



2025 MOJAVE REGIONAL URBAN WATER MANAGEMENT PLAN



TABLE OF CONTENTS

Executive Summary	ES-1
Chapter 1.0 Introduction.....	1-1
1.1.1 Background and Purpose.....	1-1
1.1.2 Basis for Plan Preparation	1-2
1.1.3 Coordination and Outreach	1-2
1.1.4 Statutory Requirements for Notice.....	1-4
1.1.5 RUWMP Adoption.....	1-4
1.1.6 Document Organization.....	1-4
Chapter 2.0 The Mojave Region	2-1
2.1.1 Regional Overview.....	2-1
2.1.2 Water Suppliers of the Mojave Region.....	2-6
2.1.3 Mojave Region Groundwater Basins	2-9
2.1.4 Major Regional Infrastructure	2-15
2.1.5 Regional Climate.....	2-20
2.1.6 Current and Projected Population.....	2-23
2.1.7 Land Use, Economy, and Demographics	2-28
2.1.8 Summary	2-33
Chapter 3.0 Regional Water Supply Characterization.....	3-1
3.1.1 Mojave Region Water Supply Sources	3-1
3.1.2 Water Quality	3-10
3.1.3 Desalination Opportunities.....	3-15
3.1.4 Delta Reliance	3-15
3.1.5 Climate Change	3-16
3.1.6 Summary of Existing and Planned Water Supplies	3-16
Chapter 4.0 Water Use Characterization.....	4-1
4.1.1 Current Regional Water Use	4-1
4.1.2 Forecasting Regional Water Use.....	4-6
4.1.3 Summary of Future Regional Water Use	4-8
Chapter 5.0 Regional Water Service Reliability.....	5-1

5.1.1	Mojave Region Five-Year Drought Risk Assessment	5-2
5.1.2	MWA Long-Term Service Reliability	5-3
5.1.3	Water Supply Reliability Summary	5-7
Chapter 6.0	Mojave Water Agency	6-1
Chapter 7.0	The City of Adelanto	7-1
Chapter 8.0	County Service Area 64 Spring Valley Lake	8-1
Chapter 9.0	County Service Area 70J Oak Hills.....	9-1
Chapter 10.0	Golden State Water Company – Barstow System.....	10-1
Chapter 11.0	Hesperia Water District.....	11-1
Chapter 12.0	Hi-Desert Water District.....	12-1
Chapter 13.0	Joshua Basin Water District.....	13-1
Chapter 14.0	Liberty Utilities – Apple Valley	14-1
Chapter 15.0	Phelan Piñon Hills Community Services District.....	15-1
Chapter 16.0	Victorville Water District.....	16-1

LIST OF TABLES

Table 1-1: Public and Public Agency Coordination	1-3
Table 2-1: Urban Water Retail Water Suppliers within the Mojave Region	2-8
Table 2-2: Groundwater Basins and Subbasins within the Mojave Region.....	2-10
Table 2-3: Historical Population.....	2-24
Table 2-4: Comparison of Incorporated City Population Data	2-25
Table 2-5: Urban Water Supplier Population Projections – UCR Study and Adjusted UCR Study	2-26
Table 2-6: Mojave Region Population Projections – UCR Study and Adjusted UCR Study	2-26
Table 2-7: Adjusted UCR Study and SCAG Population Projections	2-27
Table 2-8: 2025 RUWMP Population Projections	2-28
Table 2-9: Known Land Use Plans in the Mojave Region.....	2-30
Table 3-1: Projected Native Groundwater for each Subregion through 2050 (AFY).....	3-6
Table 3-2: MWA’s Projected Imported Water Supplies (AFY).....	3-7
Table 3-3: Summary of Return Flow for Subregion 1 and Subregion 2 through 2050 (AFY).....	3-8
Table 3-4: Recycled Water Supplies for Subregion 1 through 2050 (AFY).....	3-9
Table 3-5: Average Existing TDS and Nitrate Concentrations by SNMP Subregion.....	3-13
Table 3-6: Reduced Delta Reliance.....	3-16
Table 3-7: Projected Total Water Supply for the Mojave Region for the Next 5-Years (AFY).....	3-17
Table 3-8: Projected Total Water Supply for the Mojave Region Through 2050 (AFY).....	3-17
Table 4-1: Regional Water Use 2021-2025 (AFY)	4-3
Table 4-2: Subregion 1 Water Use 2021-2025 (AFY).....	4-4
Table 4-3: Subregion 2 Water Use 2021-2025	4-5
Table 4-4: Subregion 3 Water Use 2021-2025.....	4-5
Table 4-5: Projected Subregion 1 Water Demand 2030-2050 (AFY).....	4-9
Table 4-6: Projected Subregion 2 Water Demand 2030-2050 (AFY)	4-9
Table 4-7: Projected Subregion 3 Water Demand 2030-2050 (AFY).....	4-9
Table 4-8: Projected Regional Water Demand 2030-2050 (AFY).....	4-10
Table 5-1: MWA Five Year Drought Risk Assessment (AFY)	5-3
Table 5-2: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY)	5-5
Table 5-3: Five Consecutive Dry Years Water Supply and Demand Through 2050 (AFY).....	5-6

LIST OF FIGURES

Figure 2-1: The Mojave Region	2-3
Figure 2-2: Subareas and Management Areas within the Mojave Region	2-4
Figure 2-3: 2025 RUWMP Subregions.....	2-6
Figure 2-4: Urban Water Retail Suppliers within the Mojave Region.....	2-9
Figure 2-5: Groundwater Basins and Subbasins within the Mojave Region	2-11
Figure 2-6: Adjudicated Subareas and Defined Management Areas within the Mojave Region.....	2-13
Figure 2-7: SWP Mojave Division Aqueduct Reach Sections.....	2-16
Figure 2-8: MWA Turnouts Along the East Branch.....	2-17
Figure 2-9: R-Cubed Facilities	2-19
Figure 2-10: Average Climate Conditions	2-21
Figure 2-11: Annual Precipitation Variability (1996-2024)	2-21
Figure 2-12: Historical Annual Temperature and Trends (years)	2-22
Figure 2-13: San Bernardino County Employment Data 2015-2025.....	2-33
Figure 3-1: Floodplain and Other Regional Aquifers	3-4

APPENDICES

Appendix 1 – Notices	A-1
Appendix 2 – Reduced Delta Reliance.....	A-2
Appendix 3 – MWA Regional DWR Checklist.....	A-3
Appendix 4 – MWA WSCP	A-4

This 2025 Regional Urban Water Management Plan (RUWMP) was prepared by Zanjero in conjunction with Mojave Water Agency.



This 2025 RUWMP was prepared under the direction of a California licensed civil engineer



The Victorville Water District Retail Chapter contained within this RUWMP was prepared by:

The Golden State Water Company - Barstow System Retail Chapter contained within this RUWMP was prepared by:



EXECUTIVE SUMMARY

LAYPERSON'S DESCRIPTION

After the devastating drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands, and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA).¹ The UWMPA requires urban water suppliers serving over 3,000 customer connections or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan (UWMP) every five years,² and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon.³ The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan.⁴ In addition, each urban water supplier must prepare an annual water supply and demand assessment.⁵ The California Legislature emphasizes that aggregating these legal requirements at the urban water supplier management level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the UWMP is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP provides elected officials, management, staff, customers, and the public with an understanding of past, current, and future water conditions. The UWMP integrates local and regional land use planning, water supply planning, infrastructure considerations, and demand management measures, while also addressing statewide challenges that may manifest through climate change, drought, and evolving regulations. Thoughtful urban water management planning provides an opportunity for water suppliers to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning

¹ California Water Code Section 10610 *et seq.* (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1) and its subsequent amendments

² California Water Code Section 10610 *et seq.*

³ California Water Code Section 10631-10635

⁴ California Water Code Section 10632

⁵ California Water Code Section 10632.1

conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

ES-1 The Mojave Region

The 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP or Plan) has been prepared by Mojave Water Agency (MWA) and the ten participating urban water suppliers within the Mojave Region. The Mojave Region is concurrent with MWA's service area and encompasses approximately 4,900 square miles of eastern San Bernardino County. The Region includes a diverse mix of incorporated cities, unincorporated communities, rural domestic users, small water systems, industrial and recreational uses, agricultural uses, and urban retail water suppliers that depend primarily on local groundwater supplies supported by imported water management.

The 2025 RUWMP represents the first regional urban water management plan prepared for the Mojave Region. The regional planning approach allows MWA and the participating urban water suppliers to prepare a coordinated water management plan that evaluates shared regional water supplies, regional water demands, and long-term water service reliability using consistent assumptions and methodologies. This approach also reduces duplicative analyses, improves regional coordination, and provides a common technical foundation for local and regional decision-making.

The participating urban water suppliers include MWA, as the Region's wholesale water supplier, and the urban water retail suppliers located within MWA's service area. For adoption purposes, each participating urban water retail supplier will adopt Regional Chapters 1 through 5, MWA's wholesale supplier chapter (Chapter 6), its own retail-specific chapter, its Water Shortage Contingency Plan (WSCP), and all applicable appendices. MWA will adopt the entirety of the 2025 RUWMP, including Regional Chapters 1 through 5, its wholesale supplier chapter, all participating retail supplier chapters, its WSCP, and all applicable appendices.

Chapters 1 through 5 provide the shared regional planning framework, including the regional description, regional water supply characterization, regional water use characterization, and regional water service reliability analysis. Chapter 6 describes MWA's wholesale water supply, imported water management, managed groundwater storage, and other regional water management responsibilities. The retailer-specific chapters provide the additional information necessary to satisfy the UWMPA requirements for each participating urban water retail supplier.

The Mojave Region's fundamental water management challenge is that urban, rural, industrial, agricultural, and other water demands have historically exceeded the natural replenishment capacity of local groundwater basins. Groundwater is the foundation of the Region's water supply portfolio; however, that groundwater supply is actively managed through adjudications, stipulated agreements, imported State Water Project supplies,

recharge operations, return flows, recycled water, transfers, exchanges, and ongoing coordination among MWA, retail water suppliers, watermasters, land use agencies, and other regional partners. Together, these management actions support regional groundwater sustainability and long-term water service reliability.

For purposes of regional supply and demand evaluation, the 2025 RUWMP organizes the Mojave Region into three planning subregions. This subregional framework allows the Plan to recognize hydrologic, infrastructure, and demand differences across the Region while still evaluating overall regional reliability. The subregional framework also supports comparison of regional supplies and demands in a manner that is useful for both MWA's wholesale planning responsibilities and the participating urban water suppliers' retail planning responsibilities.

ES-2 Mojave Region Water Service Reliability

The 2025 RUWMP aggregates regional water supplies and demands through MWA's role as the Region's wholesale water supplier, State Water Project contractor, Watermaster for the Mojave Basin Area Adjudication, and administrator for the Warren Valley Basin Judgment. Because the Mojave Region depends primarily on groundwater, regional reliability is not evaluated solely by comparing annual imported water deliveries to annual demands. Instead, reliability is evaluated based on the coordinated management of groundwater, imported water, return flows, recycled water, stored water assets, transfers, exchanges, and the legal and institutional frameworks that govern water use across the Region.

The 2025 RUWMP extends the regional planning horizon through 2050. This planning horizon allows MWA and the participating urban water suppliers to evaluate long-term population growth, land use changes, water demand trends, imported water reliability, groundwater management conditions, recycled water opportunities, and infrastructure needs. These considerations help improve regional coordination and provide a common planning framework for local and regional water management decisions.

As described in *Chapter 3 – Regional Water Supply Characterization*, the Mojave Region's water supply portfolio includes native groundwater, imported State Water Project supplies, return flows, recycled water, and other managed water supplies. These supplies are not all used in the same manner or at the same time. Native groundwater and return flows help support recurring local supply conditions; imported water is used by MWA to support recharge, replacement water obligations, and regional groundwater management; recycled water helps offset potable demands at the retail water supplier level where available; and stored water assets provide an important management tool for addressing hydrologic variability, imported water fluctuations, and dry-year conditions.

Chapter 4 – Water Use Characterization, characterizes current and projected regional water demands, including demands associated with participating urban water retail suppliers and other regional water users. These demands are organized by subregion to support regional

supply and demand comparisons while recognizing that water use, groundwater conditions, infrastructure, and management needs vary across the Mojave Region. The regional demand forecast provides a common planning basis for evaluating long-term reliability and for coordinating wholesale and retail water management actions.

Chapter 5 – Regional Water Service Reliability, evaluates regional water service reliability under normal year, single dry year, and five consecutive dry year conditions through 2050, as well as the five-year Drought Risk Assessment for 2026 through 2030. The analysis demonstrates that the Mojave Region has sufficient managed water supplies to meet projected regional demands under the planning scenarios evaluated in this RUWMP. The analysis also recognizes that reliability depends on continued regional management, including MWA's importation and recharge of supplemental water supplies, implementation of adjudication requirements, use of stored water assets when needed, local retail supplier management, recycled water development where feasible, and continued demand management.

The Region's water assets are based understood as a regional reliability and management tool rather than a recurring annual supply that should be added directly to all other annual supplies. MWA stores water in wet and normal years to help manage dry-year risks, imported water variability, and groundwater basin conditions. These stored supplies provide operational flexibility and support long-term resilience, but their use is guided by hydrologic conditions, infrastructure capacity, basin management objectives, adjudication requirements, and regional water management priorities.

Each participating urban water retail supplier also evaluates water service reliability within its own chapter. Those chapters address local supply portfolios, demands, infrastructure, conservation measures, and WSCPs. Together, the regional analysis and retailer-specific analyses demonstrate that the 2025 RUWMP provides a coordinated and locally implementable framework for maintaining reliable water service throughout the Mojave Region.

In summary, the Mojave Region's coordinated management of groundwater, imported water, return flows, recycled water, transfers, exchanges, and stored water assets provides a reliable water supply portfolio to meet current and projected regional demands through 2050. The 2025 RUWMP demonstrates that the Region has reliable water supplies under normal, single dry, and five consecutive dry year conditions, while also providing the foundation for annual water supply and demand assessments and implementation of retailer-specific WSCPs.

Chapter 1.0 INTRODUCTION

The 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP, RUWMP, or Plan) establishes a long-term, coordinated framework for regional water resources planning and management through the year 2050 for the Mojave Region. The 2025 RUWMP applies to Mojave Water Agency (MWA or Agency) as the regional wholesale water supplier and to participating urban water suppliers within MWA’s service area. This Plan represents the first RUWMP prepared for the Mojave Region and reflects a shared commitment to integrated, collaborative, and forward-looking water management.

The RUWMP provides a consistent assessment of long-term water supply reliability, supports groundwater sustainability, and addresses regional vulnerability to drought, climate change, and population growth. The RUWMP is intended to inform elected officials, water supplier staff, water users, interested community parties, and the State of California regarding current conditions, projected demands, and strategies to ensure reliable and sustainable water supplies.

Participating urban water suppliers include:

- City of Adelanto
- County Service Area 64
- County Service Area 70J
- Hesperia Water District
- Hi-Desert Water District
- Golden State Water Company – Barstow System
- Joshua Basin Water District
- Liberty Utilities – Apple Valley Water Company
- Mojave Water Agency (Wholesale)
- Phelan Piñon Hills Community Services District
- Victorville Water District

While this RUWMP provides regionally consistent planning assumptions and analyses, each urban water supplier will separately prepare and adopt a Water Shortage Contingency Plan (WSCP) customized for its specific service area. The RUWMP and associated WSCPs will be adopted in accordance with statutory deadlines.

1.1.1 Background and Purpose

The California Urban Water Management Planning Act (UWMPA) requires urban water suppliers serving at least 3,000 connections or delivering more than 3,000 acre-feet of water

annually to prepare an Urban Water Management Plan (UWMP) every five years. The UWMPA authorizes multiple urban water suppliers that share common water supplies to prepare a RUWMP in lieu of individual plans.

Recognizing the benefits of regional coordination, MWA and its urban water retail suppliers jointly elected to prepare this RUWMP. Compared with developing separate agency-specific UWMPs, a regional approach promotes consistent technical assumptions, reduces duplicative effort, improves cost efficiency, enhances data accuracy, and strengthens the region's ability to pursue state and federal funding opportunities.

1.1.2 Basis for Plan Preparation

The purpose of the 2025 RUWMP is to provide a coordinated evaluation of regional water supplies, demands, and management strategies shared among participating agencies. By developing a single regional planning document, participating agencies leverage collective data resources, technical expertise, and institutional knowledge to support consistent planning and informed long-term decision-making.

This 2025 RUWMP fulfills the reporting requirements established by the California Department of Water Resources (DWR) to implement the UWMPA and aligns with statewide water management objectives. The Plan satisfies statutory requirements for MWA as a wholesale urban water supplier and for each participating retail urban water supplier.

1.1.3 Coordination and Outreach

Development of the 2025 RUWMP included coordination with local governments, neighboring water agencies, and relevant regulatory entities, as required by the UWMPA. Coordination efforts were undertaken to ensure consistency with applicable city and county General Plans, Water Master Plans, groundwater adjudications and stipulations, and other related planning documents.

In accordance with California Water Code Section (CWC) 10621(b), MWA and the participating urban water suppliers conducted joint public outreach and provided required public notices prior to adoption of the RUWMP by each individual urban water supplier. A summary of coordination and public outreach activities is provided in **Table 1-1**.

TABLE 1-1: PUBLIC AND PUBLIC AGENCY COORDINATION

Coordinating Agencies	Coordinate Regarding Demands	Sent Copy of Draft RUWMP	Sent 60-Day Notice	Notice of Public Hearing
Cities, Counties, Customers, and Relevant Parties				
Liberty Utilities (Apple Valley Water Company)	X	X	X	X
Bighorn-Desert View Water Agency		X	X	X
City of Adelanto	X	X	X	X
County Service Area 64	X	X	X	X
County Service Area 70J	X	X	X	X
Golden State Water Company - Barstow System	X	X	X	X
Helendale CSD		X	X	X
Hesperia Water District	X	X	X	X
Hi-Desert Water District	X	X	X	X
Joshua Basin Water District	X	X	X	X
Mojave Water Agency	X	X	X	X
Phelan Piñon Hills CSD	X	X	X	X
Victorville Water District	X	X	X	X
San Bernardino County Planning Department			X	X
California Department of Water Resources			X	X
Local Agency Formation Commission (LAFCO) for San Bernardino County			X	X
General Public				X

1.1.3.1 Water Supplier Information Exchange

CWC Section 10631 requires wholesale and urban water suppliers to provide each other with information regarding water supply and demand. Since both MWA, as a wholesale supplier that receives water from the California State Water Project (SWP) on behalf of the Mojave Region, and each of the urban water suppliers are already coordinating on this RUWMP, information exchange was happening throughout the RUWMP development, and any separate noticing was unnecessary.

1.1.4 Statutory Requirements for Notice

In accordance with the UWMPA, notification of the RUWMP update was provided to cities and counties within the RUWMP Planning Area at least 60 days prior to the public hearing of the RUWMP as required by CWC Section 10621(b). Electronic copies of the final RUWMP will be provided to the County of San Bernardino no later than 30 days after its submission to DWR.

1.1.5 RUWMP Adoption

Each participating agency has reviewed, approved, and will implement the portions of this RUWMP that are specific and applicable to their service area. While the RUWMP was developed collaboratively to ensure consistency and coordination across the Mojave Region, not all elements of the RUWMP apply equally to every agency. The RUWMP is therefore organized in a modular format, where Chapters 1 through 5 are universal, and Chapters 6 through 16 are unique to each participating agency. This approach allows each agency to adopt Chapters 1 through 5 collectively with their agency-specific chapter and relevant WSCP. As such, the specific timing of adoption for each supplier is referenced within their unique chapter of the RUWMP.

Any future amendments or updates made by individual agencies to their respective chapter will not alter or affect the adopted portions of the RUWMP for other participating agencies. This structure preserves local autonomy while maintaining the benefits of regional coordination, ensuring that all agencies continue to contribute to a unified framework for sustainable water management within the Mojave Region and the MWA service area.

1.1.6 Document Organization

This RUWMP is organized to reflect the collaborative efforts of all participating agencies, while still allowing each agency to meet its respective statutory reporting requirements. As such, the 2025 RUWMP is organized as follows:

- Chapter 1 – Introduction
- Chapter 2 – The Mojave Region
- Chapter 3 – Regional Water Supply Characterization
- Chapter 4 – Regional Water Use
- Chapter 5 – Regional Water Service Reliability
- Chapter 6 – Mojave Water Agency (*Wholesale Water Supplier*)
- Chapter 7 – City of Adelanto (*Urban Water Supplier*)
- Chapter 8 – County Service Area 64 (*Urban Water Supplier*)
- Chapter 9 – County Service Area 70J (*Urban Water Supplier*)

- Chapter 10 – Golden State Water Company – Barstow (*Urban Water Supplier*)
- Chapter 11 – Hesperia Water District (*Urban Water Supplier*)
- Chapter 12 – Hi-Desert Water District (*Urban Water Supplier*)
- Chapter 13 – Joshua Basin Water District (*Urban Water Supplier*)
- Chapter 14 – Liberty Utilities – Apple Valley Water Company (*Urban Water Supplier*)
- Chapter 15 – Phelan Piñon Hills Community Services District (*Urban Water Supplier*)
- Chapter 16 – Victorville Water District (*Urban Water Supplier*)

Note to DWR:

The MWA and the urban water suppliers within its service area have written this RUWMP primarily as a water resource planning tool to effectively manage water supply, reliability, and demand. This RUWMP also satisfies all the requirements of the UWMPA for MWA (as a wholesale urban water supplier) and for each participating urban water supplier.

The body of the document provides narratives, analysis, and data that DWR requests in its 2025 UWMP Guidebook, including any changes to the CWC since 2020. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2025 UWMP Guidebook.

Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2025 UWMP Guidebook. These tables are separately uploaded to DWR's web portal for each of the participating urban water suppliers, along with this RUWMP. This RUWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F of the 2025 UWMP Guidebook.

Chapter 2.0 THE MOJAVE REGION

This chapter provides an overview of the Mojave Region (Region or RUWMP Planning Area) including its population characteristics, land use patterns, and climate conditions. It also introduces the various local entities and water purveyors that play key roles in managing and delivering water resources throughout the Region. As a foundational reason for preparation of this RUWMP, the Mojave Region is also concurrent with the MWA service boundary, which also fully encompasses all participating urban water suppliers that must also comply with the UWMPA. The Mojave Region, as a result, allows this RUWMP to capture the entirety of MWA's service area, as well as the service areas of each of the urban water suppliers that sit within MWA.

2.1.1 Regional Overview

The Mojave Region encompasses approximately 4,900 square miles of eastern San Bernardino County (**Figure 2-1**), corresponding to the MWA's service area. MWA serves as the Region's wholesale water supplier and as Watermaster for the Mojave Basin Area (MBA) adjudication. Located within the Mojave Desert of southeastern California, the Region includes several large, incorporated communities that collectively drive substantial and growing water demands despite extremely arid conditions.

The intermittent Mojave River is the Region's principal hydrologic feature. Its episodic flows provide the primary source of natural recharge to underlying groundwater basins and serve as a critical conveyance for imported SWP supplies used for managed groundwater recharge. Regional water management is shaped by a persistent structural water deficit, in which current primarily urban-driven demands exceed the natural replenishment capacity of local aquifers. Imported water is therefore essential to mitigating groundwater overdraft and supporting long-term regional sustainability.

Water management is organized across multiple geographic and administrative scales. At the regional level, MWA is responsible for managing and importing supplemental water supplies and coordinating their integration with local groundwater resources in cooperation with state, regional, and local partners. From a hydrogeographic perspective, the Region overlies all or portions of 36 groundwater basins and subbasins. For planning and management purposes, MWA groups these basins into eight subareas that cover the entire Region. Although the subareas are partially defined by faults and other geologic features, they generally remain hydrologically interconnected. Five subareas—Este, Oeste, Alto

(including the Alto Transition Zone), Centro, and Baja—are within the MBA adjudication and are named for their relative position along the Mojave River. The remaining three subareas lie outside the adjudicated basin and were part of MWA’s original service area or incorporated through subsequent adjudication actions. All eight subareas are managed in a coordinated manner by MWA, the MBA Watermaster and the Warren Valley Basin Watermaster, and the numerous urban water suppliers (**Figure 2-2**).

At the local level, urban water retail suppliers—particularly those serving the cities of Victorville, Hesperia, Adelanto, and Barstow along the Interstate 15 corridor—are the primary contributors to regional growth and future water demand. Expansion of these service areas directly influences regional demand conditions and the management strategies applied within individual subareas, with the most pronounced effects occurring in incorporated cities.

Groundwater provides the foundation of the Region’s water supply portfolio. Supplies consist of a managed combination of native groundwater and imported water, overseen by MWA on behalf of its constituent retail agencies, used to meet all demands within the Region. Recharge of native groundwater occurs through multiple mechanisms, including infiltration from the Mojave River and ephemeral streams, percolating rainwater, stormwater runoff, sublateral groundwater flow from surrounding mountains, treated wastewater and return flows, septic and irrigation seepage, and managed recharge of imported SWP supplies. As the SWP contractor for the Mojave Region, MWA manages the delivery and recharge of imported water using both the Mojave River and recharge sites located throughout its service area.

Effective water management in the Mojave Region relies on extensive coordination among MWA, retail water agencies, mutual water companies, adjudication watermasters, tribal entities, rural and self-supplied users, and land use and regulatory agencies. This collaboration supports coordinated infrastructure planning, groundwater monitoring, imported water operations, and drought response within a broader framework of regional and statewide water planning.

FIGURE 2-1: THE MOJAVE REGION

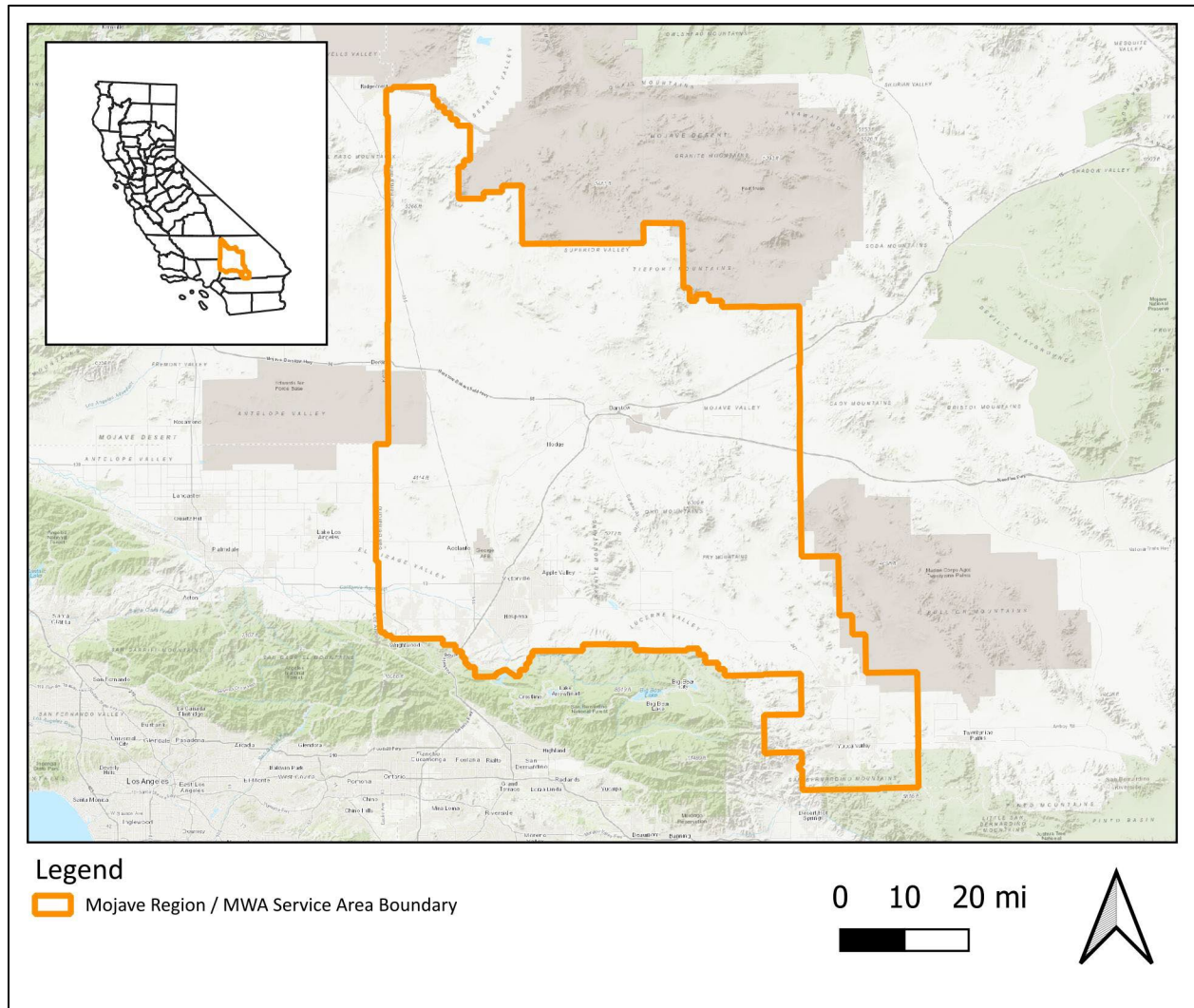
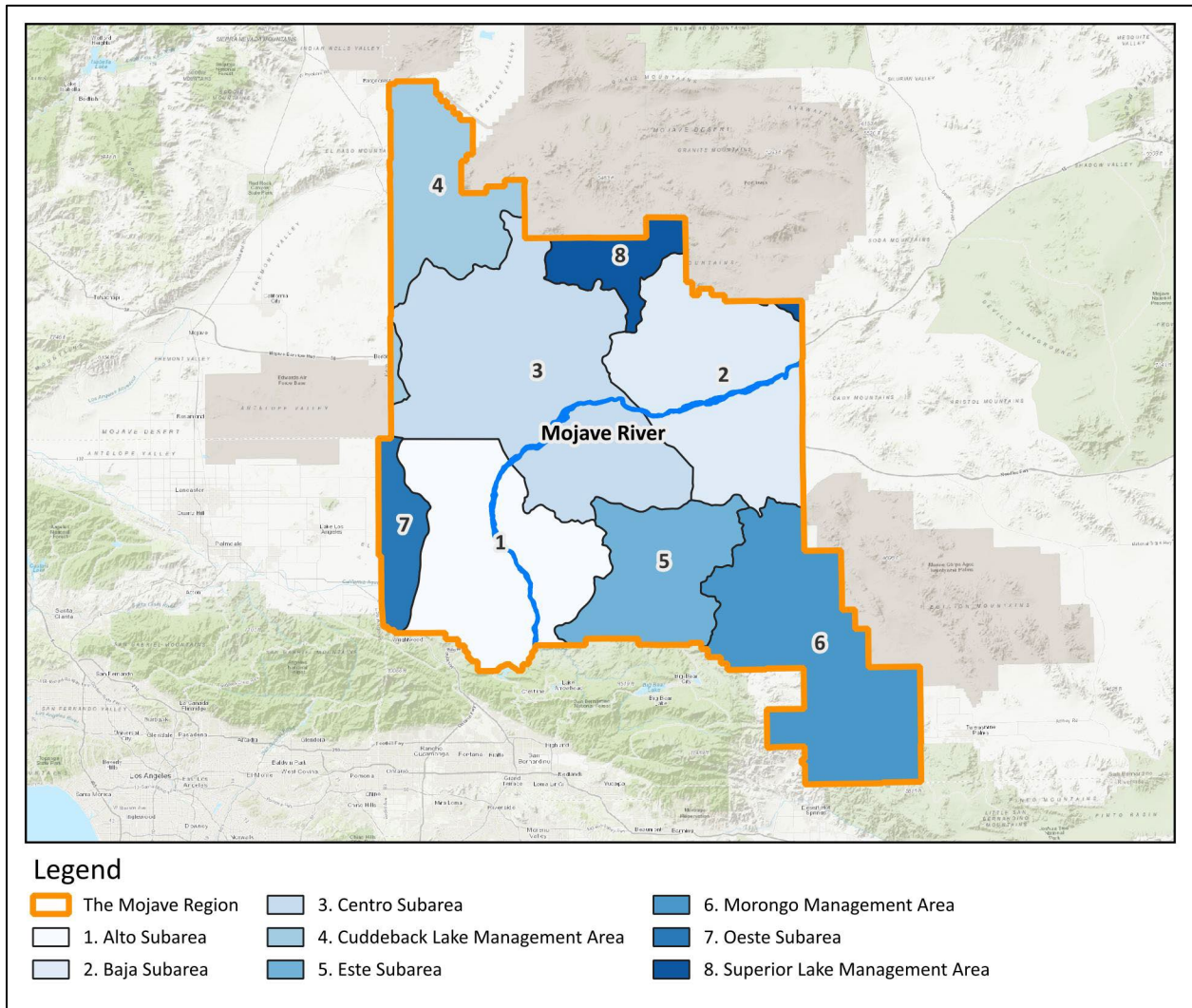


FIGURE 2-2: SUBAREAS AND MANAGEMENT AREAS WITHIN THE MOJAVE REGION

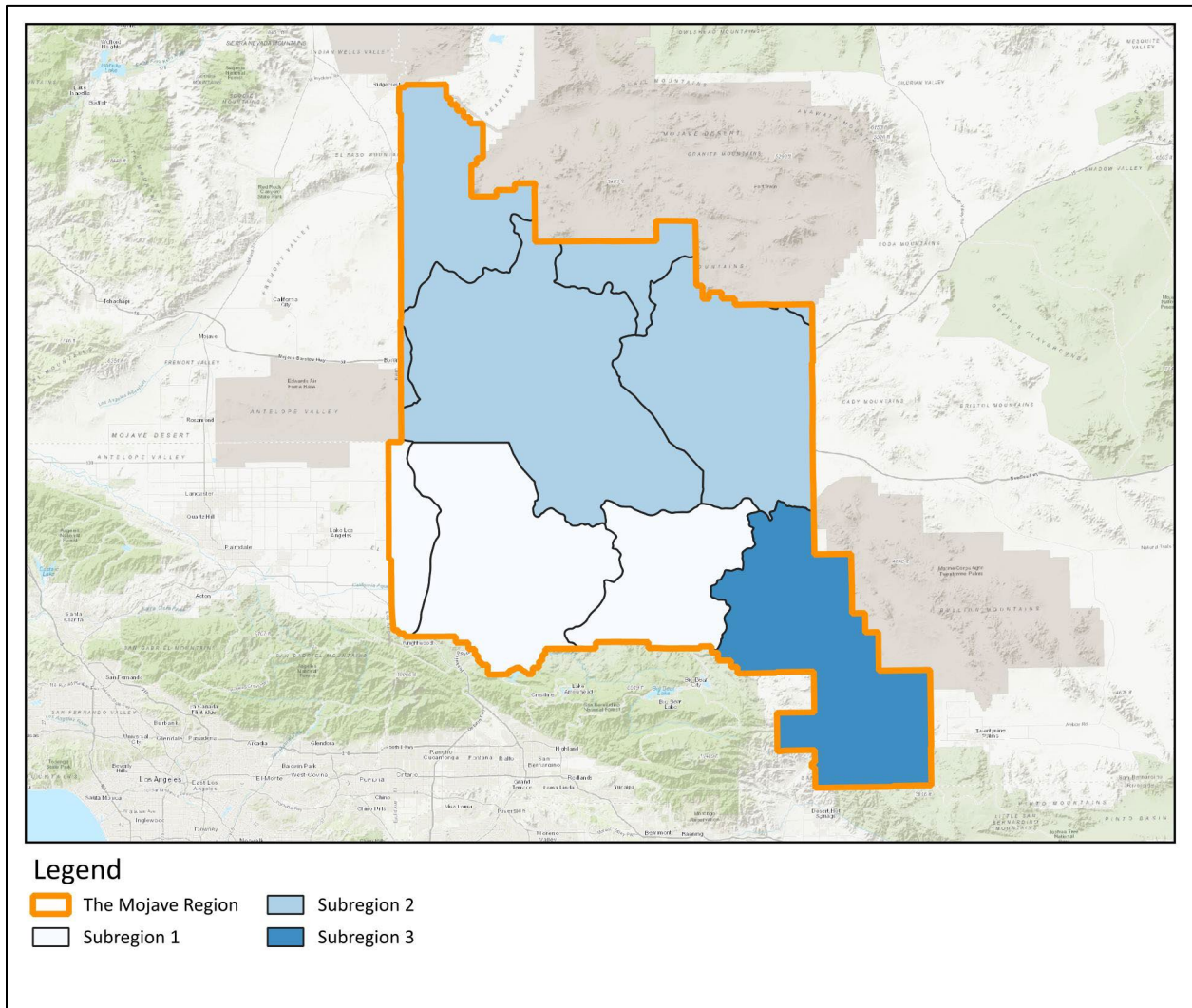


For the purposes of this RUWMP and evaluation of water supply reliability, the eight subareas are combined into the following three Subregions of the Mojave Region (**Figure 2-3**).

- Subregion 1 – Includes the subareas of Oeste, Alto (and Alto Transition), and Este: This subregion includes seven of the 10 participating RUWMP urban water suppliers (City of Adelanto, County Service Area 64, County Service Area 70J, Hesperia Water District, Liberty Utilities – Apple Valley, Phelan–Piñon Hills Community Services District, and Victorville Water District), as well as other demands reliant on MWA including other small urban water suppliers, Helendale Community Services District, rural pumpers, agriculture, and industry.
- Subregion 2 – Includes the subareas of Centro, Baja, Cuddeback Lake, and Superior Lake: This subregion includes one of the participating RUWMP urban water suppliers (Golden State Water Company–Barstow), as well as other demands reliant on MWA including other small urban water suppliers, rural pumpers, agriculture, and industry.
- Subregion 3 – Includes the subarea of Morongo: This subregion includes two of the 10 RUWMP urban water suppliers (Joshua Basin Water District and Hi-Desert Water District), as well as other demands reliant on MWA including other small urban water suppliers, Bighorn–Desert View Water Agency, rural pumpers, agriculture, and industry.

These Subregions are used to summarize demand and supply conditions in areas with generally similar groundwater conditions and MWA imported water opportunities.

FIGURE 2-3: 2025 RUWMP SUBREGIONS



2.1.2 Water Suppliers of the Mojave Region

The Mojave Region is geographically diverse but generally characterized as the High Desert. Most of the region sits between 2,000 and 5,000 feet in elevation and extends across incorporated cities, unincorporated communities, tribal lands, and large expanses of undeveloped open space. Within this Region there are several water suppliers that must comply with the UWMPA, with MWA having responsibilities as a wholesale water supplier, and several others having responsibility as urban water retail suppliers.

2.1.2.1 Mojave Water Agency

MWA serves as the wholesale water supplier for the Mojave Region and manages water supply reliability across its approximately 4,900-square-mile service area. The Agency’s core responsibility is to address the Region’s structural water management challenges, including limited local runoff and chronic groundwater overdraft within underlying basins and subbasins.

To support long-term sustainability for its retail agency partners and other customers, MWA manages the importation of SWP supplies from the California Aqueduct. In addition, MWA serves as the court-appointed Watermaster for the MBA Adjudication Judgment (MBA Judgment) (see *Chapter 3 – Water Supply Characterization*), where it regulates groundwater production and coordinates water management activities across the adjudicated subareas.

Although MWA does not provide retail water service, it fulfills a central regional function by integrating imported supplies with local groundwater management to enhance supply reliability, facilitate groundwater recharge, and improve drought resilience. This role requires ongoing coordination with retail water purveyors, adjudication watermasters, and other regional stakeholders to align imported water operations with groundwater sustainability objectives and broader regional planning efforts.

2.1.2.2 Urban Water Retail Suppliers

There are a variety of small-to-large state-permitted Public Water Systems, also referred to as urban water suppliers, located in the Mojave Region. As noted above, MWA does not sell water directly to these retailers or to any consumers; rather, it supplies water to areas of the Region used to recharge local aquifers for specific retailers as needed to satisfy the MBA Judgment’s replenishment requirements, as stipulated by the MBA Watermaster, as requested to meet needs in other adjudicated areas, and as needed to maintain overall groundwater basin health or requested to address local circumstances or retail requests. Of the twelve (12) large urban water suppliers within the Region, ten (10) are required to complete an UWMP pursuant to the UWMPA detailed in CWC Section 10610 et al. The 12 large urban water suppliers are shown in **Figure 2-4**.

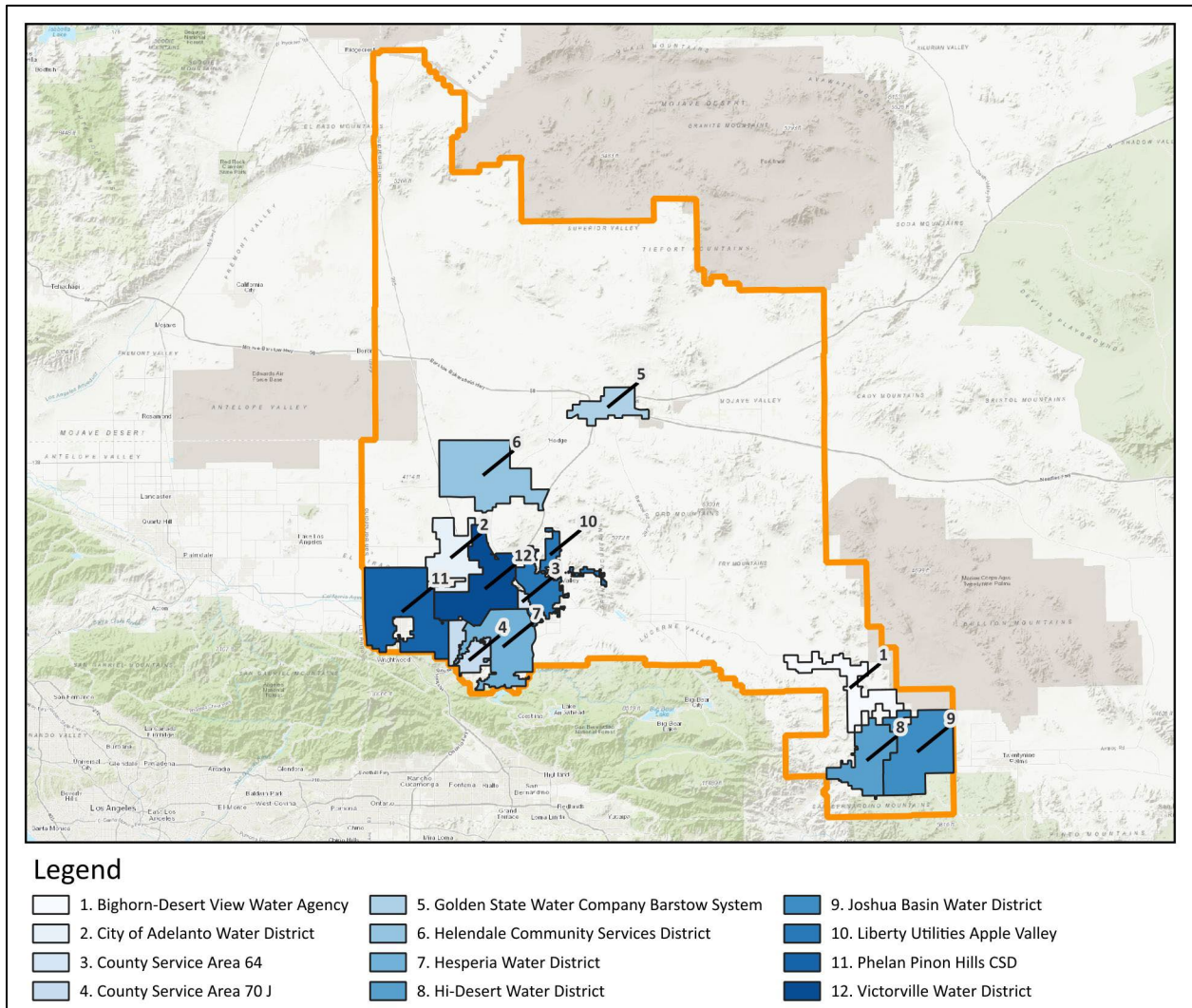
For the ten large suppliers required to prepare a UWMP, they collectively opted to pursue a coordinated RUWMP with MWA in lieu of ten individual UWMPs, hence this 2025 Regional UWMP document. **Table 2-1** lists the 10 suppliers that participated in this RUWMP, approximate service areas, and estimated total number of connections. Both Bighorn–Desert View Water Agency and Helendale Community Services District are incorporated into MWA’s wholesale demand forecast presented in *Chapter 6 – Mojave Water Agency*, as they both have not reached the UWMPA compliance threshold of 3,000+ service connections and/or do not supply more than 3,000 acre-feet of water per year, but have significant demands and are active coordinators within the Region.

TABLE 2-1: URBAN WATER RETAIL SUPPLIERS WITHIN THE MOJAVE REGION

Urban Water Retail Supplier	Service Area (sq. miles)	Approximate Connections
City of Adelanto	53	8,900
Liberty Utilities - Apple Valley Water Company	51	21,000
County Service Area 64	4	4,000
County Service Area 70J	28	3,500
Golden State Water Company - Barstow System	33	9,200
Hesperia Water District	78	29,100
Hi-Desert Water District	57	11,000
Joshua Basin Water District	97	5,600
Phelan Piñon Hills Community Services District	118	7,400
Victorville Water District	85	39,000
Bighorn-Desert View Water Agency	52	< 2,000
Helendale Community Services District	116	< 3,000

Several additional urban water suppliers dependent on MWA's supplies and management are not specifically discussed within unique chapters of this RUWMP as their size does not yet require completion of a UWMP. However, these smaller suppliers, as well as numerous other water users dependent on groundwater throughout the Region such as agriculture, industry, and rural domestic pumpers, are reflected in MWA's Wholesale chapter (*Chapter 6 - Mojave Water Agency*) and are incorporated into the Region's overall water demand characterization.

FIGURE 2-4: URBAN WATER RETAIL SUPPLIERS WITHIN THE MOJAVE REGION



2.1.3 Mojave Region Groundwater Basins

The Mojave Region overlies all or a portion of 36 groundwater basins and subbasins as defined by DWR Bulletin 118. Collectively, these basins and subbasins are broadly grouped into two larger hydrogeologically distinct areas – the South Lahontan Hydrologic Region and the Colorado River Hydrologic Region. Groundwater basins along the Mojave River and adjacent areas are referred to as the Mojave River Groundwater Basin. Remaining basins and subbasins in the southeastern Mojave Region are generally referred to as the Morongo Basin/Johnson Valley Area or “Morongo Area,” with the exception of the Lucerne Valley. The Lucerne Valley Subbasin is divided along the Helendale Fault with the southwest portion in the Mojave River Groundwater Basin and the northeast portion in the Morongo Area. Surface

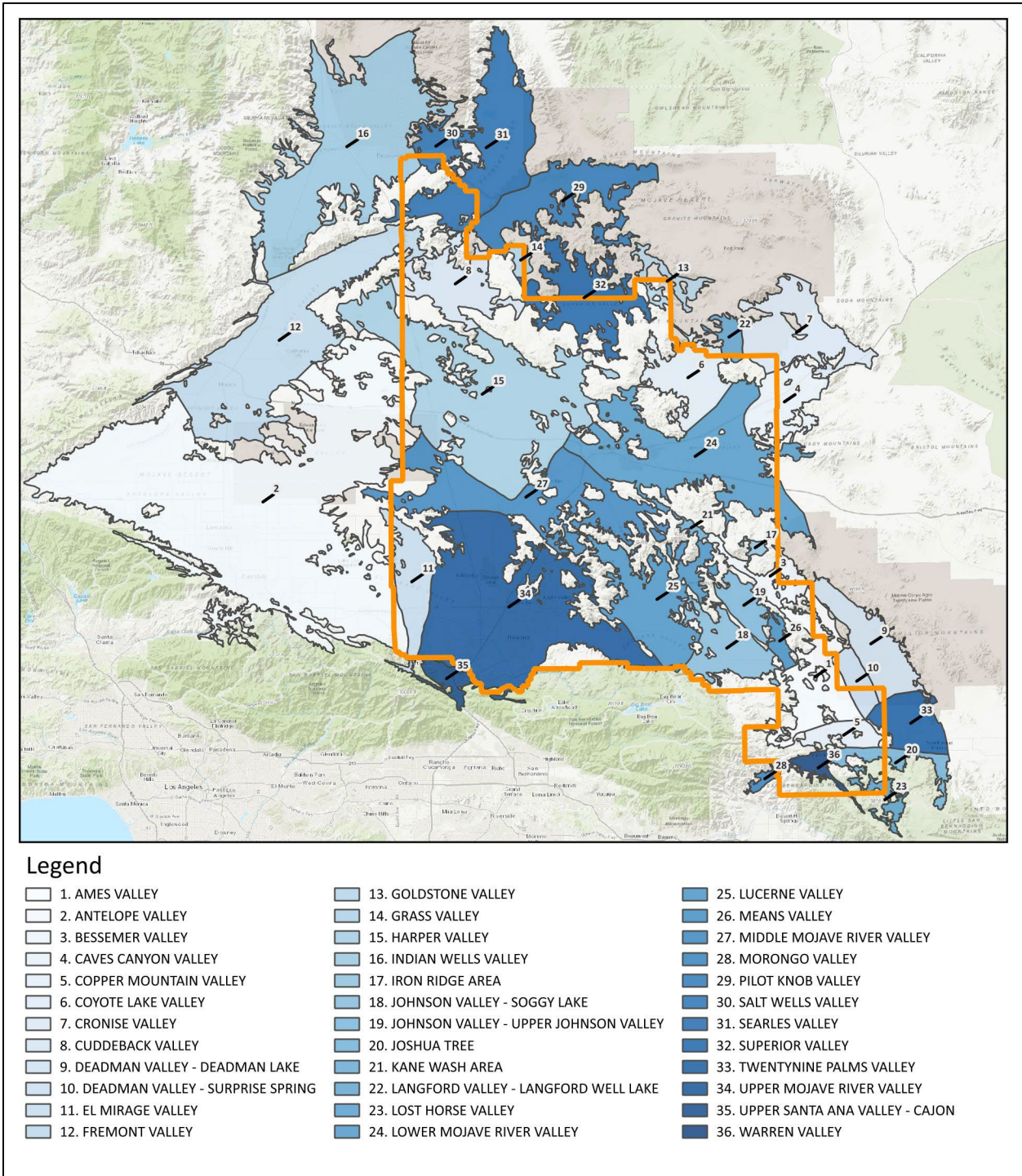
water drainage of Lucerne Valley is in the Colorado River Hydrologic Region but is not included in the Morongo Basin Area, isolating this area due to the hydrogeologic conditions.

Of the two main areas, the Mojave River Groundwater Basin is the largest. The 36 groundwater basins and subbasins are listed in **Table 2-2** and grouped by the South Lahontan (Region 6) and Colorado River (Region 7) Hydrologic Regions. The Mojave Region also overlaps a small portion of a DWR basin in the South Coast Hydrologic Region (Region 8) as shown by the last subbasin listed in **Table 2-2** – the Upper Santa Ana Valley. These basins are also shown in **Figure 2-5**.

TABLE 2-2: GROUNDWATER BASINS AND SUBBASINS WITHIN THE MOJAVE REGION

DWR Basin	Groundwater Basin Name	DWR Basin	Groundwater Basin Name
South Lahontan Hydrologic Region		Colorado River Hydrologic Region	
6-35	Cronise Valley	7-10	Twentynine Palms Valley
6-36	Langford Valley	7-11	Copper Mountain Valley
6-37	Coyote Lake Valley	7-12	Warren Valley
6-38	Caves Canyon Valley	7-13	Deadman Valley
6-40	Lower Mojave River Valley	7-13	Deadman Valley
6-41	Middle Mojave River Valley	7-15	Bessemer Valley
6-42	Upper Mojave River Valley	7-16	Ames Valley
6-43	El Mirage Valley	7-17	Means Valley
6-44	Antelope Valley	7-18	Johnson Valley
6-46	Fremont Valley	7-18	Johnson Valley
6-47	Harper Valley	7-19	Lucerne Valley
6-48	Goldstone Valley	7-20	Morongo Valley
6-49	Superior Valley	7-50	Iron Ridge Area
6-50	Cuddeback Valley	7-51	Lost Horse Valley
6-51	Pilot Knob Valley	7-62	Joshua Tree
6-52	Searles Valley	8-2	Upper Santa Ana Valley
6-53	Salt Wells Valley		
6-54	Indian Wells Valley		
6-77	Grass Valley		
6-89	Kane Wash Area		

FIGURE 2-5: GROUNDWATER BASINS AND SUBBASINS WITHIN THE MOJAVE REGION



Challenges in managing overdrafted groundwater resources along with the high cost of importing water drove the first adjudication efforts in the Region in the 1960s. In 1965, Morongo Basin was annexed into MWA’s service area adding 35.5 square miles to MWA’s boundary. The Morongo Basin was a sixth but separate area that added management and delivery obligations beyond the five other distinct hydrological subareas within the Mojave Basin Area: Este (East Basin), Oeste (West Basin), Alto (Upper Basin), Centro (Middle Basin) and Baja (Lower Basin).

2.1.3.1 Mojave River Basin

The Mojave River Basin (Mojave Basin Area or MBA) is the principal water management area of the Region. For management purposes, the MBA is separated into five distinct hydrologic divisions defined in previous studies (DWR, 1967), evolving over time based on a combination of hydrologic, geologic, engineering, and political considerations (**Figure 2-6**).

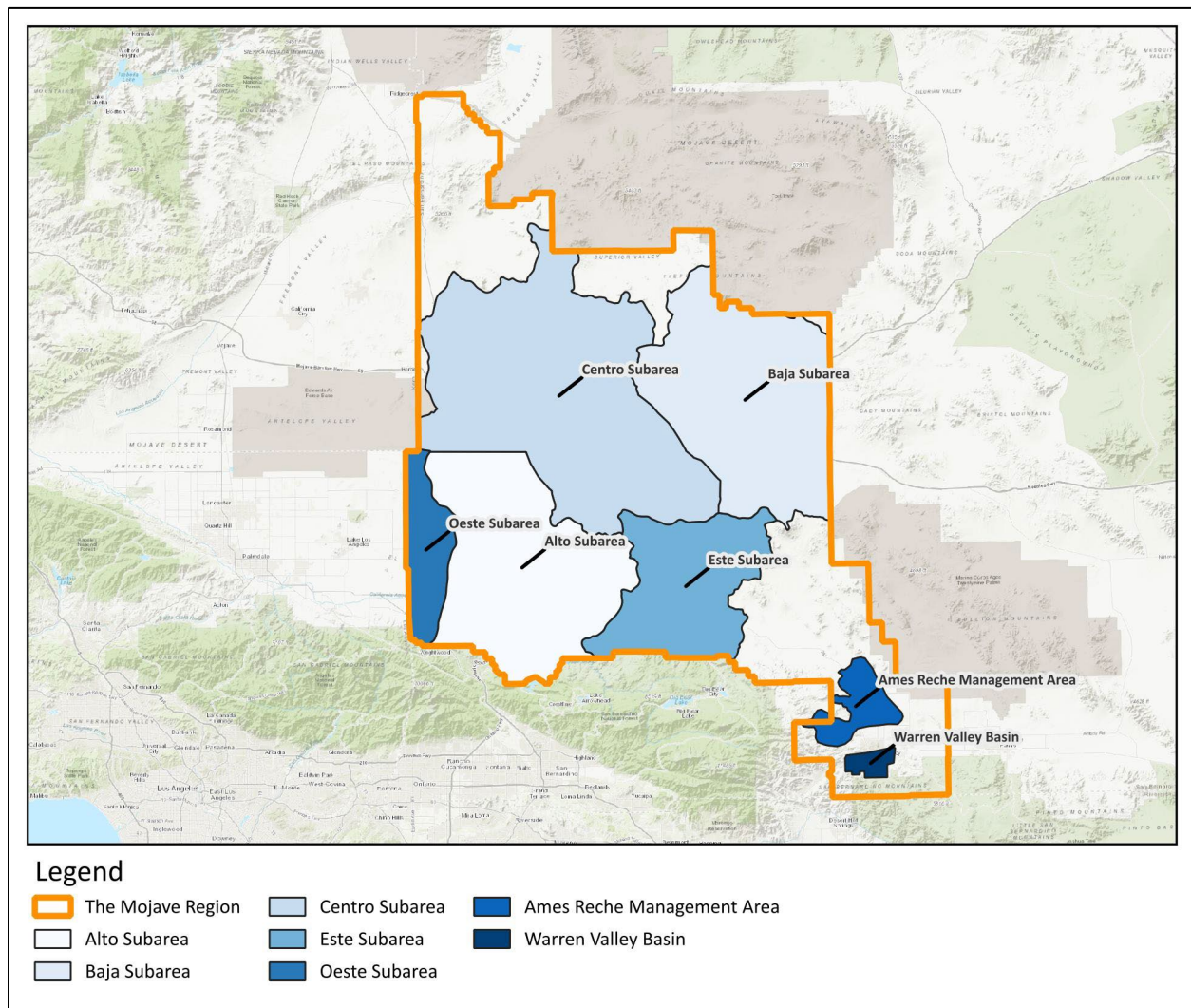
A second effort at adjudication within the MBA starting in 1990 proved more successful than attempts in the 1960s. The effort resulted in full adjudication of the MBA in 2002.⁶ It began when the City of Barstow and the Southern California Water Company filed a complaint against upstream (and up-basin) water users claiming that lowering groundwater levels and water availability due to withdrawals reduced the amount of water available to downstream users. A year later, MWA filed a cross-complaint declaring that native waterflow of the Mojave River and basin area groundwater was not sufficient to meet current and future demands. The cross-complaint asked the court to determine surface and groundwater rights for the Mojave Basin Area. Negotiations over the next two years produced a Stipulated Judgment in January 1996 that formed a class of producers which used 10 acre-feet or less per year that were dismissed from litigation and offered an equitable solution for the remaining water producers that use over 10 acre-feet per year (aka Minimal Producers). The Riverside Superior Court appointed MWA as Watermaster for the area as part of the MBA Judgment. Appeals by non-stipulated parties continued over the next several years with the California Supreme Court finally ruling on the case in August 2000. Most of the appealing parties have stipulated to the MBA Judgment since the 1996 ruling.

