a retail supplier with wholesale sales to Orange. Water consumption and production data is in fiscal years ending with June 30, 2020. The quantities presented in this document are consistently presented in acre-feet.

Submittal Table 2-3: Supplier Identification	
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)	
07/01	
Units of measure used in UWMP (select from drop down)	
Unit	AF
NOTES: Agency also wholesales to City of Orange. This is a Retail UWMP.	

The District worked with MWDOC to provide consistency in its exchange of data and information. The draft UWMP was provided to the wholesale suppliers listed in Table 2-4. Compliance with the coordination, noticing, and reporting requirements for this UWMP is presented in Chapter 10.

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
Municipal Water District of Orange County
Orange County Water District
NOTES:

Chapter 3 – System Description

3.1 District History

The District was first incorporated in 1876. In the early 1880s, farmers in Villa Park and El Modena areas joined together to build a dam on Santiago Creek to divert water from this tributary of the Santa Ana River to irrigate their fields and orchards. In 1927, several water companies merged into the Serrano Irrigation District to serve the Villa Park area. In 1928, the District, a public corporation organized under the laws of California, joined with Carpenter Irrigation District of El Modena and the Irvine Company for the construction of Santiago Dam which was completed in 1931; an agreement was made with the Irvine Company to allow the Irvine Company to divert water out of the watershed and to allocate water stored behind Santiago Dam between the three agencies. The reservoir was opened to the public for fishing in 1941. In 1956, MWD installed a pipeline to convey water to Santiago Reservoir. In 1963, the Villa Park Dam was dedicated primarily to provide flood control protection but is also used by the District for water supply.

With the urbanization in the County starting in the late 1950s and the resulting decreasing need over time for agricultural water, Serrano Irrigation District, providing irrigation water, and Villa Park Mutual Water Company, providing potable drinking water, merged in 1958 into one agency: Serrano Water District. Although it is called Serrano Water District, it remains an irrigation district by Act. Meanwhile, the Irvine Company received Carpenter Irrigation District's share of capacity in Santiago Reservoir in 1970, long before it was dissolved in 1998 with its few remaining customers annexed to the Irvine Ranch Water District (IRWD - successor water purveyor to the Irvine Company). The District now owns 50 percent of Santiago Dam; IRWD owns 50 percent. The District owns approximately 25 percent of the water in Santiago Reservoir and IRWD owns 75 percent.

3.2 Service Area Physical Description

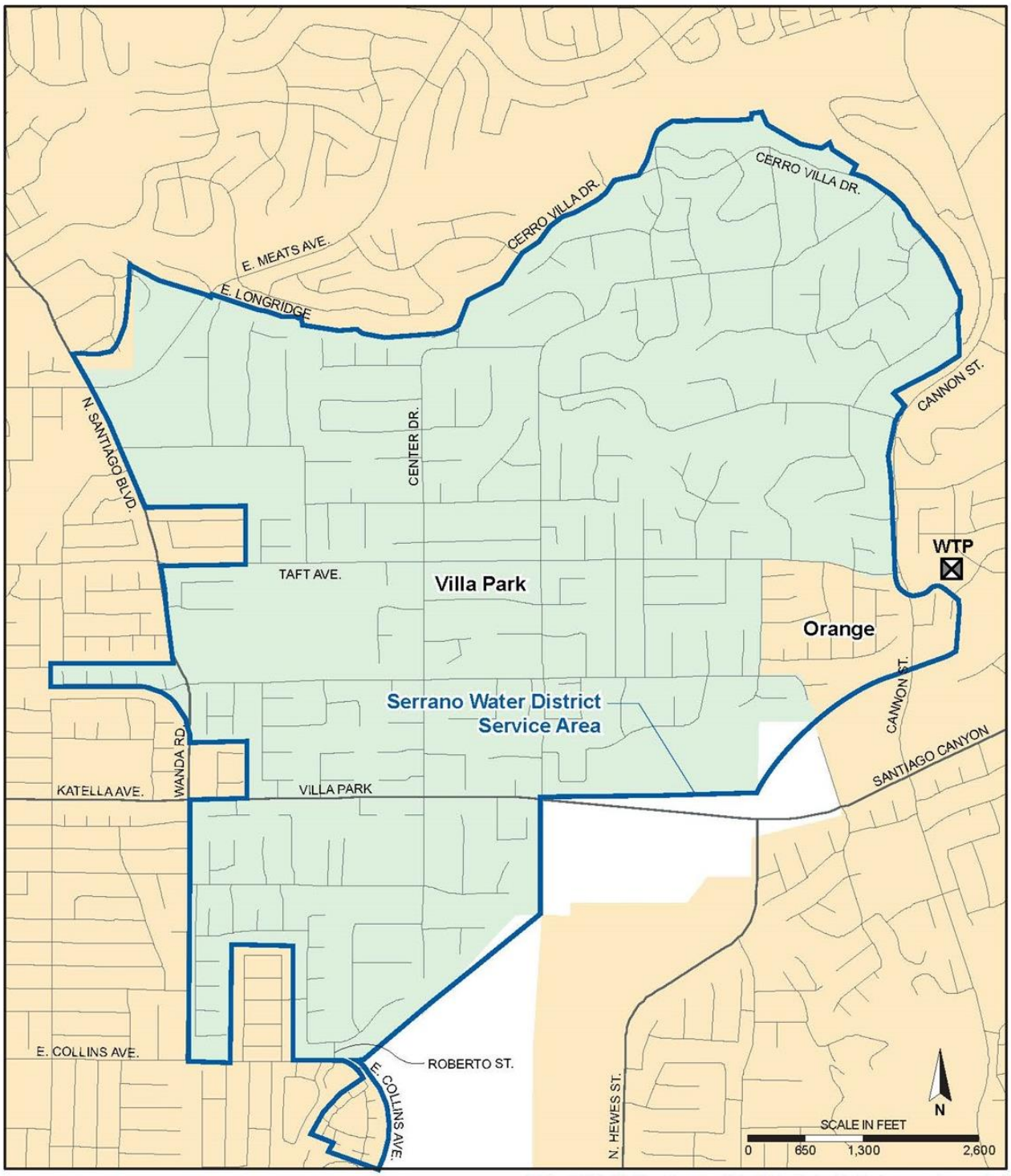
The District provides potable water to residents and businesses within the City of Villa Park and a small area of the City of Orange. The service area is characterized by gently rolling hills and steeper hillside areas ranging in elevation from 280 feet (mean sea level) to 650 feet. There are very few vacant parcels available for development. The service area, presented on Figure 1, had 2,269 service connections for its 6,263 residents and a handful of businesses. The service area boundary is similar to the Orange County Local Agency Formation Commission designated Sphere of Influence for the District except for an area to the east, beyond the Figure 1 map, that is served by another water purveyor and will not be served by the District in the future.

The District service area is in a semi-arid environment with mild winters, warm summers, and moderate rainfall of approximately 14 inches per year, occurring primarily between November and April. The usually mild pattern is infrequently varied with periods of extremely hot weather and windstorms called the Santa Ana winds. The average maximum temperature is 77 degrees Fahrenheit and the average minimum temperature is 55 degrees Fahrenheit. Rainfall in the service area impacts water demands and the local water supplies but it does not influence the imported water supplies which originates in northern California. Climate change is anticipated to result in higher temperatures overall in the service area with greater and more extreme weather fluctuations and events such as droughts and heat waves.

Groundwater is pumped from the Orange County Basin under normal conditions using three wells with a total capacity of 4,300 gallons per minute. The five year average (FY16 through FY20) groundwater production was 1,703 afy. Due to water quality regulations regarding per- and polyfluoroalkyl substances (PFAS), groundwater production halted starting in early 2020. The groundwater supply is discussed in Chapter 6. The 5 year average prior to FY20 was 1,837 acre-feet.

Surface water (local Santiago Creek water rights and imported MWD supply) is conveyed from Santiago Reservoir and treated at the District's Walter E. Howiler, Jr. Water Filtration Plant (WTP). The location of this treatment facility is shown on Figure 1. The treatment facilities produced 2,482 afy or about 2.2 million gallons per day (mgd) under average day conditions for a five year period of FY16 through FY20. The WTP has a capacity of 4 mgd to accommodate maximum day conditions. It is a direct filtration plant upgraded with treatment process modifications (e.g., ozone and chloramines) to accommodate changing drinking water regulations.

The District has a contract with the City of Orange specifying that it will make available a minimum of 1,000 afy of treated surface water (from SWD Santiago Creek water rights or imported from MWD), as available. The District does not always have surplus surface water from Santiago Creek to sell to Orange; if interested, imported water can be purchased for Orange from MWD and stored, treated, and delivered by the District. Over the previous five years (FY16 through FY20), the District sold an average of 1,689 afy to Orange through two interconnections. These interconnections are at Lockett Reservoir and along Santiago Road at Wanda Street near the WTP. The District has been able to provide approximately 1,668 afy on average over the previous ten years (FY10 through FY20) to Orange.



Note: All District lands are within Villa Park city limits except as noted.

LEGEND

- Serrano Water District Service Area
- City of Orange
- City of Villa Park
- SWD WTP

Serrano Water District
Distribution System Area

Figure 3-1

3.3 Climate Change Impacts

Climate change and or greenhouse gas emissions are considered in city and county general plans, California Environmental Quality Act documents, and integrated regional water management plans. By considering potential water supply impacts resulting from climate changes in its UWMP, the District integrates this UWMP with these documents and supports water management functions. Water conserved under the District's water use efficiency program has a direct correlation with reduced greenhouse gas emissions as energy is required to move, treat, use, and discharge water.

Information on the vulnerability of its water supplies and service area water demands is provided here to aid the District in preparing for and adapting to expected climate change impacts. By reducing reliance on imported MWD supplies and relying first on the heavily managed Orange County groundwater basin and local surface water to meet its water demands and sales, the District has greatly reduced its vulnerability to climate change.

Because climate change is such a gradual process, it can be difficult to distinguish the changes described below from the usual variability in supplies and demands. However, more intense storm events and the changing frequency and duration of drought years are becoming evident throughout the state. Therefore, MWD is increasing its water supply options to compensate for State Water Project (SWP) and Colorado River reductions due to climate change. The District will continue to adapt to changing conditions within its service area, as well as maintain its aggressive water use efficiency efforts to reduce greenhouse gas emissions. Portions of this discussion of climate change impacts to the District's water supplies and demands are repeated in chapters 4, 6, and 7 of this UWMP.

3.3.1 Impacts to Imported Supply and Local Surface Water

According to the Public Policy Institute of California,

> "…Air temperatures are projected to increase throughout the state over the coming century. Sea level is expected to rise 39 to 55 inches by 2100, and the frequency of extreme events such as heat waves, wildfires, floods, and droughts is expected to increase. Higher temperatures will result in more rain and less snow, diminishing the reserves of water held in the Sierra Nevada snowpack." (PPIC, 2011)

At the present time, statewide infrastructure to capture precipitation is limited because infrastructure in California was designed to capture slow melting snowpack not rapid stormwater runoff. The following impacts are anticipated to primarily impact the District's imported supply. Many of these impacts also affect the Districts Santiago Creek supply. MWD is anticipating these

impacts and is diversifying its supply portfolio and increasing groundwater banking to compensate for reduced SWP deliveries.

- An increase in average surface temperatures of 5.5 to 10.4 degrees Fahrenheit is anticipated by the end of the century, resulting in up to four times as many heat wave days in urban centers.
- Heat waves will increase in frequency, magnitude, and duration.
- Longer, drier, and more frequent periods of droughts anticipated with up to 2.5 times the number of critically dry years by the end of the century. Modest changes in precipitation can have a large impact on runoff. Lower inflows will make it more difficult to repel salinity in the Sacramento River - San Joaquin River Delta (Delta).
- About 25 to 40 percent of the Sierra snowpack may be lost by 2050. Higher temperatures increase the ratio of rain to snow, accelerate the rate of spring snowmelt, and shorten the overall snowfall season, leading to more rapid and earlier seasonal runoff.
- Over 55 percent increase in risk of large wildfires is anticipated. Fires result in changes in vegetation and eventually a reduction in water supply and storage capacity in the Sierras. Wildfires in the Santa Ana Mountains also impact Santiago Reservoir water supplies.
- More severe (e.g., frequency, intensity) and warmer winter storms are likely to occur, increasing runoff and flooding which could cause Delta levee failure.
- Increased tidal salinity intrusion to the Delta from sea level rise, lower inflows, and Delta levee failures. Without major changes to in-Delta facilities, more fresh water will be needed to repel seawater and maintain water quality standards, especially during drier years.
- Degraded water quality of Delta supplies is anticipated due to changing temperatures, flows, runoff rates and timing, and the ability of watersheds to assimilate wastes and pollutants. Lower Delta inflows during certain times of the year will degrade water quality by increasing temperatures and minimizing the dilution effects of runoff and wastewater discharges. Warmer water can accelerate some biological and chemical processes, increasing growth of algae and microorganisms. Higher winter flows will increase contaminant loadings from nonpoint sources. Intense rainfall following wildfires can degrade water quality.

Since winter snowpack in the Sierra Nevada functions as a major water storage system, this will have serious consequences to annual supply availability in all systems that rely on the runoff. These impacts to statewide water supplies originating from the Delta watershed, as well as current flood control practices on Sierra Nevada reservoirs, will reduce MWD's supplies from the SWP. In addition, flooding in the Delta could have devastating impacts on the reliability of Delta exports with supply outages anticipated for up to one year. These climate change impacts to the District's local surface supply will likely result in lower and greater fluctuations in availability.

MWD also obtains water from the Colorado River. Colorado River flows are anticipated to decrease by 5 to 20 percent in the next 40 years, according to Brad Udall, director of the University of Colorado Western Water Assessment. Earlier runoff and lower flows from the Rocky Mountains later in the year are also anticipated.

3.3.2 Impacts to Groundwater Supply

Although climate changes do impact the natural recharge of groundwater basins, the likelihood of it affecting groundwater resiliency, augmented replenishment, and quality is low. Due to sea level rise, the District's groundwater supplies will have increased pressure on the seawater barriers, perhaps requiring more injection supply to prevent contamination of Orange County Basin groundwater supplies. OCWD's conjunctive use management of the Basin will take on even greater importance as increased quantities of surface water will likely be imported to recharge the Basin, and as more frequent and more intense heat waves and extended dry periods deplete resources and increase demands for those resources. With the reduced Sierra snowpack, groundwater storage throughout the state will be more important as early thaws will require new storage facilities to be made available to accommodate the early flows.

3.3.3 Impacts to Water Demand

Climate change is anticipated to impact water demands through more frequent and more intense heat waves and extended dry periods, which will cause increases in demands in the District's service area. This is evident in demand patterns associated with a first dry water year. It is not known yet if changes in precipitation patterns will offset these increases. In addition, with drier conditions, wildfires in the Santa Ana Mountains (Santiago Reservoir watershed) will likely be more frequent, thus increasing demands for reservoir water supplies used for suppression.

MWDOC has incorporated into its water demand forecast from imported water users an increase of six percent during a dry year (MWDOC, 2021). On a positive note, perhaps with the changes to climate patterns more monsoon conditions may occur in Southern California, resulting in precipitation in the summer reducing outdoor landscaping demands.

3.4 Other Social, Economic, and Demographic Factors

The retail service area is almost entirely built out with few vacant parcels remaining. Villa Park, which has the smallest population of all cities in Orange County, comprises about 95 percent of the District's service area and is almost completely surrounded by Orange. Current and projected population for the District service area is presented in Table 3-1. Historical population estimates prepared for MWDOC by the Center for Demographic Research at California State University Fullerton (CDR) indicate a 2020 service area population of 6,263. Because the City of Villa Park

has a census provided population of 5,790, the remaining 473 population estimated appears to be undercounting the population in the service area that are located in the City of Orange.

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	6,263	6,311	6,394	6,485	6,458	6,403
Note: Center for Demographic Research (CDR), CSUF, 2020, provided by MWDOC.						

3.5 Land Uses within the Service Area

Since the service area is almost entirely within Villa Park, its General Plan provides the policy framework and land use planning for the majority of lands which the District serves; information provided here reflects the adopted plan. The City is 99 percent built out. The majority of lands, 87 percent, are designated for very low density residential uses with large homes on large lots. There are 2,021 housing units as of 2017 (Villa Park, 2017). The General Plan land use designation is Estate Low Density Residential at 1.75 dwelling units per acre (du/ac). The west side of the city has several subdivisions built as low density residential at 2.5 du/ac and several as low-medium density at 3 du/ac. There is one 11 acre neighborhood community center which includes Villa Park City Hall, County library, a contract post office, and retail and professional businesses. There are also four public schools in Villa Park. A condominium project with 423 units and a subdivision of 176 single family homes are located in Orange within the District service area.

According to Villa Park, there are a limited number of vacant parcels within the City that are developable. Most of the remaining developable lands are general planned and zoned for Estate Low Density Residential. There are no vacant parcels in the City of Orange that are within the District service area. Growth in the service area is anticipated to be the result of accessory dwelling units constructed on these large lots.

Chapter 4 – System Water Use

The past, current, and projected water demand by type of use is discussed in this chapter along with projected water demands. Distribution system losses are quantified here. In addition, a discussion of projected water demands for planned low-income households and climate change considerations is provided.

4.1 Water Demand

The District has several billing classifications: residential, commercial (i.e., shopping center, Villa Park government offices, and schools), and landscaping. There are no industrial uses. As required by the Act, Table 4-1 presents 2020 deliveries by water use sector. Table 4-1 also includes losses. Losses or unbilled water are described in Section 4.3 and are based on the difference between production and consumption. Water use since the 2015 UWMP has been reported to the State by the City annually. The sale of water to Orange is provided in this table. The *Agreement for Purchase and Sale of Surplus Water between the District and the City of Orange* is located in Appendix C.

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual

Use Type *(Add additional rows as needed)*	2020 Actual		
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Single Family		Drinking Water	2,277
Other Potable		Drinking Water	120
Landscape		Drinking Water	20
Losses		Drinking Water	102
Sales/Transfers/Exchanges to other agencies		Drinking Water	1,412
Other			
		TOTAL	3,931

NOTES: Other includes commercial, institutional, and govermental demands. Water losses represents non-revenue water of 4.2%. Sales to Orange included here.

The District sells treated water to the City of Orange through interconnections with the distribution systems. The interconnections are at Lockett Reservoir and North Wanda Road at Santiago Boulevard. 1,689 afy was sold to Orange over the previous five years (FY16 through FY20), similar to the 10 year average of 1,668 afy. The 10-year averaged historical sales were utilized in this plan to represent future demands.

4.2 Demand Projections

Table 4-2 presents water demand projections through 2040 for the District service area and sales to Orange. Based on the most recent Villa Park general plan land uses and demographic data from the Center for Demographic Research at California State University Fullerton previously discussed, the projected change in population within the District service area between 2020 and 2040 is minor, as presented in Table 3-1, and the development potential in the service area is very limited, thus minor increases in demands are anticipated. Historical annual sales to Orange range from less than 500 acre-feet to almost 2,000 acre-feet; the average amount sold during the previous 10 years was used for Table 4-2. It was assumed that the FY20 system losses of 4.2 percent are maintained; these losses are included in Table 4-2.

Total water use for the District is comprised of service area water deliveries, associated system losses or non-revenue water, and sales to Orange. Table 4-3 presents the sum of water demands detailed in Tables 4-1 and 4-2.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected

Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*		2025	2030	2035	2040	2045 (opt)
Single Family		2,345	2,392	2,440	2,464	
Other Potable		124	126	129	130	
Landscape		21	21	21	22	
Losses		105	107	109	110	
Sales/Transfers/Exchanges to other Suppliers	Sales to Orange	1,668	1,668	1,668	1,668	
Other						
TOTAL		4,263	4,314	4,367	4,394	

NOTES: Other includes commercial, institutional, and govermental demands. Historical water losses of 4.2% represent non-revenue water and do not include sales to Orange. 10 year average sales to Orange.

Submittal Table 4-3 Retail: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	3,931	4,263	4,314	4,367	4,394	0
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0	0
Optional Deduction of Recycled Water Put Into Long Term Storage	0	0	0	0	0	0
TOTAL WATER USE	3,931	4,263	4,314	4,367	4,394	0
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES: Includes sales to Orange of 1,688 AF.						

4.3 Distribution System Water Losses

Losses included in Table 4-1 for the District retail service area reflect the physical water losses from the water distribution system and storage facilities to the customer meter. Water audits were not conducted in accordance with the water system balance methodology developed by American Water Works Association. This is because the District, with its 2,269 connections and retail deliveries of 2,519 afy in 2020, is a Small Water Supplier, not an Urban Water Supplier (greater than 3,000 service connections or deliver more than 3,000 afy) and is thus exempt from this requirement. However, the District, though not required, is committed to performing a full system water leak correlation analysis every two to three years. In 2019 the District canvased the complete distribution system with a leak noise correlator.

The losses, or unbilled water, provided in Table 4-4 reflect the difference between supply production and customer billing. Losses do not include sales to Orange since its connection is near the WTP where production is measured.

Pursuant to Section 10608.34 of the Water Code, suppliers must show here whether it met the distribution loss standards enacted by the SWRCB which have not yet been adopted. The standards may go into effect after the 2020 UWMPs have been adopted. The estimates of losses are provided in Table 4-4 and all programs initiated by the District to reduce losses are described in Chapter 9. The Guidebook recommends that trending also be included here, but with UWMPs

only requiring loss estimates over the past six years, the wide fluctuations in annual losses, which are typical, do not show a discernable pattern yet.

Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss* (AF)
07/2015	188
07/2016	175
07/2017	124
07/2018	182
07/2019	102
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: These estimates were based on the difference between production and consumption.	

4.4 Inclusion of Future Water Savings

The Drought Risk Assessment procedures presented in Chapter 7 are intended to indicate likely benefits from triggered Water Shortage Contingency Plan responses presented in Chapter 8. Therefore, the forecasted demands in Table 4-2 do not reflect the benefits of Water Shortage Contingency Plan responses. Water conservation actions already in place are embedded in the projections. This is noted in Table 4-4.

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	No
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES:	

4.5 Water Use for Lower Income Households

SB 1087 requires water providers to grant priority service hook-ups to lower income housing developments. The UWMP Act requires documentation of future water demands associated with

planned new lower income housing by the local land use planning jurisdiction. Villa Park's most current Housing Element of the General Plan indicates the need for 17 dwelling units within the City within the 2013-2021 planning period, with more anticipated with future statewide housing needs assessments. According to the 2017 Housing Element of the General Plan, there are limited sites available to contribute to meeting its lower income housing requirements (Villa Park, 2017). There is some potential for rezoning a portion of the only commercial center in the City to accommodate multi-family housing.

According to the City Housing Element and the Planning Director, to meet the lower income housing requirements, the City is working with the State to allow second units to quality as low and extremely low income housing. Second units are also called in-law units or Accessory Dwelling Units (ADU). The City permits second units in conformance with State law. Given the low density single family character of the city and the very limited amount of land available for new development, second units are an important option for affordable housing. It is likely that some existing second units are occupied by family members or household employees with minimal or no rent charged, and therefore qualify as extremely-low-income units. Second units rented at market rates are likely affordable to moderate-income households. The land inventory in the Housing Element assumes that second unit construction will continue at the current pace, generating approximately 16 additional units during the planning period. About six units were permitted in 2021 to-date but have not yet been built.

The homes in Villa Park are on very large, lushly landscaped lots. Replacing outdoor landscaping with an ADU, even at the upper limit of 1,200 square feet, is likely to result in an overall decrease in consumption for that residence. As indicated in Table 4-4, water demands for planned low income housing were included in the demand projections presented in Table 4-2. There are no constraints to providing water service for low income housing except for a few lots on private streets where the District does not have an easement for pipelines; these few ADUs, if any, may require a longer service line than most lots require.

4.6 Climate Change Considerations

As discussed in Chapter 3, climate change is anticipated to result in an increase in outdoor water demands due to the higher temperatures and more intense and frequent extreme weather conditions. MWDOC increased its demand projections by six percent to accommodate impacts from climate change. The drought risk assessment in Chapter 7 reflects an increase for the District of 6.9 percent.

Chapter 5 – Baseline, Target, and Compliance

The DWR Guidebook for Urban Water Suppliers describes the Water Conservation Act of 2009, also known as SB X7-7 and its reporting requirements (DWR, 2021). The driver behind the legislation was to reduce Statewide urban water use by 20 percent by the year 2020. Each retail urban water supplier determined its baseline water use then established a reduced target water use for the years 2015 and 2020. In this round of 2020 UWMP, retail agencies demonstrate compliance with their established water use target for the year 2020. Regional compliance is also available through the MWDOC Regional Alliance.

However, not only is SWD a member of the Orange County 20x2020 Regional Alliance which has met its overall target for 2020, but the District exceeded its individual retail 2020 target with a lower per capita consumption. This is discussed in this chapter.

5.1 Establishing Baseline

Table 5-1 presents the base period ranges for the District's 10 year (FY99 through FY08) and five year (FY04 through FY08) periods. A 10 year base period range was used instead of a 15 year base period range because the District was not using recycled water in 2008. The baseline daily per capita consumption for the 10-year period was 466 gallons per capita per day (gpcd). This is an important number as the targets are based on reducing this consumption level.

Submittal Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1999	2008	466	373
5 Year	2004	2008	464	

*All values are in Gallons per Capita per Day (GPCD)

NOTES:

The SB X7-7 compliance worksheets prepared and submitted to DWR with this UWMP can be found in Appendix D. In these tables District population served, volume of water supplied, and

per capita consumption for each of the years within the 10-year range and the 5-year range were documented.

The five-year baseline is a target confirmation. It is needed to determine whether the 2020 target meets the legislation's minimum water use reduction requirements of at least a five percent reduction per capita for a five-year continuous period. The baseline daily per capita consumption for the five-year period was 464. Ninety-five percent of the five-year base is 441 gpcd. As discussed next under targets, 441 gpcd is higher than the 2020 target for the District of 373 gpcd, thus the District target is greater than a five percent reduction per capita over the five-year period and can be used.

5.2 Establishing Target

Individual agency targets are needed to meet the goal of a 20 percent reduction in per capita use by 2020 as set forth in the Water Conservation Act of 2009 (SB X7-7). If the individual target is not met, then a regional alliance target can be used.

5.2.1 Individual District SB X7-7 Target

DWR provided four different methods to establish water conservation targets. Method 1, Baseline Reduction Method was employed. Methodology 1 required a straightforward technical analysis of reducing baseline per capita consumption by the targets. The District baseline per capita consumption identified in SB X7-7 tables is 466 gpcd. A 20 percent reduction would result in 373 gpcd by 2020.

The District has worked hard since the last UWMP in targeting conservation efforts to meet its 2020 per capita target. The 2020 demands of 359 gpcd are below the 2020 target of 373 gpcd, thus the District met its 2020 target individually, as presented in Table 5-2. The 2015 target was 419 gpcd and actual use was 392 gpcd, below the target.

As discussed in Chapter 6, the District receives credit for the amount of wastewater generated in the District that is then used to recharge the groundwater basin. This indirect potable reuse of 420 AF in 2020 can contribute to the District meeting its target, but it was met without needing this inclusion.

5.2.2 Regional Alliance

MWDOC formed a regional alliance for its member agencies, of which the District is a member. Under the regional alliance, the entire region is able to benefit from local and regional investments such as the groundwater replenishment with recycled water, direct recycled water use, and water use efficiency programs that MWDOC and its member agencies are implementing. MWDOC provides annual monitoring and reporting for its region on progress toward compliance with the regional target. If the regional alliance meets its water use target, all agencies in that

alliance are deemed compliant regardless of individual performance. If MWDOC' regional alliance fails to meet its target, each individual supplier, including the District, will have to meet their individual targets.

As presented in its 2020 UWMP, MWDOC calculated the regional target for the alliance as 158 gpcd by 2020. Because the gross 2020 water use for the alliance was 146 gpcd, the regional alliance target was met. With credits for indirect potable reuse and recycled water direct use, 2020 water use was further reduced to 109 gpcd, easily meeting the regional target. (MWDOC, 2021).

Submittal Table 5-2: 2020 Compliance From SB X7-7 Compliance Form
Retail Supplier or Regional Alliance Only

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD		
359	0	0	373	Yes
**All values are in Gallons per Capita per Day (GPCD)*				
NOTES: MWDOC Regional Alliance, of which SWD is a member, also met its 2020 target.				

Chapter 6 – System Supplies

The District's primary water supplies are surface water from Santiago Reservoir (e.g., Irvine Lake) and groundwater. These supplies are supplemented with imported MWD untreated supply when Santiago Reservoir inflow is low. The District has rights to approximately 25 percent of the Santiago Reservoir inflow. Imported water from MWD is conveyed directly to Santiago Reservoir from MWD's Lake Mathews and is conveyed into the service area treatment facilities intermingled with local surface water. Supplies discussed here reflect gross water that could enter the District's distribution system as production quantities and includes sales to Orange.

6.1 Purchased Imported Water

MWD imports supplies to the region for MWDOC to wholesale to the District. The District purchased imported water during four of the previous five years. The maximum amount of water purchased by the District from MWDOC/MWD in the past ten years was 4,681 acre-feet in the fourth drought year of FY15. This supply is available to the District to augment its local supplies when necessary.

6.1.1 MWD Wholesale Supplies

Over 19 million Southern Californians rely on MWD for imported water. MWD wholesales imported water supplies to member cities and water districts in six Southern California counties. MWD provides between 45 and 60 percent of the municipal, industrial, and agricultural water used in its nearly 5,200 square-mile service area. The remaining supply comes from local wells, local surface water, recycled water supplies, and other regional sources.

Historically, MWD has been responsible for importing water into the region through its operation of the Colorado River Aqueduct and its contract with the State of California for SWP supplies. MWD has been working to increase its ability to supply water, particularly in dry years. MWD increased supplies received from the SWP by developing flexible Central Valley/SWP storage and transfer programs to deliver additional dry year supplies that can be conveyed through the Delta during dry years and during times of Delta regulatory restrictions. The MWD 2020 UWMP provides detailed documentation of current and projected MWD supplies and deliveries to ensure supply reliability under climate change and other vulnerable conditions (MWD, 2021).

6.1.2 MWDOC's Role

MWDOC is a regional water wholesaler and resource planning agency, managing Orange County's imported water supply to 28 water purveyors. These MWDOC member agencies, comprised of

cities and water districts, provide water to 3.2 million customers in service area that covers all of Orange County except the cities of Anaheim, Fullerton, and Santa Ana. MWDOC is MWD's second largest member agency. To aid in planning future water needs, MWDOC works with its member agencies each year to develop a forecast of future water demand. The result of this coordination effort allows MWDOC to forecast the imported demand by subtracting total demand from available local supplies. MWDOC then advises MWD annually on how much water MWDOC anticipates to purchase during the next five years.

6.1.3 SWD Imported Purchases

When local supplies are limited, the District's supply needs are augmented by water imported by MWD through MWDOC. Lake Mathews, a 39 square mile watershed drained by Cajalco Creek, is located in western Riverside County east of the Santa Ana Mountains, 10 miles southwest of the City of Riverside. Lake Mathews was constructed in the 1930's as the terminal reservoir for MWD's Colorado River Aqueduct. It also receives local runoff and is capable of receiving an increasing quantity of SWP supply (or other supplies conveyed through the California Aqueduct) via MWD's Inland Feeder. When the District purchases untreated imported water, it is delivered from Lake Mathews via the Lower Feeder and Santiago Lateral to Santiago Reservoir.

The imported MWD supply is purchased for direct District treatment and use, stored in Santiago Reservoir for future District use, for sale to Orange after treatment, purchased for IRWD and OCWD exchanges, and other arrangements. This supply costs more than the District's other supplies.

The amounts purchased for District use varies greatly from the amount used each year due to the benefits of Santiago Reservoir storage capabilities. During the five year period of FY16 through FY20, the District purchased water all but one year. The average amount of imported water purchased during the four years of purchases was 1,197 acre-feet with a high of 2,199 acre-feet in FY17, and a ten year average of 1,523 acre-feet.

The reliability of MWD's supply was addressed in its 2020 UWMP and in MWDOC's 2020 UWMP and is summarized in Chapter 7. MWD ensures a highly reliable supply of water – over 100 percent of average annual demands – to its member agencies during average, dry year, and multiple dry years. The District will continue to purchase MWD water as a supplemental supply during years when local surface supplies at Santiago Reservoir, augmented with groundwater, do not meet demands or are needed for operational purposes in keeping the WTP producing consistently.

