June 2021

2020 Urban Water Management Plan

2020 URBAN WATER MANAGEMENT PLAN

Sarina Sriboonlue, P.E.
Project Manager

Prepared for:

City of San Clemente

380 Avenida Pico, Building N

San Clemente, California 92672

Prepared by:

Arcadis U.S., Inc.

320 Commerce

Suite 200

Irvine

California 92602

Tel 714 730 9052

Fax 714 730 9345

Our Ref:

30055240

Date:

June 2021

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

%	Percent
20x2020	20% water use reduction in GPCD by year 2020
ADU	Accessory Dwelling Unit
Act	Urban Water Management Planning Act of 1983
AF	Acre-Feet
AFY	Acre-Feet per Year
AWWA	American Water Works Association
Biops	Biological Opinions
BMP	Best Management Practice
CDR	Center for Demographic Research at California State University Fullerton
CEE	Consortium for Energy Efficiency
CII	Commercial/Industrial/Institutional
City	City of San Clemente
CRA	Colorado River Aqueduct
CVP	Central Valley Project
CY	Calendar Year
DAC	Disadvantaged Communities
DCP	Delta Conveyance Project
Delta	Sacramento-San Joaquin River Delta
DMM	Demand Management Measure
DOF	Department of Finance
DRA	Drought Risk Assessment
DVL	Diamond Valley Lake
DWR	Department of Water Resources
ESA	Endangered Species Act
FY	Fiscal Year
GAP	Green Acres Project
GHG	Greenhouse Gas
GPCD	Gallons per Capita per Day
gpf	Gallons per Flush
GWRS	Groundwater Replenishment System
HECW	High Efficiency Clothes Washer
HEN	High Efficiency Nozzle
HET	High Efficiency Toilet
IPR	Indirect Potable Reuse
IRP	Integrated Water Resources Plan
JADU	Junior Accessory Dwelling Unit
kWh	Kilowatt-Hour

LBCWD	Laguna Beach County Water District
LRP	Local Resources Program
MAF	Million Acre-Feet
MET	Metropolitan Water District of Southern California
MF	Microfiltration
MG	Million Gallon
MGD	Million Gallons per Day
MHI	Median Household Income
MNWD	Moulton Niguel Water District
MWDOC	Municipal Water District of Orange County
MWELO	Model Water Use Efficiency Landscape Ordinance
NDMA	N-nitrosodimethylamine
NRW	Non-Revenue Water
OC	Orange County
OC Basin	Orange County Groundwater Basin
OCWD	Orange County Water District
ORP	On-Site Retrofit Program
PFAS	Per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfanate
Poseidon	Poseidon Resources LLC
PPCP	Pharmaceuticals and Personal Care Product
ppt	Parts per Trillion
PSA	Public Service Announcement
QWEL	Qualified Water Efficient Landscaper
RA	Replenishment Assessment
RHNA	Regional Housing Needs Assessment
RO	Reverse Osmosis
RUWMP	Regional Urban Water Management Plan
SARCCUP	Santa Ana River Conservation and Conjunctive Use Program
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCWD	South Coast Water District
SDP	Seawater Desalination Program
sf	Square Feet
SMWD	Santa Margarita Water District
SOC	South Orange County
SOCWA	South Orange County Waste Authority
STEAM	Science Technology Engineering Arts and Mathematics

SWP	State Water Project
SWRCB	California State Water Resources Control Board
TAF	Thousand Acre-Feet
TDS	Total Dissolved Solids
USBR	United States Bureau of Reclamation
UV	Ultraviolet
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act of 1983
Water Code	California Water Code
WBIC	Weather-Based Irrigation Controller
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water Savings Incentive Program
WUO	Water Use Objective

EXECUTIVE SUMMARY

INTRODUCTION AND UWMP OVERVIEW

The City of San Clemente (City) prepared this 2020 Urban Water Management Plan (UWMP or Plan) to submit to the California Department of Water Resources (DWR) to satisfy the UWMP Act of 1983 (Act or UWMP Act) and subsequent California Water Code (Water Code) requirements. The City is a retail water supplier that provides water to its residents and other customers using the raw and potable imported water supply obtained from its regional wholesaler, Municipal Water District of Orange County (MWDOC), local groundwater from within the City's service area, Irvine Ranch Water District from Baker Treatment Plant, surface water from Irvine Lake, and recycled water from the City's Water Reclamation Plant (WRP).

UWMPs are comprehensive documents that present an evaluation of a water supplier's reliability over a long-term (20-25 year) horizon. This 2020 UWMP provides an assessment of the present and future water supply sources and demands within the City's service area. It presents an update to the 2015 UWMP on the City's water resource needs, water use efficiency programs, water reliability assessment and strategies to mitigate water shortage conditions. It also presents a new 2020 Water Shortage Contingency Plan (WSCP) designed to prepare for and respond to water shortages. This 2020 UWMP contains all elements to meet compliance of the new requirements of the Act as amended since 2015.

UWMP PREPARATION

The City coordinated the preparation of this 2020 UWMP with other key entities, including MWDOC (regional wholesaler of imported water for Orange County), MET (regional wholesaler for Southern California and the direct supplier of imported water to MWDOC), and SOCWA (a Joint Powers Authority with ten member agencies, working to facilitate and manage the collection, transmission, treatment and disposal of wastewater and production of recycled water). The City also coordinated with other entities, which provided valuable data for the analyses prepared in this UWMP, such as the Center for Demographic Research (CDR) at California State University Fullerton for population projections, through MWDOC's assistance.

SYSTEM DESCRIPTION

The City is governed by a five-member City Council; its Utilities Department is responsible for ensuring a safe and reliable means of water supply to City residents within its service area.

The City spans 18.45 square miles in South Orange County, bounded to the south by San Diego County, to the west by the Pacific Ocean and to the north and east by the Cities of Dana Point and San Juan Capistrano and portions of unincorporated area of Orange County. The City's water service area covers 14.7 square miles and excludes a small section in the northern portion of the City that is serviced by South Coast Water District (SCWD), and the inland community of Talega that is serviced by Santa Margarita Water District (SMWD). The City operates 16 pumping stations, 56 pressure reducing stations, one filtration plant, 14 local and two regional reservoirs, two wells and two systems for imported water supply, and manages a 232-mile water mains system with approximately 17,791 service connections.

Lying in the South Coast Air Basin (SCAB), the City's climate is characterized by Southern California's "Mediterranean" climate with mild winters, warm summers and moderate rainfall. In terms of land use, the City is a predominantly single and multi-family residential community. The City's most recently completed

development and last new development to be built out, Marblehead Coastal, sits on a 248-acre site, and includes 313 residential units, a 52-acre commercial center and more than 125 acres of open space. Moving forward, the City will continue planning for its Regional Housing Needs Allocation (RHNA) requirements and future planned developments may include accessory dwelling units (ADUs). The current population of 51,065 is projected to increase by only 4.7% over the next 25 years.

WATER USE CHARACTERIZATION

Water use within the City's service area has been relatively stable in the past decade with an annual average of 9,018 AF. The potable and non-potable water use accounts for an average of 90% and 10% of total City water use, respectively. In FY2019-20, the City's water use was 7,099 AF of potable water (groundwater and imported) and 1,155 AF of direct recycled water for landscape irrigation. In FY 2019-20, the City's potable water use profile was comprised of 75.3% residential use, 8.7% commercial, industrial, and institutional (CII), and 13.4% large landscape/irrigation, with non-revenue water (NRW) and other uses comprising about 2.5%.

WATER USE PROJECTIONS: 5-YEAR AND 25-YEAR

The City's service area is almost completely built out- and is projected to add minimum land use and small population increase. Potable water demand is likely to increase 7.8% over the next 5 years, due largely to the impact of forecasted economic recovery from the COVID-19 pandemic. In the longer term, potable water demand is projected to decrease 2.7% from 2025 through 2045. The projected water use for 2045 is 7,448 AF for potable water and 1,320 AF for recycled water.

This demand projection considers such factors as current and future demographics, future water use efficiency measures, and long-term weather variability.

CONSERVATION TARGET COMPLIANCE

Retail water suppliers are required to comply with the requirements of Water Conservation Act of 2009, also known as SBx7-7 (Senate Bill 7 as part of the Seventh Extraordinary Session), which was signed into law in 2010 and requires the State of California to reduce urban water use by 20% by 2020 from a 2013 baseline.

The retail water suppliers can comply individually or as a region in collaboration with other retail water suppliers, in order to be eligible for water related state grants and loans. The City is part of the Orange County 20x2020 Regional Alliance created in collaboration with MWDOC and its retail member agencies as well as the Cities of Anaheim, Fullerton and Santa Ana. The Alliance was created to assist OC retail agencies in complying with SBx7-7.

The City met its 2020 water use target and is in compliance with SBx7-7; the actual 2020 consumption was 124 gallons per capita per day (GPCD), which is below its 2020 target of 153 GPCD.

WATER SUPPLY CHARACTERIZATION

The City meets its demands through a combination of groundwater, recycled water, and imported water. The City works together with three primary agencies, MET, MWDOC and Joint Regional Water Supply System (JRWSS), to ensure a safe and reliable water supply that will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include water from the Colorado River and the State Water Project (SWP) provided by MET and delivered through MWDOC.

In FY 2019-20, the City's water supplies consisted of 68% imported treated water, 14% recycled water, 13% imported or purchased untreated water (treated at the Baker WTP), and 5% groundwater. .

It is projected that by 2045, the water supply mix will shift to 66% imported water, 15% recycled water, 14% purchased water from Trabuco Canyon Water District, and 6% groundwater. Note that these representations of supply match the projected demand. The City can purchase more MET water through MWDOC, should the need arise.

The City traditionally provides wastewater services to approximately 84% of the City's incorporated area. As of the end of 2017, the City also accepts wastewater generated by Santa Margarita Water District (SMWD) water customers located within the City's boundaries. Wastewater in the remaining portions of the City is serviced by South Coast Water District. The City owns and operates a collection system and wastewater treatment facilities. Wastewater collected by the City is conveyed to its Water Reclamation Plant (WRP) where the wastewater is treated and recycled or treated and disposed of in collaboration with SOCWA. The WRP produces recycled water for irrigation and internal uses. The City benefits from these direct uses of recycled water.

WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Every urban water supplier is required to assess the reliability of their water service to its customers under a normal year, a single dry year, and a drought period lasting five consecutive years. The water service reliability assessment compares projected supply to projected demand for the three hydrological conditions between 2025 and 2045. Factors affecting reliability, such as climate change and regulatory impacts, are accounted for as part of the assessment.

The City depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. MET's and MWDOC's 2020 UWMP conclude that they can meet full-service demands of their member agencies through 2045 during normal years, single-dry years, and multiple-dry years. Consequently, the City is projected to meet full-service demands through 2045 for the same scenarios, due to diversified supply and conservation measures.

The Drought Risk Assessment (DRA) evaluates the City's near-term ability to supply water assuming the City is experiencing a drought over the next five years. Even under the assumption of a drought over the next five years, MET's 2020 UWMP concludes a surplus of water supplies would be available to all of its Member Agencies, including MWDOC and in effect, the City, should the need for additional supplies arise to close any local supply gap. Additionally, the City partakes in various efforts to reduce its reliance on imported water supplies such as continuing the use of local groundwater and increasing the use of recycled water.

WATER SHORTAGE CONTINGENCY PLANNING

Water shortage contingency planning (WSCP) is a strategic planning process that the City engages in to prepare for and respond to water shortages. A water shortage, when water supply available is insufficient to meet the normally expected customer water use at a given point in time, may occur due to a number of reasons, such as water supply quality changes, climate change, drought, and catastrophic events (e.g., earthquake). The City's WSCP provides real-time water supply availability assessment and structured steps designed to respond to actual conditions. This level of detailed planning and preparation will help maintain reliable supplies and reduce the impacts of supply interruptions.

The WSCP serves as the operating manual that the City will use to prevent catastrophic service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSCP contains the processes and procedures that will be deployed when shortage conditions arise so that the City's governing body, its staff, and its retail agencies can easily identify and efficiently implement pre-determined steps to mitigate a water shortage to the level appropriate to the degree of water shortfall anticipated.

DEMAND MANAGEMENT MEASURES

The City, along with other retail water agencies in Orange County, recognizes the need to use existing water supplies efficiently. This ethic of efficient use of water has evolved as a result of the development and implementation of water use efficiency programs that make good economic sense and reflect responsible stewardship of the region's water resources. The City participates in regional water savings programs and works closely with MWDOC to promote regional efficiency.

PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The Water Code requires the UWMP to be adopted by the Supplier's governing body. Before the adoption of the UWMP, the City notified the public and the cities and counties within its service area per the Water Code and held a public hearing to receive input from the public on the UWMP. Post adoption, the City submitted the UWMP to DWR and other key agencies and made the document available for public review no later than 30 days after filing with DWR.

1 INTRODUCTION AND UWMP OVERVIEW

The City of San Clemente (City) prepared this 2020 Urban Water Management Plan (UWMP or Plan) to submit to the California Department of Water Resources (DWR) to satisfy the UWMP Act of 1983 (Act or UWMP Act) and subsequent California Water Code (Water Code) requirements. The City is a retail water supplier that provides water to its residents and other customers using the raw and potable imported water supply obtained from its regional wholesaler, Municipal Water District of Orange County (MWDOC), local groundwater from within the City's service area, Irvine Ranch Water District from Baker Treatment Plant, surface water from Irvine Lake, and recycled water from the City's Water Reclamation Plant (WRP). The City, as one of MWDOC's 28 member agencies, prepared this 2020 UWMP in collaboration with MWDOC, Metropolitan Water District of Southern California (MET), South Orange County Wastewater Authority (SOCWA), and other key agencies.

UWMPs are comprehensive documents that present an evaluation of a water supplier's reliability over a long-term (20-25 year) horizon. In response to the changing climatic conditions and regulatory updates since the 2015 UWMP, the City has been proactively managing its water supply and demand. The water loss audit program, water conservation measures, expansion of its recycled water system and efforts for increased self-reliance in order to reduce dependency on imported water from the Sacramento-San Joaquin Delta (Delta) are some of the water management efforts that the City is a part of to maintain the reliability of water supply for its service area.

This 2020 UWMP provides an assessment of the present and future water supply sources and demands within the City's service area. It presents an update to the 2015 UWMP on City's water resource needs, water use efficiency programs, water reliability assessment and strategies to mitigate water shortage conditions. It presents a new 2020 Water Shortage Contingency Plan (WSCP) designed to prepare for and respond to water shortages. This 2020 UWMP contains all elements to meet compliance of the new requirements of the Act as amended since 2015.

1.1 Overview of Urban Water Management Plan Requirements

The UWMP Act enacted by California legislature requires every urban water supplier (Supplier) providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare, adopt, and file an UWMP with the DWR every five years in the years ending in zero and five.

For this 2020 UWMP cycle, DWR placed emphasis on achieving improvements for long term reliability and resilience to drought and climate change in California. Legislation related to water supply planning in California has evolved to address these issues, namely Making Conservation a Way of Life [Assembly Bill (AB) 1668 and Senate Bill (SB) 606] and Water Loss Performance Standard SB555. New UWMP requirements in 2020 are a direct result of these new water regulations. Two complementary components were added to the 2020 UWMP. First is the WSCP to assess the Supplier's near term 5-year drought risk assessment (DRA) and provide a structured guide for the Supplier to deal with water shortages. Second is the Annual Water Supply Demand Assessment to assess the current year plus one dry year i.e., short-term demand/supply outlook. Analyses over near- and long-term horizons together will

provide a more complete picture of Supplier's reliability and will serve to inform appropriate actions it needs to take to build up capacity over the long term.

The various key new additions in the 2020 UWMP included as a result of the most recent water regulations are:

- **Water Shortage Contingency Plan (WSCP) –** WSCP helps a Supplier to better prepare for drought conditions and provides the steps and water use efficiency measures to be taken in times of water shortage conditions. WSCP now has more prescriptive elements, including an analysis of water supply reliability; the water use efficiency measures for each of the six standard water shortage levels, that correspond to water shortage percentages ranging from 0-10% to greater than 50%; an estimate of potential to close supply gap for each measure; protocols and procedures to communicate identified actions for any current or predicted water shortage conditions; procedures for an annual water supply and demand assessment; monitoring and reporting requirements to determine customer compliance; and reevaluation and improvement procedures for evaluating the WSCP.
- **Drought Risk Assessment –** The Suppliers are now required to compare their total water use and supply projections and conduct a reliability assessment of all their sources for a consecutive five-year drought period beginning 2021.
- **Five Consecutive Dry-Year Water Reliability Assessment** - The three-year multiple dry year reliability assessment in previous UWMPs has now been extended from three to five consecutive dry years to include a more comprehensive assessment of the reliability of the water sources to improve preparedness of Suppliers for extended drought conditions.
- **Seismic Risk –** The UWMP now includes a seismic risk assessment of the water supply infrastructure and a plan to mitigate any seismic risks on the water supply assets.
- **Groundwater Supplies Coordination –** The UWMP should be in accordance with the Sustainable Groundwater Management Act of 2014 and consistent with the Groundwater Sustainability Plans, wherever applicable.
- **Lay Description** – To provide a better understanding of the UWMP to the general public, a lay description of the UWMP is included, especially summarizing the Supplier's detailed water service reliability assessment and the planned management steps and actions to mitigate any possible shortage scenarios.

1.2 UWMP Organization

This UWMP is organized into 10 main sections aligned with the DWR Guidebook recommendations. The subsections are customized to tell the City's story of water supply reliability and ways to overcome any water shortages over a planning horizon of the next 25 years.

Section 1 Introduction and UWMP Overview gives an overview of the UWMP fundamentals and briefly describes the new additional requirements passed by the Legislature for 2020 UWMP.

Section 2 UWMP Preparation identifies this UWMP as an individual planning effort of the City, lists the type of year and units of measure used and introduces the coordination and outreach activities conducted by the City to develop this UWMP.

Section 3 System Description gives a background on the City's water system and its climate characteristics, population projection, demographics, socioeconomics, and predominant current and projected land uses of its service area.

Section 4 Water Use Characterization provides historical, current, and projected water use by customer category for the next 25 years within the City's service area and the projection methodology used by MWDOC to develop the 25-year projections**.**

Section 5 Conservation Target Compliance reports the SB X7-7 water use conservation target compliance of the City (individually and as a member of the OC 20x2020 Regional Alliance).

Section 6 Water Supply Characterization describes the current water supply portfolio of the City as well as the planned and potential water supply projects and water exchange and transfer opportunities.

Section 7 Water Service Reliability and Drought Risk Assessment assesses the reliability of the City's water supply service to its customers for a normal year, single dry year, and five consecutive dry years scenarios. This section also includes a DRA of all the supply sources for a consecutive five-year drought period beginning 2021.

Section 8 Water Shortage Contingency Planning is a brief summary of the standalone WSCP document (Appendix H) which provides a structured guide for the City to deal with water shortages, incorporating prescriptive information and standardized action levels, lists the appropriate actions and water use efficiency measures to be taken to ensure water supply reliability in times of water shortage conditions, along with implementation actions in the event of a catastrophic supply interruption.

Section 9 Demand Management Measures provides a comprehensive description of the water conservation programs that the City has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets.

Section 10 Plan Adoption, Submittal, and Implementation provides a record of the process the City followed to adopt and implement its UWMP.

2 UWMP PREPARATION

The City's 2020 UWMP is an individual UWMP for the City to meet the Water Code compliance as a retail water supplier. While the City opted to prepare its own UWMP and meet Water Code compliance individually, the development of this UWMP involved close coordination with its wholesale supplier, MWDOC along with other key entities within the region.

2.1 Individual Planning and Compliance

The City opted to prepare its own UWMP (Table 2-1) and comply with the Water Code individually, while closely coordinating with MWDOC and various key entities as discussed in Section 2.2 to ensure regional integration. The UWMP Checklist was completed to confirm the compliance of this UWMP with the Water Code (Appendix A).

One consistency with MWDOC and the majority of its other retail member agencies is that the City selected to report demands and supplies using a fiscal year (FY) basis (Table 2-2).

Table 2-1: Plan Identification

DWR Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance**
☑	**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:			

Table 2-2: Supplier Identification

DWR Submittal Table 2-3: Supplier Identification	
Type of Supplier	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year	
☐	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)	
7/1	
Units of measure used in UWMP	
Unit	AF
NOTES: The energy intensity data is reported in calendar year consistent with the Greenhouse Gas Protocol.	

2.2 Coordination and Outreach

2.2.1 Integration with Other Planning Efforts

The City, as a retail water supplier, coordinated this UWMP preparation effort with other key entities, including MWDOC (regional wholesale supplier for Orange County), MET (regional wholesaler for Southern California and the direct supplier of imported water to MWDOC), and SOCWA (agency that assists in the collection and disposal of the City's wastewater). The City also developed this Plan in conjunction with other MWDOC-led efforts such as population projection from the Center for Demographic Research at California State University Fullerton (CDR).

Some of the key planning and reporting documents that were used to develop this UWMP are:

- **MWDOC's 2020 UWMP** provides the basis for the projections of the imported supply availability over the next 25 years for the City's service area.
- **MWDOC's 2020 WSCP** provides a water supply availability assessment and structured steps designed to respond to actual conditions that will help maintain reliable supplies and reduce the impacts of supply interruptions.

- **2021 OC Water Demand Forecast for MWDOC and OCWD Technical Memorandum (Demand Forecast TM)** provides the basis for water demand projections for MWDOC's member agencies as well as Anaheim, Fullerton, and Santa Ana.
- **MET's 2020 Draft Integrated Water Resources Plan (IRP)** is a long-term planning document to ensure water supply availability in Southern California and provides a basis for water supply reliability in Orange County.
- **MET's 2020 UWMP** was developed as a part of the 2020 IRP planning process and was used by MWDOC as another basis for the projections of supply capability of the imported water received from MET.
- **MET's 2020 WSCP** provides a water supply assessment and guide for MET's intended actions during water shortage conditions.
- **Local Hazard Mitigation Plan** provides the basis for the seismic risk analysis of the water system facilities.
- **Orange County Local Agency Formation Commission's 2020 Municipal Service Review for MWDOC Report** provides comprehensive review of the municipal services provided by MWDOC.
- **Water Master Plan and Sewer Master Plan** of the City provide information on water infrastructure planning projects and plans to address any required water system improvements.

Statewide Water Planning

In addition to regional coordination with various agencies described above, the City as a MWDOC member agency is currently a part of MET's statewide planning effort to reduce reliance on the water imported from the Delta.

It is the policy of the State of California to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. This policy is codified through the Delta Stewardship Council's Delta Plan Policy WR P1 and is measured through Supplier reporting in each Urban Water Management Planning cycle. WR P1 is relevant to water suppliers that plan to participate in multi-year water transfers, conveyance facilities, or new diversions in the Delta.

Through significant local and regional investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts, the City has demonstrated a reduction in Delta reliance and a subsequent improvement in regional self-reliance. For a detailed description and documentation of the City's consistency with Delta Plan Policy WR P1 see Section 7.4 and Appendix C.

2.2.2 Wholesale and Retail Coordination

The City developed its UWMP in conjunction with MWDOC's 2020 UWMP. The City provided its historical water use and initial water use projections data to MWDOC (Table 2-3). MWDOC facilitated in refining the projections of the City's water demand and the imported supply from MWDOC over the next 25 years.

The City also has been taking part in many regional programs administered by MWDOC to assist retail agencies meet various State compliance, such as the OC Regional Alliance for SB x7-7 compliance,

regional water loss program for SB555 compliance, and regional water use efficiency programs. Sections 0 and 9 provide detailed information on these programs.

Table 2-3 Retail: Water Supplier Information Exchange

DWR 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
Municipal Water District of Orange County
NOTES:

2.2.3 Public Participation

For further coordination with other key agencies and to encourage public participation in the review and update of this Plan, the City held a public hearing and notified key entities and the public per the Water Code requirements. Sections 10.2 and 10.3 describe these efforts in detail.

3 SYSTEM DESCRIPTION

The City is governed by a five-member City Council. Its Utilities Department is responsible for ensuring a safe and reliable means of water supply to City residents within its service area.

The City spans 18.45 square miles in South Orange County, bounded to the south by San Diego County, to the west by the Pacific Ocean and to the north and east by the Cities of Dana Point and San Juan Capistrano and portions of unincorporated area of Orange County. The City's water service area covers 14.7 square miles and excludes a small section in the northern portion of the City that is serviced by South Coast Water District (SCWD), and the inland community of Talega that is serviced by Santa Margarita Water District (SMWD). The City operates 16 pumping stations, 56 pressure reducing stations, one filtration plant, 14 local and two regional reservoirs, two wells and two systems for imported water supply, and manages 232-mile water mains system with approximately 17,791 service connections.

Lying in the South Coast Air Basin (SCAB), the City's climate is characterized by Southern California's "Mediterranean" climate with mild winters, warm summers and moderate rainfall. In terms of land use, the City is a predominantly single and multi-family residential community. The City's most recently completed development and last new development to be built out, Marblehead Coastal, sits on a 248-acre site, and includes 313 residential units, a 52-acre commercial center and more than 125 acres of open space. Moving forward, the City will continue planning for its Regional Housing Needs Assessment (RHNA) allocation and future planned developments beyond 2020 including considering accessory dwelling units (ADUs) as a means of providing affordable housing. The current population of 51,065 is projected to increase by only 4.7% over the next 25 years.

3.1 Agency Overview

This section provides information on the mission of the City's Utilities Department, City's organizational structure, and relationship to MWDOC.

3.1.1 Mission

The mission of the City is to work in partnership with the community to foster a tradition dedicated to:

- Maintaining a safe, healthy atmosphere in which to live, work and play;
- Guiding development to ensure responsible growth while preserving and enhancing our village character, unique environment, and natural amenities;
- Providing for the City's long-term stability through promotion of economic vitality and diversity;
- Resulting in a balanced community committed to protection of what is valued today while meeting tomorrow's needs.

In particular, the purpose of the Water Division of the Utilities Department is to provide adequate supplies of potable and recycled water while meeting health and quality standards of the State Water Resources Control Board.

3.1.2 City Council

The residents of the City are represented by a five-member council. Current City Council members are:

- Kathleen Ward, Mayor
- Gene James, Mayor Pro Tem
- Chris Duncan, Council Member
- Laura Ferguson, Council Member
- Steve Knoblock, Council Member

3.1.3 Relationship to MWDOC

The City is one of MWDOC's 28 member agencies purchasing imported water from MWDOC, Orange County's wholesale water supplier and a member agency of MET. The City's location within MWDOC's service is shown on Figure 3-1.