The MBA Judgment helps maintain proper water balances between the Mojave Basin Area’s five distinct, but interrelated, subareas (Este, Oeste, Alto, Centro, Baja). The Alto Transition Zone was also defined as a sub-management unit to better understand the water flow from Alto to Centro. Some subareas were also recognized to historically receive natural water flow from upstream subareas; to maintain that relationship, annual obligations are set according to average annual natural flow baselines defined in the MBA Judgment as Base Annual Production (BAP). The MBA Judgment established a Free Production Allowance (FPA) allocation to Producers based on each Producer’s percentage share of the BAP which is set

⁶ The MBA Judgment can be accessed at Mojave Water Agency’s website: <https://www.mojavewater.org/basin-management/watermaster/reports/>

each year by the MBA Watermaster. FPA is reduced over time until it comes within 5% of the Production Safe Yield (PSY) defined by the MBA Judgment. All water produced in excess of any Producer’s share of the FPA must be replaced by the Producer, either by payment to the Watermaster of funds sufficient to purchase Replacement Water, or by transfer of unused FPA from another Producer. The court can review and adjust the FPA for each Subarea on an annual basis as appropriate. The dynamics of the FPA and resulting forecasts of available native groundwater for the general subareas are discussed in more detail in *Chapter 3 - Water Supply Characterization*.

FIGURE 2-6: ADJUDICATED SUBAREAS AND DEFINED MANAGEMENT AREAS WITHIN THE MOJAVE REGION



2.1.3.2 Morongo Area

The Morongo Area includes 15 groundwater basins and subbasins that cover portions of the Morongo Area as defined in this RUWMP and shown in **Figure 2-5**. Several of these basins lie mostly outside of the Mojave Region, have low populations, and are essentially undeveloped

with respect to groundwater. The remaining basins have been grouped into six within the Morongo Area, with two of primary importance: the Warren Valley Basin and Ames Valley Basin.

2.1.3.3 Warren Valley Basin

The Warren Valley Basin covers an area of approximately 17,200 acres and consists of water-bearing sediments beneath the Town of Yucca Valley and surrounding area. The Warren Valley Basin (**Figure 2-6**) is geologically defined by the Pinto Mountain Fault to the north; a bedrock outcrop of the Little San Bernardino Mountains to the south; a bedrock constriction called the ‘Yucca Barrier’ to the east; and by a bedrock constriction and topographic divide to the west. Natural recharge to the Warren Valley Basin includes direct percolation of precipitation and percolation of ephemeral streamflow from Water Canyon and Covington Canyon.

After extractions began exceeding supplies in the 1950s, the area was adjudicated in 1977 in a decision known as the Warren Valley Judgment. Hi-Desert Water District (HDWD) was appointed Watermaster in the Judgment (the “Warren Valley Watermaster”) and was ordered to help develop solutions to halting overdraft. A comprehensive approach was developed by the Warren Valley Watermaster Board which included adopting a Basin Management Plan that called for SWP water delivery from MWA through the Morongo Basin Pipeline (MBP) to address demand and replenish overdraft. Native groundwater supplies associated with the Warren Valley Judgment are described in more detail in *Chapter 3 – Water Supply Characterization*.

2.1.3.4 Ames Valley Basin

In 2014 the Ames/Reche Groundwater Storage and Recovery Program and Management Agreement replaced and superseded the original adjudication called Ames Valley Basin Water Agreement between HDWD and Bighorn-Desert View Water Agency (BDVWA) established in 1991. It was created for the construction and operation of the HDWD Mainstream Well located in the Ames Valley Basin (**Figure 2-6**). The 2014 Agreement was established by BDVWA, HDWD, and County of San Bernardino, with administrative support provided by MWA, and the Stipulation and Amended and Restated Judgment (Ames/Reche Judgment) was finalized by the Superior Court of California, County of Riverside in September 2014. The Ames/Reche Management Area includes 95 square miles encompassing the communities of Flamingo Heights, Landers, Pioneertown, and Yucca Mesa. Native groundwater supplies associated with the Ames/Reche Judgment are described in more detail in *Chapter 3 – Water Supply Characterization*.

2.1.4 Major Regional Infrastructure

This sub-chapter focuses specifically on MWA’s water delivery infrastructure. Individual infrastructure assets, such as distribution pipelines, well locations or other attributes, associated with each urban water supplier are discussed in their corresponding chapter.

2.1.4.1 State Water Project

The SWP or California Aqueduct is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most facilities completed by 1973. Today, the SWP includes 28 dams and reservoirs, 26 pumping and generating plants, and approximately 660 miles of aqueducts.

The primary water source for the SWP is the Feather River, a tributary of the Sacramento River. The water flowing into the Feather River is captured by the SWP in Oroville Dam and Reservoir. Storage released from Oroville Dam flows down natural river channels to the Sacramento-San Joaquin River Delta (Delta). While some SWP supplies are pumped from the northern Delta into the North Bay Aqueduct or diverted by SWP contractors upstream, the vast majority of SWP supplies are pumped from the southern Delta into the 444-mile-long California Aqueduct. The California Aqueduct conveys water along the west side of the San Joaquin Valley to the Edmonston Pumping Plant, where water is pumped over the Tehachapi Mountains. From there the California Aqueduct divides into the East and West Branches. MWA takes its SWP deliveries from the East Branch, which was completed in 2003. MWA delivers its SWP supplies to recharge local groundwater basins through transmission pipelines, recharge facilities, and direct releases from Silverwood Lake – a SWP regulating reservoir. **Figure 2-7** depicts the SWP facilities that deliver water to MWA and details the sections of the Mojave Division Reaches of the California Aqueduct.

The initial SWP storage and conveyance facilities were designed to meet contractors’ water demands with the construction of additional storage facilities planned as demand increased. However, few additional SWP storage facilities have been constructed since the early 1970’s and a portion of the original conveyance design was never completed. SWP conveyance facilities were generally designed and have been constructed to deliver Table A amounts to all contractors. The maximum Table A Annual Amount of all SWP Contractors totals approximately 4.133 million acre-feet but full Table A Annual Amount deliveries rarely occur. Details regarding MWA’s characterization of SWP reliability is discussed in MWA’s wholesale *Chapter 6 – Mojave Water Agency*.

MWA diverts its SWP water from the East Branch of the California Aqueduct, which includes six turnout locations utilized by MWA (identified west to east): Sheep Creek Turnout, White Road Turnout, Highway 395 Turnout, Antelope Siphon Turnout, Unnamed Wash, and Cedar Springs Dam (Silverwood Lake). These turnouts are used to deliver water to recharge facilities located

throughout the MWA service area. **Figure 2-8** below depicts the MWA water turnout and delivery facilities.

FIGURE 2-7: SWP MOJAVE DIVISION AQUEDUCT REACH SECTIONS

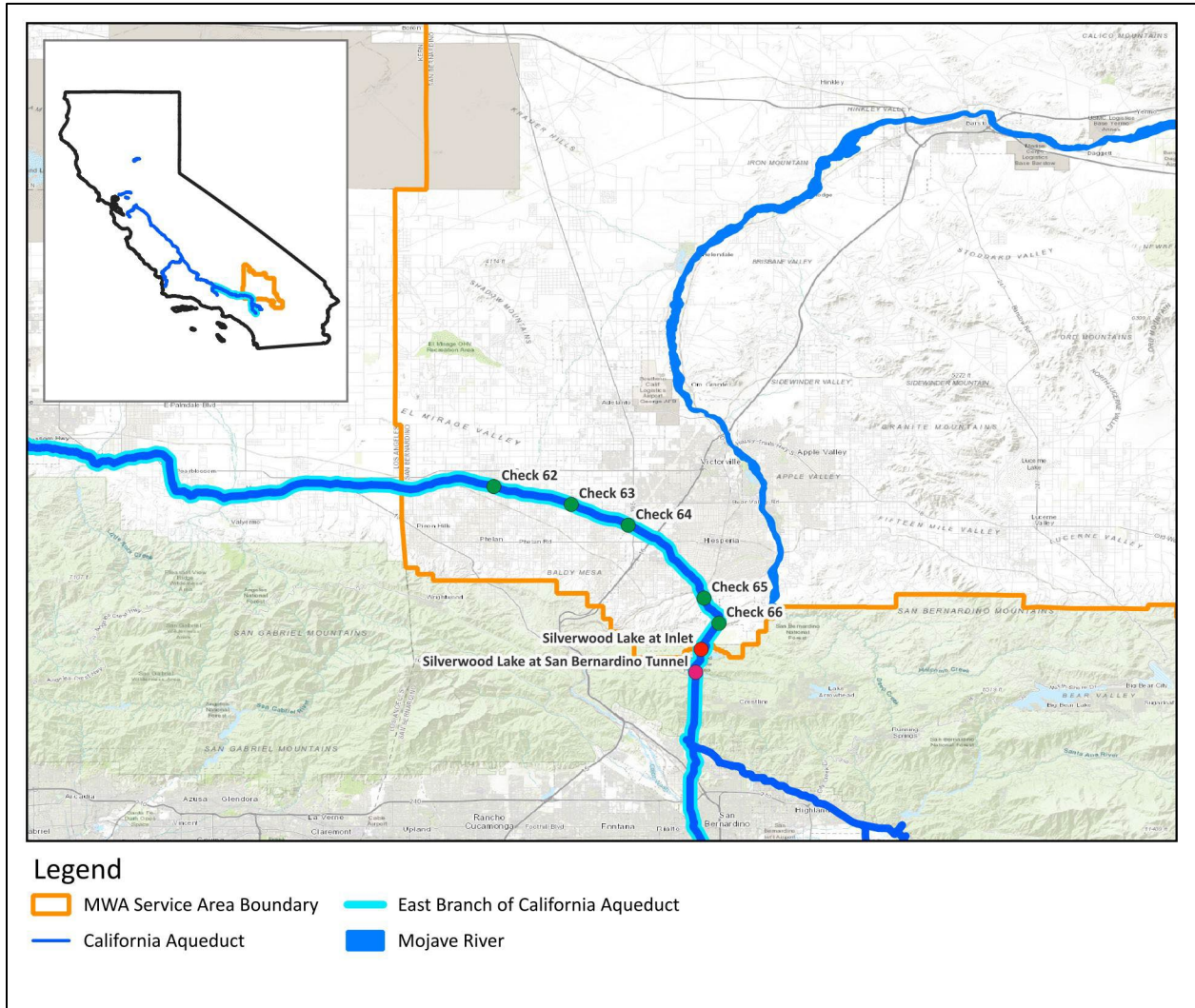
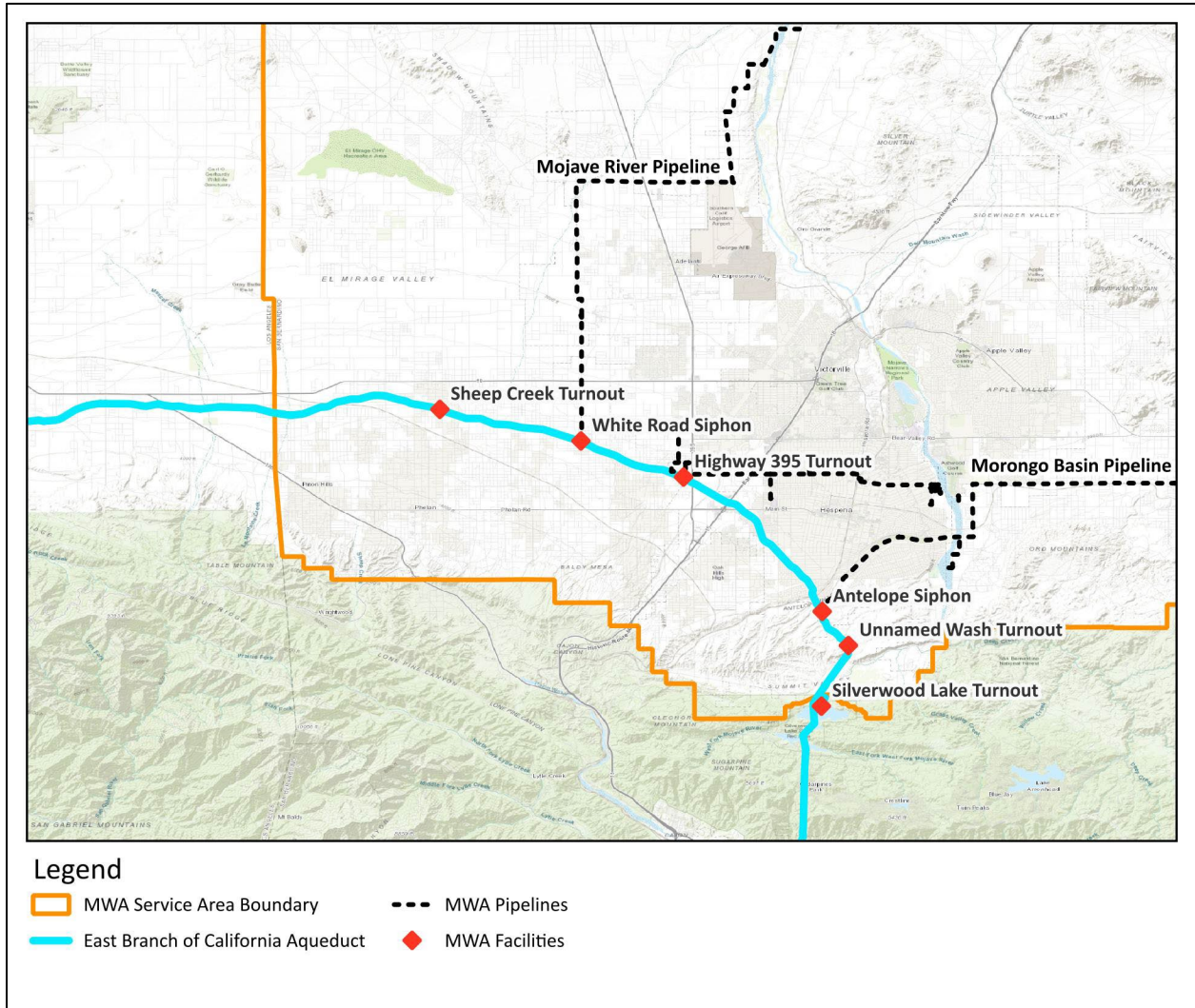


FIGURE 2-8: MWA TURNOUTS ALONG THE EAST BRANCH



2.1.4.2 Delivery System

MWA relies on the SWP contracted supplies to supplement local groundwater supplies throughout the Region using the Mojave River and two primary pipelines. The Mojave River Pipeline (MRP) is approximately 76 miles long, extending from the California Aqueduct in the Phelan area to four groundwater recharge basins along the Mojave River. These recharge basins are located in Hodge, Lenwood, Daggett/Yermo, and Newberry Springs. The MRP delivers up to 45,000 acre-feet of water per year to the Region. An additional pilot recharge basin is also currently under construction: the West Victorville Recharge Basin, located at the turnout of the MRP and adjacent to the California Aqueduct.

The second major pipeline linking the SWP to the subareas in the Region is the Morongo Basin Pipeline, which currently delivers water to groundwater recharge sites in Landers, Yucca Valley, and Joshua Tree to help address supplemental water needs for the Ames/Reche Judgment and the Warren Valley Judgment. The pipeline also allows MWA to deliver imported water into the Mojave River at the Deep Creek and Rock Springs discharge locations that serve the needs of the MBA Judgment. These two facilities are in areas of the River with high percolation rates, allowing water to recharge the aquifer directly upstream of the area with the highest groundwater pumping demand in MWA's service area (the Alto subarea). The facility includes a pipeline which extends south along the river from the MBP, a flow control facility and outlet. It can recharge a maximum of approximately 40,000 acre-feet per year.

The Amethyst Basin Facility, completed in 2019, delivers SWP water to recharge the Oro Grande Wash in Victorville just east of Sycamore Street and Amethyst Road in Victorville. It provides flood control and allows recharge through a series of dikes and recharge ponds. Water from the SWP is delivered to the recharge ponds through a pipeline that connects to the California Aqueduct at the Highway 395 turnout. Recharge capacity is about 8,000 acre-feet per year.

The Ames/Reche Recharge Facility delivers water from the SWP directly to the Pipes Wash in Landers, located north of Yucca Valley. The Ames/Reche facility consists of a pipeline extending west from the MBP at Winters Road to an outlet in Pipes Wash. Construction of the pipeline, flow control facility, and outlet was completed in 2014. The turnout is planned to flow up to a maximum capacity of five cubic feet per second, recharging a maximum of approximately 1,500 acre-feet per year.

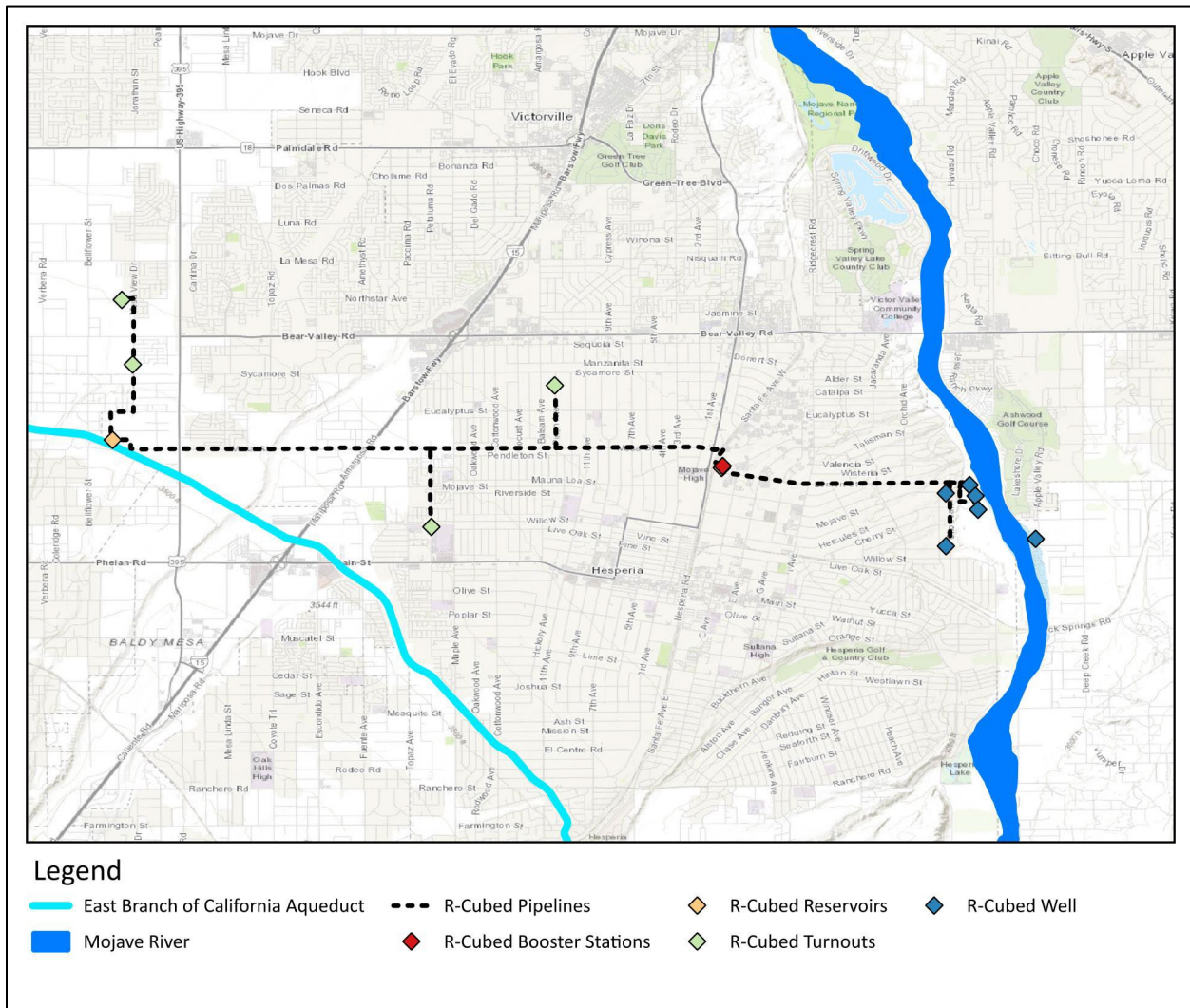
Silverwood Lake is a reservoir owned and operated by the State of California and DWR. At the California Aqueduct terminus in Hesperia, water is siphoned into the lake where it is stored for use in San Bernardino and Inland Empire areas. MWA takes deliveries of SWP from the lake via the Cedar Springs Dam which releases into the Mojave River.

Reflecting a more recent addition to the Region's infrastructure, MWA constructed and operates the Regional Recharge and Recover Project (R-Cubed). This conjunctive use project

stores SWP deliveries in recharge sites in the Floodplain Aquifer along the Mojave River near Hesperia and southern Apple Valley (Figure 2-9). When needed, MWA-owned production wells on both sides of the Mojave River, immediately downstream of the recharge area, can recover and deliver the stored water through pipelines directly to local urban water retail suppliers. Current beneficiaries of R-Cubed include Liberty Utilities (Apple Valley), City of Adelanto, City of Hesperia, and Victorville Water District.

Phase 1 of the R-Cubed Project was partially completed in 2013. It currently produces approximately 15,000 acre-feet per year, with expansion plans under consideration.

FIGURE 2-9: R-CUBED FACILITIES



2.1.5 Regional Climate

Located in the High Desert region of San Bernardino County, the climate in the Mojave Region is more extreme than the lowland areas of Southern California. As is typical of the Mojave Desert, the region is very arid because of the rain shadow effect of the surrounding mountains. The summers are extremely hot and dry with occasional monsoonal thunderstorms that can bring flash flooding and hail. Most of the precipitation happens in the winter, with snowfall possible, although much lighter than what occurs in the surrounding mountains and melting quickly.

The major settlements in the Region are along the Highway 15 corridor which generally parallels the Mojave River, primarily within the southern end of the Region including cities and communities of Hesperia, Victorville, Adelanto, and Apple Valley. Thirty-two miles to the north, also along the Highway 15 corridor, is the City of Barstow. The elevation variance across the Region leads to slight differences in reported climate data for various areas, but not significantly different for purposes of this discussion. Therefore, the following figures report data representing the southern area of the Region (using Victorville), with some discussion of the minor climate differences via reference to conditions in Barstow.

Historical averages show January as the coolest and wettest month, and July as the hottest and driest. The wet season is from December to March with a 30-year annual average rainfall of 5.8 inches for Victorville and 5 inches for Barstow. The annual mean temperature is about 62 degrees, but the High Desert climate leads to extreme temperature ranges with highs during the summer months regularly hitting the upper 90s and lows in winter dropping to averages in the lower 30s.

Other climate characteristics of the Region include monsoonal moisture in the later summer, which can cause thunderstorms. These thunderstorms do not deliver nearly as much rainfall as desert regions further east and the region receives only a small fraction of the annual precipitation compared to the eastern areas. Snowfall in Victorville during the winter, if it occurs, is light and tends to melt before accumulating. Snow in Barstow is much rarer and occurs infrequently. Autumn averages very warm and dry conditions still and becomes cooler by November with rainfall beginning as California's traditional rainy season begins. Winter conditions usually appear by late November. Spring is usually warm during the days although low temperatures are still quite cool. Rainfall usually tapers off by May.

Figure 2-10 shows the average monthly temperature, rainfall, and evapotranspiration (ET_o) for the service area. This figure reports data from Victorville. Actual annual rainfall totals deviate quite significantly from the 30-year average as illustrated in **Figure 2-11**. In most years, precipitation totals fall below the mean.

FIGURE 2-10: AVERAGE CLIMATE CONDITIONS

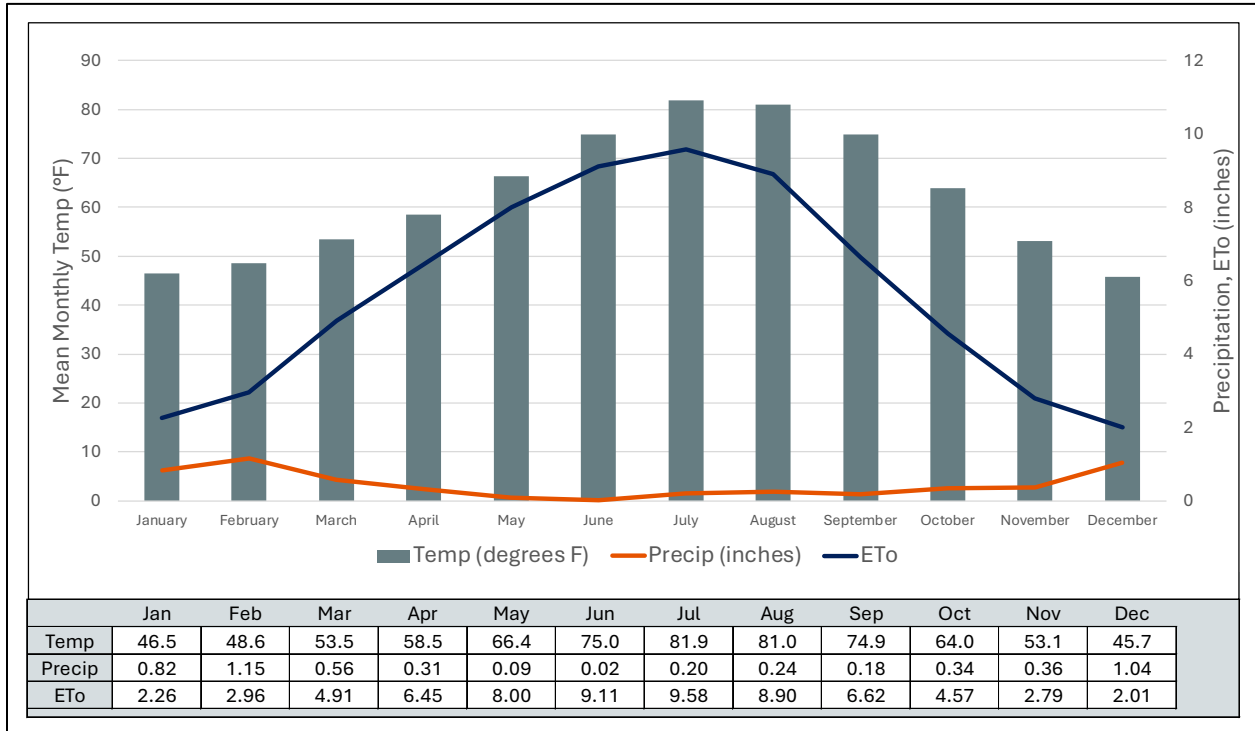
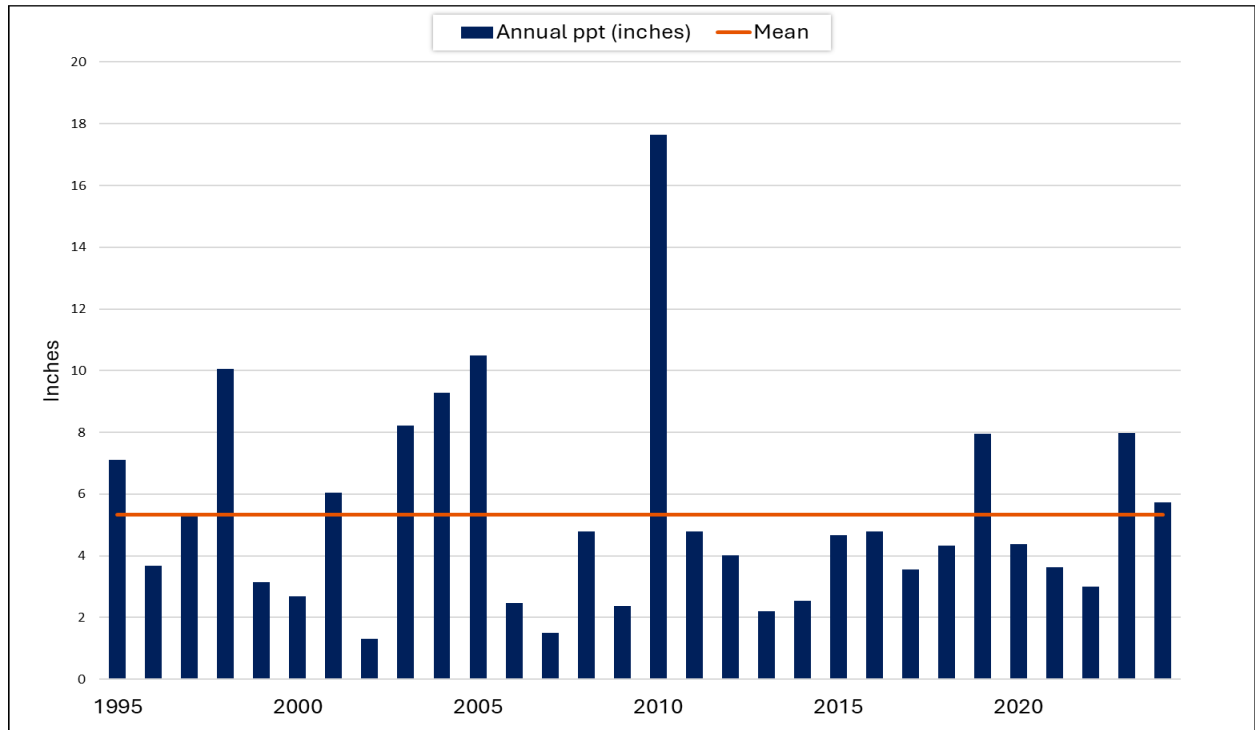


FIGURE 2-11: ANNUAL PRECIPITATION VARIABILITY (1996-2024)

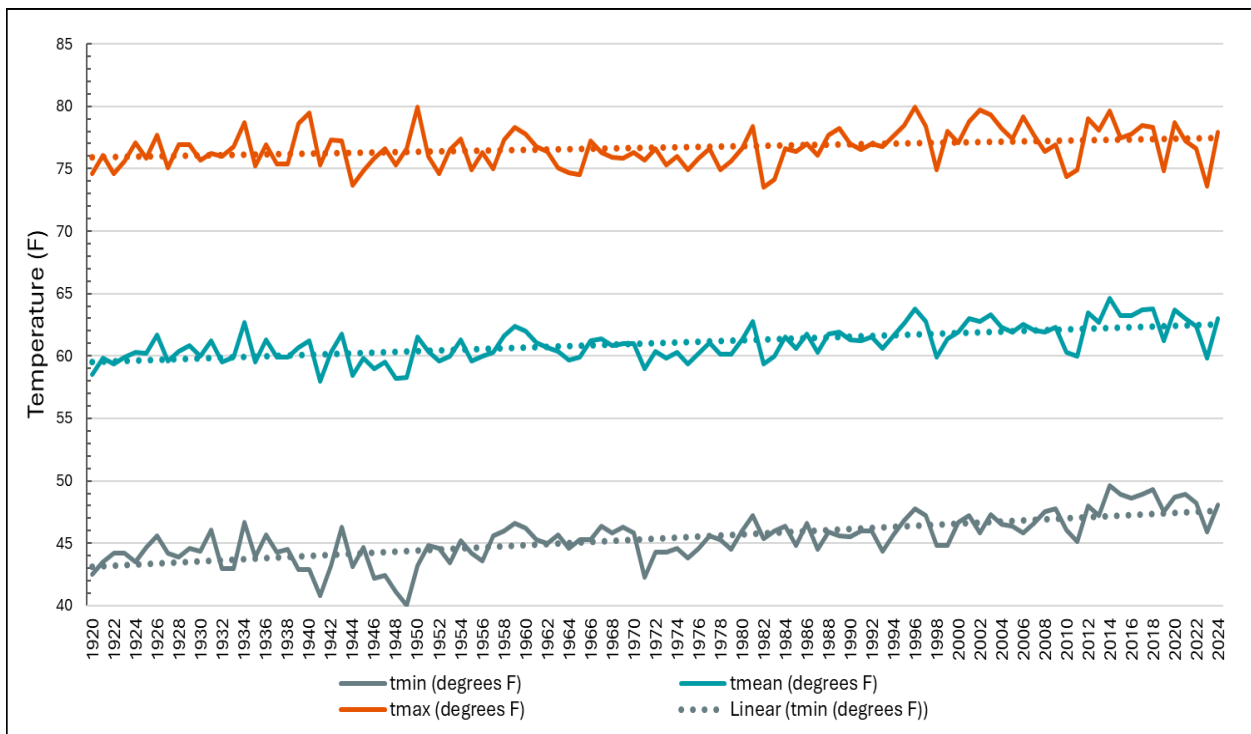


2.1.5.1 Climate Change

The CWC does not prescribe specific climate change planning and management measures for water suppliers; however, urban water suppliers should consider climate change when evaluating water supply availability and customer water use trends. For example, drier conditions or drought can lead to more residential irrigation and increased water use compared to wetter years.

Climate change will likely alter precipitation patterns, resulting in consequential externalities like reductions in Sierra Nevada snowpack. Given the region's reliance on imported water, particularly from the State Water Project, which relies on melting snowpack, any effect from climate change on Sierra Nevada snowpack levels and inflows to Northern California reservoirs and the Delta will have a serious impact on water availability. As shown by the trendlines in **Figure 2-12**, the region has experienced gradual warming in average temperatures over the last 100 years. Increasing temperatures locally within the Region can result in higher evapotranspiration, leading to additional water demand. Although annual median precipitation levels remain relatively consistent, projected changes in the frequency, magnitude, and volume of precipitation show large variability, which has implications for uncertainties in stormwater runoff and peak flow rates.

FIGURE 2-12: HISTORICAL ANNUAL TEMPERATURE AND TRENDS (YEARS)



2.1.6 Current and Projected Population

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use within the Mojave Region. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. The projections also provide the Region with the necessary data-driven means for assessing whether MWA is accomplishing its purpose of providing sufficient water to meet the Region’s current and future needs.

Similarly, the Region’s economic, social, and demographic trends provide valuable insight to water management and planning. This sub-chapter of the RUWMP addresses these factors to provide a supportable basis for forecasting future water use.

2.1.6.1 Current Population and Historical Trends

The Mojave Region has undergone a dramatic demographic transformation over the past century. In the early 20th century, the Region was sparsely populated, with an economy anchored by agriculture and the railroads, supporting only modest communities in Barstow and the Victor Valley. Following World War II, the Region began developing as Southern California’s suburban boom began pushing development eastward from Los Angeles into the Inland Empire. However, it was the housing affordability crisis in coastal California during the 1980s and 1990s that truly ignited the region’s expansion, as middle-class families sought more affordable housing opportunities. Relatively affordable housing continued to drive growth through the early 2000s, as the City of Victorville and neighboring communities in the Victor Valley entered a period of explosive residential growth, with tens of thousands of new residential homes constructed across former scrubland. This rapid expansion, however, came with significant challenges, including long commutes to employment centers, infrastructure strain, and acute vulnerability during the 2008 Housing Crisis.

The Region slowly recovered following the 2008 housing crisis, fueled by a booming logistics and warehouse industry and a rebounding real estate market. Much of this growth has been concentrated along the Interstate 15 corridor as fulfillment centers and warehouse operations locate themselves near highways and the railroads. Another notable incident was the COVID-19 pandemic that brought an unexpected tailwind to the Planning Area as remote work flexibility and record low interest rates allowed more households to acquire affordable housing in the High Desert. Taken together, the Planning Area’s growth has stabilized in recent years, with population and sprawl tempered by water conservation and growth limitations.

In terms of population, the estimated population of the Region in 2025 was 586,000. This accounts for 26% of the total population San Bernardino County and a 19.6% increase from MWA’s 2020 UWMP population for the Region of just over 490,000.

This is a significant increase from the turn of the 21st Century when the Region only accounted for 16% of the County’s entire population. There was a sizable migration into the

Region’s incorporated cities between 2000 and 2010; their annual average growth rate outpacing the overall County rate of 1.9%. Between 2011 and 2019, that growth rate slowed to 1.1% for Adelanto and 1.0% for Victorville, still outpacing the 0.8% rate for the County. **Table 2-3** provides a representation of the Region’s population over the past several decades.

TABLE 2-3: HISTORICAL POPULATION⁷

1990	2000	2010	2020	2025
266,232	321,264	453,649	507,000	586,000

2.1.6.2 Projected Population

As part of its 2020 Urban Water Management Plan (UWMP) development, MWA commissioned a population forecast by the Center for Economic Forecasting and Development at the University of California, Riverside, which was completed in 2020 (UCR Study or Beacon Economics Study). The population forecast provided population estimates for the entire Mojave Region, organized in multiple ways, as estimates for the large urban water retail suppliers, incorporated cities, and adjudicated subareas within the MWA service area. The following sections detail the population projections built from the UCR Study and subsequently used to estimate water use within the expansive Mojave Region.

Methodology

The UCR Study estimated that the Region’s population would increase by 39% over the next 35 years, surpassing San Bernardino County’s projected 21% increase as well as the State’s 13% increase for the same period – resulting in a population increase of about 200,000 people by 2065.⁸ Absent an updated UCR Study but given the release of 2020 Census data subsequent to the UCR Study’s completion, a review and update to the UCR Study was warranted to allow updated forecasts for this RUWMP. An update to the UCR Study and comparison with Southern California Association of Governments (SCAG) data was undertaken as follows:

- **2020 Census Data Update** – The UCR Study’s 2020 incorporated city population totals were compared to the subsequently available 2020 Census values, organized for the same incorporated city areas. This comparison allowed for differences between the two datasets to be captured and ultimately resulted in the derivation of refined population projections for the large urban water retail suppliers and the remaining

⁷ The 2020 and 2025 population values for the Mojave Region reflects the refined UCR Study projections described in the later portions of this chapter.

⁸ The UCR Study projected the Region’s population to increase by approximately 205,284 people by 2065. Note: this estimation was derived prior to the release of 2020 Census population data.

portion of the Region to reflect actual 2020 populations. This update is referred to as the *Adjusted UCR Study*.

- **Alternative Data Comparison** – The original UCR Study values as well as Adjusted UCR Study values were compared with projections from the SCAG. This comparison focused on assessing whether the magnitude of projected population growth within the Region by the Adjusted UCR Study was adequately characterized.

2020 Census Data Comparison

As depicted in **Table 2-4**, the 2020 Census population totals for five of the six incorporated cities within the Mojave Region were greater than their respective UCR Study population totals, with differences ranging from 2% to 6%. These differences were used to adjust the UCR Study population projections of the six large urban water suppliers associated with these particular incorporated cities (**Table 2-5**). The remaining six large urban water suppliers that do not serve an incorporated city were not adjusted as part of this validation since Census data is not available at the water retailer service area boundary level. Furthermore, the six large urban water retail suppliers associated with this adjustment collectively represent 96% of the total projected growth between 2020 – 2065.⁹

Lastly, the refined population projections presented in Table 2-5 were used to adjust the UCR Study population projection of the entire Region, as depicted in **Table 2-6**.

TABLE 2-4: COMPARISON OF INCORPORATED CITY POPULATION DATA

Incorporated City	2020 UCR	2020 Census	Percent Difference
Adelanto	35,800	38,000	6%
Apple Valley	74,200	75,800	2%
Barstow	24,200	25,400	5%
Hesperia	97,800	99,800	2%
Victorville	127,700	134,800	6%
Yucca Valley	22,200	21,700	-2%

⁹ The projected growth rate referenced is from the un-adjusted UCR Study population projections.

TABLE 2-5: URBAN WATER SUPPLIER POPULATION PROJECTIONS – UCR STUDY AND ADJUSTED UCR STUDY¹⁰

Large Urban Water Retail Supplier	UCR Study		Adjusted UCR Study	
	2020	2065	2020	2065
City of Adelanto	35,800	52,100	38,000	55,200
Liberty Utilities – Apple Valley Water Company	62,100	80,900	63,300	82,500
Golden State Water Company – Barstow System	32,200	35,100	33,800	36,900
Hesperia Water District	97,400	151,400	99,300	154,500
Victorville Water District	134,300	228,100	142,300	241,700
Hi-Desert Water District	25,700	31,000	25,100	30,300
Bighorn-Desert View Water Agency	4,100	4,600	N/A	N/A
County Service Area 64	11,200	13,700	N/A	N/A
County Service Area 70 J	10,200	11,500	N/A	N/A
Helendale CSD	6,600	7,300	N/A	N/A
Joshua Basin Water District	10,200	11,300	N/A	N/A
Phelan Piñon Hills CSD	20,800	23,000	N/A	N/A

TABLE 2-6: MOJAVE REGION POPULATION PROJECTIONS – UCR STUDY AND ADJUSTED UCR STUDY

UCR Study		Adjusted UCR Study	
2020	2065	2020	2065
492,000	698,000	507,000	722,000

¹⁰ The following six water districts which do not supply an incorporated city did not have their population projections adjusted as part of the population validation: Bighorn-Desert View Water Agency, County Service Area 64, County Service Area 70 J, Helendale CSD, Joshua Basin Water District, and Phelan Piñon Hills CSD.

Comparison to SCAG

The Adjusted UCR Study population projections were compared to population projections found in the 2024 SCAG SoCal Connect Report.¹¹ The purpose of this comparison was to ensure that the magnitude of the Adjusted UCR Study projected population growth as used for this RWUMP was within a reasonable range of SCAG’s projections, which used a different analysis and forecast method than the UCR Study. As depicted in **Table 2-7**, the SCAG provided a population projection specific to the Region through 2050.

TABLE 2-7: ADJUSTED UCR STUDY AND SCAG POPULATION PROJECTIONS

Mojave Region	2020	2050	2065
Adjusted UCR Study	507,000	673,000	722,000
SCAG	498,000	638,000	N/A

Results

The intent of the update and comparison was to provide confidence for a population projection critical to the water demand forecast method further described in *Chapter 4 – Water Use Characterization*. Population data is a key indicator used to understand per-capita demand and thus becomes the source for demand forecasts when more specific housing developments are less clear. For purposes of the RUWMP, the Adjusted UCR Study projections are used for each participating retail urban water supplier and for MWA, with the latter reflecting all the remaining small water suppliers and rural domestic users that are reliant on the water resources available to the Region. **Table 2-8** summarizes the population estimates for each participant.

¹¹ Link to the 2024 SoCal Connect Report: <https://scag.ca.gov/connect-socal-2024-read-draft-plan>. The SCAG SoCal Connect Report is updated every four years and utilizes 2020 Census data as an input for establishing its population projections.

TABLE 2-8: 2025 RUWMP POPULATION PROJECTIONS

Agency	2025	2030	2035	2040	2045	2050	2055	2060
City of Adelanto	44,588	45,913	47,239	48,565	49,890	51,216	52,542	53,867
County Service Area 64	11,691	12,099	12,390	12,646	12,884	13,103	13,304	13,490
County Service Area 70J	10,356	10,554	10,721	10,876	11,021	11,153	11,275	11,387
GSWC Barstow	35,947	37,744	39,542	43,137	46,731	54,209	57,861	61,513
Hesperia Water District	120,530	124,771	129,012	133,252	137,493	141,733	145,974	150,214
Hi-Desert Water Agency	27,139	27,538	27,938	28,338	28,737	29,137	29,537	29,937
Joshua Basin Water District	10,375	10,536	10,673	10,800	10,919	11,029	11,131	11,225
Liberty Utilities Apple Valley ¹²	70,707	72,184	73,661	75,138	76,615	78,092	79,569	81,045
Phelon-Piñon Hills CSD	21,136	21,465	21,744	22,003	22,245	22,469	22,676	22,869
Victorville Water District	148,323	157,229	166,135	175,042	183,948	192,855	201,542	210,689
Mojave Water Agency ¹³	85,602	84,485	83,152	79,907	76,230	68,100	64,002	59,422
Total Region	586,395	604,519	622,207	639,704	656,713	673,095	689,412	705,659

2.1.7 Land Use, Economy, and Demographics

Land use in the Mojave Region is undergoing a fundamental shift from its historical agricultural roots toward rapid urbanization and industrial expansion. The region's once thriving agricultural sector has declined as developmental pressures and geographic

¹² Projected population estimates for the City of Victorville presented in this table were further refined by the City using the methodology described in its retail-chapter.

¹³ The Mojave Water Agency population shown in this table represents the portion of the Mojave Region located outside the service areas of the participating urban water retail suppliers. The projected decline reflects the assumption that future population growth will be increasingly served within the urban water retail supplier service area, rather than by areas represented under MWA's wholesale population category.

proximity to Southern California have transformed the High Desert into a major commuter community and logistics hub. Broad land use trends reflect a mix of continued suburban growth, logistics and industrial expansion, and large-scale renewable energy development.

Incorporated communities such as Hesperia, Victorville, Apple Valley, and Adelanto have seen ongoing residential development, particularly single-family residential housing, driven by relatively affordable housing. At the same time, the Interstate 15 corridor has attracted significant warehouse, distribution, and manufacturing projects due to regional freight movement between Southern California and the Inland Empire, reinforcing the High Desert's role as a logistics hub. In outlying areas, land use has increasingly shifted toward utility-scale solar energy and related infrastructure, supported by state renewable energy policies and the availability of large tracts of land. However, growth is occurring alongside planning efforts tied to groundwater sustainability in the Mojave River Basin, which are influencing development patterns, water supply planning, and the pace of new projects, particularly in communities that rely heavily on groundwater in overstressed portions of the Region's many groundwater subbasins.

This transition is fueled by the Region's relatively affordable housing and its strategic location along major interstate and rail corridors, leading to a projected 40% population increase over the next four decades that continues to transform the High Desert from rural to urban. Specific land use and demographic trends are discussed in each individual retailer's chapter. This sub-chapter provides a region-wide outlook on its land use and demographic trends over the last several decades to present-day.

2.1.7.1 Current and Projected Land Use

Anchored by the rapidly growing incorporated communities of Victorville, Hesperia, and Apple Valley, the region continues to attract large master-planned residential developments and millions of square feet in new industrial and logistics facilities, fueled by affordable land and strategic infrastructure access. Utility-scale solar energy projects are simultaneously converting vast stretches of desert land to solar farms. The planned high-speed Brightline West rail station in Apple Valley is expected to further accelerate transit-oriented growth in the region. Underlying all these planned growth trends is a critical constraint: the basin's groundwater supply.

Trends in future land use will be largely influenced by urbanization as more of the High Desert landscape is transformed into residential developments. Most residential development will be concentrated in the communities in the surrounding Victor Valley at the southern end of the Region, and in and around the City of Barstow. These two growth areas are also the region's largest economic engines, where the region's burgeoning logistics and transportation industries are expanding. In addition to these broader trends, several large-scale development projects have been identified that are expected to further accelerate growth within the Region. As shown in **Table 2-9**, these projects are anticipated to significantly

influence population growth, job creation, and land use patterns, and have been incorporated into the population and water demand projections that underpin this RUWMP.

TABLE 2-9: KNOWN LAND USE PLANS IN THE MOJAVE REGION

Existing or Planned Project	Project Area (acres)	Residential Housing Units
BNSF Barstow International Gateway	4,500	N/A
Brightline West Station	300	N/A
Rancho Lucerne Planned Development	1,376	4,257
Silverwood Specific Plan	9,336	15,663

2.1.7.2 Economic Trends and Other Social and Demographic Factors

California’s High Desert region, anchored by the Cities of Victorville and Barstow, is one of the state’s most consequential emerging growth corridors. Since the end of the Great Recession, it has seen some of the strongest employment growth in California, with the third largest workforce of the state’s metropolitan areas. Straddling the convergence of Interstate 15 and Interstate 40, the region sits at a geographic crossroads between Greater Los Angeles, the Las Vegas metro, and the broader American Southwest. What was once characterized primarily as a pass-through zone, famous for Route 66, is now experiencing a structural economic transformation driven by a booming demand for logistics and warehouses, affordable housing, and multiple landmark infrastructure projects that stand to reshape the Region’s role in the national supply chain and passenger mobility network.

The most consequential economic development in the region is the emergence of large-scale logistics and warehousing infrastructure, driven by the exhaustion of industrial land in the traditional Inland Empire to the south and the availability of vast, inexpensive parcels in the High Desert. Over the last four years, approximately 4.5 million square feet of new industrial construction has been completed in the High Desert. Major investors include Prologis, Clarion, and LINK, with significant leasing activity from Amazon and Home Depot. The City of Victorville recently welcomed a 1.3-million square foot Goodyear Tire distribution center and an Amazon Fulfillment Center at the Southern California Logistics Airport (SCLA), with additional industrial projects totaling over 1.35 million square feet planned along Mojave Drive. The SCLA is already home to Boeing and General Atomics, giving it a dual identity as both an aerospace hub and an e-commerce distribution node.

Railroads have long played a foundational role in the economic development of the High Desert. The Cities of Barstow and San Bernardino first emerged as railroad hubs for local farmers to ship agricultural goods to market and as stopovers for trains heading into the Los

Angeles Basin. Recently, railroads have re-emerged as a transformative force in the region's economy with the advent of the BNSF Barstow International Gateway (BIG) and the Brightline West high-speed rail line. BNSF Railway has announced plans to invest more than \$1.5 billion in a master-planned rail facility designed to revolutionize cargo movement from Southern California ports. BIG will integrate a rail yard, intermodal facility, and warehouses to transfer containers directly from ships to rail for inland transit. It will directly connect the Ports of Los Angeles and Long Beach to Barstow via rail, allowing for faster transit of goods to the rest of the US. By moving containers by rail rather than trucks, BIG aims to reduce freeway traffic and cut emissions while creating 20,000+ jobs. Upon completion, BIG will be the largest intermodal transportation hub in North America – twice as large as any existing facility.

Passenger rail in the High Desert region anticipates a major tailwind from Brightline West. The privately financed 218-mile high-speed passenger rail line will connect Las Vegas to Rancho Cucamonga, with two planned railway station stops in Apple Valley and Hesperia. The project broke ground in 2024 and is projected to begin passenger service by 2028, with construction expected to generate more than 10,000 jobs and 1,000 permanent jobs. The Victor Valley station in Apple Valley is designed to accommodate commuter rail use, allowing High Desert residents to access employment in the Inland Empire and Los Angeles Basin at lower housing costs – a pattern that could accelerate population growth and transit-oriented development around the station.

Affordable housing is a critical driver of economic growth in the High Desert. As housing costs in coastal Southern California markets continue to rise, the High Desert has emerged as a population residential alternative for moderate household incomes. This popularity and proximity have spawned a large commuter population that works in nearby Los Angeles and Orange Counties. The number of residents commuting to jobs in neighboring counties is expected to increase in the near-term as housing prices continue to rise and supply remains constrained. Despite benefiting from population growth linked to affordable housing and commuters, the High Desert faces several structural economic and fiscal risks. With such a large proportion of the population commuting to coastal job centers in Los Angeles and Orange County, downturns in those economies can quickly ripple inland, reducing household income and housing stability. Moreover, dependence on commuters can distort land use and housing patterns. Effectively a “bedroom community,” where housing growth outpaces job creation, this imbalance can make it harder to attract employers seeking proximity to locally available workforce. However, the rise in remote workers and multiple major infrastructure developments have the potential to disrupt the High Desert's legacy status as a bedroom community into a burgeoning employment hub.

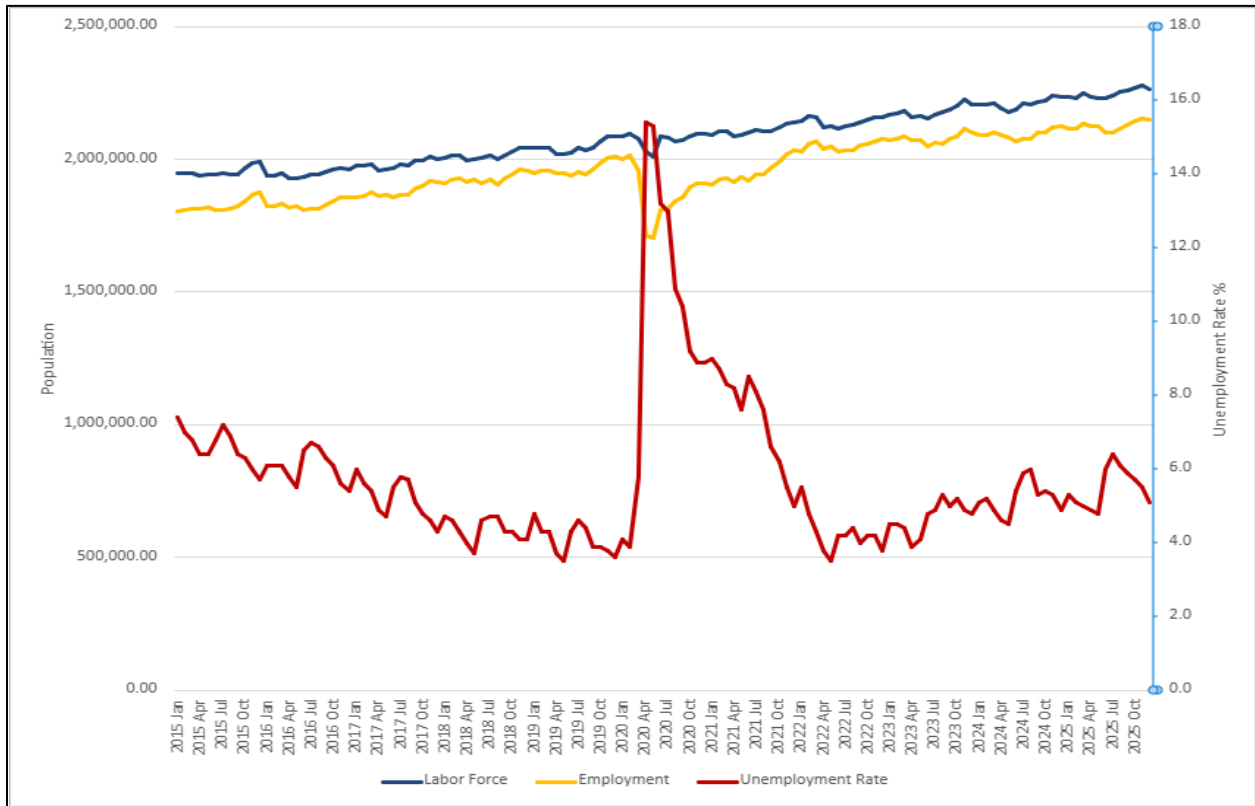
The High Desert is at an inflection point. Victorville has already become a significant logistics and population center, the fastest-growing large city in inland Southern California, though its economic gains are concentrated in lower-wage warehouse and distribution work rather than higher-value sectors that would diversify and deepen its tax base. Generally, the Region has experienced strong job growth and sectoral restructuring around the logistics industry, shaped by both regional dynamics in the High Desert and broader economic shocks such as

the COVID-19 pandemic. Over the past decade, the employment growth rate for non-farm labor in the San Bernardino County outpaced all other regions in Southern California and sustained less economic impact from the Covid-19 recession than Los Angeles, Orange, or San Diego Counties (**Figure 2-13**). Logistics, driven by the rise of e-commerce and the region's transportation infrastructure, has been the dominant sector, growing by approximately 80% over the decade, while healthcare and education have grown by roughly 30-40%, reflecting population growth and increasing service demand. These trends highlight a broader structural shift toward a service and distribution-oriented economy, with logistics serving as the region's primary economic engine.