6.2 Groundwater Resources

The District owns and operates two wells (Well Nos. 3 and 5) which provided an annual average of 1,835 afy over the last ten years. The three wells have a total capacity of 3,200 gallons per minute (gpm). Groundwater is pumped from the Lower Santa Ana Groundwater Basin which is also known as the Orange County Groundwater Basin (Basin) underlying the northern half of Orange County.

6.2.1 Orange County Groundwater Basin

The OCWD manages the Orange County Groundwater Basin (DWR Basin 8-1) with the goals to 1) protect and enhance groundwater quality, 2) protect and increase the sustainable yield of the basin in a cost-effective manner, and 3) to increase the efficiency of OCWD operations. The OCWD was formed in 1933 to manage the Basin.

OCWD Basin Management. The Basin has not been adjudicated. Producer's rights consist of municipal appropriators' rights and may include overlying and riparian rights. OCWD manages the Basin under the Orange County Water District Act, Water Code App., Ch 40. OCWD manages the basin for the benefit of municipal, agricultural, and private groundwater producers and is responsible for the protection of water rights to the Santa Ana River in Orange County as well as the management and replenishment of the Basin. The groundwater basin, which underlies north and central Orange County, provides 60 to 70 percent of the water needed in that area; imported water meets the balance of the water demand. Groundwater is pumped by producers before being delivered to customers.

The framework for basin production management is based on establishing a Basin Production Percentage (BPP). BPP is the ratio of groundwater production to total water demands expressed as a percentage and applied uniformly to all producers on an annual basis. Pumping below the BPP, the District is charged a fee on a per acre-foot basis, called the Replenishment Assessment (RA). Groundwater production above the BPP is charged the RA and the Basin Equity Assessment (BEA), which is set so that the cost of pumping above the BPP reflects the costs of importing water to use to replenish the Basin. Thus a financial disincentive is provided for production above the BPP. The OCWD Board of Directors can annually adjust the BPP. The BPP was established at 75 percent from 1993 to 2007 and reduced to 62 percent in water year 2009-10. It was lowered to reduce the accumulated overdraft in the Basin. The BPP is currently set at 77 percent and is anticipated to be set at 82 percent by 2025. The BPP is not an extraction limitation – exceedances are allowed but result in financial assessments on the excess production.

In 2014, the California Sustainable Groundwater Management Act (SGMA) was passed. The law provides authority for agencies to develop and implement groundwater sustainability plans (GSP) or alternative plans that demonstrate the basin is being managed sustainably. The Orange County

Groundwater Basin is designated by DWR as a medium priority basin due to heavy reliance on this water source, and therefore must form a Groundwater Sustainability Agency and adopt a GSP or OCWD can submit an alternative to a GSP. On January 1, 2017, the Orange County Water District, City of La Habra, and Irvine Ranch Water District submitted the Basin 8-1 Alternative (Alternative) to DWR. Elements required in GSPs as described in the California Water Code (§10727.2, 10727.4, and 10727.6) have been incorporated into the Alternative. Prior to the Alternative, OCWD provided five groundwater management plans. The first was published in 1989 and its last was published in 2015. The Basin 8-1 Alternative is designed to be functionally equivalent to a GSP and will be updated every five years per SGMA requirements (OCWD, 2021). Basin 8-1 Alternative demonstrates that the basin has operated within its sustainable yield over a period of at least 10 years.

Description of Basin. According to the MWDOC 2005 UWMP, the Orange County Groundwater Basin is dominated by a deep structural depression containing a thick accumulation of fresh water bearing interbedded marine and continental sand, silt and clay deposits. The proportion of fine material generally increases toward the coast, dividing the Basin into Forebay and pressure areas. Consequently, most surface water recharge is through the coarser, more interconnected and permeable forebay deposits. Strata in this Basin are faulted and folded, and may show rapid changes in grain size. The Newport-Inglewood fault zone parallels the coastline and generally forms a barrier to groundwater flow. Erosional channels filled with permeable alluvium break this barrier in selected locations called “Gaps’. In addition to this geologic feature, increased pumping from inland municipal wells causes the coastal gaps at Talbert, Bolsa, Sunset, and Alamitos to be susceptible to seawater intrusion. The sediments containing easily recoverable fresh water extend to about 2,000 feet in depth near center of the Basin. Although water-bearing aquifers exist below that level, water quality and pumping lift make these materials economically unviable at present. Well yields range from 500 to 4,500 gallons per minute, but are generally 2,000 to 3,000 gallons per minute.

Upper, middle, and lower aquifer systems are recognized in the basin. The upper aquifer system, also known as the “shallow” aquifer system, includes Holocene alluvium, older alluvium, stream terraces, and the upper Pleistocene deposits represented by the La Habra Formation. It has an average thickness of about 200 to 300 feet and consists mostly of sand, gravel, and conglomerate with some silt and clay beds. Generally, the upper aquifer system contains a lower percentage of water-bearing strata in the northwest and coastal portions of the area where clays and clayey silts dominate. Accordingly, recharge from the surface to the groundwater basin may be minor in these areas. Recharge to the upper aquifer system occurs primarily in the northeastern portions of the Basin. With the exception of a few large system municipal wells in the cities of Garden Grove, Anaheim, and Tustin, wells producing from the shallow aquifer system predominantly have industrial and agricultural uses. Production from the shallow aquifer system is typically about five percent of total Basin production. The middle aquifer system, also known

as the “principal” aquifer system, includes the lower Pleistocene Coyote Hills and San Pedro Formations, which have an average thickness of 1,000 feet and are composed of sand, gravel, and a minor amount of clay. The primary recharge of the middle aquifer system is derived from the Santa Ana River channel in the northeast of the County. The middle aquifer system provides 90 to 95 percent of the groundwater for the Basin.

The lower aquifer system (or deep aquifer) includes the Upper Fernando Group of upper Pliocene age and is composed of sand and conglomerate 350 to 500 feet thick. Logs of this aquifer indicate that it would probably yield large quantities of fresh water to wells, but this zone has been found to contain colored water, and the aquifer is too deep to economically construct production wells. With the exception of several production wells, few wells penetrate the deep aquifer system. Increasing accumulated overdraft of the Basin since the late 1990s has prompted increased evaluation of the Basin’s yield and how the yield can be optimized through projects and programs. As a response to various factors, including a series of years with below average precipitation and the increased accumulated overdraft, in 2003 OCWD reduced the BPP to decrease pumping from the Basin. Currently, over 300,000 afy of groundwater is produced from approximately 400 active wells within the Basin, approximately 200 of which produce less than 25 afy. Groundwater production from approximately 200 large capacity or large system wells operated by the 21 largest water retail agencies account for an estimated 97 percent of the total production.

Groundwater production is generally distributed uniformly throughout the majority of the Basin with the exceptions of the Irvine and Yorba Linda subbasins, the immediate coastal areas, and the foothill margins of the Basin, where little to no production occurs. Increases in coastal production would lead to increased stress on the Talbert and Alamitos Barriers, requiring additional barrier capacity.

Working closely with OCWD, MWDOC has developed a water balance model, which incorporates OCWD’s operating policies in managing the Basin. It is used to project the groundwater production for each producer in the Basin based on a range of assumptions provided by OCWD. Most of the assumptions involve replenishment supplies to the Basin. Historical groundwater flow was generally toward the ocean in the southwest, but modern pumping has caused groundwater levels to drop below sea level inland of the Newport-Inglewood fault zone. This trough-shaped depression encourages sea water to migrate inland, which if unchecked, could contaminate the groundwater supply. Strategic lines of wells in the Alamitos and Talbert Gaps inject imported and reclaimed water to create a mound of water seaward of the pumping trough to protect the Basin from seawater intrusion.

In addition to operating the percolation system, OCWD also operates the Talbert Barrier in Fountain Valley and Huntington Beach, and participates in the financing operation of the

Alamitos Barrier in Seal Beach and Long Beach. The barriers help prevent seawater intrusion and also help refill the Basin (MWDOC UWMP 2005). A link to the Orange County Groundwater Management Plan can be found in Appendix E of this report.

Recharge Supplies. Sources of recharge water include Santa Ana River base flow and storm flow, Santiago Creek flows, imported supplies purchased from MWD, supplemental supplies from the upper Santa Ana River watershed, and purified water primarily from the Groundwater Replenishment System (GWRS). The GWRS – the world's largest wastewater purification system for indirect potable reuse – is located in Fountain Valley and takes highly treated wastewater and purifies it. The recycled supply is then used to recharge the Basin through spreading grounds along the Santa Ana River. The GWRS is a joint project of Orange County Sanitation District (OCSD) and OCWD. After wastewater is treated by OCSD, it flows to the GWRS where it undergoes a purification process consisting of microfiltration, reverse osmosis, and ultraviolet light with hydrogen peroxide. The product water is near distilled quality. About 35 mgd of GWRS water is pumped into injection wells for the Talbert Seawater Barrier. Another 65 mgd is pumped to the OCWD percolation basins, Kraemer, La Palma, Miller, and Miraloma, all located in Anaheim. The water filters through sand and gravel to the deep aquifers of the basin to increase local drinking water supply. About 30 percent of the Basin recharge water comes from GWRS.

The GWRS is being expanded at this time to maximize water reuse. The project will increase treatment capacity from 100 mgd to 130 mgd. The final phase of the project is under construction and expected to be completed in 2023 (OCWD, 2021). This is a key project in reducing Orange County's reliance on imported Delta supplies.

Basin Overdraft. DWR has not identified the Basin as overdrafted. OCWD's act defines annual basin overdraft to be the quantity by which production exceeds the natural replenishment of groundwater supplies during a water year. Efforts undertaken by OCWD to eliminate long-term overdraft in the Basin are described in OCWD's Master Plan and Groundwater Management Plan Update.

The accumulated overdraft is defined by the act to be the quantity of water needed in the Basin Forebay to prevent landward movement of seawater into the fresh groundwater body. However, seawater intrusion control facilities have been constructed and are planned for construction since the act was written and have been effective in preventing landward movement of seawater into the fresh groundwater body. These facilities allow greater utilization of the Basin's storage capacity. In addition, spreading grounds adjacent to and within the Santa Ana River are managed to maintain groundwater levels.

6.2.2 Groundwater Recently Pumped

Table 6-1 presents the amount of groundwater pumped by the District over the previous five years. In February 2020, SWD was forced to shut their wells down due to the State of California's PFAS/PFOA Notification Levels. SWD has been using native Santiago Reservoir water in place of well water. Groundwater production is anticipated to resume in the fall of 2021.

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List***	Location or Basin Name	2016	2017	2018	2019	2020
Add additional rows as needed						
Alluvial Basin	OC Groundwater Basin	1,209	1,884	2,110	1,926	1,385
	TOTAL	1,209	1,884	2,110	1,926	1,385
NOTES:						

6.2.3 Groundwater Projected to be Pumped

Although the current BPP is 77 percent, with the emergence of PFAS affecting groundwater production in the Basin, groundwater is not expected to be pumped by SWD until the fall of 2021. When treatment is in place, the amount of groundwater allowed to be pumped by the District will be based on the current BPP for the Basin at the time of pumping. There are no other changes or expansions planned by the District for this groundwater supply at the present time. The District's existing production facilities have capacity to accommodate the expected 82 percent BPP demands on the system in 2025 plus increased demands as needed during dry years. 82 percent of projected demands was used here as the projected water supply under normal years.

Groundwater levels fluctuate depending on numerous factors including Basin storage and Santa Ana River water capture, which are influenced by climatic conditions. During past single dry year and multiple dry year events, groundwater supplies were available above the District's BPP in this non-adjudicated Basin, but at a higher price.

6.3 Surface Water

The District utilizes local surface water from the Santiago Creek watershed, as described in Section 3.2. Santiago Reservoir is commonly referred to as Irvine Lake. Santiago Reservoir was formed by Santiago Dam No. 75 (Santiago Dam) which was built in 1931. Santiago Reservoir

captures flows from Santiago Creek and its tributaries above Santiago Dam within a 63 square mile watershed. The reservoir has a maximum capacity of 28,000 acre-feet. The majority of watershed lands are undeveloped with approximately 2,500 people living in the watershed in the communities of Silverado, Modjeska, and Williams canyons (SWD, 2019). The Santiago Dam is planned to undergo a retrofit in the coming years to reenforce the spillway.

The District has water rights to approximately 25 percent of the supply flowing into Santiago Reservoir; availability is subject to precipitation in the watershed and varies year to year. IRWD owns the remaining 75 percent. The original Operating Agreement between the Irvine Company and Serrano Irrigation District can be found in Appendix E.

Villa Park Dam is downstream of Santiago Reservoir and is owned and operated by the Orange County Public Works Engineering Department for flood control purposes. Villa Park Dam captures spills from Santiago Reservoir during times of heavy precipitation as well as runoff from Fremont and Weir canyons. The District has rights to overflow supply after April 1 of each year which is accounted for within the Santiago Reservoir local surface supplies.

Surface water availability from Santiago Reservoir varies greatly each year. For the 2015 UWMP, FY11 inflow of 3,491 acre-feet was used for the projected water supply. A volume of 2,546 acre-feet was realized in FY20 and is used here for the average projected local surface water supply availability. As discussed in Chapter 7, this amount is dependent on precipitation in the Santiago Creek watershed.

6.4 Stormwater

Stormwater is not currently being intentionally diverted and captured within the District service area for beneficial reuse. Stormwater captured from the Santiago Creek watershed is stored in Santiago Reservoir as the District's local surface supply.

6.5 Wastewater and Recycled Water Opportunities

Recycled water provides a reliable and drought proof water source and could greatly reduce the region's reliance on imported supplies. However, the District does not own or operate wastewater treatment facilities. As shown on Table 6-2, the City of Villa Park sends all wastewater to approximately 14 miles to OCSD for treatment and disposal. Due to the distance of the recycled water supplies to the District service area and the lack of a recycled water infrastructure, there are no plans to use recycled water in the near future. However, wastewater generated within the District's service area (see Table 6-3) is recycled by Orange County Sanitation District in conjunction with OCWD and used for indirect potable recharge, recharging the Orange County Groundwater Basin as discussed below.

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020							
☐	There is no wastewater collection system. The supplier will not complete the table below.						
	Percentage of 2020 service area covered by wastewater collection system *(optional)*						
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*						
Wastewater Collection			**Recipient of Collected Wastewater**				
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*	
Add additional rows as needed							
City of Villa Park	Estimated	772	Orange County Sanitation District	Reclamation Plant No. 1 or Treatment Plant No. 2	No	No	
Total Wastewater Collected from Service Area in 2020:		772					
NOTES: Wastewater in AF collected based on population and unit flow coefficient of 110 gpcd.							

6.5.1 Recycled Water Coordination

Currently the District does not utilize or directly provide recycled water to any of its customers, as presented in Table 6-4. However, the District pumps groundwater from the Basin which is protected through seawater intrusion barriers and enhanced with groundwater recharge facilities (both owned and operated by OCWD) after further treating of OCSD's highly treated wastewater effluent.

The District benefits indirectly from the replenishment of the Orange County groundwater basin using the GWRS water that meets State and Federal drinking water standards. The GWRS, described in Section 6.2.1 under Recharge Supplies, takes highly treated wastewater from areas including the SWD service area, then injects it into a seawater barrier to help prevent seawater intrusion. This purified water is also percolated into deep aquifers where it becomes part of Orange County's, and the District's, drinking water supply.

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

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

WWTP Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level ***Drop down list***	2020 volumes: Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Add additional rows as needed											
						Total	0	0	0	0	0

NOTES:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

☑ Recycled water is not used and is not planned for use within the service area of the supplier.
The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water:	
Name of Supplier Operating the Recycled Water Distribution	
Supplemental Water Added in 2020 (volume) *Include units*	
Source of 2020 Supplemental Water	

Beneficial Use Type	Potential Beneficial Uses of Recycled Water (Describe)	Amount of Potential Uses of Recycled Water (Quantity) *Include volume units*	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020	2025	2030	2035	2040	2045 (opt)
				Total:	0	0	0	0	0	0
				2020 Internal Reuse						

**IPR - Indirect Potable Reuse*

NOTES:

6.5.2 Wastewater Collection, Treatment, and Disposal

OCSD operates the third largest wastewater system on the West Coast, consisting of nearly 600 miles of trunk sewers, two regional treatment plants, and an ocean discharge system. The City of Villa Park owns and operates the sanitary sewer collection system in coordination with OCSD who owns, operates, and maintains the trunk system. The trunk system conveys flow to OCSD's treatment facilities. OCSD has an extensive system of gravity flow sewers, pump stations, and pressurized sewers called force mains.

The Villa Park sewer system was constructed primarily in the 1960's and 1970's. It has approximately 153,000 linear feet of collector and trunk sewer mains ranging in size from 8 to 15 inches in diameter. Some of the trunk mains are joint use mains with the City of Orange. A "Sewer Service User Charge", which is assessed on the property tax role and based on land use, is for maintenance and rehabilitation of the sewer system within the City. OCSD, of which Villa Park is a member, assesses a "sewer hook-up fee" and a "sewer acreage fee" to support the regional treatment facilities, operations, and new trunk lines.

OCSD's Reclamation Plant No. 1 is located in the City of Fountain Valley about four miles northeast of the ocean adjacent to the Santa Ana River. The plant provides advanced primary and secondary treatment and supplies secondary treatment water to OCWD which further treats and distributes the water for various uses, including irrigation, groundwater recharge, and operation of coastal seawater barrier system.

The treatment process at Reclamation Plant No. 1 includes secondary treatment through an activated sludge system. This plant receives raw wastewater from six interceptors. The secondary effluent is either blended with the advanced primary effluent and routed to the ocean disposal system, or is sent to OCWD facilities for advanced treatment and recycling. The solid materials removed in the treatment systems are processed in large tanks to facilitate natural decomposition. Half of the material is converted to methane, which is burned as fuel in the energy recovery system, and the remaining solids are used as a soil amendment or fertilizer in other southern California counties.

OCSD's Treatment Plant No. 2 is located in the City of Huntington Beach about 1,500 feet from the ocean adjacent to the Santa Ana River. This plant provides a mix of advanced primary and secondary treatment. The plant receives sewage through five major sewers. The treatment process is similar to Plant No. 1. Approximately 33 percent of the influent receives secondary treatment through an activated sludge system, and all of the effluent is discharged to the ocean disposal system. OCSD's treated wastewater that is not recycled by OCWD is discharged through an ocean outfall at a depth of approximately 200 feet below sea level and nearly five miles offshore from the mouth of the Santa Ana River.

Because of the long distance to a recycled water source for the District service area and the City of Orange, and the lack of infrastructure to deliver the supply, it is not anticipated that recycled water will be made available to the District or Orange in the foreseeable future. The District recognizes that if recycled water becomes available, there are several school grounds located in the northwest and west-central area of the service area that could be irrigated with the supply, but its feasibility would depend on additional investigations. There are no industrial uses in the service area and landscaping demands for the limited commercial and extensive low density residential land uses would not likely be cost effective to support the cost of infrastructure to extend this source to the service area. As presented in Table 6-5, the District did not project in the 2015 UWMP to use or distribute any recycled water within the District service area by 2020.

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

☑	Recycled water was not used in 2015 nor projected for use in 2020. The Supplier will not complete the table below.

Use Type	2015 Projection for 2020	2020 Actual Use
Total	0	0

NOTES:

6.6 Desalinated Water Opportunities

Currently there are no identified District desalination projects for either ocean water or impaired groundwater. Ocean water desalination projects being planned at Huntington Beach and Dana Point will benefit the region and therefore indirectly benefit the District.

6.7 Exchange or Transfer Opportunities

MWD, MWDOC, and OCWD have and will continue to explore opportunities for water exchanges and transfers that benefit the region and reduce reliance on Delta supplies. Water transfer opportunities using MWDOC and MWD facilities as well as in-lieu options with OCWD and others are obtainable, if necessary. However, based on the current availability of groundwater, local surface water, and imported supplies, and the cost to develop new supplies, no water transfers are being considered by the District at this time.

6.8 Future Water Projects

Based on the current availability of groundwater, local surface water, and imported supplies to the District, no new water projects or supply programs are being considered for District implementation at this time, as presented in Tables 6-6 and 6-7. MWD and MWDOC are pursuing water supply projects and programs, which will increase reliability of imported supplies to the region and augment supplies with regional projects.

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
		Total	0
NOTES:			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						
NOTES:						

6.9 Summary of Existing and Planned Sources of Water

Table 6-8 presents the water supply sources and volumes utilized by the District in FY20. Because of the availability of water stored in Santiago Reservoir and the availability of groundwater, there was no purchased imported water from MWD. The local surface supply provided approximately 2,546 acre-feet for use in both the service area and to sell to Orange. Groundwater was reduced in FY20 due to regulatory concerns with only 1,385 acre-feet provided for the fiscal year.

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Groundwater (not desalinated)	OC Groundwater Basin	1,385	Drinking Water	
Surface water (not desalinated)	Santiago Reservoir	2,546	Drinking Water	
Purchased or Imported Water	MWDOC/MWD	0	Drinking Water	
	Total	3,931		0
NOTES:				

Table 6-9 presents the supplies available to the District under its current supply portfolio. The potable supplies reflect water that can enter the District distribution system as production quantities. Local surface supplies available to the District in the future were based on the average availability of 1,542 afy. Purchased imported water quantities presented in Table 6-9 represent the maximum amount of water purchased by the District from MWDOC/MWD in the past ten years, which was 4,681 acre-feet in FY15. The projected groundwater supply is based on the BPP of 82 percent of projected water demands. Even though groundwater and local surface water supplies are used before purchasing imported water, imported water has been made available to the District as needed to meet needs in the past and will be available in the future (MWD, 2020). The District utilizes the local surface water first, followed by groundwater, then meets its remaining needs with purchased imported water.

6.10 Special Conditions

Special conditions such as climate change and regulatory factors may affect the District's water supplies. As discussed previously, hydrologic conditions greatly affect surface water supplies. Regulatory conditions related to water quality can also affect the availability of supplies, currently the groundwater supplies. Potential impacts to water supplies from climate change was discussed in Section 3.3. Although it certainly impacts the replenishment of groundwater supplies, climate change has a greater effect on surface water supplies because they are more directly impacted by seasonal hydrologic conditions.

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		**2025**		**2030**		**2035**		**2040**		**2045** *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed											
Groundwater (not desalinated)	OC Groundwater Basin	2,128		2,170		2,214		2,236			
Surface water (not desalinated)	Santiago Reservoir	1,542		1,542		1,542		1,542			
Purchased or Imported Water	MWDOC/ MWD	4,681		4,681		4,681		4,681			
Total		8,351	0	8,393	0	8,437	0	8,459	0	0	0
NOTES: Groundwater reflects 82% BPP applied to projected demands. Local surface water based on average availability. Purchases of MWDOC/MWD supply based on the highest annual purchase during the previous ten years (i.e., FY15).											

MWD has conducted extensive analyses on impacts from climate change on its water supplies. The potential impacts and risks associated with climate change and other major uncertainties and vulnerabilities have been incorporated into its current IRP process. This includes potential climate change impacts to DWR's SWP supplies, and MWD's Colorado River supplies.

Regulatory conditions impacting the imported supply were assessed by MWD in its 2020 UWMP. Availability of SWP and Colorado River supplies incorporated restrictions on the SWP and CVP operations in accordance with water quality objectives established by the SWRCB, biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on October 21, 2019, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on March 31, 2020. In addition, amendments to the Coordinated Operations Agreement between the CVP and SWP made in 2018 were taken into consideration. In dry or below normal water year conditions, MWD increases supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs, as well as other storage and transfer programs. The goal being to develop additional dry year supplies that can be conveyed through the California Aqueduct during dry conditions and Delta regulatory restrictions.

6.11 Energy Reporting

A new requirement of Water Code 10631.2(a) is the need to provide an estimate of the amount of energy used to produce and convey water supplies. Energy use for production and conveyance includes extracting or diverting supplies, conveying, treating, and storing and distributing water through the distribution system. Water supply energy intensity was calculated for the 2020 calendar year (January 1 thru December 31). This is a standard for energy and greenhouse gas reporting to the Climate Registry, California Air Resources Board, and the United States Environmental Protection Agency. Calendar year reporting provides consistency when assessing direct and indirect energy consumption within a larger geographical context, as fiscal year starting dates can vary between utilities and organizations.

The District obtained energy consumption data directly from Southern California Edison Company. As presented in Table 6-10, the total volume of water entering the process in calendar year 2020 was 3,098 AF and energy consumed was approximately 2.25 million kWh. Energy intensity was 727 kWh/AF and 237 kWh/million gallons. Energy required to pump or treat water is not always proportional to water delivered.

Table 6-10: Energy Intensity (DWR Table O-1b)

Urban Water Supplier: *Serrano Water District*

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Retail Potable Deliveries

Table O-1B: Recommended Energy Reporting - Total Utility Approach

Enter Start Date for Reporting Period	1/1/2020	**Urban Water Supplier Operational Control**		
End Date	12/30/2020			
Is upstream embedded in the values reported? ☐		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*dropdown list*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*3,098*	*0*	*3098*
Energy Consumed (kWh)		*2,251,833*	*0*	*2251833*
Energy Intensity (kWh/volume)		*727*	*0.0*	*726.9*

Quantity of Self-Generated Renewable Energy

None kWh

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

Metered Data

Data Quality Narrative:

Energy data obtained from Southern California Edison

Narrative:

Energy consumed is for all water production, conveyance, treatment, storage, and distribution of water to customers. Supplies include groundwater, local native surface water, and imported purchased water.

Chapter 7 - Water Supply Reliability and Drought Risk Assessment

7.1 Introduction

During the past decade, Southern Californians have faced significant challenges to their water supply. In the past, the District had the foresight to expand its portfolio of supplies to reduce its vulnerability to seasonal and climatic variability. The local surface water supply may be most vulnerable to shortages, but this supply is augmented with groundwater supplies and a purchased imported supply. The District has worked hard to maximize its local resources to minimize imported water use. However, imported purchases remain an important supplemental source of supply. The District remains committed to maximizing the efficient use of existing local supplies and to managing all supplies available to it to ensure that adequate supplies will be available to meet future water demands while reducing its reliance on Delta water supplies.

Although the imported MWD supply is not used every year, it is an important supplemental supply for the District for use at times when the local surface water supply is limited by precipitation conditions. Most of the imported supply has historically come from the Colorado River although improvements were made to MWD's system to allow greater flexibility in conveying northern California supplies from the SWP to Lake Mathews. MWD has aggressively pursued and obtained additional supplies to augment these two sources and is continuing to acquire additional supplies to increase supply reliability.

7.2 Water Supply Reliability Assessment

During the 20th century, California experienced three significant historical statewide droughts: the six-year event of 1929 to 1934, the two-year event of 1976 to 1977, and the six-year event of 1987 to 1992. In the decade prior to an unusually wet 2017, all but two years were drought years; the statewide drought of years 2007 to 2009 was soon followed by the statewide drought of 2012 to 2016. The 2007 to 2009 drought marked the first time that a statewide proclamation of emergency was issued because of drought impacts. A statewide proclamation was repeated during the 2012 to 2016 drought (DWR 2020).

Because this UWMP reliability assessment is based on the availability of potable water supplies, not a constraint of increased costs to produce the supply, it is assumed that the District will increase its purchases of MWDOC supplies as necessary during dry years when other supplies are limited. For this reliability analysis, purchases were assumed to not exceed historical purchases. Constraints on water sources and expected water service reliability for a normal year, single dry year, and five consecutive dry years projections for 2025 through 2045, are discussed here.

7.2.1 Constraints on Water Sources

The District's imported water supply is supplied by MWD/MWDOC (as described in Chapter 6) primarily from the Colorado River with the ability to receive SWP water which is conveyed through the Delta. In its draft 2020 UWMP, MWD identified risks and uncertainties that could potentially influence the reliability of its supplies associated with the following key factors.

- San Francisco Bay - Sacramento River/San Joaquin River Delta (Bay-Delta) challenges
- Water supply conditions

In addition, water quality challenges such as algae toxins, PFAS, and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions. The following discussion of key challenges is excerpted from the MWD 2020 UWMP for the purpose of providing context on the District's imported supply. (MWD, 2020 UWMP)

Bay-Delta Issues. About 30 percent of Southern California's water supply moves from Northern California through the Delta, a critical link, to pumps in the south Delta. Endangered species protection and conveyance needs in the Delta have resulted in operational constraints to pumping. The Delta's declining ecosystem and the difficulties operating the SWP system has led to factors that can result in export reductions from the Delta, releases of additional water from storage, other operational changes associated with endangered species, or water quality requirements.

The District, as a member agency of MWDOC purchasing water from MWD, is linked to all activities that impact supplies conveyed through the Delta. Not only do Delta restrictions impact SWP supplies, but also voluntary transfers, Central Valley storage and transfers, in-region groundwater storage, and in-region surface water storage. This section summarizes the following specific Delta challenges.

Previous efforts to develop the California WaterFix project (to improve operational reliability through the Delta) have been reconfigured for a single tunnel and is now called Delta Conveyance Project. This proposed project involves construction and operation of new Delta conveyance facilities augmenting existing SWP facilities. New intake facilities as points of diversion would be located in the north Delta along the Sacramento River between Freeport and the confluence with Sutter Slough. A single main tunnel would convey water from the new intakes to the existing Banks Pumping Plant and potentially the federal Jones Pumping Plant in the south Delta. These new facilities would provide an alternate diversion location from the Delta and would be operated in coordination with the existing south Delta pumping facilities.

Due to new information and science on declining listed fish species populations, the U.S. Bureau of Reclamation released the 2019 Biological Opinion and signed a Record of Decision completing

its environmental review and adopting the 2019 Long-Term Operations Plan. The 2019 Long-Term Operations Plan and 2019 Biological Opinions are expected to increase SWP deliveries by an annual average of 200,000 acre-feet compared with previous Biological Opinions. On March 31, 2020, California Department of Fish and Wildlife issued a California Endangered Species Act (ESA) incidental take permit for the SWP that included further operational restrictions on outflow. The final approved project and incidental take permit reduce long-term average SWP deliveries by more than 200,000 which would erase any potential improvement in SWP water supply reliability anticipated to result from the 2019 Biological Opinions. According to the MWD 2020 UWMP, the continued decline of some fish populations and certain operational actions in the Bay-Delta may significantly reduce MWD's water supply availability. Future new or revised Biological Opinions or incidental take authorizations under the Federal ESA and California ESA might further adversely affect SWP and federal Central Valley Project (CVP) operations.

In December 2018, the SWRCB adopted the Phase 1 Bay-Delta Water Quality Control Plan (Bay-Delta Plan) amendments and Final Substitute Environmental Document. The Phase 1 updates established new Lower San Joaquin River flow objectives and revised southern Delta salinity objectives. In July of 2018, the SWRCB released a framework that describes the draft proposal for Phase 2, which will update the flow requirements for the Delta and its contributing watersheds, including the Sacramento River and its tributaries. The framework provides additional details about the flow requirements staff is likely to propose, how these new requirements could be implemented, and preliminary information on their potential environmental benefits and water supply effects.

In addition to these key Bay-Delta challenges, new litigation, listings of additional species under the ESAs, or new regulatory requirements imposed by the SWRCB could adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations. (MWD, 2020 UWMP)

Water Supply Conditions. As discussed in Section 6.1, swings in annual hydrologic conditions are evident with its impacts being felt most severely on the local Santiago Creek surface supply and MWD's SWP supply. Within the last decade, the SWP has experienced the lowest ever allocation of contract supplies, the lowest ever northern Sierra snowpack (affecting SWP's Feather River/ Lake Oroville supply), highest ever Sacramento River runoff, and the highest SWP allocation since 2006.

MWD's other significant supply source, the Colorado River basin, has also experienced large swings in annual hydrologic conditions, but these variations are buffered through a large volume of storage. However, analysis of historical records suggest a potential change in the relationship between precipitation and runoff in the Colorado River basin which has contributed to a drying

trend over the last 21 years. With Lake Mead and Lake Powell at less than 50 percent capacity there is practically no buffer to avoid a shortage from any future period of reduced precipitation and runoff.

Climate change is expected to shift precipitation patterns and affect reliability of water supplies, which will make water supply planning even more challenging. As discussed in Chapter 3, the areas of concern for California and the District's supplies include the reduction in snowpack, increased intensity and frequency of events, and rising sea levels. The general trend is of less water-storing snowpack and greater precipitation in the Sierras, more precipitation earlier in the year when it cannot be readily utilized, and more extreme and more frequent drought and flooding events. While uncertainties remain regarding the exact timing, magnitude, and regional impacts of climate change-related temperature and precipitation changes, researchers have identified the following specific areas of concern.