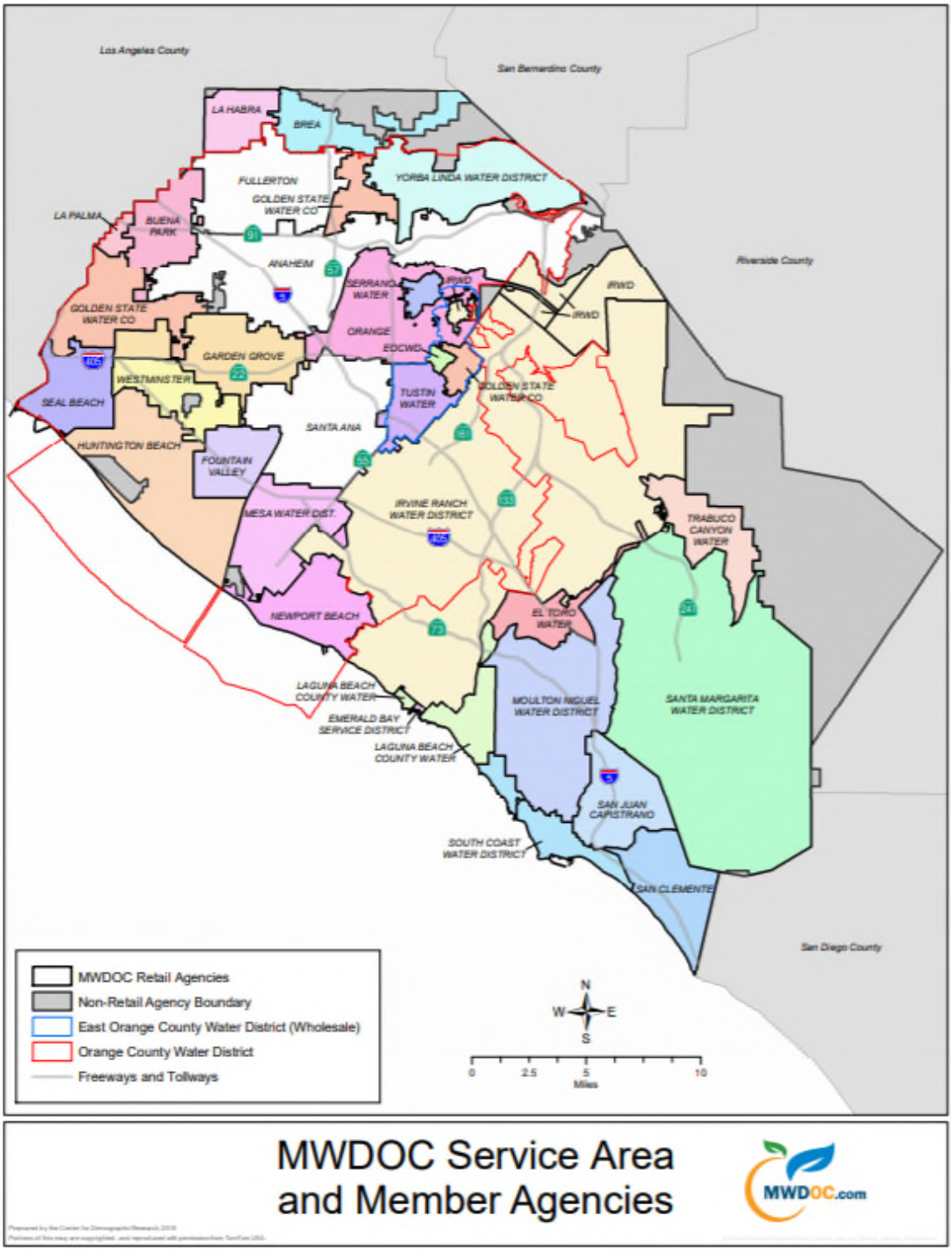

Figure 3-1: Regional Location of City of San Clemente and Other MWDOC Member Agencies

3.2 Water Service Area and Facilities

3.2.1 Water Service Area

The City spans 18.45 square miles of coastline and scenic foothills in South Orange County. It is bounded to the south by San Diego County, to the west by the Pacific Ocean and to the north and east by the Cities of Dana Point and San Juan Capistrano and portions of unincorporated area of Orange County within SMWD's service area. The City's water service area covers 14.7 square miles and excludes a small section in the northern portion of the City that is serviced by SCWD, and the inland community of Talega that is serviced by SMWD. A map of the City's water service area is shown as Figure 3-2.

Figure 3-2: City of San Clemente Water Service Area

3.2.2 Water Facilities

The City's water system consists of 13 service zones defined by reservoirs and 20 sub-zones through pressure reducing stations due to servicing a topography ranging from sea level to approximately 900 feet in elevation. The City maintains approximately 232 miles of mains, 16 pumping stations, 56 pressure reducing stations, one filtration plant, 14 local and two regional reservoirs, and two wells.

Most of the City's water supply is imported through two systems originating at MET. One of these is the Local Transmission Main (LTM) System; the second is the Water Importation Pipeline (WIP) System. The City has 14.78 cubic feet per second (cfs) capacity through the LTM, and a current capacity of 6 cfs through the WIP. The City also owns and operates a WRP with a capacity of 5.0 million gallons per day (MGD) of recycled water production. The system connections and water volume supplied are summarized in Table 3-1.

Table 3-1: Retail Only: Public Water Systems

DWR 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
CA3010036	City of San Clemente	17,791	8,254
	TOTAL	17,791	8,254
NOTES:			

3.3 Climate

The City is located within the SCAB that encompasses all of OC, and the urban areas of Los Angeles, San Bernardino, and Riverside counties. The SCAB climate is characterized by Southern California's "Mediterranean" climate: a semi-arid environment with mild winters, warm summers, and moderate rainfall.

Local rainfall has limited impacts on reducing water demand in the City, except for landscape irrigation demand. Water that infiltrates into the soil may enter groundwater supplies depending on the local geography. However, due to the large extent of impervious cover in Southern California, rainfall runoff quickly flows to a system of concrete storm drains and channels that lead directly to the ocean.

MET's water supplies come from the State Water Project (SWP) and the Colorado River Aqueduct (CRA), influenced by climate conditions in northern California and the Colorado River Basin, respectively. The years 2000-2018 have been the driest 19-year period in the history and both regions have been receiving record low precipitation which directly impact water supplies to Southern California. Due to the prolonged drought conditions since 2000, storage within the Colorado River system has declined to half of its reservoir capacity and has been fluctuating at that level (DWR, January 2020).

3.4 Population, Demographics, and Socioeconomics

3.4.1 Service Area Population

According to CDR, the City's service area has a 2020 population of 51,065, a decrease from the 2015 population of 51,280. The population is projected to increase only 4.7% by 2045. Table 3-2 shows the population projections in five-year increments out to 2045 within the City's service area.

Table 3-2: Retail: Population - Current and Projected

DWR Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045
	51,065	52,162	53,145	53,472	53,683	53,461
NOTES: Source - Center for Demographic Research at California State University, Fullerton, 2020						

3.4.2 Demographics and Socioeconomics

As shown in Table 3-3 below, the total number of dwelling units in the City is expected to increase by 2.8% in the next 25 years from 21,743 in 2020 to 22,349 in 2045. Table 3-3 also shows a breakdown of the total dwelling units by type for the 25-year period from 2020 to 2045.

Table 3-3: City of San Clemente Service Area Dwelling Units by Type

City of San Clemente Service Area Dwelling Units by Type						
Dwelling Units	2020	2025	2030	2035	2040	2045
Total	**21,743**	**21,882**	**22,030**	**22,164**	**22,265**	**22,349**
Single Family	12,427	12,474	12,494	12,506	12,510	12,516
All Other*	9,316	9,408	9,536	9,658	9,755	9,833
Source: Center for Demographic Research at California State University, Fullerton, 2020 *Includes duplexes, triplexes, apartments, condominiums, townhouses, mobile homes, etc. Yachts, houseboats, recreational vehicles, vans, etc. are included when they serve as a primary place of residence. Does not include group-quartered units, cars, railroad box cars, etc.						

In addition to the types and proportions of dwelling units, various socio-economic factors such as age distribution, education levels, general health status, income and poverty levels affect City's water management and planning. Based on the U.S. Census Bureau's QuickFacts, the City has about 17.7% of

population of 65 years and over, 21.4% under the age of 18 years and 5.1% under the age of 5 years. 94.7% of the City's population with an age of more than 25 years has a minimum of a high school diploma and 50.9% of this age group has at least a bachelor's degree.

3.4.3 CDR Projection Methodology

The City obtains its services area population and dwelling unit data from MWDOC via CDR. MWDOC contracts with CDR to update the historic population estimates for 2010 to the current year and provide an annual estimate of population served by each of its retail water suppliers within its service area. CDR uses GIS and data from the 2000 and 2010 U.S. Decennial Censuses, State Department of Finance (DOF) population estimates, and the CDR annual population estimates. These annual estimates incorporate annual revisions to the DOF annual population estimates, often for every year back to the most recent Decennial Census. As a result, all previous estimates were set aside and replaced with the most current set of annual estimates. Annexations and boundary changes for water suppliers are incorporated into these annual estimates.

In the summer of 2020, projections by water supplier for population and dwelling units by type were estimated using the 2018 Orange County Projections dataset. Growth for each of the five-year increments was allocated using GIS and a review of the traffic analysis zones (TAZ) with a 2019 aerial photo. The growth was added to the 2020 estimates by water supplier.

3.5 Land Uses

3.5.1 Current Land Uses

The City's service area can best be described as a predominantly single and multi-family residential community located along the coast in South Orange County.

Based on the zoning designation collected and aggregated by Southern California Association of Governments (SCAG) around 2018, the current land use within the City's service area can be categorized as follows:

- Single family residential – 34.7%
- Multi-family residential – 6.4%
- Commercial – 3.6%
- Industrial – 2.8%
- Institutional/Governmental – 3.7%
- Open space and parks – 42%
- Other – 2.5% (e.g., Undevelopable or Protected Land, Water, and Vacant)
- No land use designation – 4.3%

Most recently, the Marblehead Coastal development was completed within the City service area. The 248-acre site contains 313 residential units, a 52-acre commercial center and more than 125 acres of open space, including five public parks and more than four miles of public nature trails over the development's coastal bluff terrain and hills that take residents and visitors down to the ocean.

3.5.2 Projected Land Uses

The City currently does not have any major developments planned for the future. Beyond 2020, the City will continue planning for its RHNA allocation and permit the construction of ADUs as an affordable means of housing.

State law requires jurisdictions to provide their share of the RHNA allocation. SCAG determines the housing growth needs by income for local jurisdictions through RHNA. The City's RHNA allocation for the 2021 - 2029 is 982 units. This includes 282 units for very low-income households, 164 units for low -income households, 188 units for moderate-income households, and 348 units for above moderate -income households.

ADUs are separate small dwellings embedded within residential properties. There has been an increase in the construction of ADUs in California in response to the rise in interest to provide affordable housing supply. The Legislature updated the ADU law effective January 1, 2020 to clarify and improve various provisions to promote the development of ADUs. (AB-881, "Accessory dwelling units," and AB-68, "Land use: accessory dwelling units") These include:

- Allowing ADUs and Junior Accessory Dwelling Units (JADUs) to be built concurrently with a single family dwelling. JADUs max size is 500 square feet (sf).
- Opening areas where ADUs can be created to include all zoning districts that allow single family and multi-family uses
- Maximum size cannot be less than 850 sf for a one-bedroom ADU or 1,000 sf for more than one bedroom (California Department of Housing and Community Development, 2020).

About 92% of the ADUs in California are being built in the single family zoned parcels (University of California Berkeley, 2020). The increase in ADUs implies an increase in number of people per dwelling unit which translates potentially to higher water demand.

4 WATER USE CHARACTERIZATION

4.1 Water Use Overview

Water use within the City's service area has been relatively stable in the past decade with an annual average of 9,018 AF. The potable and non-potable water use accounts for an average of 90% and 10% of total City water use, respectively. In FY 2019-20, the City's water use was 7,099 AF of potable water (groundwater and imported) and 1,155 AF of direct recycled water for landscape irrigation. In FY 2019-20, the City's potable water use profile was comprised of 75.3% residential use, 8.7% commercial, industrial, and institutional (CII), and 13.4% large landscape/irrigation, with non-revenue water (NRW) and other uses comprising about 2.5%. As described in Section 3, the City's service area is almost completely built -out and is projected to add minimum land use and small population increases. Potable water demand is likely to increase 7.8% over the next 5 years, due largely to the impact of forecasted economic recovery from the COVID-19 pandemic. In the longer term, potable water demand is projected to decrease 2.7% from 2025 through 2045. The projected water use for 2045 is 7,448 AF for potable water and 1,320 AF for recycled water. The passive savings are anticipated to continue for the next 25 years and are considered in the water use projections. Permanent water conservation requirements and water conservation strategies are discussed in Section 8 and 9 of this document.

4.2 Past and Current Water Use

Aside from the natural fluctuations due to recent water shortages and associated rebounds, water use within the City's service area has been relatively stable in the past decade with an annual average of 9,018 AF. A stable trend is expected because the City is essentially built out and the rate of population growth is small (less than 0.2% per year). Water conservation efforts have also kept per capita water use down.

As a result of Governor Jerry Brown's mandatory water conservation order in 2014, the City's water use in the last five years decreased below the 10-year average. Between FY 2015-16 and FY 2019-20, water use within the City's service area ranged from 7,660 to 9,134 acre-feet per year (AFY) (potable and non-potable combined). In the past decade, between FY 2010-11 and FY 2019-20, potable and non-potable water use accounts for an average of 90% and 10% of total City water use, respectively. Potable water uses include demands from residential, CII, and large landscape irrigation. Non-potable use includes the use of recycled water for large landscape and golf course irrigation.

As of FY 2019-20 there are 17,791 active and inactive service connections in the City's water distribution system. Of these, 142 are recycled water accounts. Table 4-1 summarizes the City's potable water demand for FY2019-20; a total of 7,099 AF of potable water was used. The City has a mix of commercial uses (markets, restaurants, etc.) and office complexes. Single and multi- family residential water demand combined accounts for 75.3% of the total water demand. Commercial use accounts for 8.7% of total demand, while large landscape (irrigation) accounts for 13.4% of total potable demand.

Table 4-1: Retail: Demands for Potable Water Only– Actual

DWR Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
	Additional Description	Level of Treatment When Delivered	Volume (AF)[2]
Single Family		Drinking Water	4,112
Multi-Family		Drinking Water	1,236
Commercial		Drinking Water	618
Landscape		Drinking Water	952
Losses	Non Revenue Water	Drinking Water	157
Other	Hydrant sales	Drinking Water	23
		TOTAL	7,099
[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. *[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Volumes reported in AF. This table only represents potable water; recycled water projections are shown in Table 4-4 (DWR Submittal Tables 4-3) and Table 6-8 (DWR Submittal Tables 6-4).			

4.3 Water Use Projections

A key component of this 2020 UWMP is to provide an insight into the City's future water demand outlook. This section discusses the considerations and methodology used to estimate the 25-year water use projection. Overall, total water demand is projected to increase 6.2% between 2020 and 2045. The proportion of projected water usage per use-type is expected to stay relatively consistent with the FY 2019-2020 distribution.

4.3.1 Water Use Projection Methodology

In 2021, MWDOC and OCWD, in collaboration with their member agencies, led the effort to update water demand projections originally done as part of the 2021 OC Water Demand Forecast for MWDOC and OCWD. The updated demand projections, prepared by CDM Smith, were for the Orange County region as a whole, and provided retail agency specific demands. The projections span the years of 2025-2050 and are based upon information surveyed from each Orange County water agency.

The forecast methodology began with a retail water agency survey that asked for FY 2017-18, FY 2018-19 and FY 2019-20 water use by major sector, including number of accounts. If a member agency provided recycled water to customers that information was also requested. Given that FY 2017-18 was a slightly above-normal demand year (warmer/drier than average) and FY 2018-19 was a slightly below-normal demand year (cooler/wetter than average), water use from these two years were averaged to represent an average-year base water demand.

For the residential sectors (single family and multi-family) the base year water demand was divided by households in order to get a total per unit water use (gallons per home per day). In order to split household water use into indoor and outdoor uses, three sources of information were used, along with CDM Smith's expertise. The sources of information included: (1) *the Residential End Uses of Water* (Water Research Foundation, 2016); (2) California's plumbing codes and landscape ordinances; and (3) CA DWR's Model Water Efficient Landscape Ordinance (MWELO) calculator.

Three different periods of residential end uses of water were analyzed as follows:

- **Pre-2010 efficiency levels** – Has an average indoor water use that is considered to be moderately efficient, also does not include the most recent requirements for MWELO.
- **High-efficiency levels** – Includes the most recent plumbing codes that are considered to be highly efficient, and also includes the most recent requirements for MWELO.
- **Current average efficiency levels** – Represents the weighted average between pre-2010 efficiency and high efficiency levels, based on average age of homes for each retail water agency.

For outdoor residential water use, the indoor per capita total was multiplied by each member agency-specific persons per household in order to get an indoor residential household water use (gallons per day per home), and then was subtracted from the base year total household water use for single family and multi-family for each agency based on actual water use as reported by the agency surveys.

For existing residential homes, the current average indoor and outdoor water use for each member agency were used for the year 2020. It was assumed that indoor water uses would reach the high efficiency level by 2040. Based on current age of homes, replacement/remodeling rates, and water utility rebate programs it is believed this assumption is very achievable. It was also assumed that current outdoor water use would be reduced by 5% by 2050.

For new homes, the indoor high efficiency level was assumed for the years 2025 through 2050. Outdoor uses for new homes were assumed to be 25% and 30% lower than current household water use for single family and multi-family homes, respectively. This methodology is illustrated in Figure 4-1 below.

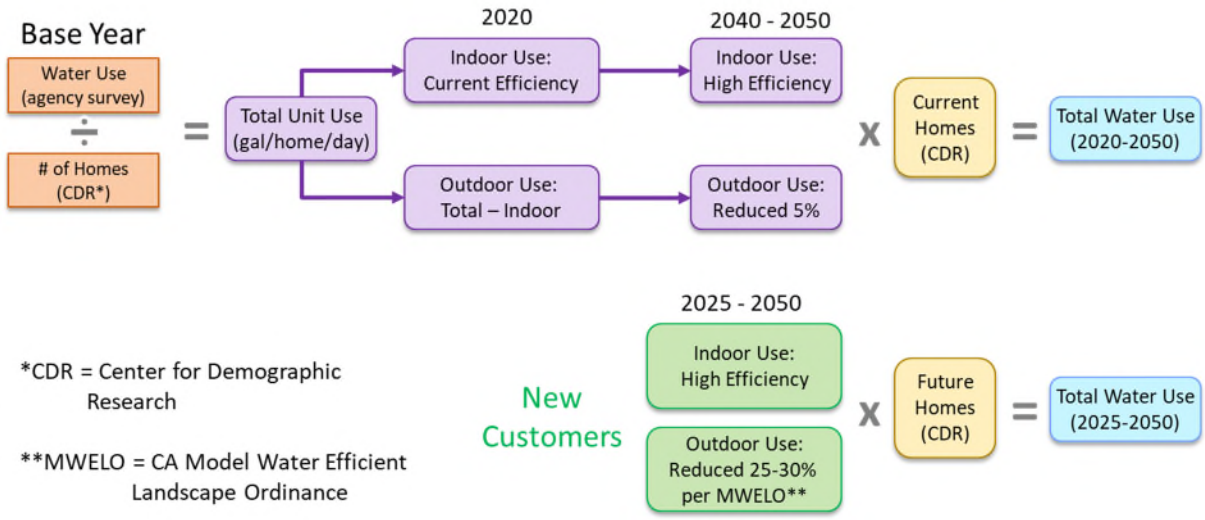

Figure 4-1: Water Use Projection Methodology Diagram

Existing and projected population, single family and multi-family households for each retail water agency were provided by CDR under contract by MWDOC and OCWD. CDR provides historical and future demographics by census tracts for all of Orange County (Section 3.4). Census tract data is then clipped to retail water agency service boundaries in order to produce historical and projected demographic data by agency.

For the CII water demands, which have been fairly stable from a unit use perspective (gallons/account/day), it was assumed that the unit demand in FY 2019-20 would remain the same from 2020-2025 to represent COVID-19 impacts. Reviewing agency water use data from FY 2017-18 through FY2019-20 revealed that residential water use increased slightly in FY 2019-20 while CII demands decreased slightly as a result of COVID-19. From 2030 to 2050, the average CII unit use from FY 2017-18 and 2018-19 was used. These unit use factors were then multiplied by an assumed growth of CII accounts under three broad scenarios:

- Low Scenario – assuming no growth in CII accounts
- Mid Scenario – assuming 0.5% annual growth in CII accounts
- High Scenario – assuming 1.5% annual growth in CII accounts

For most retail agencies, the Mid Scenario of CII account growth was used, but for those retail agencies that have had faster historical growth the High Scenario was used. For those retail agencies that have had relatively stable CII water demand, the Low Scenario was used. For the City of San Clemente, the mid-scenario was used, although final CII projections were adjusted downward to acknowledge the fact that the City's industrial and commercial business parks were built out prior to 2020.

For those agencies that supply recycled water for non-potable demands, MWDOC used agency-specified growth assumptions. Most agencies have already maximized their recycled water and thus are not expecting for this category of demand to grow. However, a few agencies in South Orange County do expect moderate growth in recycled water customers.

For large landscape customers served currently by potable water use, MWDOC assumed these demands to be constant through 2050, except for agencies that have growing recycled water demands. For the agencies that have growing recycled water demands, large landscape demands served by potable water reduced accordingly. The percentage of NRW, which represents the difference in total water production less all water billed to customers, was held constant through 2050. Note that 2050 data was not presented in the UWMP.

A member agency's water use demand projection is the summation of their residential water demand, CII demands, large landscape and recycled water demands, and water losses all projected over the 25-year time horizon. These demands were provided to each of the Orange County water agencies for their review, feedback, and revision before being finalized.

The MWDOC regional water demand projection was collaboratively developed between MWDOC and its member agencies. MWDOC's projections were built upon the same model developed by CDM Smith, and took into consideration specific assumptions and projections provided to MWDOC by its member agencies.

4.3.1.1 Weather Variability and Long-Term Climate Change Impacts

In any given year water demands can vary substantially due to weather. In addition, long-term climate change can have an impact on water demands into the future. For the 2014 OC Water Reliability Study, CDM Smith developed a statistical model of total water monthly production from 1990 to 2014 from a sample of retail water agencies. This model removed impacts from population growth, the economy and drought restrictions in order to estimate the impact on water use from temperature and precipitation.

The results of this statistical analysis are:

- Hot/dry weather demands will be 5.5% greater than current average weather demands
- Cooler/wet weather demands will be 6% lower than current average weather demands
- Climate change impacts will increase current average weather demands by:
    - 2% in 2030
    - 4% in 2040
    - 6% in 2050

4.3.2 25-Year Water Use Projection

The projected demand values were provided by MWDOC and reviewed by the City as part of the UWMP effort. As the regional wholesale supplier for much of Orange County, MWDOC works in collaboration with each of its retail agencies as well as MET, its wholesaler, to develop demand projections for imported water. The City has been proactively decreasing its reliance on imported water by pursuing a variety of water conservation strategies and increasing recycled water availability for use in lieu of potable irrigation within the service area. Future water savings and low-income water use are included in these projected values.

4.3.2.1 Water Use Projections for 2021-2025

The water use projection without drought conditions for 2021-2025 is presented in Table 4-2. This table will be adjusted to estimate the five-years' cumulative drought effects as described in the five-year DRA in Section 7. A linear increase in total water demand is expected through 2025.

Table 4-2: Water Use Projections for 2021 to 2025

Retail: Total Water Demand					
FY Ending	2021	2022	2023	2024	2025
Total Water Demand (AF)	8,374	8,494	8,613	8,733	8,853
NOTES:					

4.3.2.2 Water Use Projections for 2025-2045

Table 4-3 is a projection of the City's water demand for the next 25 years. The volume of single and multi-family residential use is projected to slightly decrease between 2025 and 2045, as does NRW volume. CII projections for 2025 through 2045 were broken down into commercial, industrial, and institutional/governmental using proportions reported for each billing sector in FY 2019-20. Demands for landscape applications are projected to decrease slightly, while projections for non-potable recycled water usage increase from 1,200 AF in 2025 to 1,320 AF in 2045.

The demand data presented in this section account for passive savings in the future. Passive savings are water savings as a result of codes, standards, ordinances and public outreach on water conservation and higher efficiency fixtures. Passive savings are anticipated to continue for the next 25 years and will result in continued water saving and reduced consumption levels. Permanent water conservation requirements and water conservation strategies are discussed in Section 8 and 9 of this document.

Table 4-3: Retail: Use for Potable and Non-Potable Water – Projected

DWR Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description	Projected Water Use (AF)[2]				
		2025	2030	2035	2040	2045
Single Family		4,399	4,381	4,363	4,318	4,314
Multi-Family		1,333	1,322	1,310	1,298	1,297
Commercial	Includes institutional and industrial water use	700	675	650	649	649
Landscape		1,026	1,017	1,009	1,000	999

DWR Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description	Projected Water Use (AF)[2]				
		2025	2030	2035	2040	2045
Losses	Non-revenue water	169	168	166	165	165
Other	Hydrant sales	25	25	25	24	24
	TOTAL	7,653	7,588	7,524	7,455	7,448
[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. *[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: Volumes reported in AF. This table only represents potable water; recycled water projections are shown in Table 4-4 (DWR Submittal Tables 4-3) and Table 6-8 (DWR Submittal Tables 6-4).						

Based on the information provided above, the total demand for potable water is listed below in Table 4-4. The City currently provides recycled water in its service area and is projected to grow its use.

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

DWR Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable	7,099	7,653	7,588	7,524	7,455	7,448
Recycled Water Demand[1]	1,155	1,200	1,320	1,320	1,320	1,320
TOTAL WATER USE	8,254	8,853	8,908	8,844	8,775	8,768
[1]Recycled water demand fields will be blank until Table 6-4 is complete *[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*						
NOTES: Volumes in AF.						

Table 4-5: Retail Only: Inclusion in Water Use Projections

DWR 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)	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 8 and 9
Are Lower Income Residential Demands Included in Projections?	Yes
NOTES:	

4.3.2.3 Water Use Projections for Lower Income Households

Since 2010, the UWMP Act has required retail water suppliers to include water use projections for single-family and multi-family residential housing for lower income and affordable households. This will assist the City in complying with the requirement under Government Code Section 65589.7 granting priority for providing water service to lower income households. A lower income household is defined as a household earning below 80% of the MHI.

DWR recommends retail suppliers rely on the housing elements of city or county general plans to quantify planned lower income housing with the City's service area (DWR, 2020). RHNA assists jurisdictions in updating general plan's housing elements section. The RHNA identifies additional housing needs and assesses households by income level for the City through 2010 decennial Census and 2005-2009 American Community Survey data. The sixth cycle of the RHNA covers the planning period of October 2021 to October 2029. The SCAG adopted the RHNA Allocation Plan for this cycle on March 4, 2021. The California Department of Housing and Community Development reviewed the housing elements data submitted by jurisdictions in the SCAG region and concluded the data meets statutory requirements for the assessment of current housing needs.

Under the assumption that the RHNA household allocations adequately represent ratios of the City's overall future income categories (not the exact ratio of all household by income but a conservative one for low-income household estimates), the RHNA low-income percentage can be used to estimate future low income demands. One objective of RHNA is to increase affordable housing, therefore RHNA has been allocating additional low-income households to various regions. Because relying on the RHNA distribution of households by income category is likely to produce an overestimate of low-income water demands, this approach represents a conservative projection of future low-income water use.

Table 4-6Table 4-6 presents the City's RHNA housing allocation. RHNA classifies low income housing into two categories: very low income (<30% - 50% MHI), and low income (51% - 80% MHI). Altogether 45.4% of the City's allocated housing need for the planning period of October 2021 to October 2029 are considered low-income housing (SCAG, 2021).

Table 4-6: SCAG 6th Cycle Household Allocation Based on Median Household Income

Household Category by Income	Number of Households	% of Total Allocated Households
Very Low Income	282	28.7%
Low Income	164	16.7%
Moderate Income	188	19.1%
Above Moderate Income	348	35.4%
Total Future Allocated Households	982	100.0%

By applying the percentage of low-income housing from the SCAG report to the total projected SF/MF residential demand calculated in Table 4-3 above, low-income demand can be conservatively estimated for both SF and MF through 2045. For example, the total low-income single family residential demand is projected to be 1,998 AF in 2025 and 1,959 AF in 2045 (Table 4-7).