At the same time, the labor market has shown improving stability compared to earlier decades. Unemployment rates, which were historically elevated in the Inland Empire, declined significantly following the post-Great Recession recovery and remained relatively moderate in the late 2010s. Although unemployment spiked sharply during the pandemic, reaching nearly 10% in 2020, the county experienced a strong recovery, with rates falling back to around 5% by 2024–2025, near statewide averages. This indicates a resilient labor market capable of rebounding from economic disruptions. However, more recent data suggest emerging signs of slowing growth and sectoral unevenness. Between 2022 and 2023, some key sectors, including logistics, manufacturing, and professional services, experienced modest employment declines, while healthcare and education continued to expand. This divergence reflects both post-pandemic normalization, particularly in goods movement, and broader economic headwinds affecting higher-wage industries.

Another defining feature of the past decade is the region's continued reliance on lower-wage and goods-moving sectors, even as wages have begun to rise across industries. While salary growth has been notable, especially in professional and healthcare fields, job concentration in logistics and warehousing has reinforced concerns about job quality and economic diversification. Overall, the High Desert has grown significantly and become more diversified over the past decade. Between the region's two largest cities, Victorville and Barstow, the High Desert is poised to leverage its emerging logistics industry and affordable housing stock to become a prosperous regional economy with its own identity.

FIGURE 2-13: SAN BERNARDINO COUNTY EMPLOYMENT DATA 2015-2025



2.1.8 Summary

The Mojave Region is one of the fastest growing regions in California. As discussed, relatively affordable housing and strategic infrastructure corridor access continue to accelerate population and economic growth. However, limited water supplies, further exacerbated by mounting hydrological and regulatory limitations, continue to adversely constrain the Region. Adequate water supplies and long-term resource management are paramount to the region’s outlook. This 2025 RUWMP helps MWA and the large urban water retail suppliers coordinate and collectively plan to meet an optimistic future condition.

Chapter 3.0 REGIONAL WATER SUPPLY CHARACTERIZATION

This chapter describes the Mojave Region’s water supply sources, which include imported surface water supplies managed by the Mojave Water Agency, and local surface and native groundwater supplies managed collectively by MWA, retail water suppliers, and designated watermasters in the adjudicated areas of the Region.

The more specific characterization of water available for import is presented in *Chapter 6 – Mojave Water Agency*, while the detailed characterization of retailer-specific groundwater is discussed within each urban water retail specific chapter (*Chapters 7 through 16*).

The available regional supplies discussed in this chapter reflect a summary of the more specific MWA and retailer supply conditions and are organized into the three Subregions described in *Chapter 2 – The Mojave Region*. Organizing supplies for each specific subregion facilitates the integration with subregional demands (*Chapter 4 – Water Use Characterization*), providing for supply reliability analysis to be presented by subregion (*Chapter 5 – Regional Water Service Reliability*). This subregional approach allows the entire Mojave Region to be viewed in a more aggregated form, while still reflecting important geographic, hydrologic and management circumstances that are lost if the analysis were completed for just the entire Mojave Region. Each of the retailer-specific chapters (*Chapters 7 through 16*) reflect each retailer’s reliance on the managed groundwater that results from two primary categories: (1) annually available sources including State Water Project (SWP) imports delivered through six turnouts on the East Branch of the California Aqueduct and subsequently recharged throughout the region, and (2) groundwater supplies comprised of natural recharge from the Mojave River and San Bernardino Mountains, return flows from water use, and imported wastewater from mountain communities. Recycled water is an important third component that is being deployed within the Mojave Region at the urban water retail supplier level and will continue to expand as an important supply source into the future.

3.1.1 Mojave Region Water Supply Sources

As described in *Chapter 2 – The Mojave Region*, the Mojave Region is situated in the High Desert of eastern San Bernardino County in a mostly closed topographic basin where water

supply is derived almost entirely from pumped groundwater from the various basins, subbasins and aquifers within its service area. Beyond the minimal precipitation in the Region, natural recharge of the aquifers occurs primarily from flows originating in the San Bernardino Mountains to the south that infiltrate into the basin-fill sediments along the mountain front. The Mojave River also contributes to groundwater recharge through streambed infiltration during wet periods and after significant mountain snowmelt that flows to the Mojave River and its tributaries. Augmentation of the native groundwater is dependent on State Water Project imports and transfers and exchanges conveyed to the Region. Additional local groundwater recharge occurs from irrigation return flows, wastewater imports, and recycled water.

The system is essentially a large underground reservoir where water moves slowly through interconnected aquifers creating the vital water supply for the region. For purposes of this RUWMP, water supplies available to the Region fall into the following major categories, each of which is described in detail throughout this chapter:

- Groundwater
- Imported Water
- Return Flows
- Treated Wastewater and Recycled Water
- Water Transfers and Exchanges
- Planned Water Suppliers

3.1.1.1 Groundwater

Groundwater is the principal source of municipal water supply in the Mojave Region. All retail water suppliers operating within the Region rely on managed groundwater – a blend of natural inflows and recharged imported water – to meet current and projected demand. As noted above, the MWA supports groundwater management in the Region by importing water supplies that are used to replenish groundwater extractions and help manage groundwater basin health.

Natural inflows into the groundwater aquifers are fed through direct percolated precipitation across the basin area and infiltration and storm runoff into stream systems during wet weather. The primary source of natural inflow is infiltration of stormflow runoff water from the San Bernardino Mountains into the Mojave River. The Mojave River is formed by the confluence of the West Fork Mojave River and Deep Creek, both originating in the northwestern San Bernardino Mountains. This mountain-front recharge provides the majority of natural groundwater replenishment to the basin and enters the system in the Alto subarea.

During Water Year 2024, natural water supplies exceeded historical averages, with total flow at the Mojave River Forks reaching 102,389 acre-feet. After accounting for 14,825 acre-feet of

SWP water that MWA imported to the West Fork Mojave River system, natural inflow was measured at 87,564 acre-feet compared to a Base Period average of 65,540 acre-feet. Despite this above-average year, the Region continues to experience long-term drought impacts, with native water supply conditions over the past 13 years averaging only 69.4% of the historical baseline (1931-1990).

As mentioned in *Chapter 2*, the Mojave Region overlies all or a portion of 36 groundwater basins and subbasins, as presented in **Figure 2-5**. Those situated along the Mojave River and adjacent areas are collectively referred to as the Mojave River Groundwater Basin, otherwise known as the Mojave Basin Area. The remaining basins in the southeastern portion of the Region are generally designated as the Morongo Basin/Johnson Valley Area (Morongo Area), with the exception of the Lucerne Valley, which is treated as a distinct management unit. MWA characterizes a long-term average of the natural supplies for the region, including both the Mojave Basin area and the Morongo Basin Area, as 57,349 acre-feet per year. This value is derived from previous assessments of natural supply available and groundwater basin conditions.

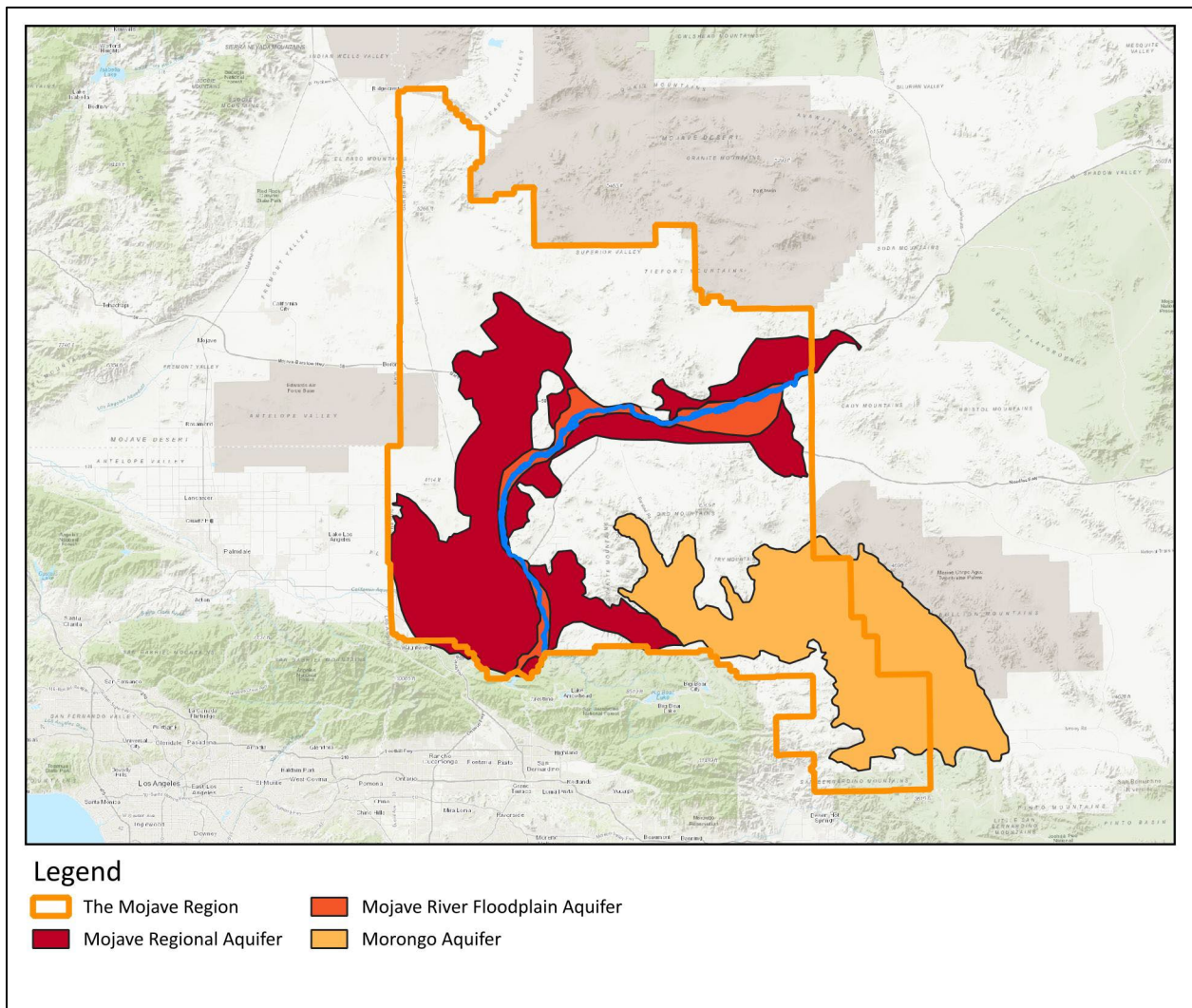
Most groundwater production in the Region relies on three primary aquifers: the Floodplain Aquifer, Regional Aquifer, and Morongo Aquifer (**Figure 3-1**). Each aquifer system has distinct hydrogeologic characteristics and recharge mechanisms. The Floodplain Aquifer is composed of sand and gravel weathered from metamorphic and granitic rocks of the San Gabriel and the San Bernardino Mountains, respectively, and deposited in a fluvial environment. Recharge occurs primarily through direct infiltration of Mojave River surface flows during the wet season, with the greatest recharge rates occurring near the mountain front where surface flows are most frequent and vigorous.

The Regional Aquifer underlies and surrounds the Floodplain Aquifer, comprising interconnected alluvial fan and basin fill deposits. Its primary recharge source is groundwater migrating laterally from the Floodplain Aquifer. Additional recharge is contributed by runoff from the higher elevations of the San Gabriel and San Bernardino Mountains, supplemented by smaller runoff volumes from local ephemeral streams and desert washes.

The Morongo Basin Area encompasses several interconnected basins in southern San Bernardino County. It is a vital water source, managed by the MWA and the local retail water suppliers, for the benefit of communities in the eastern portion of the Region. Groundwater supplies in the Morongo Area are supplemented by imported water conveyed through the 71-mile Morongo Basin Pipeline (MBP) that delivers water from the SWP's California Aqueduct to recharge basins in the Morongo Basin Area. The MBP serves a dual purpose: reducing overdraft in the Warren Valley Basin and Ames Valley Basin, and supporting groundwater

levels in the Joshua Tree Basin (see Chapter 2 – The Mojave Region).¹⁴ Groundwater flow in the Morongo Area is complex but is generally from south to north in Johnson Valley and from west to east-northeast elsewhere in the area. Natural recharge originates primarily from the mountains on the southern and western boundaries of the Morongo Area, resulting in groundwater flow gradients to the north, east, and south adjacent to the boundaries, before turning to the east-northeast. Groundwater flow is complicated locally by pumping, faulting, shallow bedrock, and enhanced recharge basins. For example, in the vicinity of the developed area of Yucca Valley, groundwater flow is controlled to some extent by local recharge basins.

FIGURE 3-1: FLOODPLAIN AND OTHER REGIONAL AQUIFERS



¹⁴ The following agencies jointly financed the MBP and currently rely on it for portions of their water supply: Hi-Desert Water District, Joshua Basin Water District, Bighorn-Desert View Water Agency, and CSA 70 W-4 Pioneer Town

3.1.1.2 Groundwater in the MBA Judgment Area

The MBA Judgment (see *Chapter 2 – The Mojave Region*) established a Production Safe Yield (PSY) system that defines sustainable groundwater pumping levels for each Subarea subject to the Judgment. Specifically, PSY is defined as the maximum production level that can be maintained over a sequence of years representative of long-term average natural water supply conditions, accounting for natural outflow, and under established patterns of water production, applied water, return flows, and consumptive use, while ensuring no long-term net reduction in groundwater storage. The MBA Judgment also assigned Base Annual Production (BAP) rights to each producer using 10 acre-feet or more, based on historical production during the period 1986-1990. Parties to the MBA Judgment are assigned a variable Free Production Allowance (FPA), which is a percentage of the BAP set annually by the Court for each Subarea based on the recommendation of the Watermaster. The BAP is reduced or “ramped-down” over time until FPA comes within 5% of the Judgment-defined PSY. The FPA changes over time as the MBA Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and PSY.

The FPA is set as follows for each Subarea for water year 2025-2026:¹⁵

- Alto Subarea – 50.4% of BAP
- Oeste Subarea – 45% of BAP
- Este Subarea – 45% of BAP
- Centro Subarea – 56% of BAP
- Baja Subarea – 19.5% of BAP

Any Producer that pumps more than their FPA must purchase Replacement Water from the Watermaster equal to the amount of production in excess of their total available FPA or transfer unused FPA from another party within their Subarea. Funds collected for Replacement Water are then used by MWA for purchase of SWP supplies and recharged into the Subarea they were produced from. In addition to purchasing water to offset the Replacement Water Obligations under the Judgment, MWA purchases and stores water in the Mojave Basin Area for future obligations (see *Chapter 6 – Mojave Water Agency*).

In *Chapters 7 through 16*, the projected FPA for each urban water retail supplier participating in the 2025 RUWMP, consistent with the UWMPA requirements, is provided.¹⁶ Using the Subregions described in *Chapter 2 – The Mojave Region*, the summary of available native groundwater is presented in **Table 3-1**. These totals represent the native groundwater (i.e. FPA) in Subregions 1 and 2 and are inclusive of FPA available to the urban water retail

¹⁵ Water Year 2024-2025 Mojave Basin Area Watermaster Annual Report, June 2026

¹⁶ For instance, see values for Hesperia Water District in Table 11-8 and Table 11-9 in *Chapter 11 – Hesperia Water District*.

suppliers participating in the 2025 RUWMP as well as all other groundwater users within each subregion outside of a participating retailer’s service area.

TABLE 3-1: PROJECTED NATIVE GROUNDWATER FOR EACH SUBREGION THROUGH 2050 (AFY)

Projected Native Groundwater For All Year Types	2030	2035	2040	2045	2050
Subregion 1	70,389	70,389	70,389	70,389	70,389
Subregion 2	39,602	39,602	39,602	39,602	39,602

3.1.1.3 Groundwater in the Morongo Subarea

As described in *Chapter 2 – The Mojave Region*, the Morongo Subarea encompasses both the Ames Valley Judgment and the Warren Valley Judgment. While these Judgments function differently than the MBA Judgment, they reflect conditions where native groundwater use exceeded natural recharge. Unlike the MBA Judgment Area, the Morongo Subarea does not have a single regional framework that establishes a quantified native groundwater production allowance applicable across all basins and users. The Morongo Subarea is composed of multiple groundwater basins with varying levels of development, monitoring, adjudication, and management. As a result, the amount of native groundwater reasonably available across the entire Morongo Subarea is not conclusively quantified for purposes of this RUWMP.

3.1.1.4 Imported Water

MWA relies on a diverse portfolio of imported surface water supplies. Imported water is delivered to the Mojave Region via the SWP California Aqueduct. As one of 29 SWP Contractors, MWA’s primary imported supply source is its Annual Table A Allocation, followed by supplementary supplies obtained by various contractual agreements, transfers, and exchanges. Upon delivery of imported water, by the East Branch of the California Aqueduct, to the Agency’s service area, MWA delivers this blend of imported water to various recharge sites throughout its service area. Fundamentally, MWA’s mission is to provide the region with imported water to supplement local groundwater supplies and recharge local groundwater basins. A summary of the MWA’s imported water supplies is provided in **Table 3-2**. Additional details on the SWP supplies and forecast reliability are detailed in *Chapter 6 – Mojave Water Agency*.

TABLE 3-2: MWA’s PROJECTED IMPORTED WATER SUPPLIES (AFY)

Total Supply		Percent Allocation	2030	2035	2040	2045	2050
Normal		54%	48,492	48,492	48,492	48,492	48,492
Single Dry Year		5%	4,490	4,490	4,490	4,490	4,490
Multi-Year Drought	Year 1	35%	31,430	31,430	31,430	31,430	31,430
	Year 2	5%	4,490	4,490	4,490	4,490	4,490
	Year 3	5%	4,490	4,490	4,490	4,490	4,490
	Year 4	20%	17,960	17,960	17,960	17,960	17,960
	Year 5	35%	31,430	31,430	31,430	31,430	31,430

3.1.1.5 Return Flows

When water supplies are extracted from the groundwater basins, a portion of the water pumped is consumed and another portion of the extracted water is returned to the groundwater aquifer and becomes part of the available water supply. This “return flow” is an important component of the Region’s managed groundwater supply. For example, nearly all indoor water use is assumed to be returned to the basin either by percolation from septic tanks or treated wastewater effluent produced by municipal wastewater facilities. The MBA Watermaster Report calculates consumptive use for each producer in each Subarea of the MBA Judgment. The calculation is based on production amount, type of use, and an evaluation of processes that consume water.

Return flows shown in **Table 3-3** are calculated as a percentage of the previous years’ water production for each water use category, as defined by the MBA Watermaster. Return flow factors, on a regional basis, average approximately 40% of the groundwater production, although this amount can vary significantly by Subarea and on an annual basis. Importantly, as water extractions increase in the Region, the return flows will also increase over time. However, as system efficiencies improve, return flows may begin to slowly decline. Nevertheless, for purposes of this 2025 RUWMP, return flows are assumed to be a percentage of the total Water Year Verified Production for each Subarea for the most recent reported Water Year.¹⁷ This value is then held constant in all future year types and all years through 2050. A return flow is not calculated for the Morongo Subarea (Subregion 3).

¹⁷ Water Year 2024–2025 Watermaster Report, June 2026, Verified Projection by Subarea, Appendix B, p.15 of 16. This methodology is consistent with the investigation of consumptive use by the MBA Watermaster.

While this is a recognized source of water affecting determinations of available FPA within the MBA Judgment Subareas, for purposes of this RUWMP, this supply source is ignored. This is a conservative assumption that allows this value to be refined while the interaction among FPA, Return Flows, and Managed Stored Groundwater continues to be evaluated to avoid inadvertently double-counting supplies in the Region’s overall water reliability assessment.

TABLE 3-3: SUMMARY OF RETURN FLOW FOR SUBREGION 1 AND SUBREGION 2 THROUGH 2050 (AFY)

Subregion ¹⁸	Verified Production	Estimated Return Flow
Subregion 1	78,278	31,300
Subregion 2	23,605	9,500

3.1.1.6 Treated Wastewater and Recycled Water

The Region’s self-sufficiency includes development of recycled and reusable water supplies combined with a region-wide emphasis on water use efficiency. Additionally, the Region also accepts treated wastewater imported into certain subareas.

Treated wastewater effluent is imported from three wastewater entities outside the Region. Specifically, treated wastewater from the Lake Arrowhead Community Services District is imported into the Alto Subarea, while effluent from Big Bear Area Regional Wastewater Agency is imported to the Este Subarea. Wastewater from Crestline Sanitation District is also imported but already accounted for in the natural groundwater recharge. This water is considered indirect potable reuse. The MBA Watermaster recognizes these imports in its annual reporting, recognizing almost 3,400 acre-feet in the Water Year 2024-2025 Report. However, over half of this came from the Big Bear facility, which is currently implementing a local recycled water program that will result in this source rarely being available to the Region. For the purposes of this 2025 RUWMP, the recycled water is only assumed available to Region 1 and will be limited to approximately 1,200 acre-feet annually (continuing from Lake Arrowhead CSD and Crestline CSD).

The Region also relies upon and anticipates increasing the local recycled water portfolio to provide both direct use, direct recharge, and indirect aquifer replenishment within the Region, particularly in Subregion 1, where the Region’s largest population base drives wastewater generation and, in turn, recycled water supply availability.

The primary recycled water source is the Victor Valley Wastewater Reclamation Authority (VWVRA) with recycled water production from its Regional Water Reclamation Plant (Regional

¹⁸ As discussed in Chapter 2 – The Mojave Region, Subregion 1 includes the Alto, Este, and Oeste Subareas while Subregion 2 includes the Centro and Baja Subareas.

WRP) and two additional Subregional WRPs, one in Hesperia, and one in Apple Valley. There are currently five permitted recycled water users in the service area: American Organics, the City of Victorville, High Desert Power Plant, the City of Hesperia, and the Town of Apple Valley.¹⁹

The VVWRA also contributes recycled water through wastewater effluent discharges to the Mojave River to replenish the downstream aquifer and to support the riparian corridor that lies within the Alto Transition zone. In the Water Year 2024–2025 Watermaster Report, Victorville and VVWRA contributed approximately 14,000 acre–feet of recharge to the Mojave River. While only permitted to discharge 14 million gallons per day (MGD)²⁰, the main Victorville facility is designed to produce up to 22 MGD of water and is capable of discharging up to 18 MGD. The Apple Valley²¹ and Hesperia²² facilities are designed to be operational in phases, with Phase I having a capacity of 1 MGD, Phase II having a capacity of 2 MGD, and Phase III having a capacity of 4 MGD. Water from the main VVWRA facility is used to both provide flows in the Mojave River and recharge the aquifer as well as cooling in a nearby power plant. The Hesperia Subregional facility is used for irrigation at the Hesperia Golf Course and local area parks (see *Chapter 11 – Hesperia Water District*). The Apple Valley Subregional Facility at Brewster Park is expected to produce irrigation water for Brewster Park, the Civic Center and Apple Valley Golf Course among other locations.

Recycled water is subject to certain restrictions within the law, and localized use requires specific infrastructure investments. The recycled water facilities are governed by National Pollutant Discharge Elimination System (NPDES) permit restrictions. Additionally, the facilities are permitted only for the following beneficial uses: Municipal and Domestic Supply, Agricultural Supply, Industrial Service Supply, Freshwater Replenishment, and Aquaculture. Future recycled water projects will play a central role in enabling the Region to continue demonstrating reduced reliance on Delta imports.

For the purposes of this 2025 RUWMP, Subregion 1 will conservatively only represent the estimated recycled water volume that is available to Hesperia Water District and the City of Victorville, as further detailed in their individual retail chapters. **Table 3-4** presents projected recycled water supplies for Subregion 1 through 2050.

TABLE 3-4: RECYCLED WATER SUPPLIES FOR SUBREGION 1 THROUGH 2050 (AFY)

Subregion	2030	2035	2040	2045	2050
Subregion 1	2,004	3,238	3,834	4,408	4,908

¹⁹ VVWRA 2024 Annual Recycled Water Report, Table 2.

²⁰ <https://www.vvraca.gov/home/showpublisheddocument/194/637694937439730000>

²¹ <https://www.vvraca.gov/home/showpublisheddocument/200/637694940317370000>

²² <https://www.vvraca.gov/home/showpublisheddocument/204/637694942003170000>

3.1.1.7 Water Transfers and Exchanges

As discussed in *Chapter 6 – Mojave Water Agency*, MWA engages in water transfers and exchanges involving its SWP assets and other SWP Contractors' SWP assets. Historically, MWA has both received and delivered water through these transfers and exchanges with various agencies throughout California. These transfers are essentially spot market transfers where short-term opportunities are identified and then actions taken for purchase and acquisition. These transfers help support management of MWA's and its retail agencies' water supply portfolios. Future MWA transfers and exchanges depend upon allocations available to MWA and other water purveyors and are not considered an available supply for purposes of this RUWMP.

3.1.1.8 Planned Water Supplies

Potential future water supply projects, supplementary to existing supplies, consist of the MWA's participation in Sites Reservoir, Delta Conveyance Project, and potential recharge projects. All of these focus on helping MWA improve the reliability and management of SWP supplies and are discussed in more detail in *Chapter 6 – Mojave Water Agency*.

3.1.2 Water Quality

Water quality is a critical consideration in the Mojave Region. Because local potable supplies are derived from blended groundwater sources, well locations, recharge activities associated with imported water, and other key system components are actively coordinated and managed among participating retailers and MWA.

3.1.2.1 Imported Water Quality

Generally, the imported surface water conveyed through the California Aqueduct and recharged throughout the Region is considered to be good quality. Many retailers rely on the imported supplies to help manage the quality of water delivered to customers, using the benefits of the imported water as a blending supply to the native groundwater. Water quality delivered to the Region is monitored by the DWR Division of Operations and Maintenance within the California Aqueduct. More details regarding the specific quality information are included in *Chapter 6 – Mojave Water Agency*.

3.1.2.2 Groundwater Quality

MWA has implemented a comprehensive groundwater monitoring program to improve understanding of both water quantity and quality across the Mojave Region’s groundwater basins. In coordination with the United States Geological Survey (USGS), this program includes an 850-well monitoring network. Water levels from these wells are recorded on a regular basis and several of the wells are tested for water quality on a rotating sampling schedule.

Numerous studies dating back to the early 1900’s have been conducted by various agencies to characterize groundwater quality in the Region and further the understanding of the Mojave River and Morongo Groundwater Basins. The most recent study was the Mojave Salt and Nutrient Management Plan completed in 2015.²³ Despite local groundwater quality degradation, these studies generally confirmed the suitability of groundwater for beneficial uses in the Region. Groundwater quality data, including intrinsic tracers, have been used to confirm sources of groundwater recharge and travel times along interpreted flow paths in the Floodplain and Regional aquifers. Investigations have also been conducted to identify the source and occurrence of key naturally occurring groundwater contaminants, including hexavalent chromium (Cr-VI) and arsenic, in the Mojave Desert region.

The impairment of groundwater from the perspective of its beneficial use as drinking water is determined by comparing concentrations of constituents of concern in the groundwater against drinking water maximum contaminant levels (MCLs) and agricultural water quality parameters needed for specific crops. Key groundwater constituents of concern in the Region include arsenic, nitrates, iron, manganese, Cr-VI, fluoride, and total dissolved solids (TDS). Some of these constituents are naturally occurring in desert environments while others are associated with human (anthropogenic) activities. Measurements exceeding drinking water standards have been found for some of these constituents within the Mojave River Basin and the Morongo Basin. If necessary, groundwater in these areas may require treatment prior to consumption.

MWA’s Salt and Nutrient Management Plan (SNMP) provides an evaluation of potential groundwater quality issues that may result from sources of salts and nutrients. The SNMP addresses whether these constituents would unreasonably degrade groundwater quality and potentially decrease the beneficial uses of groundwater within the basin. For the MWA SNMP, TDS and nitrate were analyzed as appropriate indicator constituents of salts and nutrients.

Total salinity is commonly expressed in terms of TDS as milligrams per liter (mg/L). TDS concentrations in the groundwater are influenced by the chemistry of the aquifer and quality of water recharging the aquifer. TDS is not a health hazard at typical groundwater

²³ Relevant water quality studies are available at <http://www.mojavewater.org/regional-studies.html>. Hereafter “2015 Salt and Nutrient Plan”).

concentrations but can be an aesthetic issue and can shorten the useful life of pipes and water-based appliances in homes and businesses. TDS monitoring data are widely available for source waters (both inflows and outflows) in the Region, and because TDS is a general indicator of total salinity, TDS is an appropriate indicator of salt loading. TDS concentrations generally increase in downgradient portions of the Mojave River Basin and along groundwater flow paths away from the primary recharge source in the basin, the Mojave River. Elevated TDS concentrations (greater than 1,000 mg/L) are generally associated with natural processes including mineralization and evaporation beneath dry lake beds. In the Morongo Basin, groundwater TDS concentrations generally increase along groundwater flow paths away from the southwestern margins of the basin where mountain-front recharge occurs.

Nitrate is a widespread contaminant in California groundwater. High levels of nitrate in groundwater are associated with agricultural activities, septic systems, confined animal facilities, landscape fertilization, and wastewater treatment facilities. Nitrate does occur naturally in groundwater – however, natural nitrate levels in groundwater are generally very low (typically less than about 10 mg/L as nitrate-NO₃).

The volume-weighted average of existing TDS and nitrate-NO₃ concentrations were calculated for each of the 22 analysis subregions. Results are summarized in **Table 3-5**. Average subregional TDS concentrations vary considerably, ranging from 153 mg/L to 1,716 mg/L across the Region. Average TDS concentrations are very low in the upgradient portions of the Mojave River Basin (less than 300 mg/L) and increase along the pathways along and away from the Mojave River due to natural processes (e.g., mineralization) and impacts from anthropogenic loading. Eight of the nine downgradient analysis subregions composing the Alto Transition Zone, Centro, and Baja Subareas have average TDS concentrations at or above 500 mg/L (Baja – Floodplain is the lone exception). In the Morongo Basin, average TDS concentrations are generally below the recommended secondary MCL for TDS of 500 mg/L. Exceptions include Lucerne Valley (north) (1,716 mg/L) and Johnson Valley (678 mg/L), where elevated TDS concentrations primarily reflect a high degree of mineralization and dry lakebed evaporation. Elevated TDS concentrations are naturally characteristic of dry lakes in arid desert environments.

Nitrate-NO₃ concentrations are generally low across the Region. Average SNMP subregional concentrations are approximately 6.0 mg/L. Average nitrate-NO₃ concentrations exceed 15 mg/L in Centro – Floodplain and Warren Valley. Additionally, nitrate-NO₃ concentrations are slightly elevated (between 7.5 and 10 mg/L) in Centro – Regional (west), Alto Transition Zone – Floodplain (Helendale), and Alto – Right Regional. In the Centro Subarea, elevated nitrate concentrations are associated with historical and existing agricultural operations (crop field and dairies) and other naturally occurring processes. In the Alto subarea, septic tank return flows are likely the most significant contributing factor to slightly elevated groundwater nitrate concentrations. In the Warren Valley Basin, elevated nitrate concentrations are associated with historical entrainment of septage following managed aquifer recharge operations and a high density of septic tanks in the subarea.

Chapter 3 – Regional Water Supply Characterization

The emerging water quality constituents of concern are per- and polyfluoroalkyl substances (PFAS) and perfluorooctanoic acid (PFOA). These chemical constituents are generally produced through chemical manufacturing of items like Teflon pans, stain resistant carpet, and fast-food packaging. Acceptable levels for PFAS and PFOA compounds are regulated by the State of California and have recently been lowered. As such, the regulatory actions may have some impact on the regional availability of groundwater supplies. MWA and the regional purveyors are addressing this emerging issue in the region-wide management of groundwater resources and imported supplies that augment the local sources.

TABLE 3-5: AVERAGE EXISTING TDS AND NITRATE CONCENTRATIONS BY SNMP SUBREGION

SNMP Analysis Subregion	Average Existing TDS Concentration (mg/L)	Average Existing Nitrate-NO ₃ Concentration (mg/L)
Mojave River Basin		
Baja - Floodplain	401	3.9
Baja - Regional	617	1.4
Centro - Floodplain	711	20.7
Centro - Regional (east)	618	3.2
Centro - Regional (west)	711	7.7
Centro - Regional (Harper Dry Lake)	1,028	4.0
Alto Transition Zone - Floodplain (Helendale)	915	10.0
Alto Transition Zone - Floodplain	500	3.4
Alto Transition Zone - Regional	529	3.9
Alto - Floodplain (Narrows)	205	4.3
Alto - Floodplain	177	3.3
Alto - Left Regional	310	0.9
Alto - Mid Regional	153	3.5
Alto - Right Regional	579	7.5
Oeste - Regional	781	2.5
Este - Regional	299	4.3
Morongó Basin		
Lucerne Valley (north)	1,716	5.6
Lucerne Valley (south)	472	5.7
Johnson Valley	678	6.2
Ames-Means Valley	330	5.7
Warren Valley	243	15.4
Copper Mountain-Giant Rock	247	7.5
Joshua Tree	202	14.7

3.1.2.3 Groundwater Monitoring and Protection

The general goal of groundwater protection activities is to maintain the groundwater and the aquifer to ensure a reliable high quality water supply. Activities to meet this goal include continued and increased monitoring, data sharing, education and coordination with other agencies that have local or regional authority or programs. The current MWA groundwater monitoring program includes groundwater quality data collected by MWA and the USGS through their cooperative water resources program and through the Drinking Water Program directed by the State Water Resources Control Board Department of Drinking Water (SWRCB DDW).

The SWRCB DDW enforces the monitoring requirements established in Title 22 of the CCRs for drinking water wells and all the data collected must be reported to the DDW (note: each participating retailer's specific Consumer Confidence Report is included within its respective Chapter). Title 22 also designates regulatory limits (e.g., MCLs) for various water contaminants, including volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, general physical constituents, and other parameters. Title 22 testing applies to potable public drinking water systems. MWA performs Title 22 testing only on water produced for the R-Cubed distribution system which supplies wholesale potable water to a few retail water suppliers in the Alto Subarea.²⁴ All retail water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the SWRCB DDW.

MWA has developed and actively maintains a Key Well program to support ongoing groundwater management activities, including monitoring of groundwater levels and water quality throughout the Region. Wells in the Key Well program include a combination of dedicated monitoring wells, scientific investigation wells, domestic water supply wells, and agricultural irrigation wells. Retailer's public water supply wells are not included in the Key Well program but data from these wells are tracked and included in the MWA database. Important wells identified or installed during scientific studies are continually added to the Key Well program.

There are a range of groundwater contamination sites across the region. These sites are regulated by the Lahontan and Colorado River Basin Regional Water Quality Control Boards. The potential detriments to water supply from these sites are being monitored by MWA and potentially effected retailers on a regional basis.

²⁴ Groundwater quality data are submitted electronically and are available for download online at the SWRCB water quality analyses data and download page: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/EDTlibrary.shtml

3.1.3 Desalination Opportunities

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631(i)). In the past, MWA has evaluated potential options for developing desalination projects. However, none of the opportunities are currently practical or economically feasible for MWA or the Mojave Region, and MWA has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this RUWMP.

As discussed elsewhere in this document, the groundwater supplies in the Region are not considered brackish in nature, and desalination is not required. There are brackish supplies near the dry lakes, but it is not practical to pump, treat and potentially induce migration of better-quality water to the dry lake areas. However, MWA and the retail water purveyors could partner with other SWP contractors and provide financial assistance in construction of other regional groundwater desalination facilities in exchange for SWP supplies. The desalinated water would be supplied to users in communities near the desalination plant, and a similar amount of SWP supplies would be exchanged and allocated to MWA from the SWP contractor for use in the Mojave Region. In addition, should an opportunity emerge with a local agency other than an SWP contractor, an exchange of SWP deliveries would most likely involve a third party, such as Metropolitan Water District. Most local groundwater desalination facilities would be projects implemented by retailers of SWP contractors and, if an exchange program were implemented, would involve coordination and wheeling of water through the contractor's facilities to MWA.

Because the MWA service area is not in a coastal area, it is neither practical nor economically feasible for MWA to implement a seawater desalination program.

3.1.4 Delta Reliance

The Mojave Region continues to demonstrate reduced reliance on water supplies derived from the Delta and regional self-sufficiency through the actions of the retail agencies and MWA. The reduced reliance and regional self-sufficiency are attributable to significant advances in developing recycled and reusable water supplies combined with a region-wide emphasis on water use efficiency among MWA and the retail agencies. **Table 3-6** presents the reduced reliance analysis for the Mojave Region. The Reduced Delta Reliance and improved regional self-sufficiency are detailed in **Appendix 2**.

TABLE 3-6: REDUCED DELTA RELIANCE

Year	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Water Supplies from the Delta Watershed	34.2%	34.2%	31.0%	26.1%	24.6%	23.5%	22.9%	22.3%	21.7%
Change in Water Supplies from the Delta Watershed		-0.1%	-3.3%	-8.2%	-9.6%	-10.7%	-11.4%	-12.0%	-12.5%

3.1.5 Climate Change

While the CWC does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply – both in an historical and future – projection context. The Region’s primary climate change concern involves MWA’s capability of providing imported SWP water for groundwater recharge and changes to the pattern and intensity of rainfall within the Region and snowfall in the mountains that feed the Mojave River and various local ephemeral streams.

As discussed in *Chapter 6 – Mojave Water Agency*, MWA uses DWR’s 2025 Delivery Capability Report (DCR) to assess current and future reliability of SWP Contract Table A supplies. MWA’s representation of supply availability during single dry and multiple dry years reflects its consideration of climate change impacts on its Table A water supplies.

3.1.6 Summary of Existing and Planned Water Supplies

Available wholesale water supplies in the RUWMP Planning Area consist of supplies managed exclusively by MWA and other supplies managed by constituent retail water agencies. MWA coordinates with its retailers to meet regional demands. Each retail water agency in the RUWMP Planning Area uses a unique mix of supplies and not all supply comes from MWA.

The projected total water supplies required to meet the demands of all of MWA’s retail agencies and other water uses within the Mojave Region are summarized below in **Table 3-7** and **Table 3-8**. While MWA does not anticipate meeting all regional demands solely through collective water assets it directly manages, the Agency will work collaboratively with retail agencies and other stakeholders to manage available water supplies and ensure that projected regional demands can be met. The Region’s overall water asset portfolio consists of same-year SWP Table A allocations, Article 56 Carryover (and Article 21 Interruptible Water), Stored SWP supplies as managed by MWA, Water Transfers and Exchanges, local native groundwater, local surface water, return flows, and recycled supplies.

Chapter 3 – Regional Water Supply Characterization

TABLE 3-7: PROJECTED TOTAL WATER SUPPLY FOR THE MOJAVE REGION FOR THE NEXT 5-YEARS (AFY)

Year Type		All Sources (Native Groundwater, Recycled Water, SWP Table A)
Normal		162,812
Single Dry Year		118,810
Multi-Year Drought	2026 (1 st Year)	145,759
	2027 (2 nd Year)	118,810
	2028 (3 rd Year)	118,810
	2029 (4 th Year)	132,280
	2030 (5 th Year)	145,759

TABLE 3-8: PROJECTED TOTAL WATER SUPPLY FOR THE MOJAVE REGION THROUGH 2050 (AFY)

Year Type All Sources	2030	2035	2040	2045	2050	
Normal	162,812	164,046	164,642	165,216	165,716	
Single Dry Year	118,810	120,044	120,640	121,214	121,714	
Multi-Year Drought	Year 1	145,759	146,993	147,589	148,163	148,663
	Year 2	118,810	120,044	120,640	121,214	121,714
	Year 3	118,810	120,044	120,640	121,214	121,714
	Year 4	132,280	133,514	134,110	134,684	135,184
	Year 5	145,759	146,993	147,589	148,163	148,663

Chapter 4.0 WATER USE CHARACTERIZATION

Understanding water use characteristics across the Mojave Region is fundamental to evaluating long-term water supply reliability and informing regional water management strategies. As described in Chapter 2, the Region encompasses a diverse range of communities with varying population densities, land use patterns, and economic drivers, all of which influence water use behavior and demand. This chapter characterizes current water use across the region and develops projections of future water demand over the planning horizon.

Consistent with the coordinated regional approach established for the 2025 RUWMP, population, land use, and economic assumptions described in Chapter 2 form the basis for demand projections presented herein. Retailer-specific demand characteristics, including customer class distributions and system water use profiles, are developed within their respective retailer chapters and incorporated into the regional demand projections presented in this chapter. Demands occurring outside the service area boundaries of participating urban water retail suppliers – including agricultural, industrial, and recreational uses, as well as demands from small water systems and rural domestic pumpers – are characterized within the Mojave Water Agency’s wholesale planning framework as described in *Chapter 6 – Mojave Water Agency*.

Projected water demands developed in this chapter serve as the analytical framework for integrating regional water use with available supplies described in Chapter 3 – Water Supply Characterization. Together, these elements support the evaluation of system reliability under normal, single dry year, and multiple dry year conditions presented in Chapter 5 – Water System reliability and Drought Risk Assessment.

This chapter therefore provides a comprehensive and consistent framework for quantifying regional water use, supporting both near-term and long-term planning requirements and water resource management across the Mojave Region.

4.1.1 Current Regional Water Use

Water use within the Mojave Region reflects a diverse mix of urban, rural, industrial, recreational, and agricultural demands supported by a combination of managed

groundwater and supplemental supplies. Understanding how water is currently used across the Region provides critical context for evaluating demand trends, informing future projections, and assessing long-term water supply reliability.

Water use within the Mojave Basin Area is tracked and reported through Mojave Watermaster Verified Production reports, which document production across the five Subareas in accordance with the terms of the adjudication. In addition, urban water suppliers track and report their production to the State Water Resources Control Board (SWRCB) through monthly reporting requirements. For areas outside of the Mojave Basin Area, such as Subregion 3, water use data for Hi-Desert Water District and Joshua Basin Water District is derived from agency production records and State Water Resources Control Board reporting. Historic demand data for other uses within Subregion 3, including smaller systems and non-urban demands, are based on estimates developed as part of MWA's chapter, Chapter 6 – Mojave Water Agency.

Collectively, these data sources are synthesized to characterize recent and current water use across the Mojave Region. **Table 4-1** presents a summary of regional water use for the period 2021 through 2025 by major use categories, including (1) urban water retail suppliers, (2) small potable water systems and rural domestic users, (3) other uses such as industrial, commercial, and recreational demands, and (4) agricultural uses. To further illustrate spatial variability in water use **Table 4-2 through Table 4-4** provide a breakdown of these same categories by subregion.

This characterization of recent and current water use provides insight into regional demand patterns, the relative magnitude of different water use sectors, and the influence of long-term demand management measures and regulatory frameworks. These observed trends form the basis for developing and evaluating future water demand projections presented in the later portions of this chapter.

TABLE 4-1: REGIONAL WATER USE 2021-2025 (AFY)

Water Use Category		2021	2022	2023	2024	2025
Urban Water Retail Supplier	City of Adelanto	4,487	4,640	4,570	4,636	5,044
	County Service Area 64	2,793	2,677	2,561	2,597	2,666
	County Service Area 70 J	1,794	1,725	1,633	1,146	1,742
	Golden State Water Company - Barstow	6,004	5,604	5,421	5,591	5,437
	Hesperia Water District	14,253	13,645	12,604	13,724	13,852
	Hi-Desert Water Company	2,909	2,919	2,800	2,874	2,817
	Joshua Basin Water District	1,333	1,299	1,276	1,307	1,292
	Liberty Utilities - Apple Valley Water Company	10,014	9,538	9,399	9,698	9,642
	Phelan Piñon Hills CSD	3,094	2,863	2,555	2,674	2,717
	Victorville Water District	22,346	22,071	20,079	20,389	20,956
	Subtotal Urban Water Retailer	69,028	66,981	62,897	64,636	66,164
Other	Small Water Systems and Rural Domestic	17,836	15,869	15,215	16,699	17,050
	Industrial	10,435	10,135	9,035	9,235	7,335
	Golf Course	4,615	4,715	3,515	4,415	5,215
	Recreational	9,050	9,250	8,250	7,850	7,250
	Agricultural	21,700	16,200	15,300	15,100	14,500
	Subtotal Other	63,636	56,169	51,315	53,299	51,350
Total Water Use in Mojave Region		132,664	123,150	114,212	117,934	117,514

TABLE 4-2: SUBREGION 1 WATER USE 2021-2025 (AFY)

Water Use Category		2021	2022	2023	2024	2025
Urban Water Retail Supplier	City of Adelanto	4,487	4,640	4,570	4,636	5,044
	County Service Area 64	2,793	2,677	2,561	2,597	2,666
	County Service Area 70 J	1,794	1,725	1,633	1,146	1,742
	Hesperia Water District	14,253	13,645	12,604	13,724	13,852
	Liberty Utilities - Apple Valley Water Company	10,014	9,538	9,399	9,698	9,642
	Phelan Piñon Hills CSD	3,094	2,863	2,555	2,674	2,717
	Victorville Water District	22,346	22,071	20,079	20,389	20,956
	Subtotal Urban Water Retailer	58,781	57,159	53,400	54,864	56,619
Other	Small Water Systems and Rural Domestic	12,243	10,893	10,444	11,463	11,704
	Industrial	5,600	5,100	4,900	5,500	4,400
	Golf Course	4,400	4,500	3,300	4,200	5,000
	Recreational	7,000	7,400	6,400	6,000	5,400
	Agricultural	4,700	3,800	3,400	3,400	3,000
	Subtotal Other	33,943	31,693	28,444	30,563	29,504
Total Water Use in Subregion 1		92,724	88,852	81,844	85,427	86,122

TABLE 4-3: SUBREGION 2 WATER USE 2021-2025

Water Use Category		2021	2022	2023	2024	2025
Retailer	Golden State Water Company - Barstow	6,004	5,604	5,421	5,591	5,437
	Subtotal Urban Water Retailer	6,004	5,604	5,421	5,591	5,437
Other	Small Water Systems and Rural Domestic	2,971	2,644	2,535	2,782	2,840
	Industrial	4,500	4,700	3,800	3,400	2,600
	Golf Course	0	0	0	0	0
	Recreational	2,000	1,800	1,800	1,800	1,800
	Agricultural	17,000	12,400	11,900	11,700	11,500
	Subtotal Other	26,471	21,544	20,035	19,682	18,740
Total Water Use in Subregion 2		32,476	27,148	25,456	25,273	24,178

TABLE 4-4: SUBREGION 3 WATER USE 2021-2025²⁵

Water Use Category		2021	2022	2023	2024	2025
Retailer	Hi-Desert Water Company	2,909	2,919	2,800	2,874	2,817
	Joshua Basin Water District	1,333	1,299	1,276	1,307	1,292
	Subtotal Urban Water Retailer	4,243	4,218	4,076	4,180	4,109
Other	Small Water Systems and Rural Domestic	2,621	2,332	2,236	2,454	2,506
	Industrial	335	335	335	335	335
	Golf Course	215	215	215	215	215
	Recreational	50	50	50	50	50
	Agricultural	0	0	0	0	0
	Subtotal Other	3,221	2,932	2,836	3,054	3,106
Total Water Use Subregion 3		7,464	7,150	6,912	7,234	7,214

²⁵ Subregion 3 "Other" water use categories were estimated by Zanjero using available spatial and water-use indicators as no single Watermaster or centralized reporting source tracks all non-urban retail water use throughout Subregion 3.

4.1.2 Forecasting Regional Water Use

Forecasting water use leverages the current understanding of prevailing regional water needs and trends while considering factors directly influencing more recent urban water use efficiency regulatory pressures and regional population trends. The following discusses the assumptions used to forecast water use at both the regional and subregional levels.

4.1.2.1 Forecasting Urban Water Retail Supplier Use

There are several factors significantly impacting the projection of future water use for the urban water retail suppliers ultimately informing the majority of the water use within the Mojave Region. These factors include State and local landscape regulations, building code requirements, and residential water-use mandates, as well as changes in types of housing products offered. These factors are incorporated into determining appropriate per-customer connection water demand values for use in forecasting future water needs. Relevant factors include:

- California Model Water Efficient Landscape Ordinance²⁶
- Green Building Standards Code (hereafter the “CAL Green Code”)²⁷
- Per-capita Urban Water Conservation Objectives²⁸

A significant portion of the projected growth in water demand includes a range of residential and non-residential uses within the urban water retail supplier’s service areas, driven by the varied development proposals already approved (but not yet built) as well as future proposals, to meet regional population increases. Residential customers will include both single-family dwelling units, some with accessory dwelling units, built under a variety of densities, as well as multi-family residential dwelling units. Non-residential uses are expected to include a blend of commercial, institutional, industrial, and active landscapes such as parks, in ratios similar to current residential-to-non-residential connections. The forecasted future demands of the 10 RUWMP urban water retail suppliers will reflect the needs of existing customers and future new customers. The methodology repeats that used for the 2020 Mojave Water Agency UWMP, where existing customer use and forecasted new customer use are primarily based upon multiplying the population by a gallons-per-capita-per day water factor for residential and non-residential uses.

²⁶ Information regarding the California Model Water Efficient Landscape Ordinance (MWELO) can be accessed [here](#).

²⁷ Information regarding the Green Building Standards Code (CAL Green Code) can be accessed [here](#).

²⁸ Information regarding Per-capita Urban Water Conservation Objectives can be accessed [here](#).

Forecasting Existing Customer Future Use

For each urban water retail supplier, data submitted to the SWRCB to satisfy monthly reporting requirements was obtained to establish the current water use characteristics, as presented in **Table 4-1**. The current total annual production values were then divided by each retailer's current population to generate gallons-per-capita-per-day (gpcd) values which are representative of each retailer's total gpcd when considering all residential and non-residential uses. The "current" gpcd values for these populations were then used to generate representative gpcd values for new customers as discussed below.

For existing customers' future use, the gpcd was either (1) held constant or (2) reduced slightly to reflect expected conservation through replacement of fixtures and appliances, continued adoption of a conservation ethic, and modifications of irrigated landscapes, as well as a function of continued implementation of the retailer's ongoing conservation programs.

Forecasting New Customer Future Use

One element of the information reported to SWRCB is the percentage each retailer serves to residential customers, a key value for the SWRCB's determination of the "residential gallons-per-capita-per-day" water use – or "r-gpcd." Using the total r-gpcd value as well as the wintertime r-gpcd values, which are often lower than during summer months, an estimate of the (1) residential versus non-residential per-capita use and (2) the residential indoor versus outdoor per-capita water use factor was derived for each retail supplier. The estimated gpcd values were then used to establish an anticipated gpcd value for each new customer using the following criteria:

- As stipulated by the CWC, each new residential user should have an indoor factor of 47 gpcd, dropping to 42 gpcd in the future.²⁹ For purposes of this forecast, 47 gpcd is used for all new customers until 2030 and 42 gpcd is used for growth beyond 2030.
- Using the residential indoor versus outdoor gpcd estimate from the existing customer data, an outdoor gpcd value was determined (as the difference between total r-gpcd and the estimated indoor r-gpcd). This outdoor value was added to the indoor value of 47 gpcd or 42 gpcd to generate a total residential gpcd value for future customers.
- The difference between the residential gpcd and the total gpcd created a representative non-residential gpcd value unique to each retailer. This non-residential

²⁹ CWC Section 10609.4(a)(2) establishes the indoor residential water use 'standard' to be 47 gpcd beginning in 2025 through January 1, 2030 while CWC Section 10609.4(a)(3) establishes the indoor residential water use 'standard' to be 42 gpcd beginning in 2030. These values represent average values across the entire customer base served by any urban water supplier.

gpcd was added to the residential gpcd to create an expected total gpcd for each new customer.

- The new gpcd value was multiplied by the incremental additional population anticipated during each five-year increment through 2050.
- The existing customer future demand and the new future customer demand were combined to represent the total demand for each large water retail supplier.

Projected water use for each participating urban water retail supplier is presented in the Water Use Characterization sub-chapter of each respective retailer chapter (Chapters 7 – 16). Each sub-chapter describes the retail-specific assumptions, customer use trends, existing and new customer demand forecasts, distribution system losses, and other factors used to develop each retailer’s projected water use. The regional demand summaries presented in this chapter rely on those retail-specific forecasts and aggregate them, where appropriate, to support the broader regional water use characterization and reliability analysis.

4.1.2.2 Forecasting Non-Urban Water Retail Supplier Uses

In addition to the demands associated with participating urban water retail suppliers, the Mojave Region includes other water uses such as agricultural, industrial, golf, recreational, small systems, rural domestic, and other non-retailer demands. Historical use associated with these categories is summarized in this chapter to provide a more complete accounting of regional water use.

Future demands for non-urban water retail supplier uses were developed separately from the participating retailer demand projections. The methodology and assumptions used to forecast these demands are described in *Chapter 6 – Mojave Water Agency*. The regional demand projections presented later in this chapter aggregate these retailer and non-retailer forecasts to provide a total regional demand forecast for use in *Chapter 5 – Regional Water Service Reliability*.

4.1.3 Summary of Future Regional Water Use

The preceding sections identify the forecast sources used to develop future water use projections for the Mojave Region, including participating urban retail water supplier demands and non-urban/non-retailer demands. For regional planning purposes, these forecasts are aggregated in this section to present total projected water use for the Mojave Region.

Table 4-5 through Table 4-7 summarize projected water use from 2030 through 2050 by subregion. **Table 4-8** summarizes projected regional water use from 2030 through 2050 and provides the long-term regional demand forecast used to evaluate supply and demand conditions in *Chapter 5 – Regional Water Service Reliability*.

The projections presented in **Table 4-5 through Table 4-8** reflect baseline planning demands, do not include an additional adjustment for climate change, and are rounded to the nearest five acre-feet.

TABLE 4-5: PROJECTED SUBREGION 1 WATER DEMAND 2030-2050 (AFY)

Subregion 1	2030	2035	2040	2045	2050
Year 1	89,700	91,070	92,150	93,155	93,530
Year 2	89,975	91,290	92,355	93,220	93,560
Year 3	90,250	91,500	92,545	93,305	93,585
Year 4	90,525	91,715	92,750	93,375	93,610
Year 5	90,795	91,930	92,950	93,450	93,635

TABLE 4-6: PROJECTED SUBREGION 2 WATER DEMAND 2030-2050 (AFY)

Subregion 2	2030	2035	2040	2045	2050
Year 1	24,270	24,480	24,875	25,510	26,120
Year 2	24,315	24,560	25,000	25,630	26,270
Year 3	24,355	24,635	25,130	25,755	26,415
Year 4	24,395	24,715	25,255	25,875	26,565
Year 5	24,435	24,795	25,380	25,995	26,715

TABLE 4-7: PROJECTED SUBREGION 3 WATER DEMAND 2030-2050 (AFY)

Subregion 3	2030	2035	2040	2045	2050
Year 1	7,280	7,290	7,245	7,175	6,985
Year 2	7,285	7,275	7,225	7,140	6,965
Year 3	7,280	7,270	7,210	7,100	6,955
Year 4	7,285	7,260	7,205	7,060	6,935
Year 5	7,285	7,250	7,190	7,025	6,920

TABLE 4-8: PROJECTED REGIONAL WATER DEMAND 2030-2050 (AFY)

Mojave Region	2030	2035	2040	2045	2050
Year 1	121,250	122,840	124,270	125,840	126,635
Year 2	121,575	123,125	124,580	125,990	126,795
Year 3	121,885	123,405	124,885	126,160	126,955
Year 4	122,205	123,690	125,210	126,310	127,110
Year 5	122,515	123,975	125,520	126,470	127,270

Chapter 5.0 REGIONAL WATER SERVICE RELIABILITY

This chapter outlines the Mojave Region’s general water system reliability findings as required under CWC §10635 and provides reliability information that the MWA and its constituent retail agencies may use in completing an annual supply and demand assessment under CWC §10632.1.