- Reduction in Sierra Nevada snowpack
- Reduction in Colorado River Basin snowpack
- Increased intensity and frequency of extreme weather events
- Rising sea levels resulting in impacts to coastal groundwater basins and levee failure in the Delta due to seawater intrusion, and increased risk of damage from storms, high-tide events, and the erosion of levees; and potential pumping cutbacks on the SWP and CVP due to salinity levels at the pumps

Groundwater Supply. The District's Orange County Groundwater Basin supply is actively managed by OCWD. OCWD has an extensive program to protect Basin water quality, which includes groundwater monitoring, participating in and supporting regulatory programs, remediation projects, working with groundwater producers, and providing technical assistance. A groundwater protection policy was adopted in 1987 in recognition of the serious threat posed by groundwater contamination. Efforts have focused on managing salinity and nitrates, along with synthetic organic contaminants. According to the OCWD, the water from this aquifer has always been of high quality. However, with the recent emergence of PFAS detected in the groundwater supply, SWD shut down its wells until a treatment process can be activated. OCWD and its retail water agencies are conducting a pilot program to test various treatment options for PFAS substances. According to OCWD, while the levels in the Basin are relatively low, they are exploring long term treatment solutions to continue to meet all state and federal water quality standards.

Local Surface Water Supplies. In the past, the District's WTP had difficulty treating highly turbid water from Santiago Reservoir, however, these incidences were few and far between. Rare turbidity events were due to high intensity precipitation events in the Santiago Creek watershed

causing particles to remain suspended during aqueous transport to Santiago Reservoir. However, the cause of highly turbid water also resulted in greater levels of local surface water supply availability once the water settled in the reservoir. Improvements were made to the treatment process at the WTP to allow for even fewer incidents of WTP shutdowns.

Santiago Reservoir water quality constituents have been below primary drinking water maximum contaminant levels. A comparison of average values for Santiago Reservoir water and Lake Mathews water indicates that the waters are very similar in composition. Bromide is somewhat lower and alkalinity and hardness is somewhat higher in Santiago Reservoir water. More information on water quality of the surface supplies can be found in the *Santiago Reservoir 2019 Watershed Sanitary Survey* prepared by the District and IRWD in 2019. The primary constraint to the District on the availability of imported surface supplies during times of shortages is the cost, particularly when MWD's Water Supply Allocation Plan (WSAP) is in effect. In terms of quantity and reliability, MWD has an extensive supply augmentation program to assure its member agencies that their current and projected demands for imported supplies can be reliably met through 2045 during average/normal, single dry, and multiple-dry year conditions.

Purchased Imported Water Supplies. MWD's ability to ensure water supply availability and reliability to its member agencies is based in part on its Water Surplus and Drought Management Plan (WSDM). MWD developed and adopted the WSDM Plan to provide policy guidance and manage regional water supply actions under both surplus and drought conditions to achieve the overall goal of ensuring water supply reliability to its member agencies as set forth in MWD's UWMP and Integrated Water Resources Plan. The WSDM Plan outlines various water supply conditions and corresponding actions MWD may undertake in response to moderate, serious, and extreme water shortages. Under Condition 1, MWD issues a Water Supply Watch and encourages local agencies to implement voluntary dry year conservation measures and utilize regional storage reserves. Under Condition 2, MWD issues a Water Supply Alert and calls for cities, counties, its member agencies and all other retail water providers to implement extraordinary conservation through drought ordinances and other measures to minimize the use of storage reserves.

Under Condition 3, MWD may implement its WSAP, which allocates available water supplies among its member agencies based on factors such as impacts to retail customers, population and projected growth of particular member agencies, availability of recycled water and other local supplies, conservation efforts, and other factors. At times when the WSAP is implemented, MWD member agencies do not lose their ability to receive any particular amount of imported water supplies, but instead MWD places limits on the amount of water its member agencies can purchase without facing a surcharge. In turn, MWDOC also developed a WSAP to allocate imported supplies at the retail level in its service area. Under these WSAPs, the availability of

imported water supplies is based primarily on the need for imported supplies relative to the total need for those supplies within the MWD and MWDOC service areas.

In response to prolonged drought conditions, in April 2015 MWD declared a Condition 3 shortage and decided to implement its WSAP with the goal of achieving a 15 percent reduction in regional deliveries to its member agencies starting on July 1, 2015. Importantly, MWD confirmed that implementation of its WSAP merely involves the potential application of a surcharge to those member agencies whose deliveries of water from MWD exceed their allocations, but it does not otherwise prohibit or restrict such deliveries.

To improve long term supply availability and reliability for the region, MWD has developed an adaptive management strategy as a part of its integrated resource planning process. Reliability targets were established for imported and local water supplies and water conservation to, if successful, provide a future without water shortages and mandatory restrictions under planned conditions. For imported supplies, MWD looks to make investments in additional partnerships and initiatives to maximize Colorado River Aqueduct deliveries in dry years. For the SWP, MWD is looking to make ecologically-sound infrastructure investments so that the water system can capture sufficient supplies to help meet average year demands and to refill MWD's storage network in above average and wet years. Lowering regional residential demand by 20 percent by the year 2020, reducing water use from outdoor landscaping, and advancing additional local supplies are among the actions MWD undertook to keep supplies and demands in balance.

It is important to note that MWD through MWDOC has always been able to provide the supply needed by the District. Based on the MWD 2020 UWMP conclusions, it is expected that this imported supply would continue to provide a reliable source of water to the District. As such, any supply gaps identified in the reliability analysis do not necessarily represent lack of supply but rather the amount of supply that would be more costly to purchase consistent with MWD's WSAP penalty fees. And given the drought conditions experienced recently that are anticipated to occur more frequently in the future due to climate change, any potential supply gaps represent a risk to the District's future water supply costs that, if available, may be better balanced with more cost-effective local supplies that would also increase water reliability.

7.2.2 Year Type Characterization

Climatological data in California has been recorded since the year 1858. During the twentieth century, California experienced four periods of severe drought: 1928-34, 1976-77, 1987-92, and 2011-current. The year 1977 is the driest year of record in the Four Rivers Basin determined by DWR. These rivers flow into the Delta and are the source waters for the SWP, thus MWD's selection as the single driest base year. However, Southern California sustained few adverse impacts from the 1976-77 drought, due in large part to the availability of Colorado River water

and groundwater stored in local groundwater basins. The 1987 to 1992, 2000 to 2003, 2007 to 2009, and 2012 to 2016 droughts had a greater impact on Southern California. Therefore, different base years were used here for different supplies.

To analyze the variability of reliability due to climate, hydrologic conditions that define year types were determined. The years identified in Table 7-1a through Table 7-1c reflect these year types: average, single dry year, and multiple dry years for each water source.

Average/Normal Water Year. The normal year most closely represents median runoff levels and patterns. The supply quantities for this condition are derived from historical average yields. MWD considers 1922 through 2017 representative of the water supply conditions it considers available during a normal water year. MWDOC is using the average of FY18 and FY19 as the normal water year. The District used MWD base years for the purchased imported supply. FY06 represents average conditions for groundwater and local surface water supplies.

Single Dry Water Year. The single dry year is defined as the year with the minimum useable supply. The supply quantities for this condition are derived from the minimum historical annual yield. MWD identified 1977 conditions to represent the lowest water supply available. The District used MWD's 1977 dry year for its imported supply and year 2013 for groundwater supplies. MWDOC is using FY14 as its single dry year. Calendar year 2013 was one of the driest years on record for Southern California with just over seven inches of precipitation. However, FY08 reflects the least amount of local surface water available to the District.

Multiple Dry Water Years. Multiple dry years are defined as five consecutive years with the lowest average water supply availability. Water systems are more vulnerable to these droughts of long duration because they deplete water storage reserves in local and state reservoirs and groundwater basins. MWD identified 1988 through 1992 as the driest five consecutive year historical sequence for its water supply. MWDOC is using FY12 through FY16 to represent its multiple dry years. SWD considers years 2012 through 2016 to represent this five year drought period for local groundwater and surface supplies.

Table 7-1a presents the basis of water year data for the groundwater supply from the Orange County Basin. The District's groundwater supply has proven to be 100 percent reliable during these year types. The local groundwater supplies are managed by OCWD; the BPP could change every year depending on numerous factors including Basin storage and Santa Ana River water capture, which are influenced by climatic conditions. During past single dry year and multiple dry year events, groundwater supplies were available in this non-adjudicated Basin, but at a higher price (applying the BEA) when the District's BPP is exceeded.

Because local surface supply availability (Santiago Creek) is sensitive to climatic conditions, it is presented separately in Table 7-1b. The FY06 supply represents average supply availability. The

single dry year of FY08 was selected because it was a dry year with heavy reliance on imported purchases. The multiple dry years of FY12 through FY16 represent how local surface supplies are available at the beginning of a multiple year drought but become depleted as the drought continues. Thus the third year assumed 0 percent availability.

Submittal Table 7-1a Retail: Basis of Water Year Data for GROUNDWATER SUPPLY

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 _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	2006		100%
Single-Dry Year	2013		100%
Consectutive Dry Years 1st Year	2012		100%
Consectutive Dry Years 2nd Year	2013		100%
Consectutive Dry Years 3rd Year	2014		100%
Consectutive Dry Years 4th Year	2015		100%
Consectutive Dry Years 5th Year	2016		100%

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

NOTES: Tables 7-1b and 7-1c reflect local surface water and purchased imported water

Because MWD uses different base years for its reliability analysis, purchased imported supplies are presented in Table 7-1c. These year types were selected by MWD. MWD's 2020 UWMP assumes 100 percent reliability under all three hydrologic conditions in the future. Although the District uses the imported MWD supply it obtains through MWDOC as a supplemental supply, it is important to allow the District to continuously operate its WTP and augment local supplies especially during dry years. MWD has extensive programs and plans to increase supply reliability

OPTIONAL Table 7-1b Retail: Basis of Water Year Data for LOCAL SURFACE SUPPLY			
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**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	2006		100%
Single-Dry Year	2008		36%
Consectutive Dry Years 1st Year	2012		99%
Consectutive Dry Years 2nd Year	2013		88%
Consectutive Dry Years 3rd Year	2014		0%
Consectutive Dry Years 4th Year	2015		0%
Consectutive Dry Years 5th Year	2016		0%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years			
NOTES: Tables 7-1a and 7-1c reflect groundwater and purchased imported water			

OPTIONAL Table 7-1c Retail: Basis of Water Year Data for PURCHASED SUPPLY			
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**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	Avg of 1922 to 2017		100%
Single-Dry Year	1977		100%
Consectutive Dry Years 1st Year	1988		100%
Consectutive Dry Years 2nd Year	1989		100%
Consectutive Dry Years 3rd Year	1990		100%
Consectutive Dry Years 4th Year	1991		100%
Consectutive Dry Years 5th Year	1992		100%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years			
NOTES: Availability based on MWD UWMP as imported water is supplied by MWD/MWDOC. Tables 7-1a and 7-1b reflect groundwater and local surface water			

which are addressed in its 2020 UWMP. MWD has determined in its 2020 UWMP that the region can provide reliable water supplies under both the single driest year and the multiple dry year hydrologies, with a surplus of supply for all dry year scenarios through 2045. (MWD, 2020)

7.2.3 Water Service Reliability

An assessment of the District's water supply reliability during each of the water year types for the next twenty years is presented here. Responses to an actual drought follow the water use efficiency mandates of MWD's Water Surplus and Drought Management Plan (WSDM Plan), along with implementation of the appropriate stage of the District's water shortage ordinance and Water Shortage Contingency Plan presented in Chapter 8. The District supplies are capable of meeting demands in all hydrologic year types through 2040, even with an increase in dry year demands in the retail service area. An assessment of the District's water supply reliability during each of the water year types for the next twenty years is presented here.

Water Service Reliability - Normal Year. Based on the District's groundwater, local surface water, and imported water supplies identified in Tables 7-1a, 7-1b, and 7-1c, average year availability was compared to projected average year demands through 2040. This comparison, presented in Table 7-2, indicates that water supplies will be available to meet District demands during a normal water year. As discussed in Chapter 4, the District has limited growth potential resulting in very little increase to demands. Demands can be met with existing supplies.

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	8,351	8,393	8,437	8,459	0
Demand totals *(autofill from Table 4-3)*	4,263	4,314	4,367	4,394	0
Difference	4,088	4,079	4,070	4,065	0
NOTES:					

Water Service Reliability - Single Dry Year. Supplies and demands for the District service area were analyzed to determine impacts associated with a single dry year. The projected single dry year water supply presented in Table 7-3 is based on 100 percent availability of two of the three sources presented in Table 6-9 while the local surface supply was 36 percent available.

For reliability planning, an increase in District demands associated with a single dry year was calculated. Water demands typically increase during the first dry year before it is apparent that

it will be a dry year and before demand management outreach is implemented. The first year of the recent 2012 to 2016 drought resulted in an increase of 6.9 percent in retail demands. Retail water demands presented in Table 7-3 were increased 6.9 percent for this first dry year. Sales to Orange do not reflect an increase in demands. Although additional supplies are available, supplies in Table 7-3 were matched to demands. The District can provide reliable water supplies under the single driest year hydrology with reduced supplies to meet the dry year increase in demands.

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 (Opt)
Supply totals	4,442	4,497	4,553	4,582	0
Demand totals	4,442	4,497	4,553	4,582	0
Difference	0	0	0	0	0

NOTE: Single dry year retail demands were increased 6.9%. Includes 1,688 AF sales to Orange

Water Service Reliability - Five Consecutive Dry Years. Supplies and demands for the District service area were analyzed to determine impacts associated with multiple consecutive dry years. The projected multiple dry year water supply is based on 100 percent availability of purchased imported water and groundwater and variable availability of local surface water as reflected in Table 7-1b. Supply totals through 2040 are presented in Table 7-4 for the multiple dry year scenario.

Water demands were also analyzed for this multiple dry year scenario. As was done with the single dry year demands, projected retail water demands from Table 4-3 were increased during the first year to reflect a dry year bump associated with drier weather, before additional conservation programs are implemented. The second single dry year reflected a 3.4 percent increase based on the retail service area response to the recent drought. Orange sales were not increased to reflect a bump in demands.

Although there was a strong customer response to District conservation outreach in FY14 (12 percent decrease in demands) and significantly greater savings in FY16 (32 percent decrease in demands), the third through fifth dry year water demands presented in Table 7-4 more conservatively reflect normal demands, not the decreased water usage that actually occurred.

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045 (Opt)
First year	Supply totals	4,442	4,497	4,553	4,582	0
	Demand totals	4,442	4,497	4,553	4,582	0
	Difference	0	0	0	0	0
Second year	Supply totals	4,362	4,415	4,464	4,487	0
	Demand totals	4,362	4,415	4,464	4,487	0
	Difference	0	0	0	0	0
Third year	Supply totals	4,283	4,335	4,378	4,394	0
	Demand totals	4,283	4,335	4,378	4,394	0
	Difference	0	0	0	0	0
Fourth year	Supply totals	4,294	4,346	4,383	4,394	0
	Demand totals	4,294	4,346	4,383	4,394	0
	Difference	0	0	0	0	0
Fifth year	Supply totals	4,248	4,304	4,356	4,389	0
	Demand totals	4,248	4,304	4,356	4,389	0
	Difference	0	0	0	0	0
NOTES: Projected demand were increased 6.9% in 1st year and 3.4% in 2nd year to reflect first dry years. Sales to Orange 1,688 added to all years.						

Table 7-4 presents a comparison of projected multiple dry year water supply availability over the next 20 years to the multiple dry year water demands which were increased for the first two of three years. Although additional supplies are available, supplies in Table 7-4 were matched to demands. Table 7-4 demonstrates that the region can provide reliable water supplies under the multiple dry year hydrology with reduced supplies to meet the bumped increase in demands.

7.2.4 Management Tools and Options

Water management tools and options to maximize local resources and minimize the need to import water from the Colorado River and Delta have been developed over the years. These highly reliable supplies reflect planning and forward thinking the District has undertaken to

develop its diverse supply portfolio. Actions include participating in MWDOC's regional conservation and supply augmentation programs, managing its supply sources to ensure all sources are maintained and made available for the future at needed quantities, optimizing its conjunctive use operations, and demand management activities.

As a member of MWDOC and recipient of MWD supplies, the District is indirectly receiving water under a "covered action" by MWD's participation in the Delta Conveyance Project. Reducing reliance on imported supplies is a key component of the success for any supply planning involving the Delta. An urban water supplier that anticipates participating in or receiving water from a proposed project (covered action) such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 UWMP that can 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 (DWR, 2021).

The Bay-Delta Plan is a comprehensive, long-term resource management plan for Delta that was developed as part of the Delta Reform Act of 2009 (Water Code Section 85000 et seq) and includes both regulatory policies and recommendations, aimed at promoting a healthy Delta ecosystem. Delta Plan Policy WR P1 (California Code of Regulations, Title 23, § 5003) is one of fourteen regulatory policies in the Delta Plan. WR P1 identifies UWMPs as the tool to demonstrate consistency with state policy to reduce reliance on the Delta for any supplier that is participating in or carrying out a proposed covered action or receiving Delta water from a proposed covered action. Within the supplier's UWMP, information should be provided that can be used to demonstrate consistency with this policy. Section (c)(1) of WR P1 states that suppliers that have (a) completed an urban water management plan, (b) implemented the efficiency measures in that plan, and (c) shown a measurable reduction in Delta reliance and improvement in regional self-reliance in the plan, are contributing to reduced reliance on the Delta and are therefore consistent with WR P1 (CCR, Title 23, § 5003(c)(1)).

MWD continues to develop its supply portfolio to reduce dependence on Delta supplies, particularly during dry and multiple dry years. Projects include multi-year water transfers and new diversion and conveyance facility exporting water from the Delta. MWD's reliance on supplies from the Delta watershed are expected to decrease by 314,000 acre-feet over the 2010 baseline, a decrease of about five percent of 2045 demands. Increased regional self-reliance primarily comes from water use efficiency, conjunctive use projects, water recycled, and local/regional water supply and storage projects.

MWD has prepared a detailed analysis that demonstrates consistency with the Delta Plan policy WR P1 (MWD 2020 UWMP, Appendix 11). Because the District has no control over the sources

of water MWD provides, consistency documented in MWD's UWMP is incorporated here by reference.

On a regional level, MWDOC and its member agencies also meet the three criteria of Section (c)(1) of WR P1. MWDOC and its member agencies completed UWMPs in 2015 and will be submitting UWMPs for 2020. These UWMPs identify future local supply opportunities and water use efficiency measures that will increase regional self-reliance and reduce reliance on Delta supplies. MWDOC is continuing to look into local, cost-effective, and technically feasible water supply sources, such as desalination, as described in their 2020 UWMP.

A measurable reduction in Delta reliance and improvement in regional self-reliance can be seen from the achievements of the past five years of water use efficiency and the projections for using recycled water to recharge the Basin. OCWD/OCSD will continue to increase the capacity of their facilities to increase the amount of recycled water available to recharge the Basin. MWDOC and its retail agencies remain committed to enhancing local supply and implementing water use efficiency measures to reduce their demand on imported water, thereby reducing reliance on the Delta.

On a local level, the District also meets the three criteria of Section (c)(1) of WR P1 - Reduce Reliance on the Delta Through Improved Regional Water Self Reliance. It prepared an UWMP in 2015 and will be submitting this 2020 UWMP. It has implemented effective efficiency measures over the years as reflected in its ability to meet the SB X7-7 targets for 2015 and 2020. The District's use of local surface water to the maximum available, followed by local groundwater supplies, and participating as a member of MWDOC in the expansion of the regional recycled water program to increase indirect potable water supplies to the basin, all demonstrate consistency with the Delta Plan policy WR P1 by diversifying supplies. Diversifying supplies improves water supply reliability and it reduces dependence on supplies from the Delta watershed. Appendix F presents the District's compliance with WR P1.

7.3 Drought Risk Assessment

The newly required Drought Risk Assessment (DRA) offers an opportunity to test the District's near-term supply reliability by assuming the next five consecutive years are dry. The analysis of a five-year drought beginning in 2021 reflects the water service reliability assessment required under Water Code Section 10635(b).

7.3.1 Data, Methods, and Basis for Shortage Condition

Data, methods, and the basis for water shortage conditions are described here. The District has a diverse portfolio of local and imported supplies. The assessment of imported water supplies took into consideration historical drought hydrology, plausible changes on projected supplies and

demands under climate change conditions, anticipated regulatory changes, and other applicable criteria utilized in assessing each of its supplies.

The DRA was based on the assumption that the five driest consecutive years on record for the water supplier will occur over the next five years, starting in 2021. This hydrologic sequence was discussed in Section 7.2 above and reflects the availability of imported supplies during the 1988 to 1992 drought and the other supplies available during the most recent drought of 2012 through 2016. Changes that may influence the DRA include wetter or drier monthly and annual hydrology due to normal and climate change-induced conditions, and an increase in the availability of imported supplies due to MWD enhancing its supply portfolio.

Normal unconstrained projected water use (demands) identified in Chapter 4 was used here as the base demands to compare against supply availability, and prior to determining if implementation of any shortage actions is needed to reduce these demands. The 2020 water demands were increased annually over five years to match 2025 projected demand.

Accounting for changes in demands due to dry year conditions, as noted in Table 7.4, because demands increased 6.9 percent during the first year and 3.4 percent during the second year of the recent five year drought, it was conservatively assumed demand would increase again in the first two years of a new drought. Aggressive conservation outreach resulted in an actual reduction in demands of up to 32.3 percent by FY16. However, to be conservatively high, the first two years of an increase and average demands (instead of lowered demand) for the following three years were utilized in the DRA assumptions of demand response during a drought.

7.3.2 Assessment Water Source Reliability

It is likely that the next five year drought will not replicate the historical drought hydrology exactly due to variability in climatic conditions. However, not knowing what the exact variability will be, the basis for the DRA is based on actual conditions that occurred; therefore, data from historical multiple year droughts were utilized for supplies while the more recent response to a multiple year drought was used for demands.

The District relies heavily on the utilization of groundwater and imported water to meet demands within its service area. In determining the reliability of each water source, the MWD 2020 UWMP was reviewed for the assessment of reliability of water supplies. It is documented that the imported supply was 100 percent reliable during the previous two multiple year droughts. MWD has stated that its supplies will be fully reliable during the next multiple year drought under most if not all conditions. This includes MWD's emergency supplies that have been accessed in the past and are a part of the supply portfolio. The local surface water availability presented in Table 7-1b is assumed here. This is conservative considering water was available at smaller than average quantities during the last multiple year drought.

Although groundwater is a very reliable source for the District and pumping can usually be increased to meet demands during a multiple dry year period, because of regulatory concerns the wells are temporarily shut down until 2022. Therefore, for this Drought Risk Assessment, it is assumed there is no groundwater available for year 2021 and part of 2022 and the District will rely more heavily on purchased water as well as any local surface water already stored in Santiago Reservoir.

7.3.3 Total Water Supply and Use Comparison

Table 7-5 demonstrates supply reliability during a hypothetical five year drought starting in 2021. Because of the highly reliable water supplies, even without groundwater and limited local surface water, the gross water use can be met with current supplies. Supplies do not need to be augmented over this five year period to meet the demands (including the increased first two years) and demand reductions are not required to be implemented to meet available supply. The District has a very effective water use management program under dry year or emergency conditions that is employed as needed and has historically resulted in significant reductions in water demand by the third year. Again, the Drought Risk Assessment was conservative in not reflecting the reduction in water demands by the third year yet there is no shortfall due to the ability to increase pumping and purchase additional supplies.

In accordance with the analysis provided herein, and as documented in the 2020 UWMPs prepared by MWD and MWDOC, the District is capable of meeting its customers' water demand in all hydrologic year types through 2040, even with a potential increase in dry year demands. Therefore the District's supply portfolio is reliable under all conditions conceivable. The reliable supplies reflect not only regional projects and comprehensive water supply planning by MWD and MWDOC, but also the forward thinking planning and efforts the District has undertaken to develop its local water supplies and conservation programs, thus greatly reducing reliance on imported supplies. It should be noted that MWD's Drought Risk Assessment shows a surplus of supplies available to its member agencies, including MWDOC.

DRAFT Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Gross Water Use	4,377
Total Supplies	4,377
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)	
Resulting % Use Reduction from WSCP action	0

2022	**Total**
Gross Water Use [Use Worksheet]	4,304
Total Supplies [Supply Worksheet]	4,304
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)	
Resulting % Use Reduction from WSCP action	0

2023	**Total**
Gross Water Use [Use Worksheet]	4,233
Total Supplies [Supply Worksheet]	4,233
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)	
Resulting % Use Reduction from WSCP action	0%

2024	**Total**
Gross Water Use [Use Worksheet]	4,248
Total Supplies [Supply Worksheet]	4,248
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)	
Resulting % Use Reduction from WSCP action	0%

2025	**Total**
Gross Water Use [Use Worksheet]	4,263
Total Supplies [Supply Worksheet]	4,263
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)	
Resulting % Use Reduction from WSCP action	0%
NOTE: Includes sales to Orange of 1,688 AF	

Chapter 8 – Water Shortage Contingency Plan

Due to more frequent water shortage conditions, water shortage contingency planning is taking on greater importance in California. Actions are presented here that will be taken by the Serrano Water District (SWD or District) within its retail service area in the event of a reduction in water supplies. This Water Shortage Contingency Plan (WSCP) has been developed in accordance with California Water Code Section 10632(a) and is a stand-alone document also included here as a chapter in the 2020 UWMP.

Although the District has a robust portfolio of water supplies that are highly reliable, the purpose of this WSCP is to demonstrate in structured steps how the District intends to act in the case of an actual water shortage condition. This WSCP is for the District's retail system; it sells water to the City of Orange but has no control of water shortage contingency planning for its service area. See the City of Orange WSCP for information on its water shortage planning.

8.1 Water Supply Reliability Analysis

As discussed in Chapter 6 of the 2020 Urban Water Management Plan (UWMP), the District's primary water supplies are surface water from Santiago Reservoir (e.g., Irvine Lake) and groundwater. These supplies are supplemented with imported MWD untreated supply when Santiago Reservoir inflow is low. The District has rights to approximately 25 percent of the Santiago Reservoir inflow. The Orange County Groundwater Basin is a closely monitored basin with specified pumping limitations, called Basin Production Percentage (BPP). Imported water from MWD is conveyed directly to Santiago Reservoir from MWD's Lake Mathews and is conveyed into the service area treatment facilities intermingled with local surface water. Water supply quantities are presented in Table 8-1. However, the groundwater and purchased supplies can be obtained at greater quantities, as needed. Local surface supplies are dependent on local hydrological conditions.

Chapter 7 of the 2020 UWMP describes the reliability of the District's water supplies and the customer demand over time and under dry year conditions. The local surface water is highly variable and dependent on hydrological conditions in the Santa Ana Mountains but since it can be stored in Santiago Reservoir, the quantity captured can be made available beyond the precipitation season into subsequent years. The average local supply recently produced by SWD was approximately 1,150 AF. Operationally, this supply is used first to minimize losses due to evaporation.

Table 8-1: Water Supply Availability	
Supply	**Reasonably Available Volume**
Groundwater	2,128
Local Surface Water	1,542
Purchased Surface Water from MWD	4,681
Total	8,351
NOTES: Groundwater reflects 82% BPP applied to 2025 demands. Local surface water based on average availability. Purchases of MWDOC/MWD supply based on the highest annual purchase during the previous ten years (i.e., FY15).	

The groundwater supply from the Orange County Groundwater Basin is highly reliable and carefully managed by Orange County Water District (OCWD). The current BPP is 77 percent, anticipated to increase to 82 percent by 2025. This means SWD can meet 77 percent of its water demand from groundwater. These pumping limitations can be exceeded if necessary, at an additional cost. During 2021, this supply was curtailed due to regulatory requirements associated with recently detected per- and polyfluoroalkyl substances (PFAS) in the groundwater. Additional treatment planned for 2021 will allow this supply to be available again by fall of 2021.

The purchased supply of imported water is provided by Metropolitan Water District (MWD) through Municipal Water District of Orange County (MWDOC) and is considered a highly reliable water supply but is more costly. The quantity provided in Table 8-1 is based on the total amount purchased in FY15, during the peak of the multiple year Statewide drought. Availability during a Statewide shortage reflects how highly reliable the purchased supply is. Operationally, when the District experiences a shortage of its first prioritized supply - local surface supply - it can usually readily compensate with additional groundwater pumping. If the groundwater supply is limited, the District can augment with purchased imported water. This flexibility has been tested in several droughts and as mentioned, is being tested in FY21 as the groundwater wells were idled due to regulatory concerns regarding PFAS detected in the groundwater basin.

SWD water use in 2020 and demands projected for 2025 through 2040 are summarized in Table 8-2. These demands are for normal conditions.

Table 8-2: Water Demand, Existing and Projected					
	2020	2025	2030	2035	2040
Serrano Water District	2,519	2,595	2,646	2,699	2,726
Sales to other agencies	1,412	1,668	1,668	1,668	1,668
TOTAL	3,931	4,263	4,314	4,367	4,394
NOTE: Data from UWMP Tables 4-1 and 4-2					

SWD customer water demands typically increase during the first year of a drought, followed by a decrease to below average demand in subsequent years until hydrologic conditions change and outreach efforts subside. An increase of 6.9 percent anticipated in the first dry year is reflected in the demands provided in Table 8-3.

Table 8-3: Projected Single Dry Year Supply and Demand (From UWMP Table 7-3)				
	2025	2030	2035	2040
Supply totals	4,442	4,497	4,553	4,582
Demand totals	4,442	4,497	4,553	4,582
Difference	0	0	0	0
NOTES: Single dry year includes 6.9% increase in demands. Supplies reflect availability of all supplies to meet demands. Sales to Orange of 1688 AF included.				

The issues that can lead to a shortage in one or more of the District's supplies include the following. Most threats, except drought, have a low probability but if the threat affects more than one supply source, it could have a high impact.

- Drought and extreme droughts due to climate variability
- Power outage
- Catastrophic event in the Delta such as an earthquake, dam failure, or levee failure
- Natural disaster such as a local, regional, or statewide earthquake
- Outage of key conveyance facilities such as the SWP's California Aqueduct, MWD's Colorado River Aqueduct, or MWD's Lower Feeder or Santiago Lateral
- Regulatory restrictions such as water quality standards for emerging contaminants or environmental restrictions on Delta pumping
- Water quality contamination of local or regional supplies inadvertently or as intentional acts of sabotage

For many agencies, these supply disruptions can result in significant shortages to the availability of supplies. For SWD, outages can result in changes to District operations such as reprioritizing water supplies to meet the system demands and increased outreach efforts to reduce customer demand for water.

8.2 Annual Water Supply and Demand Assessment Procedures

8.2.1 Annual Assessment

Urban water suppliers are required to submit an annual water supply and demand assessment report (called Annual Assessment) to DWR, in compliance with Water Code Section 10632(a). This new report, pursuant to California Water Code Section 10632(a)(2) is due starting in 2022. Because the District receives some amount of water from the State Water Project, the annual assessment must be submitted with 14 days of receiving its final allocations or by July 1 or each year, whichever is later. DWR will develop a guidance document to recommend procedures and analytical methods to be used at the District's discretion to effectively and efficiently comply with the Annual Assessment requirement.

The District's Annual Assessment is a written decision-making process used to determine an anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions, as described here in this WSCP. The District may reevaluate the functionality of its WSCP process at any time between its submittals to DWR every five years and make appropriate adjustments if warranted.

Assessment Step 1: Table 8-4 provides a reporting tool for the annual assessment. It begins with a determination of the following factors with Year 2021 considered the current year.

- Current year unconstrained water demand
- Infrastructure constraints, if any
- Current year total available supplies anticipated
- Resulting anticipated shortages or surplus

Because the Annual Assessment must assume that the following year will be a dry year, the following factors are also anticipated. Year 2022 is used as the second year in Table 8-4.

- Next year unconstrained water demand
- Infrastructure constraints, if any
- Next year total available supplies anticipated
- Resulting anticipated shortages, if any

Assessment Step 2: Taking these factors into consideration, the next step is to decide on the applicability of one or more of the assessment scenarios that follow in the table. The assessment scenarios begin with "normal" conditions not meriting any shortage response actions followed by dry year scenario and various supply reduction or outage scenarios.