Table 4-7: Projected Water Use for Housing Needed for Low-Income Households (AF)

Water Use Sector	FY Ending				
	2025	2030	2035	2040	2045
Total Residential Demand (AF)	5,732	5,703	5,674	5,617	5,612
Single Family Residential Demand – Low-Income Households (AF)	1,998	1,990	1,982	1,961	1,959
Multi-Family Residential Demand – Low-Income Households (AF)	605	600	595	590	589
Total Low-Income Households Demand (AF)	2,603	2,590	2,577	2,551	2,549

4.4 Water Loss

The City has conducted annual water loss audit since 2015 per the American Water Works Association (AWWA) methodology per SB 555 to understand the relationship between water loss, operating costs, and revenue losses. NRW for FY 2014-15 – FY 2019-20 (Figure 4-2) consists of three components: real losses (e.g., leakage in mains and service lines, and storage tank overflows), apparent losses (unauthorized consumption, customer metering inaccuracies and systematic data handling errors), and unbilled water (e.g., hydrant flushing, firefighting, and blow-off water from well start-ups). As derived from the water loss audit process, the City's real losses ranged from 82 AFY to 1024 AFY and apparent losses ranged from 62 AFY to 129 AFY in the last six years. The unbilled water ranged from 5 AFY to 27 AFY in the same timeframe. The City has worked significantly on refining water loss audit data quality since

beginning the program in 2015, so it may be argued that more weight should be given to water loss data from the most recent couple of years.

In the latest water loss audit (FY 2019-20), the City's total water loss was 144 AFY (Table 4-8), compared to the total water use of 7,153 AF during that time. The total water loss consists of real loss of 82 AFY and apparent loss of 62 AFY in FY 2019-20. The NRW was 156 AFY. The active and inactive service connections were relatively consistent in the last six years with 17,652 connections in FY 2019-20. The real loss performance indicator was 4 gallons/connection/day in FY 2019-20. Figure 4-3 presents the performance indicators of gallons of real and apparent loss per connection per day. Understanding and controlling water loss from a distribution system is an effective way for the City to achieve regulatory standards and manage their existing resources. The California State Water Resources Control Board (SWRCB) is still developing water loss performance standards; these standards have not yet been adopted.

Table 4-8: Retail: Last Five Years of Water Loss Audit Reporting

DWR Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss [1,2]
07/2014	598
07/2016	1086
07/2017	956
07/2018	296
07/2019	144
[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. *[2] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Water loss in AFY. No Water Loss Audit conducted in FY 2015-16.	

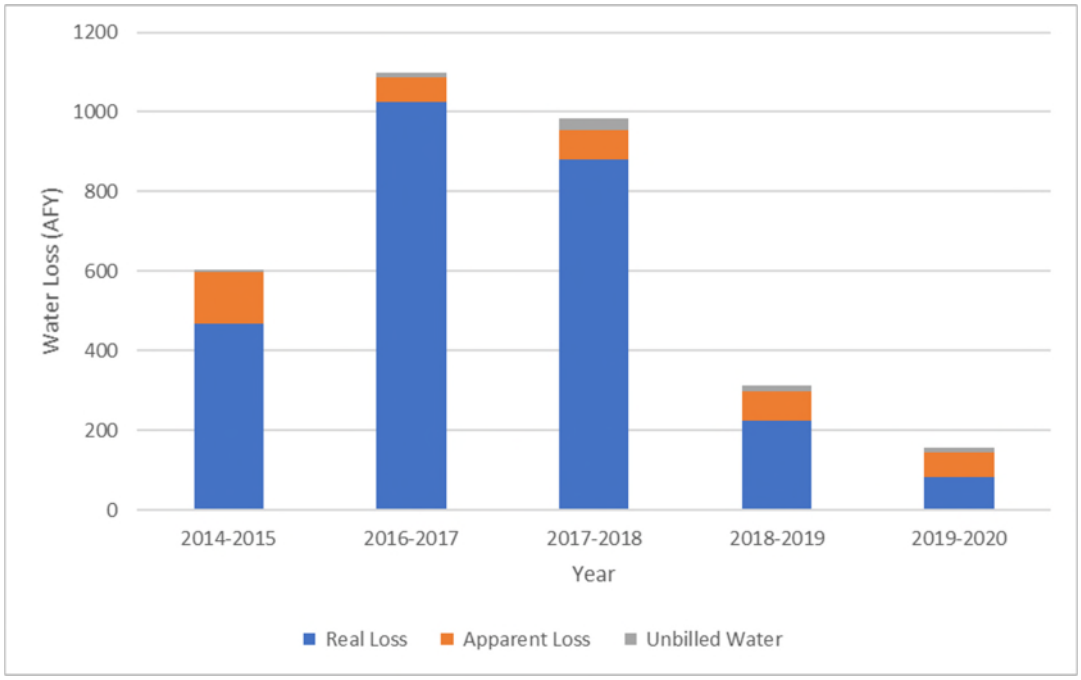

Figure 4-2: Water Loss Audit Results for FY 2014-15 to FY 2019-20

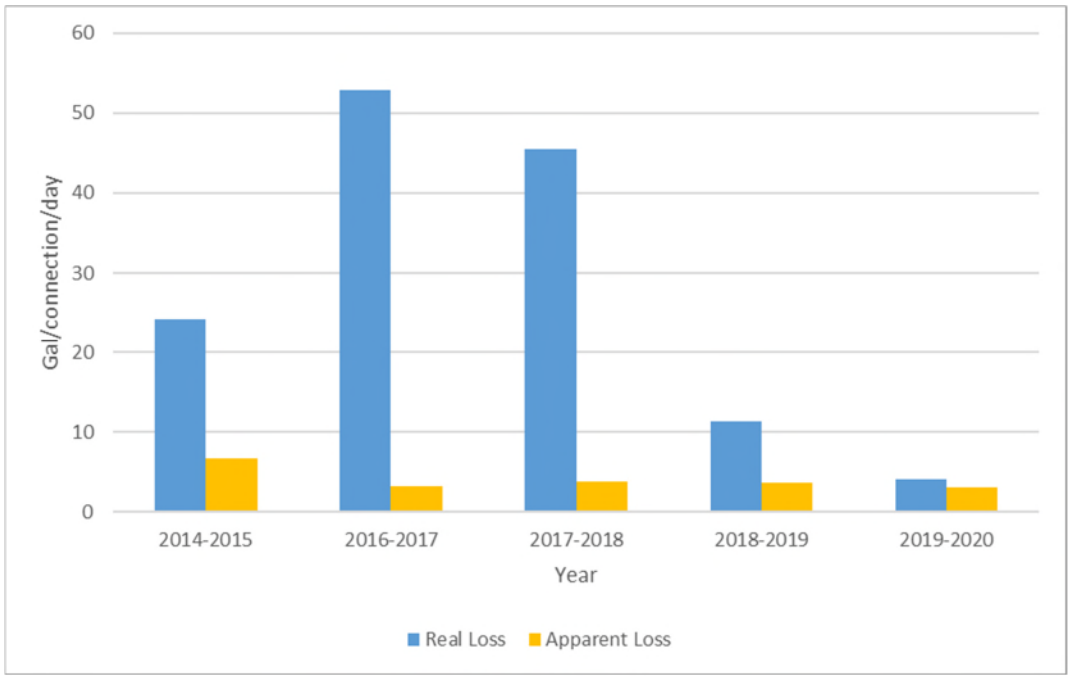

Figure 4-3: Water Loss Performance Indicators for FY 2014-15 to FY 2019-20

5 CONSERVATION TARGET COMPLIANCE

The Water Conservation Act of 2009, also known as SBx7-7 (Senate Bill 7 as part of the Seventh Extraordinary Session), signed into law on February 3, 2010, requires the State of California to reduce urban water use by 20% by the year 2020 (20x2020). To achieve this each retail urban water supplier must determine baseline water use during their baseline period and target water use for the years 2015 and 2020 to meet the state's water reduction goal. Retail water suppliers are required to comply with SBx7-7 individually or as a region in collaboration with other retail water suppliers, or demonstrate they have a plan or have secured funding to be in compliance, in order to be eligible for water related state grants and loans on or after July 16, 2016.

The City's actual 2020 water use was lower than its 2020 water use target, demonstrating compliance with SBx7-7. In its 2015 UWMP, the City revised its baseline per capita water use calculations using 2010 U.S. Census data. Changes in the baseline calculations resulted in an updated per capita water use target of 153 gallons per capita day (GPCD), the derivation of which is explained below.

The following sections describe the efforts by the City to comply with the requirements of SBx7-7 and efforts by MWDOC to assist retail agencies, including the formation of a Regional Alliance to provide additional flexibility to all water suppliers in Orange County. A discussion of programs implemented to support retail agencies in achieving their per capita water reduction goals is covered in Section 9 – Demand Management Measures of this UWMP.

Complementary to information presented in this section are SBx7-7 Verification and Compliance Forms, a set of standardized tables required by DWR to demonstrate compliance with the Water Conservation Act in this 2020 UWMP (Appendix D).

5.1 Baseline Water Use

The baseline water use is the City's gross water use divided by its service area population, reported in GPCD. Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area
- Indirect recycled water
- Water placed in long term storage
- Water conveyed to another urban supplier
- Water delivered for agricultural use
- Process water

Water suppliers must report baseline water use for two baseline periods, the 10- to 15-year baseline (baseline GPCD) and the five-year baseline (target confirmation) as described below.

5.1.1 Ten to 15-Year Baseline Period (Baseline GPCD)

The first step to calculating the City's water use targets is to determine its base daily per capita water use (baseline water use). The baseline water use is calculated as a continuous (rolling) 10-year average during a period, which ends no earlier than December 31, 2004 and no later than December 31, 2010. Water suppliers whose recycled water made up 10% or more of their 2008 retail water delivery can use up to a 15-year average for the calculation. Recycled water use was less than 10% of the City's retail delivery in 2008; therefore, a 10-year baseline period is used.

The City's baseline water use is 191 GPCD, obtained from the 10-year period July 1, 1998 to June 30, 2008.

5.1.2 Five-Year Baseline Period (Target Confirmation)

Water suppliers are required to calculate water use, in GPCD, for a five-year baseline period. This number is used to confirm that the selected 2020 target meets the minimum water use reduction requirements. Regardless of the compliance option adopted by the City, it will need to meet a minimum water use target of 5% reduction from the five-year baseline water use. This five-year baseline water use is calculated as a continuous five-year average during a period, which ends no earlier than December 31, 2007 and no later than December 31, 2010. The City's five-year baseline water use is 189 GPCD, obtained from the five-year period July 1, 2003 to June 30, 2008

5.1.3 Service Area Population

The City's service area boundaries correspond with the boundaries for a city or census designated place. This allows the City to use service area population estimates prepared by the DOF. CDR is the entity which compiles population data for Orange County based on DOF data. The calculation of the City's baseline water use and water use targets in the 2010 UWMP was based on the 2000 U.S. Census population numbers obtained from CDR. The baseline water use and water use targets in the 2015 UWMP were revised based on the 2010 U.S. Census population obtained from CDR in 2012. The population numbers and baseline water use (both 10- and 5-year baselines) were revised again in this 2020 UWMP per CDR's most recently adjusted population numbers for 2001 onward.

5.2 SBx7-7 Water Use Targets

In the 2020 UWMP, the City may update its 2020 water use target by selecting a different target method than what was used previously. The target methods and determination of the 2015 and 2020 targets are described below. The City selected Option 1 consistent with 2015.

5.2.1 SBx7-7 Target Methods

DWR has established four target calculation methods for urban retail water suppliers to choose from. The City is required to adopt one of the four options to comply with SBx7-7 requirements. The four options include:

- *Option 1* requires a simple 20% reduction from the baseline by 2020 and 10% by 2015.

- *Option 2* employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics
  - Residential indoor water use of 55 GPCD
  - Landscape water use commensurate with the Model Landscape Ordinance
  - 10% reduction in baseline CII water use
- *Option 3* is to achieve 95% of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.
- *Option 4* requires the subtraction of Total Savings from the baseline GPCD:
  - Total savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

With MWDOC's assistance in the calculation of the City's base daily per capita use and water use targets, the City selected to comply with Option 1 consistent with the option selected in 2010 and 2015.

5.2.2 2020 Targets and Compliance

Under Compliance Option 1, the simple 20% reduction, the City's 2020 target is 153 GPCD as summarized in Table 5-1. In addition, the confirmed 2020 target needs to meet a minimum of 5% reduction from the five-year baseline water use.

Table 5-1: Baselines and Targets Summary

DWR Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form				
Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1999	2005	191	153
5 Year	2004	2008	189	
**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*				
NOTES:				

The City did not make any adjustments in its actual 2020 consumption using weather normalization, economic adjustment, or extraordinary events. The City's actual 2020 consumption was 124 GPCD which is below its 2020 target of 153 GPCD (Table 5-2). The City met its 2020 water use target and is in compliance with SBx7-7.

Table 5-2: 2020 Compliance

DWR Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD*		
124	0	124	153	Y
**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*				
NOTES:				

5.3 Orange County 20x2020 Regional Alliance

A retail supplier may choose to meet the SBx7-7 targets on its own or it may form a regional alliance with other retail suppliers to meet the water use target as a region. Within a Regional Alliance, each retail water supplier will have an additional opportunity to achieve compliance under both an individual target and a regional target.

- If the Regional Alliance meets its water use target on a regional basis, all agencies in the alliance are deemed compliant.
- If the Regional Alliance fails to meet its water use target, each individual supplier will have an opportunity to meet their water use targets individually.

The City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC, its wholesaler. This regional alliance consists of 29 retail agencies in Orange County as described in MWDOC's 2020 UWMP. MWDOC provides assistance in the calculation of each retail agency's baseline water use and water use targets.

In 2015, the regional baseline and targets were revised to account for any revisions made by the retail agencies to their individual 2015 and 2020 targets. The regional water use target is the weighted average of the individual retail agencies' targets (by population). The Orange County 20x2020 Regional Alliance weighted 2020 target is 159 GPCD. The actual 2020 water use in the region is 109 GPCD, i.e., the region met its 2020 GPCD goal.

6 WATER SUPPLY CHARACTERIZATION

As a counterpart to Section 4's Water Use Characterization, this section characterizes the City's water supply. This section includes identification and quantification of water supply sources through 2045, descriptions of each water supply source and their management, opportunities for exchanges and transfers, and discussion regarding any planned future water supply projects. This section also includes the energy intensity of the City's water service, a new UWMP requirement.

6.1 Water Supply Overview

The City meets its demands with a combination of imported water, local groundwater, and recycled water. The City works together with three primary agencies, MET, MWDOC, and JRWSS to ensure a safe and reliable water supply that will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include water from the Colorado River and the SWP provided by MET and administered through MWDOC.

The City's main source of water supply is imported water from MET through purchases from MWDOC. Imported water is supplemented by local groundwater extracted from two City-owned wells and recycled water produced at the City's recycled water treatment facility. In FY 2019-20, the City relied on approximately 68% imported treated water, 14% recycled water, 13% imported or purchased untreated water (treated at the Baker WTP), and 5% groundwater (Table 6-1).

It is projected that by 2045, the City's water supply portfolio will change to approximately 66% imported water from MET / MWDOC, 15% recycled water, 14% purchased water from TCWD, and 6% groundwater (Table 6-2 and Figure 6-1). Due to rounding, the percentages total slightly more than 100%. Note that these representations of supply match the projected demand. However, the City can purchase more MET water through MWDOC, should the need arise.

The following subsections provide a detailed discussion of the City's water sources as well as the future water supply portfolio for the next 25 years.

Table 6-1: Retail: Water Supplies – Actual

DWR Submittal Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume (AF)	Water Quality
Groundwater (not desalinated)	City of San Clemente Wells from within Service Area	390	Drinking Water
Purchased or Imported Water	MWDOC (Treated)	5,641	Drinking Water
Purchased or Imported Water	MWDOC (Untreated), Treated at Baker WTP	1,068	Drinking Water
Recycled Water	City of San Clemente Water Reclamation Plant	1,155	Recycled Water
	Total	8,254	

NOTES:
Sources - OC Retail Water Usage FY 2015 to FY 2020 (MWDOC, 2020) and City of San Clemente Production Meter Data

Water Quality column refers to the end use of the water.

Table 6-2: Retail: Water Supplies – Projected

DWR Submittal Table 6-9 Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply (AF)				
		2025	2030	2035	2040	2045
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	MWDOC	5,953	5,888	5,824	5,755	5,748
Purchased or Imported Water	TCWD / Baker WTP	1,200	1,200	1,200	1,200	1,200
Groundwater (not desalinated)	San Mateo Groundwater Basin	500	500	500	500	500
Recycled Water	San Clemente WRP	1,200	1,320	1,320	1,320	1,320
	Total	8,853	8,908	8,844	8,775	8,768

NOTES:
Sources - CDM Smith, 2021; Discussions with City of San Clemente Staff (Groundwater and Recycled Water); 2017 Water Purchase Agreement with TCWD

Imported water from MWDOC includes both treated and untreated water. The purchased TCWD water volumes assume that the City purchases the minimum agreed upon volume per the Agreement referenced above.

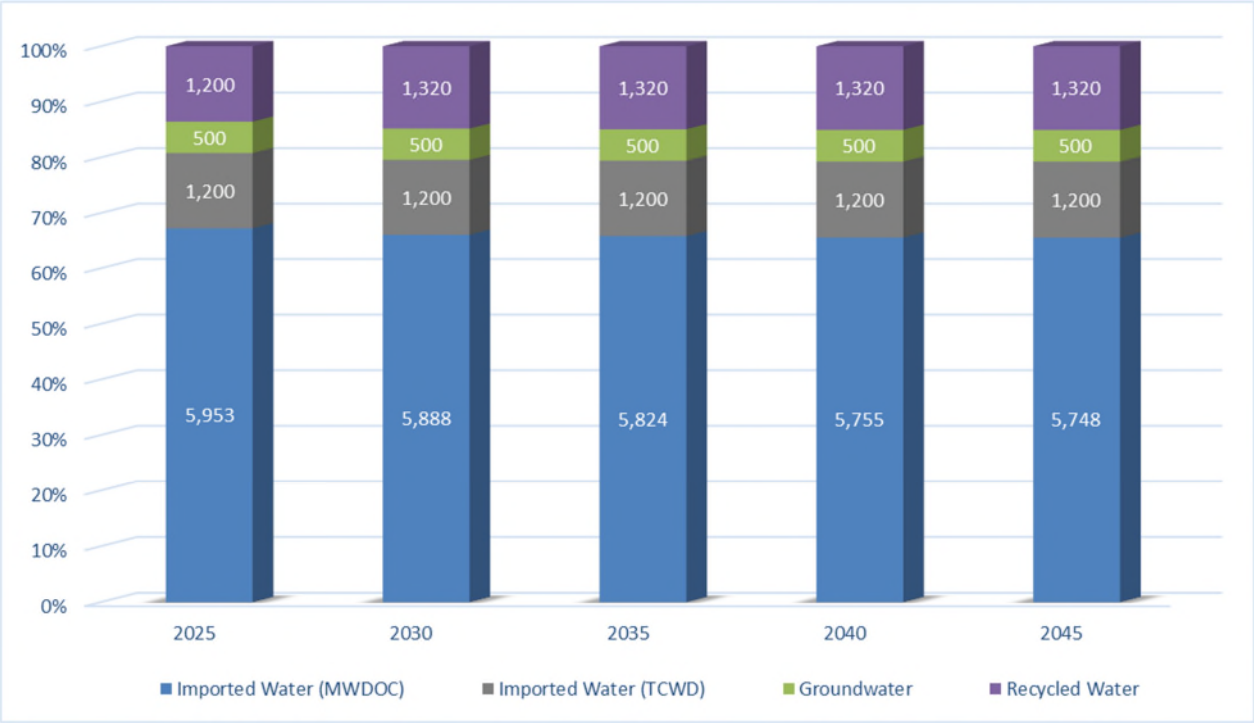

Figure 6-1: City's Projected Water Supply Portfolio (AF)

6.2 Imported Water

The City supplements its local water supply with imported water purchased from MET through MWDOC. In FY 2019-20, the City relied on a total 6,709 AFY of imported water from MET / MWDOC, with 5,641 AFY of treated water and 1,068 AFY of untreated water, making up 68% and 13% of the City's water portfolio for FY 2019-20, respectively. MET's principal sources of water are the Colorado River via the CRA and the Lake Oroville watershed in Northern California through the SWP. For Orange County, the water obtained from these sources is treated at the Robert B. Diemer Filtration Plant located in Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the MET Lower Feeder and SWP water through the Yorba Linda Feeder. The water is then delivered to the City via two systems: 1) the East Orange County Feeder (EOCF) No.2 / Joint Regional Water Supply System Transmission Main / LTM and 2) the AMP / South County Pump Station / South County Pipeline / WIP.

6.2.1 Colorado River Supplies

Background

The Colorado River was MET's original source of water after MET's establishment in 1928. The CRA, which is owned and operated by MET, transports water from the Colorado River to its terminus at Lake Mathews, in Riverside County. The actual amount of water per year that may be conveyed through the CRA to MET's member agencies is subject to the availability of Colorado River water. Approximately 40 million people rely on the Colorado River and its tributaries for water with 5.5 million acres of land

using Colorado River water for irrigation. The CRA includes supplies from the implementation of the Quantification Settlement Agreement and its related agreements to transfer water from agricultural agencies to urban uses. The 2003 Quantification Settlement Agreement enabled California to implement major Colorado River water conservation and transfer programs, in order to stabilize water supplies and reduce the state's demand on the river to its 4.4 million acre-feet (MAF) entitlement. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis. Water from the Colorado River or its tributaries is available to users in California, Arizona, Colorado, Nevada, New Mexico, Utah, Wyoming, and Mexico. California is apportioned the use of 4.4 MAF of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California, and Nevada. In addition, California has historically been allowed to use Colorado River water apportioned to, but not used by, Arizona or Nevada. MET has a basic entitlement of 550,000 AFY of Colorado River water, plus surplus water up to an additional 662,000 AFY when the following conditions exists (MET, 2021):

- Water is unused by the California holders of priorities 1 through 3
- Water is saved by the Palo Verde land management, crop rotation, and water supply program
- When the U.S. Secretary of the Interior makes available either one or both of the following:
    - Surplus water
    - Colorado River water that is apportioned to but unused by Arizona and/or Nevada.

Current Conditions and Supply

MET has not received surplus water for a number of years. The Colorado River supply faces current and future imbalances between water supply and demand in the Colorado River Basin due to long-term drought conditions. Analysis of historical records suggests a potential change in the relationship between precipitation and runoff in the Colorado River Basin. The past 21 years (1999-2020) have seen an overall drying trend, even though the period included several wet or average years. The river basin has substantial storage capacity, but the significant reduction in system reservoir storage in the last two decades is great enough to consider the period a drought (DWR, 2020a). At the close of 2020, system storage is at or near its lowest since 2000, so there is very little buffer to avoid a shortage from any future period of reduced precipitation and runoff (MET, 2021). Looking ahead, the long-term imbalance in the Colorado River Basin's future supply and demand is projected to be approximately 3.2 MAF by the year 2060 (USBR, 2012).

Over the years, MET has helped fund and implement various programs to improve Colorado River supply reliability and help resolve the imbalance between supply and demand. Implementation of such programs have contributed to achievements like achieving a record low diversion of the Colorado River in 2019, a level not seen since the 1950s. Colorado River water management programs include:

- **Imperial Irrigation District / MET Conservation Program** – Under agreements executed in 1988 and 1989, this program allows MET to fund water efficiency improvements within Imperial Irrigation District's service area in return for the right to divert the water conserved by those investments. An average of 105,000 AFY of water has been conserved since the program's implementation.

- **Palo Verde Land Management, Crop Rotation, and Water Supply Program** – Authorized in 2004, this 35-year program allows MET to pay participating farmers to reduce their water use, and for MET to receive the saved water. Over the life of the program, an average of 84,500 AFY has been saved and made available to MET.
- **Bard Seasonal Fallowing Program** – Authorized in 2019, this program allows MET to pay participating farmers in Bard to reduce their water use between the late spring and summer months of selected years, which provides up to 6,000 AF of water to be available to MET in certain years.
- **Management of MET-Owned Land in Palo Verde** – Since 2001, MET has acquired approximately 21,000 acres of irrigable farmland that are leased to growers, with incentives to grow low water-using crops and experiment with low water-consumption practices. If long-term water savings are realized, MET may explore ways to formally account them for Colorado River supplies.
- **Southern Nevada Water Authority (SNWA) and MET Storage and Interstate Release Agreement** – Entered in 2004, this agreement allows SNWA to store its unused, conserved water with MET, in exchange for MET to receive additional Colorado River water supply. MET has relied on the additional water during dry years, especially during the 2011-2016 CA drought, and SNWA is not expected to call upon MET to return water until after 2026.
- **Lower Colorado Water Supply Projects** – Authorized in 1980s, this project provides up to 10,000 AFY of water to certain entities that do not have or have insufficient rights to use Colorado River water. A contract executed in 2007 allowed MET to receive project water left unused by the project contractors along the River – nearly 10,000 AF was received by MET in 2019 and is estimated for 2020.
- **Exchange Programs** – MET is involved in separate exchange programs with the United States, which takes place at the Colorado River Intake and with San Diego County Water Authority (SDCWA), which exchanges conserved Colorado River water.
- **Lake Mead Storage Program** – Executed in 2006, this program allows MET to leave excessively conserved water in Lake Mead, for exclusive use by MET in later years.
- **Quagga Mussel Control Program** – Developed in 2007, this program introduced surveillance activities and control measures to combat quagga mussels, an invasive species that impact the Colorado River's water quality.
- **Lower Basin Drought Contingency Plan** – Signed in 2019, this agreement incentivizes storage in Lake Mead through 2026 and overall, it increases MET's flexibility to fill the CRA as needed (MET, 2021).

Future Programs / Plans

The Colorado River faces long-term challenges of water demands exceeding available supply with additional uncertainties due to climate change. Climate change impacts expected in the Colorado River Basin include the following:

- More frequent, more intense, and longer lasting droughts, which will result in water deficits

- Continued dryness in the Colorado River Basin, which will increase the likelihood of triggering a first-ever shortage in the Lower Basin
- Increased temperatures, which will affect the percentage of precipitation that falls as rain or snow, as well as the amount and timing of mountain snowpack (DWR, 2020b).

Acknowledging the various uncertainties regarding reliability, MET plans to continue ongoing programs, such as those listed earlier in this section. Additionally, MET supports increasing water recycling in the Colorado River Basin and is in the process of developing additional transfer programs for the future (MET, 2021).

6.2.2 State Water Project Supplies

Background

The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants operated by DWR and is an integral part of the effort to ensure that business and industry, urban and suburban residents, and farmers throughout much of California have sufficient water. Water from the SWP originates at Lake Oroville, which is located on the Feather River in Northern California. Much of the SWP water supply passes through the Delta. The SWP is the largest state-built, multipurpose, user-financed water project in the United States. Nearly two-thirds of residents in California receive at least part of their water from the SWP, with approximately 70% of SWP's contracted water supply going to urban users and 30% to agricultural users. The primary purpose of the SWP is to divert and store water during wet periods in Northern and Central California and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and Southern California (MET, 2021).

The Delta is key to the SWP's ability to deliver water to its agricultural and urban contractors. All but five of the 29 SWP contractors receive water deliveries below the Delta (pumped via the Harvey O. Banks or Barker Slough pumping plants). However, the Delta faces many challenges concerning its long-term sustainability such as climate change posing a threat of increased variability in floods and droughts. Sea level rise complicates efforts in managing salinity levels and preserving water quality in the Delta to ensure a suitable water supply for urban and agricultural use. Furthermore, other challenges include continued subsidence of Delta islands, many of which are below sea level, and the related threat of a catastrophic levee failure as the water pressure increases, or as a result of a major seismic event.