Assessing water service reliability is the fundamental purpose for MWA and the participating retail suppliers in preparing this 2025 RUWMP. Water service reliability reflects the Region’s ability to demonstrate that the regional water needs may be satisfied under projected hydrological and regulatory conditions. The Region’s 2025 RUWMP considers the reliability of meeting water demands by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact the regional water supplies. The reliability assessment looks beyond past experiences and considers what could be reasonably foreseen in the future in order to reflect potential water supply planning scenarios. This chapter synthesizes the details imbedded in Chapters 3 and 4, which each on their own reflect synthesis of Chapters 6 through 16, and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents two regional water reliability findings:³⁰

- Five Year Drought Risk Assessment: the 2026 through 2030 Drought Risk Assessment (“DRA”) for the Mojave Region;
- Long-Term Service Reliability: the reliability findings for a Normal Year, Single Dry Year, and Five Consecutive Dry Years in five-year increments through 2050;

In summary, regional water supplies are sufficient to meet regional water demands during normal, single dry, and five consecutive dry years through 2050.

³⁰ These findings are also used by Mojave Water Agency to represent reliability for their “wholesale water supplier” responsibilities under the UWMPA.

5.1.1 Mojave Region Five-Year Drought Risk Assessment

The Region is characterized by a unique portfolio of water supplies and infrastructure components. As noted in *Chapter 3 – Regional Water Supply Characterization* and *Chapter 6 – Mojave Water Agency*, the regional supplies that are available include MWA’s SWP Table A Annual Amount, Native Groundwater, Imported Wastewater, Return Flows, Recycled Water and Stored and Carryover supplies (such as Article 56). These supplies are managed throughout each of the Subregions. For example, although MWA brings its annual SWP Table A allocation into its service area for delivery into the Subregions, it also may store some of its Table A allocation within the SWP system under the Carryover provisions in its SWP Contract or may store portions of the Table A allocation in regional groundwater basins for use in later years. As such, the annual management of the diverse water supply sources in the regional water supply portfolio forms the supply reliability assessment described in this Chapter.

The Region, as coordinated through MWA, the participating retailers and other users, manages its water supplies to address projected dry conditions. Specifically, MWA captures and stores surplus imported water in normal and wet years to use those water assets to meet regional demands in dry years. These strategic management actions stabilize annual fluctuations in supplies that may not meet regional demands under certain dry conditions. In other words, any surplus imported water supplies are captured and stored for future delivery to improve long-term supply reliability. As discussed in *Chapter 6 – Mojave Water Agency*, MWA has preemptively stored over 250,000 acre-feet of water to mitigate against dry conditions.

Table 5-1 below shows the Region’s Five-Year Drought Risk Assessment (DRA) which integrates all of the regional water supplies for 2026 through 2030 as described in *Chapter 3 – Regional Water Supply Characterization* and reflects the water uses described in *Chapter 4 – Water Use Characterization*. As presented in the table, the Region maintains surplus water assets in the first, fourth, and fifth years of a projected five-year dry period but also indicates how stored water supplies are required to meet demands in the second and third years of the projected dry year period.

TABLE 5-1: MWA FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	145,759	118,810	118,810	132,280	145,759
Demand	119,390	119,856	120,351	120,832	121,252
Difference	26,369	-1,046	-1,541	11,448	24,507
Use of Managed Groundwater Storage	0	1,046	1,541	0	0
Revised Difference	0	0	0	0	0

The key takeaway is that MWA uses a portion of its stored water assets in the middle of a multi-year drought period to address deficits in the otherwise predictable water supplies (e.g. native groundwater, recycled water, and current-year SWP Table A). In shoulder years, where imported supplies in combination with other supplies exceed the demands, MWA has the option for excess water to be stored for future use as either carryover supply in the SWP system (e.g., San Luis Reservoir) or banked underground in local groundwater basins.

5.1.2 MWA Long-Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to 25 years to provide a guiding document for future land use and water supply planning through the next UWMP Cycle. The following sub-chapters describe the long-term water service reliability for the Region through 2050.

5.1.2.1 Normal and Single Dry Conditions 2030–2050

The Region’s long term service reliability is characterized in normal, single dry, and five consecutive dry years through 2050. The future water supplies in normal and single dry conditions depicted in this section reflect the same hydrological, regulatory, and institutional criteria associated with each water asset as described in *Chapter 3 – Regional Water Supply Characterization*. In normal years, for example, SWP supplies are generally constrained only by the projected Table A allocations derived from DWR’s DCR. Under the normal conditions, the same-year SWP Table A allocation, combined with other supplies, is adequate to fully meet demand without using any of the locally pre-stored Managed Groundwater. In dry years, additional hydrological, regulatory, and institutional issues may constrain the availability of water that reduce SWP supply availability based on reduced allocation percentages as noted in Chapter 3. In these years, Managed Groundwater Storage is available to address any shortfall forecast absent the stored groundwater. Additionally, other future water supplies, like return flow, tend to grow in annualized volumes as annualized

demands grow in parallel. However, as described in Chapter 3, many of these other supplies are not reflected as an annually available predictable supply to allow this RUWMP to make a conservative estimate of reliability. This information is described in detail in Chapter 3 and is incorporated into the supply and demand tables presented below.

The Region’s future water demands in normal and single dry conditions through 2050 reflect the same considerations described in previous sections of this chapter. In both normal and dry conditions, demands tend to reflect anticipated uses based upon the climatological conditions in the Region. Future water demands are generally predicted to increase as land uses and populations grow within the Region. This information is detailed in *Chapter 4 – Water Use Characterization* and reflected in the values shown in the tables below. In normal years, the Region projects surplus water conditions, allowing MWA to recharge and store available supplies for future dry-year needs or coordinate with other SWP contractors to manage surplus supplies. The 2027 Master Plan, currently under development, is expected to reflect MWA’s continued efforts to establish an imported water policy that helps provide further clarity regarding decisions during such circumstances.

Table 5-2 shows the normal year and single dry-year supplies and demands from 2030 through 2050. The single-dry conditions reflect the use of Managed Groundwater Storage to meet forecast shortfalls (shown as a negative difference), where the volume of Managed Groundwater Storage is set to resolve any shortfall to zero.³¹

³¹ As described in Chapter 6, MWA currently has over 250,000 acre-feet of Managed Groundwater Storage throughout the three Subregions. This supply is also available to help retail suppliers meet demands during future periods where demands may exceed the supply shown in their retail chapters in interim years but fall within the total 2050 supply shown in this RUWMP.

TABLE 5-2: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	162,812	164,046	164,642	165,216	165,716
Demand	121,250	122,840	124,270	125,840	126,635
Difference	41,562	41,206	40,372	39,376	39,081

Single Dry Year	2030	2035	2040	2045	2050
Supply	118,810	120,044	120,640	121,214	121,714
Demand	121,250	122,840	124,270	125,840	126,635
Difference	-2,440	-2,796	-3,630	-4,626	-4,921
Use of Managed Groundwater Storage	2,440	2,796	3,630	4,626	4,921
Revised Difference	0	0	0	0	0

5.1.2.2 MWA Five Consecutive Dry Years through 2050

The Region defines a drought condition lasting five consecutive years as one that constrains MWA from obtaining some of the water supplies within its water supply portfolio due to hydrological, regulatory, and institutional constraints. These conditions include more restrictive regulatory constraints that limit its Table A allocation but do not limit the availability of groundwater resources or wastewater imports. As more thoroughly described in *Chapter 6 – Mojave Water Agency*, the multiple dry years are assumed to use the following consecutive Table A allocations: 35%, 5%, 5%, 20%, 35%. These assumptions set forth the available same-year Table A supply that is added to the native groundwater and other local supplies, as summarized in *Chapter 3 – Regional Water Supply Characterization*.

The future dry year projections show the Region relying more on Managed Groundwater Storage as its population grows and water demands increase. Specifically, the Region continues to increase its use of MWA’s Managed Groundwater Storage supplies in years two and three of a five consecutive year drought through the entire planning horizon. This gradual decrease in supply availability and eventual reduction in Managed Groundwater Storage in years one, four, and five would also impact MWA’s ability to store surplus water in those years. Accordingly, although MWA will have adequate water supplies to meet the regional demands for five consecutive dry years in 2050, the Region will be using more of MWA’s Managed Groundwater Storage supplies to handle those conditions. These issues are described in significant detail in *Chapter 3 – Regional Water Supply Characterization* and reflected in the

monthly reliability table below. **Table 5-3** presents the water supply and demand conditions for MWA’s service area in five consecutive dry years from 2030 through 2050.

TABLE 5-3: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	145,759	146,993	147,589	148,163	148,663
	Demand	121,250	122,840	124,270	125,840	126,635
	Difference	24,509	24,153	23,319	22,323	22,028
Year 2	Supply	118,810	120,044	120,640	121,214	121,714
	Demand	121,575	123,125	124,580	125,990	126,795
	Difference	-2,765	-3,081	-3,940	-4,776	-5,081
	Use of Managed Groundwater Storage	2,765	3,081	3,940	4,776	5,081
	Revised Difference	0	0	0	0	0
Year 3	Supply	118,810	120,044	120,640	121,214	121,714
	Demand	121,885	123,405	124,885	126,160	126,955
	Difference	-3,075	-3,361	-4,245	-4,946	-5,241
	Use of Managed Groundwater Storage	3,075	3,361	4,245	4,946	5,241
	Revised Difference	0	0	0	0	0
Year 4	Supply	132,280	133,514	134,110	134,684	135,184
	Demand	122,205	123,690	125,210	126,310	127,110
	Difference	10,075	9,824	8,900	8,374	8,074
Year 5	Supply	145,759	146,993	147,589	148,163	148,663
	Demand	122,515	123,975	125,520	126,470	127,270
	Difference	23,244	23,018	22,069	21,693	21,393

5.1.3 Water Supply Reliability Summary

The Mojave Region’s water supply portfolio is capable of meeting the water uses in Region in normal, single dry, and five consecutive dry years from 2025 through 2050.

Chapter 6.0 MOJAVE WATER AGENCY



TABLE OF CONTENTS

Sub-Chapter 6.1 – Introduction	6-6
6.1.1 Background and Purpose.....	6-7
6.1.2 Basis for Plan Preparation	6-7
6.1.3 Coordination and Outreach	6-8
6.1.4 RUWMP Adoption.....	6-9
6.1.5 Document Organization.....	6-9
Sub-Chapter 6.2 – Water Service and System Description.....	6-10
6.2.1 Service Area Climate.....	6-11
Sub-Chapter 6.3 – Population, Land Use, Economy, and Demographics.....	6-12
6.3.1 Small Water System and Rural Domestic User Population.....	6-12
Sub-Chapter 6.4 – Imported Water Supply and Reliability Characterization.....	6-14
6.4.1 State Water Project.....	6-14
6.4.2 SWP Restrictions.....	6-20
6.4.3 Delta Conveyance Project	6-22
6.4.4 Evaluating and Managing Supply Reliability Risks.....	6-22
6.4.5 Evaluating Future Risk Scenarios	6-23
Sub-Chapter 6.5 – Managed Groundwater Storage.....	6-25
6.5.1 Alto Subarea.....	6-25
6.5.2 Centro Subarea.....	6-25
6.5.3 Baja Subarea	6-26
6.5.4 Este Subarea	6-26
6.5.5 Oeste Subarea	6-26
6.5.6 Morongo Basin	6-26
6.5.7 Summary of Managed Groundwater Storage by Subregion	6-27
6.5.8 Water Quality	6-27
6.5.9 Recycled Water Supplies	6-31
6.5.10 Desalination Opportunities.....	6-31
6.5.11 Water Transfers and Exchanges.....	6-31
6.5.12 Supply Summary.....	6-31

6.5.13	Groundwater within the Remaining Areas of the Mojave Region.....	6-33
	Sub-Chapter 6.6 – Water Use Characterization.....	6-35
6.6.1	Forecasting Water Demands Outside Participating Retailer Service Areas.....	6-35
	Sub-Chapter 6.7 – Water Conservation and Shortage Response.....	6-40
6.7.1	Demand Management Measures	6-41
6.7.2	Foundational Demand Management Measures	6-41
6.7.3	Water Shortage Contingency Plan.....	6-43
	Sub-Chapter 6.8 – Water System Reliability and Drought Risk Assessment.....	6-46
	Sub-Chapter 6.9 – Energy Intensity Analysis.....	6-47

LIST OF TABLES

Table 6-1: Public Water System Information.....	6-8
Table 6-2: Projected Small Water System and Rural Domestic User Population 2030-2050	6-13
Table 6-3: MWA's Historic SWP Table A Allocations and Deliveries	6-16
Table 6-4: SWP Allocation Compared to Actual Deliveries into MWA Service Area	6-19
Table 6-5: MWA Water Supply Portfolio Summary	6-32
Table 6-6: MWA's Projected SWP Supply for 2026 – 2030 (AFY)	6-32
Table 6-7: MWA's Projected SWP Supply Through 2050 (AFY)	6-33
Table 6-8: Projected Small Water System and Rural Domestic Demand 2030-2050 (AFY)	6-37
Table 6-9: Projected Agricultural Demand 2030-2050 (AFY).....	6-38
Table 6-10: Projected Industrial, Recreational, and Golf Course Demand 2030-2050 (AFY).....	6-39
Table 6-11: Energy Intensity – Total Utility Approach for Jan 2025 through Dec 2025.....	6-47

LISTS OF FIGURES

Figure 6-1: Example Representation of MWA’s Annual Management of SWP Supplies..... 6-20

Figure 6-2: Check 66 Electrical Conductivity 2015-2025..... 6-28

Figure 6-3: Check 66 Water Temperature 2015-2025 6-29

Figure 6-4: Check 66 Water Turbidity 2015-2025..... 6-29

Figure 6-5: Check 41 (Kern) pH Value (2015-2025) 6-30

Figure 6-6: Pacheco Pumping Plant Fluorescence 2015-2025 6-30

Sub-Chapter 6.1 – Introduction

The Mojave Water Agency (MWA or Agency) was formed in 1960 as a special act district codified in Chapter 97 of the California Water Code (CWC) Appendix as the Mojave Water Agency Law (MWA Law).³² The MWA Law states that MWA was created, in part, “to do any and every act necessary to be done so that sufficient water may be available for any present or future beneficial use of the lands and inhabitants of the agency....”³³ That statutory charge has long been shaped by the region’s fundamental water management challenge: groundwater use in excess of natural replenishment. The aquifers in MWA’s service area have been in overdraft since the early 1950s, as residents and other water users have historically used more water than is naturally replaced by limited rainfall and surface flows from the Mojave River and its tributaries originating in the San Bernardino mountains to the south. The Mojave Basin Area (MBA) Adjudication further reaffirmed MWA’s role in managing local water supplies and tasked MWA with seeking and securing supplemental water supplies to help address groundwater overdraft and support the quality of life within its boundaries.

The MWA service area encompasses approximately 4,900 square miles of eastern San Bernardino County (County) and is concurrent with the Mojave Region (Region or RUWMP Planning Area) boundary as that is used for purposes of this 2025 RUWMP. Its service area is divided into eight Subareas, each one affiliated with a hydrological groundwater basin or boundary defined through adjudications or resulting from other practical basis (see **Figure 2-1**).

As discussed in *Chapter 3 – Regional Water Supply Characterization*, water supply for the Region is sourced almost entirely from pumped groundwater. As a State Water Project (SWP) contractor and MBA Watermaster, MWA acts as a wholesale supplier to large and small retail water agencies as well as many other individual users and uses throughout its service area by importing water supplies and placing them into the various groundwater basins to support on-going groundwater basin health needs – whether stipulated by judgments or based upon pre-emptive and anticipatory actions – to support the Region’s reliance on pumped groundwater.

³² California Water Code Appendix, Mojave Water Agency Law, Section 97-1 et seq., 1960.

³³ MWA Law Section 97-1.5, July 21, 1960

6.1.1 Background and Purpose

The Agency has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this wholesale-specific chapter.³⁴ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter, in conjunction with critical Regional summary tables presented in Chapter 3, Chapter 4, and Chapter 5, presents MWA's evaluation of these requirements and demonstrates its ability to meet anticipated water demands under near-term and long-term normal and drought conditions.

The 2025 RUWMP, together with this wholesale-specific chapter, updates MWA's 2020 Wholesale Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the CWC. In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional approach also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

6.1.2 Basis for Plan Preparation

With one exception, MWA does not operate as a Public Water System (PWS) as described in California Health and Safety Code Section 116275. Rather, it is solely classified as an Urban Water Supplier pursuant to CWC Section 10617, as it provides water for wholesale water supplies for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually through the management of imported water supplies on behalf of the Region. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the MWA and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively.

The one exception of a PWS is MWA's Regional Recharge and Recover Project (R-Cubed) which is a conjunctive use project that pumps a combination of participating retailers' MBA Judgement FPA and MWA's Managed Groundwater Storage within the Floodplain Aquifer along the Mojave River in Hesperia and southern Apple Valley (see **Figure 2-9** and **Figure 3-1**). When needed, MWA-owned production wells on both sides of the Mojave River, immediately

³⁴ California Water Code Sections 10610 through 10657

downstream of the recharge areas, can recover and deliver the FPA or stored water through pipelines directly to local retail suppliers. Details of the MWA’s PWS are provided in **Table 6-1**.³⁵

TABLE 6-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610129	Mojave Water Agency (R-Cubed)	5

6.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and MWA. This coordination ensured consistency in assumptions, methodologies and regional analyses. MWA actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing regional conditions as well as MWA- and retailer-specific operations,

As required by the UWMPA, MWA coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, MWA encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan’s availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

6.1.3.1 Water Supplier Information Exchange

³⁵ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

6.1.4 RUWMP Adoption

The Agency held a public hearing regarding the 2025 RUWMP on June 11, 2026. Before the hearing, the Agency made a draft of the 2025 RUWMP available for public inspection at 13846 Conference Center Drive Apple Valley, CA 92307, and posted on MWA’s website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The Agency’s elected body adopted this 2025 RUWMP on June 11, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto MWA’s website.

MWA plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

“FINAL Submittal 2025 UWMP Tables – MWA – 06.01.2026.xls”

“Appendix F 2025 Checklist – MWA – 06.01.2026.xls”

6.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 6.2 Water Service and System Description
- Sub-Chapter 6.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 6.4 Imported Water Supply and Reliability Characterization
- Sub-Chapter 6.5 Managed Groundwater Storage
- Sub-Chapter 6.6 Water Use Characterization
- Sub-Chapter 6.7 Water Conservation and Shortage Response
- Sub-Chapter 6.8 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 6.9 Energy Intensity Analysis

Sub-Chapter 6.2 – Water Service and System Description

The Agency manages water supplies from the urban, rural, industrial, recreational, and agricultural users throughout its expansive service area, depicted in **Figure 2-1**, which covers large portions of eastern San Bernardino County and the California side of the Mojave Desert.

The Mojave River is central to MWA history and settlement in the region. The river is more of an ephemeral stream which derives its flow from drainage of 217 square miles of the northern slope of the San Bernardino Mountains. Early farmers aggressively planted the Victor Valley with fruit trees and crops, which by the 1950s created serious water overdraft. This overdraft led to a halt in development in the area. Legislation for the SWP passed in 1959 to begin work on the California Aqueduct, along with the Davis-Grunsky Act, which afforded regions the opportunity to form local water agencies. Soon after, in 1960, the Mojave Water Agency was formed.

MWA's service area is divided into seven divisions, each one represented by a publicly elected board member who serves a four-year term. The MWA Board uses a committee format to inform decisions and receive recommendations for voting matters with each committee member serving a one-year term (or until a successor is appointed). These committees generally meet once a month and include: Legislative and Community Partners Committee; Planning, Resources, Engineering and Operations Committee; Personnel, Finance, Security and Technology Committee; Morongo Basin Pipeline Commission; Technical Advisory Committee; and Watermaster.

MWA's Sphere of Influence (SOI) is generally contiguous with its service area; however, there are two areas within the SOI that are currently not in its service area. Golden State Water Company serves the Wrightwood community's 2,700 customers on the southern boundary of the MWA SOI. The other area is near Grass Valley Creek, which is a tributary to the Mojave River. These two areas are at the base of the San Bernardino Mountains and are part of the headwaters that connect the drainage to the groundwater basins that are part of the MBA Adjudication. MWA, serving as the court appointed MBA Watermaster according to the MBA Judgment, coordinates with these entities within the SOI to ensure established water supplies into the subbasins are maintained. An overview of the MBA Judgment is described in *Chapter 3 – Regional Water Supply Characterization*.

As also described more thoroughly in Chapter 3, water supply for MWA's service area is sourced almost entirely from pumped groundwater from the various basins, subbasins, and aquifers in the area. MWA's role is to help manage the groundwater basins by importing and

managing delivery of imported supplies. To help with this, two primary water delivery projects were developed to deliver much-needed supply to additional locations in MWA’s service area from the SWP. The Morongo Basin Pipeline (MBP), completed in 1995, provides imported water to the upper portions of Mojave River Basin and to the Morongo subarea. The Mojave River Pipeline, completed in 2006, provides critical recharge to lower portions of Mojave River Basin (e.g. Centro and Baja subareas) and, more recently, will provide supplies to the Regional Aquifer west of Victorville.

6.2.1 Service Area Climate

A thorough description of the Mojave Region’s climate and considerations of climate change are included in *Chapter 2 – The Mojave Region*. Since MWA’s service area is concurrent with the Region’s boundary, details in Chapter 2 sufficiently address this UWMPA requirement and no additional details are provided in this sub-chapter.

Sub-Chapter 6.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use in the Mojave Region. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Because MWA’s service area is concurrent with the Mojave Region as defined for this 2025 RUWMP, the regional population, land use, economic, and demographic conditions applicable to MWA are described in *Chapter 2 – The Mojave Region*.

Accordingly, this sub-chapter does not repeat the full regional population and land use discussion provided in Chapter 2. Instead, it identifies the subset of the regional population that is directly relevant to MWA’s wholesale demand forecast: the small water system and rural domestic user population located outside the service area boundaries of the participating urban water retail suppliers. This population is summarized at the regional level in **Table 2-8** and is further organized by RUWMP Subregion in **Table 6-2** to support the water demand forecast presented in *Sub-Chapter 6.6 – Water Use Characterization*.

6.3.1 Small Water System and Rural Domestic User Population

The MWA population presented in **Table 2-8** represents the portion of the Mojave Region associated with small water systems and rural domestic users outside the service area boundaries of the participating urban water retail suppliers. While **Table 2-8** summarizes this population at the regional level, the water demand forecast presented in *Sub-Chapter 6.6* requires this population to be organized by RUWMP Subregion.

To support this subregional breakout, residential lands outside the service area boundaries of the participating urban water retail suppliers were identified using the SCAG HELPR 2.0 land use shapefile.³⁶ Lands designated as Mixed Use Residential, Commercial and Mixed Use Residential, Mobile Home and Trailer Parks, Multi-Family Residential, Rural Residential, and Single-Family Residential were classified as residential for purposes of this analysis. These residential lands were then assigned to the appropriate RUWMP Subregion.

³⁶ SCAG HELPR 2.0 shapefile accessed at: <https://rdp.scag.ca.gov/helpr/?page=Main-Page>

The number of residential parcels within each Subregion was used to determine the proportional share of the total small water system and rural domestic user population presented in **Table 2-8**. This method allowed the regional population total to be distributed among Subregions in a manner that reflects the relative location of residential land uses outside the participating retailer service areas. The resulting population projections are presented in **Table 6-2** and provide basis for the small water system and rural domestic demand forecast presented in *Sub-Chapter 6.6*.

TABLE 6-2: PROJECTED SMALL WATER SYSTEM AND RURAL DOMESTIC USER POPULATION 2030-2050

Subregion	2030	2035	2040	2045	2050
Subregion 1	57,994	57,080	54,852	52,328	46,747
Subregion 2	14,075	13,853	13,313	12,700	11,345
Subregion 3	12,415	12,220	11,743	11,202	10,007

Sub-Chapter 6.4 – Imported Water Supply and Reliability Characterization

This sub-chapter describes MWA’s water supply sources. The description includes the historical sources available to MWA as well as projected water supply sources through 2050.³⁷ MWA delivers imported surface water to recharge facilities and groundwater systems throughout its service area, where the water contributes to local aquifer replenishment and can subsequently be extracted by retail agencies and other water users.

MWA categorizes its supply sources in essentially two groupings. The first grouping includes supply sources that are generally available on an annual basis. These sources include MWA’s SWP supplies that are made available each year. Other sources may occasionally fall into this category but are not incorporated into this RUWMP. The second set of supply sources are those that MWA could make available in any given year but are generally not renewable in MWA’s supply portfolio once they are used. In other words, although they can be replaced, like a water savings account, they are not guaranteed to be replaced on an annual basis. MWA’s long-term water supply management actions focus on optimal utilization of its annually available supply sources and protection of its pre-stored supply sources to guard against extended drought conditions and catastrophic outage impacting water users in the Region. This sub-chapter describes MWA’s water supply portfolio and develops a supply matrix that integrates the supply sources to reflect MWA’s operational objectives.

6.4.1 State Water Project

The SWP provides a primary water supply for MWA. The water supply is derived from a series of water rights and water contracts as well as pumping and conveyance structures that connect the SWP supplies to MWA’s delivery system as described in *Chapter 2 – The Mojave Region*. MWA became a State Water Project contractor in June 1963, entering into a water service contract with the California Department of Water Resources (DWR).

³⁷ The UWMP Act mandates a 20-year planning horizon and the 2025 UWMP Guidebook recommends a 25 year planning horizon.

6.4.1.1 SWP Table A Contract Amount

MWA's SWP Contract amount (Table A) has gradually increased since the Agency started taking deliveries in 1972. Initially the maximum Table A amount was 8,400 acre-feet per year (AFY) escalating to 50,800 AFY by 1990. MWA participated in two notable Table A permanent transfers, one in 1997 with Kern County Water Agency that augmented MWA's Table A by 25,000 AFY, and one in 2009 with Dudley Ridge Water District for 14,000 AFY that stepped up the Table A amount in three increments (7,000 AF in 2010, 3,000 AF in 2015, and the final 4,000 AF in 2020). MWA's current maximum SWP Contract Table A is 89,800 AFY.

MWA's SWP Contract has numerous components that allow MWA to administer and control the annually available SWP water supplies. MWA's SWP Contract has six important provisions that characterize the available supplies and the water delivery activities. The key aspects are: (1) Annual Table A Amount, (2) Annual Table A Allocation, (3) Article 56 Carryover, (4) Article 21 Surplus Supplies, (5) Article 12(f) on SWP conveyance priorities, and (6) water transfer and exchanges supported by Amendment No. 17, the "Water Management Tools".

As mentioned previously, MWA's Annual Table A Amount is 89,800 AFY, representing the maximum Table A amount available to the Agency under its SWP Contract. Although MWA's SWP Contract provides for the Annual Table A Amount, that total volume of water supply is subject to reduction each year based on actual water supply availability in the SWP system as determined by DWR. The last 100% allocation year occurred in 2023. However, actual deliveries vary widely with significantly reduced percentages of maximum contract amount being available during drought years. The long-term average annual Table A Allocation provided by DWR's 2025 Delivery Capability Report (DCR) is 54%.³⁸ Since 2005 the DCR's estimated average of total annual Table A water deliveries has decreased from 2,828 thousand acre-feet (TAF) to 2,234 TAF. This is based on several factors of note, including hydrology,³⁹ infrastructure issues through the system, Delta regulations which constrained exports, and updates to the CalSim3 model. As such, the estimated long-term average annual Table A deliveries were adjusted down from 57% of maximum in 2021, to the Final DCR 2025 long-term average estimate of 54% under existing climate conditions.

³⁸ The DWR 2025 Delivery Capability Report uses a hydrological modeling simulation to determine estimated deliveries under existing conditions using a historical time period from 1922-2021. Future delivery capability conditions are also modeled using these simulations along with CalSim3 and multiple climate change scenarios and future SWP system performance "levels of concern". Projections of future delivery capability are not part of this analysis.

³⁹ The 2025 DCR adjusted its hydrological baseline that incorporates statistically significant changes in inflow from the rim watersheds into California's Central Valley in which standard deviations of precipitation and runoff during the early periods of the past 100 years are significantly different from the recent 30 years due to climate change.

As a point of reference, from 2010–2025, the average Table A Allocation for MWA was 39,218 AF (46% of max) in which allocations during that 15-year span ranged from 5% - 100%, as presented in **Table 6-3**. Average Table A Allocations over this period closely align with the 2025 DCR model projections for future conditions that incorporate climate change.⁴⁰ It is important to note that extreme hydrologic variability may become more commonplace in future climate scenarios, and MWA could experience drastic variations in Table A Allocation and deliveries in the future.

TABLE 6-3: MWA’S HISTORIC SWP TABLE A ALLOCATIONS AND DELIVERIES

Year	MWA Contract Amount (AF)	Table A Allocation	Annual Allocation Amount (AF)
2010	82,800	50%	41,400
2011	82,800	80%	66,240
2012	82,800	65%	53,820
2013	82,800	35%	28,980
2014	82,800	5%	4,140
2015	82,800	20%	16,560
2016	85,800	60%	51,480
2017	85,800	85%	72,930
2018	85,800	35%	30,030
2019	85,800	75%	64,350
2020	89,800	20%	17,960
2021	89,800	5%	4,490
2022	89,800	5%	4,490
2023	89,800	100%	89,800
2024	89,800	40%	35,920
2025	89,800	50%	44,900
Average Allocation and Deliveries:		46%	39,218

⁴⁰ Climate change effects modeled into the DCR delivery capability estimates include changes to monthly patterns of flows, more extreme hydrologic and drought events, and lower reservoir storage levels. Long-term average Table A delivery projections are estimated between 43-48% of maximum. (2025 DCR at Section 6, Table 6-2.)

MWA's annual Table A allocation has specific utility to provide replacement water for the adjudicated basins and support sustainable groundwater management. The Morongo Basin Pipeline and Mojave River Pipeline, along with the Mojave River itself, deliver this imported water directly to dedicated recharge facilities throughout the various adjudicated subareas. MWA utilizes SWP water primarily for groundwater recharge at these facilities, while maintaining over 250,000 acre-feet of stored water supplies both within local groundwater basins and as carryover storage in the SWP system to provide reliability during drought conditions and ensure long-term water security for the numerous retail water suppliers and end users within its service area.

6.4.1.2 Article 21

Article 21 of MWA's SWP contract outlines the rules for "interruptible water service." Interruptible water service means allocation of water that is essentially surplus in the SWP system and is in addition to the Table A Allocation in any given year. In other words, DWR may determine at a later date that there is additional water that could be delivered to requesting contractors that is in excess to that system-wide Table A Allocation. Article 21 was recently amended (Contract Amendment 17), and outlines the provisions for allocation, notice, and process for obtaining, rates, and transfers of Article 21 interruptible water. Notably, Amendment 17 allows for transfers of Article 21 water from certain SWP contractors to others if the contractor can demonstrate a special need for the transfer.

As a SWP Contractor, the Agency has access to Article 21 water when "excess" water is made available. Article 21 water is identified as non-Table A water that becomes available on an intermittent, interruptible basis. Allocations of Article 21 water are made based on the available supply in proportion to each contractor's annual entitlement as set forth in its Table A for that year.

When available, Article 21 water delivery is typically made in the wettest months of the year, December through May. As such, Article 21 water is sometimes called "wet weather water". It is offered to contractors when there is ample water in the system, and the State publishes a notice to contractors when it is made available. Article 21 water is not available for carryover storage in SWP facilities; however, a change in point of delivery is possible with a separate agreement with DWR in order to store Article 21 water outside of the service area. Notifications of Article 21 water availability come based on forecasting and existing hydrology, and the Article provides for the timely processing of requests by contractors for delivery. Demands are typically submitted for Article 21 water on a weekly basis.

The ability to take advantage of Article 21 water for MWA requires access to conveyance capacity in the aqueduct and available storage outside of San Luis Reservoir. Importantly, that priority for conveyance within the SWP goes to Table A water, and Article 21 water delivery may be interrupted if it is impacting a contractor's Table A water delivery through a shared reach of the aqueduct. The Agency's location on the East Branch of the aqueduct factors into the inherent conveyance priority limitations associated with Article 21 water.

The 2025 SWP Delivery Capability Report indicates that Article 21 availability will be more frequent, especially in very wet years. Between 2000–2020, Article 21 water was available in all but two years; however, during multi-dry year stretches such as 2008–2010 and 2014–2016 the amount of Article 21 water available was orders of magnitude smaller than in normal to wet years. In summary, Article 21 water requires opportunistic operational flexibility for storage and conveyance capacity in the aqueduct to maximize its intermittent availability. Because of this uncertainty, this RUWMP does not include Article 21 as a quantifiable part of MWA’s water supply. Rather, MWA will continue to be opportunistic and access this supply as may best serve longer-term imported water policy objectives and groundwater basin needs.

6.4.1.3 Article 56 Carryover

Article 56 of MWA’s SWP Contract outlines the rules for storing unused Table A Allocation in any year for use in a subsequent year. The Article 56 Carryover water is stored in San Luis Reservoir. There are limitations to the total carryover amounts, subject to a percentage of the Annual Table A Amount, dependent on the final allocation percentage for that year. For example, if the final Table A Allocation was 50% (44,900 AF), MWA could store (carryover) 25% of its Table A Amount (22,450 AF). If storage requests exceed capacity in San Luis Reservoir, the available capacity will be allocated among contractors in proportion to their Table A entitlement. Reallocation can also result in “displacement” of stored water, sometimes known as “spill” that results in stored amounts being released.

Storing water in San Luis Reservoir for multiple years is allowed but comes with risk because of the potential of losing the stored water due to capacity restraints. Nevertheless, storage of SWP water in San Luis Reservoir under Article 56 is a critical component of MWA’s water asset management portfolio because it is a south of Delta storage option that allows carryover in multiple years. As an example of how this supply is managed, MWA had about 20,400 acre-feet of Article 56 supply available coming into the 2025 delivery year.

Due to the circumstances and water management choices made by MWA in 2025, a small amount of the available Table A supply was added to the carryover, resulting in the end-of-year 2025 Article 56 total being slightly over 21,000 acre-feet. Due to hydrologic and operational conditions in early 2026, a portion of this carryover supply was at risk of spilling. MWA anticipates that carryover storage by the end of 2026 will be slightly more than 12,500 acre-feet. The difference is expected to be used as part of MWA’s broader imported water management strategy, including meeting regional needs in 2026, potentially increasing storage in local subareas, and supporting transfers to other SWP contractors.

Although MWA may use its carryover supplies under normal year conditions, it generally preserves these supplies to manage shortage conditions derived from extended drought or catastrophic water outages.

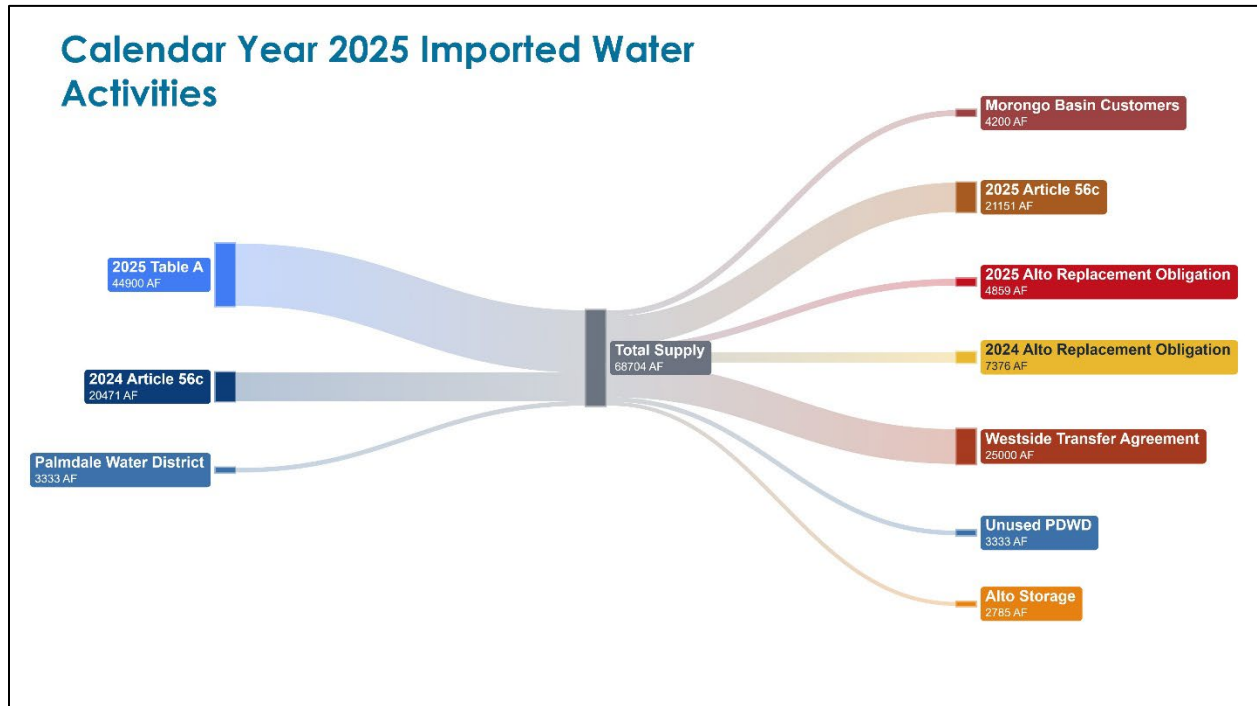
6.4.1.4 Summary of Historic SWP Deliveries

Collectively, MWA manages its SWP water supplies based on a variety of conditions, with each year reflecting a slight variance in both allocations, deliveries into the Region, and storage or sales to other parties. **Table 6-4** shows this variance between 2010 and 2025 while **Figure 6-1** provides a useful representation of how MWA evaluates and tracks its available SWP supplies year-over-year.

TABLE 6-4: SWP ALLOCATION COMPARED TO ACTUAL DELIVERIES INTO MWA SERVICE AREA

Year	Allocation	Table A Amount (AF)	Actual Deliveries (AF)
2010	50%	44,900	35,566
2011	80%	71,840	48,775
2012	65%	58,370	26,175
2013	35%	31,430	7,398
2014	5%	4,490	3,595
2015	20%	17,960	8,909
2016	60%	53,880	23,574
2017	85%	76,330	34,750
2018	35%	31,430	5,869
2019	75%	67,350	21,824
2020	20%	17,960	3,379
2021	5%	4,490	2,306
2022	5%	4,490	4,536
2023	100%	89,800	99,471*
2024	40%	35,920	2,618
2025	50%	44,900	19,220

FIGURE 6-1: EXAMPLE REPRESENTATION OF MWA’S ANNUAL MANAGEMENT OF SWP SUPPLIES



6.4.2 SWP Restrictions

Neither DWR nor the SWP guarantees delivery of 100% of water allocations every year. Under the historic lowest 5% of allocations, SWP deliveries to MWA were 4,490 AF for the year. This, in conjunction with the expected decrease in reliability of the SWP over time, places a significant constraint on the reliability of SWP supplies as a source of imported water for recharge of the Region’s managed groundwater supplies. In addition to SWP system conveyance capacity limitations, MWA’s SWP supplies are also subject to notable policy and regulatory constraints.

6.4.2.1 The Delta Reform Act

The Delta Reform Act (DRA) of 2009 established the Delta Plan and the Delta Stewardship Council.⁴¹ Ultimately, the DRA requires water purveyors to reduce reliance on water supplies derived from the Sacramento–San Joaquin Delta and improve reliance on locally developed water sources (see this RUWMP’s representation of compliance in *Chapter 3 – Regional Water Supply Characterization*). The Delta Plan is the governing document that guides the Delta’s future and spawned the DRA regional self-reliance policies. The Delta Plan has two “co-equal goals:” (1) providing a more reliable water supply for California; and (2) protecting, restoring, and enhancing the Delta ecosystem.

⁴¹ California Water Code Section 85225

Specifically, urban water purveyors should demonstrate consistency with Delta Plan Policy WR PI – Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR PI).⁴² WR PI subsection (a) states that:

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

- 1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);
- 2) That failure has significantly caused the need for the export, transfer, or use; and
- 3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

The DRA is relevant to MWA’s water asset portfolio and the water asset portfolios of its retailers because the DRA’s rules require reduced reliance on water supplies derived from the Delta in favor of locally developed water supplies. The methodology needed to comply with DRA’s regulatory requirement as noted in the policy is a reduction in “the percentage of water used from the Delta watershed.”

6.4.2.2 Healthy Rivers and Landscapes

The Bay Delta Plan’s Healthy Rivers and Landscapes program, implemented through Voluntary Agreements (VAs), establishes specific “forgone export” requirements that would directly restrict SWP deliveries to south-of-delta contractors. Under these agreements, DWR and the Bureau of Reclamation must reduce exports from key Delta pumping facilities (Jones Pumping Plant and Clifton Court Forebay) based on water year types. The required export reductions range from zero in critical and wet years to 125,000 acre-feet in dry and below normal years, and up to 175,000 acre-feet in above normal years. These forgone exports are designed to ensure that additional upstream flows provided under the VAs actually reach the Delta as outflow rather than being captured by the export facilities.

The restriction mechanism works by establishing “reference conditions” representing pre-VA baseline operations, then requiring that SWP and Central Valley Project operations avoid exporting both these reference flows and the new additive VA flows. This creates a complex accounting system where south-of-delta water contractors would experience reduced deliveries not only from the direct export limitations, but also from the operational constraints needed to ensure VA tributary flows bypass the pumps and contribute to Delta outflow. The

⁴² Cal. Code Regs., tit. 23 Section 5003.

program includes detailed daily and monthly tracking requirements to verify that the projects are indeed forgoing exports rather than simply capturing the additional upstream flows, effectively prioritizing ecosystem benefits over south-of-delta water supply reliability.

6.4.3 Delta Conveyance Project

The Delta Conveyance Project (DCP) is a proposed project by DWR to mitigate lost supply to the SWP associated with transporting water through the Sacramento-San Joaquin Delta (Delta). SWP contractors situated south of the Delta are exposed to multiple risk scenarios for long-term SWP supplies, including previously discussed regulatory compliance statutes. Additional mitigation against other water supply risks driven by rising sea levels, earthquakes, progressive risk of levee failures, and extreme drought and flood are also identified as DCP benefits. Continuation of existing operation of the Delta is expected to increasingly expose water users that depend on water exported from the Delta to risks of interrupted water supply and decreasing water supply reliability over time. In short, the DCP is a significant risk mitigation component to help overcome uncertainties associated with conveying SWP water through the Delta.

MWA is an investor and participant in the DCP. The investment costs associated with MWA's role are to fund the work plan and reserve capacity space in the project. The DCP does not increase water rights associated with the SWP but rather would restore losses caused by current physical and regulatory issues and mitigate against future changed conditions affecting SWP exports by adding a new point of diversion in the northern Delta. The Final Environmental Impact Report for the DCP was certified by DWR in December 2023 and a Change in Point of Diversion Petition was filed with State Water Resources Control Board (SWRCB) February 22, 2024. MWA's participation in the DCP is safeguard for long-term supply reliability for the Region and its critical imported water supply.

6.4.4 Evaluating and Managing Supply Reliability Risks

MWA's water supply reliability is anchored by a diverse portfolio that includes SWP allocations, natural and managed groundwater, imported wastewater, return flows, and strategically stored water supplies totaling over 250,000 acre-feet. This diversity provides crucial flexibility in responding to varying hydrological and regulatory conditions, though it also introduces complex interdependencies that require sophisticated risk management approaches.

As both SWP contractor and MBA Watermaster, MWA must navigate the intersection of imported water reliability—in which average delivery projections have declined an estimated 22% over the last 20 years—with local groundwater management obligations under multiple court judgments. The Agency's stored SWP water assets serve as a critical buffer, enabling the system to maintain reliability even during extended drought periods when imported supplies may be curtailed.

Still, MWA's water supply portfolio faces a range of threats that require comprehensive risk assessment and mitigation planning, including SWP operational and regulatory constraints, local infrastructure vulnerabilities, climate change-driven hydrological variability, extended drought scenarios, seismic risk, and other emerging challenges that could impact the Agency's ability to reliably meet regional water demands through the planning horizon.

6.4.5 Evaluating Future Risk Scenarios

MWA's reliability risk management operates within an increasingly complex regulatory environment, requiring coordination with Groundwater Sustainability Plans under the Sustainable Groundwater Management Act (SGMA), compliance with updated Urban Water Management Planning Act requirements, integration with local hazard mitigation planning, and compliance with statutes and authorities protecting federally endangered and threatened species under the Endangered Species Act (ESA), D-1641 Bay Delta Water Quality Control Plan, and California Endangered Species Act (CESA), among others.

Climate change introduces additional layers of complexity to traditional reliability planning. Regional temperature data shows gradual warming trends over the past century, potentially increasing evapotranspiration rates and water demand pressures. While the high desert climate already experiences extreme conditions that limit the impact of incremental change, MWA recognizes the need to incorporate climate vulnerability assessment into long-term planning frameworks.

The significant risks to MWA's water supplies mainly relate to sustained reductions in SWP deliveries. The SWP's own climate adaptation planning, addressing more intense flood and drought cycles and rising sea levels in the Delta, directly impacts MWA's imported supply reliability. The DWR Delivery Capability Report, as discussed previously, indicates the expectation that the long-term average of the SWP deliveries will decrease. This trend of predicted long term average reductions has occurred in previous Delivery Capability Reports as well, and it is clear DWR plans to manage the SWP along these expectations. Even as projects like the Delta Conveyance Project are proposed to alleviate some of this supply reduction, it is only expected to mitigate reductions in supply rather than eliminate or even just stabilize the trend.

The most significant risk in the immediate future would be a sustained drought. If a multi-year severe drought were to impact SWP supplies and the MWA service area simultaneously, MWA would face a period with minimal capacity to recharge groundwater coupled with significant demand from within the service area that would strain basin health. Additionally, groundwater overdraft has led to ground subsidence along certain parts of SWP infrastructure, and while SMGA aims to mitigate subsidence and its impacts to the infrastructure, several groundwater basins across the State are still not in compliance and place the infrastructure at continued risk.

Seismic risks must also be considered in water supply reliability planning. Earthquakes put SWP infrastructure at risk, including dams, pumping plants, aqueducts, tunnels, and pipelines, many of which are located in seismically active parts of the state. Cascading risk such as fire from broken gas or electrical lines and flood risk from damaged dams or levees are also of concern. For instance, a major earthquake in the Bay Area that caused levee failure in the Delta could cause a catastrophic outage of water deliveries that could last for months or longer while repairs were made and salinity levels were restored. Seismic risks to critical infrastructure and potential supply disruptions require seismic monitoring and preparedness, infrastructure improvements, and comprehensive emergency response planning and system hardening strategies.

Water supply infrastructure within the MWA service area also poses potential risks to water deliveries. Significant portions of MWA's pipelines face corrosion challenges, and repairs or replacement could reduce service capacities and the ability to take SWP water deliveries for groundwater recharge. Capital improvement projects must also be aligned to prevent artificial constraints on MWA supplies. Additionally, certain assets face other technical or biological constraints, such as water imports that could impact the Arroyo Toad or debris in the California Aqueduct limiting the ability to take water. These are systemic issues that impact the reliability of MWA's water supplies but are manageable with foresight and prioritized action.

Sub-Chapter 6.5 – Managed Groundwater Storage

As previously indicated, managed groundwater storage represents a critical component of water supply reliability across the Mojave Region, encompassing both the five MBA Judgment subareas and the Morongo Basin. MWA directly stores imported water in the MBA subareas, accounted for as “Managed Groundwater Storage,” and in the Morongo Basin under two separate agreements in the Ames Valley Basin and Warren Valley Basin.

Based on the most recent reporting, MWA maintains approximately 256,000 acre-feet of stored groundwater within the Mojave Basin Adjudication subareas, with an additional 173 acre-feet stored in the Morongo Basin under separate agreements.⁴³

6.5.1 Alto Subarea

The Alto Subarea storage account balance is approximately 194,000 acre-feet. The Alto Subarea above the Lower Narrows continues to serve as the largest repository of MWA's stored groundwater. Operating parameters have been established with a minimum operating level based on 2016 storage conditions and a maximum level representing eight years of average annual consumptive use (approximately 55,000 acre-feet). Since 1996, the subarea has experienced significant storage depletion, with a cumulative change of -510,826 acre-feet through 2024, though recent years showed recovery with a positive change of 35,963 acre-feet in Water Year 2023-2024. Water levels exhibit seasonal variation near the Mojave River, with declining trends in heavily pumped areas, particularly in the western portion of the Regional Aquifer.

6.5.2 Centro Subarea

The Centro Subarea storage account balance is approximately 35,000 acre-feet. The Centro Subarea operates under defined parameters established since 1997. The minimum operating range reflects the lowest storage since establishment of the Judgment when the basin was considered healthy, with maximum levels representing five years of average annual consumptive use (approximately 18,000 acre-feet). The subarea demonstrated positive storage recovery in Water Year 2023-2024 with a net gain of 29,794 acre-feet.

⁴³ Planning, Resources, Engineering, and Operations Committee presentation, March 31, 2026.

6.5.3 Baja Subarea

The Baja Subarea storage account balance is approximately 25,000 acre-feet. The Baja Subarea faces ongoing challenges, having lost approximately over 500,000 acre-feet of groundwater storage since 1996. However, recent trends suggest potential stabilization, with indications that continued pumping at current or lower levels due to reduced agricultural operations may halt continuous depletion. Optimal operating parameters remain under development.

6.5.4 Este Subarea

The Este Subarea storage account balance is approximately 1,300 acre-feet. The Este Subarea appears to maintain natural balance, with water supply and use remaining balanced over the past 20 years based on water level data. The subarea achieved equilibrium in Water Year 2023-2024 with no net change in storage. While optimal operating parameters have not been formally established, the long-term stability suggests sustainable management under current conditions. MWA has developed demonstration groundwater recharge facilities in the subarea and is continuing geotechnical investigations to support future recharge basin development.

6.5.5 Oeste Subarea

The Oeste Subarea currently maintains no MWA stored water accounts but demonstrates natural balance between water production, supply, and outflow. Water level data indicates short-term stability, leading to a "no change in storage" designation for planning purposes. MWA has installed monitoring wells and approved design of a pilot recharge basin on a 10-acre Agency-owned parcel.⁴⁴ Geotechnical investigations are also ongoing to identify optimal locations for future off-Mojave River recharge facilities.

6.5.6 Morongo Basin

Beyond the MBA subareas, MWA maintains strategic storage in the Morongo Basin through two separate agreements. Storage includes 173 acre-feet in the Ames-Reche Management Area but zero acre-feet in Joshua Basin. The Ames-Reche Agreement covers 95 square miles and involves multiple agencies including Bighorn Desert View Water Agency and Hi-Desert Water District. Since 2012, water levels across the Ames-Reche Management Area have remained relatively stable, with annual pumping around 1,200 acre-feet compared to the established baseline of 1,646 acre-feet per year. The Warren Valley Basin within the Morongo area benefits from imported water deliveries through the Morongo Basin Pipeline, supporting

⁴⁴ MWA Watermaster 2023-2024 Supply Conditions Report at p. 16.

both the Warren Valley Basin Judgment requirements and enhanced storage management. Water levels have generally increased since implementation of recharge and management actions.

6.5.7 Summary of Managed Groundwater Storage by Subregion

When organized into the three Subregions discussed in *Chapter 2 – The Mojave Region*, the Managed (Stored) Groundwater Storage is:

Subregion 1: 194,000 AF (*Alto*) + 1,300 AF (*Este*) + 0 AF (*Oeste*) = 195,300 AF

Subregion 2: 35,000 AF (*Centro*) + 25,000 AF (*Baja*) = 60,000 AF

Subregion 3: 173 AF (*Ames*) = 173 AF

While no formal minimum storage target has been set by MWA, this supply is viewed as a vital contingency source for potential repeating instances of very low SWP Table A Allocations in consecutive years – or for other drivers impacting the current year’s SWP Table A availability. As such, this source is recognized as available to meet Subregional demands whenever native groundwater (e.g. FPA for parties subject to the MBA Judgment), local recycled supplies, and anticipated Table A supplies are insufficient.

This supply is also available to help retail suppliers meet demands during future periods where demand may exceed the supply shown in their retail chapters in interim years but fall within the total 2050 supply shown in this RUWMP. Overall, use of this supply is represented within this RUWMP by making these supplies available in forecast supply tables for multiple dry year supply reliability in any event where a shortfall in Table A, native groundwater, or recycled water is projected prior to the use of the managed storage (see *Chapter 5 – Regional Water Service Reliability*).

6.5.8 Water Quality

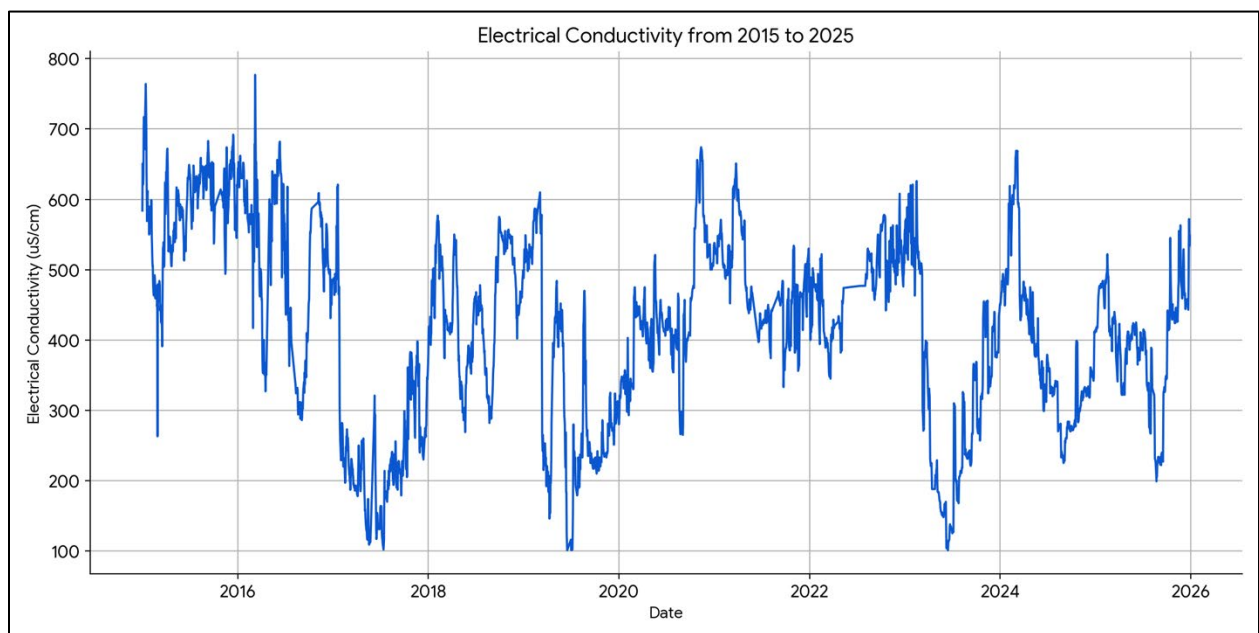
This subsection focuses on the quality of State Water Project supplies imported into the region and recharged into the various portions of the groundwater basins and adjudicated areas throughout the Mojave Region. A discussion of groundwater quality is included in *Chapter 3 – Regional Water Supply Characterization*.

The quality of imported surface water conveyed through the California Aqueduct is monitored by the DWR Division of Operations and Maintenance. DWR maintains 16 continuous water quality monitoring stations located throughout the SWP and data collected from these stations is regularly updated to the California Data Exchange Center (CDEC). The parameters for monitoring SWP water quality include electrical conductivity, water temperature, turbidity, pH, and fluorescence. SWP water quality changes as the water moves from precipitation and snowmelt runoff in Northern California to its termination points in Southern California. As such,

the water quality measurements at each station are important for purposes of tracking water quality constituents in the SWP system.