- Assessment Scenario #1: Normal Year
- Assessment Scenario #2: Dry Water Year or Outage Impacting Local Surface Supply
- Assessment Scenario #3: Catastrophic Interruption or Other Short Term Impact (<6 mo) to Imported Supply
- Assessment Scenario #4: Catastrophic Interruption or Other Short Term Impact (<6 mo) to Groundwater Supply
- Assessment Scenario #5: Catastrophic Interruption or Other Long Term Impact (>6 mo) to any supply

For each of these assessment scenarios, hydrologic and regulatory conditions to monitor are provided. When it has been determined that the District supplies reflect some form of a shortage or outage, an assessment scenario is then identified based on one of the 6 provided in Table 8-4 (which can be modified as needed to reflect the shortage conditions). Evaluation criteria are provided to determine the potential extent of the supply shortage; the evaluation criteria are to be amended to reflect the actual conditions. When conditions no longer meet the evaluation criteria, the scenario may no longer be applicable. There may be other conditions to monitor and evaluation criteria to consider in addition to those listed in Table 8-4.

For each assessment scenario, service area water demands (before demand reduction activities, called unconstrained demands) are input. Evaluation criteria are reviewed to determine if a supply shortage is projected. The Operations Plan identifies the prioritization of supply, if needed, and the quantities likely to be available by applying the evaluation criteria. The supplies minus demand will determine if a WSCP supply shortage level is triggered.

Once a supply shortage is triggered, shortage response actions can then be identified based on demand reduction activities. Demand reduction activities refer to the WSCP actions reflecting the six levels of supply shortage (discussed next in this chapter) and detailed procedures. Supply augmentation activities refer to the Operations Plan listed in each table.

This approach to the annual assessment allows the District to identify hydrologic and regulatory conditions and evaluation criteria, identify the anticipated unconstrained demand and potentially available supplies, to be assessed under various dry year or outage scenarios. The anticipated shortage is identified which triggers the shortage response actions, compliance and enforcement actions, and communication actions associated with one of the six DWR shortage levels discussed in the next section.

TABLE 8-4: SWD Annual Water Supply & Demand Assessment (Annual Assessment)		
ANNUAL ASSESSMENT REPORT SUBMITTED TO DWR:		7/1/2021
CURRENT YEAR		
Current year unconstrained demand (AF)	2021	2,534
Infrastructure constraints		Wells out due to regulatory water quality concern
Current year total available supply (AF)		
Groundwater (77% of demand available if wells were on)		0
Local surface water (average availability)		1,542
Purchased imported water (available to match demand)		992
Supply Availability		2,534
Supply shortage or surplus:		0
Supply Shortage Level expected this year:		None
NEXT YEAR - Assumed Single Dry Year		
Second year unconstrained demands, assuming dry year	2022	2,725
2nd year infrastructure constraints		Wells out due to regulatory water quality concern
Groundwater		0
Local surface water (36% of 1,542 AF in single dry year)	1,542	555
Purchased imported water (available to match demand)		2,170
Supply Availability		2,725
Shortage or surplus supply availability:		0
Supply Shortage Level expected next year:		None
Anticipated Assessment Scenario		#2: Dry Water Year
NOTE: Demand in 2021, and 2022 as the 1st dry year, is from UWMP Table 7-5 minus sales to Orange		
Explanation of information provided above: Although groundwater is temporarily not available due to regulatory constraints, local surface water and purchased imported water are expected to be available for 2021 average year conditions and 2022 dry year conditions. See Assessment Scenario #2, Dry Water Year, for evaluation criteria to determine if a shortage in supplies will result.		

Table 8-4, continued

DATE: 7/1/2021 Serrano Water District

Assessment Scenario #1: Normal Water Year			
Hydrologic and Regulatory Conditions -Customer unconstrained demands -Reservoir levels -SWP supply conditions -MWD's Colorado River supply availability -Regulatory conditions **Evaluation Criteria** -Monthly production data indicates no significant deviation from monthly average -Santiago Reservoir levels reflect average conditions -Santiago Creek inflow reflects average conditions -DWR supply reports indicate average SWP availability -MWD's Colorado River supply has average availability -MWDOC's monthly Water Supply Condition update report June 1 indicates average -OCWD annual determination of BPP in January for following fiscal year			
Unconstrained Demand: 2021 Average Year Demand		**2,534**	
Scenario #1 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
1	Local Surface Water	1,542	Maximize use of local surface supply
2	Groundwater	-	Use groundwater supply to augment surface
3	Imported	4,681	Use imported water last
Note: Local supply historical average of 1,542 AF. Groundwater BPP 77% of 2021 demands or 1,885 AF if wells were on. Purchased imported water of 4,681 AF was available to meet unconstrained demand in FY15.			
Shortage Response Actions Triggered Demand Reduction Activities: None Supply Augmentation Activities: None			

Table 8-4, continued

Assessment Scenario #2: Dry Water Year			
Hydrologic and Regulatory Conditions -Customer demands increase -Reservoir levels and watershed inflows -SWP supply conditions measured in snow surveys -MWD's Colorado River supply availability -Regulatory conditions **Evaluation Criteria** -Monthly production data indicates above monthly average increases for December through March -SWD allocation of Santiago Reservoir supply 25% to 50% of average by April 1 -Santiago Creek (native) flow below average November through April -MWD institutes Water Supply Allocation Plan (WSAP) -MWDOC's monthly Water Supply Condition update report June 1 -OCWD annual determination of BPP lower than anticipated			
Unconstrained Demands: 2022 Single Dry Year, Increased Demand		**2,725**	
Scenario #2 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
	Local Surface Water	0	No supply available
1	Groundwater	1,885	Maximize use of groundwater
2	Imported	840	Augment with imported water as needed
Note: Local surface water historically 0% to 99% available during multiple dry years; 3rd year 0% used here. Purchased imported water meets demand.			
Shortage Response Actions **Triggered** Demand Reduction Activities: See Shortage Levels 3 through 4 Actions if conditions worsen Supply Augmentation Activities: See Operations Plan			

Table 8-4, continued

Assessment Scenario #3: Catastrophic Interruption or Other Short Term Impact (<6 mo) to Local Surface Supply

Hydrologic and Regulatory Conditions

-Seismic, power outage, or other event resulting in short term system outage to local supply, conveyanc
-Facilities or supply outage due to repairs or upgrades
-Water quality of local surface supply
-Regulatory conditions
-Availability of supply in Santiago Reservoir

Evaluation Criteria

-District local supply facilities - treatment, storage and conveyance - unavailable for up to 6 months
-Planned outage of facilities or supply monitored until restored
-Santiago Reservoir/Creek/WTP influent water quality monitoring detect contaminants
-Regulatory changes result in interruption to local surface supply
-District monitoring of water availability in Santiago Reservoir

Unconstrained Demand: 2021 Average Year		**2,534**	
Scenario #3 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
	Local Surface Water	0	No supply available
1	Groundwater	1,885	Maximize use of groundwater
2	Imported	649	Augment with imported water

Note: Groundwater to be fully utilized up to BPP then augmented with purchased imported water

Shortage Response Actions Triggered

Demand Reduction Activities: See actions associated with Shortage Levels 4 through 5
Supply Augmentation Activities: See Operations Plan above. Regional emergency response coordination with other MWDOC agencies

Table 8-4, continued

Assessment Scenario #4: Catastrophic Interruption or Other Short Term Impact (<6 mo) to Imported Supply

Hydrologic and Regulatory Conditions

-Seismic, power, or other event resulting in short term system outage to imported supply
-Facilities or supply outage due to scheduled repairs or upgrades
-Regulatory conditions

Evaluation Criteria

-District treatment facilities and/or purchased supply shortage anticipated for up to 6 months
-Planned outage of facilities or supply monitored until restored
-Regulatory changes result in interruption to imported supply or SWD treatment facilities
-MWD or MWDOC institutes WSAP if an extreme shortage of imported supply is declared
-Statewide determination of a drought or other shortage emergency
-MWDOC's monthly Water Supply Condition update report June 1

Unconstrained Demand: 2021 Average Year		**2,534**	
Scenario #4 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
	Local Surface Water	0	No supply available
1	Groundwater	2,534	Exceed BPP entitlement
	Imported	0	No supply available

Note: Both local surface and imported supplies are treated at the WTP assumed to be unavailable in this scenario. Groundwater BPP can be exceeded. MWD shortage stage 5 triggers WSAP.

Shortage Response Actions Triggered

Demand Reduction Activities: See actions associated with Shortage Levels 3 to 5, depending on simultaneous impact to each of the surface supplies
Supply Augmentation Activities: See Operations Plan above. Activate regional emergency response

Table 8-4, continued

Assessment Scenario #5: Catastrophic Interruption or Other Short Term Impact (<6 mo) to Groundwater Supply

Hydrologic and Regulatory Conditions

-Seismic, power, or other event resulting in short term groundwater facilities outage
-Facilities or supply outage due to scheduled repairs or upgrades
-Groundwater supply water quality contamination
-Regulatory conditions such as PFASs resulting in reduction in groundwater supply

Evaluation Criteria

-District groundwater supply production, storage, and conveyance facilities unavailable after outage for up to 6 months
-Planned outage of facilities or supply monitored during outage
-Identify known regulatory changes resulting in interruption to treatment facilities
-OCWD annual determination of BPP

Unconstrained Demand: 2021 Average Year		**2,534**	
Scenario #5 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
1	Local Surface Water	1,542	Maximize use of local surface water
	Groundwater	0	No supply available
2	Imported	992	Augment with imported water as needed

Note: 1,542 AF local supply historical average. Purchased imported meets total demand

Shortage Response Actions Triggered

Demand Reduction Activities: See actions associated with Shortage Levels 3 to 4
Supply Augmentation Activities: See Operations Plan above

Table 8-4, continued

Assessment Scenario #6: Catastrophic Interruption or Other Long Term Impact (>6 mo)

Hydrologic and Regulatory Conditions

-Reservoir/Santiago Creek or imported supply water quality contamination
-Scheduling of Santiago Dam spillway improvements
-Statewide determination of a drought or other shortage emergency
-Seismic or other event resulting in long term local or regional system supply outage
-Wildland fire in Santiago Reservoir watershed
-Supply interruption in Delta or CR due to natural or human induced event

Evaluation Criteria

-Contaminant detected in ongoing water quality monitoring at Santiago Reservoir, Creek, or WTP inflow
-MWD detection of contaminant or spill in its ongoing monitoring
-Statewide restriction on the use of or delivery of imported water
-Santiago Reservoir levels lowered for spillway project
-Planned outage of facilities or supply monitored during outage, e.g., construction of PFAS treatment
-MWD institutes WSAP if an extreme imported supply shortage is declared
-OCWD annual determination of BPP

Unconstrained Demand: 2021 Average Year		**2,534**	
Scenario #6 Prioritization of Supplies Used	**Supply Sources**	**Available Quantity (AF)**	**Operations Plan**
1	Local Surface Water	1,542	Depending on which supply is impacted, the other supplies should be utilized in prioritized order
2	Groundwater	1,885	
3	Imported	2,534	

Note: 1,542 AF historical average surface water availability. Groundwater based on 77% BPP for 2021. Imported water based on 100% availability matching demand here

Shortage Response Actions Triggered

Demand Reduction Activities: See actions associated with Shortage Levels 4 to 6, depending on simultaneous impact to other supplies
Supply Augmentation Activities: See Operations Plan above. Activate regional emergency response coordination with other MWDOC agencies

8.2.2 Declaration of Shortages

The District implements its water shortage program – which imposes prohibitions, regulations of water use, and penalties for violations of water use – during times of severe water shortages. Water production figures are recorded daily by District staff; weekly and monthly reports are prepared and monitored. These data are available to be used to measure actual water savings resulting from the effectiveness of any water shortage stage that may be implemented. The General Manager will formally approve the Annual Assessment each year. If a water supply shortage is indicated in the Annual Assessment, the General Manager will make a formal presentation at a board of directors meeting alerting the board to the situation and declaring a water shortage. At that time, the General Manager will request implementation of specific shortage response actions that are appropriate for the situation. Coordination with the cities of Villa Park and Orange, and the County of Orange will occur if a proclamation of an emergency is necessary.

Regarding the imported water supply, as stages of water shortage are declared by MWD, the District will follow implementation of MWD stages and continue to monitor water use. It is not until MWD's Shortage Stage 5 that MWD may call for extraordinary conservation. During this stage, MWD's Drought Program Officer will coordinate public information activities with MWDOC and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided to MWDOC.

8.3 Water Shortage Levels

On January 22, 2009, the District's Board of Directors adopted the Water Conservation & Water Supply Shortage Program. The purpose of this ordinance was to provide for increasingly serious stages of water shortages and to define voluntary and mandatory water conservation measures to be implemented during these stages. Key elements of the District's Ordinance include the following: permanent mandatory restrictions, four staged responses to water supply shortages, and enforcements and penalties. The ordinance can be accessed at the District's website or in the 2020 UWMP. An emergency drought ordinance to impose a Level 2 Alert was adopted April 14, 2015.

To provide a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions, California Water Code Section 10632(a)(3) requires six water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, 50, percent shortages and greater than 50 percent supply shortage. Table 8-5 presents the mandatory water shortage levels.

Submittal Table 8-5: Water Shortage Contingency Plan Levels (DWR Table 8-1)		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** (*Narrative description*)
1	Up to 10%	Normal water supply conditions. Conservation encouraged year-round.
2	Up to 20%	Operational changes to increase production of other supplies
3	Up to 30%	Operational changes to increase production of other supplies and invoke demand reduction actions
4	Up to 40%	Operational changes to increase production of other supplies and increase demand reduction actions
5	Up to 50%	Operational changes to increase production of other supplies and increase demand reduction actions
6	>50%	Operational changes to increase production of other supplies. Shortage at this level is most likely to occur following a catastrophic event; extreme demand reduction measures will be increased.
NOTES: Numerical triggers of supply shortages are estimated triggers. The District has varied and multiple sources of water supply. Because of this, the shortages in the ordinance are not based on a percentage of supply shortage but rather the desired demand reduction. See crosswalk Figure 8-1 for correlation with District's shortage levels.		

Because the District's four shortage levels do not correspond directly to these six State mandated levels, the Water Code authorizes suppliers to continue using its own shortage levels. To present the relationship to the six standard shortage levels, a crosswalk is provided in Figure 8-1. Water shortage response actions corresponding to the six shortage levels are described in the following sections.

Depending upon the degree of water supply shortage, the District would enact any of the supply shortage levels summarized in Table 8-5. This would trigger additional water use efficiency measures for District customers, over and above the permanent measures. These levels are summarized below.

- Level 1, up to a 10 percent shortage, has permanent mandatory restrictions in effect at all times and if not adhered to, represent waste and unreasonable use of water. These measures are designed to optimize water use efficiency even before a water supply shortage may be realized and to alter behavior under normal seasonal and annual fluctuations as well as when there is a shortage of up to 10 percent. All District customers are required to adhere to these restrictions throughout the year.

Figure 8-1: Crosswalk Table Comparison of Shortage Levels				
Ordinance Shortage Levels	**Shortage Conditions**		**2020 WSCP Level**	**2020 Shortage Range**
Permanent: Year-round	Up to 10%		1	Up to 10%
Level 1: Moderate	15-30%		2	Up to 20%
			3	Up to 30%
Level 2: High	30-50%		4	Up to 40%
			5	Up to 50%
Level 3: Severe	50%+		6	>50%

- Level 2, a minor water supply shortage, has mandatory restrictions enacted in times of a 10 to 20 percent supply shortage. This level is within the ordinance Level 1 with its 15 to 30 percent supply shortage.
- Level 3, an alert water supply shortage, has mandatory restrictions enacted in times of a 20 to 30 percent supply shortage. This level is within the ordinance Level 1 with its 15 to 30 percent supply shortage.
- Level 4, a severe water supply shortage, has mandatory restrictions enacted in times of a 30 to 40 percent supply shortage. This level is within the ordinance Level 2 with its 30 to 50 percent supply shortage.
- Level 5, a critical water supply shortage, has mandatory restrictions enacted in times of a 40 to 50 percent supply shortage. This level is within the ordinance Level 2 with its 30 to 50 percent supply shortage.
- Level 6, an emergency water supply shortage under emergency conditions, has mandatory restrictions enacted in times of a greater than 50 percent supply shortage. This level is within the ordinance Level 3 with its equal to or greater than 50 percent supply shortage.

8.4 Shortage Response Actions

The purpose of the mandatory Annual Assessment (Water Code Section 10632.1) is to evaluate conditions affecting supply availability and determine if a shortage is apparent, what steps to take. Procedures for declaring a water shortage and the demand management measures required are discussed in Section 8.5, Communication Protocols. Specific actions to take to reduce demands or augment supplies is discussed here. Circumstances vary with each shortage

and the decisions regarding the most appropriate actions to take would be made by the General Manager. Actions described in this section are comprehensive and would be adapted to one of the six shortage levels to respond to the needs.

8.4.1 Demand Reduction

Shortage Level 1 – Permanent Mandatory Restrictions. Implementing the District's permanent restrictions has been highly effective in reducing average annual water demand over time as evidenced in the District's response to SB X7-7 (see Chapter 5 of the 2020 UWMP).

- **Limits on Watering Hours and Duration.** Watering or irrigating is prohibited any day of the week between 10am and 4pm. This applies to lawns, landscaping, and all other vegetated areas. Water is limited to no more than 15 minutes per day per station (unless hand watered or on low water drip type systems)
- **Water Flow or Runoff.** It is prohibited to water lawns, landscaping, and vegetated areas in a manner that causes or allows water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.
- **Hosing or Washing Down Hard or Paved Surfaces.** It is prohibited to use water to hose or wash down hard or paved surfaces, such as sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, unless using a bucket or automatic shut-off hose nozzle, with a few exemptions.
- **Obligation to Fix Leaks, Breaks, or Malfunctions**. Loss or escape of water through breaks, leaks, or malfunctions in the water user's plumbing, distribution or irrigation system is prohibited for any period of time after such water waste should have reasonably been discovered and corrected. Leaks, breaks, or malfunctions must be corrected in no more than three days of District notification.
- **Recirculating Decorative Water Fountains and Features.** Decorative water fountains and water features must recirculate water.
- **Limits on Washing Vehicles**. It is prohibited to use water to hose or wash down a motorized or non-motorized vehicle, including but not limited to automobiles, trucks, vans, buses, motorcycles, boats or trailers, unless using a bucket or automatic shut-off hose nozzle, with a few exemptions.
- **Water Served Only Upon Request.** Eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, clubs or other public places where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.
- **No Installation of Single-Pass Cooling Systems.** Installation of single-pass cooling systems is prohibited in buildings requesting new water service.
- **No Installation of Non-recirculating Water Systems in Car Wash and Laundry Systems.** Installation of non-recirculating water systems is prohibited in new commercial conveyor

car wash and new laundry systems. All new commercial conveyor car wash systems must have installed operational recirculating water systems or obtain a waiver from the District.

- **Water-Efficient Pre-Rinse Kitchen Dish Wash Spray Valves.** Food preparation establishments, such as restaurants and cafes, are prohibited from using non-water efficient kitchen spray valves.

Shortage Levels 2 through 6 – Potential Shortage Response Actions. Table 8-6 lists the DWR categories of shortage response actions aligned to respond to specific defined shortage Levels 1 through 6 within the District retail service area. Because 95 percent of the District customers are single family residential with over 50 percent of water demand associated with outdoor landscaping, reducing irrigation requirements would achieve the desired water savings required during a shortage. However, asking homeowners to reduce irrigation at the higher levels can be difficult and expensive (e.g., replacing dead landscaping after the shortage is over) because of the size of the individual parcels and the financial investment made in landscaping. Therefore, as presented in Table 8-6, for Levels 2 through 5 watering limitations April through October increase with each shortage level increase.

For Level 6, no watering or irrigating (with certain exceptions) is allowed. It is anticipated that total demands could be reduced by approximately 75 percent under Level 6 watering restrictions alone to meet potential supply reductions of greater than 50 percent. Unless a regional disaster, Level 6 may require extensive public outreach to ensure that water use is curtailed during the duration of the outage.

Because large single family homes are the predominant land use in Villa Park, leaks can consume a significant amount of water on the customer side of the meter. The speed of fixing leaks greatly impacts the amount of water saved. The ordinance requires quicker responses to leaks under increasing supply shortage levels. For example, Level 2 and 3 shortages require fixes of leaks, breaks, and malfunctions within 72 hours decreasing to 48 hours under Level 4 and 5 shortages, and within 24 hours under Level 6 shortage.

The District's drought rate structure was enacted in 2015 in response to the State mandate to reduce water use by 36 percent. SWD responded with an outreach program that included bill inserts notifying customers of their unique water budget and penalty structure. These customized structures relied on the identification each customers' 2013 consumption and they were budgeted with a 36 percent reduction. For every percentage of water use that they exceeded their new baseline budget, that percentage was multiplied by their water bill for the month with an additional multiplier of 1.5 for a penalty charge. This resulted in a significant increase in costs if not reduction occurred, thus was effective in reducing demands by 38 percent.

Submittal Table 8-6: Demand Reduction Actions (DWR Table 8-2)				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply to you.*	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforce-ment?
Add additional rows as needed				
Level 1	Landscape - Limit landscape irrigation to specific days		Watering limited to three days a week April through October and one day per week November through March, with minor exceptions	No
Level 2	Same as Level 1 plus further outreach/restrictions to achieve 20% savings			
	Landscape - Restrict or prohibit runoff from landscape irrigation	up to 2%	Fix leaks, breaks, and malfunctions within 72 hours	No
	Expand Public Information Campaign	up to 20%	Implement public outreach	No
Level 3	Same as Level 2 plus further outreach/restrictions to achieve 30% savings			
	Expand Public Information Campaign	up to 30%	Enhance public outreach	No
	Landscape - Restrict or prohibit runoff from landscape irrigation	up to 4%	Fix leaks, breaks, and malfunctions within 72 hours	No
	Landscape - Limit landscape irrigation to specific days	up to 10%	Watering limited to two days a week April through October and one day per week November through March, with minor exceptions; no watering 10:00am to 4:00pm	Yes
Level 4	Same as Level 3 plus further outreach/restrictions to achieve 40% savings			
	Implement or Modify Drought Rate Structure or Surcharge	up to 40%	12% then 32% savings were realized in FY15 and FY16, respectively, after implementing budget based drought rate structure in 2015	Yes
	Landscape - Restrict or prohibit runoff from landscape irrigation	up to 8%	Fix leaks, breaks, and malfunctions within 48 hours	No
Level 5	Same as Level 4 plus further outreach/restrictions to achieve 50% savings			
	Implement or Modify Drought Rate Structure or Surcharge	up to 50%	Increase penalties to achieve greater savings	Yes
	Landscape - Prohibit all landscape irrigation		No watering or irrigating with certain exceptions	
Level 6	Same as Level 5 plus further outreach/restrictions to achieve more than 50% savings			
	Landscape - Restrict or prohibit runoff from landscape irrigation	up to 16%	Fix leaks, breaks, and malfunctions within 48 hours	No
	Moratorium or Net Zero Demand Increase on New Connections	0	No new potable water service and no new annexations to service areas	No
	Implement or Modify Drought Rate Structure or Surcharge	up to 75%	Increase penalties to achieve greater savings	Yes
NOTES: Each level includes the restrictions from the previous level. All levels include permanent water use efficiency measures				

8.4.2 Supply Augmentation

The District has three water supplies: local surface water, groundwater, and purchased imported water. As presented in Table 8-4 under the Operations Plan for each Annual Assessment scenario,

these supplies would be managed uniquely in response to the conditions underlying the cause of the shortage. The supply augmentation responses as an Operations Plan identified in Table 8-4, have been integrated into the District's supply management planning for shortage conditions. For example, the local surface water supply is utilized as the first priority water supply and is typically augmented by pumping groundwater, while imported surface water may be purchased to store in Santiago Reservoir to meet desired water levels. When one or more of these supplies is limited, as is the case in 2021 with the wells shut down due to a regulatory constraint, additional water is obtained first by utilizing water stored in Santiago Reservoir, then by increased purchases of imported water. This is not necessarily triggered by a response to a shortage level but rather as an ongoing operational plan to manage the robust supplies most efficiently and cost effectively. This is evident in the discussion and tables in Chapter 6 of the 2020 UWMP and is reflected in Table 8-7.

Table 8-7: Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online*	How much is this going to reduce the shortage gap? *Include volume or percentage used.*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
Level 1	Other actions (describe)	up to 10%	Operational plan: change in allocation of existing supplies
Level 2	Other actions (describe)	up to 20%	Operational plan: change in allocation of existing supplies
Level 3	Other actions (describe)	up to 30%	Operational plan: change in allocation of existing supplies
Level 4	Other actions (describe)	up to 40%	Operational plan: change in allocation of existing supplies
Level 5	Other actions (describe)	up to 50%	Operational plan: change in allocation of existing supplies
Level 6	Other actions (describe)	up to 4,582 AF	Additional purchases will reduce shortage gap
NOTES: Due to the varied portfolio of supplies available under different operating conditions, the District does not anticipate a shortage of supply until level 6			

Although the increased use of an existing supply may be considered a redundant supply according to the guidebook because it is incorporated into the operational plan of the system, it is the logical action to address any shortage gaps that occur during dry conditions or outages. There is no need to pursue acquiring emergency dry year supplies when the reliability of the current supplies have been proven through the years to be adequate to respond to a supply shortage, along with demand management actions. The District will respond to the water shortages defined in the Annual Assessment (presented in Table 8-4), which may result in the need for demand reduction activities or a change in the Operations Plan to optimize supplies.

8.4.3 Operational Changes

Operational changes that can be implemented to address water shortage levels are identified in the Annual Assessment Table 8-4 for each of the Assessment Scenarios of possible shortages or outages. These operational plan changes reflect a change in water supplies and volume needed to respond to the specific dry year or outage condition.

8.4.4 Additional Mandatory Restrictions

There are no additional mandatory restrictions as options to respond to water shortage levels besides those identified in Table 8-6 and elsewhere in this WSCP.

8.4.5 Emergency Response Plan

America's Water Infrastructure Act of 2018 Section 2013(b) requires community water systems serving populations greater than 3,300 to develop or update an Emergency Response Plan (ERP). The District is vulnerable to potential disaster situations that could result in catastrophic interruption of water supplies. The most likely events triggering a catastrophic supply interruption include a regional power outage. Other catastrophic events include an earthquake in the Delta affecting imported water supplies and an earthquake in Southern California affecting the conveyance and treatment of supplies. Human-made threats include contamination to the water system, structural damage from an explosive device, employee assaulted with a weapon, Supervisory Control and Data Acquisition System (SCADA) or IT system intrusion, water supply interruption, or a bomb threat. A catastrophic supply interruption that affects more than one of the District's three supplies can result in an extreme shortage for water available for extended fire fighting needs and customer consumption.

The District prepared its ERP in 2006 and although it cannot be provided in this document for security reasons, it is summarized here. The ERP provides the District with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of human-made or natural origins. The ERP also describes how SWD will respond to potential threats identified in the vulnerability assessment as well as additional emergency response situations. During an outage, various actions will need to be taken to continue water service, especially for key functions such as fire fighting. Various parts of the District's staged response plan - reflecting DWR's six levels of shortages - can be invoked, as needed, during declared water shortages.

There are a number of other water utilities within the regional area: MWD, Irvine Ranch Water District, and City of Orange, with their own water supply and treatment systems. Bypass turnout valve connections from SWD's water distribution system to the City of Orange are in place and are currently maintained by SWD. The valves also enable SWD to serve as alternative potable water source from the City of Orange, if needed.

The District can deal with both planned and unplanned power outages. In the event of an unplanned power outage within the service area, water supply can be maintained by gravity from the treated water reservoirs located throughout the distribution system. Mobile generators the District owns or can obtain quickly from neighboring agencies would be transported to key locations to allow for transfers to upper zones. Public outreach to reduce demands would occur immediately. A high level of public outreach and water use restrictions would occur with a regional outage, particularly one invoking a Level 6 supply shortage.

8.4.6 Seismic Risk Assessment and Mitigation Plan

MWDOC updated its "Orange County Regional Water and Wastewater Hazard Mitigation Plan" in 2019 for its member agencies. The Hazard Mitigation Plan (HMP) identified and prioritized hazards affecting the County of Orange, assessed the associated vulnerability of the systems from those hazards, and provided mitigation plans in accordance with Disaster Mitigation Act of 2000 and Federal Emergency Management Agency's HMP guidance documents.

The plan provides a framework for planning for natural and human-made hazards. SWD is a participating agency in this program and its Board of Directors adopted the plan. The update from the 2012 plan added power outage and climate change hazards. Seismic hazards addressed include fault rupture, ground shaking, and liquefaction, while geologic hazards addressed include expansive soils and land subsidence. The plan provides a strategy and blueprint for mitigating the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources and the member agencies' ability to expand on and improve these tools. The highest ranked hazards, based on probability and impact, were power outage and wildfire, followed by seismic hazard – ground shaking, and seismic hazard – liquefaction.

The seismic risk to the District is primarily associated with ground shaking. All of the service area and lands between the service area and Santiago Reservoir are considered to have "high" and "extreme" ground shaking susceptibility. To mitigate these potential impacts, the District has stocked long term storable equipment and supplies to allow the wells to be brought back in service as soon as possible. The District Earthquakes that occur outside of Orange County could have a significant impact on the District's imported water supply. Both the Colorado River Aqueduct and the State Water Project facilities could be disrupted, along with the Sacramento River-San Joaquin River Delta, where failure of levees and flooding of islands with salt water from San Francisco Bay could disrupt water supplies for years. However, if the wells are not impacted by earthquakes but imported supplies are reduced or eliminated, the District can supply 100 percent of the District's demand with groundwater.

8.4.7 Shortage Response Action Effectiveness

The locally appropriate shortage response actions for demand management were quantified for effectiveness in Table 8-6, reflecting the shortage level required. This given suite of response actions can be expected to deliver the expected outcomes necessary to meet the requirements of a given shortage level. For example, for a supply shortage of 20 percent, public information outreach to encourage conservation would reflect the effort required to achieve the 20 percent reduction. A greater level of outreach would achieve a greater level of savings, although with diminishing results without financial impacts. For example, allocations were initiated by MWD/MWDOC in FY15, the third year of the most recent drought. In addition, the District and MWDOC initiated additional conservation outreach. Water use was reduced 12 percent in that year.

The upper shortage levels would require the imposition of the District's drought rate structure to achieve more substantial savings. These savings can be quantified by analyzing actions also undertaken in the recent drought. Although several actions were implemented over the course of the five year drought, the action correlated with the greatest water savings was the implementation of the District's drought rate structure. This was enacted in 2015 in response to the Governor's call to reduce water demand by 36 percent. SWD responded with a temporary penalty rate structure coupled with an outreach program that included bill inserts notifying customers of their unique water budget and the penalty structure. These individually customized budgets were based on each customers' 2013 consumption as a starting point with a 36 percent reduction as the goal with penalties if exceeded. Overall demand in FY16 decreased 38.4 percent from FY13.

Considering that such a significant amount of land for most Villa Park homes is dedicated to outdoor landscaping, the potential for even further reduced demand is great. However, a Level 6 demand management action would certainly not be chosen without significant concern because the financial impact to homeowners would be significant if the shortage were extended to a point where the landscaping is irreparably damaged.

8.5 Communication Protocols

Communication protocols can differ between a supply shortage resulting from hydrological conditions and an emergency short- or long-term outage. Table 8-8 summarizes the communication protocols associated with each of the six water shortage levels.

Table 8-8: Communication Protocols	
Shortage Level	Communication Protocols and Procedures
1	• Ongoing outreach efforts to promote ongoing efficiency programs
2	• Initiate public information campaign to announce water supply conditions and needed actions from the public • Announce water supply shortage status to key stakeholders • Increase conservation messages on City website and in standard outreach efforts
3	• Supplement Level 2 activities with additional tactics, as needed • Provide regular condition updates to stakeholders • Continue promotion of ongoing water efficiency programs programs/tools • Enhance promotion of ongoing water efficiency programs targeted advertising
4	• Update campaign and messages to raise awareness for more severe water saving actions and behaviors by the public • Announce water supply shortage status to key stakeholders • Supplement Level 3 outreach with additional tactics, as needed • Conduct specialized outreach to reduce discretionary outdoor use while minimizing landscape damage
5	• Update campaign and messages to reflect extreme or emergency condition and likely need to focus water use on health/safety needs • Announce water supply shortage status to key stakeholders • Supplement Level 4 outreach with additional tactics, as needed • Suspend promotion of long-term water efficiency programs to focus on imminent needs
6	• Formal and detailed communication protocols in the District's ERP and MWDOC's hazard mitigation plan are activated. This level requires a formal protocol with regional agencies to address the catastrophe or extreme supply shortage • Update campaign and messages to reflect extreme or emergency condition and likely need to focus water use on health/safety needs • Announce water supply shortage status to key stakeholders • Supplement Level 5 outreach with additional tactics, as needed • Suspend promotion of long-term water efficiency programs to focus on emergency needs
NOTE: Response actions for each stage are provided in Table 8-6.	