Current Conditions and Supply

"Table A" water is the maximum entitlement of SWP water for each water contracting agency. Currently, the combined maximum Table A amount is 4.17 million AFY. Of this amount, 4.13 million AFY is the maximum Table A water available for delivery from the Delta. On average, deliveries are approximately 60% of the maximum Table A amount (DWR, 2020b).

SWP contractors may receive Article 21 water on a short-term basis in addition to Table A water if requested. Article 21 of SWP contracts allows contractors to receive additional water deliveries only under specific conditions, generally during wet months of the year (December through March). Because a SWP contractor must have an immediate use for Article 21 supply or a place to store it outside of the SWP, there are few contractors like MET that can access such supplies.

Carryover water is SWP water allocated to an SWP contractor and approved for delivery to the contractor in a given year, but not used by the end of the year. The unused water is stored in the SWP's share of San Luis Reservoir, when space is available, for the contractor to use in the following year.

Turnback pool water is Table A water that has been allocated to SWP contractors that has exceeded their demands. This water can then be purchased by another contractor depending on its availability.

SWP Delta exports are the water supplies that are transferred directly to SWP contractors or to San Luis Reservoir storage south of the Delta via the Harvey O. Banks pumping plant. Estimated average annual Delta exports and SWP Table A water deliveries have generally decreased since 2005, when Delta export regulations affecting SWP pumping operations became more restrictive due to federal biological opinions (BiOps). The BiOps protect species listed as threatened or endangered under the federal and state Endangered Species Acts (ESAs) and affect the SWP's water delivery capability because they restrict SWP exports in the Delta and include Delta outflow requirements during certain times of the year, thus reducing the available supply for export or storage.

Before being updated by the 2019 Long-Term Operations Plan, the prior 2008 and 2009 BiOps resulted in an estimated reduction in SWP deliveries of 0.3 MAF during critically dry years to 1.3 MAF in above normal water years as compared to the previous baseline. However, the 2019 Long-Term Operations Plan and BiOps are expected to increase SWP deliveries by an annual average of 20,000 AF as compared to the previous BiOps (MET, 2021). Average Table A deliveries decreased in the 2019 SWP Final Delivery Capability Report compared to 2017, mainly due to the 2018 Coordinated Operation Agreement (COA) Addendum and the increase in the end of September storage target for Lake Oroville. Other factors that also affected deliveries included changes in regulations associated with the Incidental Take Permit (ITP) and the Reinitiation of Consultation for Long-Term Operations (RoC on LTO), a shift in Table A to Article 21 deliveries which occurred due to higher storage levels in the SWP San Luis Reservoir, and other operational updates to the SWP and federal Central Valley Project (CVP) (DWR, 2020b). Since 2005, there are similar decreasing trends for both the average annual Delta exports and the average annual Table A deliveries (Table 6-3).

Table 6-3: MET SWP Program Capabilities

Year	Average Annual Delta Exports (MAF)	Average Annual Table A Deliveries (MAF)
2005	2.96	2.82
2013	2.61	2.55
2019	2.52	2.41
Percent Change*	-14.8%	-14.3%

*Percent change is between the years 2019 and 2005.

Ongoing regulatory restrictions, such as those imposed by the BiOps on the effects of SWP and the CVP operations on certain marine life, also contribute to the challenge of determining the SWP's water delivery reliability. In dry, below-normal conditions, MET has increased the supplies delivered through the

California Aqueduct by developing flexible CVP/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Harvey O. Banks pumping plant capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. In addition, the SWRCB has set water quality objectives that must be met by the SWP including minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity level.

The following factors affect the ability to estimate existing and future water delivery reliability:

- **Water availability at the source:** Availability can be highly variable and depends on the amount and timing of rain and snow that fall in any given year. Generally, during a single-dry year or two, surface and groundwater storage can supply most water deliveries, but multiple-dry years can result in critically low water reserves. Fisheries issues can also restrict the operations of the export pumps even when water supplies are available.
- **Water rights with priority over the SWP:** Water users with prior water rights are assigned higher priority in DWR's modeling of the SWP's water delivery reliability, even ahead of SWP Table A water.
- **Climate change:** Mean temperatures are predicted to vary more significantly than previously expected. This change in climate is anticipated to bring warmer winter storms that result in less snowfall at lower elevations, reducing total snowpack. From historical data, DWR projects that by 2050, the Sierra snowpack will be reduced from its historical average by 25 to 40%. Increased precipitation as rain could result in a larger number of "rain-on-snow" events, causing snow to melt earlier in the year and over fewer days than historically, affecting the availability of water for pumping by the SWP during summer. Furthermore, water quality may be adversely affected due to the anticipated increase in wildfires. Rising sea levels may result in potential pumping cutbacks on the SWP and CVP.
- **Regulatory restrictions on SWP Delta exports:** The BiOps protect special-status species such as delta smelt and spring- and winter-run Chinook salmon and imposed substantial constraints on Delta water supply operations through requirements for Delta inflow and outflow and export pumping restrictions. Restrictions on SWP operations imposed by state and federal agencies contribute substantially to the challenge of accurately determining the SWP's water delivery reliability in any given year (DWR, 2020b).
- **Ongoing environmental and policy planning efforts:** Governor Gavin Newsom ended California WaterFix in May 2019 and announced a new approach to modernize Delta Conveyance through a single tunnel alternative. The EcoRestore Program aims to restore at least 30,000 acres of Delta habitat, with the near-term goal of making significant strides toward that objective by 2020 (DWR, 2020b).
- **Delta levee failure:** The levees are vulnerable to failure because most original levees were simply built with soils dredged from nearby channels and were not engineered. A breach of one or more levees and island flooding could affect Delta water quality and SWP operations for several months. When islands are flooded, DWR may need to drastically decrease or even cease SWP Delta exports to evaluate damage caused by salinity in the Delta.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. New BiOps for listed species under the Federal ESA or by the California Department of Fish and Game's issuance of incidental take authorizations under the Federal ESA and California ESA might further adversely affect SWP and CVP operations. Additionally, new litigation, listings of additional species or new regulatory requirements could further 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.

Future Programs / Plans

MET's Board approved a Delta Action Plan in June 2007 that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta Action Plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Delta while a long-term solution is implemented. Currently, MET is working towards addressing four elements: Delta ecosystem restoration, water supply conveyance, flood control protection, and storage development.

In May 2019, Governor Newsom ended California WaterFix, announced a new approach to modernize Delta Conveyance through a single tunnel alternative, and released Executive Order 10-19 that directed state agencies to inventory and assess new planning for the project. DWR then withdrew all project approvals and permit applications for California WaterFix, effectively ending the project. The purpose of the Delta Conveyance Project (DCP) gives rise to several project objectives (MET, 2021). In proposing to make physical improvements to the SWP Delta conveyance system, the project objectives are:

- To address anticipated rising sea levels and other reasonably foreseeable consequences of climate change and extreme weather events.
- To minimize the potential for public health and safety impacts from reduced quantity and quality of SWP water deliveries, and potentially CVP water deliveries, south of the Delta resulting from a major earthquake that causes breaching of Delta levees and the inundation of brackish water into the areas in which existing pumping plants operate.
- To protect the ability of the SWP, and potentially the CVP, to deliver water when hydrologic conditions result in the availability of sufficient amounts, consistent with the requirements of state and federal law.
- To provide operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on project operations.

6.2.3 Untreated Imported Water – Baker Treatment Plant

The Baker Treatment Plant is a 28.1 MGD drinking water treatment plant at the site of the former Baker Filtration Plant in Lake Forest. The facility is operated by IRWD and is a joint regional project by five South Orange County water districts: ETWD, IRWD, MNWD, SMWD, and TCWD, who have capacity rights of 3.2 MGD, 6.8 MGD, 8.4 MGD, 8.4 MGD, and 1.3 MGD, respectively. In 2017, TCWD entered into a 20-year agreement with the City to sell and deliver a minimum of 1,200 AFY of water treated from the Baker Treatment Plant to the City, with the option to extend the agreement for another 10 years.

The plant has multiple water supply sources that increase water supply reliability, including imported untreated water from MET through the Santiago Lateral and local surface water from Irvine Lake. It provides a reliable local drinking water supply during emergencies or extended facility shutdowns on the MET delivery system and increases operational flexibility by creating redundancy within the water conveyance system. The facility has supplied South Orange County with high quality water since it was placed into operation in January 2017. The City began receiving water from Baker Treatment Plant in December 2017.

6.2.4 Storage

Storage is a major component of MET's dry year resource management strategy. MET's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan (WSAP), is dependent on its storage resources. Due to the pattern of generally drier hydrology, the groundwater basins and local reservoirs have dropped to low operating levels and remain below healthy storage levels. For example, the Colorado River Basin's system storage at the close of 2020, was at or near its lowest since 2000, so there is very little buffer to avoid a shortage from any future period of reduced precipitation and runoff (MET, 2021).

MET stores water in both DWR and MET surface water reservoirs. MET's surface water reservoirs are Lake Mathews, Lake Skinner, and Diamond Valley Lake, which have a combined storage capacity of over 1 MAF. Approximately 650,000 AF are stored for seasonal, regulatory, and drought use, while approximately 370,000 AF are stored for emergency use.

MET also has contractual rights to DWR surface reservoirs, such as 65 thousand acre-feet (TAF) of flexible storage at Lake Perris (East Branch terminal reservoir) and 154 TAF of flexible storage at Castaic Lake (West Branch terminal reservoir) that provides MET with additional options for managing SWP deliveries to maximize the yield from the project. This storage can provide MET with up to 44 TAF of additional supply over multiple dry years, or up to 219 TAF to Southern California in a single dry year (MET, 2021).

MET endeavors to increase the reliability of water supplies through the development of flexible storage and transfer programs including groundwater storage (MET, 2021). These include:

- **Lake Mead Storage Program:** Executed in 2006, this program allows MET to leave excessively conserved water in Lake Mead, for exclusive use by MET in later years. MET created "Intentionally Created Surplus" (ICS) water in 2006-2007, 2009-2012, and 2016-2019, and withdrew ICS water in 2008 and 2013-2015. As of January 1, 2021, MET had a total of 1.3 MAF of Extraordinary Conservation ICS water.
- **Semitropic Storage Program:** The maximum storage capacity of the program is 350 TAF, and the minimum and maximum annual yields available to MET are 34.7 TAF and 236.2 TAF, respectively. The specific amount of water MET can expect to store in and subsequently receive from the program depends on hydrologic conditions, any regulatory requirements restricting MET's ability to export water for storage and demands placed by other program participants. During wet years, MET has the discretion to use the program to store portions of its SWP supplies which are in excess, and during dry years, the Semitropic Water Storage District returns MET's previously stored water to MET by direct groundwater pump-in or by exchange of surface water supplies.

- **Arvin-Edison Storage Program:** The storage program is estimated to deliver 75 TAF, and the specific amount of water MET can expect to store in and subsequently receive from the program depends on hydrologic conditions and any regulatory requirements restricting MET's ability to export water for storage. During wet years, MET has the discretion to use to program to store portions of its SWP supplies which are in excess, and during dry years, the Arvin-Edison Water Storage District returns MET's previously stored water to MET by direct groundwater pump-in or by exchange of surface water supplies.
- **Antelope Valley-East Kern (AVEK) Water Agency Exchange and Storage Program:** Under the exchange program, for every two AF MET receives, MET returns 1 AF back to AVEK, and MET will also be able to store up to 30 TAF in the AVEK's groundwater basin, with a dry-year return capability of 10 TAF.
- **High Desert Water Bank Program:** Under this program, MET will have the ability to store up to 280 TAF of its SWP Table A or other supplies in the Antelope Valley groundwater basin, and in exchange will provide funding for the construction of monitoring and production wells, turnouts from the California Aqueduct, pipelines, recharge basins, water storage, and booster pump facilities. The project is anticipated to be in operation by 2025.
- **Kern-Delta Water District Storage Program:** This groundwater storage program has 250 TAF of storage capacity, and water for storage can either be directly recharged into the groundwater basin or delivered to Kern-Delta Water District farmers in lieu of pumping groundwater. During dry years, the Kern-Delta Water District returns MET's previously stored water to MET by direct groundwater pump-in return or by exchange of surface water supplies.
- **Mojave Storage Program:** MET entered into a groundwater banking and exchange transfer agreement with Mojave Water Agency that allows for the cumulative storage of up to 390 TAF. The agreement allows for MET to store water in an exchange account for later return.

6.2.5 Planned Future Sources

Beyond the programs highlighted in Sections 6.2.1 through 6.2.3, MET continues to invest in efforts to meet its goal of long-term regional water supply reliability, focusing on the following:

- Continuing water conservation
- Developing water supply management programs outside of the region
- Developing storage programs related to the Colorado River and the SWP
- Developing storage and groundwater management programs within the Southern California region
- Increasing water recycling, groundwater recovery, stormwater, and seawater desalination
- Pursuing long-term solutions for the ecosystem, regulatory and water supply issues in the California Bay-Delta (MET, 2021).

6.3 Groundwater

Historically, local groundwater has been the cheapest and most reliable source of supply for the City. The City supplements its demands with groundwater extracted from a subunit of the non-adjudicated San Mateo Valley Groundwater Basin (Basin). In FY 2019-20, the City relied on 390 AFY – approximately 5% of the City's water supply portfolio for FY 2019-20 – from the Basin to meet its demands. The City has two operating wells, Well 6 and Well 8, located near the San Clemente Golf Course (Dudek, 2015). The City has established a safe pumping yield on its local subunit of the Basin of approximately 500 AFY to prevent seawater intrusion and overdraft, while using regular water quality monitoring to maximize sustainable groundwater production in any given year.

6.3.1 Basin Characteristics

Per DWR's designation, the Basin is a non-adjudicated, very low-priority basin located to the south of the Orange County boundary, within the boundary of the Marine Corps Base (Base), Camp Pendleton, in San Diego County. The Basin covers an area of 4.7 square miles (DWR, 2019a). Historically, the Base utilized groundwater from the Basin for Base use and for irrigation of agricultural lease lands on Base property. Recent data have not been obtained on use of water from the basin by the Base.

Marine terrace deposits characterized as predominantly fine to coarse sand and gravel in the southern part of San Clemente are underlain by the San Mateo and Capistrano Formations. These deposits are in direct hydraulic contact with the ocean and are subject to seawater intrusion. The San Mateo Formation consists of marine sands and conglomerates, while the Capistrano Formation that underlies it consists of interbedded sandstone and shale zones, with nested turbidite-filled channels that are conducive to groundwater production (Dudek, 2015).

Confined groundwater in the Basin is produced from a deep-lying series of semi-consolidated sandstone beds with numerous coarse gravel lenses. The majority of the soils have slow or very slow infiltration rates. The usable surface area of the Basin was identified to be 107 acres with a hypothetical usable depth ranging from 10 to 110 feet (Boyle Engineering Corporation, 1987). The City has successfully relied on well water production during drought years.

Groundwater quality from the City's two wells is described in Section 7.2.3.2.

6.3.2 Basin Management

Due to the unadjudicated, very low-priority designation of the San Mateo Valley Basin, a formal management plan does not exist. However, the City worked with Dudek to prepare a Water Well Aquifer Study in 2015 to evaluate the Basin's water quality and the City wells' production operations.

The Basin has recharge areas along San Mateo Creek, downgradient from drinking water supply wells (DWR, 2019b).

6.3.3 Historical Groundwater Production

The City pumps groundwater through its two operating wells: Wells 6 and 8. Besides a slight peak in FY 2017-18, groundwater produced by the City in the last five years have been relatively stable (Table 6-4).

Table 6-4: Groundwater Volume Pumped (AF)

DWR 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	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	San Mateo Groundwater Basin	433	462	620	411	390
	TOTAL	433	462	620	411	390
NOTES: Source - OC Retail Water Usage FY 2015 to FY 2020 (MWDOC, 2020)						

6.3.4 Planned Future Sources

At the time of this writing, the City does not have plans to drill additional wells in the Basin.

6.4 Surface Water

In FY 2019-20, 11 AFY – approximately 0.1% of the City's water supply portfolio for FY 2019-20 – was attributed to local surface water from Irvine Lake and treated at the Baker Treatment Plant. The surface water is used during emergencies or when untreated imported water is unavailable from MET. The City does not rely on surface water as a primary water source. For more detail on the Baker Treatment Plant, refer to Section 6.2.3.

6.4.1 Existing Sources

Santiago Reservoir, or Irvine Lake, is the largest surface water reservoir in Orange County. Irvine Lake was built in 1931 and captures runoff from the upper Santiago Creek Watershed, as well as stores imported water (Orange County Local Agency Formation Commission, 2020). The 700-acre Irvine Lake is co-owned by IRWD and Serrano Water District. The lake holds more than 9 billion gallons of water and is contained by the 810-foot-tall Santiago Dam. IRWD uses water from Irvine Lake as a source of water for non-drinking purposes such as irrigation and, during winters with above average precipitation, as a source of water for the Baker Treatment Plant, which is a source of supply for the City (Section 6.2.3). Serrano Water District also uses Irvine Lake to provide treated drinking water to its customers in the City of Villa Park and parts of the City of Orange. Both agencies balance the benefits of storing water in Irvine Lake with minimizing evaporation and preserving the ability to capture rainwater from the surrounding hills. During years with less rainfall, IRWD and Serrano Water District also add imported water from MET to the lake (IRWD, 2021).

6.4.2 Planned Future Sources

As of 2021, there are no additional surface water sources planned in the City's service area.

6.5 Stormwater

6.5.1 Existing Sources

There are, currently, no direct stormwater uses in the City's Service area.

6.5.2 Planned Future Sources

As of 2021, there are no planned direct uses of stormwater in the City's service area.

6.6 Wastewater and Recycled Water

The City is directly involved in wastewater services through its ownership and operation of the wastewater collection system in its service area. Additionally, the City owns and operates wastewater treatment facilities. The sewer system service area encompasses about 14.3 square miles and includes approximately 180 miles of sewer main.

Recycled water is wastewater that is treated through primary, secondary, and tertiary processes and is acceptable for most non-potable water purposes such as irrigation and commercial and industrial process water per Title 22 requirements. Recycled water opportunities have continued to grow in Southern California as public acceptance and the need to expand local water resources continues to be a priority. Recycled water also provides a degree of flexibility and added reliability during drought conditions when imported water supplies are restricted. The following sections expand on the existing agency collaboration involved in these efforts as well as the City's projected recycled water use over the next 25 years.

6.6.1 Agency Coordination

SOCWA was formed in 2001 as a Joint Powers Authority with ten member agencies, consisting of local retail water agencies and cities that provide water to their residents, to fulfill their wastewater needs. The City's primary role in SOCWA is for discharge of treated wastewater in the jointly owned San Juan Creek Ocean Outfall and for wastewater pretreatment. SOCWA's other member agencies include El Toro Water District, Irvine Ranch Water District, City of Laguna Beach, Moulton Niguel Water District, South Coast Water District, City of San Juan Capistrano, Santa Margarita Water District, Trabuco Canyon Water District, and Emerald Bay Services District. Figure 6-1 shows a map of the SOCWA member agencies.

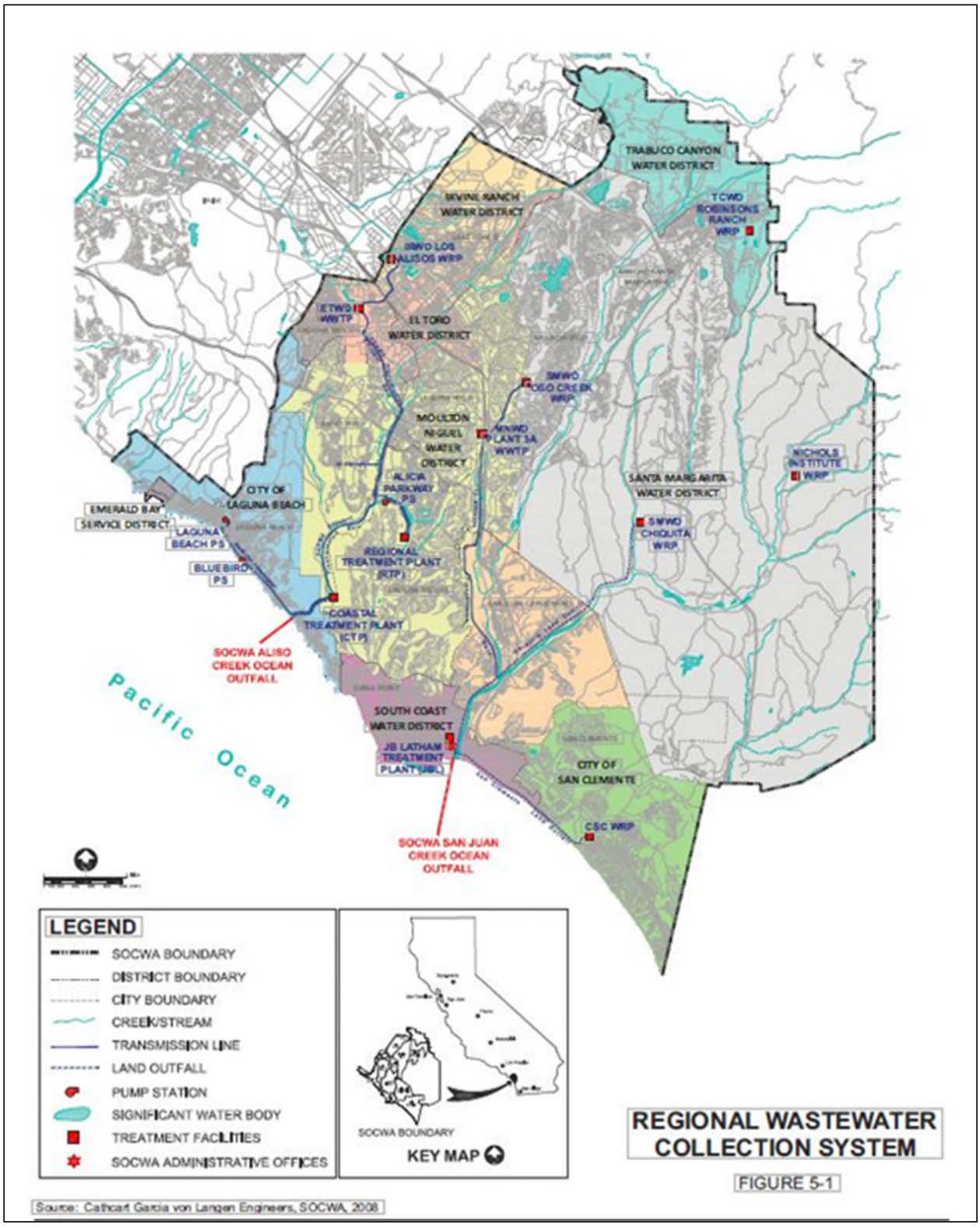

Figure 6-2: SOCWA Member Agencies

6.6.2 Wastewater Description and Disposal

The City provides wastewater service to approximately 84% of the incorporated area of the City boundaries. Wastewater in the remaining portions of the system has typically been serviced by South Coast Water District and Santa Margarita Water District; however, since December 2017, the City has been receiving approximately 600,000 gallons per day of raw wastewater from Santa Margarita Water District's Talega service area through an interim Agreement. The City and SMWD are in the process of formalizing a long-term agreement to continue the conveyance and treatment of wastewater from the Talega area of the City.

The City's 14.3 square mile service area contains approximately 180 miles of gravity sewers ranging in size from 6" to 24" in diameter, 12 pump stations and five miles of pressure force mains. Wastewater is conveyed to the treatment plant located on Avenida Pico from two pump of the stations situated in the vicinity of the Wastewater Reclamation Plant (WRP). The pump stations are equipped with variable frequency drives that pace incoming flows to the WRP.

Wastewater first enters the WRP at the headworks building for metering, screening, and grit removal. Incoming flows are accurately metered through a Parshall flume combined with ultra-sonic flow meter, screened through bar screens to remove the larger debris that can clog downstream piping, pumps and equipment, and then conveyed into grit tanks for removal of coarse material such as sand and other fine inorganic material particles that cause wear in pumps and occupy valuable space in the digesters.

The first treatment process is primary clarification. The clarifiers provide a quiescent zone to promote the settling of suspended solids. Along with the removal of most of these solids, a portion of the biological oxygen demand (BOD) substances and grease and oils are also removed.

The next step is the activated sludge process that consists of aeration basins and secondary clarifiers. The aeration basins contain a population of bacteria and other microorganisms known as mixed liquor. The mixed liquor culture feeds on the primary effluent suspended material and soluble BOD. Air is pumped and diffused into the aeration basins to provide aerobic conditions and mixing.

The mixed liquor then flows to the secondary clarifiers, which are similar to the primary units. The mixed liquor settles and is collected at one end of the basin. Most of the settled mixed liquor is returned to the aeration basins to treat incoming primary effluent. To maintain balance in this biological treatment process, a portion of the mixed liquor is removed. The clear liquid called secondary effluent then flows through the land outfall to SOCWA's Ocean Outfall for disposal.

A portion is diverted and pumped to the reclamation process. Reclamation provides further treatment beyond secondary and is commonly referred to as Tertiary Treatment. The process includes a chemical addition to promote the formation of floc. Flocculation is the aggregation of secondary effluent suspended solids into larger particles. The flocculated effluent is then filtered and disinfected by chlorine. The tertiary effluent is used within the plant and distributed offsite to City customers.

Effluent from the City's Water Treatment Plant that is not used for recycled water enters a land outfall splitter box before discharging to SOCWA's Ocean Outfall for disposal. Turbidity levels are monitored at the splitter box and, if within specifications, a portion of secondary effluent is diverted to the reclamation facilities for tertiary treatment.

Solids removed from the primary clarifiers (primary sludge) and secondary clarifiers (waste activated sludge) are pumped to anaerobic digesters. The digesters further treat the solids to reduce their organic content. The resulting bio-solids are then conditioned, dewatered, and trucked to a regional composting site.

Table 6-5 summarizes the wastewater collected by the City in its collection system in 2020. Table 6-6 shows the amount of the City's wastewater treated and disposed of by SOCWA in 2020.

Table 6-5: Wastewater Collected Within Service Area in 2020 (AF)

DWR 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					
	Percentage of 2020 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	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?	Is WWTP Operation Contracted to a Third Party?
San Clemente	Metered	4,354	San Clemente/SOCWA	WRP	Yes	No
Total Wastewater Collected from Service Area in 2020:		4,354				
NOTES: Wastewater quantified by influent metering at WRP. Includes approximately 600,000 gallons per day of wastewater originating from Santa Margarita Water District.						

Table 6-6: Wastewater Treatment and Discharge within Service Area in 2020 (AF)

DWR Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020										
☐	No wastewater is treated or disposed of within the UWMP service area. The Supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
WRP	San Juan Creek Ocean Outfall	Dana Point	Ocean outfall	No	Secondary	4,354	3,199	1,155	0	0
					Total	4,354	3,199	1,155	0	0
NOTES:										

6.6.3 Current Recycled Water Uses

The City currently owns and operates a 5 MGD WRP that takes a portion of the City's wastewater and treats it to tertiary levels. The recycled water is used for irrigation and process water at the treatment plant and sent offsite to customers for irrigation and grading. In 2016, the City expanded the WRP's recycled water capabilities and was able to increase its recycled water availability from 3 landscaping customers to approximately 140 customers. In FY 2019-20, approximately 1,155 AF of recycled water from the WRP, or approximately 14% of the City's total water demand in the same year, was used to irrigate the City's landscapes.