Of the 16 water quality monitoring stations, Check 66 is located closest to MWA’s turnouts and Check 41 is examined to align operational decisions and data monitoring. Check 66 is located at an elevation of 3,448 feet in San Bernardino County near the City of Hesperia in the South Lahontan Hydrologic Region (see **Figure 2-7**). **Figures 6-2** through **6-4** show the measured publicly available electrical conductivity, temperature, and turbidity at Check 66 since 2015 through 2025. **Figure 6-5** shows pH at the Check 41 Kern measurement location and **Figure 6-6** shows fluorescence at the Pacheco Pumping Plant.⁴⁵

FIGURE 6-2: CHECK 66 ELECTRICAL CONDUCTIVITY 2015-2025



⁴⁵ These varying water quality monitoring station locations were chosen because Check 66 does not collect these water quality parameters and the Kern location (Check 41) and Pacheco Pumping Plant monitoring stations were the nearest to Check 66.

FIGURE 6-3: CHECK 66 WATER TEMPERATURE 2015-2025

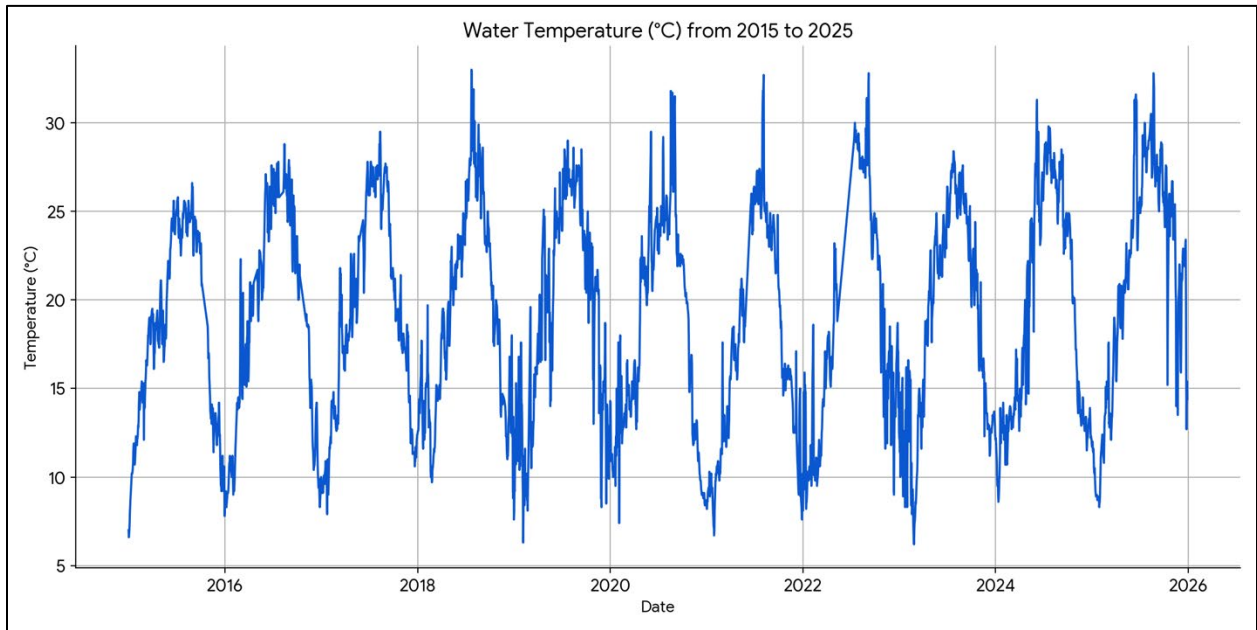


FIGURE 6-4: CHECK 66 WATER TURBIDITY 2015-2025

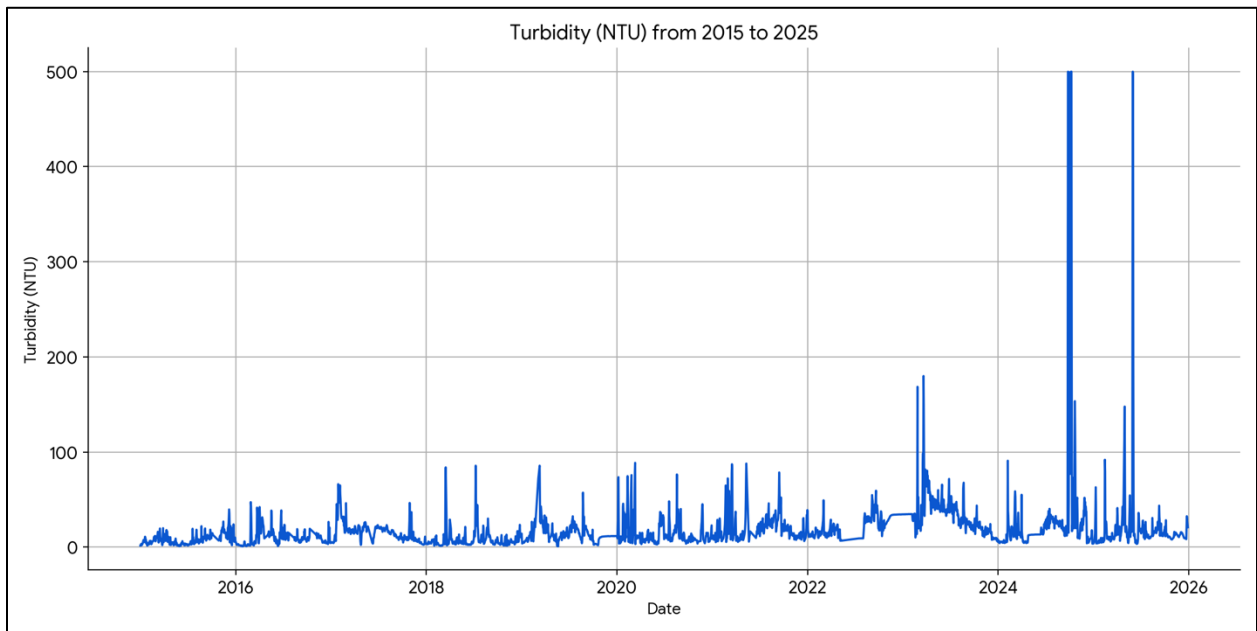


FIGURE 6-5: CHECK 41 (KERN) PH VALUE (2015-2025)

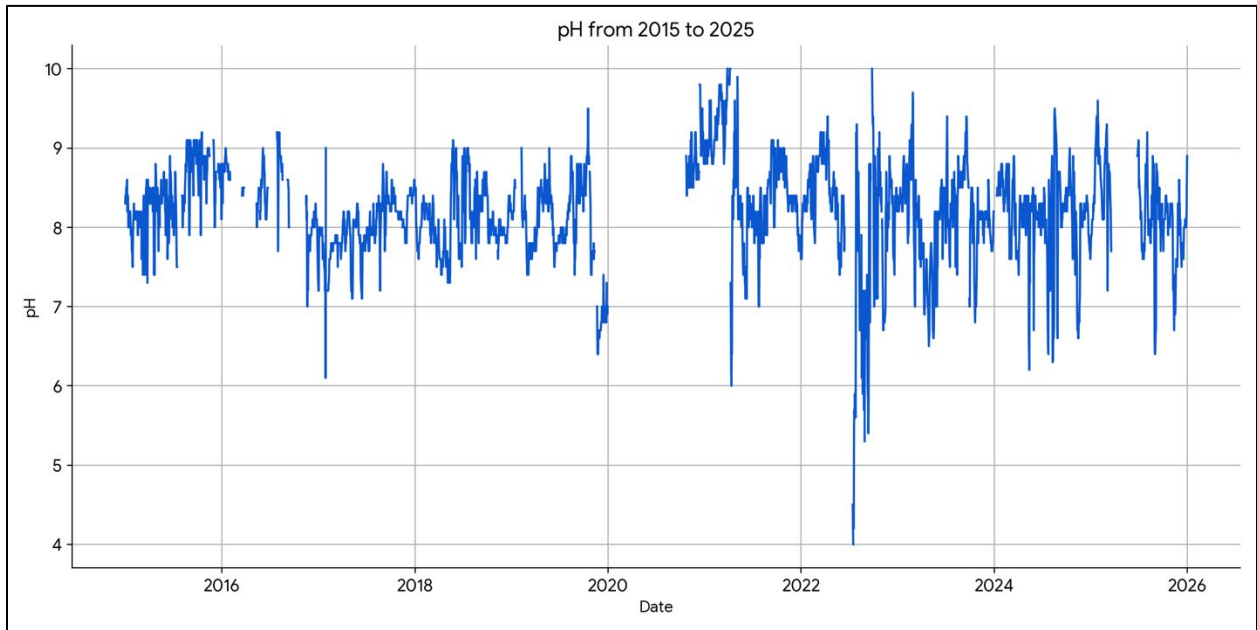
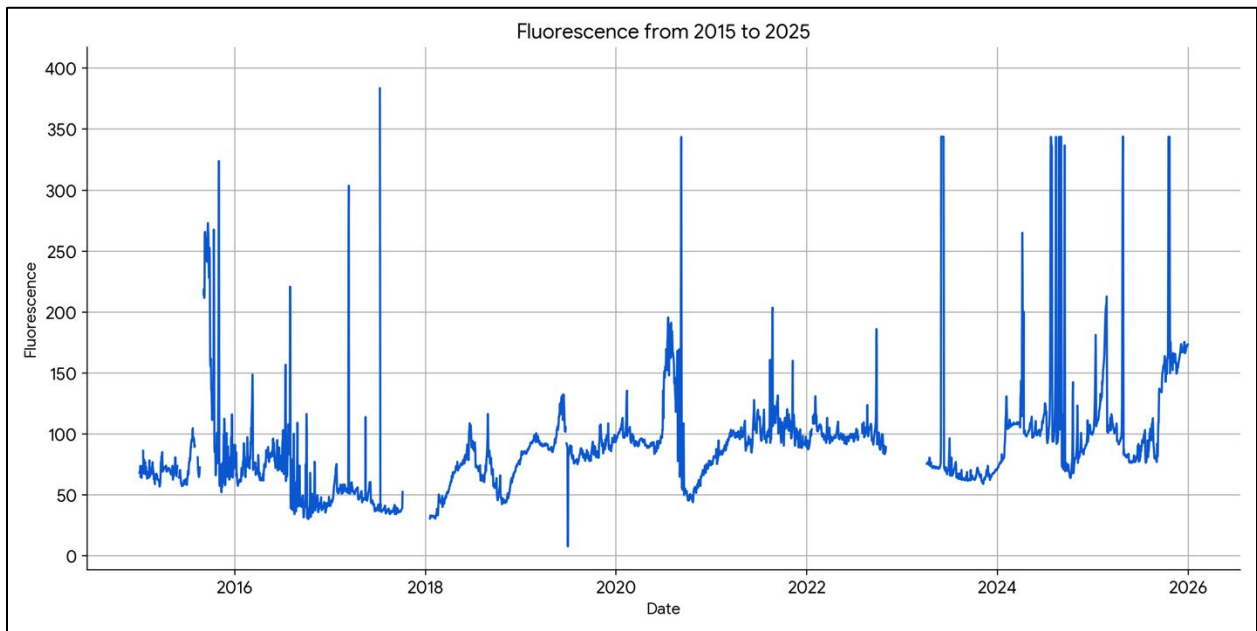


FIGURE 6-6: PACHECO PUMPING PLANT FLUORESCENCE 2015-2025



6.5.9 Recycled Water Supplies

MWA is not directly involved with the creation or distribution of recycled water supplies. This activity does occur within a few of the retailer's service areas, notably Hesperia Water District and the City of Victorville. MWA has zero recycled water supplies nor forecasts for such supplies.

6.5.10 Desalination Opportunities

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). This discussion takes place in *Section 3.1.3 of Chapter 3 – Regional Water Supply Characterization*.

6.5.11 Water Transfers and Exchanges

MWA engages in water transfers and exchanges involving its SWP assets and other SWP Contractors' SWP assets. Historically, MWA has both received and delivered water through these transfers and exchanges with various agencies throughout California. These transfers are essentially spot market transfers where short-term opportunities are identified and then actions taken for purchase and acquisition. These transfers help support management of MWA's and its retail agencies' water supply portfolios. Future MWA transfers and exchanges depend upon allocations available to MWA and other water purveyors and are not considered an available supply for purposes of this RUWMP.

6.5.12 Supply Summary

Mojave Water Agency operates a diverse and strategically managed water supply portfolio that serves over 500,000 residents across a 4,900-square-mile service area. As both a SWP contractor and MBA Watermaster, MWA's water supply strategy centers on importing surface water for groundwater recharge to support sustainable management of local groundwater basins.

MWA's water supply portfolio consists of four primary components that work together to provide reliable water service through varying hydrological conditions. SWP imports form the foundation of MWA's supply strategy, with a maximum annual Table A contract amount of 89,800 acre-feet delivered through six turnout locations on the East Branch of the California Aqueduct. These imported supplies are primarily used for groundwater recharge rather than direct service delivery, supporting the adjudicated basin management framework that governs regional water use.

This integrated portfolio enables MWA to maintain water supply reliability across normal, single dry year, and multiple dry year conditions. The Agency's water supply diversification includes annual imported water deliveries combined with strategically managed locally

stored groundwater as well as SWP carryover supplies. A summary of MWA’s water supply portfolio is shown in **Table 6-5**.

TABLE 6-5: MWA WATER SUPPLY PORTFOLIO SUMMARY

Source	Annual Amount	Description
State Water Project – Table A	89,800	Maximum Table A contract amount; actual deliveries vary (46% average 2010-2025)
SWP – Article 21	Variable	Intermittent SWP surplus water when available
SWP – Article 56 Carryover	Variable	Stored SWP allocation in San Luis Reservoir
Managed Groundwater Storage	256,000 ⁴⁶	Storage across Mojave Basin subareas and Morongo Basin

For purposes of this RUWMP, the forecast of MWA’s SWP supplies are presented in **Table 6-6** and **Table 6-7**.

TABLE 6-6: MWA’S PROJECTED SWP SUPPLY FOR 2026 – 2030 (AFY)

Year		SWP Contract Table A	Percent Allocation	Allocation Amount
Normal		89,800	54%	48,492
Single Dry		89,800	5%	4,490
Multi-Year Drought	2026 (1st year)	89,800	35%	31,430
	2027 (2nd year)	89,800	5%	4,490
	2028 (3rd year)	89,800	5%	4,490
	2029 (4th year)	89,800	20%	17,960
	2030 (5th year)	89,800	35%	31,430

⁴⁶ March 2026 State Water Project Allocation and Imported Water Operations Plan Update, Presentation on March 31, 2026 to the Planning, Resources, Engineering, and Operations Committee.

TABLE 6-7: MWA’S PROJECTED SWP SUPPLY THROUGH 2050 (AFY)

Total Supply		Percent Allocation	2030	2035	2040	2045	2050
Normal		54%	48,492	48,492	48,492	48,492	48,492
Single Dry Year		5%	4,490	4,490	4,490	4,490	4,490
Multi-Year Drought	Year 1	35%	31,430	31,430	31,430	31,430	31,430
	Year 2	5%	4,490	4,490	4,490	4,490	4,490
	Year 3	5%	4,490	4,490	4,490	4,490	4,490
	Year 4	20%	17,960	17,960	17,960	17,960	17,960
	Year 5	35%	31,430	31,430	31,430	31,430	31,430

The characterizations of MWA’s SWP Table A Allocation long-term reliability reflect numerous hydrological and regulatory issues that inform the State’s DCR modeling, are reasonable assessments related to SWP system management, and reflect MWA’s local conditions. Long-term water management hydrological and regulatory issues include the Bay-Delta Water Quality Control Plan, the Coordinated Operations Agreement, the Delta Biological Opinion, the Delta Conveyance Project, modifications to San Luis Reservoir, SWP seismic considerations, DWR’s Emergency Planning, and assessments related to MWA’s local groundwater conditions and climate. MWA thoughtfully engages on all these issues and undertakes actions that help mitigate supply related impacts that may be caused by one or more listed items. These issues are all considered in MWA’s planning and incorporated into its supply characterizations in this RUWMP.

6.5.13 Groundwater within the Remaining Areas of the Mojave Region

Besides its primary role as an importer of SWP supplies, MWA provides the geographic representation for the use of groundwater throughout the rest of the Region that is outside the service areas of the participating RUWMP retailers. The demand for water mostly reflects the other small retail water suppliers, rural domestic users, agricultural users, and large and small industries that are subject to the MBA Judgment.

Like to the other retail agencies, these users pump groundwater from the adjudicated MBA, specifically in Subregion 1 and Subregion 2 (see **Figure 2-3**). As discussed elsewhere, the basins used to meet these demands are recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water

delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Chapter 2 – The Mojave Region*.

6.5.13.1 Mojave Region’s Remaining Free Production Allowance

Under the MBA Judgment, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The FPA for each participating retail water supplier is discussed and quantified for near- and long-term forecasts in each of their respective Chapters. For the remaining areas of the Mojave Region not part of the retail service areas, particularly in Subregion 1 and Subregion 2, there is a cumulative FPA that represents the near- and long-term FPA available to meet all these other users and uses. This groundwater is not controlled directly by MWA as a water supply but is managed through MWA’s role as the MBA Watermaster and represented in determinations of Base FPA.

For purposes of fully representing available FPA, this subchapter uses recent FPA quantities as they are presented by the MBA Watermaster in recent reports. Specifically, the forecast availability of native groundwater is determined by removing the retailer-specific FPA from the MBA Watermaster report for Base FPA.⁴⁷ This value, along with the representation of MWA’s imported supply, is reflected in the water supply summary tables presented in *Chapter 3 – Regional Water Supply Characterization*.

- Subregion 1 – Total annual Base FPA is approximately 70,400 acre-feet. Total RUWMP Retailer FPA is approximately 38,000 acre-feet. Remaining Base FPA is approximately 32,300 acre-feet.
- Subregion 2 – Total annual Base FPA is approximately 39,600 acre-feet. Total retailer FPA is approximately 8,050 acre-feet. Remaining Base FPA is approximately 31,500 acre-feet.

⁴⁷ Water Year 2024–2025 Watermaster Report, Appendix B-Summary, p. 15 of 16.

Sub-Chapter 6.6 – Water Use Characterization

This sub-chapter describes the methodology used to forecast water demands within MWA’s service area that occur outside the service area boundaries of the ten participating urban water retail suppliers addressed in Chapters 7 through 16. These demands include small water systems, rural domestic users, agricultural uses, industrial uses, and golf course and recreational uses that are not otherwise quantified in the individual retailer chapters. Because MWA’s service area is concurrent with the Mojave Region, these demands are part of the overall regional water use forecast and are necessary to evaluate MWA’s wholesale water supply planning responsibilities.

Current regional water use, including use by participating urban water retail suppliers and other water users within the Mojave Region, is summarized in *Section 4.4.1 – Current Regional Water Use of Chapter 4 – Water Use Characterization*. Section 4.4.1 presents recent water use by major category and subregion and provides the current-use accounting used for the regional demand analysis. To avoid duplicating these tables and descriptions, this sub-chapter focuses on the methodology used to project future demands for small water systems and rural domestic users, industrial uses, golf course, recreational uses, and agricultural uses outside the service areas of the participating RUWMP retailers.

The resulting forecasts are incorporated into the regional demand summaries presented in *Chapter 4 – Water Use Characterization* and carried forward into *Chapter 5 – Regional Water Service Reliability*. Accordingly, this sub-chapter does not repeat the regional demand totals presented in Chapter 4 or the retailer-specific forecasts presented in Chapters 7 through 16. Instead, it presents the other-use demand forecasts developed for MWA’s wholesale planning purposes and documents the assumptions, data sources, and methods used to develop those values. When combined with the applicable retailer forecasts, these other-use demands form the basis for the Subregion and Regional demand totals summarized in **Tables 4-5** through **4-8**.

6.6.1 Forecasting Water Demands Outside Participating Retailer Service Areas

Small retail water supplier and rural domestic uses, agricultural uses, industrial uses, recreational uses, and golf course uses were forecast separately from the demands developed for the participating urban water retail suppliers. For the adjudicated portions of

MWA’s service area, these categories are tracked and reported annually by the Mojave Watermaster by adjudicated subarea. The Watermaster-reported production data were used as the primary basis for characterizing historical use and developing future demand forecasts in Subregions 1 and 2.

The Morongo Subarea is not part of the MBA adjudication, and comparable Watermaster-reported production data are not available for water uses outside of Hi-Desert Water District and Joshua Basin Water District. Accordingly, small retail water supplier and rural domestic, agricultural, industrial, recreational, and golf course demands outside of those retailer service areas were estimated using best available planning-level information, including available supplier data, land use and spatial information, and demand assumptions developed as part of MWA’s broader demand analysis.

6.6.1.1 Small Water Systems and Rural Domestic Use

MWA’s service area includes small public water systems and rural domestic users located outside the service area boundaries of the participating urban water retail suppliers. *Chapter 2 – The Mojave Region* presents the overall population associated with MWA’s wholesale demand area; however, this sub-chapter focuses on the methodology used to translate that population into projected water demands. For the adjudicated portions of MWA’s service area, small water system and rural domestic use is tracked through Mojave Watermaster reporting. Water use for small public water systems is generally metered and reported, while use by small private pumpers, which primarily reflects rural residential domestic use, is estimated by the Mojave Watermaster. These data were used to characterize recent historical use and develop a representative per-capita demand factor.

Future demand for this user class within Subregions 1 and 2 was estimated by dividing the reported total water use by the associated small water system and rural domestic population. In 2025, this user class within Subregions 1 and 2 had an estimated population of approximately 72,023 and a total water use of 14,544 acre-feet, resulting in an estimated use factor of 178 gallons per capita per day, or approximately 0.20 acre-feet per person per year. This use factor is generally consistent with values calculated using 2021 through 2024 data and was therefore determined to be representative of recent and future demand conditions for this user class.

In 2025, the small water system and rural domestic population within Subregion 3 was estimated at approximately 12,580. However, because the Morongo Subarea is not part of the Mojave Basin Area adjudication, no comparable Watermaster reporting framework exists to track small water system and rural domestic production outside the service areas of Hi-Desert Water District and Joshua Basin Water District. Thus, future demands for this user class in Subregion 3 were estimated by applying the 0.20 acre-foot per person per year use factor developed from Subregions 1 and 2 to the Subregion 3 small water system and rural domestic population projections.

The resulting demand forecast was developed by applying the representative 0.20 acre-foot per person per year use factor to the small water system and rural domestic population projections presented in **Table 6-2**. Projected demands for this user class are summarized by Subregion in **Table 6-8** and rounded to the nearest 5 acre-feet.

TABLE 6-8: PROJECTED SMALL WATER SYSTEM AND RURAL DOMESTIC DEMAND 2030-2050 (AFY)

Subregion	2030	2035	2040	2045	2050
Subregion 1	11,550	11,370	10,925	10,420	9,310
Subregion 2	2,805	2,760	2,650	2,530	2,260
Subregion 3	2,475	2,435	2,340	2,230	1,995

Helendale Community Services District represents a notable component of the small water system and rural domestic demand forecast in Subregion 1. In 2025, Helendale CSD accounted for approximately 13% of Subregion 1’s small water system and rural domestic demand. Although Helendale CSD does not currently meet the UWMPA reporting threshold and is therefore not required to prepare an individual UWMP, it is one of the larger small retail water suppliers within the Mojave Region and is approaching the statutory threshold for UWMP preparation. Appropriately, Helendale CSD was included in MWA’s wholesale demand forecast and coordinated during development of the RUWMP, but its demands are addressed within this MWA wholesale chapter rather than in a separate retailer chapter.

6.6.1.2 Agricultural Use

Like the majority of groundwater users governed by the MBA Adjudication, agricultural users are assigned an FPA that is monitored by the Mojave Watermaster. Agricultural use has historically represented one of the larger water use categories in the Mojave Region; however, agricultural demands have declined substantially over the past several decades as production has adjusted to the adjudication framework and changing land use conditions. Watermaster Annual Production Reports prepared since the 2020 MWA Wholesale UWMP indicate that agricultural has continued to decline below levels previously projected, particularly in the Centro and Baja Subareas where some agricultural lands have converted to solar development.⁴⁸

For purposes of this 2025 RUWMP, the 2025 agricultural demand of approximately 14,500 acre-feet is considered representative of long-term planning conditions. Therefore, agricultural demands are held constant by Subregion through 2050. The resulting agricultural demand forecast, rounded to the nearest five acre-feet, is presented in **Table 6-9**.

⁴⁸ Regional Agricultural Water Use from 2021 through 2025 is presented in Table 4-1.

TABLE 6-9: PROJECTED AGRICULTURAL DEMAND 2030-2050 (AFY)

Subregion	2030	2035	2040	2045	2050
Subregion 1	3,000	3,000	3,000	3,000	3,000
Subregion 2	11,500	11,500	11,500	11,500	11,500
Subregion 3 ⁴⁹	0	0	0	0	0

6.6.1.3 Industrial, Golf Course, and Recreational Uses

Industrial, recreational, and golf course uses outside the service area boundaries of the participating urban water retail suppliers were forecast separately from the small water system, rural domestic and agricultural demands. For the adjudicated portions of MWA’s service area, these uses are tracked by the Mojave Watermaster and reported in the Watermaster Annual Production Reports. Based on recent reporting, these use categories have shown modest declines between 2021 and 2025, with no identified growth trend or known development activity indicating a near-term increase in demand.

For purposes of this 2025 RUWMP, 2025 water use was determined to be representative of long-term planning conditions for industrial, recreational, and golf course uses. Accordingly, the 2025 demand values are held constant by subregion through 2050. For Subregion 3, demands outside the service area boundaries of Hi-Desert Water District and Joshua Basin Water District were estimated using publicly available aerial imagery, remote sensing data, and land use information as the Morongo Subarea is not subject to a centralized Watermaster reporting framework. The resulting demand forecast, rounded to the nearest five acre-feet, is presented in **Table 6-10**.

⁴⁹ A spatial review using aerial imagery, remote sensing data, and land use information confirmed the no agricultural use in Subregion 3. This review was conducted because the Morongo Subarea is not subject to a centralized Watermaster reporting framework comparable to the MBA adjudicated subareas.

TABLE 6-10: PROJECTED INDUSTRIAL, RECREATIONAL, AND GOLF COURSE DEMAND 2030-2050 (AFY)

Subregion		2030	2035	2040	2045	2050
Industrial	Subregion 1	4,400	4,400	4,400	4,400	4,400
	Subregion 2	2,600	2,600	2,600	2,600	2,600
	Subregion 3	335	335	335	335	335
Recreational	Subregion 1	5,400	5,400	5,400	5,400	5,400
	Subregion 2	1,800	1,800	1,800	1,800	1,800
	Subregion 3	50	50	50	50	50
Golf Course	Subregion 1	5,000	5,000	5,000	5,000	5,000
	Subregion 2	0	0	0	0	0
	Subregion 3	215	215	215	215	215

The forecasts presented in **Tables 6-8** through **6-10** represent the water demand components within MWA's service area that are outside the service area of the participating urban water retail suppliers. These forecasts are not intended to replace or duplicate the regional demand summaries presented in *Chapter 4 – Water Use Characterization*. Rather, they provide the supporting other-use demand values that are combined with the applicable retailer demand forecasts to develop the Subregion and regional demand totals presented in **Tables 4-5** through **4-8**. The integrated regional demand forecast is then carried forward into *Chapter 5 – Regional Water Service Reliability*.

Sub-Chapter 6.7 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the MWA’s demand management measures and water shortage response framework. As a wholesale urban water supplier, MWA’s conservation and shortage response responsibilities differ from those of the participating retail water suppliers. MWA does not generally provide direct retail water service; rather, it supports regional water reliability through imported water management, groundwater recharge, stored water management, regional conservation coordination, and administration of adjudicated groundwater management responsibilities.

MWA’s demand management efforts are focused on supporting efficient regional water use, coordinating conservation messaging and programs with participating agencies, and maintaining long-term reliability of the groundwater supplies that serve the Mojave Region. These efforts complement the retail-level demand management measures implemented by the participating urban water retail suppliers within their respective service areas.

MWA’s Water Shortage Contingency Plan (WSCP), adopted with the 2020 UWMP and readopted as part of this 2025 RUWMP, provides the Agency’s framework for evaluating water supply conditions and responding to potential shortages. The WSCP addresses water supply reliability, Annual Water Supply and Demand Assessment procedures, six standard shortage levels, shortage response actions, communication protocols, legal authorities, financial considerations, reevaluation procedures, and plan adoption and availability. Because MWA’s role is regional and wholesale in nature, implementation of the WSCP emphasizes coordination with retail water agencies, management of available imported and stored supplies, and actions to mitigate extended drought conditions or catastrophic interruptions to regional water supply availability.

No substantive changes have been made to MWA’s 2020 WSCP for purposes of this 2025 RUWMP. However, the water supply reliability analysis, demand forecasts, drought risk assessment, and related planning assumptions have been updated through the 2025 RUWMP. Accordingly, the WSCP remains applicable as MWA’s shortage response framework, while the updated reliability findings presented in this chapter and in *Chapter 5 – Regional Water Service Reliability* provide the current basis for evaluating supply conditions over the planning horizon.

A complete description of MWA’s WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 4.

6.7.1 Demand Management Measures

MWA has implemented a broad set of demand management measures (DMMs) to promote efficient use of water resources and support long-term regional water supply reliability. Because MWA functions primarily as a wholesale water supplier, State Water Project contractor, and regional groundwater management agency, its DMMs differ from those implemented by retail water suppliers. MWA does not generally provide direct retail water service or regulate day-to-day customer water use within the service areas of participating urban water retail suppliers. Instead, MWA’s DMMs focus on regional conservation coordination, public education and outreach, technical support, water use efficiency programs, regional supply planning, and management of imported and stored water supplies.

MWA’s DMMs are implemented in coordination with participating retail agencies, small water systems, rural domestic users, and other regional water users. These efforts complement the retail-level DMMs described in the individual retailer chapters of this RUWMP and help provide a consistent regional framework for water conservation, efficient water use, and long-term reliability planning.

MWA will continue to implement and refine its DMMs to support efficient water use, regional water supply reliability, and compliance with applicable State requirements. Additional information regarding MWA’s foundational, recent, and planned DMM activities is provided in the following subsections.

6.7.2 Foundational Demand Management Measures

MWA’s foundational DMMs remain generally consistent with those described in the 2020 UWMP and continue to serve as the basis for regional conservation and water use efficiency efforts. These measures include metering of imported water deliveries, public education and outreach, conservation program coordination and staffing support, distribution system asset management for MWA-owned facilities, and wholesale supplier assistance.

Water Measurement and Accounting

MWA measures State Water Project deliveries received through its turnouts and tracks water delivered to recharge, recovery, and other Agency-managed facilities. These data support regional water accounting, operational planning, and long-term supply reliability analyses.

Public Education and Outreach

MWA implements public education and outreach programs to promote efficient water use throughout the Mojave Region. These efforts include conservation messaging, educational materials, public presentations, workshops, community events, and coordination with regional partners such as the Alliance for Water Awareness and Conservation.

Conservation Program Coordination and Staffing Support

MWA supports regional conservation through dedicated program coordination, staffing, and funding. These efforts include technical and administrative support for conservation programs, participation in regional events and conferences, and support for rebate, education, and outreach activities that encourage efficient water use across the Region.

MWA-Owned Facility Management

MWA operates and maintains facilities associated with imported water delivery, recharge, recovery, and regional water supply management. MWA monitors and maintains these facilities to support reliable operations, accurate flow measurement, water quality compliance where applicable, and efficient use of imported and stored water supplies.

Wholesale Supplier Assistance

MWA provides technical, financial, and programmatic assistance to retail suppliers and regional partners to support conservation and water-use efficiency. This assistance includes coordination through regional conservation programs, support for public information and education efforts, and implementation of programs that help retail suppliers and their customers reduce demand where appropriate.

6.7.2.1 Recent DMM Activities

Since the 2020 UWMP, MWA has continued to implement regional conservation, education, and coordination activities. These efforts have included continued public outreach, regional conservation messaging, coordination with participating retail agencies, support for conservation programs, and development of updated regional planning analyses through the 2025 RUWMP.

6.7.2.2 Planned DMM Activities

MWA will continue implementing DMMs that reflect its wholesale and regional water management role. Planned activities include continued coordination with participating retail agencies, ongoing public education and outreach, support for regional conservation programs, continued measurement and accounting of imported and stored supplies, and maintenance of MWA-owned facilities needed to support long-term regional water supply reliability.

6.7.3 Water Shortage Contingency Plan

MWA has adopted a WSCP in accordance with CWC Section 10632. The WSCP establishes a structured framework for evaluating regional water supply conditions, coordinating with retail water suppliers, and implementing appropriate response actions during drought, constrained imported water conditions, or other supply interruptions. Because MWA functions as a wholesale water supplier, SWP contractor, and regional groundwater management agency, the WSCP is focused on regional supply management and coordination rather than direct regulation of retail customer water use.

6.7.3.1 Summary of Water Shortage Levels and Response Actions

MWA's WSCP includes six standard shortage stages corresponding to progressively severe shortage conditions of up to 10%, 20%, 30%, 40%, 50% and greater than 50%. These stages provide a consistent framework for evaluating the relative severity of regional supply constraints. However, unlike retail shortage stages, MWA's stages are implemented primarily through wholesale and regional water management actions, including use of stored supplies, access to flexible or alternative supplies, coordination of voluntary demand reduction messaging, and operational adjustments to MWA facilities, including R-Cubed deliveries where appropriate.

- Stage 1 – Up to 10% Shortage:

During Stage 1, MWA may access stored supplies, as needed, to address supply deficits. MWA may also coordinate voluntary conservation messaging with retail agencies, public agencies, and the broader community to encourage efficient water use and communicate the potential for future shortage conditions.

- Stage 2 – Up to 20% Shortage:

During Stage 2, MWA may continue to access stored supplies while increasing coordination with retail agencies. MWA may also implement voluntary demand reduction messaging and reduce R-Cubed deliveries, as appropriate, to help align supply availability with projected demands.

- Stage 3 – Up to 30% Shortage:

During Stage 3, MWA may intensify regional coordination, continue use of stored supplies, and further evaluate operational adjustments to MWA-managed facilities. R-Cubed deliveries may be reduced in coordination with affected retail agencies, while voluntary demand reduction messaging may be expanded to address increased severity of the shortage condition.

- Stage 4 – Up to 40% Shortage:

During Stage 4, MWA may continue to rely on stored supplies, voluntary demand reduction, and reduced R-Cubed deliveries as appropriate. At this stage, MWA would evaluate regional supply conditions, operational constraints, and available management actions to preserve stored water assets and maintain reliability for essential regional needs.

- Stage 5 – Up to 50% Shortage:

During Stage 5, MWA may implement more intensive regional supply management actions, including increased reliance on stored supplies, pursuit of alternative supplies, and continued operational coordination with retail agencies. MWA may also further reduce R-Cubed deliveries where appropriate and expand regional communication regarding shortage conditions and available response actions.

- Stage 6 – Greater than 50% Shortage:

During Stage 6, MWA would implement emergency-level regional supply management actions necessary to address severe shortage conditions or catastrophic supply interruptions. These actions may include use of available stored supplies, pursuit of alternative supplies or transfers, operational adjustments to MWA facilities, reduction of R-Cubed deliveries, and close coordination with retail agencies, DWR, SWP contractors, and other regional partners to support continued water supply reliability for essential needs.

6.7.3.2 Summary of Monitoring Procedures and Implementation

MWA conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated regional water supply and demand conditions over a rolling twelve-month period spanning July through June. The Annual Assessment serves as the primary mechanism for evaluating near-term supply reliability and determining whether implementation of one or more WSCP shortage stages may be warranted.

MWA has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this RUWMP, the methodology and demand assumptions applied are consistent with those presented in this chapter and in *Chapter 5 – Regional Water Service Reliability*. The Annual Assessment considers available regional supplies, projected demands, infrastructure capability, imported water availability, stored water assets, and other locally applicable factors that may influence water supply reliability.

Implementation of the WSCP relies on coordination among MWA staff, retail water suppliers, regional partners, stakeholders, and the public. During shortage conditions, MWA may

communicate regional supply conditions, shortage stage determinations, available response actions, and recommended coordination measures to retailer water suppliers, regional partners, stakeholders, and the public. This approach supports consistent messaging while allowing retail suppliers to implement customer-level shortage response actions within their respective service areas.

Sub-Chapter 6.8 – Water System Reliability and Drought Risk Assessment

MWA’s water system reliability and drought risk assessment findings are presented in *Chapter 5 – Regional Water Service Reliability*. The reliability analysis is informed by the MWA-specific supply and operational information presented in this chapter, including imported water supply availability and reliability considerations described in Sub-Chapter 6.4, managed groundwater storage described in Sub-Chapter 6.5, and MWA’s wholesale demand forecast for uses outside the participating retail supplier service areas described in Sub-Chapter 6.6. These MWA-specific inputs are combined with the regional supply characterization presented in *Chapter 3 – Regional Supply Characterization* and the regional water use forecast presented in *Chapter 4 – Water Use Characterization* to evaluate regional reliability under the UWMPA-required considerations. Chapter 5 integrates these assumptions to satisfy the applicable water system reliability and drought risk assessment requirements, including the Five-Year Drought Risk Assessment, normal year, single dry year, and five consecutive dry year analyses through 2050.

The results demonstrated in Chapter 5 demonstrate that the Mojave Region’s water supply portfolio is capable of meeting the water uses in the Region in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 6.9 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, this sub-chapter summarizes energy use associated with MWA’s water management operations to the extent such information is readily available. MWA’s energy reporting differs from a traditional retail water supplier because the Agency does not generally operate a retail potable water distribution system or deliver water directly to end-use customers. Instead, MWA’s primary operations consist of importing SWP supplies, conveying water to recharge locations, placing water into groundwater storage, and managing regional water supply reliability. Accordingly, the energy information presented in this sub-chapter focuses on MWA-controlled water management processes for which energy and water volume data are readily obtainable, including conveyance, recharge, recovery, hydropower, and related operations, as applicable.

The principal exception to MWA’s recharge-focused operating model is the Regional Recharge and Recovery Project, or R-Cubed, which stores imported supplies in the Floodplain Aquifer and, when needed, recovers and delivers that water through MWA-owned wells and pipelines directly to participating retail water suppliers. Because R-Cubed includes recovery and direct delivery components, its energy use is included in MWA’s energy evaluation where data are readily available.

TABLE 6-11: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR JAN 2025 THROUGH DEC 2025

	Sum of All Water Management Processes	Hydropower	Net Utility ⁵⁰
Volume of Water Entering Process (acre-feet)	32,557	10,000	22,557
Energy Consumed/Generated (kWh)	6,851,692	89,701	6,761,991
Energy Intensity (kWh/acre-foot)	210	9	300

⁵⁰ Hydropower generation occurring within the MWA system is considered a net benefit and subtracted from the total use.

Chapter 7.0 THE CITY OF ADELANTO



TABLE OF CONTENTS

Sub-Chapter 7.1 – Introduction	7-7
7.1.1 Background and Purpose	7-7
7.1.2 Basis for Plan Preparation	7-8
7.1.3 Coordination and Outreach	7-8
7.1.4 RUWMP Adoption	7-9
7.1.5 Document Organization	7-10
Sub-Chapter 7.2 – Water Service and System Description	7-11
7.2.1 Service Area Climate	7-13
Sub-Chapter 7.3 – Population, Land Use, Economy, and Demographics	7-14
7.3.1 Current Population and Historic Trends	7-14
7.3.2 Projected Population	7-15
7.3.3 Current and Projected Land Use	7-16
7.3.4 Economic Trends & Other Social and Demographic Factors	7-17
Sub-Chapter 7.4 – Water Supply and Infrastructure Characterization	7-18
7.4.1 Groundwater	7-18
7.4.2 Groundwater Quality	7-21
7.4.3 Recycled Water Supplies	7-24
7.4.4 Desalination Opportunities	7-24
7.4.5 Water Transfers and Exchanges	7-24
7.4.6 Supply Summary	7-25
7.4.7 Delivery System Details	7-26
Sub-Chapter 7.5 – Water Use Characterization	7-28
7.5.1 Current Customer Water Use	7-29
7.5.2 Compliance with Water Use Targets and Objectives	7-33
7.5.3 Forecasting Customer Use	7-34
7.5.4 Forecasting Water Use for DRA and Annual Assessment	7-37
7.5.5 Projecting Disadvantaged Community Water Use	7-39
Sub-Chapter 7.6 – Water Conservation and Shortage Response	7-40
7.6.1 Demand Management Measures	7-40

7.6.2	Foundational Demand Management Measures	7-41
7.6.3	Water Shortage Contingency Plan	7-43
Sub-Chapter 7.7 – Water System Reliability and Drought Risk Assessment		7-46
7.7.1	Five Year Drought Risk Assessment	7-46
7.7.2	Long Term Service Reliability	7-47
7.7.3	Annual Reliability Assessment	7-49
7.7.4	Water Supply Reliability Summary	7-50
Sub-Chapter 7.8 – Energy Intensity Analysis		7-51

LIST OF TABLES

Table 7-1: Public Water System Information	7-8
Table 7-2: Customer Water Service Connections	7-12
Table 7-3: Historical Population	7-15
Table 7-4: Population Growth Rate – 2015–2024	7-15
Table 7-5: Population Forecast and Growth Rate	7-16
Table 7-6: Last Five Years of the City’s FPA Supply (AFY)	7-19
Table 7-7: Projected Mojave Adjudication FPA for the City through 2030 (AFY)	7-19
Table 7-8: Projected Mojave Adjudication FPA for the City through 2050 (AFY)	7-20
Table 7-9: Last Five Years of Replacement and Make-up Water Supplies (AFY)	7-21
Table 7-10: City’s Potable Water Quality	7-23
Table 7-11: City’s Managed Groundwater Production 2021–2025 (AFY)	7-25
Table 7-12: City’s Projected Managed Groundwater Supply 2026 – 2030 (AFY)	7-26
Table 7-13: City’s Projected Managed Groundwater Supply Through 2050 (AFY)	7-26
Table 7-14: Potable Customer Use 2021–2025 (AF)	7-31
Table 7-15: Distribution System Loss 2021 – 2024	7-33
Table 7-16: Forecast Future Water Use (Values in Acre-feet per year)	7-36
Table 7-17: Forecast DRA Water Use for 2026 through 2030 (AFY)	7-39
Table 7-18: Five Year Drought Risk Assessment (AFY)	7-47
Table 7-19: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY)	7-48
Table 7-20: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY)	7-49
Table 7-21: Energy Intensity – Total Utility Approach for Dec 2024 through Dec 2025	7-51

LIST OF FIGURES

Figure 7-1: City of Adelanto Water City Service Area..... 7-12
Figure 7-2: Potable Water System..... 7-27

APPENDICES

Adelanto Appendices..... 7-52

Sub-Chapter 7.1 – Introduction

The City of Adelanto (City) operates as a retail water supplier, providing water and wastewater services through the Adelanto Public Utilities Authority (APUA/Authority), a component unit of the City. The City Council serves as the governing body for the Authority and oversees its operations.

Adelanto is located on U.S. Highway 395, in the western portion of California’s Mojave Desert in southwestern San Bernardino County. The City is situated 35 miles north of the City of San Bernardino, via Interstate 15. Elevations within the City range approximately between 2,700 and 3,200 feet above mean sea level. The terrain generally slopes from southwest to northeast. The terrain has allowed the development to occur mostly in Assessment City 1A and towards the northern end of the City. The City’s key planning objectives include responsible growth for its rural, suburban, agricultural, commercial, and industrial land uses, paired with economic development that attracts and maintains quality business and industry while being beneficial to its residents.

The City’s water supply is sourced almost entirely from groundwater pumped from the Mojave River Groundwater Basin. Ensuring an adequate and reliable water supply for current and future customers is fundamental to the City’s mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the City supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on City-specific system characteristics, demands, demand management measures, and reliability.

7.1.1 Background and Purpose

The City has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.⁵¹ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter presents the City’s evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the City’s 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory

⁵¹ California Water Code Sections 10610 through 10657.

guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

7.1.2 Basis for Plan Preparation

The City operates a Public Water System as described in California Health and Safety Code Section 116275. The City is also classified as an Urban Water Supplier pursuant to CWC Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of an UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the City and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively. Details of the City’s Public Water System are provided in **Table 7-1**.⁵²

TABLE 7-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610001	City of Adelanto	~8,878

7.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies and regional analyses. The City actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and City-specific operations.

As required by the UWMPA, the City coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts,

⁵² Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

including General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, the City encouraged the active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

7.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

7.1.4 RUWMP Adoption

The City held a public hearing regarding the 2025 RUWMP on June, 10, 2026. Before the hearing, the City made a draft of the 2025 RUWMP available for public inspection at City Hall, 11600 Air Expressway Adelanto, CA 92301, and on the City's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The City's elected body adopted this 2025 RUWMP on June, 10, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the City's website.

The City plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- "FINAL Submittal 2025 UWMP Tables – City of Adelanto – 06.01.2026.xls"
- "Appendix F 2025 Checklist – City of Adelanto – 06.01.2026.xls"

7.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 7.2 Water Service and System Description
- Sub-Chapter 7.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 7.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 7.5 Water Use Characterization
- Sub-Chapter 7.6 Water Conservation and Shortage Response
- Sub-Chapter 7.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 7.8 Energy Intensity Analysis

Sub-Chapter 7.2 – Water Service and System Description

The City of Adelanto provides potable water service to the residents and businesses within its service area, as depicted in **Figure 7-1**, which corresponds to the City’s jurisdictional boundaries.

Water service in City relies entirely on groundwater extracted from wells located throughout the service area. The City manages six active wells that tap into local aquifers to meet local demand and maintains an emergency intertie connection with the City of Victorville for backup supply. An additional eight inactive wells are maintained by the City and may be returned to service in the future. Once extracted, groundwater is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the City’s eight steel storage tanks, which collectively provide more than 21 million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The City’s water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes over 113 miles of water mains, eight booster pump stations, several pressure-reducing stations, thousands of service connections, thousands of valves and fire hydrants that allow the City to isolate portions of the system for maintenance or emergencies without disrupting service to the broader community. **Table 7-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the City’s customer base. The City contracts with Woodard and Curran to engage in regular inspection, maintenance, management, and replacement of system components to ensure long-term reliability and safety of the water supply.

While the APUA currently discharges treated effluent from the Adelanto Wastewater Treatment Facility to percolation ponds, the City is continuing to explore the development of a recycled water program. Planned improvements are focused on enabling the beneficial reuse of treated effluent, including development of recycled water storage and distribution infrastructure to support non-potable uses such as irrigation and dust control. These efforts are intended to enhance long-term water supply reliability, reduce reliance on groundwater, and support sustainable water management within the community.

FIGURE 7-1: CITY OF ADELANTO WATER CITY SERVICE AREA

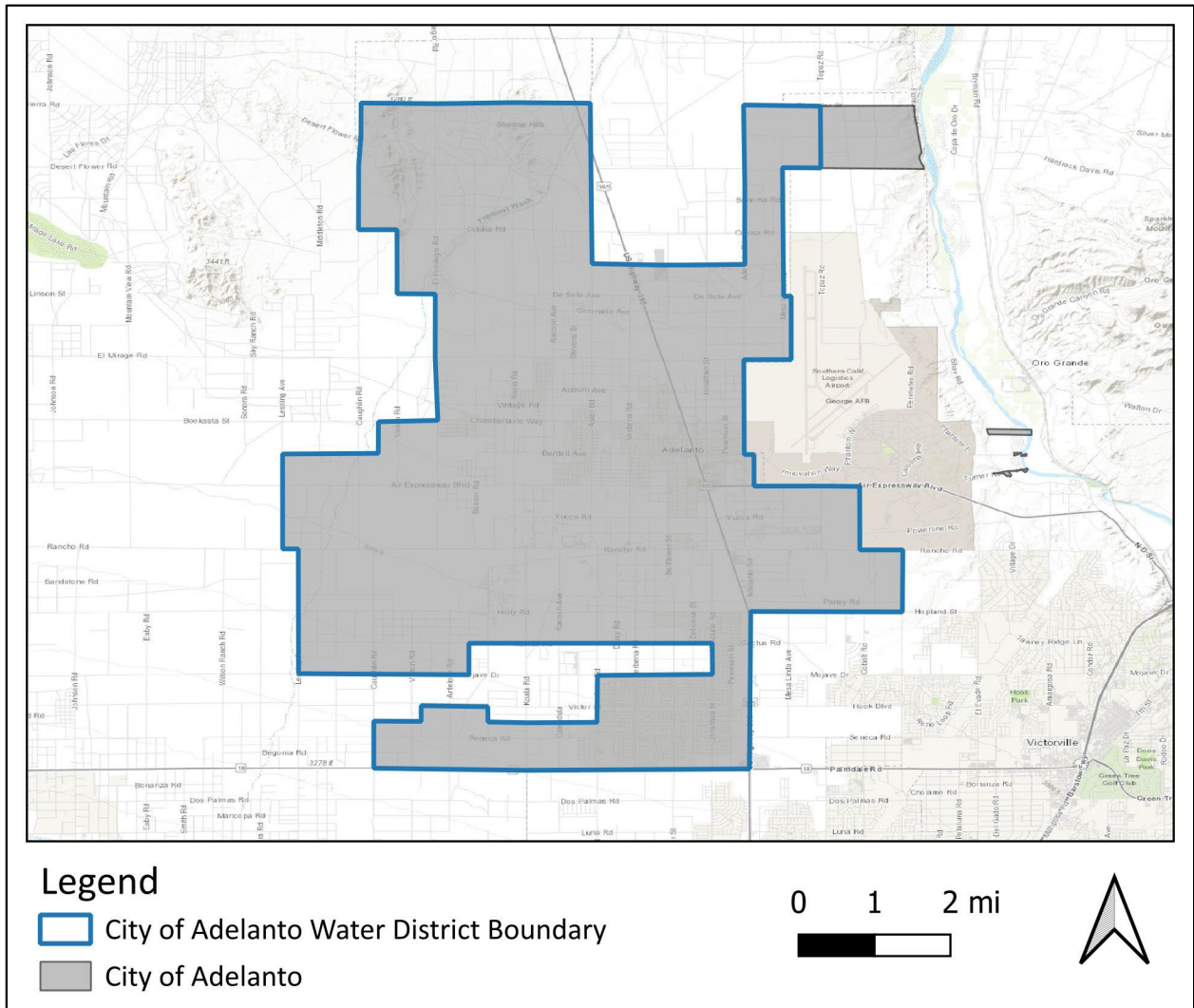


TABLE 7-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	8,329	7,880	7,308	7,940	8,326
Multi-Family Residential	82	81	415	591	169
Commercial/Institutional	159	159	169	249	243
Industrial	166	169	109	122	104
Landscape Irrigation	41	29	30	36	36
Total	8,777	8,318	8,031	8,938	8,878

7.2.1 Service Area Climate

Located in California's Mojave Basin Area, the City's service area experiences a climate characteristic of the High Desert. The region is highly arid due to the rain shadow effect of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and pronounced diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 5.52 inches, occurring primarily as rainfall between December and March and generally tapers off by May. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. Although snowfall is rare, winter snowfall averages 1.4 inches annually. The annual average temperature is approximately 61 degrees Fahrenheit; however, the High Desert climate produces significant seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, the City's service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of Planning Area's climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

7.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the City's water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 7.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the City's economic, social, and demographic trends give valuable insight to water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

7.3.1 Current Population and Historic Trends

Population estimates for the City are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA's Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study's development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the City reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers party to the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Adelanto originated in the late 19th century as a small railroad and agricultural settlement in the High Desert and remained sparsely populated for much of the 20th century. Significant

population increase occurred following incorporation in 1970, driven by residential development and improved regional connectivity. Growth accelerated between 2000 and 2020, during which the City’s population approximately doubled, reflecting sustained suburban expansion and housing development that exceeded broader regional growth rates. Continued development and land availability within the service area are expected to support additional population growth over the planning horizon.

Table 7-3 presents the City’s historical population while **Table 7-4** presents the City’s population growth over the last decade. The population values reflect the City’s service area, which generally corresponds to the City of Adelanto’s boundaries as shown in **Figure 7-1**, but excludes small portions of the City near the Southern California Logistics Airport.

TABLE 7-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
6,751	17,895	31,760	33,786	37,959	44,588

TABLE 7-4: POPULATION GROWTH RATE – 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	33,786	34,362	35,186	35,156	35,130	37,959	39,285	40,611	41,936	43,262
Growth Rate		1.70%	2.40%	-0.09%	-0.07%	8.05%	3.49%	3.38%	3.26%	3.16%

7.3.2 Projected Population

CWC Section 10631(a) requires urban retail water agencies to evaluate their projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

Population growth within the City is projected to increase moderately over the planning horizon, reflecting continued residential development, available land for expansion, and regional housing demand within the High Desert. Growth is expected to occur primarily through suburban residential expansion supported by commercial and service development needed to accommodate new residents, rather than through significant urban densification. While growth rates are anticipated to moderate over time, overall population is expected to continue increasing throughout the planning horizon, consistent with broader regional trends within the RUWMP Planning Area. More broadly, incorporated areas served by municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial

share of future regional population growth relative to unincorporated areas as illustrated in Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region.

Table 7-5 presents the City’s projected population and associated growth rates through 2060.

TABLE 7-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
City of Adelanto	44,588	45,913	47,239	48,565	49,890	51,216	52,542	53,867
Growth Rate		2.97%	2.89%	2.81%	2.73%	2.66%	2.59%	2.52%

7.3.3 Current and Projected Land Use

The primary land use within the City is residential, consisting largely of low-density, single-family housing developments. This land use pattern reflects the City’s role as an affordable residential community within the High Desert region. While predominantly residential, the City also includes industrial and commercial land uses, with development concentrated along with U.S. Highway 395 corridor. As of 2020, the City was approximately 15% built out, indicating substantial capacity for future growth within the existing land use framework.

Future growth within the City is anticipated to occur primarily through continued infill and incremental residential development consistent with historical trends and the population projections described in the prior subsection. The City has not identified any large-scale master planned developments or projects requiring preparation of a Water Supply Assessment that would materially alter projected growth patterns over the current planning horizon. As a result, anticipated development is reflected within the baseline population projections and does not rely on discrete, project-specific assumptions.

Over the long term, the City envisions a gradual transition to a more integrated land use pattern that includes residential expansion supported by industrial, logistics, and renewable energy development. However, this transition is expected to occur incrementally and is not associated with specific large-scale developments that would significantly affect near-term water demand projections.

7.3.4 Economic Trends & Other Social and Demographic Factors

The City's service area reflects a community undergoing gradual economic transition within the High Desert region. Historically, local economic conditions have been shaped by housing affordability, land availability and proximity to employment centers in the Inland Empire and Southern California. These factors have supported steady population growth, within the City functioning in part as a residential community for commuters working outside the immediate area.

In recent years, the City has sought to expand its economic base through industrial, logistics, and renewable energy development. The City's location along key regional transportation corridors provides opportunities to support warehousing, distribution, and related commercial activity. However, while these sectors represent an important component of the City's long-term economic strategy, development has occurred incrementally and has not resulted in large-scale, near-term employment or population shifts beyond those reflected in historical trends. Consistent with these conditions, future economic growth within the service area is expected to occur gradually and in coordination with residential development. As a result, economic factors influencing water demand are generally captured within the population and land use projections described in the two prior subsections. Broader regional economic conditions that influence growth within the City are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Demographically, the service area includes a diverse population with a range of household types, income levels, and housing characteristics. According to the 2020 U.S. Census, the ethnic makeup of the City is 68.3% Hispanic/Latino, 16.8% African American, 8.1% White, and 1.7% Asian, with 37% of the population identifying as two or more races. Median household income levels remain below statewide averages, and a notable portion of the population is classified as disadvantaged.

Sub-Chapter 7.4 – Water Supply and Infrastructure Characterization

The City relies primarily on groundwater for its water supply. Through a municipal network of six active wells, the City pumps groundwater from the underlying Alto Subarea of the Mojave Basin Area (MBA). As described in *Regional Chapter 3 – Regional Water Supply Characterization*, the MBA is an adjudicated basin administered by a court-appointed Watermaster. The aforementioned regional chapter describes the MBA’s water supplies and related management structures and details. Generally, the City pumps groundwater that is recharged and managed by MWA.