Shortage. A water supply shortage or threat of shortage exists when the District determines, in its sole discretion that it exists, due to drought, catastrophe, or other water supply condition. The District's Board of Directors may declare a specific level of Water Supply Shortage condition at a regular or special public meeting in accordance with State law. For notification of a Level 6 water emergency, except as otherwise provided by State law, the District must publish a copy of the water emergency resolution in a newspaper used for the publication of official notices within the jurisdiction of the District within five business days of the date that the emergency is declared. Except as otherwise provided by State law, additional mandatory water use efficiency requirements will take effect on the tenth business day after the date that the emergency is declared.

Emergency. During an emergency water shortage, communications during the response will proceed along the chain of command identified in the ERP. The number of people notified will increase as the incident expands and decrease as the incident contracts toward its conclusion. The type and extent of the disaster will dictate the normal and/or alternative methods of communication that will be used. The possibility of a coordinated attack that targets multiple systems has been considered and it would be reasonable to assume that some methods of communication will either be unavailable or limited to certain areas. Communications with the public may include boil water orders, unsafe water alerts, or do not drink notices that would be coordinated with the Orange County Health Department and the State Division of Drinking Water.

During a MWD Shortage Stage 5, MWD's Drought Program Officer will coordinate public information activities with MWDOC. The District will participate in member agency meetings with MWDOC to monitor and discuss water allocations. This will enable the District to be aware of imported water use on a timely basis as a result of specific actions taken in response to MWD's Water Shortage Contingency Plan. As done in the past, the District will follow the Water Supply Allocation Plan guidelines of MWD once an extreme shortage is declared. This allocation plan is enforced by MWD using rate surcharges. MWDOC follows the guidelines of the allocation plan and imposes the surcharge that MWD applies to its member agencies that exceed their water allocation.

8.6 Compliance and Enforcement

Any violation of the District's Water Conservation & Water Supply Shortage Program, including waste of water and excessive use, is a misdemeanor. Penalties for failure to comply with any provisions of the ordinance include the following.

First Violation: SWD will issue a written warning and deliver a copy of the ordinance by mail

Second Violation: A second violation within the preceding twelve calendar months is punishable by a fine not to exceed $100

Third Violation: A third violation within the preceding twelve calendar months is punishable by a fine not to exceed $250

Fourth and Subsequent Violations: A fourth and any subsequent violation is punishable by a fine not to exceed $500

Water Flow Restrictor: In addition to any fines, the District may install a water flow restrictor device.

In addition to any other remedies that the District may have for enforcement, service of water would be discontinued or appropriately limited to any customer who willfully uses water in violation of any provision of the plan.

8.7 Legal Authorities

On January 22, 2009, the District's board of directors approved the ordinance establishing the Water Conservation & Water Supply Shortage Program. The purpose of this ordinance was to provide for increasingly serious stages of water shortages and to define voluntary and mandatory water conservation measures to be implemented during these stages. Key elements of the District's Ordinance include the following: permanent mandatory restrictions, staged responses to water supply shortages, and enforcements and penalties. The ordinance can be found in Appendix G of the 2020 UWMP. In addition, this WSCP was adopted by the board of directors June 15, 2021 as its plan for responding to any potential water shortages.

The Board of Directors has the power to declare a water shortage emergency in accordance with Water Code Chapter 3 (commencing with Section 350) of Division 1 regarding water shortage emergencies. It also has the power to implement the applicable provisions of the District's shortage ordinance when in its opinion the demand for water consumption exceeds the District's available supply (allowing for a safe reserve), or threatens to do so, provided there are no immediate resources available to remedy the situation. Such declaration shall be made by public announcement and shall be published in a newspaper of general circulation and shall become effective immediately upon such publication.

The District shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency under California Government Code, California

Emergency Services Act (Article 2, Section 8558). The relevant agencies (i.e., County of Orange, City of Orange) are provided in Table 10-1 of the 2020 UWMP.

8.8 Financial Consequences

During an interruption of water supplies or prolonged drought or water shortage of any kind, expenditures may increase as damage to the water system requires emergency repairs or if additional imported water must be purchased at a higher rate or if the pumping BPP is exceeded. Expenditures may also go down, depending on the supply being impacted, as less water is pumped so power costs are lower, water treatment chemicals and operational costs are reduced because less surface water is treated at the water treatment plant, or water purchase expenses are lower as imported water purchases are unavailable during a catastrophic event. However, the District will experience a reduction in revenue due to reduced water sales. The amount of the decrease in revenues would be indirectly related to the demand reduction actions required under each of the six shortage levels.

The District receives water revenue from a service charge for the first five unit followed by a consumption (commodity) charge for each unit of consumption greater than one unit. The rates have been designed to recover most of the cost of water service in the service and commodity charges. Therefore, the total cost of purchasing water and producing local supplies would decrease as the usage or sale of water decreases, however there are significant fixed costs associated with maintaining a minimal level of service.

The District pays OCWD the Replenishment Assessment (RA) for each acre-foot of water extracted. The cost to pump from the basin is about half the cost of imported water. As previously discussed, the BPP is set annually by OCWD. If the District were to exceed the BPP percent established for that year, it pays the RA plus a Basin Equity Assessment (BEA) charge which makes the cost of groundwater equivalent to purchasing imported water. Purchased MWD/MWDOC water during times of drought can also increase the cost of water when MWD or MWDOC trigger the Water Supply Allocation Plan (WSAP) rate surcharges discussed below.

The costs of discouraging excessive water use during a drought emergency would be shared with MWDOC as the regional water use efficiency outreach provider and the District as the enforcer. Those costs associated with excessive use during an emergency are not anticipated to be significantly greater than messaging provided during a drought/emergency for overall demand management actions. If significant enforcement or outreach is warranted, one additional staff person may be needed temporarily, otherwise existing personnel can be utilized.

8.9 Monitoring and Reporting

Water demand must be monitored frequently during emergency water shortages to enable the District to effectively manage the balance between supply and demand. All individual accounts in the District are metered, and overall water production and the status of the District's supply is continuously monitored through District facilities and its SCADA system. Water production figures are recorded daily; weekly and monthly reports are prepared and monitored. These data are available to identify an increase in production that may reflect a dry year and measure water savings resulting from the effectiveness of any water shortage contingency level that may be implemented.

As done in the past, the District follows MWD's WSAP guidelines once an extreme shortage is declared. This allocation plan is enforced by MWD using rate surcharges. MWDOC follows the guidelines of the allocation plan and imposes the surcharge that MWD applies to its member agencies that exceed their water allocation. This results in higher costs to the District if its purchases exceed its allocation.

As stages of water shortage are declared by MWDOC, the District implements those stages. It is not until MWD's Shortage Stage 5 that MWD may call for extraordinary conservation. During this stage, MWD's Drought Program Officer will coordinate public information activities with MWDOC and monitor the effectiveness of ongoing conservation programs. The District collects, tracks, and analyzes data to monitor customer compliance and to meet State reporting requirements. Monthly reporting on estimated conservation water savings is provided to MWDOC. The District will participate in member agency meetings with MWDOC to monitor and discuss water allocations. This will enable the District to be aware of imported water use on a timely basis as a result of specific actions taken in response to MWD's Water Shortage Contingency Plan.

As done in the past, the District will follow the WSAP guidelines of MWD once an extreme shortage is declared. This allocation plan is enforced by MWD using rate surcharges. MWDOC follows the guidelines of the allocation plan and imposes the surcharge that MWD applies to its member agencies that exceed their water allocation. This results in higher costs to the District if its purchases exceed its allocation. For example, MWD declared a Stage Level 3 in April 2015 for a 15 percent reduction on imported deliveries. MWDOC implemented Stage Level 3 the following day. This allocation was in effect for a 12 month period from July 1, 2015 to June 30, 2016.

On May 9, 2016, the Governor issued Executive Order B-37-16 to make water conservation a way of life in California and directed the State Water Resources Control Board to establish permanent reporting and data collection by urban water suppliers. On April 21, 2020, the State Water Resources Control Board adopted Resolution No. 2020-0009, which requires monthly urban water conservation reporting. The Urban Water Supplier Reporting tool is used for monthly

reporting. The monthly reporting required by the State Water Resources Control Board will be used for reporting purposes of this WSCP.

8.10 Refinement Procedures

The District is required to submit the Annual Assessment to DWR. This new report (Table 8-4) is due by July 1 of each year, starting in 2022. The annual report will be based on the assessment of demands on the system in conjunction with supply availability as outlined above. The District may at this time each year reevaluate the functionality of its WSCP process and make appropriate adjustments if warranted. The WSCP will be reviewed at least every five years as a part of the UWMP update.

8.11 Special Water Feature Distinction

There are no known special water features in the District service area.

8.12 Plan Adoption, Submittal, and Availability

This WSCP was adopted by the District Board of Directors June 15, 2021 and submitted to DWR in July of 2021. It is available to the public through the District website. It is a living document that is meant to be updated, as needed, between the required five year update. If the WSCP is amended, a copy will be provided to DWR within 30 days of adoption.

Chapter 9 - Demand Management Measures

9.1 Background

The District is committed to conservation as a means to maintain the lower water demands within its service area. Because of the effectiveness of the programs, the District was able to exceed its 2020 water use target of 373 gpcd with District-wide average water use of 359 gpcd.

Conservation programs are provided by the District for its retail service area only. Although the District sells water to Orange each year, it does not have responsibility for its system or customers. The City of Orange has its own conservation program and, like the District, works jointly with MWDOC and MWD to implement extensive conservation programs. Providing regional programs on behalf of the District and other retail agencies in Orange County minimizes confusion to customers and maintains a consistent message to the public to use water efficiently.

The District plans to continue implementation of its conservation programs in conjunction with MWDOC. As a member agency of MWDOC, the District benefits from various regional programs performed by MWDOC on behalf of its member agencies. MWDOC became a signatory to the Best Management Practices (BMP) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) in 1991. MWDOC has made the State-mandated Demand Management Measures (DMMs) the cornerstone of its conservation programs for its member agencies.

AB 1420 conditions the eligibility for a water management grant or loan on implementing or scheduling for implementation the DMMs listed in Water Code section 10631(f), or in demonstrating that certain BMPs are not locally cost effective. Based on this DWR had determined that it will equate the DMMs with the BMPs for loan and grant funding eligibility purposes. Compliance on a regional basis required participation in a regional conservation program, such as MWDOC's, that achieves the level of conservation equivalent to the amount of savings achieved if each of the participating urban water suppliers implemented the DMMs.

Retail water agencies throughout Orange County recognize the need to use existing water supplies efficiently – implementation of BMP-based efficiency programs makes good economic sense and reflects responsible stewardship of the region's water resources. All retail water agencies in Orange County are actively implementing BMP-based programs. The District continues to work cooperatively with MWDOC and MWD in implementing the DMMs throughout the county. Most of the cost of implementing these programs is incorporated in MWDOC's rate surcharges.

The District and MWDOC's commitment to implement BMP-based water use efficiency program continues today. Implementation responsibility is clear between MWDOC as the wholesaler and regional program manager, and the District for each of the DMMs. To help facilitate implementation of BMPs throughout Orange County, MWDOC's efforts focus on the following three areas.

Regional Program Implementation. MWDOC develops, obtains funding for, and implements regional BMP programs on behalf of all retail water agencies in Orange County. This approach minimizes confusion to consumers by providing the same programs with the same participation guidelines, and also maintains a consistent message to the public to use water efficiently. Further, MWDOC helps build partnerships to accomplish conservation.

Local Program Assistance. When requested, MWDOC assists retail agencies to develop and implement local programs within their individual service areas. This assistance includes collaboration with each retail agency to design a program to fit that agency's local needs, which may include providing staffing, targeting customer classes, acquiring grant funding from a variety of sources, and implementing, marketing, reporting, and evaluating the program. MWDOC provides assistance with a variety of local programs including, but not limited to, Home Water Surveys, Large Landscape Water Use Reports, Drip Irrigation Pilot Program, Public Agency Water Smart Landscape Incentives, HOA and Public Information, School Education, Conservation Pricing, and Water Waste Prohibitions. Many of these local programs have also been structured through Integrated Regional Water Management Planning processes in north, central and south Orange County.

Research and Evaluation. An integral component of any water use efficiency program is the research and evaluation of potential and existing programs. Research allows an agency to measure the water savings benefits of a specific program and then compare those benefits to the costs of implementing the program in order to evaluate the economic feasibility of the program when compared to other efficiency projects or existing or potential sources of supply. Furthermore, in 2013 MWDOC published its first Orange County Water Use Efficiency Master Plan to define how Orange County will comply with (it actually exceeded) the state mandate of a 20 percent reduction in water use by 2020, and how MWDOC will achieve its share of Metropolitan's Integrated Resources Plan water savings goal. The Master Plan is being utilized to achieve the water savings goal at the lowest possible costs while maintaining a mix of programs desired by water agencies and consumers throughout Orange County.

9.2 Demand Management Measures

Urban water conservation practices are intended to reduce long-term urban demands from what they would have been without implementation of these practices. They are in addition to

programs that may be instituted during occasional water supply shortages. The District and the Water Use Efficiency Department at MWDOC take pride in providing programs to assist customers in reducing the amount of water used. Programs administered by MWDOC's Water Use Efficiency Department to assist in promoting regional water use efficiency, as well as SWD's DMM activities, are described in the following order.

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

California Water Efficiency Partnership, CalWEP, previously known as California Urban Water Conservation Council, is a voluntary statewide organization of water agencies, public interest organizations, and private entities tasked with overseeing the BMP reporting process, implementing and revising the *Memorandum of Understanding Regarding Urban Water Conservation*, and generally promoting urban water use efficiency in California.

9.2.1 Water Waste Prevention Ordinance

The Board of Directors passed a resolution In 2009 prohibiting waste and unreasonable use of water. These provisions are incorporated into the District's water conservation program as Section IV, located in Appendix G. It explicitly states that the waste of water is to be prohibited. It includes specific actions that waste water, effective at all times, such as excessive runoff from landscape irrigation.

9.2.2 Metering

The District service area is fully metered and requires meters for all customers and will continue to require metering of all connections. The District has a meter replacement program, replacing aging meters before they lose accuracy.

9.2.3 Conservation Pricing

The District's water rates meet the CalWEP definition of "conservation pricing" that includes "rates designed to recover the cost of providing service." All customers in the District are metered and billed monthly based on commodity rates. The District requires meters for all customers, with the exception of dedicated fire services. The water rate structure includes a fixed charge for

the first unit of water with usage above that amount billed per unit. The service charge is based on meter size and is designed to cover the cost of water distribution, meter reading, and maintenance of the distribution system and a portion of the capital improvement program. The conservation pricing portion is structured to recover the actual cost of water, including the groundwater replenishment assessment, imported water charges, and energy and maintenance costs for the water production and treatment facilities.

The drought penalty rate structure implemented in 2015 was in response to the multi-year drought. It can be reactivated if needed in the future. It is described in the WSCP Chapter 8.

9.2.4 Public Education and Outreach

The District and MWDOC partner on public information education and outreach programs for the District's retail operations. MWDOC's public information programs reach thousands of consumers annually. MWDOC's water use efficiency public information programs are built around communication, coordination and partnerships with its member agencies and cities, MWD, and other local, state, and federal legislative and regulatory bodies. The goal is to help member agencies and the public understand current issues and the challenges, opportunities, and costs involved in securing a reliable supply of high quality water.

Through a variety of public information programs, MWDOC assists its member agencies in reaching the public with accurate, consistent information regarding present and future water supplies and the importance of implementing water efficient techniques and behaviors. MWDOC also assists its member agencies in publicizing the availability of water use efficiency programs and technologies throughout Orange County. MWDOC launched its "Water: Do More with Less" outreach effort partnering with leading organizations and businesses to facilitate water efficient behaviors and attitudes.

MWDOC conducts the following activities on behalf of, and in coordination with, its member agencies.

- Public affairs workgroup
- Poster/slogan contest
- Local and regional events
- Speakers bureau
- Information materials
- Water quality reports
- Media relations

In addition, the District provides public information directly to its customers to raise awareness of water usage and conservation efforts. For example, a drought tolerant landscape

beautification contest was jointly funded by the District and Villa Park. The District regularly distributes a variety of information materials to the public including billing inserts and manager's reports to the Board of Directors with conservation information. Its billing system indicates water usage compared with previous year usage. The District actively encourages the media to highlight District efforts and activities. The District participates in the monthly Public Affairs Workgroup meetings conducted by MWDOC to coordinate public outreach efforts and share information on a countywide basis.

MWDOC's school education programs promote water conservation and water conservation related benefits and is considered one of the most successful and well recognized water education curriculums in Southern California. For more than 35 years, MWDOC teachers, assisted by its mascot "Ricki the Rambunctious Raindrop," have been educating students in grades Kindergarten through high school about the water cycle, the importance and value of water, and the personal responsibility we all have as environmental stewards.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

The District's has over $88 million in assets. Its distribution system asset management program consists of long term planning elements and responding to needs as they arise. The capital improvement program identifies treatment and distribution system infrastructure in its renewal and replacement program to replace before breaks or malfunctions. The distribution system maintenance program is based on a regular schedule of maintenance that staff are responsible for implementing on a daily basis to reduce distribution system losses. With such a low estimate of system losses (4.2 percent in 2020) over the years, the future distribution system loss standard being developed by the SWRCB will likely not be difficult to meet.

9.2.6 Water Conservation Program Coordination and Staffing Support

SWD created the position of Water Conservation Specialist in response to the most recent drought. In addition, District staff work closely with MWDOC's Water Use Efficiency staff to develop and implement District and regional programs. The Conservation Specialist is a "concierge" to the customers, dedicated to helping customers implement water efficiency measures by adjusting sprinklers, applying for MWDOC rebates, among other activities. The conservation coordinator activities indirectly provide additional outreach to District customers.

9.2.7 Other Demand Management Measures

As a member agency of MWDOC, the District participates in numerous residential water conservation rebate programs. Because of the lack of industrial lands and limited commercial uses, the District focuses on residential water use efficiency programs. Programs not already described above include high efficiency washing machine rebates, smart irrigation timer and

rotating nozzle rebates, and turf removal rebates. One of the most successful DMMs during the last five years was the turf removal rebate, where over 16,000 square feet was replaced.

9.3 Implementation over the Past Five Years

The DMMs implemented by the District are described in Section 9.2. This section provides a quantification of the implementation of DMMs over the previous five years of 2016 through 2020. The nature and extent of the DMM programs (e.g., toilet replacement rebate values, rotating nozzles, etc.) are provided. Because the District's conservation efforts with its retail customers have been so successful resulting in the ability to meet its 2020 water use target, it will continue to implement the current programs individually and with MWDOC. Table 9-1 quantifies activities implemented by MWDOC and the District for the District's retail service area during the previous five years.

Table 9-1: MWDOC and SWD Conservation Program Activities

Measures Installed	2015/16	2016/17	2017/18	2018/19	2019/20
He Efficiency Clothes Washers	8	11	8	2	7
High Efficiency Toilets	54			3	
Rain Barrels	34	6			
Premium High Efficiency Toilets	1	2			
Rotating Nozzles	1,256				
CII Weather Based Irrigation Controllers	2				
Residential Weather Based Irrigation Controllers	12	4	9	11	8
Turf Removal (square feet)	5,771	5,450	555	4,000	840
Spray-to-Drip (squre feet)			1,554		

Source: MWDOC, 2021

Metering. All customers are metered. The District has a meter replacement program; approximately 600 meters over 15 years old were recently replaced with the remaining meters to be replaced over the next three years.

Public Education and Outreach. As described in Section 9.2.2, the District expanded its education and outreach efforts during the recent drought. District management has conducted town hall meetings, spoke at Rotary luncheons, and attended other outreach speaking engagements at approximately seven events. Signage has been provided with four banners and billboards with rotating messages linked to current water use efficiency messaging.

Water Conservation Program Coordination and Staffing Support. The District trained staff to offer a Water Use Efficiency Concierge service to the community during the last drought. The service has been retained.

9.4 Future Water Use Objectives

The Water Code requires that suppliers or the State develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. The first report will require information on what DMMs suppliers will implement to meet their objectives. DWR encourages the District to consider aligning conservation management actions in consideration of these future unknown obligations.

Chapter 10 – Plan Adoption, Submittal, and Implementation

This chapter discusses the UWMP and WSCP adoption, submittal, and implementation process. Since an addendum was provided for the 2015 UWMP to address reduced Delta reliance interests, this addendum was included in the noticing and review actions required for the 2020 UWMP and WSCP. It is noted here that the WSCP was adopted as a stand alone plan that can be updated at any time before the next required update in 2025.

10.1 Inclusion of all 2020 Data

Data provided in the UWMP and the WSCP reflect fiscal years beginning July 1. Data utilized is current through the end of the last full fiscal year – June 30, 2020. The WSCP was adopted at the same time as the UWMP.

As required by *California Water Code* Section 10631(k), MWDOC provided its member agencies information that quantified water availability to meet their projected demands over the next 25 years, in five-year increments. Based on the projections of retail demand and local supply development provided by MWDOC's member agencies and the imported supply availability described in MWD's 2020 UWMP, MWDOC provided data specific to each member agency to be used by that agency to update its own UWMP. These data were used wherever possible for consistency between documents.

10.2 Notice of Public Hearing

To provide public opportunities to participate in the UWMP and WSCP process, the District provided notification of the preparation of the updated UWMP and the WSCP and public noticing of the public hearings. These steps were consistent with all California Water Code requirements for notification of availability of this document in its draft and final forms.

10.2.1 Notice to City and County

During the preparation of this UWMP and WSCP, the District notified several agencies, including the City of Villa Park, the primary city within the District's service area, of its UWMP and WSCP preparation and public hearing date, 60 days prior to the public hearings held on June 15, 2021 at a District Board of Directors meeting. As presented in Table 10-1 and Table 10-2, the cities of Orange and Villa Park and the County of Orange – in addition to MWDOC and OCWD – received the 60 day and public hearing notifications.

The draft versions of the UWMP and WSCP were provided to the cities of Villa Park and Orange, County of Orange, MWDOC, and OCWD prior to the public hearings, for review and comment. The notice repeated the time and place of the public hearings held separately for each document but at the same meeting.

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Orange	☑	☑
City of Villa Park	☑	☑
MWDOC	☑	☑
Orange County Water District	☑	☑
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Orange County	☑	☑
	☐	☐

10.2.2 Notice to the Public

The District encouraged public participation in the UWMP and WSCP development process through the noticing of the public hearing and by encouraging the review of the draft documents. Availability of the draft UWMP and WSCP and a legal notice of the public hearings was provided prior to the June 15, 2021 public hearing held at a Board meeting. The public hearing notice provided the time and place of the hearing as well as the location (District headquarters) where the UWMP and WSCP were available for public review during normal business hours. This notice was published in the Orange County Register once a week for two consecutive weeks with at least five days between each notice.

A copy of the draft UWMP and WSCP were made available for public review at the District offices during normal business hours prior to the notification appearing in the newspaper. However, due to the coronavirus pandemic, a draft was also made available to the public on the SWD website, to minimize physical contact in the District offices.

In addition, the draft document was electronically sent to the cities and county in Table 10-1 and other entities in Table 10-2. A notice of the public hearing date, time, and location was provided with the draft document. The public hearing was held consistent with the Dymally-Alatorre Bilingual Services Act. This act requires that every local public agency serving a substantial number of non-English speaking people shall employ persons to ensure the provision of information in the language of the non-English speaking person.

10.3 Public Hearing and Adoption

The public hearing was held at a regularly scheduled Board of Director's meeting on June 15, 2021 at 8:30 a.m. at District headquarters. The adoption of both the UWMP and WSCP occurred as separate actions following the public hearing on both items at the same meeting. Documentation of public noticing required by the Act, of the public hearing encouraging the involvement of various community groups, letters of correspondence, and the adoption resolution are included in Appendix H.

10.4 Plan Submittal and Public Availability

The draft UWMP and WSCP were made available for public review before the public hearing. In addition, the adopted plans were made available for public review during normal business hours for at least 30 days following submittal to DWR. The adoption resolutions are provided in Appendix H.

The final 2020 UWMP and WSCP were provided electronically to the following entities within 30 days after adoption or by July 1, 2021.

- California State Library
- City of Villa Park
- City of Orange
- County of Orange
- Department of Water Resources (plus all tables as required by the Act) by July 1, 2021
- Municipal Water District of Orange County
- Orange County Water District

The documents were also posted on the District's website for public availability. DWR received the adopted UWMP and WSCP text and the UWMP data tables electronically through the WUEdata online submittal tool that DWR developed, prior to the July 1, 2021 deadline. The District submitted a CD of the adopted 2020 UWMP and WSCP to the California State Library within 30 days of adoption.

Appendix A

DWR 2020 UWMP Checklist

Serrano Water District

Appendix A

DWR 2020 Urban Water Management Plan Checklist

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Section 1.1
Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1
Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.2
Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Appendix H
Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) -	System Supplies	Section 2.2

		if any - with water use projections from that source.		
Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Wholesale only
Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.2
Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.2
Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Table 3-1
Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4
Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Table 3-1
Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3-5
Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Tables 4-1 & 4-2
Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.3
Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Table 4-5
Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.4
Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.3

Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5
Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.6
Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 5.1 & 5.2 Appendix D
Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.2.1
Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Wholesale only
Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	NA
Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.1
Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SB X7-7 2020 Compliance Form.	Baselines and Targets	Appendix D
Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 7.2.3

Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, 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.*	System Supplies	Sections 7.2.1 & 7.2.3
Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.9
Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9 Table 6-9
Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.1
Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2
Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.1 Appendix E
Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.1

Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2 Table 6-1
Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2.3
Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7
Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2 Tables 6-2 and 6-3
Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Table 6-4
Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5
Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5 Tables 6-5 and 6-4
Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Sections 6.5.2 & 6.5.3 Table 6-6
Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3
Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with	System Supplies (Recycled Water)	Section 6.5.2 Table 6-2

		quantified amount of collection and treatment and the disposal methods.		
Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Sections 6.8 & 6.9
Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11 Table 6-10
Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.2.1
Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.2.4 Appendix F
Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2.3
Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3
Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3.1

Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3
Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3.3 Table 7-5
Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Sections 3.3, 6.10, 7.2.1, & 7.3.1
Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8
Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Section 8.1
Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.9
Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.2.1 Table 8-4
Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 8.2 Table 8-4

Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.3
Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Figure 8-1
Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.4.2 Table 8-7
Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.4.1 Table 8-6
Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.4.3
Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.4.1 Table 8-6
Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Table 8-6
Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Section 8.4.6
Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 8.5 Table 8-8

Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 8.5 Table 8-8
Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Section 8.6
Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.7
Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.2.2
Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 8.2.2
Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8
Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8
Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Section 8.8
Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 8.9
Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 8.11

Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12 & 10.4 Appendix H
Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 10.4
Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Wholesale only
Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.3
Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2.1 Table 10-1
Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4

Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Appendix H
Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2
Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix H
Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4 Appendix H
Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.4 Appendix H
Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.4 Appendix H
Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	NA

Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 8.12

Appendix B

References

Appendix B – References

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Zielinski, 2010. "The Colorado River Runs Dry", by Sarah Zielinski published in Smithsonian magazine. October 2010.

Appendix C

Agreement for Purchase and Sale of Surplus Water

Agr. 2453.4
C.2

AGREEMENT FOR PURCHASE AND SALE OF SURPLUS WATER

THIS AGREEMENT FOR PURCHASE AND SALE OF SURPLUS WATER (hereinafter, the "Agreement") is entered into as of June 2, 2005, by and between SERRANO WATER DISTRICT, a special governmental district formed and operating under the Irrigation District Law, California Water Code Section 20500, et seq. (hereinafter, "Serrano"), and the CITY OF ORANGE, municipal corporation formed and operating under the general laws of the State of California (hereinafter, "Orange").

RECITALS

A. Orange owns and operates a domestic water distribution system for the delivery of potable water to the lands and residents within its service boundaries (hereinafter, the "Orange Water System"). Orange delivers through the Orange Water System both groundwater produced by Orange, and treated imported water purchased from the Metropolitan Water District of Southern California ("MWD") through the Municipal Water District of Orange County ("MWDOC"). In consideration for the delivery of such treated imported water, Orange pays to MWDOC, as the wholesaler of MWD treated imported water, a blended rate that includes, among other components, the costs of water and treatment, a meter fee and a readiness to serve charge (such total cost paid to MWDOC and/or to MWD to purchase an acre-foot of MWD treated imported water, whose components and/or methodology may be modified in the future by MWDOC or MWD, is hereinafter referred to as the "MWD Treated Imported Water Rate"). As of the date of this Agreement, the MWD Treated Imported Water Rate is $475.50 (four hundred seventy-five dollars and 50 cents) per acre-foot.

B. Serrano owns and operates a domestic water distribution system for the delivery of potable water to the lands and residents within its service boundaries (hereinafter, the "Serrano Water System"). In addition to producing groundwater for delivery through the Serrano Water System, Serrano treats and delivers surface water stored in Santiago Reservoir, also known as "Irvine Lake" (such water is hereinafter referred to as "Surface Water"). Serrano obtains Surface Water by means of water rights which Serrano holds in and to a portion of the flow of Santiago Creek; and Serrano captures, diverts and stores these Surface Water flows, together with occasional deliveries of untreated MWD imported water ("Untreated Imported Water"), in Santiago Reservoir. Serrano also captures and diverts surface water behind the Villa Park Dam on Santiago Creek. Serrano treats its Surface Water and Untreated Imported Water supplies at a water treatment facility owned and operated by Serrano. Serrano delivers this treated water to its customers through the Serrano Water System.

C. The Serrano Water System is adjacent to the Orange Water System, and interconnections have been installed to transfer water between the two water systems.

D. Orange desires to purchase treated water from Serrano.

E. From time to time, Serrano has surplus Surface Water which, if not put to beneficial use, will evaporate or otherwise go to waste. At other times, Serrano has access to Untreated Imported Water which is available for sale to Orange. Serrano desires to sell to Orange, and Orange desires to purchase from SWD, treated Surface Water ("Treated Surface Water") when such water is surplus to Serrano's needs. Serrano also desires to sell to Orange,

and Orange desires to purchase from Serrano, available Untreated Imported Water that SWD has treated and distributed into the Serrano Water System (such water is hereinafter referred to as "Treated Imported Water") (such surplus Treated Surface Water and Treated Imported Water is hereinafter collectively referred to as "Surplus Treated Water").

F. Serrano has the authority under Water Code Section 22228 to enter into and perform any agreement with any person, public corporation or agency for the exchange, transfer or delivery to or by either or both parties of any water right or water. Serrano also has the authority under Water Code Section 22259, if its board of directors deems it to be in the best interests of Serrano, to enter into a contract for the lease or sale of any surplus water or use of surplus water not then necessary for use within its boundaries, for use either within or without the boundaries of Serrano.

EXECUTORY AGREEMENTS

NOW, THEREFORE, in consideration of the facts recited above, and the covenants, conditions and promises contained herein, the parties agree as follows:

1. Sale of Treated Surface Water. Subject to the conditions noted in Paragraphs 1.1 and 1.2 below, and subject to the availability of Surface Water, Serrano agrees to make available for sale to Orange a minimum of 1000 acre feet of Treated Surface Water each year during the term of this Agreement. At the beginning of each fiscal year, Serrano shall provide Orange with written notice of the actual quantity of Treated Surface Water that is available and a schedule by which such water can be delivered to Orange.

1.1 Orange acknowledges that, under the instruments governing Serrano's water rights in Santiago Creek and its ownership interest in Santiago Reservoir, the Irvine Ranch Water District ("IRWD") has a first right of refusal to purchase any and all surplus Surface Water stored in Santiago Reservoir, and that Serrano cannot declare any surplus Surface Water to be available for sale to Orange as Treated Surface Water until Serrano has first offered such water for sale to IRWD and IRWD has declined such offer.

1.2 Orange acknowledges that there may be periods in which Serrano has no surplus Surface Water for treatment and delivery to Orange as Treated Surface Water.

1.3 Upon notification by Serrano of the amount of Treated Surface Water available, Orange shall notify Serrano of its intention to purchase all or a portion of such Treated Surface Water during the year. Orange agrees to purchase a minimum of 1000 acre feet of Treated Surface Water per year, subject to: (1) the conditions noted in Paragraphs 1.1 and 1.2 above; (2) that Orange has the ability to accept the water at the interconnections designated in Paragraph 3; and (3) that the water meets state and federal water quality standards. Orange shall also notify Serrano of the schedule by which it will take delivery of the Treated Surface Water and the location(s) at which it will take delivery.

1.4 All Treated Surface Water delivered by Serrano to Orange shall be billed at a per acre-foot rate equal to 85% of the MWD Treated Imported Water Rate in effect as of the date of the Treated Surface Water delivery to Orange.