6.6.4 Projected Recycled Water Uses

The City currently uses water from its recycled water system for direct non-potable reuse such as landscape irrigation. As of 2020, the City has not solidified which neighborhoods and areas will be included in the next expansion, though staff is reviewing the cost-effectiveness of several expansion options and considering levels of interest from specific HOAs and City facilities. The City's goal is to increase RW production beginning before 2025 and completing the expansion by 2030. Additionally, the City did enter into a temporary agreement (with the intention to develop a permanent one) with neighboring Santa Margarita Water District in December 2017 to accept wastewater flows from the Talega area of San Clemente, which are currently being delivered through the Avenida Pico trunk line for treatment at the WRP. These sewer flows were previously treated by SMWD at their Chiquita Water Reclamation Plant. The City previously had excess plant capacity to treat these additional (approximately 0.6 MGD) flows and they will help contribute to the City's ability to eventually serve additional recycled water customers with an expanded non-potable distribution system. In addition, the City plans to buy into the construction of the recently completed Trampas Canyon reservoir, which SMWD will use for the storage of recycled water. This will allow the City to store treated wastewater in the winter months both for use by the City and for sale to SMWD during the warmer months when the demand for landscape irrigation water peaks.

Table 6-7 below illustrates the current and projected uses for recycled water in the City. The projected 2020 recycled water use from the City's 2015 UWMP was compared to the 2020 actual recycled water use as shown in Table 6-8. Recycled water for 2020 was 82.5% of what was predicted for 2020 in the 2015 UWMP.

Table 6-7: Retail: Recycled Water Direct Beneficial Uses Within Service Area

DWR 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:	WRP										
Name of Supplier Operating the Recycled Water Distribution System:	San Clemente										
Supplemental Water Added in 2020 (volume)											
Source of 2020 Supplemental Water											
Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape irrigation (exc golf courses)	N/A	N/A	See beneficial use type	Tertiary	545	590	710	710	710	710
Golf course irrigation	N/A	N/A	See beneficial use type	Tertiary	382	380	380	380	380	380
Industrial use	N/A	N/A	See beneficial use type	Tertiary	228	230	230	230	230	230
				Total:	1,150	1,200	1,320	1,320	1,320	1,320
NOTES:											

Table 6-8: Retail: 2020 UWMP Recycled Water Use Projection Compared to 2020 Actual

DWR 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**
Agricultural irrigation			
Landscape irrigation (excludes golf courses)		900	545
Golf course irrigation		450	382
Commercial use			
Industrial use		50	228
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		1,400	1,155
NOTE:			

6.6.5 Potential Recycled Water Uses

The City recognizes the benefits of recycled water use and recently completed an expansion of its WRP. The City continues to support, encourage, and contribute to the continued development of recycled water and potential uses throughout the region. Staff is evaluating the potential for a Phase II expansion and regional uses for its recycled water.

6.6.6 Optimization Plan

The City has advocated the use of recycled water since 1957 and requires recycled systems where applicable and feasible. Using recycled water also provides customers with a more reliable supply of water that is not subject to water supply allocations imposed by MET or MWDOC. The City will conduct future cost/benefit analyses for recycled water projects and seek creative solutions to facilitate the conversion of dedicated irrigation accounts from potable to recycled water, in coordination with MWDOC, MET and other cooperative agencies. These include solutions for funding, regulatory requirements, institutional arrangements, and public acceptance.

The City and Santa Margarita Water District (SMWD) are currently developing an agreement for the sale and purchase of recycled water between the agencies. The proposed interconnection will allow for the distribution of recycled water through a jointly owned recycled water pump station and pressure reducing station. SMWD may have an option to purchase unused recycled water from the City, and the City would have access to store water in Trampas Canyon Recycled Water Reservoir for use during WRP outages or peak demand periods.

Table 6-9: Retail: Methods to Expand Future Recycled Water Use

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AFY)
Recycled Water Expansion Phase II	Expansion of existing recycled water distribution system to provide access/ conversion from potable water to additional irrigation customers/HOAs.	2025	165
		Total	165
NOTES:			

6.7 Desalination Opportunities

In 2001, MET developed a Seawater Desalination Program (SDP) to provide incentives for developing new seawater desalination projects in MET's service area. In 2014, MET modified the provisions of their Local Resources Program (LRP) to include incentives for locally produced seawater desalination projects that reduce the need for imported supplies. To qualify for the incentive, proposed projects must replace an existing demand or prevent new demand on MET's imported water supplies. In return, MET offers three incentive formulas under the program:

- Sliding scale incentive up to $340 per AF for a 25-year agreement term, depending on the unit cost of seawater produced compared to the cost of MET supplies.
- Sliding scale incentive up to $475 per AF for a 15-year agreement term, depending on the unit cost of seawater produced compared to the cost of MET supplies.
- Fixed incentive up to $305 per AF for a 25-year agreement term.

Developing local supplies within MET's service area is part of their IRP goal of improving water supply reliability in the region. Creating new local supplies reduce pressure on imported supplies from the SWP and Colorado River.

On May 6th, 2015, the SWRCB approved an amendment to the state's Water Quality Control Plan for the Ocean Waters of California (California Ocean Plan) to address effects associated with the construction and operation of seawater desalination facilities (Desalination Amendment). The amendment supports the use of ocean water as a reliable supplement to traditional water supplies while protecting marine life and water quality. The California Ocean Plan now formally acknowledges seawater desalination as a beneficial use of the Pacific Ocean and the Desalination Amendment provides a uniform, consistent process for permitting seawater desalination facilities statewide.

If the following projects are developed, MET's imported water deliveries to Orange County could be reduced. These projects include the Huntington Beach Seawater Desalination Project and the Doheny Desalination Project.

Brackish groundwater is groundwater with a salinity higher than freshwater, but lower than seawater. Brackish groundwater typically requires treatment using desalters.

The City has not attempted to investigate seawater desalination on its own due to economic and physical impediments. The City participated in a pilot program to explore desalination at Doheny State Beach. A project is currently being evaluated by South Coast Water District and the City of Laguna Beach. There may be potential for future City involvement in this project as it is developed.

6.7.1 Ocean Water Desalination

Huntington Beach Seawater Desalination Project – Poseidon Resources LLC (Poseidon), a private company, is developing the Huntington Beach Seawater Desalination Project to be co-located at the AES Power Plant in the City of Huntington Beach along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 MGD (56,000 AFY) of drinking water to provide approximately 10% of Orange County's water supply needs.

Over the past several years, Poseidon has been working with OCWD on the general terms and conditions for selling the water to OCWD. OCWD and MWDOC have proposed a few distribution options to agencies in Orange County. The northern option proposes the water be distributed to the northern agencies closer to the plant within OCWD's service area with the possibility of recharging/injecting a portion of the product water into the OC Basin. The southern option builds on the northern option by delivering a portion of the product water through the existing OC-44 pipeline for conveyance to the South Orange County water agencies. A third option is also being explored that includes all of the product water to be recharged into the OC Basin. Currently, a combination of these options could be pursued.

The Huntington Beach Seawater Desalination project plant capacity of 56,000 AFY would be the single largest source of new, local drinking water available to the region. In addition to offsetting imported demand, water from this project could provide OCWD with management flexibility in the OC Basin by augmenting supplies into the Talbert Seawater Barrier to prevent seawater intrusion.

In May 2015, OCWD and Poseidon entered into a non-binding Term Sheet that provided the overall partner structure in order to advance the project. Based on the initial Term Sheet, which was updated in 2018, Poseidon would be responsible for permitting, financing, design, construction, and operations of the treatment plant while OCWD would purchase the production volume, assuming the product water quality and quantity meet specific contract parameters and criteria. Furthermore, OCWD would then distribute the water in Orange County using one of the proposed distribution options described above.

Currently, the project is in the regulatory permit approval process with the Regional Water Quality Control Board and the California Coastal Commission. Once all of the required permits are approved, Poseidon will work with OCWD and interested member agencies in developing a plan to distribute the water. Subsequent to the regulatory permit approval process, and agreement with interested parties, Poseidon estimates that the project could be online as early as 2027.

Under guidance provided by DWR, the Huntington Beach Seawater Desalination Plant's projected water supplies are not included in the supply projections due to its current status within the criteria established by State guidelines (DWR, 2020c).

Doheny Desalination Project – South Coast Water District (SCWD) is proposing to develop an ocean water desalination facility in Dana Point. SCWD intends to construct a facility with an initial capacity of up to 5 million gallons per day (MGD). The initial up to 5 MGD capacity would be available for SCWD and potential partnering water agencies to provide a high quality, locally controlled, drought-proof water supply. The desalination facility would also provide emergency backup water supplies, should an earthquake, system shutdown, or other event disrupt the delivery of imported water to the area. The Project would consist of a subsurface slant well intake system (constructed within Doheny State Beach), raw (sea) water conveyance to the desalination facility site (located on SCWD owned property), a seawater reverse osmosis (SWRO) desalination facility, brine disposal through an existing wastewater ocean outfall, solids handling facilities, storage, and potable water conveyance interties to adjacent local and regional distribution infrastructure.

The Doheny Ocean Desalination Project has been determined as the best water supply option to meet reliability needs of SCWD and South Orange County. SCWD is pursuing the Project to ensure it meets the water use needs of its customers and the region by providing a drought-proof potable water supply, which diversifies SCWD's supply portfolio and protects against long-term imported water emergency outages and supply shortfalls that could have significant impact to coastal communities, public health, and the local economy. Phase I of the Project (aka, the "Local" Project) will provide SCWD and the region with up to 5 MGD of critical potable water supply that, together with recycled water, groundwater, and conservation, will provide the majority of SCWD's water supply through local reliable sources. An up to 15 MGD capacity project has been identified as a potential future "regional" project that could be phased incrementally, depending on regional needs.

On June 27, 2019, SCWD certified the final EIR and approved the Project. The Final EIR included considerable additional information provided at the request of the California Coastal Commission and the San Diego Regional Water Quality Control Board, including an updated coastal hazard analysis, updated brine discharge modeling, updated groundwater modeling, and updated hydrology analysis. The approval of the Project also included a commitment to 100 percent carbon neutrality through a 100 percent offset of emissions through the expansion of Project mitigation and use of renewable energy sources. SCWD is currently in the permitting process and finalizing additional due-diligence studies. If implemented, SCWD anticipates an online date of 2025.

Under guidance provided by DWR, the Doheny Seawater Desalination Project's projected water supplies are not included in the supply projections due to its current status within the criteria established by State guidelines (DWR, 2020c).

6.7.2 Groundwater Desalination

There are limited brackish groundwater opportunities within the City's service area. The City's Groundwater Supply and Management Study from 1987 has identified small pockets of groundwater in the Prima Deshecha Canada and Segunda Deshecha Canada sub-basins. Due to the low yield and potential for salt-water intrusion, the City has yet to consider these sources of groundwater.

6.8 Water Exchanges and Transfers

Interconnections with other agencies result in the ability to share water supplies during short-term emergency situations or planned shutdowns of major imported water systems. However, beyond short-term outages, transfers can also be involved with longer term water exchanges to deal with droughts or water allocation situations. The following subsections describe the City's existing and planned exchanges and transfers.

6.8.1 Existing Exchanges and Transfers

The City maintains interconnections with the SMWD, SCWD, and the City of San Juan Capistrano. It also maintains an emergency interconnection with Irvine Ranch Water District (IRWD) through their 2008 Emergency Interconnect Agreement with participating south Orange County water agencies, which allows the City to access IRWD water supplies, including north Orange County groundwater, when available in times of water shortages or other regional supply challenges.

6.8.2 Planned and Potential Exchanges and Transfers

The City does not currently have plans to introduce new exchanges and transfers. However, MWDOC continues to help its retail agencies develop transfer and exchange opportunities that promote reliability within their systems. Therefore, MWDOC will look to help its retail agencies navigate the operational and administrative issues of transfers within the MET distribution system.

On a regional scale, the Santa Ana River Conservation and Conjunctive Use Project (SARCCUP) is a joint project established by five regional water agencies within the Santa Ana River Watershed (Eastern Municipal Water District, Inland Empire Utilities Agency, Western Municipal Water District, OCWD, and San Bernardino Valley Municipal Water District).

In 2016, SARCCUP was successful in receiving $55 million in grant funds from Proposition 84 through DWR. The overall SARCCUP program awarded by Proposition 84, consists of three main program elements:

- Watershed-Scale Cooperative Water Banking Program
- Water Use Efficiency: Landscape Design and Irrigation Improvements and Water Budget Assistance for Agencies
- Habitat Creation and *Arundo Donax* Removal from the Santa Ana River

The Watershed-Scale Cooperative Water Banking Program is the largest component of SARCCUP and since 2016, Valley, MET, and the four SARCCUP-MWD Member Agencies, with MWDOC representing OCWD, have been discussing terms and conditions for the ability to purchase surplus water from Valley

to be stored in the Santa Ana River watershed. With the Valley and MET surplus water purchase agreement due for renewal, it was the desire of Valley to establish a new agreement with MET that allows a portion of its surplus water to be stored within the Santa Ana River watershed.

An agreement between MET and four SARCCUP-MWD Member Agencies was approved in 2021 that gives the SARCCUP agencies the ability to purchase a portion (up to 50%) of the surplus water that San Bernardino Valley Municipal Water District (Valley), a SWP Contractor, sells to MET. Such water will be stored in local groundwater basins throughout the Santa Ana River watershed and extract during dry years to reduce the impacts from multiyear droughts. In Orange County, 36,000 AF can be stored in the OC Basin for use during dry years. More importantly, this stored SARCCUP water can be categorized as "extraordinary supplies", if used during a MET allocation, and can enhance a participating agencies' reliability during a drought. Moreover, if excess water is available MWDOC can purchase additional water for its service area.

Further details remain to be developed between OCWD, retail agencies, and MWDOC in how the water will be distributed in Orange County and who participates.

6.9 Summary of Future Water Projects

The City continually reviews practices that will provide its customers with adequate and reliable supplies. Trained staff continue to ensure the water quality is safe and the water supply will meet present and future needs in an environmentally and economically responsible manner.

Although the City has various projects planned to maintain and improve the water system, there are currently no City-specific planned projects that have both a concrete timeline and a quantifiable increase in supply.

6.9.1 City Initiatives

The City anticipates water demand in the City to remain relatively constant over the next 25 years. Any new water supplies that may be developed would primarily serve to provide a redundant or more cost-effective source of water. Alternatively, the City plans to focus its capital project efforts on better managing water conveyance, improving yields from its own existing sources, and replacing or repairing existing infrastructure.

The projects that have been identified by the City to improve the City's water supply reliability and enhance the operations of the City include facilities projects such as filter plant and pump station rehabilitation, replacement and construction of new pump stations, dead end water system improvements, meter replacements, vault lid replacement at the Avenida Columbo Pressure Reducing Station, updates to the water and sewer standards, water system rehabilitation and an air-vac replacement program. Projects identified in the City's Capital Improvement Program include those listed below. For the full list of projects, refer to the City's Capital Improvement Program.

Well Filter Plant Rehabilitation - This plant treats water from Wells 6 and 8 for iron and manganese. Construction started in fall 2020. Anticipated completion is fall 2021.

Blanco Pump Station Rehabilitation - Located on Via Blanco, this pump station that conveys water to Reservoir No. 9 will be expanded to increase capacity to improve system performance based on the loss

of a critical easement line. The project is currently in the design phase and construction is expected to take place in FY 2022-23.

Reata Pump Station Rehabilitation - This pump station conveys water to Reservoir No. 7 and will be expanded for greater pumping capacity based on the loss of a critical easement line. The project is currently in the design phase and the phase will be completed in 2021, with the construction expected to take place in FY 2022-23.

Pico Booster Pump Station Pump Replacement - This pump conveys water from the Reservoir 11 subzone. Reservoir 11A was constructed for potable water and Reservoir 11 was converted to recycled water storage. The pumps will be replaced to improve pumping efficiency and reduce power consumption. The design phase of the project is completed, and construction is anticipated in the next two years.

Calle Real Pump Station Rehabilitation – The project is currently in 60% design. Construction anticipated to begin in FY 2022-23. The upgraded station will pump water to Reservoir No. 10 and will provide system redundancy for improved reliability in the event of an unplanned outage.

Reeves Pump Station (New Pump Station) – Design is expected to be completed in 2021. Construction is anticipated to begin in FY 2024-25. The pump station will improve hydraulics to Reservoir 7 and system redundancy during emergency events or outages.

Costero Risco Pressure Reducing Station Rehabilitation – The Costero Risco Pressure Reducing Station Vault has been experiencing excessive lateral pressures from the slope above and is in need of replacement. The project proposes to install a new concrete vault in the same location with improved subsurface drainage as well as constructing shoring behind the vault.

Dead End Water System Improvements – There are several locations throughout the City's potable water distribution system where the water mains "dead-end," not allowing this water to cycle through the water distribution system. By installing a fire hydrant or blow off at the dead-ends, operators will be able to flush the stagnated water out of the system. This will allow the Utilities Department to more effectively maintain the water quality throughout the potable water distribution system.

6.9.2 Regional Initiatives

Beyond City-specific projects, the City consistently coordinates its long-term water shortage planning with MWDOC and its neighboring agencies. MWDOC has identified the following future regional projects, some of which can indirectly benefit the City to further increase local supplies and offset imported supplies (CDM Smith, 2019).

Poseidon Huntington Beach Ocean Desalination Project – Poseidon proposes to construct and operate the Huntington Beach Ocean Desalination Plant on a 12-acre parcel adjacent to the AES Huntington Beach Generating Station. The facility would have a capacity of 50 MGD and 56,000 AFY, with its main components consisting of a water intake system, a desalination facility, a concentrate disposal system, and a product water storage tank. This project would provide both system and supply reliability benefits to South Orange County (SOC), the OC Basin, and Huntington Beach. The capital cost in the initial year for the plant is $1.22 billion.

Doheny Ocean Desalination Project – SCWD is proposing to construct an ocean water desalination facility in Dana Point at Doheny State Beach. The facility would have an initial up to 5 MGD capacity, with the potential for future expansions up to 15 MGD. The project's main components are a subsurface water intake system, a raw ocean water conveyance pipeline, a desalination facility, a seawater reverse osmosis (SWRO) desalination facility, a brine disposal system, and a product water storage tank.

San Juan Watershed Project – SMWD and other project partners have proposed a multi-phased project within the San Juan Creek Watershed to capture local stormwater and develop, convey, and recharge recycled water into the San Juan Groundwater Basin and treat the water upon pumping it out of the basin. The first phase includes the installation of three rubber dams within San Juan Creek to promote in-stream recharge of the basin, with an anticipated production of 700 AFY on average. The second phase would develop additional surface water and groundwater management practices by using stormwater and introducing recycled water for infiltration into the basin and has an anticipated production of up to 2,660 to 4,920 AFY. The third phase will introduce recycled water directly into San Juan Creek through live stream recharge, with an anticipated production of up to 2,660 AFY (SMWD, 2021).

Cadiz Water Bank – SMWD and Cadiz, Inc. are developing this project to create a new water supply by conserving groundwater that is currently being lost to evaporation and recovering the conserved water by pumping it out of the Fenner Valley Groundwater Basin to convey to MET's CRA. The project consists of a groundwater pumping component that includes an average of 50,000 AFY of groundwater that can be pumped from the basin over a 50-year period, and a water storage component that allows participants to send surplus water supplies to be recharged in spreading basins and held in storage.

South Orange County Emergency Interconnection Expansion – MWDOC has been working with the SOC agencies on improvements for system reliability primarily due to the risk of earthquakes causing outages of the MET imported water system as well as extended grid outages. Existing regional interconnection agreements between IRWD and SOC agencies provides for the delivery of water through the IRWD system to participating SOC agencies in times of emergency. MWDOC and IRWD are currently studying an expansion of the program, including the potential East Orange County Feeder No. 2 pipeline and an expanded and scalable emergency groundwater program, with a capital cost of $867,451.

SARCCUP – SARCCUP is a joint project established between MET, MWDOC, Eastern MWD, Western MWD, Inland Empire Utilities Agency, and OCWD that can provide significant benefits in the form of additional supplies during dry years for Orange County. Surplus SWP water from San Bernardino Valley Water District (SBVMWD) can be purchased and stored for use during dry years. This water can even be considered an extraordinary supply under MET allocation Plan, if qualified under MET's extraordinary supply guidelines. OCWD has the ability to store 36,000 AF of SARCCUP water and if excess water is available MWDOC has the ability to purchase additional water. Further details remain to be developed between OCWD, retail agencies, and MWDOC in how the water will be distributed in Orange County and who participates.

Moulton Niguel Water District (MNWD) / OCWD Pilot Storage Program - OCWD entered into an agreement with MNWD to develop a pilot program to explore the opportunity to store water in the OC Basin. The purpose of such a storage account would provide MNWD water during emergencies and/or provide additional water during dry periods. As part of the agreement, OCWD hired consultants to evaluate where and how to extract groundwater from the OC Basin with several options to pump the water to MNWD via the East Orange County Feeder No. 2; as well as a review of existing

banking/exchange programs in California to determine what compensation methodologies could OCWD assess for a storage/banking program.

6.10 Energy Intensity

A new requirement for this 2020 UWMP is an energy intensity analysis of the Supplier's water, wastewater, and recycled water systems, where applicable for a 12-month period. The City owns and operates a water distribution system and a wastewater collection system. Whereas other sections of this report use FY data, this section reports the energy intensity for each system using data from CY2019.

Water and energy resources are inextricably connected. Known as the "water-energy nexus," the California Energy Commission estimates the transport and treatment of water, treatment and disposal of wastewater, and the energy used to heat and consume water account for nearly 20% of the total electricity and 30% of non-power plant related natural gas consumed in California. In 2015, California issued new rules requiring 50% of its power to come from renewables, along with a reduction in greenhouse gas (GHG) emissions to 40% below 1990 levels by 2030. Consistent with energy and water conservation, renewable energy production, and GHG mitigation initiatives, the City reports the energy intensity of its water and wastewater operations.

The methodology for calculating water energy intensity outlined in Appendix O of the UWMP Guidebook was adapted from the California Institute for Energy Efficiency exploratory research study titled "Methodology for Analysis of the Energy Intensity of California's Water Systems" (Wilkinson 2000). The study defines water energy intensity as the total amount of energy, calculated on a whole-system basis, required for the use of a given amount of water in a specific location.

UWMP reporting is limited to available energy intensity information associated with water processes occurring within an urban water supplier's direct operational control. Operational control is defined as authority over normal business operations at the operational level. Any energy embedded in water supplies imparted by an upstream water supplier (e.g., water wholesaler) or consequently by a downstream water purveyor (e.g., retail water provider), or by an end user or customer, is not included in the UWMP energy intensity tables. The City's calculations conform to methodologies outlined in the UWMP Guidebook and Wilkinson study.

6.10.1 Water Supply Energy Intensity

In CY 2019, the City consumed a total of 365.3 kilowatt-hours (kWh) per AF for water extraction and delivery services (Table 6-10). The basis for calculations is provided in more detail in the following subsections.

Table 6-10: Recommended Energy Intensity – Multiple Water Delivery Products

Urban Water Supplier: *San Clemente*

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

Retail Potable Deliveries

Table O-1A: Recommended Energy Reporting - Water Supply Process Approach

Enter Start Date for Reporting Period: 1/1/2019

End Date: 12/31/2019

☐ Is upstream embedded in the values reported?

		Urban Water Supplier Operational Control							
		Water Management Process						Non-Consequential Hydropower (if applicable)	
	Water Volume Units Used	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process	AF	*528.40*	*0*	*0*	*0*	*7,153.40*	*7153.4*	*0*	*7153.4*
Energy Consumed (kWh)	*N/A*	*359,370*	*0*	*0*	*0*	*2,253,767*	*2613137*	*0*	*2613137*
Energy Intensity (kWh/vol.)	*N/A*	*680.1*	*0.0*	*0.0*	*0.0*	*315.1*	*365.3*	*0.0*	*365.3*

Quantity of Self-Generated Renewable Energy

0 kWh

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

Combination of Estimates and Metered Data

Data Quality Narrative:

Volume of Water Entering the Process is based on MWDOC Water Use Report data. San Clemente typically completes Annual Water Audits for fiscal years, so 2019 data was calculated from the 2019 and 2020 audits by adding values for months in CY 2019.
Energy Consumed is based on metered data.

Narrative:

San Clemente relies on local ground/surface water, imported water, and recycled water to meet their customers' water needs. Operational control in the potable water system is limited to groundwater wells and potable water booster stations.
In CY 2019, 528.4 AF of Water was extracted from the San Mateo Groundwater Basin. The City consumed 235.7 AF of surface water in of 2019 and imported 6,389.3 AF of water throughout 2019.
Energy use is based on SDG&E bills.

6.10.1.1 Operational Control and Reporting Period

As described throughout the report, the City is a retail agency that relies on groundwater and imported water.

Water supply energy intensity was calculated for the 2019 calendar year. This is a standard for energy and GHG 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.

6.10.1.2 Volume of Water Entering Processes

According to the MWDOC Water Use Report data, the City extracted 528.4 AF of water from its local subunit of the San Mateo Groundwater Basin, consumed 235.7 AF of surface water, and imported 6,389.3 AF of water in 2019. Water volume is based on water audit data.

6.10.1.3 Energy Consumption and Generation

According to SDG&E bills, groundwater wells consumed 359,370 kWh of electricity and pump stations along the distribution system consumed 2,253,767 kWh of electricity. Currently, the City does not generate renewable energy. Energy consumption is based on metered data.

6.10.2 Wastewater and Recycled Water Energy Intensity

In CY2019, the City consumed 1,254.8 kWh per AF for wastewater collection and treatment services (Table 6-11). The wastewater system in turn provided the water consumed by the recycled water system. The basis for calculations is provided in more detail in the following subsections.

Table 6-11: Recommended Energy Intensity – Wastewater & Recycled Water

Urban Water Supplier: *San Clemente*

Table O-2: Recommended Energy Reporting - Wastewater & Recycled Water					
Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control			
End Date	12/31/2019	Water Management Process			
☐ Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used	AF				
Volume of Wastewater Entering Process (volume units selected above)		*4,182.10*	*4,182.10*	*3,079.00*	*4182.1*
Wastewater Energy Consumed (kWh)		*948,022*	*4,299,476*	*0*	*5247498*
Wastewater Energy Intensity (kWh/volume)		*226.7*	*1028.1*	*0.0*	*1254.8*
Volume of Recycled Water Entering Process (volume units selected above)		*0*	*0*	*1103.1*	*1103.1*
Recycled Water Energy Consumed (kWh)		*0*	*0*	*84818*	*84818*
Recycled Water Energy Intensity (kWh/volume)		*0.0*	*0.0*	*76.9*	*76.9*

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

0 kWh

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

Metered Data

Data Quality Narrative:

The volume of wastewater entering the process is obtained through meter readings. All of this water is treated at the City's Wastewater Treatment Plant and then a portion enters the recycled water system while the rest outfalls to the ocean. Energy consumed is based on metered data.

Narrative:

San Clemente operates the local wastewater collection system as well as a Water Reclamation Plant. Water treated at the reclamation plant is delivered to customers for use in irrigation. The volume of recycled water entering the system is based on metered deliveries to clients. Assuming the rest of the collected wastewater is discharged, we can then calculate the volume of wastewater that is discharged.

6.10.2.1 Operational Control and Reporting Period

The City's existing sewer system is made up of a network of gravity sewers, 12 sewer lift stations, and a Water Reclamation Plant. Water treated at the Water Reclamation Plant either enters the recycled water system or proceeds to an ocean outfall. Similar to the water supply energy intensity, wastewater energy intensity was calculated for the 2019 calendar year.

6.10.2.2 Volume of Wastewater Entering Processes

In CY2019, the City collected and conveyed 4,182.1AF of wastewater based on metered data. This water was treated at the Water Reclamation Plant and 1103.1 AF of recycled water was produced and distributed to customers, resulting in 3,079 AF of wastewater discharged to the ocean outfall. The volume of recycled water delivered is based on data from customer meters.