7.4.1 Groundwater

Groundwater is the primary water supply source for all urban retail water suppliers within the MBA. The City, like many of the MWA’s other retail agencies, pumps groundwater from the adjudicated MBA, specifically the Alto Subarea. The basin is recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Sub-Chapter 3.1.1 Mojave Region Water Supply Sources of Regional Chapter 3 – Regional Water Supply Characterization*.

7.4.1.1 City of Adelanto’s Free Production Allowance

Under the Judgment governing the MBA, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The City’s FPA is based on historical production coupled with evaluation of groundwater conditions, as administered by MWA in its role as the Watermaster.

The City’s FPA changes over time as the Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the MBA. The City’s FPA has continued to be significantly reduced as a percentage of the Base Annual Production (BAP) number. The City’s BAP is tracked as one entry in the Watermaster’s annual report as: “Adelanto, City of”. The City’s BAP in water year 2025 was 5,182 acre-feet per year. The current 50.4% FPA of this source is 2,612 acre-feet. **Table 7-6** presents the City’s FPA for the

most recent five year period pursuant to the MBA Judgment. Detailed discussion of the adjudication framework and administration of production allowances is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

TABLE 7-6: LAST FIVE YEARS OF THE CITY’S FPA SUPPLY (AFY)

Year	Base Annual Production	Percent FPA	FPA Supply
2021	5,182	55%	2,850
2022	5,182	50%	2,591
2023	5,182	53.3%	2,762
2024	5,182	50.4%	2,612
2025	5,182	50.4%	2,612

The 50.4% FPA represents a reduction that aligns with the long-term Production Safe Yield considered by the Watermaster. Accordingly, the City’s projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at 50.4% as shown in **Table 7-7**.

TABLE 7-7: PROJECTED MOJAVE ADJUDICATION FPA FOR THE CITY THROUGH 2030 (AFY)

Year Type		Projected FPA
Normal		2,612
Single Dry-Year		2,612
Multi-Year Drought	2026 (1 st Year)	2,612
	2027 (2 nd Year)	2,612
	2028 (3 rd Year)	2,612
	2029 (4 th Year)	2,612
	2030 (5 th Year)	2,612

Although the Production Safe Yield of the MBA appears to be stabilizing in the Alto Subarea, out of an abundance of caution the future FPA has been reduced to 50% to address long-term water supply planning options. **Table 7-8** presents the City’s projected FPA in a normal year, single dry year, and five consecutive dry years from 2030 through 2050 at 50%.

TABLE 7-8: PROJECTED MOJAVE ADJUDICATION FPA FOR THE CITY THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		2,591	2,591	2,591	2,591	2,591
Single Dry-Year		2,591	2,591	2,591	2,591	2,591
Multi-Year Drought	Year 1	2,591	2,591	2,591	2,591	2,591
	Year 2	2,591	2,591	2,591	2,591	2,591
	Year 3	2,591	2,591	2,591	2,591	2,591
	Year 4	2,591	2,591	2,591	2,591	2,591
	Year 5	2,591	2,591	2,591	2,591	2,591

A summary of long-term reliability and other factors that will affect FPA such as hydrological and regulatory issues is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

7.4.1.2 Carryover Water Supplies

The City does not currently hold carryover water supplies as part of its overall water supply management in the Alto Subarea.⁵³ Although such supplies may become available in the future, they are not assumed to be available for purposes of this analysis and are therefore not included in the supply availability evaluation presented in this sub-chapter, in order to preserve a conservative assessment of water supply reliability.

7.4.1.3 Replacement and Make-up Water Supplies

The City has taken actions to augment its water supplies through the Watermaster’s water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed the City’s annual FPA from the Alto Subarea. Make-up water supplies, by contrast, are acquired to satisfy obligations under the Judgment to maintain flows from the Alto Subarea to downstream subareas when natural conditions and production patterns would otherwise result in a shortfall.

A detailed description of these programs, obligations, and administrative processes is provided in *Regional Chapter 3 – Water Supply Characterization*. **Table 7-9** summarizes the

⁵³ Water Year 2025 Watermaster Report, Appendix H.

quantities of replacement and make-up water supplied to the City during the most recent five-year period.

TABLE 7-9: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions ⁵⁴
2021	1,456
2022	2,039
2023	1,640
2024	1,636
2025	2,364

7.4.2 Groundwater Quality

Groundwater produced by the City is obtained from wells completed in the Mojave River Groundwater Basin and is treated as necessary to meet all applicable federal and state drinking water standards prior to delivery to customers. Water quality within the basin is influenced by natural hydrogeologic conditions as well as localized land use and recharge patterns. The City routinely monitors groundwater quality in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the City’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The City’s most recent CCR is available on the City’s website and provides the most current information on potable water quality conditions.⁵⁵

⁵⁴ Water Acquisitions calculated as (Verified Production – Base FPA) + Makeup Water Obligation

⁵⁵ City of Adelanto 2024 CCR available at:

<https://adelantoca.gov/Documents/Services/Water%20&%20Sewer/Consumer%20Confidence%20Report/Consumer%20Confidence%20Report%202024.English.pdf?t=202507101838470>

While this section focuses on groundwater quality as it pertains to the City's supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 7-10 presents a summary of groundwater quality constituents based on information reported in the CSA's 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

TABLE 7-10: CITY'S POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Arsenic (ppb)	N/A	10	ND - 2.1	0.08
Fluoride (ppm)	N/A	2	ND - 1.4	0.49
Goss Alpha Particle Activity (pCi/L)	N/A	15	ND - 6.7	1
Nitrate as N (ppm)	N/A	10	ND - 0.50	0.25
Total Chromium (ug/L)	N/A	50	0.00 - 0.00	0
Disinfection By-Products				
Haloacetic Acid (ug/L) (HAA5)	N/A	60	N/A	3.8
Total Trihalomethanes (ug/L)	N/A	80	0.2 - 1.40	20.89
Radioactive Contaminants				
Gross Alpha (pCi/L)	N/A	15	ND - 6.70	1
Secondary Standards				
Chloride (ppm)	N/A	500	16.0 - 51.0	47
Iron (ug/L)	N/A	300	ND - 1000	7.33
Manganese	N/A	50	ND - 890	61.35
Odor (units)	N/A	3	ND - 1.00	0.36
Specific Conductance (uS/cm)	N/A	1600	ND - 800	800
Sulfate (mg/L)	N/A	500	ND - 220	220
Total Dissolved Solids (mg/L)	N/A	1,000	250 - 650	403
Turbidity	N/A	5	ND - 0.59	0.15
Lead and Copper				
Lead (ug/L)	N/A	N/A	N/A	0.55
Copper (ug/L)	N/A	N/A	N/A	ND
Microbial Contaminants				
Total Coliform (# of positive samples)	N/A	N/A	N/A	0
Fecal Coliform or E. Coli (#of positive samples)	N/A	N/A	N/A	0
Federal Unregulated Contaminants				
Calcium (mg/L)	N/A	N/A	ND - 25.00	25
Hardness (mg/L)	N/A	N/A	ND - 74.0	74
Magnesium (mg/L)	N/A	N/A	ND - 2.60	2.6
Sodium (mg/L)	N/A	N/A	ND - 140	140
Total Alkalinity (mg/L) (as CaCO3)	N/A	N/A	ND - 75.0	75

7.4.3 Recycled Water Supplies

The City of Adelanto does not currently utilize recycled water within its service area; however, the City continues to evaluate opportunities to develop a recycled water program. Treated effluent generated within the service area is presently managed through discharge to percolation facilities, consistent with existing wastewater operations. Ongoing planning efforts are focused on assessing the feasibility of recycled water production, storage, and distribution infrastructure to support future non-potable uses. Development of recycled water supplies would provide an opportunity to enhance long-term water supply reliability, reduce reliance on groundwater, and support sustainable water management within the community.

7.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water, pursuant to CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the City due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the City has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

7.4.5 Water Transfers and Exchanges

The City of Adelanto’s water supply portfolio is primarily managed through groundwater production in accordance with the MBA adjudication, supplemented as needed through replacement and make-up water. In addition to these core supplies, the City has the ability to utilize interconnections with neighboring agencies to support operational flexibility and system reliability.

The City maintains interties with regional partners, including connections that have been utilized to supplement supplies during periods of reduced FPA or operational constraint. These interties provide an important operational tool for managing short-term supply needs and maintaining system reliability; however, water conveyed through these connections is ultimately derived from the same regional groundwater system and does not represent an independent supply source.

As groundwater demands increase, the City may rely more heavily on supplies conveyed through these interconnections to meet system demands. While these supplies function operationally similar to transfers or exchanges, they are not currently implemented through formalized long-term transfer programs such as permanent BAP transfers. Accordingly, water supplies associated with formal transfers and exchanges are not explicitly assumed in the supply projections presented in this subchapter. The City will continue to evaluate opportunities to utilize interties and other transfer mechanisms, where available, to enhance

operational flexibility and support system reliability during periods of supply constraint or emergency conditions.

7.4.6 Supply Summary

Groundwater serves as the City’s principal water supply source. These supplies, pumped from the Alto Subarea of the MBA, are generally sufficient to meet existing and future demands. The City’s water supplies are aggregated into the historically managed groundwater system. Managed groundwater consists of supplies provided through the MBA, including make-up and replacement supplies as well as transfers and exchanges among producers. Under the MBA Judgment, producers in the Alto Subarea are able to meet their water supply requirements through production from the basin’s managed groundwater system. This system incorporates the natural yield of the basin along with supplies made available through regional management actions, including imported water recharge managed by MWA, conservation, water reuse, and transfers of FPA among producers. Consistent with this framework, the City’s total managed groundwater production for the historical period represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 7-11**.

TABLE 7-11: CITY’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	4,487
2022	4,640
2023	4,570
2024	4,636
2025	5,044

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 7.5 – Water Use Characterization*. Within the adjudicated MBA management framework, the City’s groundwater production adjusts to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 7-12** and **Table 7-13**.⁵⁶

⁵⁶ The values presented in **Table 7-12** and **Table 7-13** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 7.5 – Water Use Characterization*.

TABLE 7-12: CITY'S PROJECTED MANAGED GROUNDWATER SUPPLY 2026 – 2030 (AFY)

Year Type		Managed Groundwater Production
Normal		5,455
Single Dry-Year		5,455
Multi-Year Drought	2026 (1 st Year)	5,455
	2027 (2 nd Year)	5,485
	2028 (3 rd Year)	5,520
	2029 (4 th Year)	5,550
	2030 (5 th Year)	5,555

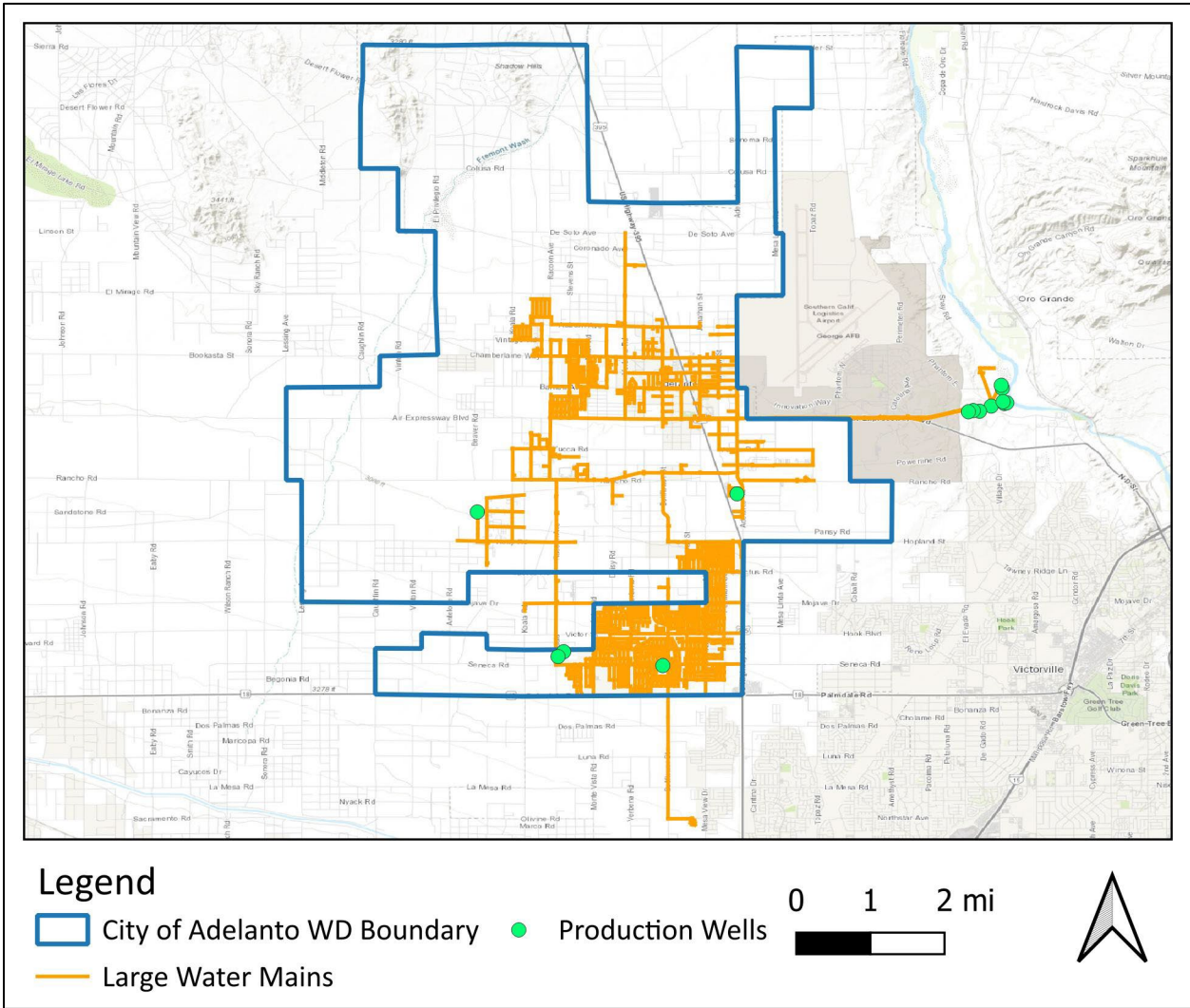
TABLE 7-13: CITY'S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		5,555	5,700	5,845	5,990	6,135
Single Dry-Year		5,555	5,700	5,845	5,990	6,135
Multi-Year Drought	Year 1	5,555	5,700	5,845	5,990	6,135
	Year 2	5,585	5,730	5,875	6,020	6,165
	Year 3	5,615	5,760	5,905	6,050	6,195
	Year 4	5,645	5,790	5,935	6,075	6,220
	Year 5	5,670	5,815	5,960	6,105	6,250

7.4.7 Delivery System Details

The City's potable water system conveys groundwater produced from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the City's storage reservoirs, which collectively provide approximately 21 million gallons of storage before being distributed through the pressurized potable water system. The distribution system consists of more than 113 miles of pipeline, and approximately 8,880 service connections. The City's potable water distribution system is shown in **Figure 7-2**.

FIGURE 7-2: POTABLE WATER SYSTEM



Sub-Chapter 7.5 – Water Use Characterization

Understanding water use characteristics is essential for the City to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the City's retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provide a realistic prediction of future water use based upon the City's past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the City's water supplies, presented in *Sub-Chapter 7.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 7.7 – Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the City's 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the City's residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the City's UWUO, comparison to the City's actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the City's 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the City’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the City should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the City’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

7.5.1 Current Customer Water Use

As described in *Sub-Chapter 7.2 – Water Service and System Description*, the City provides water service to approximately 8,880 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the City and treated to meet all applicable state and federal drinking water standards. Information regarding the City’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provides the basis for determining the City’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

7.5.1.1 Customer Water Use 2021–2025

Recent customer water use data assists the City in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The City is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The City records potable water use within five primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Industrial
- Landscape Irrigation
- Other

Table 7-14 presents the City's past customer potable water use by customer classification for 2021-2025 in acre-feet.

TABLE 7-14: POTABLE CUSTOMER USE 2021-2025 (AF)

Use Category	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	211	156	159	195	227	231	277	260	250	245	182	190	2,583
	2022	175	165	164	207	208	257	244	213	249	207	173	165	2,425
	2023	188	141	146	141	246	215	211	265	190	217	181	149	2,291
	2024	149	137	141	198	203	252	244	212	223	200	168	149	2,277
	2025	219	132	169	161	157	192	291	213	227	199	227	146	2,335
Multi-Family Residential	2021	21	15	15	18	20	20	23	26	53	24	20	20	274
	2022	23	25	37	24	21	11	23	30	29	20	19	20	283
	2023	20	11	15	12	22	16	18	24	14	20	17	19	208
	2024	14	11	16	21	14	25	24	20	27	32	25	23	250
	2025	34	17	25	27	21	29	38	29	25	27	28	24	324
Commercial/ Institutional	2021	33	47	31	48	55	70	74	74	44	68	48	54	646
	2022	39	42	47	66	67	46	71	82	87	73	51	56	726
	2023	61	29	86	85	139	107	68	87	53	80	46	39	879
	2024	42	63	76	44	180	66	94	93	86	97	91	67	999
	2025	115	71	86	110	86	100	139	114	112	110	112	64	1,219
Industrial	2021	12	10	11	12	17	17	22	23	26	21	19	16	208
	2022	26	19	19	23	22	22	16	26	29	34	9	18	264
	2023	36	43	41	33	46	36	30	0	0	32	0	0	299
	2024	0	31	16	45	37	42	55	15	15	26	32	18	331
	2025	27	11	19	32	11	26	27	27	26	34	26	14	281
Landscape Irrigation	2021	4	2	3	10	10	7	12	12	13	10	5	3	89
	2022	3	4	5	7	11	13	12	12	12	10	4	2	94
	2023	98	72	1	3	8	9	9	8	6	112	5	2	334
	2024	4	1	1	5	7	11	14	12	11	8	6	2	81
	2025	3	2	3	4	6	6	6	6	12	11	6	8	69
Other	2021	0	56	0	15	6	33	5	23	8	7	3	3	159
	2022	13	7	3	8	1	3	2	4	12	10	3	3	69
	2023	1	0	1	0	92	5	3	6	2	26	7	5	151
	2024	1	1	0	2	1	1	0	0	3	1	2	13	26
	2025	35	9	2	1	3	0	0	2	2	1	2	1	58
Total Metered Deliveries	2021	280	287	220	298	336	378	413	418	393	374	277	285	3,959
	2022	279	261	275	335	330	352	368	367	418	353	259	263	3,860
	2023	404	297	291	275	554	388	339	390	266	487	257	215	4,162
	2024	211	243	249	315	441	397	430	352	364	363	324	273	3,964
	2025	434	242	305	336	284	353	502	398	404	377	404	249	4,288

The single-family residential and multi-family residential classifications continue to represent the primary components of the City’s water service; however, their relative contribution to total demand has declined in recent years. Historically, residential uses accounted for approximately 75% percent of total potable water demand in 2020, but between 2021 and 2025 this share decreased to approximately 62%. Over the same period, commercial and institutional uses increased modestly from approximately 22% to 25%, while industrial demand, which was previously negligible, accounted for approximately 7% of total use. This shift reflects gradual changes in the City’s economic and land use profile, including incremental growth in commercial and industrial activity, while the overall demand pattern remains broadly consistent with the City’s predominantly residential service area.

7.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the City’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the City has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).⁵⁷ An electronic copy of the audit in Excel format is to be submitted to DWR by October 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the City shall assess compliance every three years as an average of recent losses. Additionally, the City will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 7-15** summarizes the City’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

⁵⁷ Title 23 California Code of Regulations Section 638.1 et seq.

TABLE 7-15: DISTRIBUTION SYSTEM LOSS 2021 - 2024⁵⁸

2021	2022	2023	2024
7.3%	15.0%	N/A	N/A
Average:			11.2%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the City’s distribution system loss represents about 11.2% of water entering the system.

7.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the City was developed using information submitted as part of the City’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 58.5 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 12.7%. Using the information from the same period, the average “apparent” water loss averaged 3.3% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 16%, although recent AWWA audits discussed above show losses closer to 11.2%.

7.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the City’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

7.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the City to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving

⁵⁸ Water loss audit data for 2023 and 2024 were not available at the time this 2025 RUWMP was prepared; the City is currently in the process of completing these audits.

a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the City to measure progress on achieving water efficiency goals.

The City's 2020 GPCD target was established in the 2010 UWMP using the methodology set forth in CWC Section 10608.20(b). The City selected the "20% reduction from baseline" approach (Method 1), which defines the target as 80% of baseline per capita water use calculated over the applicable baseline period. The resulting 2020 target was 192 GPCD.

The City's calculation of its actual 2020 GPCD utilized the same methodology, in which gross water use represents total potable water supplied to the system, including deliveries, system losses, and authorized unbilled consumption. This total volume, derived from system production records, was divided by the City's estimated population to calculate per capita water use, resulting in an actual value of 116 GPCD. Because this value was less than the City's established target, the City was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the City was determined to have an actual GPCD of 103, calculated using the same methodology presented above.

7.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. In 2023 and 2025, the City submitted required annual reports to the SWRCB demonstrating that actual water use remained below its calculated UWUO, confirming compliance in 2023 and 2025.

7.5.3 Forecasting Customer Use

Future water use within the City's service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the City’s future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the City, are presented in the following subsections and corresponding tables.

7.5.3.1 Existing Customer Future Use

Future water use associated with the City’s existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 7.5.2.1*, the City’s current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the City has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the City’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the City’s existing customer demand is projected to remain at approximately 5,120 acre-feet per year, based on a representative GPCD of 103, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the City’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

7.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. This approach applies representative water use factors to projected population growth to

estimate incremental demand associated with new development within the City’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the City’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the City, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 5 GPCD
- Total Non-Residential Use: 50 GPCD
- Total Use: 102 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the City’s representative loss percentage has been applied to new customer demand projections.

Table 7-16 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the City’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 7.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 7-16: FORECAST FUTURE WATER USE (VALUES IN ACRE-FEET PER YEAR)

2025	2030	2035	2040	2045	2050
5,120	5,555	5,700	5,845	5,990	6,135

7.5.3.3 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The water use forecast presented in **Table 7-16** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions.

Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 7-16** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.⁵⁹

7.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The City will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

7.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the City’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related but distinct analyses required

⁵⁹ California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

under California Water Code: the five year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the City’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

7.5.4.1 Projecting Water Use for Five Year Drought Risk Assessment

The DRA requires the City to evaluate water supply reliability over a five year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the City’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the City’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the City’s long-term water use forecast developed for the 2025 RUWMP and the City’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the City’s evaluation of water supply reliability across planning timeframes.

Table 7-17 presents the City’s projected unconstrained water demands for the DRA period (2026–2030), with values rounded to the nearest five acre-feet. These values form the basis for the reliability analysis presented in *Sub-Chapter 7.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 7-17: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
5,455	5,485	5,520	5,550	5,555

7.5.4.2 Projecting Water Use for Annual Assessments

The City conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The City has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

7.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the City’s sub-chapter within the 2025 RUWMP, the City’s service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.⁶⁰ Accordingly, the water use forecast presented in **Table 7-17** is inclusive of disadvantaged community water use.

⁶⁰ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 7.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the City's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The City has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the City's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the City evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the City's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the City's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 7a.

7.6.1 Demand Management Measures

The City has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The City is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the City leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The City will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

7.6.2 Foundational Demand Management Measures

The City's foundational DMMs remain unchanged from the 2020 UWMP and continue to serve as the basis for ongoing water conservation efforts. These measures include water waste prevention ordinances, metering, conservation-based rate structures, public education and outreach, programs to assess and manage distribution system losses, and coordination of conservation program implementation.

Water Waste Prevention Ordinances

The City has adopted water conservation regulations through its Municipal Code, which establish prohibitions on water waste and define enforcement mechanisms to address non-compliant uses. These regulations provide a baseline level of conservation that is in effect at all times and may be expanded during declared shortage conditions.

Metering

The City meters all potable water service connections, enabling accurate measurement of water use and supporting volumetric billing. Metering provides the foundation for tracking consumption patterns, identifying inefficiencies, and implementing effective conservation programs.

Conservation Pricing

The City utilizes a tiered rate structure designed to encourage efficient water use by increasing the marginal cost of water at higher levels of consumption. This pricing approach supports long-term demand management by incentivizing conservation across all customer classes.

Public Education and Outreach

The City implements public education and outreach efforts to promote water conservation and increase customer awareness of efficient water use practices. These efforts include dissemination of conservation materials and coordination with regional programs to support consistent messaging.

Programs to Assess and Manage Distribution System Losses

The City conducts regular water loss audits in accordance with AWWA methodologies to quantify and manage systems losses. These efforts support ongoing maintenance, leak detection, and system improvements to enhance overall water use efficiency.

Conservation Program Coordination and Staffing Support

The City supports the implementation of DMMs through coordination with regional partners and internal staff resources. This approach allows the City to leverage available programs and funding opportunities while maintaining effective administration of local conservation efforts.

Other Demand Management Measures

The City has adopted additional measures, including landscape water conservation requirements consistent with the Model Water Efficient Landscape Ordinance (MWELO). These measures support long-term reductions in outdoor water use and promote efficient landscape design and irrigation practices.

7.6.2.1 Recent DMM Activities

The City has continued to implement DMMs focused on improving system efficiency, reducing potable water demands, and supporting long-term water conservation. Recent activities include upgrading the City’s customer water metering system to an advanced metering infrastructure (AMI) system, which will improve the City’s ability to track customer water use, identify abnormal consumption patterns, and support more effective customer service and conservation messaging. The AMI project is currently underway and is anticipated to be completed in summer 2026.

The City has also advanced efforts to reduce potable water use at its wastewater treatment plant by converting the plant’s internal water system to use treated effluent. This project is expected to eliminate potable water demand associated with certain plant operations and is anticipated to be completed in spring 2026. Together, these activities support the City’s broader efforts to improve water use efficiency, reduce system demands, and make more effective use of available local water resources.

7.6.2.2 Planned DMM Activities

The City will continue to implement and refine its existing DMMs to support efficient water use and compliance with applicable State requirements. Planned activities include continued implementation of the AMI system, use of improved metering data to support customer outreach and system management, and ongoing evaluation of opportunities to reduce potable water use where feasible.

The City is also studying the feasibility of developing Title 22 recycled water supplies for community use. This effort is intended to evaluate potential opportunities for beneficial reuse of treated effluent, including future non-potable applications that could offset potable demands and enhance long-term water supply reliability. The City will continue to assess the technical, regulatory, and financial feasibility of recycled water implementation as part of its broader demand management and water supply planning efforts.

7.6.3 Water Shortage Contingency Plan

The City has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the City can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the City may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the City's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the City's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

7.6.3.1 Summary of Water Shortage Levels and Response Actions

The City's WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the City to implement proportional measures to manage water use and maintain essential public health and safety services during periods of reduced supply. The WSCP includes six shortage levels, each associated with a targeted reduction in water use relative to normal conditions. As shortage conditions intensify, the City may implement progressively more restrictive measures to reduce demand and manage available supplies. The general framework of shortage levels and representative response actions is summarized below:

- Stage 1 – Up to 10% Shortage

Minor shortage conditions prompt voluntary conservation and public awareness measures to reduce discretionary water use.

- Stage 2 – Up to 20% Shortage:
Moderate shortage conditions require additional conservation measures and increased enforcement of water waste restrictions.
- Stage 3 – Up to 30% Shortage:
Significant shortage conditions result in expanded restrictions on outdoor irrigation and other non-essential water uses.
- Stage 4 – Up to 40% Shortage:
Severe shortage conditions result in expanded restrictions on outdoor irrigation and other non-essential water uses.
- Stage 5 – Up to 50% Shortage:
Critical shortage conditions require strict limitations on water use with prioritization of essential public health and safety needs.
- Stage 6 – Greater than 50% Shortage
Emergency shortage conditions trigger maximum conservation actions, including suspension of non-essential water uses.

As water supply conditions change, the City may transition between shortage levels based on ongoing evaluation of supply availability, customer demand, and system conditions.

7.6.3.2 Summary of Monitoring Procedures and Implementation

The City's WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures are intended to ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The City evaluates water supply reliability each year through its Annual Assessment, which considers local water supplies, unconstrained demand, planned water use, infrastructure conditions, and current year and assumed dry year scenarios to determine whether implementation of a water shortage level is warranted. The City's Annual Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of shortage response actions. Under the WSCP, the City evaluates available supply and anticipated demand on or before June 1 of each year, and if a current or expected shortage level is identified, the City Council may trigger the appropriate response actions through resolution.

Additional detail regarding the Annual Assessment is provided in *Subsection 7.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter 7.5 – Water Use Characterization*.

Implementation of the WSCP includes coordination among City staff and communication with customers and regional partners. The City monitors production data, customer demand, and system conditions on an ongoing basis, with reporting intensity increasing as shortage levels escalate, and uses this information to evaluate the effectiveness of response actions and determine whether modifications, escalation, or termination of shortage stages are necessary.

Sub-Chapter 7.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the City’s water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 7.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 7.5 – Water Use Characterization* to assess the City’s ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the City’s water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the City’s capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the City’s Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the City’s water supply reliability and inform the implementation of the City’s WSCP, as described in *Sub-Chapter 7.6 – Water Conservation and Shortage Response*.

7.7.1 Five Year Drought Risk Assessment

The DRA evaluates the City’s ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the City’s unconstrained demand forecast described in *Sub-Chapter 7.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the City’s managed groundwater supplies, which include groundwater production, replacement water, and make-up water, as described in *Sub-Chapter 7.4 – Water Supply and Infrastructure Characterization*. Under the

terms of the MBA adjudication, the City has discretion in managing its groundwater production and associated supplemental supplies, allowing it to adjust its supply portfolio to meet projected demands during dry conditions.

The DRA compares projected water demands to available supplies to evaluate the City’s capacity to meet customer needs over the five-year period. **Table 7-18** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 7-18: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	5,455	5,485	5,520	5,550	5,555
Demand	5,455	5,485	5,520	5,550	5,555
Difference	0	0	0	0	0

7.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The City’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

7.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the City’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the City’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the City’s supplies are managed within the framework of the MBA adjudication, which provides flexibility in balancing groundwater production and supplemental supplies. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 7-19 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 7-19: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	5,555	5,700	5,845	5,990	6,135
Demand	5,555	5,700	5,845	5,990	6,135
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	5,555	5,700	5,845	5,990	6,135
Demand	5,555	5,700	5,845	5,990	6,135
Difference	0	0	0	0	0

7.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the City’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the City continues to manage its supplies within the framework of the MBA adjudication, which allows for flexibility in balancing groundwater production and supplemental supplies. This managed approach enables the City to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 7-20 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the City has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 7-20: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	5,555	5,700	5,845	5,990	6,135
	Demand	5,555	5,700	5,845	5,990	6,135
	Difference	0	0	0	0	0
Year 2	Supply	5,585	5,730	5,875	6,020	6,165
	Demand	5,585	5,730	5,875	6,020	6,165
	Difference	0	0	0	0	0
Year 3	Supply	5,615	5,760	5,905	6,050	6,195
	Demand	5,615	5,760	5,905	6,050	6,195
	Difference	0	0	0	0	0
Year 4	Supply	5,645	5,790	5,935	6,075	6,220
	Demand	5,645	5,790	5,935	6,075	6,220
	Difference	0	0	0	0	0
Year 5	Supply	5,670	5,815	5,960	6,105	6,250
	Demand	5,670	5,815	5,960	6,105	6,250
	Difference	0	0	0	0	0

7.7.3 Annual Reliability Assessment

Each year, the City considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the City’s Water Shortage Contingency Plan. The City has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

7.7.4 Water Supply Reliability Summary

The City's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 7.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the City evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The City’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the City’s service area, rather than long-distance conveyance or advanced treatment processes.

The City continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 7-21**.

TABLE 7-21: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR DEC 2024 THROUGH DEC 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	5,445
Energy Consumed (kWh)	452,615
Energy Intensity (kWh/acre-foot)	83

ADELANTO APPENDICES

This page is reserved for City of Adelanto-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to the City of Adelanto’s adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the City of Adelanto retailer chapter, the City’s WSCP, and applicable City-specific appendices.

Chapter 8.0 COUNTY SERVICE AREA

64 SPRING VALLEY LAKE



TABLE OF CONTENTS

Sub-Chapter 8.1 – Introduction	8-7
8.1.1 Background and Purpose.....	8-7
8.1.2 Basis for Plan Preparation.....	8-8
8.1.3 Coordination and Outreach	8-8
8.1.4 RUWMP Adoption.....	8-9
8.1.5 Document Organization.....	8-10
Sub-Chapter 8.2 – Water Service and System Description	8-11
8.2.1 Service Area Climate.....	8-13
Sub-Chapter 8.3 – Population, Land Use, Economy, and Demographics	8-14
8.3.1 Current Population and Historic Trends.....	8-14
8.3.2 Projected Population	8-15
8.3.3 Current and Projected Land Use.....	8-16
8.3.4 Economic Trends & Other Social and Demographic Factors.....	8-16
Sub-Chapter 8.4 – Water Supply and Infrastructure Characterization	8-17
8.4.1 Groundwater	8-17
8.4.2 Groundwater Quality.....	8-20
8.4.3 Recycled Water Supplies.....	8-23
8.4.4 Desalination Opportunities.....	8-23
8.4.5 Water Transfers and Exchanges	8-23
8.4.6 Supply Summary.....	8-23
8.4.7 Delivery System Details.....	8-25
Sub-Chapter 8.5 – Water Use Characterization	8-27
8.5.1 Current Customer Water Use	8-28
8.5.2 Compliance with Water Use Targets and Objectives.....	8-32
8.5.3 Forecasting Customer Use.....	8-33
8.5.4 Forecasting Water Use for DRA and Annual Assessment.....	8-36
8.5.5 Projecting Disadvantaged Community Water Use	8-38
Sub-Chapter 8.6 – Water Conservation and Shortage Response	8-39
8.6.1 Demand Management Measures	8-39

8.6.2	Water Shortage Contingency Plan.....	8-42
Sub-Chapter 8.7 – Water System Reliability and Drought Risk Assessment.....		8-45
8.7.1	Five Year Drought Risk Assessment.....	8-45
8.7.2	Long-Term Service Reliability	8-46
8.7.3	Annual Reliability Assessment.....	8-48
8.7.4	Water Supply Reliability Summary	8-49
Sub-Chapter 8.8 – Energy Intensity Analysis.....		8-50

LIST OF TABLES

Table 8-1: Public Water System Information.....	8-8
Table 8-2: Customer Water Service Connections.....	8-12
Table 8-3: Historical Population	8-15
Table 8-4: Population Growth Rate 2015-2024.....	8-15
Table 8-5: Population Forecast and Growth Rate.....	8-16
Table 8-6: Last Five Years of CSA 64's FPA Supply (AFY).....	8-18
Table 8-7: Projected Mojave Adjudication FPA for the CSA through 2030 (AFY)	8-18
Table 8-8: Projected Mojave Adjudication FPA for the CSA through 2050 (AFY).....	8-19
Table 8-9: Last Five Years of Replacement and Make-up Water Supplies (AFY)	8-20
Table 8-10: CSA 64's Potable Water Quality.....	8-22
Table 8-11: CSA 64's Managed Groundwater Production 2021-2025 (AFY).....	8-24
Table 8-12: CSA 64's Projected Managed Groundwater Supply 2026-2030 (AFY).....	8-24
Table 8-13: CSA 64's Projected Managed Groundwater Supply through 2050 (AFY).....	8-25
Table 8-14: Potable Customer Use 2022-2025 (AF)	8-30
Table 8-15: Distribution System Loss 2021-2024	8-31
Table 8-16: Forecast Future Water Use (AFY).....	8-35
Table 8-17: Forecast DRA Water Use for 2026 through 2030 (AFY).....	8-37
Table 8-18: Five Year Drought Risk Assessment (AFY).....	8-46
Table 8-19: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY).....	8-47
Table 8-20: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY).....	8-48
Table 8-21: Energy Intensity – Total Utility Approach for Dec 2024 Through Sept 2025.....	8-50

LIST OF FIGURES

Figure 8-1: CSA 64's Service Area.....	8-12
Figure 8-2: Potable Water System	8-26

APPENDICES

CSA 64 Appendices.....8-51

Sub-Chapter 8.1 – Introduction

San Bernardino County Department of Public Works, Special Districts County Service Area 64 – Spring Valley Lake (CSA 64) is a special services district governed by the San Bernardino County Board of Supervisors and responsible for providing potable water and sewage collection services to the Spring Valley Lake area, an unincorporated community located southeast of the City of Victorville. CSA 64 is situated along the upper reaches of the Mojave River in the Victor Valley High Desert Region of San Bernardino County.

CSA 64 is populated by the Spring Valley Lake community between Victorville and Apple Valley. Elevations within CSA 64 vary from 2,900 feet in the southwesterly portion to 2,780 feet in the northeasterly portion. The County’s key planning objectives include responsible growth for its rural, suburban, agricultural, commercial, and industrial land uses, paired with economic development that attracts and maintains quality business and industry while being beneficial to its residents.

CSA 64’s water supply is sourced almost entirely from groundwater pumped from the Mojave River Groundwater Basin. Ensuring an adequate and reliable water supply for current and future customers is fundamental to the County’s mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), CSA 64 supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on CSA 64-specific system characteristics, demands, demand management measures, and reliability.

8.1.1 Background and Purpose

CSA 64 has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.⁶¹ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter presents CSA 64’s evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the CSA 64 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory guidance issued since 2020 by the California Department of Water Resources (DWR)

⁶¹ California Water Code Sections 10610 through 10657.

pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

8.1.2 Basis for Plan Preparation

CSA 64 operates a Public Water System as described in California Health and Safety Code Section 116275. CSA 64 is also classified as an Urban Water Supplier pursuant to CWC Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which CSA 64 and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively. Details of CSA 64’s Public Water System are provided in **Table 8-1**.⁶²

TABLE 8-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610121	CSA 64	~4,037

8.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies and regional analyses. CSA 64 actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and CSA 64-specific operations.

As required by the UWMPA, CSA 64 coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

⁶² Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

Consistent with CWC Section 10641, CSA 64 encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

8.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

8.1.4 RUWMP Adoption

CSA 64 held a public hearing regarding the 2025 RUWMP on June 23, 2026. Before the hearing, CSA 64 made a draft of the 2025 RUWMP available for public inspection at 385 North Arrowhead Avenue, San Bernardino, CA 92415, and posted on CSA 64's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

CSA 64's elected body adopted this 2025 RUWMP on June 23, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the County's website.

CSA 64 plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- "FINAL Submittal 2025 UWMP Tables – CSA 64 – 06.01.2026.xls"
- "Appendix F 2025 Checklist – CSA 64 – 06.01.2026.xls"

8.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 8.2 Water Service and System Description
- Sub-Chapter 8.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 8.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 8.5 Water Use Characterization
- Sub-Chapter 8.6 Water Conservation and Shortage Response
- Sub-Chapter 8.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 8.8 Energy Intensity Analysis

Sub-Chapter 8.2 – Water Service and System Description

CSA 64 provides potable water service to the residents and businesses within its service area, depicted in **Figure 8-1**, which largely coincides with the community of Spring Valley Lake.

Water service in CSA 64 relies entirely on groundwater extracted from wells located throughout the service area. The CSA manages five active wells that tap into local aquifers to provide the community's water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the CSA's three reservoirs, which collectively provide nearly three million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

CSA 64's water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes approximately 41 miles of distribution and transmission mains, one booster station, and thousands of service connections. **Table 8-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the CSA's customer base. The County also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

FIGURE 8-1: CSA 64's SERVICE AREA

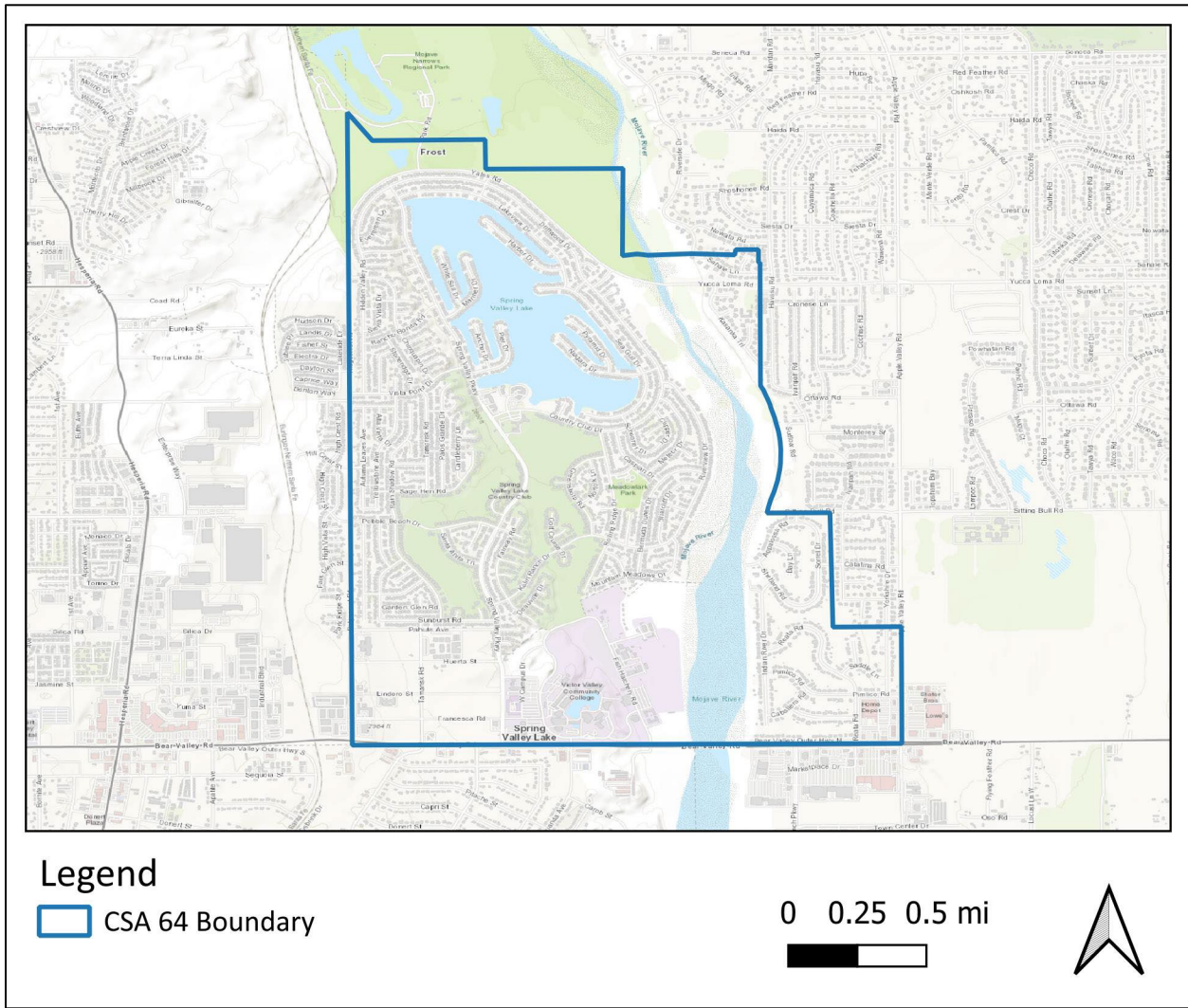


TABLE 8-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	3,904	3,923	3,943	9,954	3,941
Multi-Family Residential	3	3	3	3	3
Commercial/Institutional	52	51	51	51	54
Landscape Irrigation	8	8	8	8	32
Other	0	0	0	0	0
Total	3,967	3,985	4,005	4,016	4,030

8.2.1 Service Area Climate

Located in California’s Mojave Basin Area, CSA 64’s service area experiences the climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and pronounced diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 8.17 inches, occurring primarily as rainfall between December and March. Precipitation generally tapers off by May. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. Although snowfall is rare, winter snowfall averages four inches annually. The annual average temperature is approximately 60 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, CSA 64’s service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of the RUWMP Planning Area’s climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

8.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on CSA 64’s water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 8.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area’s economic, social, and demographic trends provide valuable insight into water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

8.3.1 Current Population and Historic Trends

Population estimates for the CSA are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA’s Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study’s development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for CSA 64 reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

CSA 64 serves the community of Spring Valley Lake. Situated between the City of Victorville and Town of Apple Valley, the suburban enclave is characterized by single-family residential

homes arranged around the approximately 200-acre man-made lake. The master planned residential community has steadily grown, with residential densities generally higher than surrounding rural High Desert communities. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 8-3 presents the CSA’s historical population while **Table 8-4** presents the CSA’s population growth over the last decade.

TABLE 8-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
5,353	7,595	9,075	10,907	11,244	11,691

TABLE 8-4: POPULATION GROWTH RATE 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	10,907	10,998	11,077	11,151	11,212	11,244	11,333	11,423	11,512	11,602
Growth Rate		0.83%	0.72%	0.67%	0.55%	0.29%	0.79%	0.79%	0.78%	0.78%

8.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

CSA 64 is characterized by its master planned Spring Valley Lake residential community. With higher residential densities, the CSA is largely built out, with limited capacity for additional developments. This is reflected in the regionally refined UCR Study where the population was projected to only increase by 2,500 between 2020 and 2065. By 2065, CSA 64’s population is projected to reach 13,700, but the annual growth rate over the 45-year period is only 0.49%.

More broadly, incorporated areas served by municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 8-5 presents the CSA’s projected population and associated growth rates through 2060.

TABLE 8-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
CSA 64	11,691	12,099	12,390	12,646	12,884	13,103	13,304	13,490
Growth Rate		3.49%	2.41%	2.07%	1.88%	1.70%	1.53%	1.40%

8.3.3 Current and Projected Land Use

Land use in CSA 64 is largely residential and approaching built-out conditions. Comprised primarily of single-family residential homes arranged around Spring Valley Lake, the community is effectively a residential enclave situated between two incorporated cities. Commercial uses are limited and located outside the community’s gates, further reflecting the community’s emphasis on a residential character. Accordingly, residential land uses represent the largest share of developed land and account for the majority of potable water demand, as discussed further in *Sub-Chapter 8.5 – Water Use Characterization*.

8.3.4 Economic Trends & Other Social and Demographic Factors

Spring Valley Lake is a residential focused community. Economically, households served by the CSA tend to exhibit higher incomes and higher home values. Employment patterns also mirror regional trends, where many residents commute to jobs in neighboring Victorville or the broader Inland Empire. The higher home values found in the CSA generally skew towards older and more affluent households. Aside from these attributes, the CSA shares many of the economic, social, and demographic factors within the broader RUWMP Planning Area. Broader regional economic conditions that influence growth within the CSA are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 8.4 – Water Supply and Infrastructure Characterization

The CSA sources its water supplies primarily from groundwater. Through a municipal network of five active wells, the CSA pumps groundwater from the underlying Alto Subarea of the Mojave Basin Area. As discussed in *Regional Chapter 3 – Regional Water Supply Characterization*, the Mojave Basin Area (MBA) is an adjudicated basin administered by a court-appointed Watermaster. The aforementioned regional chapter describes the MBA’s water supplies and related management structures and details. Generally, the CSA pumps groundwater that is recharged and managed by MWA.

8.4.1 Groundwater

Groundwater is the primary water supply source for all urban retail water suppliers within the MBA. CSA 64, like many of MWA’s other retail agencies, pumps groundwater from the adjudicated MBA, specifically the Alto Subarea. The basin is recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Sub-Chapter 3.1.1 Mojave Region Water Supply Sources of Regional Chapter 3 – Regional Water Supply Characterization*.

8.4.1.1 CSA 64’s Free Production Allowance

Under the Judgment governing the MBA, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The CSA’s FPA is based on historical production coupled with evaluation of groundwater conditions, as administered by MWA in its role as the Watermaster.

The CSA’s FPA changes over time as the Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the MBA. The CSA’s FPA has continued to be significantly reduced as a percentage of the Base Annual Production (BAP) number. CSA 64’s BAP is tracked as one entry in the Watermaster’s annual report as: “San Bernardino County Service Area 64”. CSA 64’s BAP in water year 2025 was 3,822 acre-feet per year. The current 50.4% FPA of this source is 1,927 acre-feet. **Table 8-6**

presents the CSA’s FPA for the most recent five-year period pursuant to the MBA Judgment. Detailed discussion of the adjudication framework and administration of production allowances is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

TABLE 8-6: LAST FIVE YEARS OF CSA 64’s FPA SUPPLY (AFY)

Year	Base Annual Production	Percent FPA	FPA Supply
2021	3,822	55%	2,102
2022	3,822	50%	1,911
2023	3,822	53.3%	2,037
2024	3,822	50.4%	1,926
2025	3,822	50.4%	1,926

The 50.4% FPA represents a reduction that aligns with the long-term Production Safe Yield considered by the Watermaster. Accordingly, the CSA’s projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at 50.4% as shown in **Table 8-7**.

TABLE 8-7: PROJECTED MOJAVE ADJUDICATION FPA FOR THE CSA THROUGH 2030 (AFY)

Year Type		Projected FPA
Normal		1,926
Single Dry-Year		1,926
Multi-Year Drought	2026 (1 st Year)	1,926
	2027 (2 nd Year)	1,926
	2028 (3 rd Year)	1,926
	2029 (4 th Year)	1,926
	2030 (5 th Year)	1,926

Although the Production Safe Yield of the MBA appears to be stabilizing in the Alto Subarea, out of an abundance of caution the future FPA has been reduced to 50% to address long-term water supply planning options. **Table 8-8** presents the CSA’s projected FPA in a normal year, single dry year, and five consecutive dry years from 2030 through 2050 at 50%.

TABLE 8-8: PROJECTED MOJAVE ADJUDICATION FPA FOR THE CSA THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		1,911	1,911	1,911	1,911	1,911
Single Dry-Year		1,911	1,911	1,911	1,911	1,911
Multi-Year Drought	Year 1	1,911	1,911	1,911	1,911	1,911
	Year 2	1,911	1,911	1,911	1,911	1,911
	Year 3	1,911	1,911	1,911	1,911	1,911
	Year 4	1,911	1,911	1,911	1,911	1,911
	Year 5	1,911	1,911	1,911	1,911	1,911

A summary of long-term reliability and other factors that will affect FPA such as hydrological and regulatory issues is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

8.4.1.2 Carryover Water Supplies

CSA 64 does not currently hold carryover water supplies as part of its overall water supply management in the Alto Subarea.⁶³ Although such supplies may become available in the future, they are not assumed to be available for purposes of this analysis and are therefore not included in the supply availability evaluation presented in this sub-chapter, in order to preserve a conservative assessment of water supply reliability.

8.4.1.3 Replacement and Make-up Water Supplies

The CSA has taken actions to augment its water supplies through the Watermaster’s water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed the CSA’s annual FPA from the Alto Subarea. Make-up water supplies, by contrast, are acquired to satisfy obligations under the Judgment to maintain flows from the Alto Subarea to downstream subareas when natural conditions and production patterns would otherwise result in a shortfall.

A detailed description of these programs, obligations, and administrative processes is provided in *Regional Chapter 3 – Water Supply Characterization*. **Table 8-9** summarizes the

⁶³ Water Year 2025 Watermaster Report, Appendix H.

quantities of replacement and make-up water supplied to the CSA during the most recent five-year period.

TABLE 8-9: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions ⁶⁴
2021	626
2022	507
2023	431
2024	722
2025	746

8.4.2 Groundwater Quality

Groundwater produced by the CSA is obtained from wells completed in the Mojave River Groundwater Basin and is treated as necessary to meet all applicable federal and state drinking water standards prior to delivery to customers. Water quality within the basin is influenced by natural hydrogeologic conditions as well as localized land use and recharge patterns. The CSA routinely monitors groundwater quality in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the CSA’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The CSA’s most recent CCR is available through the CSA’s website and provides the most current information on potable water quality conditions.⁶⁵

While this section focuses on groundwater quality as it pertains to the CSA’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including

⁶⁴ Water Acquisitions calculated as (Verified Production – Base FPA) + Makeup Water Obligation

⁶⁵ CSA 64 2024 CCR available at: https://specialdistricts.sbcounty.gov/wp-content/uploads/sites/54/64_2024_Final.pdf

basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 8-10 presents a summary of groundwater quality constituents based on information reported in the CSA’s 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

TABLE 8-10: CSA 64's POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Lead (ppb)	0.2	15	N/A	ND
Copper (ppm)	0.3	1.3	N/A	0.05
Total Coliform (# of positive samples)	0	1	N/A	0
Fecal Coliform or E. Coli (# of positive samples)	0	0	N/A	0
E.Coli (# of positive samples)	0	0	N/A	0
Uranium (pCi/L)	0	15	1.4	1.4
Gross Alpha (pCi/L)	0	15	3.5	3.5
Radium-228 (pCi/L)	0	5	2.18	2.18
Nitrate as N (ppm)	10	10	.61-2.6	1.43
Fluoride (ppm)	1	2	0.24	0.24
Perchlorate (ug/L)	1	6	1.1	1.1
Hexavalent Chromium (ppb)	0.02	10	ND-1.6	0.54
Secondary Standards				
Odor Threshold (Units)	N/A	3	ND-2	0.12
Chloride (ppm)	N/A	500	19	19
Specific Conductance (umhos/cm)	N/A	1,600	290	290
Total Dissolved Solids/TDS (ppm)	N/A	1,000	160	160
Sulfate (ppm)	N/A	500	14	14
Federal Unregulated Contaminates				
pH (Lab)	N/A	N/A	8.3	8.3
Aggressive Index	N/A	N/A	12.07	12.07
Alkalinity, Total (as CaCO ₃) (mg/L)	N/A	N/A	79	79
Bicarbonate (HCO ₃) (mg/L)	N/A	N/A	97	97
Hardness, Total (as CaCO ₃) (mg/L)	N/A	N/A	88	88
Calcium (Ca) (mg/L)	N/A	N/A	30	30
Magnesium (Mg) (mg/L)	N/A	N/A	3.4	3.4
Potassium (K) (mg/L)	N/A	N/A	1.1	1.1
Sodium (Na) (mg/L)	N/A	N/A	22	22
Total Anions (meq/L)	N/A	N/A	2.6	2.6
Total Cations (meq/L)	N/A	N/A	2.8	2.8

8.4.3 Recycled Water Supplies

CSA 64 does not currently utilize recycled water as a water supply source and does not have the infrastructure necessary to do so. Implementation of recycled water within the CSA 64 service area would require construction of conveyance and distribution facilities to access recycled water from regional sources, such as the Victor Valley Wastewater Reclamation Authority (VWVRA) or subregional water reclamation facilities. At this time, CSA 64 has no plans to develop or utilize recycled water supplies.

8.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the CSA due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the CSA has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

8.4.5 Water Transfers and Exchanges

CSA 64 does not currently participate in water transfers or exchanges, including transfers of BAP or FPA within the Alto Subarea. The CSA's water supply portfolio is primarily managed through groundwater production in accordance with the MBA adjudication, supplemented through the purchase of replacement and make-up water. While transfer and exchanges may represent a potential mechanism to augment supplies under certain conditions, CSA 64 does not rely on such activities as part of its current or projected water supply strategy. Accordingly, no water supplies associated with transfers or exchanges are assumed in the analyses presented in this sub-chapter.

8.4.6 Supply Summary

Groundwater serves as the CSA's principal water supply source. These supplies, pumped from the Alto Subarea of the MBA, are generally sufficient to meet existing and future demands. The CSA's water supplies are aggregated into the historically managed groundwater system. Managed groundwater consists of supplies provided through the MBA, including make-up and replacement supplies as well as transfers and exchanges among producers. Under the MBA Judgment, producers in the Alto Subarea are able to meet their water supply requirements through production from the basin's managed groundwater system. This system incorporates the natural yield of the basin along with supplies made available through regional management actions, including imported water recharge managed by MWA, conservation, water reuse, and transfers of FPA among producers. Consistent with this framework, the CSA's total managed groundwater production for the historical period

represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 8-11**.