2. Sale of Treated Imported Water.

2.1 In the event that Serrano has no surplus Treated Surface Water, but can purchase Untreated Imported Water at a rate no greater than the then-effective MWDOC rate for untreated MWD imported water, Serrano shall notify Orange of the availability of Untreated Imported Water for purchase, treatment and delivery by Serrano to Orange as Treated Imported Water. If Orange desires to purchase such Treated Imported Water, Serrano shall obtain such Untreated Imported Water for treatment, sale and delivery as Treated Imported Water to Orange.

2.2 All Treated Imported Water delivered by Serrano to Orange shall be billed at a per acre-foot rate equal to 90% of the MWD Treated Imported Water Rate in effect as of the date of the Treated Imported Water delivery to Orange.

3 Surplus Treated Water Delivery and Pressures. Surplus Treated Water purchased under this Agreement shall be delivered at the following pressures when taken at the following locations:

Interconnection Location	Pressure
Lockett Reservoir	20 PSI
Santiago Road	100 PSI

Surplus Treated Water shall be deemed delivered and sold by Serrano to Orange when such water passes the Serrano meter at the interconnection location designated by Orange for the delivery of such water. The parties hereto acknowledge that Surplus Treated Water purchased by Orange from Serrano may come from a variety of sources, including but not limited to surface flows of Santiago Creek and its tributaries, imported MWD water from different sources, or a blend of such waters.

4. Invoicing and Payment for Purchased Surplus Treated Water.

4.1 Serrano shall read its meters at all interconnection locations at which Orange takes delivery of Surplus Treated Water from Serrano, and Serrano shall invoice Orange for such water on the basis of the meter readings within thirty (30) days following the date of delivery.

4.2 Within thirty (30) days of receipt of an invoice from Serrano for the sale of Surplus Treated Water, Orange shall pay such invoice.

5. No Conveyance of Water or Facility Rights Intended. Serrano and Orange mutually understand and agree that this Agreement is not intended to and does not constitute a lease, sale, assignment, conveyance or other transfer to Orange, of either:

5.1 Any appropriative, contractual, riparian, prescriptive, overlying or other water right, or any other right or entitlement to water or the delivery of water, or any water storage right, including but not limited to any right under the instruments governing

Serrano's water rights to Santiago Creek Water and rights to impound and store water in the Santiago Reservoir.

5.2 Any legal, beneficial or possessory right, title or interest in any Serrano facility, including but not limited to the Serrano water treatment facility or any pipelines used to transmit Surplus Treated Water to Orange.

6. Orange Indemnification of Serrano. Neither Serrano nor any officer, director, employee or representative of Serrano (hereinafter, collectively, the "Serrano Parties") shall be responsible for any damage or liability occurring by reason of anything done or omitted to be done by Orange in the performance or under the authority of this Agreement. Pursuant to Government Code Section 895.4, Orange shall fully indemnify, defend and hold Serrano and the Serrano Parties harmless from any liability imposed for injury (as defined in Government Code Section 810.8) occurring by reason of anything done or omitted to be done by Orange in the performance or under the authority of this Agreement.

7. Serrano Indemnification of Orange. Neither Orange nor any officer, director, employee or representative of Orange (hereinafter, collectively, the "Orange Parties") shall be responsible for any damage or liability occurring by reason of anything done or omitted to be done by Serrano in the performance or under the authority of this Agreement. Pursuant to Government Code Section 895.4, Serrano shall fully indemnify, defend and hold Orange and the Orange Parties harmless from any liability imposed for injury (as defined in Government Code Section 810.8) occurring by reason of anything done or omitted to be done by Serrano in the performance or under the authority of this Agreement.

8. Disputes. If any legal action or proceeding is necessary to interpret or enforce any of the terms or conditions of this Agreement, the prevailing party shall be entitled to its legal fees incurred in such legal action, in addition to any other relief to which it may be entitled.

9. Waiver of Breach. No failure on the part of either party hereto to insist upon or demand the strict performance by the other of any covenant, term, condition or promise of this Agreement, or to exercise any right or remedy as a result of any breach thereof, shall constitute a continuing waiver of any such breach or of any such covenant, term, condition or promise. No waiver of any breach shall in any way affect, alter or modify this Agreement, but each and every covenant, term, condition and promise of this Agreement shall continue in full force and effect.

10. Notices. Except as otherwise set forth hereinabove, all notices, payments, transmittals of documentation and other writings required or permitted to be delivered or transmitted to any of the parties under this Agreement shall be personally served or deposited in a United States mail depository, first class postage prepaid, and addressed as follows:

If to Serrano:

Serrano Water District
18021 Lincoln Avenue
Villa Park, California 92667
Attn: General Manager

If to Orange: City of Orange
300 E. Chapman
Orange, California 92666
Attn: Water Manager

or such other address or person as either party may direct to the other in writing. Except where service is by registered or certified mail, return receipt requested, service of any instrument or writing shall be deemed completed forty-eight (48) hours after deposit in a United States mail depository.

11. Warranty of Authority. Each officer of Serrano and Orange affixing his or her signature below thereby warrants and represents that he or she has the full legal authority to bind his or her respective party to all of the terms, conditions and provisions of this Agreement, that his or her respective party has the full legal right, power, capacity and authority to enter into this Agreement and perform all of the obligations herein, and that no other approvals or consents are necessary in connection therewith.

12. Term and Termination. The term of this Agreement shall be for five (5) years. Upon the expiration of this initial five-year term, the Agreement shall automatically be renewed for an additional five (5) years unless one of the parties gives to the other party written notice of non-renewal within thirty (30) days prior to the expiration of the initial term.

13. Headings. The titles and headings of Sections and Paragraphs of this Agreement, as herein set forth, have been inserted for the sake of convenience only, and are not to be taken, deemed or construed to be any part of the terms, covenants or conditions of this Agreement, or to control, limit or modify any of the terms, covenants or conditions hereof.

14. Force Majeure. The obligations by any party hereunder shall not be deemed to be in default where delays or failures to perform are due to any cause without the fault and beyond the reasonable control of such party. If written notice of such delay or impossibility of performance is provided to the other party within a reasonable time after the commencement of such delay or condition of impossibility, an extension of time for such cause will be granted in writing for the period of the enforced delay, or longer as may be mutually agreed upon by the parties in writing, or the performance rendered impossible may be excused in writing by the party so notified.

15. Severability . If any term, provision, covenant, or condition of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this Agreement shall continue in full force and effect, unless and to the extent the rights and obligations of either party has been materially altered or abridged by such holding.

16. Integration, Construction and Amendment. This Agreement represents the entire understanding of Serrano and Orange as to those matters contained herein, and no prior oral or written understanding shall be of any force or effect with respect to those matters covered by this Agreement. This Agreement shall be governed by the laws of the State of California and construed as if drafted by both of the parties hereto. This Agreement may not be modified, altered or amended except in writing signed by Serrano and Orange.

17. Successors. This Agreement, and all of the terms, conditions and provisions herein, shall inure to the benefit of, and be binding upon, Serrano and Orange; provided, however, that neither party may assign any of its rights or obligations under this Agreement without the prior written consent of the other.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

SERRANO WATER DISTRICT

By: Robert F. Ricker
President

By:
Secretary

APPROVED AS TO FORM:

RUTAN & TUCKER

By: _____
General Counsel,
Serrano Water District

CITY OF ORANGE

By: M. A. M
Mark A. Murphy, Mayor

ATTEST:

Deputy
City Clerk, City of Orange

APPROVED AS TO FORM:

By: _____
City Attorney, City of Orange

Appendix D

SB X7-7 Compliance Tables

Appendix D

SB X7-7 Compliance Tables

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
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
NOTES: Population estimate developed by CDR (CSUF) and provided by MWDOC.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	6,263
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	2020 Gross Water Use
	3,931	1,412		-		-	**2,519**
* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES: Treated water exported to Orange was 1,412 AF							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Groundwater
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	1,385	-	1,385

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment Complete one table for each source.			
Name of Source	Surface Water		
This water source is *(check one)* **:**			
☑	The supplier's own water source		
☐	A purchased or imported source		
Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	2,546		2,546

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water ***Fm SB X7-7 Table 4***	**2020 Population** ***Fm SB X7-7 Table 3***	**2020 GPCD**
2,519	6,263	**359**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
359	-	-	-	-	359	373	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

Appendix E

Operating Agreement between the Irvine Company and SID

Orange County Water District Groundwater Management Plan and Basin 8-1 Alternative

THIS AGREEMENT, made and entered into in triplicate this 6th day of February, 1928, by and between THE IRVINE COMPANY, a corporation duly organized and existing under the laws of the State of West Virginia, with its principal place of business in Tustin, Orange County, California, and herein referred to as first party, and the CARPENTER IRRIGATION DISTRICT, a public corporation organized under the laws of California, and the SERRANO IRRIGATION DISTRICT, a public corporation organized under the laws of California, herein designated the second parties,

W I T N E S S E T H :

That, WHEREAS, the Carpenter Irrigation District, one of the second parties herein, is the successor in interest of The John T. Carpenter Water Company, a corporation, in the diverting, handling and distribution of water to and for land owners in the same territory covered by the water system of said water company, which territory is within the boundaries of said Carpenter Irrigation District; and the Serrano Irrigation District, the other of the second parties herein, is the successor in interest of Serrano Water Association (unincorporated) in the diverting, handling and distributing of water to and for land owners in the same territory covered by the water system of said water association, which territory is now within the boundaries of said Serrano Irrigation District; and

WHEREAS, the parties hereto claim to be entitled to the use of all the water flowing in that certain stream commonly known as Santiago Creek, in Orange County, California, having acquired the same both as owners or representative of owners of lands riparian to said creek and by prior appropriation; and

WHEREAS, the proportion of said waters of said creek to which each of the parties hereto is entitled and the time and manner of use of the same has been duly defined and established by a

contract between the first party herein and the predecessors in interest of the second parties dated March 3, 1906, and confirmed by a judgment of the Superior Court of Orange County, California, rendered March 10, 1906, in an action in said Court, No. 3521, in which the first party was plaintiff and Ed H. Adams and others were defendants, as amended and modified by a contract between the same parties dated November 18, 1909, and confirmed by judgment of said court dated December 16, 1909; that the parties hereto, or their predecessors in interest, at all times since the dates of said contracts have been and are now using the waters of said creek for irrigation and domestic purposes in the proportions and in the manner defined by said contracts, by second parties and their predecessors upon certain lands in what is known as Villa Park-El Modena sections in Orange County, California, by first party upon a portion of the Rancho San Joaquin known as The Irvine Ranch; and

WHEREAS, it is the intention, understanding and agreement of the parties hereto that said contract made March 3, 1906, as modified by the contract dated November 18, 1909, and all the terms, conditions and provisions thereof which have not terminated by their own expressed limitation shall be and remain in full force and effect until the "Santiago Reservoir" herein provided for has been fully completed, and the distribution of water therefrom has been commenced; but when said reservoir has been completed and water begun to be distributed therefrom, that thereupon all terms and conditions of said prior contract which are in conflict with the terms and conditions of this contract shall cease and terminate and have no further force or effect; and

WHEREAS, the parties hereto or their predecessors in interest for many years last past, in order to conserve said waters and to obtain a greater supply of water for the irrigation of their said land or lands within their respective boundaries,

have been diverting and spreading the storm waters of said creek upon different spreading basins in Santiago Canyon by means of intakes and check-dams and also by means of check-dams placed in Ladd Canyon, a tributary of said Santiago Creek, as provided in the said contracts; and

WHEREAS, the parties hereto or their predecessors in interest have caused an extended study of the water-shed and water resources of said Santiago Creek and its tributaries to be made by Messrs. Howells & Howells, and Olmsted and Gillelen, Engineers, as a result of which a large water storage project in Santiago Creek appears to be justified, and such study indicates that the most feasible and economical site is that designated in the report of Howells & Howells, Engineers, heretofore rendered to the parties hereto and hereinafter designated as the "Santiago Reservoir", having a flow-line on 790 feet sea level, elevation U. S. G. datum, and flooding approximately 665 acres of valley and hillside land belonging to the said first party herein; and

WHEREAS, it is not determined, but may be determined in the future by the parties hereto, that it will be to their mutual benefit to further conserve the overflow and storm waters of Santiago Creek by erecting a dam at a lower point on Santiago Creek on land owned by second parties or persons they represent, herein known as the "Barham Ranch", hereinafter designated "Lower Reservoir", and by the erecting of a dam in Fremont Canyon, the waters of which canyon flow into said Santiago Creek below the said "Santiago Reservoir";

NOW, THEREFORE, in order to carry into effect the foregoing intents and purposes, and in consideration of the mutual advantages and benefits derived by each of the parties hereto from the carrying out of the foregoing development, IT IS HEREBY MUTUALLY AGREED by and between the parties hereto each with the other as follows, to wit:

FIRST

Preliminary Preparation.

That immediately after the execution of this agreement or within such time as it can reasonably be done, each of the second parties hereto shall take and prosecute such proceedings as may be necessary or legally required to authorize, vote and create, to issue and sell a bond issue and bonds of its district in amount or amounts to raise a sufficient fund of money to erect, complete and pay for at least their part of the "Santiago Reservoir" dam and other work connected therewith as hereinafter provided for, and as much more as they may deem best; and the first party will then execute the proper deeds conveying to second parties all lands in the Santiago Creek located on the Irvine Ranch which may be required for the erection, maintenance, repair and replacement of the said Santiago dam, also for the overflow or flooding by the reservoir formed by the said dam, and also for the pipe lines or other conduits for conducting water into or out of such reservoir by the parties hereto in the manner herein specified, and also for telephone, power lines and for roads, all such deeds to provide that all lands thereby conveyed shall be used exclusively for such purposes for which the lands are conveyed as above provided, and if said land or any part thereof so conveyed should be abandoned or not so used, it shall revert to the grantor. A dis-use for one year shall constitute an abandonment so far as any particular road or telephone or power line is concerned, provided said use has commenced.

When the funds of second parties are available for the purpose and such deeds are executed, then the parties hereto shall proceed with the diligent performance of the remaining provisions of this agreement.

SECOND

Dam and Reservoir.

That said second parties shall first thereafter proceed with proper diligence to erect, construct and fully complete a hydraulic fill dam across the channel of Santiago Creek, at or near the fourth road crossing of said creek, which crossing is located North 42° West 4725 feet from the East corner of Block 69 of Irvine Subdivision of the Rancho San Joaquin, etc., according to map recorded in Book 1, page 88, Map Records of Orange County, California, which dam shall be the plan designated U. 790, having a flow-line on 790 feet sea level and forming a reservoir having a capacity of 25,880 acre feet of water, estimated to cost approximately $550,000, and shall be so erected, constructed and completed according to the plans and specifications contained in the report made by Howells and Howells, Engineers, a copy of which report is in the hands of each of the parties hereto and made a part hereof, which said plans and specifications contained in said report shall not be changed or modified except by an agreement in writing of the parties hereto particularly specifying the change to be made.

The reservoir formed by said dam shall be known as "Santiago Reservoir".

That the erection and completion of said dam shall be under the exclusive direction, supervision and control of said second parties and at their direct cost and expense; that said first party herein, in consideration of the use of the reservoir formed by said dam and the delivery to and use of water stored therein to said first party as provided in this agreement, shall pay, in addition to the lands conveyed as above provided, to said second parties, a sum of money equal to one-half of the total cost of said dam and its appurtenances, including Engineers' fees, and all other actual costs, such money to be paid in stallments as and when second parties, under their agreement for construction of

said dam, are to pay the cost of such dam, it being understood that the second parties pay their installments, respectively, of their one-half of such cost contemporaneously when the first party pays its respective installments. The fees and expenses heretofore incurred or paid by either party hereto to Messrs. Howells & Howells, and Olmsted and Gillelen, Engineers, for work in connection with said reservoir, shall be treated as a portion of the actual costs of said dam. If at any time after said dam is partially constructed either party hereto should not have sufficient funds on hand to pay their respective shares for the completion of said dam, then the party having such funds, at its option, may and shall have the right to complete the erection and construction of the said dam, and any moneys advanced by it to carry the share of expenses that should be paid by the parties so failing to pay, shall draw one percent per month interest until paid.

THIRD

Spreading Water and Use of Check-Dams.

The parties hereto shall continue to use and apportion all of the waters of said Santiago Creek and its tributaries, both surface and sub-surface flow, together with the check-dams and gravel basins heretofore and now used for the conservation and spreading of water in the same manner as they are being used by the parties hereto at the date of the execution of this agreement, and as provided for in the said contracts, until the "Santiago Reservoir" above referred to shall be completed and accepted and the water impounded ready for distribution; that when said "Santiago Reservoir" shall have been so completed, impounding water and the water ready for distribution, all check-dams and gravel basins heretofore used for the storage of water above the said "Santiago Reservoir" shall be abandoned and their use by the said second parties shall cease and terminate and all rights heretofore granted therefor shall revert to the said first party herein; that the second

parties herein shall have the right to the use of all gravel beds below said "Santiago Reservoir" heretofore used for the spreading of the waters of said creek, or any portion thereof, as provided for in said contracts, so long as the first party shall remain the owner of the land covered by the same, but in any event second parties shall have the right to the use of said gravel beds or spreading basins as provided in said contracts for a period of five (5) years from and after the completion and erection of the dam to be erected for the formation of "Santiago Reservoir", and at the end of said period the right of the said second parties to the use of the same shall cease and terminate and the same shall revert to the said first party.

FOURTH

Prior Use of Water for Riparian Owners.

The second parties herein, or their successors in interest, shall have the first or prior right to take and distribute during the period of each year beginning June 20th at 12:00 M. and ending November 20th, at 12:00 M., to and for the use of owners of lands within the boundaries of second parties, and which owners have heretofore used and are now using the waters of said creek for irrigating approximately 2500 acres of land, an amount of the water not exceeding in quantity 1000 acre feet of the water impounded in said "Santiago Reservoir", the waters so taken to be measured and delivered at intakes installed by second parties at the dam of said reservoir.

That the right above mentioned shall be prior to the rights of all parties hereto to the waters or use thereof in said reservoir, and all measurements, divisions or allocations of water in said reservoir between the parties hereto shall be subject and subordinate to such prior right above mentioned.

That the said first party shall not install, maintain or operate any pumping plant or any submerged dam, or install, main-

tain or operate any other device for raising water, either in the Santiago Canyon or in any of the smaller canyons draining into same except for raising or otherwise securing the waters allotted to it as its proportion of the waters in said "Santiago Reservoir", or in any other reservoir constructed in accordance with this agreement, except that the first party herein as the owner of lands riparian to said creek shall have the right to use within its watershed any waters of said creek, exclusive of the waters contained in said reservoir, for watering stock, for drinking, washing and other domestic uses; provided, however, that if the said first party shall in the aggregate use for said purposes waters of said creek obtained by means of wells placed on the lands of the first party from the flow of waters that would naturally supply the waters of said creek, an amount in excess of 150 acre feet during said year for water use commencing November 20th of each year, then all amounts in excess thereof shall be measured and charged to said first party and considered in the allocation of waters to said first party from said reservoir; provided, however, that first party shall have the right to put down wells within the watershed of Santiago Creek or its tributaries and take and use any of the waters so developed in said wells for whatsoever purpose it so desires, provided such water in said wells shall be taken from geological strata below the strata from which drainage into the Santiago Creek or its tributaries takes place, and that no depletion in surface or underground flow of said Santiago Creek or its tributaries is caused by the operation of any wells so put down. If the parties hereto are unable to agree upon the amount of waters so used by said first party for domestic purposes as hereinbefore set forth, or should not be able to agree whether or not water obtained from wells was obtained from wells not in any way depleting the waters of said creek or waters that naturally would drain into the reservoir hereinbefore provided for, then the said matter or matters upon

which said parties shall not agree shall be left to arbitration as provided for in subdivision Ninth hereof.

FIFTH

Division of Remaining Water in said Reservoir.

That after the completion of the "Santiago Reservoir" as hereinabove provided, when water has been caught and impounded therein, all such water remaining therein after the prior right to 1000 acre feet of water has been satisfied or reserved as above provided shall be divided between the parties hereto, and second parties hereby grant, cede and will deliver to the first party the portion of said waters as follows, to wit:

When there is less than 10,000 acre feet and more than 9,000 acre feet in the reservoir, including in said estimate the 1000 acre feet hereinbefore referred to, then the second parties, in addition to the said 1000 acre feet so reserved, shall each take 2000 acre feet, and the first party shall have the remainder. If there is less than 9,000 acre feet, including said 1000 acre feet so reserved, then the 1000 acre feet so reserved shall go to the second parties, and of the balance the first party shall have one-half and the second parties each one-fourth. If said reservoir should contain 10,000 acre feet or more, then after the prior right to 1000 acre feet of water has been satisfied as above provided, the said first party shall be entitled to 5,000 acre feet and the second parties shall each be entitled to 2,000 acre feet. That during such years as the reservoir shall contain in excess of 22,-000 acre feet, first party shall be entitled to use, in addition to said 5,000 acre feet, such excess water in an amount not to exceed 2000 acre feet, and during such years as the reservoir contains 24,000 acre feet or more, the excess amount of water over and above said 24,000 acre feet shall be available for use by any of the parties hereto in such amount as it may desire, but if two or more of said parties hereto desire to use the same, the water

shall be delivered one-half to the first party and the remainder to second parties in equal shares.

That to the amounts of water which first party shall be entitled to in any water year from said reservoir as above provided, shall be added one-half of all the water diverted in such year for use by second parties from the Santiago Creek below the said dam and at the submerged dam of the said second parties, in addition to water stored in said reservoir; that said second parties shall continue to measure the water received at their point of intake near their submerged dam as they have done in the past and shall keep a record of the quantity received there as shown by such measurements, and a quantity of water equal to one-half of the water diverted in any year for use at said point, in addition to water stored in said reservoir, shall be added to the amount which first party is entitled in such year to receive from the said reservoir and be delivered to it at its intake installed near the dam of said reservoir. It is agreed, however, that said second parties shall use this additional water, or water stored in lower reservoir, before they use the water from the Santiago Reservoir, and that the excess water from rainfall or other cause not diverted for use by the said second parties shall not be included in this additional water estimate for division of storage water. And excepting, if first party does not elect to join with second parties in the construction of the lower reservoir herein provided for, and second parties at their own expense construct the same, any waters conserved in said dam shall not be accounted for in the division of waters in said upper reservoir. The water so divided and distributed shall be measured at the dam and delivered into the intakes of the respective parties installed at the dam of said reservoir; and such water so received may be used by the respective parties at any time and at any place desired by such party.

SIXTH

Supervision of Operations - Measuring Water.

That the said second parties shall have the exclusive management and supervision of the operation of said "Santiago Reservoir" and the measuring and distribution of water therefrom. That for that purpose said second parties shall employ a superintendent acceptable by or agreeable to all parties to this agreement and who shall have the actual control and superintendence of the operation of said reservoir and measuring and distributing water, but such superintendent shall be subject to the direction of the said second parties. That said first party may consult and advise with such superintendent and serve notices or demands upon him concerning any matters affecting the interest of said first party.

That in the erection of the dam of said reservoir proper outlets shall be constructed through which water may be taken from the reservoir, and that at all such outlets there shall be a proper meter or measuring device which will determine the quantity of flowing water delivered to either of the parties hereto, and there shall also be placed within the reservoir some device which will show the depth of water in the reservoir and the dimensions of the body of water impounded therein from which may be determined the quantity of water impounded in the reservoir.

That all measuring devices of water shall be of the most improved and most accurate kind, and the process of measuring water shall be of the last and best approved design or plan.

That the water year shall begin on November 20th at 12:00 o'clock, M., and at that time the quantity of water impounded in the dam shall be measured and shall then be allocated or divided between the parties hereto in accordance with the provisions of subdivision Fifth, provided, however, that measurements of the quantity of water impounded in the reservoir may be made and taken at such other times as the superintendent may deem advisable or

either of the parties hereto may desire, and in any event shall be taken on April 20th of each year for the purpose of determining the total amount of water added during the winter season to the waters in said reservoir at the commencement of said water year, November 20th, taking into consideration the amount of water used by either party between the commencement of said water year, November 20th, and the following April 20th, and that said allocation or division shall be on the basis set by subdivision Fifth and finally determining the division of waters for said water year between the parties hereto.

That a record shall be made and kept by the superintendent of all waters measured in the reservoir and the date and quantity of water found therein and the quantity of water measured and delivered to each of the parties hereto, on the first of each calendar month following, and copies of such record shall be delivered to either of the parties hereto upon request, and each party shall be entitled to an inspection of such record whenever desired within reasonable office hours.

SEVENTH.

Upkeep and Repairs.

The said second parties herein shall supervise, do and perform all work necessary to keep the dam forming the "Santiago Reservoir" and all things in connection therewith in good order and repair; to make from time to time all repairs, replacements and additions required; to keep everything in connection therewith in good workable order, including spillway and freeboard; to stop any leaks that may come into the dam; to replace any washout; to keep meters or measuring devices and all outlets in the dam in good order; if found necessary or convenient to perform said work, said second parties may in addition to the superintendent keep a man continuously at or near the said dam to watch the same, and immediately repair any leaks or breaks that may arise, and particularly

to immediately notify the superintendent of impending dangers, and for that purpose to keep the said watchman and superintendent in telephone communication, maintaining a telephone at said dam for that purpose; that all money expended for labor and material in making said repairs, including the wages of the watchman and other help, and the salary of the superintendent, shall be deemed expenses in the operation of said reservoir. A detailed account shall be kept of such expenses and a copy of such account shall be rendered monthly or quarterly, as may be found most convenient, to first party, and first party shall thereupon pay to the said second parties one-half of all such repairs and upkeep as shown by said account. Provided, however, that when any work or repairing or replacing shall cost more than the sum of One Thousand Dollars ($1,000), consent of first party shall be obtained before such cost shall be incurred or the work done.

EIGHTH

Accounts and Inspection.

The said second parties shall keep a detailed account of the costs of the erection of said dam and the installation of all outlets and meters or measuring devices, for all roads, telephones and other conveniences in connection therewith, and a detailed account of all money expended for repairs, replacements and additions necessary to the maintenance and operation of said reservoir, and shall render monthly or quarterly, as may be found most convenient, copy of such report to first party and shall notify either by phone or in writing the said first party, or its designated representative, of amy matters that should be considered or determined by first party in connection with either the construction or operation of said reservoir, dam or other things in connection therewith, and the said first party shall have the right at any time to inspect the work done upon said dam or anything in connection therewith, and to inspect the operation and upkeep of the same, and shall

have the right to consult with and interview the superintendent or the keeper or other representative of said second parties concerning the same, and to inspect the books of said second parties in which said accounts are kept, for the purpose of verifying said accounts, and shall have the right to be informed concerning all matters in connection therewith. Should the second parties for any reason at any time refuse to make necessary repairs to the said dam, the first party is hereby given the right to make such repairs, and the second parties to repay one-half of such cost, together with interest at the rate of one percent per month.

NINTH

Arbitration.

In the event questions concerning the construction, maintenance, repair or replacement of the said dam shall arise which require the determination of the parties hereto, a conference between them shall be called by written notice of the time and place of such conference, and a representative of each of the parties hereto, together with the superintendent, shall be had, and such questions shall be determined by the parties and satisfactory conclusions reached concerning the same, and such conclusions shall be placed in writing, signed by the parties, and shall thereafter govern their action or proceedings in relation to same.

If the parties fail to agree upon such questions at such conferences, the matter shall be settled by arbitration, the first party appointing one arbitrator and the second parties appointing one arbitrator, which arbitrators shall be disinterested parties having no interest with either side, and men of good reputation and having some special qualifications with reference to the questions to be determined, and the two arbitrators thus appointed shall request a Judge of the Superior Court of Orange County to act with them, or if such judge refuses to act, then request such

judge to appoint a third arbitrator, or if such judge refuses to appoint such third arbitrator, then the two so appointed shall appoint a third, and the three arbitrators so chosen and acting shall appoint a meeting and hear the claims of the respective parties, and such evidence as the arbitrators may deem necessary, and instead of receiving evidence the arbitrators can themselves make such investigation and inspection to enable them to determine the question, and a decision by a majority of such arbitrators shall be binding and conclusive upon the parties hereto, such decision to be in writing and a copy thereof furnished to each of the parties hereto, and thereafter the parties shall be governed in their actions and proceedings by such decision as to the question so determined.

TENTH

First Party Prevented from Using Water.

It is understood and agreed that the first party has the right and is entitled to use the water it may receive from any of the reservoirs mentioned in this agreement, on land within or without the watershed of Santiago Creek, as first party or its successors or assigns may see fit and determine from time to time or at any tim

It is understood that the main consideration to the first party for granting rights herein contained and co-operating with second parties in the development and storage of water in said creek is the right granted herein to take the water allocated to it in the said reservoirs and use the same on lands outside of the watershed, and such consideration will be removed or destroyed if the first party shall be prevented from exercising that right in the future.

It is therefore agreed that in the event any action or other legal process or proceeding be commenced against the first party to prevent, and the final judgment in which will prevent, the said first party taking and using said waters out of the watershed, the said first party will within ten days after any notice or process is served upon it, give to second parties notice in

writing of the commencement of such proceedings and furnish them with a copy of any complaints, petitions or other pleading showing the claims therein made, and the said first party shall appear in such proceedings and proceed to contest the same, and the said second parties will aid and assist the said first party in every way possible in the defense of such proceedings and will furnish its counsel or attorney to aid in the proceedings and will aid in procuring evidence, papers, and other things which may assist in the defense of said action, and will co-operate in every way in the defense thereof, and the cost and expense of defending such action or proceedings will be charges in as an expense of maintaining said reservoir, as hereinabove provided, and paid by the parties in the same proportion, and so long as said action or proceedings may be deferred or defeated, this contract shall remain in full force or effect; but if said action, proceedings or process shall result in a final judgment preventing the first party from using the water on lands out of the watershed and the said first party is thereby prevented from getting the full benefit of the development and the performance of this contract as herein set forth, then and in that event an equitable adjustment shall be made between the parties hereto so that the first party may take advantage of and realize upon its investment in said dam by sale or disposal of its interest, in whole or in part, to municipalities or others that may be able to receive the waters stored therein, and if said party of the first part is unable to so dispose of its said interest and unable to make use of its respective right to the waters therein, then the cost of maintenance of said dam shall be equitable adjusted between the parties hereto in accordance with the uses that they can make of the waters stored therein; that on the rendering of any such judgment, the parties hereto shall immediately, through their representatives, have a conference and shall attempt to equitably adjust their respective rights therein; that if the

said parties fail to reach an agreement by such conference, the question shall then be reached by arbitration in the same manner as provided in paragraph Ninth hereof. In case the water stored in said reservoir, or the rights of either party to the same, is taken from the party or parties hereto by any municipality through the exercise of the right of eminent domain, then in the consideration of damages or allowance that may be made to the parties hereto, or to the first party, to be paid by said municipality, the value of the land occupied by the said reservoir so taken shall be estimated and all consideration paid therefor shall go to the first party, in that the said land for the use of said reservoir is being furnished by first party in the first instance.

ELEVENTH

Barham Ranch Reservoir.

If at any time within five (5) years after the completion of the dam erected at the "Santiago Reservoir", the second parties herein should desire to erect and construct a dam on what is known as the "Barham Ranch" at a point known as "The Narrows", the Northeast corner of which dam will be South 59° 54' 30" East 872.70 feet from the Northwest corner, Section 19, Township 4 South, Range 8 West, S.B.M., the said second parties will thereupon notify the first party in writing of such desire, and, within one hundred twenty (120) days after receiving such notice, the said first party will notify the said second parties in writing whether the said first party desires to join with the said second parties in the construction and maintenance of said dam and the operation of reservoir formed by it.

If the said first party by such notice agrees to join in the construction of said dam, then the said second parties shall furnish the necessary land upon which to erect the dam and the right to flood all lands in the canyon owned by the second parties which will be overflowed or flooded by the waters in any reservoir formed by said dam, and the said first party will by proper deed convey to

the said second parties the right to flood all the lands in the canyon owned by said first party and which will be overflowed or flooded by the waters in any reservoir formed by said dam, and all rights of way necessary in connection with the same; and the said second parties shall thereupon proceed with the work of building and erecting said dam of approximately eighty feet in height and according to plans and specifications which shall first have been approved by the parties hereto, and the said second parties shall have the direction and supervision of the erection of said dam the same as in the provision of this contract concerning the erection of the "Santiago Reservoir" contained in paragraph Second hereof; and the said first party shall pay one-half of the cost thereof and the second parties the remaining cost, as also provided in said Second paragraph herein. After said dam is completed and water has been collected and stored in the reservoir formed by said dam, which reservoir shall be known as the "Lower Reservoir", the waters collected therein shall be divided and delivered, and the parties hereto shall be entitled to receive and use the waters in said reservoir on their respective lands in the following proportions, the first party shall have one half, and the second parties each one-fourth. Provided, however, that instead of the first party taking out of the "Lower Reservoir" the amount of water to which it may be entitled under the division, it, the said first party, may take such amount of water from the "Santiago Reservoir" in addition to the waters in said last named reservoir to which the first party may be entitled. In other words, the first party may take the same quantity from the "Santiago Reservoir" as it may be entitled to take from the "Lower Reservoir" to be delivered in the same manner. Should, however, the first party take all its share of water in the two reservoirs, as in this agreement provided, from the Santiago Reservoir, thereby preventing the second parties getting from the last named reservoir their pref-

erential right to said 1000 acre feet, they may take the same from the lower reservoir.