6.10.2.3 Energy Consumption and Generation

According to San Diego Gas & Electric bills, the City's wastewater lift stations consumed 948,022 kWh of electricity. The City-owned Water Reclamation Plant consumed 4,299,476 kWh of electricity which includes wastewater treatment, recycled water treatment and most recycled water distribution. Two additional pump stations are used to pump recycled water, and they consumed 84,818 kWh in 2019. Currently, the City does not generate renewable energy. Energy consumption data was based on metered data.

6.10.3 Key Findings and Next Steps

Calculating and disclosing direct operationally-controlled energy intensities is another step towards understanding the water-energy nexus. However, much work is still needed to better understand upstream and downstream (indirect) water-energy impacts. When assessing water supply energy intensities or comparing intensities between providers, it is important to consider reporting boundaries as they do not convey the upstream embedded energy or impacts energy intensity has on downstream users. Engaging one's upstream and downstream supply chain can guide more informed decisions that holistically benefit the environment and are mutually beneficial to engaged parties. Suggestions for further study include:

- Supply-chain engagement – The City relies on a variety of water sources for its customers. While some studies have used life cycle assessment tools to estimate energy intensities, there is a need to confirm this data. The 2020 UWMP requirement for all agencies to calculate energy intensity will help the City and neighboring agencies make more informed decisions that would benefit the region as a whole regarding the energy and water nexus. A similar analysis could be performed with upstream supply chain energy, for example, with State Project Water.
- Internal benchmarking and goal setting – With a focus on energy conservation and a projected increase in water demand despite energy conservation efforts, the City's energy intensities will likely decrease with time. Conceivably, in a case where water demand decreases, energy intensities may rise as the energy required to pump or treat is not always proportional to water

delivered. In the course of exploring the water-energy nexus and pursuing renewable energy goals, there is a need to assess whether energy intensity is a meaningful indicator or if it makes sense to use a different indicator to reflect the City's commitment to energy and water conservation.

- Regional sustainability – Water and energy efficiency are two components of a sustainable future. Efforts to conserve water and energy, however, may impact the social, environmental, and economic livelihood of the region. In addition to the relationship between water and energy, over time, it may also be important to consider and assess the connection these resources have on other aspects of a sustainable future.

7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Building upon the water supply identified and projected in Section 6, this key section of the UWMP examines the City's projected water supplies, water demand, and the resulting water supply reliability. Water service reliability reflects the City's ability to meet the water needs of its customers under varying conditions. For the UWMP, water supply reliability is evaluated in two assessments: 1) the Water Service Reliability Assessment and 2) the DRA. The Water Service reliability assessment compares projected supply to projected demand in 2025 through 2045 for three hydrological conditions: a normal year, a single dry year, and a drought period lasting five consecutive years. The DRA, a new UWMP requirement, assesses near-term water supply reliability. It compares projected water supply and demand assuming the City experiences a drought period for the next five consecutive years. Factors affecting reliability, such as climate change and regulatory impacts, are accounted for in the assessment.

7.1 Water Service Reliability Overview

Every urban water supplier is required to assess the reliability of their water service to their customers under normal, single-dry, and multiple dry water years. The City depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. Development of local supplies augments the reliability of the water system. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below. MET's and MWDOC's 2020 UWMPs conclude that they are able to meet full-service demands of their member agencies starting 2025 through 2045 during normal years, a single-dry year, and multiple-dry years. Consequently, the City is projected to meet full-service demands through 2045 for the same scenarios.

MET's 2020 IRP update describes the core water resources that will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2025 through 2045. The foundation of MET's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance, and infrastructure improvements.

Table 7-1 shows the basis of water year data used to predict drought supply availability. The average (normal) hydrologic condition for the MWDOC service area, which the City is a part of, is represented by FY 2017-18 and FY 2018-19 and the single-dry year hydrologic condition by FY 2013-14. The five consecutive years of FY 2011-12 to FY 2015-16 represent the driest five -consecutive year historic sequence for MWDOC's service area. Locally, Orange County rainfall for the five--year period totaled 36 inches, the driest on record.

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

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year	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	2018-2019	-	100%
Single-Dry Year	2014	-	109%
Consecutive Dry Years 1st Year	2012	-	109%
Consecutive Dry Years 2nd Year	2013	-	109%
Consecutive Dry Years 3rd Year	2014	-	109%
Consecutive Dry Years 4th Year	2015	-	109%
Consecutive Dry Years 5th Year	2016	-	109%
NOTES: Assumes an increase of 9% above average year demands in dry and multiple dry years based on the Demand Forecast TM (CDM Smith, 2021). 109% represents the percent of average supply needed to meet demands of a single-dry and multiple-dry years. Since the City is able to meet all of its demand with imported water from MWDOC/MET (on top of local groundwater and recycled water) the percent of average supply value reported is equivalent to the percent of average demand under the corresponding hydrologic condition.			

The following sections provide a detailed discussion of the City's water source reliability. Additionally, the following sections compare the City's projected supply and demand under various hydrological conditions, to determine the City's supply reliability for the 25-year planning horizon.

7.2 Factors Affecting Reliability

In order to prepare realistic water supply reliability assessments, various factors affecting reliability were considered. These include climate change and environmental requirements, regulatory changes, water quality impacts, and locally applicable criteria.

7.2.1 Climate Change and the Environment

Changing climate patterns are expected to shift precipitation patterns and affect water supply availability. Unpredictable weather patterns will make water supply planning more challenging. Although climate

change impacts are associated with exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners (MET, 2021). These areas include:

- A reduction in Sierra Nevada Mountain snowpack.
- Increased intensity and frequency of extreme weather events.
- Prolonged drought periods.
- Water quality issues associated with increase in wildfires.
- Changes in runoff pattern and amount.
- Rising sea levels resulting in:
    - Impacts to coastal groundwater basins due to seawater intrusion.
    - Increased risk of damage from storms, high-tide events, and the erosion of levees.
    - Potential pumping cutbacks to the SWP and CVP.

Other important issues of concern due to global climate change include:

- Effects on local supplies such as groundwater.
- Changes in urban and agricultural demand levels and patterns.
- Increased evapotranspiration from higher temperatures.
- Impacts to human health from water-borne pathogens and water quality degradation.
- Declines in ecosystem health and function.
- Alterations to power generation and pumping regime.
- Increases in ocean algal blooms affected seawater desalination supplies.

The major impact in California is that without additional surface storage, the earlier and heavier runoff (rather than snowpack retaining water in storage in the mountains), will result in more water being lost to the oceans. A heavy emphasis on storage is needed in California.

In addition, the Colorado River Basin supplies have been inconsistent since about the year 2000, with precipitation near normal while runoff has been less than average in two out of every three years. Climate models are predicting a continuation of this pattern whereby hotter and drier weather conditions will result in continuing lower runoff, pushing the system toward a drying trend that is often characterized as long-term drought.

Dramatic swings in annual hydrologic conditions have impacted water supplies available from the SWP over the last decade. The declining ecosystem in the Delta has also led to a reduction in water supply deliveries, and operational constraints, which will likely continue until a long-term solution to these problems is identified and implemented (MET, 2021).

Legal, environmental, and water quality issues may have impacts on MET supplies. It is felt, however, that climatic factors would have more of an impact than legal, water quality, and environmental factors. Climatic conditions have been projected based on historical patterns, but severe pattern changes are still a possibility in the future (MET, 2021).

7.2.2 Regulatory and Legal

Ongoing regulatory restrictions, such as those imposed by the BiOps on the effects of the SWP and the federal CVP operations on certain marine life, also contribute to the challenge of determining water

delivery reliability. Endangered species protection and conveyance needs in the Delta have resulted in operational constraints that are particularly important because pumping restrictions impact many water resources programs – SWP supplies and additional voluntary transfers, Central Valley storage and transfers, and in-region groundwater and surface water storage. BiOps protect special-status species listed as threatened or endangered under the ESAs and impose substantial constraints on Delta water supply operations through requirements for Delta inflow and outflow and export pumping restrictions.

In addition, the SWRCB has set water quality objectives that must be met by the SWP including minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity level. SWRCB plans to fully implement the new Lower San Joaquin River (LSJR) flow objectives from the Phase 1 Delta Plan amendments through adjudicatory (water rights) and regulatory (water quality) processes by 2022. These LSJR flow objectives are estimated to reduce water available for human consumptive use. New litigation, listings of additional species under the ESAs, or regulatory requirements imposed by the SWRCB could further 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.

The difficulty and implications of environmental review, documentation, and permitting pose challenges for multi-year transfer agreements, recycled water projects, and seawater desalination plants. The timeline and roadmap for getting a permit for recycled water projects are challenging and inconsistently implemented in different regions of the state. Indirect potable reuse projects face regulatory restraints such as treatment, blend water, retention time, and Basin Plan Objectives, which may limit how much recycled water can feasibly be recharged into the groundwater basins. New regulations and permitting uncertainty are also barriers to seawater desalination supplies, including updated Ocean Plan Regulations, Marine Life Protected Areas, and Once-Through Cooling Regulations (MET, 2021).

7.2.3 Water Quality

The following sub-sections include narratives on water quality issues experienced in various water supplies, if any, and the measures being taken to improve the water quality of these sources.

7.2.3.1 Imported Water

MET is responsible for providing high quality potable water throughout its service area. Over 300,000 water quality tests are performed per year on MET's water to test for regulated contaminants and additional contaminants of concern to ensure the safety of its waters. MET's supplies originate primarily from the CRA and from the SWP. A blend of these two sources, proportional to each year's availability of the source, is then delivered throughout MET's service area.

MET's primary water sources face individual water quality issues of concern. The CRA water source contains higher TDS and the SWP contains higher levels of organic matter, lending to the formation of disinfection byproducts. To remediate the CRA's high level of salinity and the SWP's high level of organic matter, MET blends CRA and SWP supplies and has upgraded all of its treatment facilities to include ozone treatment processes. In addition, MET has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of the following emerging contaminants: N-nitrosodimethylamine (NDMA),

pharmaceuticals and personal care products (PPCP), microplastics, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane (MET, 2021). While unforeseeable water quality issues could alter reliability, MET's current strategies ensure the delivery of high-quality water.

The presence of quagga mussels in water sources is a water quality concern. Quagga mussels are an invasive species that was first discovered in 2007 at Lake Mead, on the Colorado River. This species of mussels forms massive colonies in short periods of time, disrupting ecosystems and blocking water intakes. They can cause significant disruption and damage to water distribution systems. MET has had success in controlling the spread and impacts of the quagga mussels within the CRA, however the future could require more extensive maintenance and reduced operational flexibility than current operations allow. It also resulted in MET eliminating deliveries of CRA water into Diamond Valley Lake (DVL) to keep the reservoir free from quagga mussels (MET, 2021).

7.2.3.2 Groundwater

Current and historical data from Well 6 indicates that it consistently produces relatively good quality water that is not impacted by saline water. It does not exhibit ion ratios or analyte concentrations that are indicative of saline water intrusion, even with levels of chloride and TDS that have slightly varied over time (Dudek, 2015).

In Well 8, salinity and chloride in the water produced increased from 2009 to 2012. The City's Water Well Aquifer Study concluded that the salinity of water produced by the well increased as cumulative production increased and that there may be evidence of incipient seawater intrusion in the deeper portion of the well and at the bottom of the upper screened interval. However, water quality improved when pumping stopped as upgradient water from the east moved into the well area. The source of the incipient saline water is currently unknown (Dudek, 2015).

A recently completed capital improvement project sealed off the lower levels of the screened area in Well No. 8 to improve water quality. The improvement should improve water quality and potentially increase annual production within the well. In addition, the City rehabilitated Well No. 5 and Calafia Well for the purpose of utilizing the wells for monitoring the water quality within the aquifer.

7.2.4 Locally Applicable Criteria

Within Orange County, there are no significant local applicable criteria that directly affect reliability. Through the years, the water agencies in Orange County have made tremendous efforts to integrate their systems to provide flexibility to interchange with different sources of supplies. There are emergency agreements in place to ensure all parts of the County have an adequate supply of water. In the northern part of the County, agencies are able to meet a majority of their demands through groundwater with very little limitation, except for the OCWD Basin pumping percentage. For the agencies in southern Orange County, most of their demands are met with imported water where their limitations are based on the capacity of their systems, which are very robust.

However, if a major earthquake on the San Andreas Fault were to occur, it would be damaging to all three key regional water aqueducts and disrupt imported supplies for up to six months. The region would likely impose a water use reduction ranging from 10-25% until the system is repaired. MET has taken proactive

steps to handle such disruption, such as constructing DVL, which mitigates potential impacts. DVL, along with other local reservoirs, can store a six to twelve-month supply of emergency water (MET, 2021).

7.3 Water Service Reliability Assessment

This Section assesses the City's reliability to provide water services to its customers under various hydrological conditions. This is completed by comparing the projected long-term water demand (Section 4), to the projected water supply sources available to the City (Section 6) in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years.

7.3.1 Normal Year Reliability

The water demand forecasting model developed for the Demand Forecast TM (described in Section 4.3), to project the 25-year demand for Orange County water agencies, also isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The explanatory variables of population, temperature, precipitation, unemployment rate, drought restrictions, and conservation measures were used to create the statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition. The average (normal) demand is represented by the average water demand of FY 2017-18 and FY 2018--19 (CDM Smith, 2021).

The City is 100% reliable for normal year demands from 2025 through 2045 (Table 7-2) due to diversified supply and conservation measures. For simplicity, the table shows supply to balance demand in the table. However, the City can purchase more MET water through MWDOC, should the need arise. The City has entitlements to receive imported water from MET through MWDOC via connections to MET's regional distribution system. All imported water supplies are assumed available to the City from existing water transmission facilities, as per MET and MWDOC's 2020 UWMPs.

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

DWR Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals (AF)	8,853	8,908	8,844	8,775	8,768
Demand totals (AF)	8,853	8,908	8,844	8,775	8,768
Difference (AF)	0	0	0	0	0
NOTES: This table compares the projected demand and supply volumes determined in Sections 4.3.2 and 6.1, respectively.					

7.3.2 Single Dry Year Reliability

A single dry year is defined as a single year of minimal to no rainfall within a period where average precipitation is expected to occur. The water demand forecasting model developed for the Demand Forecast TM (described in Section 4.3) isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the normal year condition (average of FY 2017-18 and FY 2018-19). For a single dry year condition (FY 2013-14), the model projects 9% increase in demand for the City's service area (CDM Smith, 2021). Detailed information of the model is included in Appendix E.

The City has documented that it is 100% reliable for single dry year demands from 2025 through 2045 with a demand increase of 9% from normal demand with significant reserves held by MET and conservation. A comparison between the supply and the demand in a single dry year is shown in Table 7-3. For simplicity, the table shows supply to balance demand in the table. However, the City can purchase more MET water through MWDOC, should the need arise.

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

DWR Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals (AF)	9,649	9,709	9,639	9,564	9,557
Demand totals (AF)	9,649	9,709	9,639	9,564	9,557
Difference (AF)	0	0	0	0	0
NOTES: It is conservatively assumed that a single dry year demand is 9% greater than each respective year's normally projected total water demand. Groundwater is sustainably managed through pumping within the safe yield and monitoring the Basin (Section 6.3); recycled water provides additional local supply (Section 6.6.3); and based on MET's and MWDOC's UWMPs, imported water is available to close any local water supply gap (Section 7.5.1).					

7.3.3 Multiple Dry Year Reliability

Assessing the reliability to meet demand for five consecutive dry years is a new requirement for the 2020 UWMP, as compared to the previous requirement of assessing three or more consecutive dry years. Multiple dry years are defined as five or more consecutive dry years with minimal rainfall within a period of average precipitation. The water demand forecasting model developed for the Demand Forecast TM (described in Section 4.3) isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the normal year condition (average of FY 2017-18 and

FY 2018-19). For a single dry year condition (FY 2013-14), the model projects a 9% increase in demand for the region where the City's service area is located (CDM Smith, 2021). It is conservatively assumed that a multiple dry year scenario is a repeat of the single dry year over five consecutive years.

Even with a conservative demand increase of 9% each year for five consecutive years, the City is capable of meeting its customers' demands from 2025 through 2045. (For simplicity, the table shows supply to balance demand in the table. However, the City can purchase more MET water through MWDOC, should the need arise.

Table 7-4), with significant reserves held by MET and conservation. For simplicity, the table shows supply to balance demand in the table. However, the City can purchase more MET water through MWDOC, should the need arise.

Table 7-4: Retail: Multiple Dry Years Supply and Demand Comparison

DWR Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045
First year	Supply totals	9,127	9,661	9,695	9,624	9,563
	Demand totals	9,127	9,661	9,695	9,624	9,563
	Difference	0	0	0	0	0
Second year	Supply totals	9,258	9,673	9,681	9,609	9,561
	Demand totals	9,258	9,673	9,681	9,609	9,561
	Difference	0	0	0	0	0
Third year	Supply totals	9,388	9,685	9,667	9,594	9,560
	Demand totals	9,388	9,685	9,667	9,594	9,560
	Difference	0	0	0	0	0
Fourth year	Supply totals	9,519	9,697	9,653	9,579	9,559
	Demand totals	9,519	9,697	9,653	9,579	9,559
	Difference	0	0	0	0	0
Fifth year	Supply totals	9,649	9,709	9,639	9,564	9,557
	Demand totals	9,649	9,709	9,639	9,564	9,557
	Difference	0	0	0	0	0

NOTES:
The multiple dry-year projections estimate a 9% increase on total normal water demand. The 2025 column assesses supply and demand for FY 2020-21 through FY 2024-25; the 2030 column assesses FY 2025-26 through FY 2029-30 and so forth, in order to end the water service reliability assessment in FY 2044-45.

Groundwater is sustainably managed through pumping within the safe yield and monitoring the Basin (Section 6.3); recycled water provides additional local supply (Section 6.6.3); and based on MET's and MWDOC's UWMPs, imported water is available to close any local water supply gap (Section 7.5.1).

7.4 Management Tools and Options

Existing and planned water management tools and options for the City and MWDOC's service area that seek to maximize local resources and result in minimizing the need to import water are described below. Although the City does not produce groundwater from the OC Basin, collaborative initiatives between MWDOC and OCWD benefit the City.

- **Reduced Delta Reliance:** MET has demonstrated consistency with Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (Delta Plan policy WR P1) by reporting the expected outcomes for measurable reductions in supplies from the Delta. MET has improved its self-reliance through methods including water use efficiency, water recycling, stormwater capture and reuse, advanced water technologies, conjunctive use projects, local and regional water supply and storage programs, and other programs and projects. In 2020, MET had a 602,000 AF change in supplies contributing to regional self-reliance, corresponding to a 15.3% change, and this amount is projected to increase through 2045 (MET, 2021). For detailed information on the Delta Plan Policy WR P1, refer to Appendix C.

- **The continued and planned use of groundwater:** The water supply resources within MWDOC's service area are enhanced by the existence of groundwater basins that account for the majority of local supplies available and are used as reservoirs to store water during wet years and draw from storage during dry years, subsequently minimizing MWDOC's reliance on imported water. Groundwater basins are managed within a safe basin operating range so that groundwater wells are only pumped as needed to meet water use. Although MWDOC does not produce or manage recycled water, MWDOC supports and partners in recycled water efforts, including groundwater recharge.

- **Groundwater storage and transfer programs:** MWDOC and OCWD's involvement in SARCCUP includes participation in a CUP that improves water supply resiliency and increases available dry-year yield from local groundwater basins. The groundwater bank has 137,000 AF of storage (OCWD, 2020b). Additionally, MET has numerous groundwater storage and transfer programs in which MET endeavors to increase the reliability of water supplies, including the AVEK Waster Agency Exchange and Storage Program and the High Desert Water Bank Program. The IRWD Strand Ranch Water Banking Program has approximately 23,000 AF stored for IRWD's benefit, and by agreement, the water is defined to be an "Extraordinary Supply" by MET and counts essentially 1:1 during a drought/water shortage condition under MET's WSAP In addition, MET has encouraged storage through its cyclic and conjunctive use programs that allow MET to deliver water into a groundwater basin in advance of agency demands, such as the Cyclic Storage Agreements under the Main San Gabriel Basin Judgement.

- **Water Loss Program:** The water loss audit program reduces MWDOC's dependency on imported water from the Delta by implementing water loss control technologies after assessing audit data and leak detection.

- **Increased use of recycled water:** MWDOC partners with local agencies in recycled water efforts, including OCWD to identify opportunities for the use of recycled water for irrigation

purposes, groundwater recharge and some non-irrigation applications. OCWD's GWRS and Green Acres Project (GAP) allow Southern California to decrease its dependency on imported water and create a local and reliable source of water that meet or exceed all federal and state drinking level standards. Expansion of the GWRS is currently underway to increase the plant's production to 130 MGD, and further reduce reliance on imported water.

- **Implementation of demand management measures (DMMs) during dry periods:** During dry periods, water reduction methods to be applied to the public through the retail agencies, will in turn reduce MWDOC's overall demands on MET and reliance on imported water. MWDOC is assisting its retail agencies by leading the coordination of Orange County Regional Alliance for all of the retail agencies in Orange County. MWDOC assists each retail water supplier in Orange County in analyzing the requirements of and establishing their baseline and target water use, as guided by DWR. The City's specific DMMs are further discussed in Section 9.

7.5 Drought Risk Assessment

Water Code Section 10635(b) requires every urban water supplier include, as part of its UWMP, a DRA for its water service as part of information considered in developing its DMMs and water supply projects and programs. The DRA is a specific planning action that assumes the City is experiencing a drought over the next five years and addresses the City's water supply reliability in the context of presumed drought conditions. Together, the water service reliability assessment (Sections 7.1 through 7.3), DRA, and WSCP (Section 8 and Appendix H) allow the City to have a comprehensive picture of its short-term and long-term water service reliability and to identify the tools to address any perceived or actual shortage conditions.

Water Code Section 10612 requires the DRA to be based on the driest five-year historic sequence of the City's water supply. However, Water Code Section 10635 also requires that the analysis consider plausible changes on projected supplies and demands due to climate change, anticipated regulatory changes, and other locally applicable criteria.

The following sections describe the City's methodology and results of its DRA.

7.5.1 DRA Methodology

The water demand forecasting model developed for the Demand Forecast TM (described in Section 4.3) isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (average of FY 2017-18 and FY 2018-19). For a single dry year condition (FY 2013-14), the model projects a 9% increase in demand for the region encompassing the City's service area (CDM Smith, 2021).

Locally, the five consecutive years of FY 2011-12 through FY 2015-16 represent the driest five -consecutive year historic sequence for the City's water supply. This period that spanned water years 2012 through 2016 included the driest four-year statewide precipitation on record (2012-2015) and the smallest Sierra -Cascades snowpack on record (2015, with 5% of average). It was marked by extraordinary heat: 2014, 2015 and 2016 were California's first, second and third warmest year in terms

of statewide average temperatures. Locally, Orange County rainfall for the five--year period totaled 36 inches, the driest on record.

As discussed in Section 6, the City is projected to rely on mainly groundwater, recycled water, purchased water from TCWD, and imported water supply from MWDOC / MET. The City maximizes local water supply use before the purchase of imported water. The difference between total forecasted potable demands and local potable supply projections is the demand on MWDOC's imported water supplies, which are supplied by MET. The City's DRA focuses on the assessment of imported water from MWDOC / MET, which will be used to close any local water supply gap. This assessment aligns with the DRA presented in MWDOC's 2020 UWMP.

Water Demand Characterization

All of MWDOC's water supplies are purchased from MET, regardless of hydrologic conditions. As described in Section 6.2, MET's supplies are from the Colorado River, SWP, and in--region storage. In its 2020 UWMP, MET's DRA concluded that even without activating WSCP actions, MET can reliably provide water to all of their member agencies, including MWDOC, and in effect the City, assuming a five--year drought from FY 2020-21 through FY 2024-25. Beyond this, MET's DRA indicated a surplus of supplies that would be available to all of its member agencies, including MWDOC, should the need arise. Therefore, any increase in demand that is experienced in MWDOC's service area, which includes the City, will be met by MET's water supplies.

Based on the Demand Forecast TM, in a single dry year, demand is expected to increase by 9% above a normal year. Both MWDOC and the City's DRA conservatively assumes a drought from FY 2020-21 through FY 2024-25 is a repeat of the single dry year over five consecutive years.

The City's demand projections were developed as part of the Demand Forecast TM, led by MWDOC. As part of the study, MWDOC first estimated total retail demands for its service area.. This was based on estimated future demands using historical water use trends, future expected water use efficiency measures, additional projected land-use development, and changes in population. The City's projected water use, linearly interpolated per the demand forecast, is presented annually for the next five years in Table 4-2. Next, MWDOC estimated the projections of local supplies derived from current and expected local supply programs from their member agencies. Finally, the demand model calculated the difference between total forecasted demands and local supply projections. The resulting difference between total demands, adjusted for savings from conservation, and local supplies represents the total regional demand on MWDOC's supplies from MWDOC's member agencies, including the City.

Water Supply Characterization

MWDOC's assumptions for its supply capabilities are discussed and presented in 5-year increments under its 2020 UWMP water reliability assessment. For MWDOC's DRA, these supply capabilities are further refined and presented annually for the years 2021 to 2025 by assuming a repeat of historic conditions from FY 2011-12 to FY 2015-16. For its DRA, MWDOC assessed the reliability of supplies available to MWDOC through MET using historical supply availability under dry-year conditions. MET's supply sources under the Colorado River, SWP, and in-region supply categories are individually listed and discussed in detail in MET's UWMP. Future supply capabilities for each of these supply sources are also individually tabulated in Appendix 3 of MET's UWMP, with consideration for plausible changes on projected supplies under climate change conditions, anticipated regulatory changes, and

other factors. MWDOC's supplies are used to meet consumptive use, surface water and groundwater recharge needs that are in excess of locally available supplies. In addition, MWDOC has access to supply augmentation actions through MET. MET may exercise these actions based on regional need, and in accordance with their WSCP, and may include the use of supplies and storage programs within the Colorado River, SWP, and in-region storage.

7.5.2 Total Water Supply and Use Comparison

The City's DRA reveals that its supply capabilities are expected to balance anticipated total water use and supply, assuming a five-year consecutive drought from FY 2020-21 through FY 2024-25 (Table 7-5). For simplicity, the table shows supply to balance the modeled demand in the table. However, the City can purchase more MET water from MWDOC, should the need arise.

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

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	9,127
Total Supplies	9,127
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2022	**Total**
Total Water Use	9,258
Total Supplies	9,258
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2023	**Total**
Total Water Use	9,388
Total Supplies	9,388
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2024	Total
Total Water Use	9,519
Total Supplies	9,519
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2025	Total
Total Water Use	9,649
Total Supplies	9,649
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

Note: Groundwater is sustainably managed through pumping within the safe yield and monitoring the Basin (Section 6.3); recycled water provides additional local supply (Section 6.6.3); and based on MET's and MWDOC's UWMP, imported water is available to close any local water supply gap (Section 7.5.1).

7.5.3 Water Source Reliability

Approximately 5% of the City's total water supply can rely on local groundwater through FY 2044-45. The City makes sure to pump groundwater within established and observed safe yield values to continue sustainable production from the Basin. Improvements made to Well No. 8 and monitoring may increase the City's future yield within the Basin.

Additionally, the City's use of direct recycled water should also be considered. The ability to continue producing water locally greatly improves the City's water reliability. More detail on these uses is available in Sections 6.6.3 and 6.6.4.

Moreover, although they would not normally be considered part of the City's water portfolio, the interconnections the City has with SMWD, SCWD, the City of San Juan Capistrano, and indirectly, through IRWD could help mitigate any water supply shortages, though shortages are not expected.

The City's DRA concludes that its water supplies meet total water demand, assuming a five-year consecutive drought from FY 2020-21 through FY 2024-25 (Table 7-5). For simplicity, the table shows supply to balance the modeled demand in the table. However, the City can purchase more MET water from MWDOC, should the need arise.