TABLE 8-11: CSA 64’s MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	2,793
2022	2,677
2023	2,561
2024	2,597
2025	2,666

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 8.5 – Water Use Characterization*. Within the adjudicated MBA management framework, the CSA’s groundwater production adjusts to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 8-12** and **Table 8-13**.⁶⁶

TABLE 8-12: CSA 64’s PROJECTED MANAGED GROUNDWATER SUPPLY 2026-2030 (AFY)

Year Type		Managed Groundwater Production
Normal		2,740
Single Dry-Year		2,740
Multi-Year Drought	2026 (1 st Year)	2,740
	2027 (2 nd Year)	2,755
	2028 (3 rd Year)	2,770
	2029 (4 th Year)	2,785
	2030 (5 th Year)	2,795

⁶⁶ The values presented in **Table 8-12** and **Table 8-13** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 8.5 Water Use Characterization*.

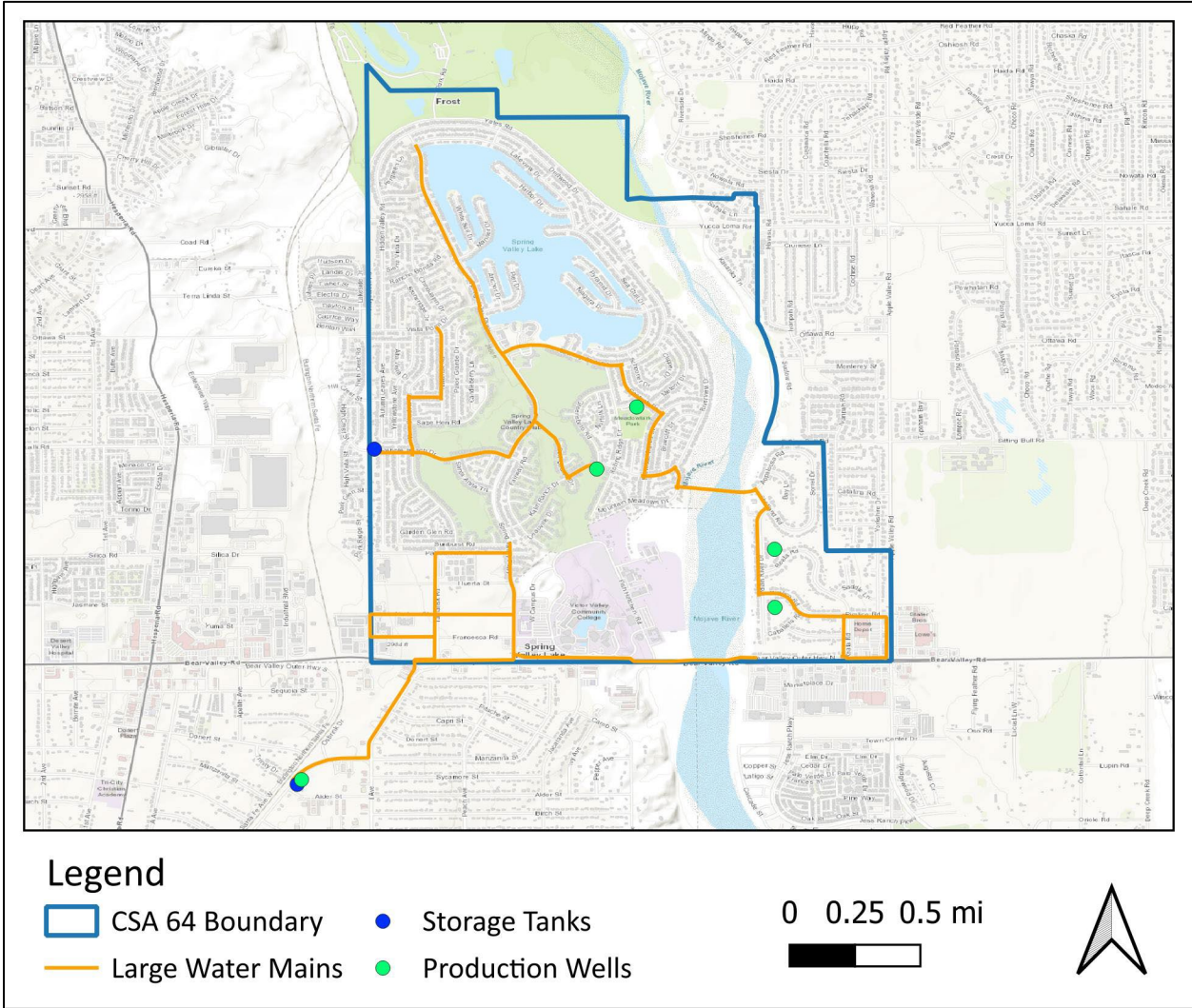
TABLE 8-13: CSA 64's PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		2,795	2,850	2,895	2,935	2,975
Single Dry-Year		2,795	2,850	2,895	2,935	2,975
Multi-Year Drought	Year 1	2,795	2,850	2,895	2,935	2,975
	Year 2	2,805	2,860	2,905	2,945	2,985
	Year 3	2,820	2,865	2,910	2,955	2,990
	Year 4	2,830	2,875	2,920	2,960	3,000
	Year 5	2,840	2,885	2,930	2,970	3,005

8.4.7 Delivery System Details

The CSA’s potable water system conveys groundwater produced from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the CSA’s storage reservoirs, which collectively provide approximately three million gallons of storage before being distributed through the pressurized potable water system. The distribution system consists of more than 41 miles of pipeline, and approximately 4,037 service connections. The CSA’s potable water distribution system is shown in **Figure 8-2**.

FIGURE 8-2: POTABLE WATER SYSTEM



Sub-Chapter 8.5 – Water Use Characterization

Understanding water use characteristics is essential for the CSA to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the CSA’s retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the CSA’s past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1.2 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the CSA’s water supplies, presented in *Sub-Chapter 8.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 8.7 – Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the CSA’s 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the CSA’s residential and non-residential customers for 2022 through 2025 as well as distribution system losses for this same period.

- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the CSA’s UWUO, comparison to the CSA’s actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the CSA’s 2020 GPCD target.
- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the CSA’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the CSA should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the CSA’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

8.5.1 Current Customer Water Use

As described in *Sub-Chapter 8.2 – Water Service and System Description*, the CSA provides water service to approximately 4,037 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the CSA and treated to meet all applicable state and federal drinking water standards. Information regarding the CSA’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provide the basis for determining the CSA’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

8.5.1.1 Customer Water Use 2022 – 2025

Recent customer water use data assists the CSA in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The CSA is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The CSA records potable water use within four primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional

- Irrigation

Table 8-14 presents the CSA's past customer potable water use by customer classification for 2022-2025 in acre-feet.

TABLE 8-14: POTABLE CUSTOMER USE 2022-2025 (AF)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2022	140	109	125	129	152	180	225	270	275	240	192	148	2,185
	2023	109	100	99	81	131	193	198	228	237	207	175	148	1,907
	2024	139	99	104	98	124	183	223	259	252	233	212	160	2,086
	2025	141	104	117	135	157	178	224	242	241	226	193	152	2,110
Multi-Family Residential ⁶⁷	2022	0	0	0	1	0	1	0	1	0	1	0	1	5
	2023	0	0	0	0	0	1	0	1	0	1	0	1	4
	2024	0	1	0	1	0	1	0	1	0	1	0	1	5
	2025	0	0	0	0	0	1	0	1	0	1	0	1	5
Commercial Institutional	2022	9	10	9	13	15	18	20	27	24	29	18	16	208
	2023	8	10	5	10	12	24	15	28	24	28	14	18	195
	2024	10	10	5	12	10	20	21	30	22	26	18	19	204
	2025	10	12	12	24	14	24	20	33	19	27	17	18	228
Landscape Irrigation	2022	2	6	1	11	2	25	4	37	6	27	4	9	133
	2023	1	3	2	6	3	35	5	40	7	38	5	16	160
	2024	4	3	3	15	3	34	5	53	7	38	6	15	185
	2025	4	7	4	9	1	25	6	37	3	34	5	13	148
Other	2022	-	-	-	-	-	-	-	-	-	-	-	-	0
	2023	-	-	-	-	-	-	-	-	-	-	-	-	0
	2024	-	-	-	-	-	-	-	-	-	-	-	-	0
	2025	-	-	-	-	-	-	-	-	-	-	-	-	0
Total Metered Deliveries	2022	151	126	135	153	169	223	249	336	305	296	213	174	2,532
	2023	118	114	106	96	146	254	218	297	268	273	194	182	2,266
	2024	152	113	111	125	137	239	249	343	281	298	236	195	2,479
	2025	154	123	133	168	173	228	250	312	263	289	215	184	2,491

⁶⁷ Monthly values are rounded to the nearest whole acre-foot. Accordingly, the sum of displayed monthly values may differ from the annual total.

The single-family residential and multi-family residential classifications continue to represent the primary components of the CSA’s water service, accounting for approximately 85% of the CSA’s annual potable water demand. When compared to previous use data, these water use characteristics have remained relatively consistent throughout the last 10 years, reflecting the CSA’s predominantly residential service area and the continued prevalence of low-density single-family housing.

8.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the CSA’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the CSA has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA). An electronic copy of the audit in Excel format is to be submitted to DWR by October 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the CSA shall assess compliance every three years as an average of recent losses. Additionally, the CSA will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 8-15** summarizes the CSA’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 8-15: DISTRIBUTION SYSTEM LOSS 2021-2024

2021	2022	2023	2024
11.7%	7.9%	4.4%	11.1%
Average:			8.8%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. On average, however, the CSA’s distribution system loss represents about 8.8% of water entering the system.

8.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the CSA was developed using information submitted as part of the CSA’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 18.0 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 3.0%. Using the information from the same period, the average “apparent” water loss averaged 1.3% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 13.8%, although recent AWWA audits discussed above show losses closer to 9%.

8.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the CSA’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

8.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the CSA to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the CSA to measure progress on achieving water efficiency goals.

The CSA’s 2020 GPCD target was established in the 2020 UWMP as 269 GPCD, derived as the “gross water use” divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The CSA’s calculation of their actual 2020 GPCD used the same methodology: “Gross water” was defined as total water production measured and reported based upon well production records. This value, divided by the CSA’s estimated population in 2020, resulted in a compliance value of 214 GPCD. Because this value was less than the CSA’s established target, the CSA was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the CSA was determined to have an actual GPCD of 208, calculated using the same methodology presented above.

8.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. The CSA submitted required annual reports to the SWRCB in 2024 and 2025.

8.5.3 Forecasting Customer Use

Future water use within the CSA's service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the CSA's future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the CSA, are presented in the following subsections and corresponding tables.

8.5.3.1 Existing Customer Future Use

Future water use associated with the CSA's existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 8.5.2.1*, the CSA's current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water

production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the CSA has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the CSA’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the CSA’s existing customer demand is projected to remain at approximately 2,724 acre-feet per year, based on a representative GPCD of 208, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the CSA’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

8.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the CSA’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the CSA’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the CSA, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 78 GPCD
- Total Non-Residential Use: 40 GPCD
- Total Use: 165 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are

assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the CSA’s representative loss percentage has been applied to new customer demand projections.

Table 8-16 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the CSA’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 8.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 8-16: FORECAST FUTURE WATER USE (AFY)

2025	2030	2035	2040	2045	2050
2,725	2,795	2,850	2,895	2,935	2,975

8.5.3.3 Adjusting Water Use Forecasts for Single Dry and Multiple Dry Conditions

The water use forecast presented in **Table 8-16** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions.

Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 8-16** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.⁶⁸

⁶⁸ California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

8.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The CSA will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

8.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the CSA’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related, but distinct analyses required under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the CSA’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

8.5.4.1 Forecasting Water Use for DRA and Annual Assessment

The DRA requires the CSA to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the CSA’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the CSA’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the CSA’s long-term water use forecast developed for the 2025 RUWMP and the CSA’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the CSA’s evaluation of water supply reliability across planning timeframes.

Table 8-17 presents the CSA’s projected unconstrained water demands for the DRA period (2026–2030), with values rounded to the nearest five acre-feet. These values form the basis for the reliability analysis presented in *Sub-Chapter 8.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 8-17: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
2,740	2,755	2,770	2,785	2,800

8.5.4.2 Projecting Water Use for Annual Assessments

The CSA conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The CSA has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

8.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. Based on available demographic data, the CSA’s service area does not include lower income households as defined by these criteria.⁶⁹ Accordingly, the water use forecast presented in **Table 8-16** does not include a separate component for lower income household water use.

⁶⁹ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 8.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the CSA's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The CSA has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the CSA's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the CSA evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the CSA's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the CSA's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 8a.

8.6.1 Demand Management Measures

The CSA has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The CSA is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the CSA leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The CSA will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

8.6.1.1 Foundational Demand Management Measures

CSA 64’s foundational DMMs consist of established policies, programs, and operational practices that support efficient water use and long-term system reliability. These measures are consistent with the framework presented in the CSA’s 2020 UWMP and reflect the characteristics of the service area, which is predominantly residential and largely built out.

Water Waste Prevention Ordinances

The CSA enforces water waste prevention requirements through County ordinances and operational policies that prohibit inefficient water use practices, including excess runoff, irrigation during inappropriate times, and other avoidable losses. These requirements establish the regulatory framework for reducing unnecessary water use and are implemented through monitoring, customer communication, and enforcement actions as necessary.

Metering

All potable water service connections within the CSA are metered. Metering enables accurate measurement of customer water use, supports volumetric billing, and provides the data necessary for system monitoring, demand forecasting, and regulatory reporting. Meters are read on a bi-monthly basis, and customers are billed accordingly. This approach ensures that water use is directly tied to consumption and supports customer awareness of water use patterns.

Conservation Pricing

The CSA utilizes a three-tiered metered rate structure designed to promote efficient water use. The rate structure includes a fixed facility charge based on meter size and a volumetric charge that increases with higher levels of water use. The structure is applied across customer classes and serves as a primary mechanism for encouraging efficient water use within the CSA’s service area.

Public Education and Outreach

The CSA implements public education and outreach programs to promote water conservation and inform customers about efficient water use practices. These efforts include coordination with regional partners, such as participation in the AWAC, which provides consistent conservation messaging across MWA’s service area. Public outreach activities include the distribution of conservation materials, customer communication regarding water use practices, and participation in community and school-based education efforts where applicable. These programs are designed to increase awareness of water use efficiency and support long-term behavioral changes among customers.

Programs to Assess and Manage Distribution System Losses

The CSA conducts ongoing operational and maintenance activities to assess and manage real water losses within the distribution system. These efforts include routine system inspections, leak detection, infrastructure maintenance, and timely repair of identified issues.

Conservation Program Coordination and Staffing Support

The CSA implements its DMMs through County staff and coordination with regional partners. Participation in regional conservation programs allows the CSA to leverage shared resources, technical expertise, and outreach materials.

8.6.1.2 Recent DMM Activities

In recent years, the CSA has continued to implement targeted conservation programs through its customer rebate program, with a focus on improving indoor and outdoor water use efficiency. From 2021 through 2025, the CSA offered rebates for high-efficiency plumbing fixtures, including toilets, showerheads, and faucets, as well as weather-based irrigation controllers. Over this period, high-efficiency toilet replacements represented the most widely utilized measure. These programs are administered by the CSA in coordination with regional partners and reflect a continued emphasis on cost-effective, customer-driven actions that reduce water use. Collectively, these rebate programs complement the CSA’s foundational demand management measures by directly reducing both indoor and outdoor water demand and supporting long-term water use efficiency objectives.

8.6.1.3 Planned DMM Activities

At this time, the CSA does not anticipate implementing new demand management programs beyond those currently in place. The CSA’s existing DMMs provide a comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. The CSA remains committed to efficient and responsible use of water resources and will continue to evaluate opportunities to enhance existing programs, incorporate new technologies, and improve program effectiveness over time. This includes ongoing efforts to reduce system losses, expand metering and data capabilities, and support customer awareness and

conservation practices. Consistent with applicable State requirements, including UWUO provisions, the CSA will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

8.6.2 Water Shortage Contingency Plan

The CSA has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the CSA can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the CSA may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the CSA’s Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the CSA’s WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

8.6.2.1 Summary of Water Shortage Levels and Response Actions

The CSA 64 WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the CSA to implement proportional measures to manage water use and maintain essential public health and safety services during periods of reduced supply.

While the CWC defines six standardized shortage levels, the CSA utilizes a four-stage shortage framework that is cross-referenced to the State’s standard levels for consistency. The CSA shortage levels are associated with progressively higher demand reduction targets and increasingly restrictive response actions as conditions intensify. The general framework of shortage levels and representative response actions is summarized below:

- Stage 1 – Up to 10% Shortage (Drought Watch):

Increased public awareness and voluntary conservation measures, including expanded outreach, water use surveys, system efficiency actions, and initial limitations on outdoor irrigation practices.

- Stage 2 – Up to 40% Shortage (Drought Alert):

Implementation of additional conservation measures and mandatory water use restrictions, including expanded irrigation limitations, prohibitions on non-essential water uses, leak repair requirements, and enhanced participation in rebate and efficiency programs.

- Stage 3 – Up to 50% Shortage (Drought Critical Condition):

Expansion of mandatory restrictions, including further reductions in irrigation frequency, increased enforcement, restrictions on vehicle washing and decorative water features, and intensified conservation and monitoring efforts.

- Stage 4 – Greater than 50% Shortage (Drought Emergency):

Implementation of emergency response measures necessary to protect public health and safety, including significant restrictions on outdoor water use, potential moratoriums on new connections, increased system monitoring, and other actions as determined by the CSA.

Response actions are implemented cumulatively, such that measures adopted at lower shortage levels remain in effect as higher levels are enacted. As water supply conditions change, the CSA may transition between water shortage levels based on ongoing evaluation of supply availability, customer demand, infrastructure conditions, and applicable State requirements. Additional detail regarding specific shortage levels, response actions, and implementation procedures is provided in the CSA's WSCP.

8.6.2.2 Summary of Monitoring Procedures and Implementation

CSA 64's WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. CSA 64 monitors key indicators of water supply reliability, including groundwater conditions in the Alto Subarea, production capacity, customer demand, infrastructure constraints, and applicable State mandates. This information is used to evaluate supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The CSA's Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term water supply reliability and determining whether a water shortage level should be implemented. Additional detail regarding the Annual Assessment is provided in *Subsection 8.5.4 of Sub-Chapter 8.5 – Water Use Characterization*. Implementation of the

WSCP includes coordination among County staff and communication with customers, local agencies, and regional partners. When a water shortage stage is implemented, the CSA provides public notification of applicable conservation measures and restrictions. Water use is monitored through metered consumption and production data to evaluate the effectiveness of response actions and ensure demand reduction targets are achieved.

Sub-Chapter 8.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the CSA's water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 8.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 8.5 – Water Use Characterization* to assess the CSA's ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the CSA's water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the CSA's capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the CSA's Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the CSA's water supply reliability and inform the implementation of the CSA's WSCP, as described in *Sub-Chapter 8.6 – Water Conservation and Shortage Response*.

8.7.1 Five Year Drought Risk Assessment

The DRA evaluates the CSA's ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the CSA's unconstrained demand forecast described in *Sub-Chapter 8.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the CSA's managed groundwater supplies, which include groundwater production, replacement water, and make-up water, as described in *Sub-Chapter 8.4 – Water Supply and Infrastructure Characterization*. Under the

terms of the MBA adjudication, the CSA has discretion in managing its groundwater production and associated supplemental supplies, allowing it to adjust its supply portfolio to meet projected demands during dry conditions.

The DRA compares projected water demands to available supplies to evaluate the CSA’s capacity to meet customer needs over the five-year period. **Table 8-18** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 8-18: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	2,740	2,755	2,770	2,785	2,795
Demand	2,740	2,755	2,770	2,785	2,795
Difference	0	0	0	0	0

8.7.2 Long-Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The CSA’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

8.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the CSA’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the CSA’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the CSA’s supplies are managed within the framework of the MBA adjudication, which provides flexibility in balancing groundwater production and supplemental supplies. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 8-19 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 8-19: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	2,795	2,850	2,895	2,935	2,975
Demand	2,795	2,850	2,895	2,935	2,975
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	2,795	2,850	2,895	2,935	2,975
Demand	2,795	2,850	2,895	2,935	2,975
Difference	0	0	0	0	0

8.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the CSA’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the CSA continues to manage its supplies within the framework of the MBA adjudication, which allows for flexibility in balancing groundwater production and supplemental supplies. This managed approach enables the CSA to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 8-20 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the CSA has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 8-20: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	2,795	2,850	2,895	2,935	2,975
	Demand	2,795	2,850	2,895	2,935	2,975
	Difference	0	0	0	0	0
Year 2	Supply	2,805	2,860	2,905	2,945	2,985
	Demand	2,805	2,860	2,905	2,945	2,985
	Difference	0	0	0	0	0
Year 3	Supply	2,820	2,865	2,910	2,955	2,990
	Demand	2,820	2,865	2,910	2,955	2,990
	Difference	0	0	0	0	0
Year 4	Supply	2,830	2,875	2,920	2,960	3,000
	Demand	2,830	2,875	2,920	2,960	3,000
	Difference	0	0	0	0	0
Year 5	Supply	2,840	2,885	2,930	2,970	3,005
	Demand	2,840	2,885	2,930	2,970	3,005
	Difference	0	0	0	0	0

8.7.3 Annual Reliability Assessment

Each year, the CSA considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the CSA’s Water Shortage Contingency Plan. The CSA has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

8.7.4 Water Supply Reliability Summary

The CSA's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 8.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the CSA evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The CSA’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the CSA’s service area, rather than long-distance conveyance or advanced treatment processes.

The CSA continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 8-21**.

TABLE 8-21: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR DEC 2024 THROUGH SEPT 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	2,259
Energy Consumed (kWh)	865,501
Energy Intensity (kWh/acre-foot)	383

CSA 64 APPENDICES

This page is reserved for CSA 64-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to CSA 64's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the CSA 64 retailer chapter, the CSA's WSCP, and applicable CSA-specific appendices.

Chapter 9.0 COUNTY SERVICE AREA

70J OAK HILLS



TABLE OF CONTENTS

Sub-Chapter 9.1 – Introduction.....	9-7
9.1.1 Background and Purpose.....	9-7
9.1.2 Basis for Plan Preparation	9-8
9.1.3 Coordination and Outreach.....	9-8
9.1.4 RUWMP Adoption	9-9
9.1.5 Document Organization	9-10
Sub-Chapter 9.2 – Water Service and System Description	9-11
9.2.1 Service Area Climate.....	9-13
Sub-Chapter 9.3 – Population, Land Use, Economy, and Demographics	9-14
9.3.1 Current Population and Historic Trends	9-14
9.3.2 Projected Population	9-15
9.3.3 Current and Projected Land Use.....	9-16
9.3.4 Economic Trends & Other Social and Demographic Factors.....	9-16
Sub-Chapter 9.4 – Water Supply and Infrastructure Characterization.....	9-17
9.4.1 Groundwater.....	9-17
9.4.2 Groundwater Quality.....	9-20
9.4.3 Recycled Water Supplies.....	9-23
9.4.4 Desalination Opportunities	9-23
9.4.5 Water Transfers and Exchanges	9-23
9.4.6 Supply Summary	9-23
9.4.7 Delivery System Details	9-25
Sub-Chapter 9.5 – Water Use Characterization.....	9-26
9.5.1 Current Customer Water Use	9-27
9.5.2 Compliance with Water Use Targets and Objectives.....	9-31
9.5.3 Forecasting Customer Use	9-32
9.5.4 Forecasting Water Use for DRA and Annual Assessment.....	9-35
9.5.5 Projecting Disadvantaged Community Water Use	9-37
Sub-Chapter 9.6 – Water Conservation and Shortage Response	9-38
9.6.1 Demand Management Measures	9-38

9.6.2 Water Shortage Contingency Plan9-41

Sub-Chapter 9.7 – Water System Reliability and Drought Risk Assessment9-44

9.7.1 Five Year Drought Risk Assessment9-44

9.7.2 Long Term Service Reliability9-45

9.7.3 Annual Reliability Assessment9-47

9.7.4 Water Supply Reliability Summary9-47

Sub-Chapter 9.8 – Energy Intensity Analysis9-48

LIST OF TABLES

Table 9-1: Public Water System Information.....	9-8
Table 9-2: Customer Water Service Connections.....	9-12
Table 9-3: Historical population.....	9-15
Table 9-4: Population Growth Rate 2015-2024.....	9-15
Table 9-5: Population Forecast and Growth Rate.....	9-16
Table 9-6: Last Five Years of CSA 70J’s FPA Supply (AFY)	9-18
Table 9-7: Projected Mojave Adjudication FPA for the CSA through 2030 (AFY)	9-18
Table 9-8: Projected Mojave Adjudication FPA for the CSA through 2050 (AFY).....	9-19
Table 9-9: Last Five Years of Replacement and Make-up Water Supplies (AFY)	9-20
Table 9-10: CSA 70J’s Potable Water Quality	9-22
Table 9-11: CSA 70J’s Managed Groundwater Production 2021-2025 (AFY).....	9-24
Table 9-12: CSA 70J’s Projected Managed Groundwater Supply 2026-2030 (AFY).....	9-24
Table 9-13: CSA 70J’s Projected Managed Groundwater Supply Through 2050 (AFY).....	9-25
Table 9-14: Potable Customer Use 2022-2025 (values in Acre-Feet)	9-29
Table 9-15: Distribution System Loss 2021-2024	9-30
Table 9-16: Forecast Future Water Use (AFY).....	9-34
Table 9-17: Forecast DRA Water Use for 2026 through 2030 (AFY).....	9-37
Table 9-18: Five Year Drought Risk Assessment (AFY).....	9-45
Table 9-19: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY).....	9-46
Table 9-20: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY).....	9-47
Table 9-21: Energy Intensity – Total Utility Approach for Dec 2024 Through Jan 2025.....	9-48

LIST OF FIGURES

Figure 9-1: CSA 70J's Service Area 9-12

APPENDICES

CSA 70J Appendices 9-49



Sub-Chapter 9.1 – Introduction

San Bernardino County Department of Public Works, Special Districts County Service Area 70 Zone J Oak Hills (CSA 70J) is a special services district governed by the San Bernardino County Board of Supervisors and responsible for providing potable water and sewage collection services to the unincorporated community of Oak Hills. CSA 70J is situated in the Victor Valley High Desert Region and is bordered by the City of Hesperia to the east, the unincorporated community of Phelan to the west, the City of Victorville to the north, and the unincorporated area of Summit Valley to the southwest.

CSA 70 J is located approximately 35 miles northwest of the City of San Bernardino. Elevations within CSA 70J vary from 4,260 feet in the southwesterly portion to 3,470 feet in the northeasterly portion. The County's key planning objectives include responsible growth for its rural, suburban, agricultural, commercial, and industrial land uses, paired with economic development that attracts and maintains quality business and industry while being beneficial to its residents.

CSA 70J's water supply is sourced entirely from pumped groundwater from the Mojave River Groundwater Basin. Ensuring an adequate and reliable water supply for current and future customers is fundamental to the County's mission. Through its participation in the 2025 Mojave RUWMP (2025 RUWMP), CSA 70J supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on CSA 70J-specific system characteristics, demands, demand management measures, and reliability.

9.1.1 Background and Purpose

CSA 70J has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.⁷⁰ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter presents CSA 70J's evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the CSA 70J 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory

⁷⁰ California Water Code Sections 10610 through 10657.

guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

9.1.2 Basis for Plan Preparation

CSA 70J operates a Public Water System as described in California Health and Safety Code Section 116275. CSA 70J is also classified as an Urban Water Supplier as described in CWC Section 10617, as it provides water for municipal purposes to more than 3,000 connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be met through participation in a RUWMP, which CSA 70J and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively. Details of CSA 70J’s Public Water System are provided in **Table 9-1**.⁷¹

TABLE 9-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610125	CSA 70J	~3,458

9.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies, and regional analyses. CSA 70J actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and CSA 70J-specific operations.

As required by the UWMPA, CSA 70J coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts,

⁷¹ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, CSA 70J encouraged the active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

9.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in Sub-Chapter 1.3 Coordination and Outreach of Regional Chapter 1 – Introduction.

9.1.4 RUWMP Adoption

CSA 70J held a public hearing regarding the 2025 RUWMP on June 23, 2026. Before the hearing, CSA 70J made a draft of the 2025 RUWMP available for public inspection at 385 North Arrowhead Avenue, San Bernardino, CA 92415, and on CSA 70J's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

CSA 70J's elected body adopted this 2025 RUWMP on June 23, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the County's website.

CSA 70J plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- "FINAL Submittal 2025 UWMP Tables – CSA 70J – 06.01.2026.xls"
- "Appendix F 2025 Checklist – CSA 70 J – 06.01.2026.xls"

9.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 9.2 Water Service and System Description
- Sub-Chapter 9.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 9.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 9.5 Water Use Characterization
- Sub-Chapter 9.6 Water Conservation and Shortage Response
- Sub-Chapter 9.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 9.8 Energy Intensity Analysis

Sub-Chapter 9.2 – Water Service and System Description

CSA 70J provides potable water service to the residents and businesses within its service area, depicted in **Figure 9-1**, which largely coincides with the Oak Hills unincorporated area and the southwestern portion of the City of Hesperia’s sphere of influence.

Water service in CSA relies entirely on groundwater extracted from wells located throughout the service area. The CSA manages five active wells that tap into local aquifers to provide the community’s water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of CSA 70J’s 12 reservoirs, which collectively provide nearly four million gallons of storage. These reservoirs, as well as two de-sanding tanks, help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

CSA 70J’s water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes approximately 154 miles of distribution and transmission mains, six booster stations, and thousands of service connections. **Table 9-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the CSA’s customer base. The County also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

FIGURE 9-1: CSA 70J’s SERVICE AREA

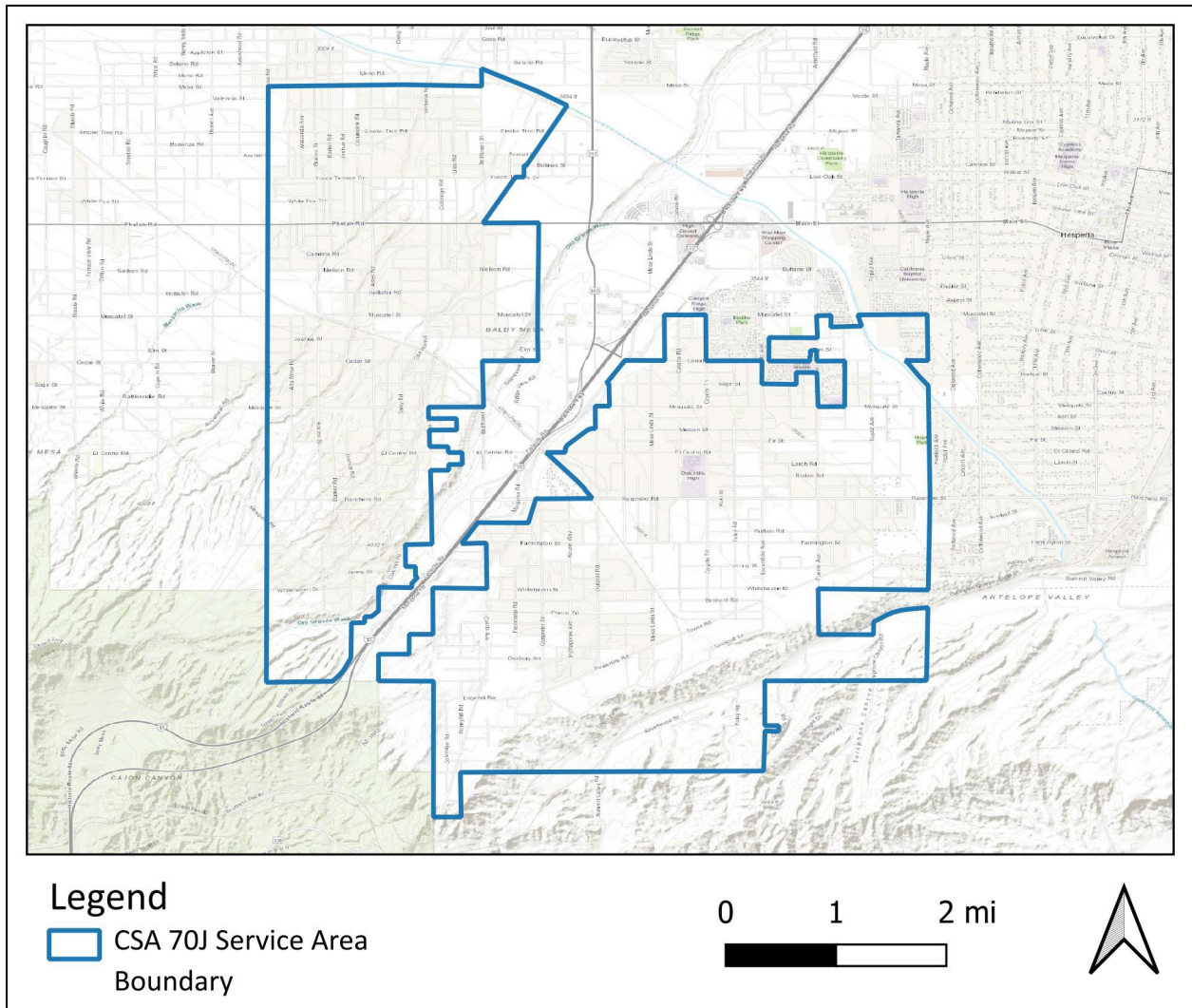


TABLE 9-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	3,314	3,356	3,374	3,409	3,430
Multi-Family Residential	1	1	1	1	1
Commercial/Industrial	28	26	25	24	26
Landscape Irrigation	0	0	0	0	1
Other	0	0	0	0	0
Total	3,343	3,383	3,400	3,434	3,458

9.2.1 Service Area Climate

Located in California’s Mojave Basin Area, CSA 70J’s service area experiences the climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and pronounced diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 8.17 inches, occurring primarily as rainfall between December and March. Precipitation generally tapers off by May. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. Although snowfall is rare, winter snowfall averages four inches annually. The annual average temperature is approximately 60 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, CSA 70J’s service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of the RUWMP Planning Area’s climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

9.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on CSA 70J’s water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 9.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area's economic, social, and demographic trends provide valuable insight into water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

9.3.1 Current Population and Historic Trends

Population estimates for the CSA are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA's Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study's development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for CSA 70J reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

CSA 70J serves the residential community of Oak Hills. Located in the High Desert, adjacent to the City of Hesperia, CSA 70J is an unincorporated community in San Bernardino County.

Compared to neighboring communities, CSA 70J is dominated by large, often multi-acre parcels, for single-family housing. Moreover, development has historically occurred incrementally rather than through large master-planned subdivisions, resulting in a dispersed pattern. These historical trends are likely to continue as CSA 70J experiences continued, albeit modest, growth in residential development. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 9-3 presents the CSA’s historical population while **Table 9-4** presents the CSA’s population growth over the last decade.

TABLE 9-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
3,328	5,652	9,467	9,851	10,162	10,356

TABLE 9-4: POPULATION GROWTH RATE 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	9,851	9,933	10,013	10,087	10,143	10,162	10,201	10,239	10,278	10,317
Growth Rate		0.83%	0.81%	0.74%	0.56%	0.19%	0.38%	0.37%	0.38%	0.38%

9.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

CSA 70J is dominated by low-density, single-family homes, often situated on multi-acre parcels. The projected population will be largely linked to the expansion of single-family homes as the rural community attracts more households. Population is projected to steadily increase over the planning horizon reflecting continued low-density residential development. By 2065, CSA 70J’s population is projected to reach 11,500, but the annual growth rate over the 45-year period is only 0.29%. More broadly, incorporated areas served by municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 9-5 presents the CSA’s projected population and associated growth rates through 2060.

TABLE 9-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
CSA 70J	10,356	10,554	10,721	10,876	11,021	11,153	11,275	11,387
Growth Rate		1.91%	1.58%	1.45%	1.33%	1.20%	1.09%	0.99%

9.3.3 Current and Projected Land Use

CSA 70J’s service area is predominantly residential, characterized by very low- to medium-density development consistent with a rural living environment. Land uses are primarily single-family residential, supplemented by a limited number of public facilities and small-scale commercial uses. The area is among the higher-value communities in Victor Valley, largely due to its multi-acre parcel configurations. Consistent with the modest population projected for the service area, future development is expected to remain limited and primarily residential in nature, reflecting continued incremental infill and low-density expansion.

9.3.4 Economic Trends & Other Social and Demographic Factors

CSA 70J is a primarily residential service area whose economic and demographic characteristics generally reflect broader Inland Empire trends. Employment patterns also mirror regional trends, where many residents commute to jobs in neighboring Victorville, Hesperia, and the greater Inland Empire. Population growth with the CSA is expected to remain modest, consistent with its historic development patterns and regional growth dynamics. Aside from these localized characteristics, the CSA shares many of the economic, social, and demographic conditions present across the RUWMP Planning Area. Broader regional economic conditions that influence growth within the CSA are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 9.4 – Water Supply and Infrastructure Characterization

The CSA sources its water supplies primarily from groundwater. Through a municipal network of five active wells, the CSA pumps groundwater from the underlying Alto Subarea of the Mojave Basin Area. As discussed in *Regional Chapter 3 – Regional Water Supply Characterization*, the Mojave Basin Area (MBA) is an adjudicated basin administered by a court-appointed Watermaster. The aforementioned regional chapter describes the MBA’s water supplies and related management structures and details. Generally, the CSA pumps groundwater that is recharged and managed by MWA.

9.4.1 Groundwater

Groundwater is the primary water supply source for all urban retail water suppliers within the MBA. CSA 70J, like many of MWA’s other retail agencies, pumps groundwater from the adjudicated MBA, specifically the Alto Subarea. The basin is recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Sub-Chapter 3.1.1 Mojave Region Water Supply Sources of Regional Chapter 3 – Regional Water Supply Characterization*.

9.4.1.1 CSA 70J’s Free Production Allowance

Under the Judgment governing the MBA, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The CSA’s FPA is based on historical production coupled with evaluation of groundwater conditions, as administered by MWA in its role as the Watermaster.

The CSA’s FPA changes over time as the Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the MBA. The CSA’s FPA has continued to be significantly reduced as a percentage of the Base Annual Production (BAP) number. CSA 70J’s BAP is tracked as one entry in the Watermaster’s annual report as: “San Bernardino County Service Area 70J”. CSA 70J’s BAP in water year 2025 was 1,015 acre-feet per year. The current 50.4% FPA of this source is 512 acre-feet. **Table 9-6**

presents the CSA’s FPA for the most recent five-year period pursuant to the MBA Judgment. Detailed discussion of the adjudication framework and administration of production allowances is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

TABLE 9-6: LAST FIVE YEARS OF CSA 70J’s FPA SUPPLY (AFY)

Year	Base Annual Production	Percent FPA	FPA Supply
2021	1,015	55%	558
2022	1,015	50%	508
2023	1,015	53.3%	541
2024	1,015	50.4%	512
2025	1,015	50.4%	512

The 50.4% FPA represents a reduction that aligns with the long-term Production Safe Yield considered by the Watermaster. Accordingly, the CSA’s projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at 50.4% as shown in **Table 9-7**.

TABLE 9-7: PROJECTED MOJAVE ADJUDICATION FPA FOR THE CSA THROUGH 2030 (AFY)

Year Type		Projected FPA
Normal		512
Single Dry-Year		512
Multi-Year Drought	2026 (1 st Year)	512
	2027 (2 nd Year)	512
	2028 (3 rd Year)	512
	2029 (4 th Year)	512
	2030 (5 th Year)	512

Although the Production Safe Yield of the MBA appears to be stabilizing in the Alto Subarea, out of an abundance of caution the future FPA has been reduced to 50% to address long-term water supply planning options. **Table 9-8** presents the CSA’s projected FPA in a normal year, single dry year, and five consecutive dry years from 2030 through 2050 at 50%.

TABLE 9-8: PROJECTED MOJAVE ADJUDICATION FPA FOR THE CSA THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		508	508	508	508	508
Single Dry-Year		508	508	508	508	508
Multi-Year Drought	Year 1	508	508	508	508	508
	Year 2	508	508	508	508	508
	Year 3	508	508	508	508	508
	Year 4	508	508	508	508	508
	Year 5	508	508	508	508	508

A summary of long-term reliability and other factors that will affect FPA such as hydrological and regulatory issues is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

9.4.1.2 Carryover Water Supplies

CSA 70J does not currently hold carryover water supplies as part of its overall water supply management in the Alto Subarea.⁷² Although such supplies may become available in the future, they are not assumed to be available for purposes of this analysis and are therefore not included in the supply availability evaluation presented in this sub-chapter, in order to preserve a conservative assessment of water supply reliability.

9.4.1.3 Replacement and Make-up Water Supplies

The CSA has taken actions to augment its water supplies through the Watermaster’s water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed the CSA’s annual FPA from the Alto Subarea. Make-up water supplies, by contrast, are acquired to satisfy obligations under the Judgment to maintain flows from the Alto Subarea to downstream subareas when natural conditions and production patterns would otherwise result in a shortfall.

A detailed description of these programs, obligations, and administrative processes is provided in *Regional Chapter 3 – Water Supply Characterization*. **Table 9-9** summarizes the

⁷² Water Year 2025 Watermaster Report, Appendix H.

quantities of replacement and make-up water supplied to the CSA during the most recent five-year period.

TABLE 9-9: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions ⁷³
2021	1,287
2022	1,184
2023	1,009
2024	1,264
2025	1,267

9.4.2 Groundwater Quality

Groundwater produced by the CSA is obtained from wells completed in the Mojave River Groundwater Basin and is treated as necessary to meet all applicable federal and state drinking water standards prior to delivery to customers. Water quality within the basin is influenced by natural hydrogeologic conditions as well as localized land use and recharge patterns. The CSA routinely monitors groundwater quality in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the CSA’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The CSA’s most recent CCR is available through the CSA’s website and provides the most current information on potable water quality conditions.⁷⁴

While this section focuses on groundwater quality as it pertains to the CSA’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including

⁷³ Water Acquisitions calculated as (Verified Production – Base FPA) + Makeup Water Obligation

⁷⁴ CSA 70J 2024 CCR available at: https://specialdistricts.sbcounty.gov/wp-content/uploads/sites/54/70J_2024_Final.pdf

basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 9-10 presents a summary of groundwater quality constituents based on information reported in the CSA’s 2024 CCR. The table reflects a subset of reported constituents and has been adopted for clarity and relevance to this UWMP.

TABLE 9-10: CSA 70J’s POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Lead (ppb)	0.2	15	N/A	ND
Copper (ppm)	0.3	1.3	N/A	ND
Total Coliform (# of positive samples)	0	1	N/A	0
Fecal Coliform or E. Coli (# of positive samples)	0	0	N/A	0
E.Coli (# of positive samples)	0	0	N/A	0
Nitrate as N (ppm)	10	10	1.7-2.7	2.29
Fluoride (ppm)	1	2	0.33-0.53	0.46
Arsenic (ppb)	0.004	10	4.0-5.4	4.85
Chromium – Total Cr (ppb)	(100)	50	ND-26	17.6
Hexavalent Chromium (ppb) ⁷⁵	0.02	10	16.9	10-26
Secondary Standards				
Odor Threshold (Units)	N/A	3	ND-1	1
Chloride (ppm)	N/A	500	8.2-10	9.13
Specific Conductance (umhos/cm)	N/A	1,600	200	190-220
Total Dissolved Solids/TDS (ppm)	N/A	1,000	135	110-150
Sulfate (ppm)	N/A	500	4.08	3.5-4.6
Federal Unregulated Contaminates				
pH (Lab)	N/A	N/A	8.78	8.7-8.8
Aggressive Index	N/A	N/A	11.86	11.81-11.90
Alkalinity, Total (as CaCO3) (mg/L)	N/A	N/A	74.5	68-84
Bicarbonate (HCO3) (mg/L)	N/A	N/A	71.5	64-81
Hardness, Total (as CaCO3) (mg/L)	N/A	N/A	15.8	14-17
Calcium (Ca) (mg/L)	N/A	N/A	6.3	5.5-7.0
Potassium (K) (mg/L)	N/A	N/A	0.58	1-1.5
Sodium (Na) (mg/L)	N/A	N/A	39	47

⁷⁵ The MCL for Hexavalent Chromium was established by the California State Water Board on October 1, 2024. CSA 70 J Oak Hills has naturally occurring Hexavalent Chromium that was detected at levels that exceed the MCL. While a water system the size of CSA 70 J Oak Hills is not considered in violation of the Hexavalent Chromium MCL until after October 1, 2027, the County is working to address this exceedance and comply with the MCL established by the Board.

9.4.3 Recycled Water Supplies

CSA 70J does not currently utilize recycled water as a water supply source and does not have the infrastructure necessary to do so. Implementation of recycled water within the CSA 70J service area would require construction of conveyance and distribution facilities to access recycled water from regional sources, such as the Victor Valley Wastewater Reclamation Authority (VWVRA) or subregional water reclamation facilities. At this time, CSA 70J has no plans to develop or utilize recycled water supplies.

9.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the CSA due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the CSA has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

9.4.5 Water Transfers and Exchanges

CSA 70J does not currently participate in water transfers or exchanges, including transfers of BAP or FPA within the Alto Subarea. The CSA's water supply portfolio is primarily managed through groundwater production in accordance with the MBA adjudication, supplemented through the purchase of replacement and make-up water. While transfer and exchanges may represent a potential mechanism to augment supplies under certain conditions, CSA 70J does not rely on such activities as part of its current or projected water supply strategy. Accordingly, no water supplies associated with transfers or exchanges are assumed in the analyses presented in this sub-chapter.

9.4.6 Supply Summary

Groundwater serves as CSA 70J's principal water supply source. These supplies, pumped from the Alto Subarea of the MBA, are generally sufficient to meet existing and future demands. The CSA's water supplies are aggregated into the historical managed groundwater system. Managed groundwater consists of supplies provided through the MBA, including make-up and replacement supplies as well as transfers and exchanges among producers. Under the MBA Judgment, producers in the Alto Subarea are able to meet their water supply requirements through production from the basin's managed groundwater system. This system incorporates the natural yield of the basin along with supplies made available through regional management actions, including imported water recharge managed by MWA, conservation, water reuse, and transfers of FPA among producers. Consistent with this framework, the CSA's total managed groundwater production for the

historical period represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 9-11**.

TABLE 9-11: CSA 70J’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	1,794
2022	1,725
2023	1,633
2024	1,146
2025	1,742

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 9.5 – Water Use Characterization*. Within the adjudicated Mojave Basin Area management framework, the CSA’s groundwater production adjusts to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 9-12** and **Table 9-13**.⁷⁶

TABLE 9-12: CSA 70J’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026–2030 (AFY)

Year Type		Managed Groundwater Production
Normal		1,795
Single Dry-Year		1,795
Multi-Year Drought	2026 (1 st Year)	1,795
	2027 (2 nd Year)	1,800
	2028 (3 rd Year)	1,805
	2029 (4 th Year)	1,810
	2030 (5 th Year)	1,815

⁷⁶ The values presented in **Table 9-12** and **Table 9-13** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 9.4 – Water Supply and Infrastructure Characterization*.

TABLE 9-13: CSA 70J’s PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		1,815	1,835	1,855	1,875	1,890
Single Dry-Year		1,815	1,835	1,855	1,875	1,890
Multi-Year Drought	Year 1	1,815	1,835	1,855	1,875	1,890
	Year 2	1,820	1,840	1,860	1,875	1,895
	Year 3	1,820	1,845	1,860	1,880	1,895
	Year 4	1,825	1,845	1,865	1,885	1,900
	Year 5	1,830	1,850	1,870	1,885	1,900

9.4.7 Delivery System Details

The CSA’s potable water system conveys groundwater produced from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the CSA’s storage reservoirs, which collectively provide approximately four million gallons of storage before being distributed through the pressurized potable water system. The distribution system consists of more than 154 miles of pipeline, and approximately 3,458 service connections.

Sub-Chapter 9.5 – Water Use Characterization

Understanding water use characteristics is essential for the CSA to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the CSA's retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the CSA's past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the CSA's water supplies, presented in *Sub-Chapter 9.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 9.7 – Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the CSA's 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the CSA's residential and non-residential customers for 2022 through 2025 as well as distribution system losses for this same period.

- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the CSA’s UWUO, comparison to the CSA’s actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the CSA’s 2020 GPCD target.
- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the CSA’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the CSA should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the CSA’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

9.5.1 Current Customer Water Use

As described in *Sub-Chapter 9.2 – Water Service and System Description*, the CSA provides water service to approximately 3,458 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the CSA and treated to meet all applicable state and federal drinking water standards. Information regarding the CSA’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provides the basis for determining the CSA’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

9.5.1.1 Customer Water Use 2022 - 2025

Recent customer water use data assists the CSA in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The CSA is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The CSA records potable water use within five primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Irrigation

Table 9-14 presents the CSA's past customer potable water use by customer classification for 2022-2025 in acre-feet.

TABLE 9-14: POTABLE CUSTOMER USE 2022–2025 (VALUES IN ACRE-FEET)⁷⁷

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2022	98	98	97	97	114	114	160	160	165	165	124	124	1,515
	2023	73	73	82	82	113	113	128	128	140	140	101	101	1,275
	2024	93	93	77	77	94	94	160	160	152	152	122	122	1,396
	2025	96	96	90	90	116	116	163	163	163	163	112	112	1,481
Multi-Family Residential	2022	0	0	0	0	0	0	0	0	0	0	0	0	2
	2023	0	0	0	0	0	0	0	0	0	0	0	0	2
	2024	0	0	0	0	0	0	0	0	0	0	0	0	2
	2025	0	0	0	0	0	0	0	0	0	0	0	0	2
Commercial Institutional	2022	5	5	8	8	13	13	25	25	0	0	0	0	103
	2023	2	2	3	3	14	14	21	21	20	20	9	9	139
	2024	3	3	3	3	14	14	21	21	19	19	13	13	148
	2025	2	2	5	5	14	14	14	14	19	19	7	7	124
Landscape Irrigation	2022	0	0	0	0	0	0	0	0	0	0	0	0	0
	2023	0	0	0	0	0	0	0	0	0	0	0	0	0
	2024	0	0	0	0	0	0	0	0	0	0	0	0	0
	2025	0	0	1	1	0	0	0	0	0	0	0	0	3
Total Metered Deliveries	2022	103	103	105	105	127	127	185	185	165	165	124	124	1,619
	2023	76	76	85	85	127	127	150	150	160	160	111	111	1,416
	2024	96	96	80	80	108	108	181	181	172	172	135	135	1,546
	2025	98	98	96	96	131	131	177	177	182	182	120	120	1,610

⁷⁷ Monthly water use is presented in whole acre-feet; therefore, values less than 1 acre foot may appear as zero in individual months but are included in the reported annual totals.

The single-family residential and multi-family residential classifications continue to represent the primary components of the CSA’s water service, accounting for approximately 92% of the CSA’s annual potable water demand. When compared to previous use data, these water use characteristics have remained relatively consistent throughout the last 10 years, reflecting the CSA’s predominantly residential service area and the continued prevalence of low-density single-family housing.

9.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the CSA’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the CSA has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA). An electronic copy of the audit in Excel format is to be submitted to DWR by October 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the CSA shall assess compliance every three years as an average of recent losses. Additionally, the CSA will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 9-15** summarizes the CSA’s reported losses for 2021, 2023, and 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 9-15: DISTRIBUTION SYSTEM LOSS 2021-2024

2021	2023	2024
12.2%	2.0%	13.1%
Average:		9.1%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. On average, however, the CSA's distribution system loss represents about 9.1% of water entering the system.

9.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the CSA was developed using information submitted as part of the CSA's annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 758 gallons per mile of the distribution system (i.e., mains) per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 8.4%. Using the information from the same period, the average "apparent" water loss averaged 1.4% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 9.7%, although recent AWWA audits discussed above show losses closer to 9%.

9.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the CSA's derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

9.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the CSA to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the CSA to measure progress on achieving water efficiency goals.

The CSA's 2020 GPCD target was established in the 2020 UWMP as 176 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The CSA's calculation of their actual 2020 GPCD used the same methodology: "Gross water" was defined as total water production measured and reported based upon well production records. This value, divided by the CSA's estimated population in 2020, resulted in a

compliance value of 142 GPCD. Because this value was less than the CSA’s established target, the CSA was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the CSA was determined to have an actual GPCD of 154, calculated using the same methodology presented above.

9.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier’s service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. The CSA submitted required annual reports to the SWRCB in 2024 and 2025.

9.5.3 Forecasting Customer Use

Future water use within the CSA’s service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in Sub-Chapter 4.1.2 Forecasting Regional Water Use Future of Regional Chapter 4 – Water Use Characterization, this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the CSA’s future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the CSA, are presented in the following subsections and corresponding tables.

9.5.3.1 Existing Customer Future Use

Future water use associated with the CSA’s existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 9.5.2.1*, the CSA’s current GPCD, derived from recent water production and

population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the CSA has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the CSA’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the CSA’s existing customer demand is projected to remain at approximately 1,788 acre-feet per year, based on a representative GPCD of 154, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the CSA’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

9.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the CSA’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the CSA’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the CSA, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 48 GPCD
- Total Non-Residential Use: 24 GPCD

- Total Use: 119 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the CSA’s representative loss percentage has been applied to new customer demand projections.

Table 9-16 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the CSA's ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 9.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 9-16: FORECAST FUTURE WATER USE (AFY)

2025	2030	2035	2040	2045	2050
1,790	1,815	1,835	1,855	1,875	1,890

9.5.3.3 Adjusting Water Use Forecasts for Single Dry and Multiple Dry Conditions

The water use forecast presented in **Table 9-16** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions. Accordingly, no adjustments have been made to the forecast to account for single dry or

multiple dry year conditions. The values presented in **Table 9-16** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.⁷⁸

9.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The CSA will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

9.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the CSA’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related, but distinct analyses required under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the CSA’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

⁷⁸ California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

9.5.4.1 Projecting Water Use for Five Year Drought Risk Assessment

The DRA requires the CSA to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the CSA’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the CSA’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the CSA’s long-term water use forecast developed for the 2025 RUWMP and the CSA’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the CSA’s evaluation of water supply reliability across planning timeframes.

Table 9-17 presents the CSA’s projected unconstrained water demands for the DRA period (2026–2030), with values rounded to the nearest five acre-feet. These values form the basis for the reliability analysis presented in *Sub-Chapter 9.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 9-17: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
1,795	1,800	1,805	1,810	1,815

9.5.4.2 Projecting Water Use for Annual Assessments

The CSA conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The CSA has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

9.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the CSA’s sub-chapter within the 2025 RUWMP, a portion of the CSA’s service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.⁷⁹ Accordingly, the water use forecast presented in **Table 9-17** is inclusive of disadvantaged community water use.

⁷⁹ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 9.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the CSA's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The CSA has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the CSA's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the CSA evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the CSA's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the CSA's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 9a.

9.6.1 Demand Management Measures

The CSA has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State urban water use objectives.

The CSA is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the CSA leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The CSA will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

9.6.1.1 Foundational Demand Management Measures

CSA 70J's foundational DMMs consist of established policies, programs, and operational practices that support efficient water use and long-term system reliability. These measures are consistent with the framework presented in the CSA's 2020 UWMP and reflect the characteristics of the service area, which is predominantly residential, low-density, and largely composed of single-family homes on large parcels.

Water Waste Prevention Ordinances

The CSA enforces water waste prevention requirements through County ordinances and operational policies that prohibit inefficient water use practices, including excess runoff, irrigation during inappropriate times, and other avoidable losses. These requirements establish the regulatory framework for reducing unnecessary water use and are implemented through monitoring, customer communication, and enforcement actions as necessary.

Metering

All potable water service connections within the CSA are metered. Metering enables accurate measurement of customer water use, supports volumetric billing, and provides the data necessary for system monitoring, demand forecasting, and regulatory reporting. Meters are read on a bi-monthly basis, and customers are billed accordingly. This approach ensures that water use is directly tied to consumption and supports customer awareness of water use patterns.

Conservation Pricing

The CSA utilizes a six-tiered metered rate structure designed to promote efficient water use. The rate structure includes a fixed facility charge based on meter size and a volumetric charge that increases with higher levels of water use. The structure is applied across customer classes and serves as a primary mechanism for encouraging efficient water use within the CSA's service area.