The prior right to 1000 acre feet provided for in the Fourth paragraph of this agreement, under all conditions, regardless of the number of dams that may be built, shall remain with said second parties.

At the completion of the dam and collection of water in the reservoir, the said second parties shall have the sole management of its operation and the same care as to the upkeep and repairs as herein provided in relation to the "Santiago Reservoir", and the cost of repairs and operation shall be divided between the parties in the same manner as herein provided for the "Santiago Reservoir."

In the event the first party's notice to second parties shall be that it does not desire to join in the construction and operation of the said "Barham Ranch" dam and the said second parties shall on their own account proceed with the construction of said dam, then said first party shall have no rights thereto nor any liabilities in connection therewith, nor shall any waters stored therein be considered in division of water stored in "Santaigo Reservoir", except that first party hereby agrees to deed to the said second parties all lands of the first party which would be overflowed by the back-waters from said dam approximately eighty feet in height and the reservoir formed by it at the price of an amount ten percent (10%) in excess of the value of the same for other purposes than water storage for the acreage, said value to be agreed upon by the parties hereto, and if unable to agree upon the same, then the value shall be determined by arbitration as hereinbefore provided in paragraph Ninth. It is agreed that this provision shall not be binding upon either of the parties hereto in case of suit brought by the second parties to condemn said lands for reservoir purposes. Said notice provided for at the commencement of paragraph Eleventh shall be given, even after five years, to said

first party if said second parties shall desire to build said dam.

TWELFTH

Fremont Canyon Reservoir.

It is further agreed that if at any time within five (5) years after the completion of the dam erected at the Santiago Reservoir it should be found practicable by the engineers of the parties hereto to construct a dam in the said Fremont Canyon to impound the storm waters which may flood therein, and a pipe line from said dam to convey the waters impounded therein to the "Santiago Reservoir", all the parties hereto and their successors in interest shall have the right to jointly enter upon said lands and construct the same; and when the parties hereto have so determined to construct a dam at said Fremont Canyon, an agreement in writing shall be made and signed by the parties hereto to the effect that they elect to exercise the privileges provided for in this paragraph.

Thereupon the said first party will convey to the said second parties the land necessary for the site of the dam which shall be located in said Fremont Canyon in the Northerly quarter of Block 70 of Irvine Subdivision, above referred to, and a right of way for pipe line from the reservoir formed by said dam to the "Santiago Reservoir" and for road purposes in going from one dam to the other, and for such other things as may be necessary to use in connection with the same, and the right to overflow and flood all lands back of said dam or by the reservoir formed by the dam, and thereupon the said second parties shall proceed to erect and construct a dam of such size and according to such plans and specifications as may then be agreed upon or provided by the engineers of the parties hereto, and when completed the said second parties shall have the supervision of the operation of the reservoir formed thereby, which shall be known as the "Fremont Canyon Reservoir", and the said second parties shall have charge of the upkeep and repair of said dam and the same shall be handled and operated in the same manner as herein provided for the "Santiago Reservoir",

and the cost of construction and all repairs shall be paid in the same proportion and in the same manner as herein provided for the "Santiago Reservoir", and all provisions of this contract relating to the "Santiago Reservoir" shall apply to the "Fremont Canyon Reservoir" and dam in so far as they may be applicable, but the second parties shall have no preferential right in the waters of the "Fremont Canyon Reservoir" over the said first party. That the water impounded by said "Fremont Canyon Reservoir" shall be conducted by a pipe line to the "Santiago Reservoir" and the same divided in the same manner and at the same time as the waters of the said "Santiago Reservoir". Or if the parties hereto shall then prefer, the same may be divided at or near the intakes to be installed at the dam of the "Fremont Canyon Reservoir", the first party being entitled to one-half thereof and the said second parties each one-fourth thereof.

In the event the said first party desires to erect the dam and form the reservoir thereby in Fremont Canyon, but the said second parties should not desire or choose to co-operate in the same, then it is agreed that the said first party may alone construct the said dam and form the said reservoir, and in that event shall pay the entire cost thereof and shall be entitled to all the benefits derived thereby; provided, however, that said first party shall not have the right to construct said dam alone at any time within five years from date hereof, without the consent of the second parties. Also provided that if said first party should erect said dam and form said reservoir in Fremont Canyon without the co-operation or aid of the said second parties, then the said first party shall have the right to empty and impound the waters of the "Fremont Canyon Reservoir" into the "Santiago Reservoir" when there is space in said reservoir for the reception of the same. All water received in said "Santiago Reservoir" from said "Fremont Canyon Reservoir" shall belong to and be measured and allotted to said first

party in addition to the water hereinbefore provided as going to said first party during each water year, a reasonable allowance being made for loss through evaporation or seepage, provided, however, if all water received during said water year, including the water coming from said "Fremont Canyon Reservoir", shall amount to 20,000 acre feet, then the same shall be allotted as first hereinbefore provided, with no special allotment given said first party. No special right in the water received from said "Fremont Canyon" dam or reservoir shall carry over from one water year to the next water year. Said notice provided for at the commencement of Paragraph Twelfth shall be given even after five years to said second parties if said first party shall desire to build said dam.

THIRTEENTH

Use of Reservoirs.

In the use and operation of the reservoir or reservoirs herein provided for, fences or other means may be provided to protect the waters impounded in such reservoirs from use by the public generally, and the members of the general public shall not have the right to use the same, but it is agreed that the parties hereto, under their joint control, may grant concessions on satisfactory terms to use the waters impounded in said reservoir or reservoirs for fishing, hunting, boating and such other uses as will not pollute or interfere with the use of said waters by the parties hereto for the purpose intended in such use.

At any time when the waters impounded in said reservoirs, or to be impounded therein, shall be deemed dangerous on account of the condition of said dam, either party hereto shall call attention to the said danger, and if they are unable to agree upon the necessary procedure relative to the same, then either party shall have the right to call the matter to the attention of the State Engineer, and upon his investigation or the investigation of engineers under his authority, it is found that said waters impounded in said reservoir, or any of said reservoirs, shall be dangerous, then no quantity of water shall be impounded in said dam or kept therein constituting

such dangerous condition, and that said procedure shall be followed until said dam or dams are put into a proper condition.

FOURTEENTH

That this agreement shall bind and inure to the benefit of the parties hereto, their successors and assigns, and all persons directly interested with either of the parties hereto; and this contract shall continue until the same is terminated by its own terms or by agreement of the parties hereto or by judgment of a court of competent jurisdiction.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed in the name and under the corporate seal of each party, by the duly authorized officers of the respective parties.

THE IRVINE COMPANY

SEAL

By JAMES IRVINE (signed)
President

By W. D. HELLIS (signed)
Secretary

CARPENTER IRRIGATION DISTRICT

SEAL

By L. W. Evans (signed)
President

By Donald S. Smiley (signed)
Secretary

SERRANO IRRIGATION DISTRICT

SEAL

By Willard Smith (signed)
President

By F. H. Collins (signed)
Secretary.

R E S O L U T I O N

- - - o o o O O o o o - - -

"Upon motion of C. F. Krauss, seconded by James G. Scarborough, the following resolution was adopted:-

Be it resolved by the Board of Directors of The Irvine Company, a Corporation, having its place of business in Santa Ana, County of Orange, California,

1st. That the President and Secretary of this Corporation be and they are hereby authorized, instructed and empowered to execute and deliver in the name of and under the Corporate Seal of said Corporation, all deeds, conveyances, contracts, leases and other instruments in writing, which may be necessary to transfer, convey, or lease any lands or property sold, rented, or otherwise disposed of by said corporation, and this authority shall include the assignment of mortgages.

The undersigned certifies that the foregoing is a true and correct copy of a resolution adopted at a meeting of the Board of Directors of The Irvine Company held June 21st, 1904 and recorded in Book 4, Page 143, Miscellaneous Records of Orange County.

W. D. Hellis (signed)
Secretary of said

SEAL

THE IRVINE COMPANY

Orange County Water District Groundwater Management Plan

For a copy of the Orange County Water District Groundwater Management Plan 2015 Update, please click on the link:

http://www.ocwd.com/what-we-do/groundwater-management/groundwater-management-plan/

Basin 8-1 Alternative

"Basin 8-1 Alternative" is available on OCWD's website:

https://www.ocwd.com/media/4918/basin-8-1-alternative-final-report-1.pdf.

Appendix F

Reduced Delta Reliance Reporting

Appendix F
REDUCED DELTA RELIANCE REPORTING

Background

Under the Sacramento-San Joaquin Delta (Delta) Reform Act of 2009, state and local public agencies proposing a covered action in the Delta, prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council. Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:

(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);

(2) That failure has significantly caused the need for the export, transfer, or use; and

(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:

(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;

(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and

(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as 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, consistent with Water Code section 1011(a).

The analysis and documentation provided below includes all of the elements described in WR P1(c)(1) to be included in a water supplier's 2015 and 2020 UWMPs to support certification of consistency for a future covered action.

Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1 (c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as a reduction in the amount of water used, or as a percentage of water used from the Delta.

The expected outcomes for the Serrano Water District's (SWD or District) regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's UWMP Guidebook 2020 – Final Draft (Guidebook Appendix C) issued March 29, 2021. The data used in this analysis represent the total regional efforts of Metropolitan Water District of Southern California (MWD or Metropolitan) and its member agencies, and were developed by Municipal Water District of Orange County (MWDOC) and SWD in conjunction with MWD as part of the UWMP coordination process.

The following provides a summary of the near term (2025) and long term (2040) expected outcomes for SWD's Delta reliance and regional self-reliance. The results show that as a region, MWD and MWDOC, and its member agencies are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of Delta water used.

Expected Outcomes for Regional Self-Reliance for SWD

Near term (2025). Normal water year regional self-reliance is expected to increase by 1,344 acre-feet (AF) from the 2010 baseline; this represents an increase of 39 percent of 2025 normal water year retail demands (Table F-2).

Long term (2040). Normal water year regional self-reliance is expected to increase by nearly 1,495 AF from the 2010 baseline, this represents an increase of 43 percent of 2040 normal water year retail demands (Table F-2).

Demonstration of Reduced Reliance on the Delta

The methodology used here to determine the District's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. Some of the key assumptions underlying the District's demonstration of reduced reliance include the following.

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of the District and MWDOC, in conjunction with information provided by MWD.
- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

Baseline and Expected Outcomes

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in DWR Guidebook Appendix C. Data for the 2010 baseline were taken from SWD's 2005 UWMP as the UWMPs generally do not provide normal water year projections for the year they are adopted. MWDOC and MWD have agreed that a projection can be used instead of actual because actual demand reflects hydrologic variables (MWDOC, 2021a).

Consistent with the 2010 baseline data approach, the expected outcomes for reduced Delta reliance and improved regional self-reliance for 2015 and 2020 relied on SWD's 2010 and 2015 UWMPs respectively to provide the projected demand. Expected outcomes for 2025 through 2040 are from the current 2020 UWMP demand projections. Documentation of the specific data sources and assumptions are included in the discussions below.

Service Area Demands without Water Use Efficiency

In alignment with DWR Guidebook Appendix C, this analysis uses normal water year demands, rather than normal water year supplies to calculate expected outcomes in terms of the percentage of water used. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the UWMP Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as the District need to explicitly calculate and report water use efficiency savings separate from service area demands to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the DWR Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. Table F-1 shows the results of this adjustment for the District. Supporting narratives and documentation for the data shown in Table F-1 are provided below.

Table F-1 Determining Water Use Efficiency as a Supply

Service Area Water Use Efficiency Demands	2010	2015	2020	2025	2030	2035	2040
Service Area Water Demands with Water Use Efficiency	3,430	3,284	2,930	2,575	2,626	2,679	2,706
Non-Potable Water Demands	-	-	-	-	-	-	-
Potable Service Area Demands with Water Use Efficiency	3,430	3,284	2,930	2,575	2,626	2,679	2,706

Total Service Area Population	2010	2015	2020	2025	2030	2035	2040
Service Area Population	6,307	6,421	6,263	6,311	6,394	6,485	6,458

Water Use Efficiency Since Baseline	2010	2015	2020	2025	2030	2035	2040
Per Capita Water Use (GPCD)	486	457	418	364	367	369	374
Change in Per Capita Water Use from Baseline (GPCD)		(29)	(68)	(121)	(119)	(117)	(111)
Estimated Water Use Efficiency Since Baseline		208	476	857	851	848	806

Total Service Area Water Demands	2010	2015	2020	2025	2030	2035	2040
Service Area Water Demands with Water Use Efficiency	3,430	3,284	2,930	2,575	2,626	2,679	2,706
Estimated Water Use Efficiency Since Baseline	-	208	476	857	851	848	806
Service Area Water Demands without Water Use Efficiency	3,430	3,492	3,406	3,432	3,477	3,527	3,512

Service Area Demands with Water Use Efficiency

The service area demands shown in Table F-1 represent the total actual and projected water demands for SWD's retail service area which are municipal retail demands. These demands do not include wholesale sales to the City of Orange. Water demands and the methodologies used to calculate them are described in Chapter 4 of SWD's UWMP.

Non-Potable Water Demands

There are no demands being met with non-potable water in the District service area. Non-potable supplies have a demand hardening effect due to the inability to shift non-potable supplies to meet potable water demands. When water use efficiency or conservation measures are implemented, they fall solely on the potable water users. This is consistent with the approach for water conservation reporting used by the State Water Resources Control Board.

Total Service Area Population

The District's total service area population presented in Table F-1 comes from the Center for Demographic Research. These actual and projected population estimates are described in Chapter 4 of the 2020 District's UWMP.

Water Use Efficiency Since Baseline

The water use efficiency numbers shown in Table F-1 represent the formulation that SWD utilized; it is consistent with Appendix C of the DWR UWMP Guidebook approach.

Service area demands are divided by the service area population to get per capita water use in gallons per capita per day (GPCD) for each five-year period. The change in per capita water use from the baseline is the comparative GPCD from each five-year period compared to the 2010 baseline. Changes in per capita water use over time are then applied back to the service area population to calculate the estimated WUE Supply. This estimated WUE Supply is considered an additional supply that may be used to show reduced reliance on Delta water supplies.

The demand and water use efficiency data shown in Table F-1 were collected from the following sources.

- Baseline (2010) values: MWDOC's 2005 UWMP, Table 2-1-3-3-1-C
- 2015 values: SWD 2010 UWMP, Table 14
- 2020 values: SWD 2015 UWMP, Table 4-2
- 2025-2040 values: SWD 2020 UWMP, Table 4-3

It should be noted that the results of this calculation differs from what SWD calculated under the Water Conservation Act of 2009 (SB X7-7) due to differing formulas. The SB X7-7 calculations are presented in Appendix D and Chapter 5 of the 2020 UWMP.

Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table F-2 presents expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table F-2 represent efforts to improve regional self-reliance for the District's entire service area and include the total contributions of the District. Supporting narratives and documentation for all data shown in Table F-2 are provided below.

The results shown in Table F-2 demonstrate that the District's service area is measurably improving its regional self-reliance. In the near-term (2025), the expected outcome for normal water year regional self-reliance increases by 1,344 AF from the 2010 baseline; this represents an increase of about 39.2 percent of 2025 normal water year retail demands. In the long-term (2040), normal water year regional self-reliance is expected to increase by more than 1,495 AF from the 2010 baseline; this represents an increase of about 42.5 percent of 2040 normal water year retail demands.

Table F-2 Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040
Water Use Efficiency	-	208	476	857	851	848	806
Water Recycling			-	-	-	-	-
Stormwater Capture and Use	-	-	-	-	-	-	-
Advanced Water Technologies	104	463	462	591	769	784	792
Conjunctive Use Projects	-	-	-	-	-	-	-
Local and Regional Water Supply and Storage Projects	-	-	-	-	-	-	-
Other Programs and Projects the Contribute to Regional Self-Reliance	-	-	-	-	-	-	-
Water Supplies Contributing to Regional Self-Reliance	104	671	938	1,448	1,620	1,632	1,598

Service Area Water Demands without Water Use Efficiency	2010	2015	2020	2025	2030	2035	2040
Service Area Water Demands without Water Use Efficiency (AF)	3,430	3,492	3,406	3,432	3,477	3,527	3,512

Change in Regional Self Reliance	2010	2015	2020	2025	2030	2035	2040
Water Supplies Contributing to Regional Self-Reliance (AF)	104	671	938	1,448	1,620	1,632	1,598
Change in Water Supplies Contributing to Regional Self-Reliance (AF)		567	834	1,344	1,516	1,528	1,495

Change in Regional Self Reliance (as a Percent of Water Demand without WUE)	2010	2015	2020	2025	2030	2035	2040
Water Supplies Contributing to Regional Self-Reliance (%)	3.0	19.2	27.5	42.2	46.6	46.3	45.5
Change in Water Supplies Contributing to Regional Self-Reliance (%)		16.2	24.5	39.2	43.6	43.3	42.5

Water Use Efficiency

The water use efficiency information shown in Table F-2 is taken directly from Table F-1 above.

Advanced Water Technologies

The District benefits indirectly from the replenishment of the Orange County groundwater basin using the GWRS water that meets State and Federal drinking water standards. The GWRS, described in Section 6.2.1 under Recharge Supplies, takes highly treated wastewater from region including SWD's service area, then injects it into a seawater barrier to help prevent seawater intrusion. This purified water is also percolated into deep aquifers where it becomes part of Orange County's, and the District's, drinking water supply. The District's credit for wastewater generated in the service area that is used to recharge the groundwater basin, called indirect potable reuse, averaged 506 AF over the previous five years.

Reliance on Water Supplies from the Delta Watershed

MWD's service area as a whole reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and demand management measures. Quantifying SWD's investments in self-reliance, locally, regionally, and throughout Southern California is infeasible for the reasons noted in the following section on the accounting of supplies for MWD. Due to the regional nature of these investments, SWD is relying on MWD's regional accounting of measurable reductions in supplies from the Delta watershed.

The results shown in MWD's UWMP Appendix 11, Table A.11-3, demonstrate that MWD's service area, which includes SWD, is measurably reducing its Delta reliance. In the near-term (2025), the expected outcome for normal

water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline; this represents a decrease of 3 percent of 2025 normal water year retail demands. In the long- term (2045), normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline; this represents a decrease of just over 5 percent of 2045 normal water year retail demands.

Table C-2 Metropolitan Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
CVP/SWP Contract Supplies	1,472,000	1,029,000	984,000	1,133,000	1,130,000	1,128,000	1,126,000	1,126,000
Delta/Delta Tributary Diversions	-	-	-	-	-	-	-	-
Transfers and Exchanges of Supplies from the Delta Watershed	20,000	44,000	91,000	58,000	52,000	52,000	52,000	52,000
Other Water Supplies from the Delta Watershed	-	-	-	-	-	-	-	-
Total Water Supplies from the Delta Watershed	**1,492,000**	**1,073,000**	**1,075,000**	**1,191,000**	**1,182,000**	**1,180,000**	**1,178,000**	**1,178,000**

Service Area Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Demands without Water Use Efficiency Accounted For	5,493,000	5,499,000	5,219,000	4,938,000	5,019,000	5,143,000	5,248,000	5,361,000

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Water Supplies from the Delta Watershed	1,492,000	1,073,000	1,075,000	1,191,000	1,182,000	1,180,000	1,178,000	1,178,000
Change in Supplies from the Delta Watershed	**NA**	**(419,000)**	**(417,000)**	**(301,000)**	**(310,000)**	**(312,000)**	**(314,000)**	**(314,000)**
Percent Change in Supplies from the Delta Watershed(as a Percent of Demand w/out WUE)	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Percent of Supplies from the Delta Watershed	27.2%	19.5%	20.6%	24.1%	23.6%	22.9%	22.4%	22.0%
Change in Percent of Supplies from the Delta Watershed	**NA**	**-7.6%**	**-6.6%**	**-3.0%**	**-3.6%**	**-4.2%**	**-4.7%**	**-5.2%**

Infeasibility of Accounting Supplies from the Delta Watershed for Metropolitan's Member Agencies and their Customers

Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. Metropolitan's member agencies coordinate reliance on the Delta through their membership in Metropolitan, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally—not by individual Metropolitan member agencies and not by the customers of those member agencies.

Metropolitan's member agencies, and those agencies' customers, indirectly reduce reliance on the Delta through their collective efforts as a cooperative. Metropolitan's member agencies do not control the amount of Delta water they receive from Metropolitan. Metropolitan manages a statewide integrated conveyance system consisting of its participation in the State Water Project (SWP), its Colorado River Aqueduct (CRA) including Colorado River water resources, programs and water exchanges, and its regional storage portfolio. Along with the SWP, CRA, storage programs, and Metropolitan's conveyance and distribution facilities, demand management programs increase the future reliability of water resources for the region. In addition, demand management programs provide system-wide benefits by decreasing the demand for imported water, which helps to decrease the burden on the district's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Metropolitan's costs are funded almost entirely from its service area, with the exception of grants and other assistance from government programs. Most of Metropolitan's revenues are collected directly from its member agencies. Properties within Metropolitan's service area pay a property tax that currently provides approximately 8 percent of the fiscal year 2021 annual budgeted revenues. The rest of Metropolitan's costs are funded through rates and charges paid by Metropolitan's member agencies for the wholesale services it provides to them.[1] Thus,

[1] A standby charge is collected from properties within the service areas of 21 of Metropolitan's 26 member agencies, ranging from $5 to $14.20 per acre annually, or per parcel if smaller than an acre. Standby charges go towards those member agencies' obligations to Metropolitan for the Readiness-to-Serve Charge. The total amount collected annually is approximately $43.8 million, approximately 2 percent of Metropolitan's fiscal year 2021 annual budgeted revenues.

Metropolitan's member agencies fund nearly all operations Metropolitan undertakes to reduce reliance on the Delta, including Colorado River Programs, storage facilities, Local Resources Programs and Conservation Programs within Metropolitan's service area.

Because of the integrated nature of Metropolitan's systems and operations, and the collective nature of Metropolitan's regional efforts, it is infeasible to quantify each of Metropolitan member agencies' individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as an integrated regional cooperative.

In addition to the member agencies funding Metropolitan's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those member agencies may also invest in their own local programs to reduce water demand. However, to the extent those efforts result in reduction of demands on Metropolitan, that reduction does not equate to a like reduction of reliance on the Delta. Demands on Metropolitan are not commensurate with demands on the Delta because most of Metropolitan member agencies receive blended resources from Metropolitan as determined by Metropolitan—not the individual member Serrano—and for most member agencies, the blend varies from month-to-month and year-to-year due to hydrology, operational constraints, use of storage and other factors.

Colorado River Programs

As a regional cooperative of member agencies, Metropolitan invests in programs to ensure the continued reliability and sustainability of Colorado River supplies. Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the CRA. The CRA consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four regulating reservoirs, and 242 miles of aqueducts, siphons, canals, conduits and pipelines terminating at Lake Mathews in Riverside County. Metropolitan owns, operates, and manages the CRA. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA, and is responsible for obtaining and scheduling energy resources adequate to power pumps at the CRA's five pumping stations.

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including supplies from the Imperial Irrigation District (IID)-Metropolitan Conservation Program, the implementation of the Quantification Settlement Agreement (QSA) and related agreements, and the exchange agreement with San Diego County Water Authority (SDCWA). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's CRA supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead.

Storage Investments/Facilities

Surface and groundwater storage are critical elements of Southern California's water resources strategy and help Metropolitan reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. The Metropolitan system, for purposes of meeting demands during times of shortage, regulating system flows, and ensuring system reliability in the event of a system outage, provides over 1,000,000 acre-feet of system storage capacity. Diamond Valley Lake provides 810,000 acre-feet of that storage capacity, effectively doubling Southern California's previous surface water storage capacity. Other existing imported water storage available to the region consists of Metropolitan's raw water reservoirs, a share of the SWP's raw water reservoirs in and near the service area, and the portion of the groundwater basins used for conjunctive-use storage.

Since the early twentieth century, DWR and Metropolitan have constructed surface water reservoirs to meet emergency, drought/seasonal, and regulatory water needs for Southern California. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and Metropolitan's Diamond Valley Lake (DVL). Some reservoirs such as Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, and Orange

County Reservoir, which have a total combined capacity of about 3,500 AF, are used solely for regulating purposes. The total gross storage capacity for the larger remaining reservoirs is 1,757,600 AF. However, not all of the gross storage capacity is available to Metropolitan; dead storage and storage allocated to others reduce the amount of storage that is available to Metropolitan to 1,665,200 AF.

Conjunctive use of the aquifers offers another important source of dry year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region's major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs in the service area; the following table lists the groundwater conjunctive use programs that have been developed in the region.

Program	Metropolitan Agreement Partners	Program Term	Max Storage AF	Dry-Year Yield AF/Yr
Long Beach Conjunctive Use Storage Project (Central Basin)	Long Beach	June 2002-2027	13,000	4,300
Foothill Area Groundwater Storage Program (Monkhill/ Raymond Basin)	Foothill MWD	February 2003-2028	9,000	3,000
Orange County Groundwater Conjunctive Use Program	MWDOC OCWD	June 2003-2028	66,000+	22,000
Chino Basin Conjunctive Use Programs	IEUA TVMWD Watermaster	June 2003-2028	100,000	33,000
Live Oak Basin Conjunctive Use Project (Six Basins)	TVMWD City of La Verne	October 2002-2027	3,000	1,000
City of Compton Conjunctive Use Project (Central Basin)	Compton	February 2005-2030	2,289	763
Long Beach Conjunctive Use Program Expansion in Lakewood (Central Basin)	Long Beach	July 2005-2030	3,600	1,200
Upper Claremont Basin Groundwater Storage Program (Six Basins)	TVMWD	Sept. 2005- 2030	3,000	1,000
Elsinore Basin Conjunctive Use Storage Program	Western MWD Elsinore Valley MWD	May 2008- 2033	12,000	4,000
TOTAL			**211,889**	**70,263**

Metropolitan Demand Management Programs

Demand management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These Demand Management Programs incentivize the development of local water supplies and the conservation of water to reduce the need to import water to deliver to Metropolitan's member agencies. These programs are implemented below the delivery points between Metropolitan's and its member agencies' distribution systems and, as such, do not add any water to Metropolitan's supplies. Rather, the effect of these downstream programs is to produce a local supply of water for the local agencies and to reduce demands by member agencies for water imported through Metropolitan's system. The following discussions outline how Metropolitan funds local resources and conservation programs for the benefit of all of its member agencies and the entire Metropolitan service area. Notably, the history of demand management by Metropolitan's member

agencies and the local agencies that purchase water from Metropolitan's members has spanned more than four decades. The significant history of the programs is another reason it would be difficult to attempt to assign a portion of such funding to any one individual member Serrano.

Local Resources Programs

In 1982, Metropolitan began providing financial incentives to its member agencies to develop new local supplies to assist in meeting the region's water needs. Because of Metropolitan's regional distribution system, these programs benefit all member agencies regardless of project location because they help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs and free up conveyance capacity to the benefit of all the agencies that rely on water from Metropolitan.

For example, the Groundwater Replenishment System (GWRS) operated by the Orange County Water District is the world's largest water purification system for indirect potable reuse. It was funded, in part, by Metropolitan's member agencies through the Local Resources Program. Annually, the GWRS produces approximately 103,000 acre-feet of reliable, locally controlled, drought-proof supply of high-quality water to recharge the Orange County Groundwater Basin and protect it from seawater intrusion. The GWRS is a premier example of a regional project that significantly reduced the need to utilize imported water for groundwater replenishment in Metropolitan's service area, increasing regional and local supply reliability and reducing the region's reliance on imported supplies, including supplies from the State Water Project.

Metropolitan's local resource programs have evolved through the years to better assist Metropolitan's member agencies in increasing local supply production. The following is a description and history of the local supply incentive programs.

Local Projects Program

In 1982, Metropolitan initiated the Local Projects Program (LPP), which provided funding to member agencies to facilitate the development of recycled water projects. Under this approach, Metropolitan contributed a negotiated up-front funding amount to help finance project capital costs. Participating member agencies were obligated to reimburse Metropolitan over time. In 1986, the LPP was revised, changing the up-front funding approach to an incentive-based approach. Metropolitan contributed an amount equal to the avoided State Water Project pumping costs for each acre-foot of recycled water delivered to end-use consumers. This funding incentive was based on the premise that local projects resulted in the reduction of water imported from the Delta and the associated pumping cost. The incentive amount varied from year to year depending on the actual variable power cost paid for State Water Project imports. In 1990, Metropolitan's Board increased the LPP contribution to a fixed rate of $154 per acre-foot, which was calculated based on Metropolitan's avoided capital and operational costs to convey, treat, and distribute water, and included considerations of reliability and service area demands.

Groundwater Recovery Program

The drought of the early 1990s sparked the need to develop additional local water resources, aside from recycled water, to meet regional demand and increase regional water supply reliability. In 1991, Metropolitan conducted the Brackish Groundwater Reclamation Study which determined that large amounts of degraded groundwater in the region were not being utilized. Subsequently, the Groundwater Recovery Program (GRP) was established to assist the recovery of otherwise unusable groundwater degraded by minerals and other contaminants, provide access to the storage assets of the degraded groundwater, and maintain the quality of groundwater resources by reducing the spread of degraded plumes.

Local Resources Program

In 1995, Metropolitan's Board adopted the Local Resources Program (LRP), which combined the LPP and GRP into one program. The Board allowed for existing LPP agreements with a fixed incentive rate to convert to the sliding scale up to $250 per acre-foot, similar to GRP incentive terms. Those agreements that were converted to LRP are known as "LRP Conversions."

Competitive Local Projects Program

In 1998, the Competitive Local Resources Program (Competitive Program) was established. The Competitive

Program encouraged the development of recycled water and recovered groundwater through a process that emphasized cost-efficiency to Metropolitan, timing new production according to regional need while minimizing program administration cost. Under the Competitive Program, agencies requested an incentive rate up to $250 per acre-foot of production over 25 years under a Request for Proposals (RFP) for the development of up to 53,000 acre-feet per year of new water recycling and groundwater recovery projects. In 2003, a second RFP was issued for the development of an additional 65,000 acre-feet of new recycled water and recovered groundwater projects through the LRP.

Seawater Desalination Program

Metropolitan established the Seawater Desalination Program (SDP) in 2001 to provide financial incentives to member agencies for the development of seawater desalination projects. In 2014, seawater desalination projects became eligible for funding under the LRP, and the SDP was ended.

2007 Local Resources Program

In 2006, a task force comprised of member Serrano representatives was formed to identify and recommend program improvements to the LRP. As a result of the task force process, the 2007 LRP was established with a goal of 174,000 acre-feet per year of additional local water resource development. The new program allowed for an open application process and eliminated the previous competitive process. This program offered sliding scale incentives of up to $250 per acre-foot, calculated annually based on a member Serrano's actual local resource project costs exceeding Metropolitan's prevailing water rate.

2014 Local Resources Program

A series of workgroup meetings with member agencies was held to identify the reasons why there was a lack of new LRP applications coming into the program. The main constraint identified by the member agencies was that the $250 per acre-foot was not providing enough of an incentive for developing new projects due to higher construction costs to meet water quality requirements and to develop the infrastructure to reach end-use consumers located further from treatment plants. As a result, in 2014, the Board authorized an increase in the maximum incentive amount, provided alternative payment structures, included onsite retrofit costs and reimbursable services as part of the LRP, and added eligibility for seawater desalination projects. The current LRP incentive payment options are structured as follows:

- Option 1 – Sliding scale incentive up to $340/AF for a 25-year agreement term
- Option 2 – Sliding scale incentive up to $475/AF for a 15-year agreement term
- Option 3 – Fixed incentive up to $305/AF for a 25-year agreement term

On-site Retrofit Programs

In 2014, Metropolitan's Board also approved the On-site Retrofit Pilot Program which provided financial incentives to public or private entities toward the cost of small-scale improvements to their existing irrigation and industrial systems to allow connection to existing recycled water pipelines. The On-site Retrofit Pilot Program helped reduce recycled water retrofit costs to the end-use consumer which is a key constraint that limited recycled water LRP projects from reaching full production capacity. The program incentive was equal to the actual eligible costs of the on-site retrofit, or $975 per acre-foot of up-front cost, which equates to $195 per acre-foot for an estimated five years of water savings ($195/AF x 5 years) multiplied by the average annual water use in previous three years, whichever is less. The Pilot Program lasted two years and was successful in meeting its goal of accelerating the use of recycled water.