As detailed in Section 8, the City has in place a robust WSCP and comprehensive shortage response planning efforts that include demand reduction measures and supply augmentation actions. However, since the City's DRA shows a balance between water supply and demand, no water service reliability concern is anticipated, and no shortfall mitigation measures are expected to be exercised over the next five years. The City and its wholesale supplier, MWDOC, will periodically revisit its representation of the supply sources and of the gross water use estimated for each year, and will revise its DRA if needed.

8 WATER SHORTAGE CONTINGENCY PLANNING

8.1 Layperson Description

Water shortage contingency planning is a strategic planning process that the City engages to prepare for and respond to water shortages. A water shortage, when water supply available is insufficient to meet the normally expected customer water use at a given point in time, may occur due to a number of reasons, such as water supply quality changes, climate change, drought, and catastrophic events (e.g., earthquake). The City's WSCP provides real-time water supply availability assessment and structured steps designed to respond to actual conditions. This level of detailed planning and preparation will help maintain reliable supplies and reduce the impacts of supply interruptions.

The Water Code Section 10632 requires that every urban water supplier that serves more than 3,000 AFY or have more than 3,000 connections prepared and adopt a standalone WSCP as part of its UWMP. The WSCP is required to plan for a greater than 50% supply shortage. This WSCP due to be updated based on new requirements every five years and will be adopted as a current update for submission to DWR by July 1, 2021.

8.2 Overview of the WSCP

The WSCP serves as the operating manual that the City will use to prevent catastrophic service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSCP contains processes and procedures documented in the WSCP, which are given legal authority through the WSCP Response Ordinance. This way, when shortage conditions arise, the City's governing body, its staff, and the public can easily identify and efficiently implement pre-determined steps to mitigate a water shortage to the level appropriate to the degree of water shortfall anticipated. Figure 8-1 illustrates the interdependent relationship between the three procedural documents related to planning for and responding to water shortages.

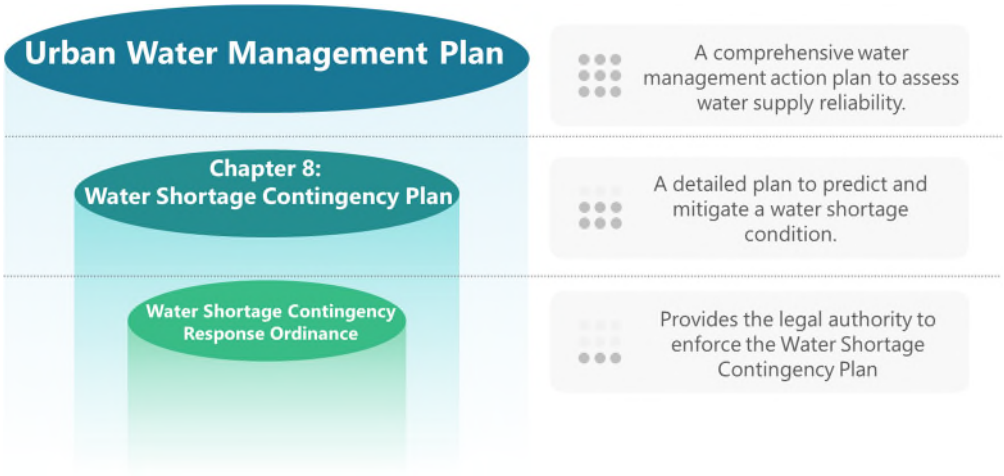

Figure 8-1: UWMP Overview

A copy of the City's WSCP is provided in Appendix H and includes the steps to assess if a water shortage is occurring, and what level of shortage drought actions to trigger the best response as appropriate to the water shortage conditions. The WSCP has prescriptive elements, including an analysis of water supply reliability; the drought shortage actions that align with water shortage levels that correspond to water shortage percentages ranging from 10% to greater than 50%; an estimate of potential to close supply gap for each measure; protocols and procedures to communicate identified actions for any current or predicted water shortage conditions; procedures for an annual water supply and demand assessment; monitoring and reporting requirements to determine customer compliance; and reevaluation and improvement procedures for evaluating the WSCP.

8.3 Summary of Water Shortage Response Strategy and Required DWR Tables

This WSCP is organized into twelve sections that align with the Water Code Section 16032 requirements.

1. Water Supply Reliability Analysis
2. Annual Water Supply and Demand Assessment Procedures
3. Six Standard Water Shortage Stages
4. Shortage Response Actions
5. Communication Protocols
6. Compliance and Enforcement
7. Legal Authorities
8. Financial Consequences of the WSCP
9. Monitoring and Reporting
10. WSCP Refinement Procedures
11. Special Water Feature Distinction
12. Plan Adoption, Submittal, and Availability

The WSCP is based on adequate details of demand reduction and supply augmentation measures that are structured to match varying degrees of shortage will ensure the relevant stakeholders understand what to expect during a water shortage situation. The City has selected to retain its existing water shortage levels as defined in City Code -and shows the City's water shortage levels in relationship to the six standard water shortage levels prescribed by statute in Water Code Section 10632 (a)(3)(A) (Table 8-1). This crosswalk is intended to clearly translate the City's water shortage levels to those mandated by statute.

The supply augmentation actions that align with each shortage level are described in Table 8-3 (DWR Table 8-3). These augmentations represent short-term management objectives triggered by the WSCP and do not overlap with the long-term new water supply development or supply reliability enhancement projects.

The demand reduction measures that align with each shortage level are described in Table 8-2 (DWR Table 8-2). This table also estimates the extent to which that action will reduce the gap between supplies and demands to demonstrate that the chosen suite of shortage response actions can be expected to deliver the expected outcomes necessary to meet the requirements of a given shortage level.

Table 8-1: Water Shortage Contingency Plan Levels

DWR Submittal Table 8-1 Water Shortage Contingency Plan Levels				
2015 Shortage Level	**Percent Shortage Range**	**Shortage Response Actions**		**Corresponding 2020 Shortage Level**
1 – Water Watch	Up to 10%	Shortage response will focus on existing permanent water waste prohibitions, in addition to public outreach for voluntary conservation and the implementation of the first phase of demand management rates.	→	Level 1
2 – Water Alert	Up to 20%	Shortage response will focus on increased utilization of staff time for water waste patrols, restrictions on potable irrigation frequency, and the implementation of the second phase of demand management rates.	→	Level 2
3 – Water Warning	Up to 30%	Shortage response will focus on the prohibition of the use of water to wash down surfaces, restrictions on potable irrigation frequency, and the implementation of the third phase of demand management rates.	→	Level 3
4 – Water Shortage	Up to 40%	Shortage response will focus on the prohibition of washing cars outside of commercial facilities that recycle wash water, the prohibition of irrigation in the winter months, and restrictions on potable irrigation of non-functional spaces.	→	Level 4

DWR Submittal Table 8-1 Water Shortage Contingency Plan Levels				
2015 Shortage Level	**Percent Shortage Range**	**Shortage Response Actions**		**Corresponding 2020 Shortage Level**
	Up to 50%	Shortage response will focus on restrictions on potable irrigation of non-functional spaces and the suspension of potable water use in construction projects.	→	Level 5
5 – Water Emergency	>50%	Shortage response will focus on the prohibition refilling pools and spas and the prohibition of all use of potable water in irrigation.	→	Level 6
NOTES:				

Table 8-2: Demand Reduction Actions

DWR Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Expand Public Information Campaign	0-4%	Press releases, social media posts, and/or bill messaging	No
1	Implement or Modify Drought Rate Structure or Surcharge	5-10%	Variable rate surcharge	Yes
2	Landscape - Limit landscape irrigation to specific days	11-15%	3 days/week Mar-Nov*; 1 day/week Dec-Feb***	Yes

DWR Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2	Increase Water Waste Patrols	16-20%	Recruitment of additional, temporary, and/or existing staff for increased patrols	Yes
2	Implement or Modify Drought Rate Structure or Surcharge	11-20%^	Fixed and variable rate surcharges	Yes
3	Other - Prohibit use of potable water for washing hard surfaces	21-25%		Yes
3	Landscape - Limit landscape irrigation to specific days	26-30%	2 days/week Mar-Nov**; 1 day/week Dec-Feb***	Yes
3	Implement or Modify Drought Rate Structure or Surcharge	>20%^	Variable rate surcharge	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	31-35%		Yes
4	Landscape - Other landscape restriction or prohibition	36-40%	Potable irrigation prohibited during the months of November through April.	Yes
4	Landscape - Prohibit certain types of landscape irrigation	41-45%	Non-functional landscapes (i.e. with the exception of parks and golf courses) may, with notice, have potable irrigation turned off at the meter.	No

DWR Submittal Table 8-2: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Other - Prohibit use of potable water for construction and dust control	46-50%	No will-serve letters will be provided for potable water for use in construction.	No
5	Other water feature or swimming pool restriction	51-55%	Refilling of pools and spas prohibited beyond a 1-inch top-off.	Yes
5	Landscape - Prohibit all landscape irrigation	>55%	Recycled water irrigation is exempt, unless otherwise directed by the City Council.	Yes

NOTES: All shortage response actions for the prior shortage level(s) also apply to the consequent shortage level. With the exception of that for the rate surcharges which is figured as cumulative savings from implementation of prior rate surcharges only (see below), percent reduction in shortage is figured as cumulative savings from implementation of all prior shortage response actions.

*Even residential addresses may run irrigation on Mondays, Wednesdays, and Fridays; odd residential addresses may irrigate on Tuesdays, Thursdays, and Saturdays; and commercial and irrigation accounts may irrigate on Sundays, Tuesdays, and Fridays.

**Even residential addresses may run irrigation on Mondays and Thursdays; odd residential addresses may irrigate on Wednesdays and Saturdays; and commercial and irrigation accounts may irrigate on Tuesdays and Fridays.

***Even residential addresses may run irrigation on Mondays; odd residential addresses may irrigate on Saturdays; and commercial and irrigation accounts may irrigate on Thursdays.

^The second and third phase of demand management rates, as proposed by the current rate structure in the San Clemente Municipal Code, can be implemented by action of the City Council in addition to, or in lieu of, other proposed demand reduction actions.

Table 8-3: Supply Augmentation and Other Actions

DWR Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
1	Stored Emergency Supply	0-10%	Pumping of additional groundwater, within safe short-term yield limits
2	Other Purchases	11-20%	Purchase of additional water supplies from MET/MWDOC or through emergency agreement with IRWD
3	Other Purchases	21-30%	Purchase of additional water supplies from MET/MWDOC or through emergency agreement with IRWD
4	Other Purchases	31-50%	Purchase of additional water supplies from MET/MWDOC or through emergency agreement with IRWD
5	Other Purchases	>50%	Purchase of additional water supplies from MET/MWDOC or through emergency agreement with IRWD
NOTES:			

Water shortage contingency planning is a strategic planning process to prepare for and respond to water shortages. Detailed planning and preparation can help maintain reliable supplies and reduce the impacts of supply interruptions. This chapter provides a structured plan for dealing with water shortages, incorporating prescriptive information and standardized action levels, along with implementation actions in the event of a catastrophic supply interruption.

A well-structured WSCP allows real-time water supply availability assessment and structured steps designed to respond to actual conditions, to allow for efficient management of any shortage with predictability and accountability. A water shortage, when water supply available is insufficient to meet the normally expected customer water use at a given point in time, may occur due to a number of reasons, such as population growth, climate change, drought, and catastrophic events. The WSCP is the City's operating manual that is used to prevent catastrophic service disruptions through proactive, rather than reactive, management. This way, if and when shortage conditions arise, the City's governing body, its staff, and the public can easily identify and efficiently implement pre-determined steps to manage a water shortage.

9 DEMAND MANAGEMENT MEASURES

The City, along with other retail water agencies throughout Orange County, recognizes the need to use existing water supplies efficiently. This ethic of efficient use of water has evolved as a result of the development and implementation of water use efficiency programs that make good economic sense and reflect responsible stewardship of the region's water resources. The City works closely with MWDOC to promote regional efficiency by participating in the regional water savings programs, leveraging MWDOC local program assistance, and applying the findings of MWDOCs research and evaluation efforts. This chapter communicates the City's efforts to promote conservation and to reduce demand on water supplies. A detailed description of demand management measures is available in Appendix J.

9.1 Demand Management Measures for Retail Suppliers

The goal of the DMM section is to provide a comprehensive description of the water conservation programs that a supplier has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets. The reporting requirements for DMMs were significantly modified and streamlined in 2014 by Assembly Bill 2067. Additionally, this section of the UWMP will report on the role of MWDOC's programs in meeting new state regulations for complying with the SWRCB's new Conservation Framework. These categories of demand management measures are as follows:

- 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 DMMs that have a significant impact on water use as measured in GPCD, including innovative measures, if implemented; and
- Programs to assist retailers with Conservation Framework Compliance.

9.1.1 Water Waste Prevention Ordinances

The San Clemente City Council adopted a Water Conservation Ordinance 1598 on June 2, 2015 amending Chapter 13.12 of Title 13 of the City's Municipal Code. The Urgency Ordinance updated the City's Water Conservation Ordinance and Water Conservation Program in response to the California Governor's state of emergency drought declaration and the new SWRCB drought response plan regulations.

The ordinance established a permanent water conservation clause that is effective at all times and is not dependent upon a water shortage for implementation. Prohibition against waste was established for the following activities/water-using features:

- Unrepaired leaks in plumbing or irrigation systems
- Operation of irrigation systems in the daytime hours, excepting that for inspection and repair purposes

- Washing of vehicles without a shutoff nozzle
- New commercial car washes that do not recycle used wash water
- Washing of equipment and machinery, structures, or surfaces without a shutoff nozzle
- Unnecessary refilling of swimming pools and spas
- Operation of fountains, decorative basins, ponds, and waterways that do not recirculate water
- Single-pass cooling systems
- New commercial laundry facilities that do not reuse rinse water
- Automatic daily laundering of towels at commercial lodging establishments
- Failure to promote water conservation displays at visitor-serving facilities
- Automatically serving water to customers and not using water-conserving practices in the kitchen at food and beverage service facilities
- Failure to promote water conservation displays at public and quasi-public entities
- Using potable water for dust control when recycled water is available, or using water hoses without a water shutoff nozzle, on a construction site
- Use of hydrants, outside of a fire or other emergency, without prior approval from the City
- Water spillage not minimized or contained by the user
- Indiscriminate use of water

In an event of a water supply shortage, the ordinance established provisions for five response levels associated with increasingly restrictive prohibitions, from Level 1: Water Watch to Level 5: Water Emergency, where the City's water uses are required to reduce usage by more than 50%.

The provisions and water conservation measures to be implemented in response to each shortage level, are described in the 2020 WSCP located in Appendix H of this 2020 UWMP. The City's current Water Conservation Ordinance is included in the WSCP.

The Water Conservation Ordinance refers to an enforcement procedure for violations of this and other sections of the City Municipal Code, beginning with a warning letter/notice of noncompliance. If and when a violation of the ordinance is not addressed by the responsible party, an authorized designee of the City Manager, e.g. the Water Conservation Analyst, may progress with the issuance of administrative fines of $100, $200, and $500 for the second, third, and fourth instance or day, respectively, of the violation, consistent with the fine schedule for enforcement of all other City codes. While the size of the fines may not be sufficient to motivate the most careless of water users, most water customers respond promptly to the initial notice of noncompliance, as it serves as a reminder of the value of water and that its waste is a violation of social norms, as well as of the City's Municipal Code.

9.1.2 Metering

The City is fully metered for all customer sectors, including single family, multi-family, CII, and large landscape. All utility water accounts are metered and billed monthly based on commodity rates. Meters are required for all new connections and new CII developments are required to have dedicated irrigation meters in order to separately quantify and bill indoor and outdoor water usage. All new multi-family residential developments are required to individually meter each dwelling unit, rather than use a master-meter which services the entire building, which helps motivate efficient water use by individual

tenants/owners, who become aware of and responsible for the entire cost of their specific water consumption.

The City changes out meters based on a combination of service call and meter age. This process results in the replacement of 200-300 meters annually. The City is currently looking at options for an innovative metering program and evaluating the costs versus benefits of such programs.

9.1.3 Conservation Pricing

The City of San Clemente bills all customers on a monthly basis. The monthly bill includes both water and sewer, each billed separately. Water rates include both a fixed service fee and a variable consumption charges for water usage.

All water customers are charged fixed service charges based on the service meter size. These fixed service charges are driven by costs independent of consumption. The fixed service charge helps to fund system replacement costs, service and main line maintenance, and administrative expenses.

Table 9-1: Service Charges Based on Service Meter Size

Meter Size	Water
Up to 1” (92% of meters in service area)	$26.56
1.5”	$65.53
2”	$98.93
3”	$204.70
4”	$360.58
6”	$733.56

Water Consumption Rates

In addition to the fixed water service charge, water usage is billed at a flat rate per billing unit, with one unit equal to one hundred cubic feet (“ccf”) or 748 gallons of water, which varies based on customer classification. The flat rate includes two components: the City Distribution Charge and a Water Supply Charge.

City Distribution Charge

The City Distribution Charge is a commodity rate which imposes a uniform rate per unit of water consumed by customer classification. The consumption-based rate has two elements: the account base costs (including baseline supplies, treatment, distribution, and storage, up to a level that meets the City’s baseline demands throughout the year) and peaking costs (i.e., meeting peak, summer water demands and conservation costs).

Water Supply Charge

The Water Supply Charge is a wholesale pass-through rate which decouples the cost of wholesale water from the City Distribution Charge. The Wholesale Water Supply Pass-Through fee reflects the actual cost

to purchase wholesale water and is annually recalculated based on the cost to purchase wholesale water from the City's water suppliers. The pass-through cost for 2019 was based on current wholesale water supply and is calculated as follows in Table 9-2 below.

Table 9-2: Water Rates Effective January 1, 2021

Classification	Tier	Price Per Unit
Single Family Residential (SFR)	City Distribution Charge	$2.11
	Water Supply charge	$2.82
	Total SFR Commodity Rate	**$4.93**
Multi-Family Residential (MFR)	City Distribution Charge	$1.92
	Water Supply charge	$2.82
	Total MFR Commodity Rate	**$4.74**
Commercial (COM)	City Distribution Charge	$1.94
	Water Supply charge	$2.82
	Total COM Commodity Rate	**$4.76**
Irrigation (IRR)	City Distribution Charge	$2.98
	Water Supply charge	$2.82
	Total IRR Commodity Rate	**$5.80**
Non-Potable Irrigation	Uniform Rate	**$3.21**

Demand Management Rates

To increase revenue stability necessary to provide water service, the Demand Management Rate will be implemented during periods of decreased demand such as droughts or water supply interruptions. The Demand Management Rates take into account both the impact from reduced revenue and any cost savings from reduced operational needs, to recover the City's costs to provide service. They also have the ancillary effect of driving water conservation behaviors in customers who may be motivated by cost savings more than by contributing to the public benefits of water use efficiency. This drought surcharge will be added to the commodity rate (per unit costs) shown in the table above if and only once enacted by the City Council.

Table 9-3: Demand Management Rates

	5-10% Reduction	11-20% Reduction	Greater than 20% Reduction
Fixed Rate Surcharge ($/meter equivalent)	$0.00	$0.74	$0.74
Variable Rate Surcharge ($/CCF)	$0.19	$0.30	$0.57

9.1.4 Public Education and Outreach

The City's public education and outreach program is comprised of its own water conservation outreach activities combined with the programs administered by MWDOC, its wholesale supplier.

City Conservation Program Outreach

Especially due to the City's geographical location at the southernmost end of Orange County, staff has prioritized customizing MWDOC outreach and generating educational materials specific to San Clemente and its residents and the City's culture to generate interest in and response to water conservation efforts. Customer service is a priority within the City's Utilities Department culture, which also carries over to water conservation responses and outreach. In-house outreach activities include:

- Design and publication of newspaper advertisements, billing inserts and messaging.
- Management of a regularly updated suite of Water Conservation city webpages with relevant information for residents on leak detection, appropriate irrigation schedules, and current rebates.
- Water conservation news, reminders, and opportunities shared via the City's social media accounts.
- Direct communication with and conservation assistance to customers who contact any branch of the City with water related inquiries, including in-person residential water use audits when feasible.
- Staffing of City environmental program booths at local public events, such as Garden Fest, Earth Day Festival, and Ocean Festival, to create awareness about the water and wastewater systems in their community, and to communicate with and excite residents about water use efficiency opportunities.

MWDOC Public Affairs Programs

MWDOC develops, coordinates, and delivers a substantial number of public information, education, and outreach programs aimed at elevating water agency and consumer awareness and understanding of current water issues as well as efficient water use and water-saving practices, sound policy, and water reliability investments that are in the best interest of the region. These efforts encourage good water stewardship that benefit all City residents, businesses, and industries across all demographics. Several examples are included below:

Print and Electronic Materials

MWDOC offers a variety of print and electronic materials that are designed to assist City water users of all ages in discovering where their water comes from, what MWDOC and other water industry professionals are doing to address water challenges, how to use water most efficiently, and more. Through MWDOC's social media presence, website, eCurrents newsletter, media tool kits, public service announcements (PSAs), flyers, brochures, billing inserts for utilization by the City, and other outreach materials, MWDOC ensures that stakeholders are equipped with sufficient information and subject knowledge to assist them in making good behavioral and civic choices that ultimately affect the quality and quantity of the region's water supply.

Public Events

Each year, MWDOC hosts an array of public events intended to engage a diverse range of water users in targeted discussions and actions that homes in on their specific interests or needs. Some of these public events include:

- MWDOC Water Policy Forums and the Orange County Water Summit are innovative and interactive symposiums that bring together hundreds of business professionals, elected officials, water industry stakeholders, and community leaders from throughout the state for a discussion on new and ongoing water supply challenges, water policy issues, and other important topics that impact our water supply, economy, and public health.
- Inspection Trips of the state's water supply systems are sponsored each year by MWDOC and MET. Orange County elected officials, residents, business owners, and community leaders are invited to tour key water facilities throughout the state and learn more about the critical planning, procurement, and management of Southern California's water supply, as well as the issues surrounding delivery and management of our most precious natural resource – water.
- Community Events and Events Featuring MWDOC Mascot Ricky the Rambunctious Raindrop provide opportunities to interact with Orange County water users in a fun and friendly way, offer useful water-related information or education, and engage them in important discussions about the value of water and how their decisions at home, at work, and as tax- or ratepayers may impact Orange County's quality and quantity of water for generations to come.

Education Programs and Initiatives

Over the past several years, MWDOC has amplified its efforts in water education programs and activities for Orange County's youngest water users. This is accomplished by continuing to grow professional networks and partnerships that consist of leading education groups, advisors, and teachers, and by leading the way for MWDOC and its 28 member agencies to be key contributors of both Southern California and Orange County water-centric learning. Several key water education programs and initiatives that the City supports and funds include the following:

- Environmental Literacy is an individual's awareness of the interconnectedness and interdependency between people and natural systems, being able to identify patterns and systems within their communities, while also gathering evidence to argue points and solve problems. By using the environment as the context for learning, K-12 students gain real-world knowledge by asking questions and solving problems that directly affect them, their families, and

their communities. This approach to K-12 education builds critical thinking skills and promotes inquiry, and is the foundation for all MWDOC education programs, initiatives, and activities.

- MWDOC Choice School Programs have provided Orange County K-12 students water-focused learning experiences for nearly five (5) decades. Interactive, grade-specific lessons invite students to connect with, and learn from, their local ecosystems, guiding them to identify and solve local water-related environmental challenges affecting their communities. Choice School Programs are aligned with state standards, and participation includes a dynamic in-class or virtual presentation, and pre- and post-activities that encourage and support Science Technology Engineering Arts and Mathematics (STEAM)-based learning and good water stewardship.
- Water Energy Education Alliance (WEEA) is a coalition of education and water and energy industry professionals led by MWDOC that works together to build and bolster Career Technical Education programs (CTE) for Southern California high school students. These CTEs focus on workforce pathways in the Energy, Environment, and Utility Sectors, and connections established through this powerful Southern California alliance assist stakeholders as they thoughtfully step up their investment in the education and career success of California's future workforce.
- MWDOC Water Awareness Poster Contest is an annual activity developed to encourage Orange County's K-12 students to investigate and explore their relationship to water, connect the importance of good water stewardship to their daily lives, and express their conclusions creatively through art. Each year, MWDOC receives hundreds of entries, and 40 winners from across Orange County are invited to attend a special awards ceremony with their parents and teachers, and Ricky the Rambunctious Raindrop.
- Boy Scouts Soil and Water Conservation Merit Badge and Girl Scouts Water Resources and Conservation Patch Programs guide Orange County Scouts on a learning adventure of where their water comes from, the importance of Orange County water resources, and how to be water efficient. These STEAM-based clinics are hosted by MWDOC and include interactive learning stations, hands-on activities, and a guided tour of an Orange County water source, water treatment facility, or ecological reserve.
- Partnerships are an integral part of achieving water-related goals that impact all Orange County water users. MWDOC's partner list is extensive, and acts as a collective catalyst for all those involved to grow and prosper. Some of MWDOC's most recognized partners include local, regional, state, and federal legislators, educators, water and energy industry leaders, environmental groups, media, and business associations all focused on the common goals of water education, water use efficiency, and advocacy on behalf of the region.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

Senate Bill 1420 signed into law in September 2014 requires urban water suppliers that submit UWMPs to calculate annual system water losses using the water audit methodology developed by the AWWA. SB 1420 requires that the water loss audit be submitted to DWR every five years as part of the urban water supplier's UWMP. Water auditing is the basis for effective water loss control. DWR's UWMP Guidebook includes a water audit manual intended to help water utilities complete the AWWA Water Audit on an annual basis.

MWDOC helps member agencies evaluate and reduce their distribution systems' real and apparent losses through comprehensive Water Loss Control Programs. In October 2015, the MWDOC Board of Directors authorized staff to begin implementing a Water Loss Control Technical Assistance Program (TAP) to support member agency compliance with Senate Bills 1420 and 555, both of which address distribution system Water Loss. The TAP program established a menu of technical assistance that water retailers can elect to participate in. These programs connect water retailers with industry experts who provide one on one technical assistance through data analysis, agency specific advising and assessment. The City has utilized the following TAP services:

- Water Balance Compilation and Validation
- Component Analysis of Real and Apparent Losses

Through the TAP, Water Loss Audit and summary Reports have been completed for the City on an annual basis, and most recently at the end of 2020, quantifying total water loss while breaking it down into apparent losses and real losses. In particular, expressing water loss audit results in terms of Real Losses per Service Connection per Day allows for standardized comparison across MWDOC retailer agencies and is a metric consistent with the Water Board's forthcoming economic model. The Real Losses per Service Connection per Day for Fiscal Year 2020 was 4.16 gal/connection/day. The FY 2020 Water Loss Audit also identified a data validity score of 74 out of a possible 100. To some extent, the data validity score grades operational practices that can affect the reliability of data used to calculate annual losses, but has its limitations as a tool for evaluating overall water loss audit quality. Thus, the recommendations in the 2020 Report focus more on upcoming regulatory requirements, which can be met by (1) establishing a compliance strategy, (2) improving confidence in water loss audit results, (3) carrying out activities which may have been halted by the 2020 pandemic, including field investigations and leak intervention pilot programs, and (4) conducting a real loss component analysis or leak simulation.

Additionally, the City has conducted leak detection and repair activities since 1989, and has permanently incorporated the system water audit, leak detection, and meter testing and calibration programs into its utility operations. Approximately 40 miles or 19% of the City's roughly 212-mile potable distribution system is proactively leak detected on a quarterly basis. Leak detection results are maintained in a maintenance management database program. Any detected leaks are quickly investigated in order to make appropriate repairs.