In 2016, Metropolitan's Board authorized the On-site Retrofit Program (ORP), with an additional budget of $10 million. This program encompassed lessons learned from the Pilot Program and feedback from member agencies to make the program more streamlined and improve its efficiency. As of fiscal year 2019/20, the ORP has successfully converted 440 sites, increasing the use of recycled water by 12,691 acre-feet per year.

Stormwater Pilot Programs

In 2019, Metropolitan's Board authorized both the Stormwater for Direct Use Pilot Program and a Stormwater for Recharge Pilot Program to study the feasibility of reusing stormwater to help meet regional demands in Southern

California. These pilot programs are intended to encourage the development, monitoring, and study of new and existing stormwater projects by providing financial incentives for their construction/retrofit and monitoring/reporting costs. These pilot programs will help evaluate the potential benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches. Metropolitan's Board authorized a total of $12.5 million for the stormwater pilot programs ($5 million for the District Use Pilot and $7.5 million for the Recharge Pilot).

Current Status and Results of Metropolitan's Local Resource Programs

Today, nearly one-half of the total recycled water and groundwater recovery production in the region has been developed with an incentive from one or more of Metropolitan's local resource programs. During fiscal year 2020, Metropolitan provided about $13 million for production of 71,000 acre-feet of recycled water for non-potable and indirect potable uses. Metropolitan provided about $4 million to support projects that produced about 50,000 acre-feet of recovered groundwater for municipal use. Since 1982, Metropolitan has invested $680 million to fund 85 recycled water projects and 27 groundwater recovery projects that have produced a cumulative total of about 4 million acre-feet.

Conservation Programs

Metropolitan's regional conservation programs and approaches have a long history. Decades ago, Metropolitan recognized that demand management at the consumer level would be an important part of balancing regional supplies and demands. Water conservation efforts were seen as a way to reduce the need for imported supplies and offset the need to transport or store additional water into or within the Metropolitan service area. The actual conservation of water takes place at the retail consumer level. Regional conservation approaches have proven to be effective at reaching retail consumers throughout Metropolitan's service area and successfully implementing water saving devices, programs and practices. Through the pooling of funding by Metropolitan's member agencies, Metropolitan is able to engage in regional campaigns with wide-reaching impact. Regional investments in demand management programs, of which conservation is a key part along with local supply programs, benefit all member agencies regardless of project location. These programs help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Incentive-Based Conservation Programs

Conservation Credits Program

In 1988, Metropolitan's Board approved the Water Conservation Credits Program (Credits Program). The Credits Program is similar in concept to the Local Projects Program (LPP). The purpose of the Credits Program is to encourage local water agencies to implement effective water conservation projects through the use of financial incentives. The Credits Program provides financial assistance for water conservation projects that reduce demands on Metropolitan's imported water supplies and require Metropolitan's assistance to be financially feasible.

Initially, the Credits Program provided 50 percent of a member Serrano's program cost, up to a maximum of $75 per acre-foot of estimated water savings. The $75 Base Conservation Rate was established based Metropolitan's avoided cost of pumping SWP supplies. The Base Conservation Rate has been revisited by Metropolitan's Board and revised twice since 1988, from $75 to $154 per acre-foot in 1990 and from $154 to $195 per acre-foot in 2005.

In fiscal year 2020 Metropolitan processed more than 30,400 rebate applications totaling $18.9 million.

Member Serrano Administered Program

Some member agencies also have unique programs within their service areas that provide local rebates that may differ from Metropolitan's regional program. Metropolitan continues to support these local efforts through a member Serrano administered funding program that adheres to the same funding guidelines as the Credits Program. The Member Serrano Administered Program allows member agencies to receive funding for local conservation efforts that supplement, but do not duplicate, the rebates offered through Metropolitan's regional rebate program.

Water Savings Incentive Program

There are numerous commercial entities and industries within Metropolitan's service area that pursue unique

savings opportunities that do not fall within the general rebate programs that Metropolitan provides. In 2012, Metropolitan designed the Water Savings Incentive Program (WSIP) to target these unique commercial and industrial projects. In addition to rebates for devices, under this program, Metropolitan provides financial incentives to businesses and industries that created their own custom water efficiency projects. Qualifying custom projects can receive funding for permanent water efficiency changes that result in reduced potable demand.

Non-Incentive Conservation Programs

In addition to its incentive-based conservation programs, Metropolitan also undertakes additional efforts throughout its service area that help achieve water savings without the use of rebates. Metropolitan's non-incentive conservation efforts include:

- residential and professional water efficient landscape training classes
- water audits for large landscapes
- research, development and studies of new water saving technologies
- advertising and outreach campaigns
- community outreach and education programs
- advocacy for legislation, codes, and standards that lead to increased water savings

Current Status and Results of Metropolitan's Conservation Programs

Since 1990, Metropolitan has invested $824 million in conservation rebates that have resulted in a cumulative savings of 3.27 million acre-feet of water. These investments include $450 million in turf removal and other rebates during the last drought which resulted in 175 million square feet of lawn turf removed. During fiscal year 2020, 1.06 million acre-feet of water is estimated to have been conserved. This annual total includes Metropolitan's Conservation Credits Program; code-based conservation achieved through Metropolitan-sponsored legislation; building plumbing codes and ordinances; reduced consumption resulting from changes in water pricing; and pre-1990 device retrofits.

Infeasibility of Accounting Regional Investments in Reduced Reliance Below the Regional Level

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual Serrano, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member Serrano's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

Serrano Water District's 2015 UWMP Appendix I and Availability of Documents

The information contained in this Appendix F is also intended to be a new Appendix H attached to SWD's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). As stated in WR P1(c)(1)(C), the policy requires that, **commencing in 2015**, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

SWD provided notice of the availability of the draft 2020 UWMP (including this Appendix F which will also be a new Appendix H to its 2015 UWMP) 2020 WSCP, and the public hearing to consider adoption of both plans and Appendix H to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The 60 day notification letter sent to the relevant agencies, cities, and the County of Orange and the notice published in the newspapers advertising the public hearing are included in the 2020 UWMP Appendix H. This Appendix F to the District's 2020 UWMP will also be recognized and treated as Appendix H to SWD's 2015 UWMP.

The District held the public hearing for the 1) draft 2020 UWMP, 2) Appendix H to the 2015 UWMP, and 3) 2020 WSCP on June 15, 2021, at the Board of Directors meeting. On June 15, SWD's Board determined that the 2020 UWMP and WSCP accurately represent the water resources plan for its service area and it determined that Appendix F included in 2020 UWMP and Appendix H to the 2015 UWMP include all of the elements described in Delta Plan Policy WR P1, *Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance* (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in the resolution, the Board adopted the 2020 UWMP, Appendix H to the 2015 UWMP, and the 2020 WSCP and authorized their submittal to the State of California. The resolution is included in the 2020 UWMP Appendix H.

References

References below were provided by MWDOC. Additional references for this document can be found in the District's 2020 UWMP Appendix B.

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2017/12-Dec/Reports/064863458.pdf

http://www.mwdh2o.com/PDF_About_Your_Water/Annual_Achievement_Report.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2016/12-Dec/Reports/064845868.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2012/05%20-%20May/Letters/064774100.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2020/10%20-%20Oct/Letters/10132020%20BOD%209-3%20B-L.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2001/10-October/Letters/003909849.pdf

Appendix G

Water Conservation & Water Supply Shortage Program

SERRANO WATER DISTRICT

Water Conservation & Water Supply Shortage Program

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Water Conservation & Water Supply Shortage Program

Appendix

AN RESOLUTION OF THE SERRANO WATER DISTRICT ESTABLISHING A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM AND REGULATIONS

Section I: Title.

This chapter will be known as the Serrano Water District Water Conservation and Water Supply Shortage Program.

Section II. Findings.

a. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the southern California region.

b. Southern California is a semi-arid region and is largely dependent upon imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the State and western United States, make the region highly susceptible to water supply reliability issues.

c. Careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

d. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

e. Article XI, Section 7 of the California Constitution declares that a city or county may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws.

f. California Water Code section 375 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

g. The adoption and enforcement of a water conservation and supply shortage program is necessary to manage the the Serrano Water District's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortage within the Serrano Water District. Such program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

Section III. Declaration of Purpose and Intent.

a. The purpose of this chapter is to establish a water conservation and supply shortage program that will reduce water consumption within the Serrano Water District through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the Serrano Water District to avoid and minimize the effect and hardship of water shortage to the greatest extent possible.

b. This chapter establishes permanent water conservation standards intended to alter behavior related to water use efficiency at all times and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

Section IV. Definitions.

a. The following words and phrases whenever used in this chapter have the meaning defined in this section:

1. **"Person"** means any natural person or persons, corporation, public or private entity, governmental agency or institution, including all agencies and departments of Serrano Water District, or any other user of water provided by the Serrano Water District.

2. **"Landscape irrigation system"** means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.

3. **"Large landscape areas"** means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.

4. **"Single pass cooling systems"** means equipment where water is circulated only once to cool equipment before being disposed.

5. **"Potable water"** means water which is suitable for drinking.

6. **"Recycled water"** means the reclamation and reuse of non-potable water for beneficial use as defined in Title 22 of the California Code of Regulations.

7. **"Billing unit"** means the unit of water used to apply water rates for purposes of calculating water charges for a persons water usage and equals 100 cubic feet or seven hundred forty-eight (748) gallons of water.

Section V. Application

a. The provisions of this chapter apply to any person in the use of any potable water provided by the Serrano Water District.

b. The provisions of this chapter do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

c. The provisions of this chapter do not apply to the use of recycled water, with the exception of Section VI(a).

d. The provisions of this chapter do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.

e. This chapter is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to the local jurisdiction or Regional Water Quality Control Board for information on any stormwater ordinances and stormwater management plans.

Section VI: Permanent Water Conservation Requirements – Prohibition Against Waste

The following water conservation requirements are effective at all times and are permanent. Violations of this section will be considered waste and an unreasonable use of water.

a. **Limits on Watering Hours**: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 10:00 a.m. and 4:00 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

b. **Limit on Watering Duration**: Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.

c. **No Excessive Water Flow or Runoff:** Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.

d. **No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

e. **Obligation to Fix Leaks, Breaks or Malfunctions:** Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than three (3) days of receiving notice from the Serrano Water District, is prohibited.

f. **Re-circulating Water Required for Water Fountains and Decorative Water Features**: Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.

g. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility.

h. **Drinking Water Served Upon Request Only:** Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

i. **No Installation of Single Pass Cooling Systems**: Installation of single pass cooling systems is prohibited in buildings requesting new water service.

j. **No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems:** Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.

k. **Restaurants Required to Use Water Conserving Dish Wash Spray Valves**: Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

m. **Commercial Car Wash Systems:** Effective on January 1, 2009, all new commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the Serrano Water District.

Section VII: Level 1 Water Supply Shortage

a. A Level 1 Water Supply Shortage exists when the Serrano Water District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the Serrano Water District of a Level 1 Water Supply Shortage condition, the Serrano Water District will implement the mandatory Level 1 conservation measures identified in this section.

b. **Additional Water Conservation Measures:** In addition to the prohibited uses of water identified in Section VI, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage:

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three days per week on a schedule established and posted by the Serrano Water District. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the Serrano Water District. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the Serrano Water District unless other arrangements are made with the Serrano Water District.

Section VIII. Level 2 Water Supply Shortage

a. A Level 2 Water Supply Shortage exists when the Serrano Water District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the Serrano Water District of a Level 2 Water Supply Shortage condition, the Serrano Water District will implement the mandatory Level 2 conservation measures identified in this section.

b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Section VI and VII, the following additional water conservation requirements apply during a declared Level 2 Water Supply Shortage:

1. **Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two days per week on a schedule established and posted by the Serrano Water District. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the Serrano Water District. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the Serrano Water District unless other arrangements are made with the Serrano Water District.

3. **Limits on Filling Ornamental Lakes or Ponds**: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this ordinance.

4. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

5. **Limits on Filling Residential Swimming Pools & Spas:** Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

Section IX. Level 3 Water Supply Shortage – Emergency Condition

a. A Level 3 Water Supply Shortage condition is also referred to as an "Emergency" condition. A Level 3 condition exists when the Serrano Water District declares a water shortage emergency and notifies its residents and businesses that a significant reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety. Upon the declaration of a Level 3 Water Supply Shortage condition, the Serrano Water District will implement the mandatory Level 3 conservation measures identified in this section.

b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Section VI, VII, and VIII, the following water conservation requirements apply during a declared Level 3 Water Supply Shortage Emergency:

1. **No Watering or Irrigating:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use, unless the Serrano Water District has determined that recycled water is available and may be applied to the use:

   i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device;

   ii. Maintenance of existing landscape necessary for fire protection;

   iii. Maintenance of existing landscape for soil erosion control;

   iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

   v. Maintenance of landscape within active public parks and playing fields, day care centers, golf course greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section VIII(b)(1) and time restrictions in Section VI(a) and (b)(1);

   vi. Actively irrigated environmental mitigation projects.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the Serrano Water District unless other arrangements are made with the Serrano Water District.

3. a. **No New Potable Water Service**: Upon declaration of a Level 3 Water Supply Shortage Emergency condition, no new potable water service will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

      1. A valid, unexpired building permit has been issued for the project; or
      2. The project is necessary to protect the public health, safety, and welfare; or

3. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the Serrano Water

4. **Discontinue Service**: The Serrano Water District, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.

5. **No New Annexations:** Upon the declaration of a Level 3 Water Supply Shortage condition, the Serrano Water District will suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any increased use of water.

Section X. Procedures for Determination / Notification of Water Supply Shortage

a. **Declaration and Notification of Water Supply Shortage:** The existence of Level 1, Level 2 or Level 3 Water Supply Shortage conditions may be declared by resolution of the Serrano Water District adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Level 1, Level 2 or Level 3 conditions will take effect on the tenth day after the date the shortage level is declared. Within five (5) days following the declaration of the shortage level, the Serrano Water District must publish a copy of the resolution in a newspaper used for publication of official notices. If the Serrano Water District activates a water allocation process, it must provide notice of the activation by including it in the regular billing statement or by any other mailing to the address to which the Serrano Water District customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth day following the date of mailing or at such later date as specified in the notice.

Section XI. Hardship Waiver

a. **Undue and Disproportionate Hardship:** If, due to unique circumstances, a specific requirement of this chapter would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirements as provided in this section.

b. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

1. **Application**: Application for a waiver must be on a form prescribed by the Serrano Water District and accompanied by a non-refundable processing fee in an amount set by the Serrano Water District resolution.

2. **Supporting Documentation**: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

3. **Required Findings for Waiver:** An application for a waiver will be denied unless the Serrano Water District finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water

use information for the property as shown by the records of the Serrano Water District or its Agent, all of the following:

i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

ii. That because of special circumstances applicable to the property or its use, the strict application of this chapter would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the Serrano Water District to effectuate the purpose of this chapter and will not be detrimental to the public interest; and

iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

4. **Approval Authority**: The General Manager must act upon any completed application no later than ten (10) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply too the subject property during the period of the mandatory water supply shortage condition. The decision of the General Manager will be final.

Section XII. Penalties and Violations

a. **Misdemeanor:** Any violation of this chapter may be prosecuted as a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days, or by a fine not exceeding one thousand dollars ($1,000), or by both.

b. **Penalties:** Penalties for failure to comply with any provisions of the ordinance are as follows:

1. **First Violation:** The Serrano Water District will issue a written warning and deliver a copy of this ordinance by mail.

2. **Second Violation:** A second violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed one hundred dollars ($100).

3. **Third Violation:** A third violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed two hundred and fifty ($250).

4. **Fourth and Subsequent Violations:** A fourth and any subsequent violation is punishable by a fine not to exceed five hundred ($500).

i. **Water Flow Restrictor:** In addition to any fines, the Serrano Water District may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized

restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.

5. **Discontinuing Service:** In addition to any fines and the installation of a water flow restrictor, the Serrano Water District may disconnect a customer's water service for willful violations of mandatory restrictions in this chapter.

c. **Cost of Flow Restrictor and Disconnecting Service:** A person or entity that violates this ordinance is responsible for payment of the Serrano Water District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the Serrano Water District's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the Serrano Water District before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

d. **Separate Offenses**: Each day that a violation of this ordinance occurs is a separate offense.

e. **Notice and Hearing**:

1. The Serrano Water District will issue a Notice of Violation by mail or personal delivery at least ten (10) days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the Serrano Water District no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the Serrano Water District will mail written notice of the hearing date to the customer at least ten (10) days before the date of the hearing.

2. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the Serrano Water District may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Level condition.

Section XIII. Severability

If any section, subsection, sentence, clause or phrase in this chapter is for any reason held invalid, the validity of the remainder of the chapter will not be affected. The Board of Directors hereby declares it would have passed this chapter and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

Other Measures Available for Consideration

a. **Water Allocations and Mandatory Reductions**

1. **Water Allocations / Water Budget**: The Serrano Water District will activate a water allocation process using a method that does not in effect penalize persons for prior implementation of conservation methods or installation of water-saving devices. The Serrano Water District must provide notice of activation of the allocation process by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the Serrano Water District customarily mails the billing statement for fees or charges for on-going water service.

   Following the effective date of the water allocation, any person using water in excess of the allocation will be subject to a 20% penalty for each billing unit of water in excess of the allocation. The penalty for excess water usage will be cumulative to any other remedy or penalty that may be imposed for violation of this ordinance.

b. **Large Landscape Areas – Rain Sensors**: Large landscape areas, such as parks, cemeteries, golf courses, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.

c. **Construction Purposes**: Recycled or non-potable water must be used for construction purposes when available.

d. **Water Recycling Required if Available**: The use of potable water, other than recycled water, is prohibited for specified uses after the Serrano Water District has provided to the user an analysis showing that recycled water is available, a cost-effective alternative to potable water for such uses and the user has had a reasonable time, as determined by the Serrano Water District, to make the conversion to recycled water.

e. **Water Recycling – New Service:** Prior to the connection of any new water service, an evaluation must be done by the Serrano Water District to determine whether recycled water exists to supply all or some of the water needed and recycled water must be utilized to the extent feasible.

f. **Reporting Mechanism - Hotline**: The Serrano Water District will establish a water waste hotline for residents to report violations of this chapter.

g. **State Model Landscape Ordinance:** The Department of Water Resources State Model Landscaping Ordinance is adopted by reference and incorporated as part of this Chapter. The full text of the Model Landscaping Ordinance is available on the Serrano Water District website at www.serranowater.org and a copy is maintained with the Serrano Water District.

APPENDIX

WATER CONSERVATION ORDINANCE SUMMARY TABLE

Permanent	Level 1	Level 2	Level 3 – Emergency	Other Provisions for Consideration
Restrictions o No Watering: 10:00 am-4:00 pm, except by hand o Irrigation system limit of 15 minutes o No excessive water flow or runoff o No washing down hard or paved surfaces o Obligation to fix leaks in reasonable time (within 3 days of notice) o Fountains only with re-circulating water o Wash vehicles only with bucket or shut-off nozzle o Restaurants only serve water on request	Same as Permanent + o Watering limited to 3 days a week o Fix leaks within 72 hours	Same as Permanent & Level 1 + o Watering limited to 2 days a week o Fix leaks within 48 hours o No filling or re-filling ornamental lakes or ponds o Wash vehicles only at car wash with re-circulating system o No filling residential pools or outdoor spas	Same as Permanent, Level 1 & Level 2 + o No watering or irrigating with certain exceptions o Fix leaks within 24 hours o No new potable water service o No new annexations to service areas	o Water allocation requirements and penalties for exceeding allotment o Mandatory % reduction and penalties for overage o Large landscape areas must have rain sensors o Departments prepare annual conservation reports.

PASSED AND ADOPTED by the Board of Directors of Serrano Water District at a regular meeting on March 17, 2009, by the following roll call vote:

AYES: DIRECTORS:

NOES: DIRECTORS:

ABSENT: DIRECTORS:

Jerry Haight, President

David H. Noyes, Secretary

Appendix H

Public Participation and Plan Adoption

All notifications and the draft and final reports were sent to the following agencies:

City of Orange

City of Villa Park

County of Orange

Municipal Water District of Orange County

Orange County Water District

The final report was also sent to DWR and California State Library

SERRANO WATER DISTRICT
18021 EAST LINCOLN STREET
VILLA PARK, CA 92861-6446
714-538-0079

Directors
Greg Mills, President
Brad Reese, Vice-President
C.L. "Larry" Pharris Jr.
Frank O. Bryant
Jerry L. Haight

Jerry Vilander, General Manager

Via Email Transmission: sfranks@villapark.org

March 22, 2021

City of Villa Park
Steve Franks, City Manager
17855 Santiago Blvd.
Villa Park, CA 92861

Dear Steve:

The Serrano Water District is in the process of preparing its 2020 Urban Water Management Plan (UWMP). UWMP's are prepared by California's urban water suppliers to support long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either supplies over 3,000 acre-feet annually or serves 3,000 or more connections is required to prepare an UWMP every five years. Serrano Water District was re-classified as small supplier in 2016. Serrano Water District is required to prepare a UWMP because of the wholesale water provided to the City of Orange and to ensure we are eligible for potential loans or grant funding.

This letter is intended to notify your agency that Serrano Water District is in the process of preparing the 2020 UWMP. Additionally, Serrano Water District will be preparing and adopting its Water Shortage Contingency Plan (WSCP) and is also considering an Addendum to the 2015 UWMP to demonstrate consistency with the Delta Plan Policy to Reduce Reliance on the Delta through Improved Regional Water Self-Reliance (California Code Reg., tit. 23, § 5003).

Pursuant to Water Code Section 10621(b), Serrano Water District must notify cities within its service area and the county at least 60 days prior to holding a public hearing. A public hearing on Serrano Water District's UWMP, WSCP, and possibly the addendum to the 2015 UWMP is scheduled for June 15, 2021 at 8:30 a.m. A draft of all documents will be available for your review prior to the June 15 public hearing.

We encourage you to review these documents when they are prepared and provide comments. If you would like more information or have any questions, please direct questions to me at (714) 538-0079 or via email at jerryv@serranowater.org.

Sincerely,

Jerry Vilander
General Manager

RESOLUTION NO. 2021-06-02

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SERRANO WATER DISTRICT ADOPTING THE DISTRICT'S 2020 RETAIL AND WHOLESALE URBAN WATER MANAGEMENT PLAN

WHEREAS, the Retail and Urban Water Management Planning Act, Water Code sections 10610 *et seq.*, requires every urban water supplier to prepare, process and adopt an urban water management plan every five years; and

WHEREAS, Water Code section 10621 requires that every urban water supplier adopt its 2020 Urban Water Management Plan by July 1, 2021; and

WHEREAS, the District constitutes an "urban retail and wholesale water supplier" under Water Code section 10308.12(r), because the District provides more than 3,000 acre feet combined annually at retail and wholesale for potable purposes; and

WHEREAS, the District has retained Karen E. Johnson, Water Resources Planning, to prepare the District's draft 2020 Retail and Wholesale Urban Water Management Plan to comply with the Urban Water Management Planning Act; and

WHEREAS, pursuant to Water Code section 10621, the District has provided timely notice to the cities of Orange and Villa Park of the draft Retail and Wholesale Urban Water Management Plan; and

WHEREAS, pursuant to Water Code section 10642, the District has made the draft Retail and Retail and Wholesale Urban Water Management Plan available to public inspection; and

WHEREAS, on June 15, 2021, the District's Board of Directors conducted a duly noticed public hearing on the District's Retail and Wholesale Urban Water Management Plan, and considered all of the testimony and evidence presented at that public hearing.

NOW, THEREFORE, the Board of Directors of the Serrano Water District does hereby resolve as follows:

Section 1. The Serrano Water District 2021 Retail and Wholesale Urban Water Management Plan, as presented to the Board of Directors, is hereby adopted.

Section 2. Pursuant to Water Code section 10644, District staff is hereby authorized and directed to submit copies of the adopted Retail and Wholesale Urban Water Management Plan to the California Department of Water Resources, to the California State Library, and to the cities of Orange and Villa Park.

PASSED and ADOPTED by the Board of Directors of the Serrano Water District at a regular meeting held on June 15, 2021, by the following roll call vote:

DIRECTORS: YES: Mills, Reese, Pharris Jr., Haight, Bryant

DIRECTORS: NO:

DIRECTORS: ABSENT:

SERRANO WATER DISTRICT

15/Jun/2021

President, Board of Directors

ATTEST:

Secretary, Serrano Water District

RESOLUTION NO. 2021-06-03

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SERRANO WATER DISTRICT ADOPTING THE DISTRICT'S 2020 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act, Water Code sections 10610 *et seq.,* requires every urban water supplier to prepare, process and adopt an urban water management plan every five years; and

WHEREAS, Water Code section 10621 requires that every urban water supplier adopt its 2020 Urban Water Management Plan by July 1, 2021; and

WHEREAS, the District constitutes an "urban wholesale water supplier" under Water Code section 10308.12(r), because the District provides more than 3,000 acre feet combined annually at wholesale and retail for potable purposes; and

WHEREAS, the District has retained Karen E. Johnson, Water Resources Planning, to prepare the District's draft 2020 Wholesale Urban Water Management Plan to comply with the Urban Water Management Planning Act; and

WHEREAS, Among the new requirements for the 2020 UWMP is a requirement for agencies that must prepare an UWMP to also prepare and adopt a separate plan called a Water Shortage Contingency Plan (WSCP). The elements of the District's WSCP must be incorporated into the District's 2020 UWMP; and

WHEREAS, the District has made the draft WSCP available to public inspection; and

WHEREAS, the District will make available the WSCP available for inspection by its customers during normal business hours, and to the Cities of Villa Park and Orange, and the County of Orange no later than 30 days after adoption of the WSCP; and

WHEREAS, on June 15, 2021, the District's Board of Directors conducted a duly noticed public hearing on the District's WSCP, and considered all of the testimony and evidence presented at that public hearing.

NOW, THEREFORE, the Board of Directors of the Serrano Water District does hereby resolve as follows:

Section 1. The Serrano Water District 2021 Water Shortage Contingency Plan, as presented to the Board of Directors, is hereby adopted.

Section 2. Pursuant to Water Code section 10644, District staff is hereby authorized and directed to submit copies of the adopted WSCP to the California Department of Water Resources, to the California State Library, and to the cities of Orange and Villa Park and the County of Orange.

PASSED and ADOPTED by the Board of Directors of the Serrano Water District at a regular meeting held on June 15, 2021, by the following roll call vote:

DIRECTORS: YES: Mills, Reese, Pharris Jr., Haight, Bryant

DIRECTORS: NO:

DIRECTORS: ABSENT:

SERRANO WATER DISTRICT

15 June 2021

President, Board of Directors

ATTEST:

Secretary, Serrano Water District

RESOLUTION No. 2021-06-04

RESOLUTION OF THE SERRANO WATER DISTRICT ADOPTING AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, The California Urban Water Management Planning Act, (Wat. Code §10610, et seq. (the Act)), mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan (Plan); and

WHEREAS, the Act generally requires that said Plan be updated and adopted at least once every five years on or before July 1, in years ending in six and one; and

WHEREAS, pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009 (Wat. Code § 85000, et seq.), the Delta Plan, and Water Code section 85021, which declares that the State's policy is to "reduce reliance on the Delta in meeting California's future water needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency," urban water suppliers are encouraged by the California Department of Resources (DWR) and the Delta Stewardship Council (DSC) to consider adopting an Addendum to their 2015 Plans to demonstrate consistency with the Delta Plan Policy WR P1 to Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003); and

WHEREAS, Serrano Water District ("District" or "Serrano") constitutes an "urban wholesale water supplier" under Water Code section 10308.12(r), because the District provides more than 3,000 acre feet combined annually of wholesale and retail supplies for potable purposes; and

WHEREAS, Serrano has prepared an Addendum to its 2015 Plan in accordance with Delta Plan Policy WR P1, and in accordance with applicable legal requirements, has undertaken certain coordination, notice, public involvement, public comment, and other procedures in relation to its Addendum; and

WHEREAS, in accordance with the Act and Delta Plan Policy WR P1, Serrano has prepared its Addendum to the 2015 Plan with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its Addendum to its 2015 Plan, and has also utilized DWR's Urban Water Management Plan Guidebook 2020, including its related appendices, in preparing its Addendum to the 2015 Plan; and

WHEREAS, in accordance with applicable law, including Water Code section 10642, and Government Code section 6066, a Notice of a Public Hearing regarding Serrano's Addendum to the 2015 Plan was published within the jurisdiction of Serrano on May 13, 2021 and May 20, 2021; and

WHEREAS, in accordance with applicable law, including but not limited to Water Code section 10642, a public hearing was held on June 15, 2021 at or about 9 A.M., or soon thereafter, at the District's boardroom at 18021 East Lincoln Street, Villa Park, California, where the public

was also able to participate via Zoom and telephonically in order to provide members of the public and other interested entities with the opportunity to be heard in connection with proposed adoption of the Addendum to the 2015 Plan and issues related thereto; and

WHEREAS, pursuant to said public hearing on Serranos's Addendum to the 2015 Plan, Serrano, among other things, encouraged the active involvement of diverse social, cultural, and economic members of the community within Serrano's service area with regard to the Addendum to the 2015 Plan and encouraged community input regarding Serrano's Addendum to the 2015 Plan; and

WHEREAS, Serrano has reviewed and considered the purposes and requirements of the Act and Delta Plan Policy WR P1, the contents of the Addendum to the 2015 Plan, and the documentation contained in the administrative record in support of the Addendum to the 2015 Plan, and has determined that the factual analyses and conclusions set forth in the Addendum to the 2015 Plan are legally sufficient; and

WHEREAS, Serrano desires to adopt the Addendum to the 2015 Plan prior to July 1, 2021 in order to comply with the Act and Delta Plan Policy WR P1.

WHEREAS, Section 10652 of the California Water Code provides that the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) (CEQA) does not apply to the preparation and adoption, including addenda thereto, of urban water management plans pursuant to this part.

NOW THEREFORE BE IT RESOLVED, the Board of Directors of the Serrano Water District hereby resolves as follows:

1. The Addendum to Serrano's 2015 Urban Water Management Plan to demonstrate consistency with the Delta Plan Policy to Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance is hereby adopted as amended by changes incorporated by the Board of Directors as a result of input received (if any) at the public hearing and ordered filed with the Secretary of the Board of Directors;

2. The General Manager of the District is hereby authorized and directed to include a copy of this Resolution in Serrano's 2015 Plan Addendum;

3. The General Manager of the District is hereby authorized and directed, in accordance with Water Code sections 10621(d) and 10644(a)(1)-(2), to electronically submit a copy of the Addendum to the 2015 Plan to DWR no later than July 1, 2021;

4. The General Manager of the District is hereby authorized and directed, in accordance with Water Code section 10644(a), to submit a copy of the Addendum to the 2015 Plan to the California State Library, and to any city or county within which Serrano provides water supplies no later than thirty (30) days after this adoption date;

5. The General Manager of the District is hereby authorized and directed, in accordance with Water Code section 10645, to make the Addendum to the 2015 Plan available for public review at the District's offices during normal business hours and on its website at

https://www.serranowater.org/pdf/Final_2015_SWD_UWMP.pdf no later than thirty (30) days after filing a copy of the Addendum to the 2015 Plan with DWR.

6. Serrano finds and determines that this resolution is not subject to CEQA pursuant to Water Code Section 10652 because CEQA does not apply to the preparation and adoption, including addenda thereto, of an urban water management plan or to the implementation of the actions taken pursuant to such plans. Because this resolution comprises the Board of Director's adoption of its Addendum to the 2015 Plan and involves its implementation, no CEQA review is required.

7. The document and materials that constitute the record of proceedings on which this resolution and the above findings have been based are located at 8021 East Lincoln Street, Villa Park, California.

PASSED and ADOPTED by the Board of Directors of the Serrano Water District at a regular meeting held on June 15, 2021, by the following roll call vote:

DIRECTORS: YES: Mills, Reese, Pharris Jr., Haight, Bryant

DIRECTORS: NO:

DIRECTORS: ABSENT:

SERRANO WATER DISTRICT

15 June 2021

President, Board of Directors

ATTEST:

Secretary, Serrano Water District