To further support member agencies such as San Clemente in their water loss audit and leak detection programs, in 2019, the MWDOC Board authorized the implementation of a Water Loss Control Shared Services Business Plan (Business Plan). The City has utilized the following Shared Services:

- Water Balance Validation
- Distribution System Leak Detection
- Suspected Leak Investigations

In the first year of this program, 53 miles of distribution system leak detection has been completed in San Clemente's service area, resulting in the discovery of 4 previously unidentified leaks in the City's system that have been repaired or are in the process of being repaired. The water savings and associated financial recovery for these leaks and repairs are currently being quantified. Since 2017, a total of 200 customer water meter accuracy tests have been completed, along with the testing of imported water

turnout and groundwater well supply meters, improving agency knowledge of meter performance and accuracy of water balance results.

9.1.6 Water Conservation Program Coordination and Staffing Support

The City has one full-time Water Conservation Analyst position. The responsibilities of the Water Conservation Analyst are to develop and provide coordination, monitoring, and oversight of conservation programs; communicate and promote water conservation programs and issues to senior management, City Council, and the public; interact with and participate with water conservation coordinators and staff of other agencies; educate on and enforce violations of the City's Water Conservation Ordinance; and manage the City's UWMP. There is collaboration between the Water Conservation Analyst, MWDOC, and its represented agencies to implement regional and local DMMs.

The source of funding for the City's water conservation program is from the water operating fund. There are tangential conservation benefits to realize in coordinating with the City's Clean Ocean Program, through promoting the reduction of irrigation water runoff which leads to decreased outdoor water use and/or more efficient irrigation equipment.

9.1.7 Other Demand Management Measures

9.1.7.1 Residential Program

MWDOC assists the City with the implementation of residential DMMs by making available the following programs aimed at increasing landscape and indoor water use efficiency for residential customers. Funding for these programs typically comes from grants, MET, MWDOC and the City.

High Efficiency Clothes Washer Rebate Program

The High Efficiency Clothes Washer (HECW) Rebate Program provides residential customers with rebates for purchasing and installing HECWs that. Approximately 15% of home water use goes towards laundry, and HECWs use 35-50% less water than standard washer models, with savings of approximately 10,500 gallons per year, per device. Devices must meet or exceed the Consortium for Energy Efficiency (CEE) Tier 1 Standard, and a listing of qualified products can be found at ocwatersmarthomes.com. There is a maximum of one rebate per home.

Premium High Efficiency Toilet Rebate Program

The largest amount of water used inside a home, 30%, goes toward flushing the toilet. The Premium High Efficiency Toilet (HET) Rebate Program offers incentives to residential customers for replacing their toilets using 1.6 gallons per flush or more. Premium HETs use just 1.1 gallons of water or less per flush, which is 14% less water than WaterSense standard toilets. In addition, Premium HETS save an average of 9 gallons of water per day while maintaining high performance standards.

9.1.7.2 CII Programs

MWDOC provides a variety of financial incentives to help City businesses, restaurants, institutions, hotels, hospitals, industrial facilities, and public sector sites achieve their efficiency goals. Water users in these sectors have options to choose from a standardized list of water efficient equipment/devices or may

complete customized projects through a pay-for-performance where the incentive is proportional to the amount of water saved. Such projects include high efficiency commercial equipment installation and manufacturing process improvements. Funding for these programs is typically through grants, MET, MWDOC and the City.

Water Savings Incentive Program

The Water Savings Incentive Program (WSIP) is designed for non-residential customers to improve their water efficiency through upgraded equipment or services that do not qualify for standard rebates. WSIP is unique because it provides an incentive based on the amount of water customers actually save. This "pay-for-performance" design lets customers implement custom projects for their sites.

Projects must save at least 10 MG of water to qualify for the Program and are offered from $195 to $390 per acre-foot of water saved. Examples of successfully projects include, but are not limited to, changing industrial process system water, capturing condensation and using it to supplement cooling tower supply, and replacing water-using equipment with more efficient products.

On-site Retrofit Program

The On-site Retrofit Program (ORP) provides another pay-for-performance financial incentive to commercial, industrial and institutional property owners, including Homeowner Associations (HOAs), who convert potable water irrigation or industrial water systems to recycled water use.

Projects commonly include the conversion of mixed or dedicated irrigation meters using potable water to irrigate with reclaimed water, or convert industrial equipment, such as a cooling tower, to use recycled water instead of potable. Financial incentives of up to $1,300 per AF of potable water saved are available for customer-side meter retrofits. Funding is provided by MET, USBR, and DWR.

Multi-Family Premium High Efficiency Toilet Incentive Program

MWDOC makes an effort to reach all water users in Orange County. For the Multi-Family Premium HET Rebate Program, MWDOC targets multi-family buildings in both disadvantaged communities (DAC) and non-DAC communities, in addition to targeting all commercial buildings, and single family residential homes through Premium HET device rebates.

MWDOC offers the DAC Multi-Family HET Program, a special version of the HET Program, to ensure regardless of economic status all water-users in Orange County can benefit from the rebate. This Program targets 3.5 gallons per flush (gpf) or greater toilets to replace them with WaterSense Labeled 1.1 gpf or less. For this purpose, DAC are referenced as communities facing economic hardship. This is defined using criteria established by DWR and the County of Orange, which includes communities where the MHI is less than 85% of the Orange County MHI.

The DAC Multi-Family Program is contractor-driven, where a contractor works with building owners to replace all of the toilets in the building(s). To avoid any cost to tenants, the rebate is $200 per toilet paid to the contractor, essentially covering the contractor's cost; therefore, there is little to no charge to the building owners that may be passed through to tenants. This process was formed after consulting contractors and multi-family building owners in Orange County. To serve those in multi-family buildings outside of designated DAC locations, MWDOC offers $75 per toilet through the same contractor-driven format. An additional option is available through SoCalWater$mart, which offers up to $250 per toilet to

multi-family buildings that were built before 1994, therefore targeting buildings built before legislation required low-flow plumbing fixtures in new construction.

Device Retrofits

MWDOC offers additional financial incentives under the Socal Water$mart Rebate Program which offers rebates for various water efficient devices to CII customers. Core funding is provided by MET and supplemental funding is sourced from MWDOC via grant funds and/or retail water agencies.

9.1.7.3 Landscape Programs

One of the most active and exciting water use efficiency sectors MWDOC provides services for are those programs that target the reduction of outdoor water use. With close to 60% of water consumed outdoors, this sector has been and will continue to be a focus for MWDOC and the City. Funding for these programs typically is through grants, MET, MWDOC and the City.

Turf Removal Program

The Orange County Turf Removal Program offers incentives to remove turf grass from residential, commercial, and public properties throughout the County. This program is a partnership between MWDOC, MET, and local retail water agencies. The goals of this program are to increase water use efficiency through sustainable landscaping practices that result in multi-benefit projects across Orange County. Participants replace their turf grass with drought-tolerant, CA Friendly, or CA Native landscaping, and retrofit their irrigation systems to high efficiency equipment, such as drip, or remove it entirely, and are encouraged to utilize smart irrigation timers, which are also eligible for a rebate (see below). Furthermore, projects are required to include a stormwater retention feature, such as a rain garden or dry streambed, to promote ecological sustainability, and they must have a minimum of three plants per 100 square feet to increase plant density and promote healthy soils. These projects save water and also reduce dry and wet weather runoff, increase urban biomass, and sequester more carbon than turf landscapes.

Landscape Design and Maintenance Plan Assistance Programs

To maximize the water efficiency, quality, and community influence of Orange County's Turf Removal Program Projects, MWDOC offers free landscape designs and free landscape maintenance plans to participating residential customers. The Landscape Design Assistance Program is offered at the beginning stages of their turf removal project so that customers may receive a customized, professionally designed landscape to replace their turf. Landscape designs include plant selection, layout, irrigation plans, and a stormwater capture feature. These designs help ensure climate appropriate plants are chosen and planted by hydrozone, that appropriate high efficiency irrigation is properly utilized, that water savings are maximized as a result of the transformation. Landscape maintenance plans are offered after a project is complete to ensure that the new landscape is cared for properly and water savings are maximized.

Smart Timer Rebate Program

Smart Timers are irrigation clocks that are either weather-based irrigation controllers (WBICs) or soil moisture sensor systems. WBICs adjust automatically to reflect changes in local weather and site-specific landscape needs, such as soil type, slopes, and plant material. When WBICs are programmed properly,

turf and plants automatically receive the proper amount of water throughout the year. During the fall months in particular, when property owners and landscape professionals often overwater, Smart Timers can save significant amounts of water.

Rotating Nozzles Rebate Program

The Rotating Nozzle Rebate Program provides incentives to residential and commercial properties for the replacement of high-precipitation rate spray nozzles with low-precipitation rate multi-stream, multi-trajectory rotating nozzles. The rebate offered through this Program aims to offset the cost of the device and installation.

Spray-to-Drip Rebate Program

The Spray-to-Drip Rebate Program offers residential, commercial, and public agency customers rebates for converting areas irrigated by traditional high-precipitation rate spray heads to low-precipitation rate drip irrigation. Drip irrigation systems are extremely water-efficient. Rather than spraying wide areas subject to wind drift, overspray and runoff, drip systems use point emitters to deliver water to specific locations at or near plant root zones. Water drips slowly from the emitters either onto the soil surface or below ground. As a result, less water is lost to wind, evaporation, and overspray, saving water and reducing irrigation runoff and non-point source pollution.

Socal Water$mart Rebate Program for Landscape

The City through MWDOC also offers financial incentives under the SoCal Water$mart Rebate Program for a variety of water efficient landscape devices, such as Central Computer Irrigation Controllers, large rotary nozzles, and in-stem flow regulators.

Landscape Training Classes

The California Friendly and Native Landscape Training and the Turf Removal and Garden Transformation Workshops provide education to residential homeowners, property managers, and professional landscape contractors on a variety of landscape water efficiency practices that they can employ and use to help design a beautiful garden using California Friendly and native plant landscaping principles. The California Friendly and Native Landscape Class demonstrates how to: implement storm water capture features in the landscape; create a living soil sponge that holds water; treat rainwater by a resource; select and arrange plants to maximize biodiversity and minimize water use; and control irrigation to minimize water waste, runoff and non-point source pollution.

The Turf Removal and Garden Transformation Workshop teaches participants how to transform thirsty turfgrass into a beautiful, climate-appropriate water efficient garden. This class teaches how to: evaluate the landscape's potential; plan for garden transformation; identify the type of turfgrass in the yard; remove grass without chemicals; build healthy, living soils; select climate-appropriate plants that minimize water use and maximize beauty and biodiversity; and implement a maintenance schedule to maintain the garden.

Qualified Water Efficient Landscape Certification (Commercial)

Since 2018, MWDOC along with the City, has offered free Qualified Water Efficient Landscaper (QWEL) certification classes designed for landscape professionals. Classes are open to any city staff, professional landscaper, water district employee, or maintenance personnel that would like to become a Qualified

Water Efficient Landscaper. The QWEL certification program provides 20 hours of instruction on water efficient areas of expertise such as local water supply, sustainable landscaping, soil types, irrigation systems and maintenance, as well as irrigation controller scheduling and programing. QWEL has received recognition from EPA WaterSense for continued promotion of water use efficiency. To earn the QWEL certification, class participants must demonstrate their ability to perform an irrigation audit as well as pass the QWEL exam. Successful graduates will be listed as a Certified Professional on the WaterSense website as well as on MWDOC's landscape resources page, to encourage Turf Removal participants or those making any landscape improvements to hire a QWEL certified professional.

Started in December 2020, a hybrid version of QWEL is available in conjunction with the California Landscape Contractors Association's Water Management Certification Program. This joint effort allows landscape industry an opportunity to obtain two nationally recognized EPA WaterSense Professional Certifications with one course and one written test. This option is offered through MET.

OC Water Smart Gardens Resource Page

MWDOC's OC Water Smart Gardens webpage provides a surplus of helpful guides and fact sheets, as well as an interactive photo gallery of water-saving landscape ideas. The purpose of this resource is to help Orange County residents find a broad variety of solutions for their water efficient landscaping needs. This includes a detailed plant database with advanced to search features; photo and/or video-based garden tours; garden gallery with images organized into helpful landscape categories such as back yards, hillsides, full sun, and/or shade with detailed plant information; and the ability to select and store plants in a list that the user can print for use when shopping.

Additional technical resources are available such as a watering calculator calibrated for local evapotranspiration rates, and a garden resources section with fact sheets on sustainable landscape fundamentals, water and soil management, composting, solving run-off, and other appropriate topics. The page is accessible through mwdoc.com and directly at www.ocwatersmartgardens.com.

9.2 Implementation over the Past Five Years

During the past five years, FY 2015-16 to 2020-21, the City, with the assistance of MWDOC, has continued water use efficiency rebate programs for its residential, CII, and landscape customers as described below. Implementation data is provided in Appendix I. The City will continue to implement all applicable programs in the next five years.

Table 9-4: City of San Clemente Water Conservation Efficiency Program Participation

Measure	Metric	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20
Central Computer Irrigation Controllers	computer controllers	-	-	-	-	-
Flow Restrictor	restrictors	-	-	-	-	-

Measure	Metric	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20
HECWs	washers	76	71	87	64	58
HETs	toilets	246	-	-	10	2
Rain Barrels	barrels	78	10	8	3	-
Cisterns	cisterns	-	-	-	-	-
Premium HETs	toilets	2	18	8	-	-
Rotating Nozzles	nozzles	653	-	146	-	35
CII WBICs	clocks	3	13	41	-	15
Residential WBICs	clocks	37	37	40	33	35
Zero Water Urinals	urinals	-	-	-	-	-
Plumbing Flow Control	valves	-	-	-	-	-
Soil Moisture Sensor	controllers	-	-	-	-	-
Ice-Making Machine	machines	-	-	-	-	-
Turf Removal	sf	39,789	4,196	40,140	6,500	20,139

Measure	Metric	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20
Spray-to-Drip	sf			10,848	-	-
Landscape Design Assistance						6
WSIP	projects	-	-	-	-	-
Recycled Water	projects	16*	6**	-	-	-
*16 projects: Irrigated area: 19,606,012 sf, 640 AFY **6 sites, 1,607,189 sf irrigated area, 93.4 AFY						

9.3 Water Use Objectives (Future Requirements)

To support Orange County retailers with SB 606 and AB 1668 compliance (Conservation Framework), MWDOC is providing multi-level support to member agencies to ensure they meet the primary goals of the legislation including to Use Water More Wisely and to Eliminate Water Waste. Beginning in 2023, under these regulations, urban water suppliers are required to calculate and report their annual urban water use objective (WUO), submit validated water audits annually, and to implement and report BMP CII performance measures.

Urban Water Use Objective

An Urban Water Supplier's urban WUO is based on efficient water use of the following:

- Aggregate estimated efficient **indoor residential** water use;
- Aggregate estimated efficient **outdoor residential** water use;
- Aggregate estimated efficient **outdoor** irrigation landscape areas with dedicated irrigation meters or equivalent technology in connection with **CII** water use;
- Aggregate estimated efficient **water losses;**
- Aggregate estimated water use for variances approved the State Water Board;
- Allowable **potable reuse water** bonus incentive adjustments.

MWDOC offers a large suite of programs, described in detail throughout section 1.3.6, that will assist Orange County retailers in meeting and calculating their WUO.

Table 9-5 describes MWDOC's programs that will assist agencies in meeting their WUO through both direct measures: programs/activities that result in directly quantifiable water savings; and indirectly: programs that provide resources promoting water efficiencies to the public that are impactful but not directly measurable.

Table 9-5: MWDOC Programs to Assist in Meeting WUO

WUO Component	Calculation	Program	Impact
Indoor Residential	Population and GPCD standard	**Direct Impact** • HECW • HET • Multi-Family HET (DAC/ non-DAC)	**Direct Impact** Increase of indoor residential efficiencies and reductions of GPCD use
Outdoor Residential	Irrigated/irrigable area measurement and a percent factor of local ETo	**Direct Impact** • Turf Removal • Spray-to-Dip • Smart Timer • High Efficiency Nozzle (HEN) • Rain Barrels/Cisterns **Indirect Impact** • Landscape Design and Maintenance Assistance • Orange County Friendly Gardens Webpage • CA Friendly/Turf Removal Classes • QWEL	**Direct Impact** Increase outdoor residential efficiencies and reductions of gallons per ft^2 of irrigated/ irrigable area used **Indirect Impact** Provide information, resources, and education to promote efficiencies in the landscape

WUO Component	Calculation	Program	Impact
Outdoor Dedicated Irrigation Meters	Irrigated/irrigable area measurement and a percent factor of local ETo	**Direct Impact** • Turf Removal • Spray-to-Dip • Smart Timer • HEN • Central Computer Irrigation Controllers • Large Rotary Nozzles • In-Stem Flow Regulators **Indirect Impact** • Orange County Friendly Gardens Webpage • CA Friendly/Turf Removal Classes • QWEL	**Direct Impact** Increase outdoor residential efficiencies and reductions of gallons per ft^2 of irrigated/ irrigable area used **Indirect Impact** Provide information, resources, and education to promote efficiencies in the landscape
Water Loss	Following the AWWA M36 Water Audits and Water Loss Control Program, Fourth Edition and AWWA Water Audit Software V5	**Direct Impact** • Water Balance Validation • Customer Meter Accuracy Testing • Distribution System	**Direct Impact** Identify areas of the distribution system that need repair, replacement or other action

WUO Component	Calculation	Program	Impact
		Pressure Surveys • Distribution System Leak Detection • No-Discharge Distribution System Flushing • Water Audit Compilation • Component Analysis	
Bonus Incentives	One of the following: • Volume of potable reuse water from existing facilities, not to exceed 15% of WUO • Volume of potable reuse water from new facilities, not to exceed 10% of WUO	**Direct Impact** • GWRS	**Direct Impact** The GWRS (run by OCWD) significantly increases the availability of potable reuse water

In addition, MWDOC is providing support to agencies to assist with the calculation of WUOs. DWR will provide residential outdoor landscape measurements; however, Urban Water Suppliers are responsible for measuring landscape that is irrigated/irrigable by dedicated irrigation meters. MWDOC is contracting for consultant services to assist agencies in obtaining these measurements. Services may include but are not limited to:

- Accounting/database clean up (e.g., data mining billing software to determine dedicated irrigation customers);
- Geolocation of dedicated irrigation meters;

- In-field measurements;
- GIS/Aerial imagery measurements;
- Transformation of static/paper maps to digital/GIS maps.

These services will help agencies organize and/or update their databases to determine which accounts are dedicated irrigation meters and provide landscape area measurements for those accounts. These data points are integral when calculating the WUO. MWDOC is also exploring funding options to help reduce retail agencies' costs of obtaining landscape area measurements for dedicated irrigation meters.

CII Performance Measures

Urban water supplies are expected to report Best Management Practices (BMPs) and more for CII customers. MWDOC offers a broad variety of programs and incentives to help CII customers implement BMPs and increase their water efficiencies.

Table 9-6: CII Performance Measures and Programs

Component	Program Offered	Impact
CII Performance Measures	• WSIP • ORP • HETs • HE Urinals • Plumbing Flow Control Valves • Connectionless Food Steamers • Air-cooled Ice Machines • Cooling Tower Conductivity controllers • Cooling Tower pH Controllers • Dry Vacuum Pumps • Laminar Flow Restrictors	WSIP incentivizes customized CII water efficiency projects that utilize BMPs. ORP incentivizes the conversion of potable to recycled water and is applicable to CII dedicated irrigation meters or CII mixed-use meters that may be split to utilize recycled water for irrigation. Additional CII rebates based on BMPs increase the economic feasibility of increasing water efficiencies.

10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The Water Code requires the UWMP to be adopted by the Supplier's governing body. Before the adoption of the UWMP, the Supplier has to notify the public and the cities and counties within its service area per the Water Code and hold a public hearing to receive input from the public on the UWMP. Post adoption, the Supplier submits the UWMP to DWR and the other key agencies and makes it available for public review.

This section provides a record of the process the City followed to adopt and implement its UWMP.

10.1 Overview

Recognizing that close coordination among other relevant public agencies is key to the success of its UWMP, the City worked closely with many other entities, including representation from diverse social, cultural, and economic elements of the population within the City's service area, to develop and update this planning document. The City also encouraged public involvement through its public hearing process, which provided residents with an opportunity to learn and ask questions about their water supply management and reliability. Through the public hearing, the public has an opportunity to comment and put forward any suggestions for revisions of the Plan.

Table 10-1 summarizes external coordination and outreach activities carried out by the City and their corresponding dates. The UWMP checklist to confirm compliance with the Water Code is provided in Appendix A.

Table 10-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Notified the cities and counties within the Supplier's service area that Supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	3/1/21	Appendix K
Public Hearing Notice	5/27/2021 & 6/3/2021	Appendix K
Held Public Hearing	6/15/2021	Appendix K
Adopted UWMP	6/15/2021	Appendix L
Submitted UWMP to DWR (no later than 30 days after adoption)	7/1/2021	-

External Coordination and Outreach	Date	Reference
Submitted UWMP to the California State Library (no later than 30 days after adoption)	7/1/2021	-
Submitted UWMP to the cities and counties within the Supplier's service area (no later than 30 days after adoption)	7/1/2021	-
Made UWMP available for public review (no later than 30 days after filing with DWR)	7/31/2021	-

This UWMP was adopted by the City Council on June 15, 2021. A copy of the adopted resolution is provided in Appendix L.

10.2 Agency Coordination

The Water Code requires the Suppliers preparing UWMPs to notify any city or county within their service area at least 60 days prior to the public hearing. As shown in Table 10-2, the City sent Letters of Notification to the City of San Juan Capistrano and the County of Orange, as well as to SOCWA, SCWD and SMWD on March 1, 2021 to state that it was in the process of preparing an updated UWMP (Appendix K).

Table 10-2: Retail: Notification to Cities and Counties

DWR Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
San Juan Capistrano	☑	☑
SCWD	☑	☑
SMWD	☑	☑
SOCWA	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Orange County	☑	☑

The City's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. The City involved the relevant agencies in this 2020 UWMP at various levels of contribution as described below.

The City is dependent on imported water from MET through MWDOC, its regional wholesaler. MWDOC provided assistance to the City's 2020 UWMP development by providing much of the data and analysis such as population projections from the California State University at Fullerton CDR and the information quantifying water availability to meet the City's projected demands for the next 25 years, in five-year increments. Additionally, MWDOC led the effort to develop a Model Water Shortage Ordinance that its retail suppliers can adopt as is or customize and adopt as part of developing their WSCPs. This 2020 UWMP was developed in collaboration with MWDOC's 2020 UWMP to ensure consistency between the two documents.

The various planning documents of the key agencies that were used to develop this UWMP are listed in Section 2.2.1.

10.3 Public Participation

The City encouraged community and public interest involvement in the plan update through a public hearing and inspection of the draft document on June 15, 2021. As part of the public hearing, the City discussed adoption of the UWMP, SBx7-7 baseline values, compliance with the water use targets (Section 5), implementation, and economic impacts of the water use targets (Section 9).

Copies of the draft Plan were available on the City's website, www.san-clemente.org, and in hardcopy format by appointment with the Utilities Director.

Public hearing notifications were published in local newspapers and mailed to neighboring water agencies. A copy of the published Notice of Public Hearing is included in Appendix K.

The hearing was conducted during a regularly scheduled meeting of the City Council.

10.4 UWMP Submittal

The City Council reviewed and approved the 2020 UWMP at its June 15, 2021 meeting after the public hearing. See Appendix L for the resolution approving the Plan.

By July 1, 2021, the City's adopted 2020 UWMP was filed with DWR, California State Library, the City of San Juan Capistrano and the County of Orange. The submission to DWR was done electronically through the online submittal tool – WUE Data Portal. The City will make the Plan available for public review on its website no later than 30 days after filing with DWR.

10.5 Amending the Adopted UWMP or WSCP

Based on DWR's review of the UWMP, the City will make any amendments in its adopted UWMP, as required and directed by DWR and will follow each of the steps for notification, public hearing, adoption, and submittal for the amending the adopted UWMP.

If the City revises its WSCP after UWMP is approved by DWR, then an electronic copy of the revised WSCP will be submitted to DWR within 30 days of its adoption.

11 REFERENCES

Boyle Engineering Corporation. (1987, September). *City of San Clemente Groundwater Supply and Management Study.*

California Department of Housing and Community Development. (2020). *Accessory Dwelling Units (ADUs) and Junior Accessory Dwelling Units (JADUs)*. https://www.hcd.ca.gov/policy-research/accessorydwellingunits.shtml

California Department of Water Resources (DWR). (2020a, January). *California's Most Significant Droughts: Comparing Historical and Recent Conditions*. https://water.ca.gov/-/media/DWR-Website/Web-Pages/What-We-Do/Drought-Mitigation/Files/Publications-And-Reports/a6022_CalSigDroughts19_v9_ay11.pdf. Accessed on October 12, 2020.

California Department of Water Resources (DWR). (2020b, August 26). *The Final State Water Project Delivery Capability Report (DCR) 2019*. https://data.cnra.ca.gov/dataset/state-water-project-delivery-capability-report-dcr-2019. Accessed on December 28, 2020.

California Department of Water Resources (DWR). (2020c, August). *Draft Urban Water Management Plan Guidebook 2020.* https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans/Draft-2020-UWMP-Guidebook.pdf?la=en&hash=266FE747760481ACF779F0F2AAEE615314693456. Accessed on December 28, 2020.

CDM Smith. (2021, March 30). *Orange County Water Demand Forecast for MWDOC and OCWD Technical Memorandum.*

City of San Clemente. (2013, June 18). *Agenda Report: San Clemente City Council Meeting June 18, 2013.* https://www.san-clemente.org/Home/ShowDocument?id=14809.

California Department of Water Resources (DWR). (2019a). *Sustainable Groundwater Management Act 2019 Basin Prioritization: Process and Results.* file:///C:/Users/CVillacis/Downloads/sgma_bp_process_document.pdf.

California Department of Water Resources (DWR). (2019b). *SGMA Basin Prioritization Dashboard*. https://gis.water.ca.gov/app/bp-dashboard/final/#.

Dudek. July 2015. *Water Well Aquifer Study*.

Irvine Ranch Water District (IRWD). (2021a). *Facilities: Irvine Lake.* https://www.irwd.com/construction/irvine-lake. Accessed on February 2, 2021.

Irvine Ranch Water District (IRWD). (2021b). *Water Banking: The Strand Ranch Integrated Water Banking Project.* https://www.irwd.com/construction/irvine-lake. Accessed on February 2, 2021.

Metropolitan Water District of Southern California (MET). (2021, June). *2020 Urban Water Management Plan.*

Orange County Local Agency Formation Commission (OC LAFCO). (2020, September). *Municipal Service Review for the Municipal Water District of Orange County.*

Santa Margarita Water District (SMWD). (2021). San Juan Watershed Project. *About the Project: Phases.* http://sanjuanwatershed.com/about-the-project/eir/phases/. Accessed on April 20, 2021.

The Metropolitan Water District Act. (1969). http://www.mwdh2o.com/Who%20We%20Are%20%20Fact%20Sheets/1.2_Metropolitan_Act.pdf

United States Bureau of Reclamation (USBR). (2012, December). *Colorado River Basin Water Supply and Demand Study: Study Report.* https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/Study%20Report/CRBS_Study_Report_FINAL.pdf. Accessed on December 29, 2020.

University of California Berkeley. (2020). *About Accessory Dwelling Units.* https://www.aducalifornia.org/. Accessed on December 9, 2020.

APPENDICES

Arcadis U.S., Inc.
320 Commerce, Suite 200
Irvine
California 92602
Phone: 714 730 9052
www.arcadis.com

Maddaus Water Management, Inc.
Danville, California 94526
Sacramento, California 95816
www.maddauswater.com