Public Education and Outreach

The CSA implements public education and outreach programs to promote water conservation and inform customers about efficient water use practices. These efforts include coordination with regional partners, such as participation in the AWAC, which provides consistent conservation messaging across MWA’s service area. Public outreach activities include the distribution of conservation materials, customer communication regarding water use practices, and participation in community and school-based education efforts where applicable. These programs are designed to increase awareness of water use efficiency and support long-term behavioral changes among customers.

Programs to Assess and Manage Distribution System Losses

The CSA conducts ongoing operational and maintenance activities to assess and manage real water losses within the distribution system. These efforts include routine system inspections, leak detection, infrastructure maintenance, and timely repair of identified issues.

Conservation Program Coordination and Staffing Support

The CSA implements its DMMs through County staff and coordination with regional partners. Participation in regional conservation programs allows the CSA to leverage shared resources, technical expertise, and outreach materials

9.6.1.2 Recent DMM Activities

In recent years, the CSA has continued to implement targeted conservation programs through its customer rebate program, with a focus on improving indoor and outdoor water use efficiency. From 2021 through 2025, the CSA offered rebates for high-efficiency plumbing fixtures, including toilets, showerheads, and faucets, as well as weather-based irrigation controllers. Over this period, high-efficiency toilet replacements represented the most widely utilized measure. These programs are administered by the CSA in coordination with regional partners and reflect a continued emphasis on cost-effective, customer-driven actions that reduce water use. Collectively, these rebate programs complement the CSA’s foundational demand management measures by directly reducing both indoor and outdoor water demand and supporting long-term water use efficiency objectives.

9.6.1.3 Planned DMM Activities

At this time, the CSA does not anticipate implementing new demand management programs beyond those currently in place. The CSA’s existing DMMs provide a comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. The CSA remains committed to efficient and responsible use of water resources and will continue to evaluate opportunities to enhance existing programs, incorporate new technologies, and improve program effectiveness over time. This includes ongoing efforts to reduce system losses, expand metering and data capabilities, and support customer awareness and

conservation practices. Consistent with applicable State requirements, including UWUO provisions, the CSA will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

9.6.2 Water Shortage Contingency Plan

The CSA has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the CSA can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the CSA may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the CSA’s Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the CSA’s WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

9.6.2.1 Summary of Water Shortage Levels and Response Actions

The CSA 70J WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the CSA to implement proportional measures to manage water use and maintain essential public health and safety services during periods of reduced supply.

While the CWC defines six standardized shortage levels, the CSA utilizes a four-stage shortage framework that is cross-referenced to the State’s standard levels for consistency. The CSA shortage levels are associated with progressively higher demand reduction targets and increasingly restrictive response actions as conditions intensify. The general framework of shortage levels and representative response actions is summarized below:

- Stage 1 – Up to 10% Shortage (Drought Watch):

Increased public awareness and voluntary conservation measures, including expanded outreach, water use surveys, system efficiency actions, and initial limitations on outdoor irrigation practices.

- Stage 2 – Up to 40% Shortage (Drought Alert):

Implementation of additional conservation measures and mandatory water use restrictions, including expanded irrigation limitations, prohibitions on non-essential water uses, leak repair requirements, and enhanced participation in rebate and efficiency programs.

- Stage 3 – Up to 50% Shortage (Drought Critical Condition):

Expansion of mandatory restrictions, including further reductions in irrigation frequency, increased enforcement, restrictions on vehicle washing and decorative water features, and intensified conservation and monitoring efforts.

- Stage 4 – Greater than 50% Shortage (Drought Emergency):

Implementation of emergency response measures necessary to protect public health and safety, including significant restrictions on outdoor water use, potential moratoriums on new connections, increased system monitoring, and other actions as determined by the CSA.

Response actions are implemented cumulatively, such that measures adopted at lower shortage levels remain in effect as higher levels are enacted. As water supply conditions change, the CSA may transition between water shortage levels based on ongoing evaluation of supply availability, customer demand, infrastructure conditions, and applicable State requirements. Additional detail regarding specific shortage levels, response actions, and implementation procedures is provided in the CSA's WSCP

9.6.2.2 Summary of Monitoring Procedures and Implementation

CSA 70J's WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. CSA 70J monitors key indicators of water supply reliability, including groundwater conditions in the Alto Subarea, production capacity, customer demand, infrastructure constraints, and applicable State mandates. This information is used to evaluate supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The CSA's Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term water supply reliability and determining whether a water shortage level should be implemented. Additional detail regarding the Annual Assessment is provided in *Subsection 9.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter*

9.5 – Water Use Characterization. Implementation of the WSCP includes coordination among County staff and communication with customers, local agencies, and regional partners. When a water shortage stage is implemented, the CSA provides public notification of applicable conservation measures and restrictions. Water use is monitored through metered consumption and production data to evaluate the effectiveness of response actions and ensure demand reduction targets are achieved.

Sub-Chapter 9.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the CSA’s water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 9.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 9.5 – Water Use Characterization* to assess the CSA’s ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the CSA’s water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the CSA’s capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the CSA’s Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the CSA’s water supply reliability and inform the implementation of the CSA’s WSCP, as described in *Sub-Chapter 9.6 – Water Conservation and Shortage Response*.

9.7.1 Five Year Drought Risk Assessment

The DRA evaluates the CSA’s ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the CSA’s unconstrained demand forecast described in *Sub-Chapter 9.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the CSA’s managed groundwater supplies, which include groundwater production, replacement water, and make-up water, as described in *Sub-Chapter 9.4 – Water Supply and Infrastructure Characterization*. Under the

terms of the MBA adjudication, the CSA has discretion in managing its groundwater production and associated supplemental supplies, allowing it to adjust its supply portfolio to meet projected demands during dry conditions.

The DRA compares projected water demands to available supplies to evaluate the CSA’s capacity to meet customer needs over the five-year period. **Table 9-18** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 9-18: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	1,795	1,800	1,805	1,810	1,815
Demand	1,795	1,800	1,805	1,810	1,815
Difference	0	0	0	0	0

9.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The CSA’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

9.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the CSA’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the CSA’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the CSA’s supplies are managed within the framework of the MBA adjudication, which provides flexibility in balancing groundwater production and supplemental supplies. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 9-19 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 9-19: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	1,815	1,835	1,855	1,875	1,890
Demand	1,815	1,835	1,855	1,875	1,890
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	1,815	1,835	1,855	1,875	1,890
Demand	1,815	1,835	1,855	1,875	1,890
Difference	0	0	0	0	0

9.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the CSA’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the CSA continues to manage its supplies within the framework of the MBA adjudication, which allows for flexibility in balancing groundwater production and supplemental supplies. This managed approach enables the CSA to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 9-20 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the CSA has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 9-20: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	1,815	1,835	1,855	1,875	1,890
	Demand	1,815	1,835	1,855	1,875	1,890
	Difference	0	0	0	0	0
Year 2	Supply	1,820	1,840	1,860	1,875	1,895
	Demand	1,820	1,840	1,860	1,875	1,895
	Difference	0	0	0	0	0
Year 3	Supply	1,820	1,845	1,860	1,880	1,895
	Demand	1,820	1,845	1,860	1,880	1,895
	Difference	0	0	0	0	0
Year 4	Supply	1,825	1,845	1,865	1,885	1,900
	Demand	1,825	1,845	1,865	1,885	1,900
	Difference	0	0	0	0	0
Year 5	Supply	1,830	1,850	1,870	1,885	1,900
	Demand	1,830	1,850	1,870	1,885	1,900
	Difference	0	0	0	0	0

9.7.3 Annual Reliability Assessment

Each year, the CSA considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the CSA’s Water Shortage Contingency Plan. The CSA has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

9.7.4 Water Supply Reliability Summary

The CSA’s water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 9.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the CSA evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The CSA’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the CSA’s service area, rather than long-distance conveyance or advanced treatment processes.

The CSA continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 9-21**.

TABLE 9-21: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR DEC 2024 THROUGH JAN 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	1,863
Energy Consumed (kWh)	2,855,620
Energy Intensity (kWh/acre-foot)	1,533

CSA 70J APPENDICES

This page is reserved for CSA 70J-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to CSA 70J's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the CSA 70J retailer chapter, the CSA's WSCP, and applicable CSA-specific appendices.

Chapter 10.0 GOLDEN STATE WATER COMPANY – BARSTOW SYSTEM



TABLE OF CONTENTS

Sub-Chapter 10.1 – Introduction	10-8
10.1.1 Background and Purpose.....	10-8
10.1.2 Basis for Plan Preparation	10-9
10.1.3 Coordination and Outreach.....	10-9
10.1.4 RUWMP Adoption	10-10
10.1.5 Document Organization	10-10
Sub-Chapter 10.2 – Water Service and System Description	10-12
10.2.1 Service Area Climate.....	10-14
Sub-Chapter 10.3 – Population Land Use, Economy, and Demographics	10-16
10.3.1 Current Population and Historical Trends	10-16
10.3.2 Projected Population	10-18
10.3.3 Current and Projected Land Use.....	10-18
10.3.4 Economic Trends & Other Social and Demographic Factors.....	10-21
Sub-Chapter 10.4 – Water Supply and Infrastructure Characterization	10-22
10.4.1 Groundwater.....	10-22
10.4.2 Groundwater Quality.....	10-26
10.4.3 Recycled Water Supplies.....	10-28
10.4.4 Desalination Opportunities	10-30
10.4.5 Water Transfers and Exchanges	10-30
10.4.6 Supply Summary	10-30
10.4.7 Delivery System Details	10-32
Sub-Chapter 10.5 – Water Use Characterization	10-33
10.5.1 Current Customer Water Use	10-33
10.5.2 Compliance with UWUO and SBx7-7	10-36
10.5.3 Forecasting Customer Use	10-38
10.5.4 Forecasting Water Use for DRA and Annual Assessment.....	10-39
10.5.5 Projecting Disadvantaged Community Water Use	10-40
Sub-Chapter 10.6 – Water Conservation and Shortage Response.....	10-41
10.6.1 Demand Management Measures	10-41



10.6.2 Water Shortage Contingency Plan 10-46

Sub-Chapter 10.7 – Water System Reliability and Drought Risk Assessment..... 10-54

10.7.1 Five Year Drought Risk Assessment 10-54

10.7.2 Long Term Service Reliability 10-55

10.7.3 Annual Reliability Assessment10-57

10.7.4 Water Supply Reliability Summary 10-58

Sub-Chapter 10.8 – Energy Intensity Analysis..... 10-59

Sub-Chapter 10.9 – Summary 10-60



LIST OF TABLES

Table 10-1: Public Water System Information.....	10-9
Table 10-2: Customer Water Service Connections.....	10-14
Table 10-3: Historical population	10-17
Table 10-4: Population Growth Rate – 2015 – 2024.....	10-17
Table 10-5: Population Forecast and Growth Rate	10-18
Table 10-6: Summary of Land Use Plans in Service Area With Future Residential Units.....	10-20
Table 10-7: Last Five Years of GSWC Barstow’s FPA Supply and Actual Groundwater Pumped (AFY)...	10-23
Table 10-9: Projected Mojave Adjudication FPA for Retailer through 2050 (AFY).....	10-24
Table 10-10: Last Five Years of Replacement and Make-up Water Supplies (AFY)	10-24
Table 10-11: Projected Water Supply Acquisitions through 2030 (AFY).....	10-25
Table 10-13: Retailer Potable Water Quality.....	10-27
Table 10-14: Last Five Years of Recycled Water Supplies (AFY).....	10-28
Table 10-15: Projected Recycled Water Supplies 2030 (AFY).....	10-28
Table 10-16: Projected Recycled Water Supplies through 2050 (AFY).....	10-29
Table 10-17: GSWC Barstow’s Managed Groundwater Pumping 2021–2025 (AFY)	10-30
Table 10-18: GSWC Barstow’s Projected Managed Groundwater Supply 2026 – 2030 (AFY)	10-31
Table 10-19: GSWC Barstow’s Projected Managed Groundwater Supply Through 2050 (AFY)	10-31
Table 10-20: Potable Customer Use 2021 – 2025 (Values in Acre-Feet).....	10-35
Table 10-21: Distribution System Loss, 2021 – 2025.....	10-36
Table 10-22: Distribution System Loss, 2021 – 2025.....	10-36
Table 10-23: Demonstration of Compliance with GPCD Target	10-37
Table 10-24: Forecast Total Future Water Use (Values in Acre-feet per year).....	10-39
Table 10-25: Forecast DRA Water Use for 2026 through 2030 (acre-feet per year).....	10-40
Table 10-26 Cross-reference for Standard vs Supplier Shortage Levels	10-49
Table 10-27: Five Year Drought Risk Assessment (AFY).....	10-54
Table 10-28: Normal Year Water Supply and Demand through 2050 (AFY).....	10-55
Table 10-29: Single Dry Year Water Supply and Demand through 2050 (AFY).....	10-55
Table 10-30: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY)	10-56
Table 10-31: Normal Year Water Supply and Demand (AFY).....	10-57



Table 10-32: Single Dry Year Water Supply and Demand (AFY).....10-58
Table 10-33: Energy Intensity – Total Utility Approach for Month Year through Month Year10-59



LIST OF FIGURES

Figure 10-1: GSWC - Barstow Water Service Area	10-13
Figure 10-2 City of Barstow Land Use Map.....	10-20



APPENDICES

GSWC-Barstow System Appendices 10-61



Sub–Chapter 10.1 – Introduction

The Golden State Water Company – Barstow System (GSWC Barstow) is an investor-owned public utility providing water service to approximately 1 million customers and over 270,000 connections in 80 communities throughout California. Its water systems serve communities spanning from the Clearlake System in the northern portion of the state to the Calipatria System in Southern California. While water rates are set separately for GSWC’s customer service areas, oversight of the water rate setting process and operations is provided by the California Public Utilities Commission (CPUC).

GSWC Barstow is located in San Bernardino County in the center of the Mojave River Basin area of the Mojave Desert. The City of Barstow area has long been an important transportation corridor, dating back to its American settlement in the 1830s. People, goods, and animals would travel through the area from Utah and New Mexico to Los Angeles and back. Importantly, water was readily available in the areas where the Mojave River rose to the surface during and after the rainy season on its course through the desert. These locations came to be known as the Fish Ponds and Grapevines areas which are located in and around the GSWC Barstow service area. During a mining boom east of the City of Barstow in the 1860s and 1870s, railways were built to transport goods and people through the area and further into the American interior. These railways were eventually accompanied by major interstate highways, including Route 66, Interstate 15, Interstate 40 and California State Route 58, all of which converge in the City of Barstow. The local economy is closely tied to transportation industry, and it also includes a strong military presence.

Today, the GSWC Barstow service area serves mostly residential connections in the City of Barstow and surrounding unincorporated areas of the San Bernardino County, along with some commercial and industrial customers. Water supply for the GSWC Barstow service area is now primarily derived from groundwater within the Lower Mojave River Valley Groundwater Basin. GSWC Barstow also incorporates water supplies derived from Mojave Water Agency (MWA) water management activities into its groundwater development and use.

Through its participation in the 2025 Mojave RUWMP (2025 RUWMP), GSWC Barstow advances regional strategy that aligns local planning with basin-wide resource management, supports coordinated supply reliability, and positions GSWC Barstow to adapt effectively as conditions evolve.

10.1.1 Background and Purpose

GSWC Barstow has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP



and preparation of this chapter.⁸⁰ The UWMPA requires urban water suppliers to assess the availability of their supplies to meet forecast water use during average, single-dry and five consecutive drought years through 2050. This chapter specifically addresses GSWC Barstow’s evaluation of the aforementioned requirements and verifies that future demands will not exceed supplies while also assuring the availability of supplies in dry-year conditions.

The 2025 RUWMP along with this chapter provides an update to the GSWC Barstow’s 2020 UWMP and presents new data and analysis as required by the California Department of Water Resources (DWR) and the California Water Code (CWC) since 2020. The 2025 RUWMP is also a comprehensive regional water planning document that describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use for all urban water suppliers and water users within the Planning Area.

10.1.2 Basis for Plan Preparation

GSWC Barstow operates a Public Water System (PWS) as described in California Health and Safety Code Section 116275. Additionally, GSWC Barstow is classified as an Urban Water Supplier as described in CWC Section 10617, providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of an UWMP every five years. Under CWC Section 10620(d)(1), these requirements may be met through participation in a RUWMP, which the GSWC Barstow, along with all the other Urban Water Suppliers within the Planning Area, have elected to pursue. GSWC Barstow’s Public Water System detail is listed in **Table 10-1**.

TABLE 10-1: PUBLIC WATER SYSTEM INFORMATION

PWS Number	PWS Name	Number of Municipal Connections
CA3610043	GOLDEN STATE WATER CO - BARSTOW	9,219

10.1.3 Coordination and Outreach

GSWC Barstow coordinated with neighboring agencies and relevant public entities, as required by the UWMPA to ensure consistency with related land use and water resource planning efforts. This coordination included agencies that share common water sources, regional water management entities, and local governments with land use authority. The GSWC Barstow also met the requirements of CWC Section 10621(b) by conducting a required public hearing to encourage community participation. As part of 2025 RUWMP development,

⁸⁰ California Water Code Sections 10610 through 10657.



these coordination and outreach activities were carried out at the regional level. A detailed description of these efforts is provided in *Sub–Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

Water Supplier Information Exchange

10.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub–Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

10.1.4 RUWMP Adoption

GSWC Barstow held a public hearing regarding the 2025 RUWMP on May 27, 2026. Before the hearing, the GSWC Barstow made a draft of the 2025 RUWMP available for public inspection on the City’s website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

GSWC’s Vice President adopted this 2025 RUWMP on May 27, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the City’s website.

GSWC plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- Final 2025 Submittal Tables
- Final Energy Use Tables

10.1.5 Document Organization

This chapter is organized as follows:

- Section 10.2 Water Service and System Description
- Section 10.3 Population, Land Use, Economy, and Demographics
- Section 10.4 Water Supply and Infrastructure Characterization
- Section 10.5 Water Use Characterization
- Section 10.6 Water Conservation and Shortage Response
- Section 10.7 Water System Reliability and Drought Risk Assessment (DRA)
- Section 10.8 Energy Intensity Analysis



- Section 10.9 Summary



Sub-Chapter 10.2 – Water Service and System Description

GSWC Barstow is located in the County of San Bernardino and serves approximately 66% of the City of Barstow and surrounding unincorporated areas of the Mojave Desert. The GSWC Barstow service area and City of Barstow boundaries are depicted in **Figure 10-1**.

Elevations within the service area range from 2,073 feet to 2,760 feet above mean sea level. The Mojave River, an intermittent river whose headwaters are in the San Bernardino Mountains, flows mostly underground through the City of Barstow area from west to east and is a major source of groundwater for GSWC Barstow.

GSWC Barstow relies entirely on groundwater from the Centro Subarea of the adjudicated Lower Mojave River Valley Groundwater Basin. GSWC Barstow currently operates 15 active wells with a total well capacity is 15,010 gallons per minute (gpm), or approximately 24,211 acre-feet per year (AFY). This excludes one inactive well that is planned to go back into service following installation of iron treatment.

Table 10-2 shows the historical and current service connections by customer class. Single family and multifamily residential customers account for approximately 90% of service connections in the GSWC Barstow service area.



FIGURE 10-1: GSWC - BARSTOW WATER SERVICE AREA

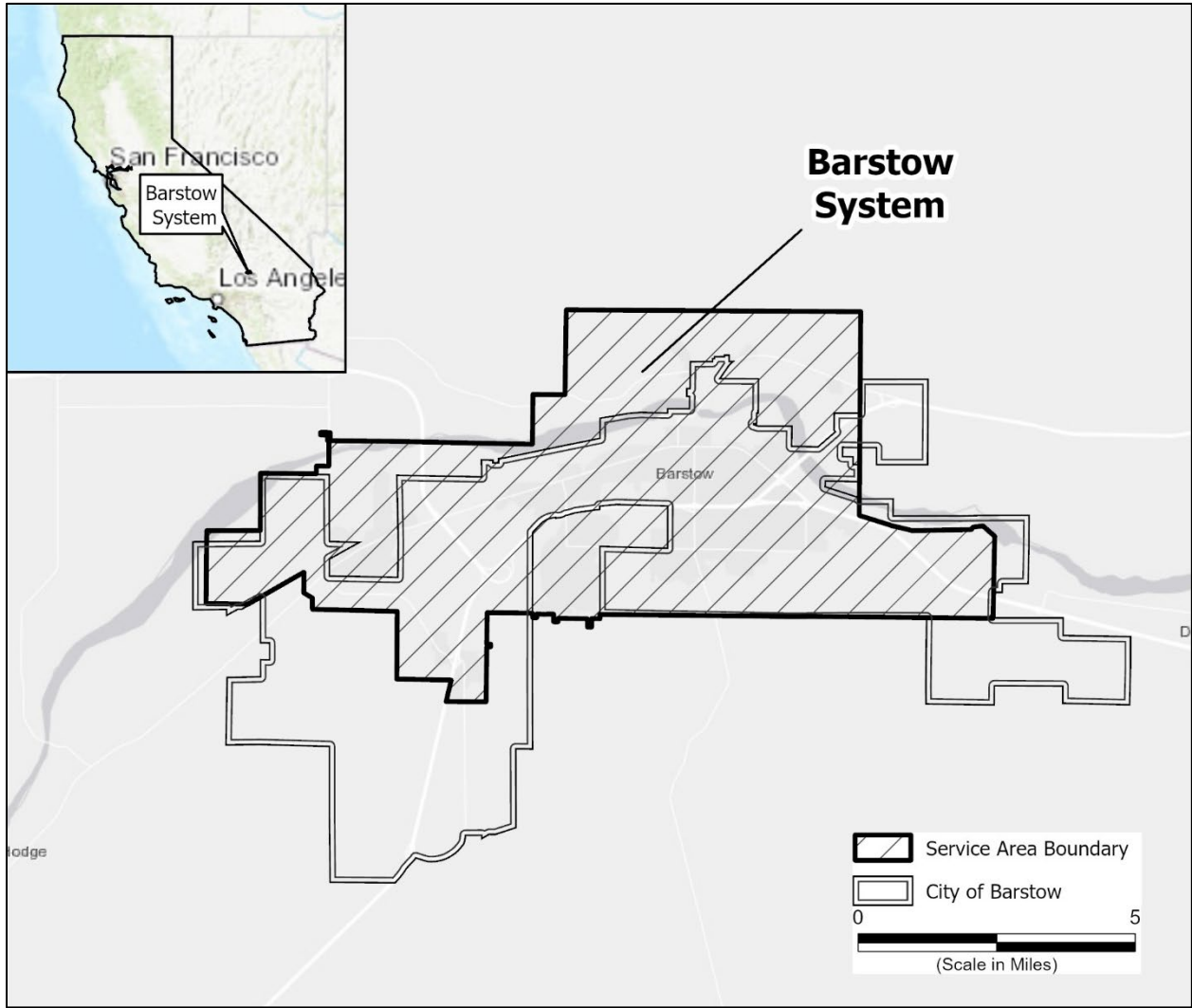


TABLE 10-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2020	2021	2022	2023	2024	2025
Single Family	7,893	7,899	7,771	7,840	7,807	7,852
Multifamily	458	470	478	476	480	500
Commercial/Institutional	637	632	664	658	648	638
Industrial	9	9	8	9	8	8
Landscape	38	42	43	46	48	50
Hydrant/Construction	39	38	-	-	-	8
Fire Protection	155	158	154	161	159	162

10.2.1 Service Area Climate

GSWC Barstow experiences a high desert climate typical of the Mojave Desert. Based on modeled data from the Oregon State University Parameter Elevation Regression on Independent Slopes Model (PRISM) Climate Group for 1994 to 2024, the average annual rainfall was approximately 4.8 inches per year. Precipitation is largely seasonal, with 65% of precipitation in the wet season from December through March. Based on data from the California Irrigation Management Information System (CIMIS) from the nearby City of Victorville, the average annual reference evapotranspiration (ET_o) is approximately 68 inches per year.

Because the average annual ET_o exceeds precipitation by approximately 63 inches, and about 65% of the annual precipitation occurs in the wet season, growing turf or other plantings in this region requires a significant amount of irrigation during the dry season. This irrigation demand contributes to the observed seasonal variation in water demand throughout the service area.

A review of long-term climate data from PRISM (1895 to 2024) shows that temperature has increased at an average rate of 0.3°F per decade. Mean annual temperature for 2020 to 2024 was 2.9°F higher than for 1895 to 1960. Review of long-term climate data also shows that rainfall exhibits considerable variability over time, and periods of consecutive years with below-average rainfall are common. Since 1895, sequences of below-average rainfall lasting three or more years have occurred eleven times, and sequences lasting five or more years have occurred four times.



10.2.1.1 Climate Change

Changing climate can affect both water demands and supplies. For example, extreme and higher temperatures can lead to increases in water use, and more frequent, severe, prolonged droughts could lead to not only less surface water available but also exacerbate ongoing stressors in groundwater basins.

A discussion of these potential changes is included in *Chapter 1.5 Regional Climate of Regional Chapter 2*.



Sub–Chapter 10.3 – Population Land Use, Economy, and Demographics

Population and land use projections provide the foundation for estimating future water demand within the service area, as changes in population, housing, and development patterns directly influence water use. Evaluation of the GSWC Barstow’s economic, social, and demographic trends further refines demand projections by informing water use characteristics and consumption patterns. Collectively, these factors support the development of reliable long-term demand forecasts for planning purposes.

10.3.1 Current Population and Historical Trends

The historical, current, and projected population estimate for the GSWC Barstow service area is based on forecasts prepared by the Mojave Water Agency (MWA) in partnership with the University of California Riverside Center for Economic Forecasting and Development (UCR/Beacon Economics) as part of the MWA Population Forecast – 2020 Edition (2020 MWA Population Forecast).

Historical population data from the 2020 MWA Population Forecast were based on two primary sources: the United States Census Bureau (US Census) decennial census and the California Department of Finance (DOF) annual estimates dating back to 1970. US Census data were used to derive population shares by census block to calculate population for subareas and purveyors within each city or town. For purposes of this UWMP, population estimates from the 2020 MWA Population Forecast were refined to incorporate the latest 2020 US Census data.

Historical and current population estimates for the GSWC Barstow service area are provided in **Table 10–3**. It is estimated that GSWC Barstow’s service area population was approximately 36,000 in 2025. **Table 10–4** provides the historical population growth rate for the GSWC Barstow service area. Between 2015 and 2024, population in the GSWC Barstow service area have increased modestly, reflecting low but steady net annual growth rates generally ranging from 0.5% to 2%.

As discussed in Section 10.3.4, the City of Barstow is assumed to be demographically representative of the service area. Median age, household income, and other demographic characteristics continue to provide a basis for water demand forecasting in the service area.



TABLE 10-3: HISTORICAL POPULATION

1990	1995	2000	2005	2010	2015	2020	2025
29,905	29,621	29,337	29,755	30,173	32,938	33,762	35,947

TABLE 10-4: POPULATION GROWTH RATE – 2015 - 2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	32,938	33,103	33,267	33,432	33,597	33,762	34,003	34,245	34,486	35,217
Growth Rate		0.50%	0.50%	0.49%	0.49%	0.49%	0.71%	0.71%	0.70%	2.07%



10.3.2 Projected Population

Accurate population projections are a critical component of water supply planning as they provide the basis for forecasting future water demand, evaluating system capacity, and supporting long-term water management and infrastructure decisions. In accordance with CWC Section 10631(a), GSWC coordinates with local land use agencies to ensure that population and development projections are consistent with anticipated growth within the service area. Population data presented in *Chapter 2.6.2* provide the foundation for these projections and support the development of reliable, system-specific water demand forecasts.

As described in the previous section, the population projections are based on the 2020 MWA Population Forecast and refined to incorporate the latest 2020 US Census data. The population projections were developed using a comprehensive econometric model for the MWA service area, which included population estimates for incorporated cities, subareas, and individual water purveyors. The model incorporated economic indicators such as residential housing stock, home prices, and employment trends. As discussed in Section 10.3.3, the population projections were also refined to incorporate growth anticipated in the Draft City of Barstow General Plan Update 2048 (Draft General Plan Update). By 2060, population in the GSWC Barstow service area is projected to reach approximately 61,500, which is approximately a 71% increase from 2025. Population projections and annual growth rate for the GSWC Barstow service area are provided in **Table 10-5**.

TABLE 10-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
GSWC – Barstow System	35,947	37,744	39,542	43,137	46,731	54,209	57,861	61,513
Annual Growth Rate		0.98%	0.93%	1.76%	1.61%	3.01%	1.31%	1.23%

10.3.3 Current and Projected Land Use

GSWC Barstow’s service area encompasses approximately 66% of the City of Barstow. While the GSWC Barstow service area boundary and the City of Barstow boundary are not coterminous, the entire GSWC Barstow service area falls within the City of Barstow’s planning sphere of influence, and future development will continue to be guided by the adopted General Plan and its subsequent updates.



Current land use in the GSWC Barstow service area is primarily zoned for residential uses, with additional areas designated for commercial and industrial development. According to the City of Barstow’s 2015–2020 General Plan (General Plan), the land use patterns that existed in 2015 were not expected to change substantially by 2020 or in the near term thereafter.

Residential growth, where anticipated, is expected to consist largely of infill development in neighborhoods already zoned for single-family or multifamily residential uses that are served by GSWC but not yet fully built out. The General Plan also identifies modest growth of commercial and industrial land uses in the southwest portion of the City of Barstow near the Interstate-15/Lenwood Road area. Agriculture remains absent from within the service area, although agricultural uses occur elsewhere in the Lower Mojave River Valley Groundwater Basin.

The City of Barstow is currently preparing City of Barstow General Plan Update 2048, which provides a comprehensive update to the City of Barstow’s current General Plan. Per the Draft General Plan Update, the Plan Area could potentially result in a growth of 6,608 dwelling units, 18,531 residents, 15,341,198 square feet of non-residential uses, and 10,819 jobs by 2048 compared to 2023. Summary of the future land use plans within the Draft General Plan Update is provided in **Table 10–6**.

The Draft General Plan Update also includes the Barstow International Gateway (BIG) Specific Plan, a large industrial and logistics development proposed by BNSF Railway Company (BNSF). The BIG Specific Plan is a 4,335-acre project that would feature an intermodal rail facility, transload warehouses, and supporting infrastructure to handle freight more efficiently. The BIG Specific Plan would be located partly in incorporated Barstow and partly in an unincorporated portion of San Bernardino County, which the Draft General Plan Update proposes for concurrent annexation to the City of Barstow.

The Draft General Plan Update, BIG Specific Plan, Zoning Amendments, and associated Environmental Impact Report (EIR) are currently in public review. Following the public review, the City of Barstow will proceed toward preparing the Final General Plan Update and EIR, with an eventual adoption decision by the City Council. This would replace the existing General Plan.

To support regional coordination and for long-term planning purposes, this UWMP incorporates growth projections consistent with the Draft General Plan Update and BIG Specific Plan. However, portions of the proposed land use associated with these planning documents are located outside the current certificated service area of GSWC Barstow and, in some cases, outside the existing municipal boundaries of the City of Barstow. Provision of water service to such areas would require, among other actions, annexation to the City and/or expansion of GSWC Barstow’s service area, including approval by the California Public Utilities Commission (CPUC).

Accordingly, inclusion of these demands in this UWMP does not represent a commitment or obligation by GSWC to provide water service to these areas. All such service would be subject



to future regulatory approvals, environmental review, and demonstration of adequate water supply, infrastructure, and financial feasibility.

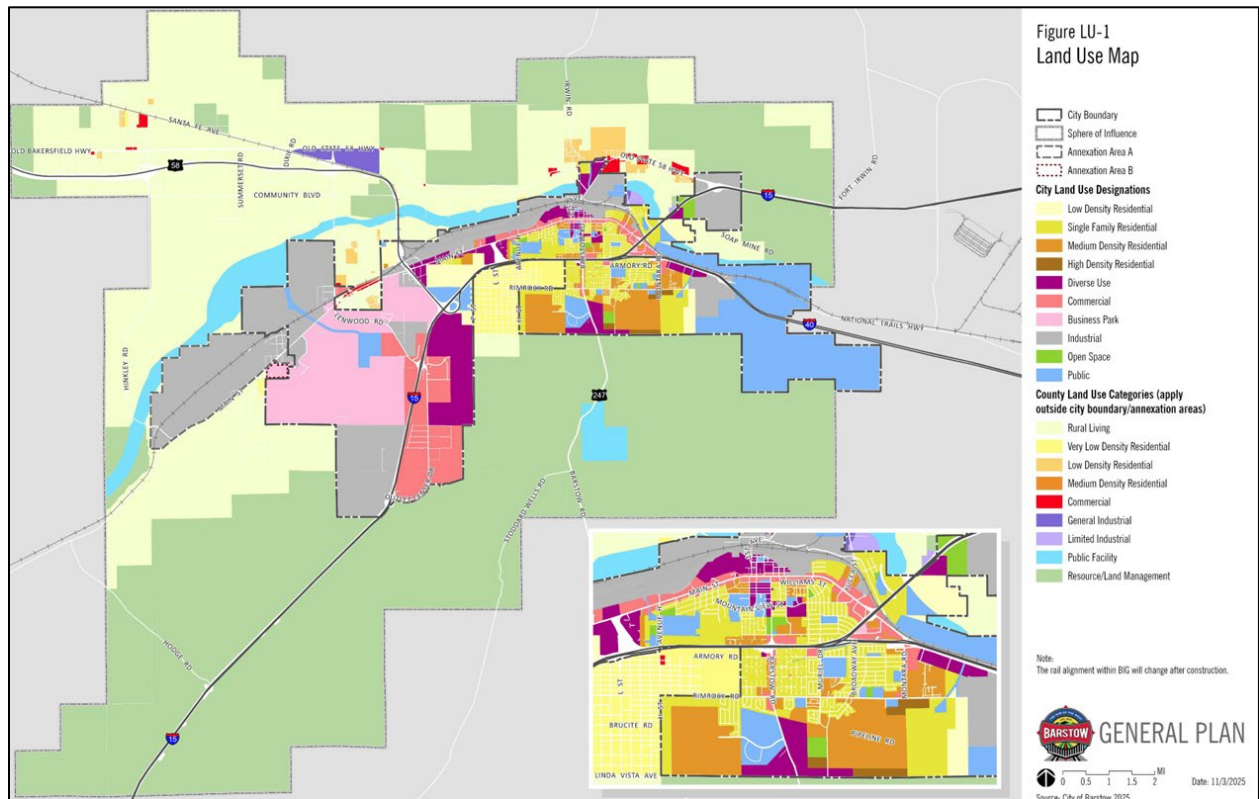
TABLE 10-6: SUMMARY OF LAND USE PLANS IN SERVICE AREA WITH FUTURE RESIDENTIAL UNITS

	Single-family	Multi-family	Non-Residential
Draft General Plan Update	19,738		26,412,790

NOTES: This summary of land use plans is for the entire Draft General Plan Update area, which includes areas outside GSWC Barstow’s existing service area.
 Source: City of Barstow Proposed General Plan and BIG Project Draft EIR, 2025.

The Draft General Plan Update land use map is provided in **Figure 10-2**.

FIGURE 10-2 CITY OF BARSTOW LAND USE MAP



Source: City of Barstow, 2025. Draft General Plan Update.



10.3.4 Economic Trends & Other Social and Demographic Factors

Demographic characteristics of the GSWC Barstow service area were approximated using data for the City of Barstow. This community has a significant Hispanic population, representing approximately 49% of residents. Median household income is approximately \$53,380, which is below the statewide average of approximately \$99,000. Owner occupancy rate is around 44%, which is below the California owner occupancy rate of 56% (US Census, 2025).



Sub–Chapter 10.4 – Water Supply and Infrastructure Characterization

This chapter describes and quantifies the current and projected water supplies for GSWC Barstow. GSWC Barstow has historically relied upon groundwater supplies as its primary source of supply to meet demands within the service area boundary. GSWC Barstow has also incorporated water supplies derived from MWA water management activities as part of its groundwater development and use actions. All of GSWC Barstow’s water supply sources and quantities are described in the following sections.

10.4.1 Groundwater

GSWC Barstow relies entirely on groundwater from the Lower Mojave River Valley Basin. More specifically, GSWC Barstow pumps groundwater from the Centro Subarea, which is a subarea of the Mojave Basin Area as defined in the Mojave Basin Adjudication. Additional information on the Adjudication, Mojave Basin Area, Centro Subarea, and overall groundwater management is provided in *Chapter 2.3*.

10.4.1.1 GSWC Barstow’s Free Production Allowance

The GSWC Barstow service area overlies both the Baja and Centro subareas; however, GSWC only uses supplies derived from the Centro Subarea to serve the GSWC Barstow system. GSWC Barstow’s Base Annual Production (BAP) in the Centro Subarea is 14,407 AFY. Its Free Production Allowance (FPA), which is the percentage of the BAP set annually by the Court based on the recommendation of the Mojave Basin Watermaster, is reported under “Golden State Water Company” in annual Mojave Basin Area Watermaster reports. Over the last five years, GSWC’s FPA in the Centro Subarea has declined by 9%, as shown in **Table 10–7**. For the 2025–2026 water year, GSWC Barstow’s FPA is 56% of its BAP, equivalent to approximately 8,068 AF excluding carryover supplies.

Table 10–7 also shows the groundwater pumped over the past 5 years. Groundwater extractions for the GSWC Barstow service area declined by approximately 9% from 2021 to 2025.



TABLE 10-7: LAST FIVE YEARS OF GSWC BARSTOW’S FPA SUPPLY AND ACTUAL GROUNDWATER PUMPED (AFY)

Year	Percent FPA (a)	GSWC Barstow FPA Supply (a)	GSWC Barstow Groundwater Pumped (b)
2021	65.0%	9,365	6,004
2022	60.0%	8,644	5,604
2023	55.0%	7,924	5,433
2024	56.0%	8,068	5,602
2025	56.0%	8,068	5,442

NOTES:
 (a) Values are in water year.
 (b) Values are in calendar year.

The current FPA of 56% for GSWC Barstow has been in effect since water year 2024 and aligns with the Production of Safe Yield (PSY) as assessed by the Mojave Basin Watermaster. This ensures that projected water use under normal year, single dry year, and five consecutive dry year conditions remain within sustainable limits. The Centro Subarea continues to experience overdraft, and for planning purposes, the FPA is expected to remain at 56% through 2030, reflecting a stabilized allocation consistent with long-term sustainable production. Accordingly, GSWC Barstow’s projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at 56% and is shown in **Table 10-8**.

TABLE 10-8: PROJECTED MOJAVE ADJUDICATION FPA FOR GSWC BARSTOW THROUGH 2030 (AFY)

Year Type		Projected GSWC Barstow FPA
Normal		8,068
Single Dry-Year		8,068
Multi-Year Drought	2026 (1 st Year)	8,068
	2027 (2 nd Year)	8,068
	2028 (3 rd Year)	8,068
	2029 (4 th Year)	8,068
	2030 (5 th Year)	8,068

For planning purposes, this UWMP conservatively assumes that GSWC Barstow’s FPA in the Centro Subarea will remain consistent at 56% through 2050 in all hydrologic year types. **Table 10-9** presents GSWC Barstow’s projected supply availability under normal year, single dry year, and five consecutive dry years through 2050. This excludes potential carryover supplies.



TABLE 10-9: PROJECTED MOJAVE ADJUDICATION FPA FOR RETAILER THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		8,068	8,068	8,068	8,068	8,068
Single Dry-Year		8,068	8,068	8,068	8,068	8,068
Multi-Year Drought	Year 1	8,068	8,068	8,068	8,068	8,068
	Year 2	8,068	8,068	8,068	8,068	8,068
	Year 3	8,068	8,068	8,068	8,068	8,068
	Year 4	8,068	8,068	8,068	8,068	8,068
	Year 5	8,068	8,068	8,068	8,068	8,068

10.4.1.2 Carryover Water Supplies

GSWC Barstow has taken actions to protect its water supplies against hydrological and regulatory variability. Specifically, GSWC Barstow has invested time and effort in storing water assets for future use through the carryover provisions of the Mojave Basin Adjudication. The carryover water supplies are derived from GSWC Barstow’s unused FPA in each year. This carryover supply, however, cannot exceed the previous year’s FPA. As such, any unused carryover supply is returned to the Centro Subarea to be considered in the Watermaster’s annual Mojave Basin Area Watermaster reports. GSWC Barstow’s carryover supply in water year 2024–2025 totals 8,068 AF.

10.4.1.3 Replacement and Make-up Water Supplies

GSWC Barstow did not acquire any replacement or make-up water in the Centro Subarea over the past five water years, as shown in **Table 10-10**.

TABLE 10-10: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions
2021	0
2022	0
2023	0
2024	0
2025	0



As shown in **Table 10-11**, GSWC does not anticipate any replacement water supplies for use through 2030 in normal year, single dry year, and five consecutive dry years.

TABLE 10-11: PROJECTED WATER SUPPLY ACQUISITIONS THROUGH 2030 (AFY)

Year Type		Projected Water Acquisitions
Normal		0
Single Dry-Year		0
Multi-Year Drought	2026 (1 st Year)	0
	2027 (2 nd Year)	0
	2028 (3 rd Year)	0
	2029 (4 th Year)	0
	2030 (5 th Year)	0

As shown in **Table 10-12**, GSWC does not anticipate any replacement water supplies for use through 2050 in normal year, single dry year, and five consecutive dry years.

TABLE 10-12: PROJECTED WATER SUPPLY ACQUISITIONS THROUGH 2050 (AFY)

Projected Water Acquisitions		2030	2035	2040	2045	2050
Normal		0	0	0	0	0
Single Dry-Year		0	0	0	0	0
Multi-Year Drought	Year 1	0	0	0	0	0
	Year 2	0	0	0	0	0
	Year 3	0	0	0	0	0
	Year 4	0	0	0	0	0
	Year 5	0	0	0	0	0



10.4.2 Groundwater Quality

The groundwater quality conditions in the Lower Mojave River Valley Groundwater Basin are described in detail in *Chapter 3.2* and are incorporated herein by reference.

The drinking water quality of the GSWC Barstow system must comply with state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the State Water Resources Control Board (SWRCB), Division of Drinking Water can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations (CCR). There are two general types of drinking water standards:

- Primary Maximum Contaminant Levels (MCL) are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into potential health effects, detectability and treatability, and costs of treatment. PWSs may not serve water that exceeds Primary MCLs for any constituent.
- Secondary MCLs are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content, and are considered limits for constituents that may affect consumer acceptance of the water.

GSWC Barstow’s groundwater system contains active chlorinated wells that treat local groundwater supplies. GSWC Barstow routinely monitors the water that is treated and served to customers to ensure that water delivered to customers meets drinking water standards. The results of this testing are reported to the SWRCB Division of Drinking Water following each test and are summarized annually in Water Quality Reports (also known as “Consumer Confidence Reports”), which are provided to customers on GSWC Barstow’s website. **Table 10-13** summarizes the GSWC Barstow Service Area’s most recent Consumer Confidence Report.

GSWC’s monitoring, management, and treatment of its source water results in high quality drinking water that meets all applicable drinking water standards. GSWC tracks changes in constituent concentrations to proactively address water quality issues before they impact supply reliability. Although there is the potential for some regulated constituents to be present in groundwater, treatment improvements are planned to maintain reliable operation of existing well(s). If needed, GSWC will plan for equivalent replacement of well capacity to ensure continued production reliability. These improvements and potential replacement capacity needs have been incorporated into GSWC Barstow’s General Rate Case (GRC) planning and budgeting.



TABLE 10-13: RETAILER POTABLE WATER QUALITY

Primary Standards – Health Based (units)	Primary MCL	PHG (MCLG)	Range of Detection	Average Level	Most Recent Sampling Date
Arsenic (µg/L)	10	0.004	ND - 3.2	2.2	2023
Barium (mg/L)	1	2	ND - 0.14	0.11	2023
Fluoride (mg/L)	2.0	1	0.30 - 0.49	0.37	2023
Nitrate [as N] (mg/L)	10	10	0.75 - 7.8	3.1	2024
Volatile Organic Constituents	Secondary MCL	PHG (MCLG)	Range of Detection	Average Level	Most Recent Sampling Date
Ethylbenzene (µg/L)(a)	300	300	ND - 1.6	ND	2024
Xylenes (mg/L)(a)	1.750	1.8	0.00054 - 0.011	ND	2024
Gross Alpha Activity (pCi/L)	15(c)	0	ND - 11	5.3	2023
Uranium (pCi/L)	20	0.43	1.5 - 8.3	4.4	2024
Secondary Standards – Aesthetic (units)	Secondary MCL	PHG (MCLG)	Range of Detection	Average Level	Most Recent Sampling Date
Chloride (mg/L)	500	n/a	79 - 120	97	2023
Specific Conductance (µS/cm)	1600	n/a	760 - 1000	890	2023
Sulfate (mg/L)	500	n/a	110 - 170	140	2023
Total Dissolved Solids (mg/L)	1000	n/a	460 - 630	540	2023
Turbidity (units)	5	n/a	ND - 0.14	ND	2023
Other Parameters (units)	Notification Level	PHG (MCLG)	Range of Detection	Average Level	Most Recent Sampling Date
Alkalinity (mg/L)	n/a	n/a	130 - 200	160	2023
Calcium (mg/L)	n/a	n/a	70 - 110	86	2023
Hardness [as CaCO ₃] (mg/L)	n/a	n/a	230 - 340	270	2023
Hardness [as CaCO ₃] (grains/gal)	n/a	n/a	13 - 20	16	2023
Magnesium (mg/L)	n/a	n/a	12 - 19	15	2023
pH (pH units)	n/a	n/a	7.5 - 7.9	7.7	2023
Potassium (mg/L)	n/a	n/a	2.7 - 3.9	3.2	2023
Sodium (mg/L)	n/a	n/a	66 - 100	80	2023
Unregulated Drinking Water Constituents (units)	Notification Level	PHG (MCLG)	Range of Detection	Average Level	Most Recent Sampling Date
Perfluorohexanesulfonic Acid (PFHxS) (ng/L) (b)	3	n/a	ND - 5.3	ND	2024
Perfluorohexanoic Acid (PFHxA) (ng/L) (b)	n/a	n/a	ND - 5.4	ND	2024
Perfluorooctanoic acid (PFOA) (ng/L) (b)	5.1	n/a	ND - 5.9	ND	2024
Perfluorooctane Sulfonate (PFOS) (ng/L)(b)	6.5	n/a	ND - 4.3	ND	2024
Perfluoropentanoic acid (PFPeA) (b)	n/a	n/a	ND - 4.9	ND	2024
Lithium	n/a	n/a	ND - 21.9	8.28	2023



10.4.3 Recycled Water Supplies

GSWC Barstow does not currently include recycled water as part of its water supply portfolio, as the City of Barstow Wastewater Treatment Facility (WWTF) does not presently treat effluent to meet direct-delivery recycled water standards established under Title 22 of the CCR, and therefore does not provide recycled water supplies to customers within the GSWC Barstow service area. Accordingly, recycled water is not included in GSWC Barstow’s long-term water supply portfolio.

TABLE 10-14: LAST FIVE YEARS OF RECYCLED WATER SUPPLIES (AFY)

Year	Recycled Water Supplies
2021	0
2022	0
2023	0
2024	0
2025	0

TABLE 10-15: PROJECTED RECYCLED WATER SUPPLIES 2030 (AFY)

Year Type		Projected Recycled Water Supplies
Normal		0
Single Dry-Year		0
Multi-Year Drought	2026 (1st Year)	0
	2027 (2nd Year)	0
	2028 (3rd Year)	0
	2029 (4th Year)	0
	2030 (5th Year)	0



TABLE 10-16: PROJECTED RECYCLED WATER SUPPLIES THROUGH 2050 (AFY)

Projected Recycled Water Supplies		2030	2035	2040	2045	2050
Normal		0	0	0	0	0
Single Dry-Year		0	0	0	0	0
Multi-Year Drought	Year 1	0	0	0	0	0
	Year 2	0	0	0	0	0
	Year 3	0	0	0	0	0
	Year 4	0	0	0	0	0
	Year 5	0	0	0	0	0



10.4.4 Desalination Opportunities

Desalinated water supplies can come from ocean water, brackish surface water, and brackish groundwater. GSWC does not provide desalinated water for beneficial uses in the GSWC Barstow service area.

10.4.5 Water Transfers and Exchanges

In addition to groundwater production, GSWC Barstow continues to explore opportunities to purchase and manage water supplies through transfers, exchanges, and groundwater banking programs. Transfers, exchanges, and groundwater banking provide important opportunities to enhance the long-term reliability of supplies available to meet customer demands. GSWC Barstow participates in local transfer and exchange programs within the MWA service area to augment its groundwater supplies. GSWC Barstow has executed several permanent transfers of groundwater BAP rights from other parties within the Centro Subarea, thereby increasing its baseline groundwater production rights.

10.4.6 Supply Summary

GSWC Barstow relies entirely on local groundwater from the Centro Subarea to meet customer demands. **Table 10-17** summarizes the total volume of groundwater used by GSWC Barstow from the Centro Subarea over the past five years, produced in accordance with its BAP and FPA.

Future water supplies are anticipated to continue to consist of groundwater. GSWC Barstow’s total water supply projections are shown in **Table 10-18** for the next five years (i.e., 2026 – 2030), and in **Table 10-19** in five-year increments through 2050, in normal year, single dry year, and five consecutive dry years.

TABLE 10-17: GSWC BARSTOW’S MANAGED GROUNDWATER PUMPING 2021-2025 (AFY)

Year	Groundwater Pumping
2021	6,004
2022	5,604
2023	5,433
2024	5,602
2025	5,442



TABLE 10-18: GSWC BARSTOW’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026 – 2030 (AFY)

Year Type		Managed Groundwater Pumping
Normal		8,068
Single Dry-Year		8,068
Multi-Year Drought	2026 (1 st Year)	8,068
	2027 (2 nd Year)	8,068
	2028 (3 rd Year)	8,068
	2029 (4 th Year)	8,068
	2030 (5 th Year)	8,068

TABLE 10-19: GSWC BARSTOW’S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Pumping	2030	2035	2040	2045	2050
Normal	8,068	8,068	8,068	8,068	8,068
Single Dry-Year	8,068	8,068	8,068	8,068	8,068
Multi-Year Drought	Year 1	8,068	8,068	8,068	8,068
	Year 2	8,068	8,068	8,068	8,068
	Year 3	8,068	8,068	8,068	8,068
	Year 4	8,068	8,068	8,068	8,068
	Year 5	8,068	8,068	8,068	8,068



10.4.7 Delivery System Details

GSWC Barstow solely relies on groundwater from the Centro Subarea to meet service area demands. The GSWC Barstow operates 15 active wells with a combined capacity of 15,010 gpm. An additional well is currently inactive but planned to come back online following implementation of iron treatment. Water is treated with sodium hypochlorite at the wellheads and pumped directly into the delivery system, which consists of 12 storage tanks and 182 miles of distribution pipelines. GSWC Barstow’s entire system is potable.

GSWC Barstow does not have imported water connections or emergency interconnections. This configuration means that purchased water is not directly available; however, imported water from the Mojave Water Agency is used to recharge local groundwater supplies.

Approximately 64% of the wastewater generated within the service area is collected by approximately 113 miles of gravity sewers owned by the City of Barstow and conveyed to the Barstow Regional WWTF, which is owned and operated by the City. The remaining wastewater is treated by private septic systems. The Barstow Regional WWTF provides primary and secondary treatment but does not currently provide the tertiary treatment required to meet recycled water standards established under Title 22 of the CCR. Treated effluent is disposed of in percolation ponds.



Sub–Chapter 10.5 – Water Use Characterization

Understanding water use characteristics is essential to enable the GSWC Barstow to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This chapter characterizes the GSWC Barstow’s retail customer water needs – current and forecast over the next few decades. Characteristics such as how water uses vary among different land use classifications, throughout the year, and under differing hydrologic conditions, all help with that understanding.

A thorough characterization and analysis provide a realistic prediction of future water use based upon GSWC Barstow’s past and current water use, in addition to considerations of anticipated growth, new regulations, changing climate conditions and trends in customer water use behaviors. A thorough analysis examines each water use sector for a variety of factors, then aggregates the information into a comprehensive projection of customer water use that becomes the foundation for integration with the GSWC Barstow water supplies (see *Section 10.4*) to assess long-term water system reliability (see *Section 10.7*).

This section is organized as follows:

- Current Customer Water Use
- Compliance with 2020 Urban Water Use Target and SBx7-7
- Forecasting Customer Use
- Forecasting Water Use for DRA and Annual Assessment
- Projecting Disadvantaged Community Water Use

10.5.1 Current Customer Water Use

This subsection presents data on GSWC Barstow’s residential and non-residential customers from 2021 through 2025 and summarizes the distribution system losses over the same period. Customer water use trends provided basis for the UWMP’s water use forecast through 2050.



10.5.1.1

Customer Water Use: 2021–2025

Potable uses are served by GSWC Barstow’s potable water delivery system. Potable water deliveries comply with Title 22 Drinking Water Standards. Non-potable water uses may include recycled and untreated raw water deliveries, such as tertiary treated recycled water, remediated groundwater, or untreated surface or groundwater supplies that do not meet potable drinking water standards. However, there are currently no non-potable uses within GSWC Barstow service area.

Demand within GSWC Barstow’s water service area is measured using water meters that are installed at each customer account. Records of current and historical water use at each account are maintained by GSWC. Demand within GSWC Barstow’s service area is tracked and reported for the following sectors:

- **Single Family Residential:** Attached or detached dwelling units that are individually metered.
- **Multi-Family Residential:** Two or more dwelling units served by a common water meter.
- **Commercial/Institutional:** Includes commercial and institutional customers. If irrigation water use at these sites is separately metered, it is included in the landscape sector.
- **Industrial:** Includes industrial customers. If irrigation water use at these sites is separately metered, it is included in the landscape sector.
- **Landscape:** Water meters used exclusively for outdoor uses associated with multiple family residential customers (i.e., homeowner associations [HOAs]) and other irrigation sites.

Water use categories described in CWC §10631(d)(1)(G) through (I), listed below, were not included in GSWC Barstow’s water demand calculations because they do not apply to the system:

- Sales to other agencies;
- Sales for agricultural irrigation; and
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

GSWC Barstow’s total water demand consists of only potable water demands within its service area.

GSWC Barstow’s past and current potable water use by customer class are presented by sector in **Table 10-20**. Residential customers accounted for approximately 60% of metered demand between 2021 and 2025. The other major use category is commercial/institutional, which accounted for approximately 38% of metered demand between 2021 and 2025.



Together, the residential and commercial/institutional usage sectors comprised roughly 97% of demands between 2021 and 2025. These values exclude distribution system losses, described in the next subsection.

TABLE 10-20: POTABLE CUSTOMER USE 2021 – 2025 (VALUES IN ACRE-FEET)

Sector	2021	2022	2023	2024	2025
Single-Family Residential	1,969	1,879	1,756	1,844	1,799
Multi-Family Residential	894	1,023	974	925	854
Commercial Institutional	1,830	1,748	1,653	1,777	1,778
Industrial	167	44	48	48	43
Landscape Irrigation	64	51	59	56	65
Total Metered Deliveries	4,924	4,745	4,490	4,650	4,539

NOTES: Values exclude distribution system losses.

10.5.1.2 Existing Distribution System Losses

Total demand includes water consumed by metered accounts, authorized but unbilled uses, and system water losses. These losses are categorized as either apparent or real losses. Real losses represent physical losses from the distribution system, such as seepage, leaks, and spills. Apparent losses reflect non-physical losses, including meter inaccuracies, data handling errors, and unauthorized consumption.

Since 2016, urban retail water suppliers have been required under CWC Section 10608.34 and CCR §638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as “water loss audit reports”). The distribution system water losses for the GSWC Barstow system for the past five years are shown in **Table 10-21**.

In 2022, the SWRCB adopted new performance standards for urban retail water suppliers that would reduce water loss by nearly 35%. Effective starting in 2023, the SWRCB provided a volumetric standard to each urban retail water supplier that sets cost-effective levels of achievable water loss given each water system’s characteristics and budgets. Suppliers will be required to start meeting individual volumetric loss standards over a three-year period beginning January 2028.

CWC Section 10631(3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the SWRCB pursuant to CWC Section 10608.34 have been met.

Table 10-22 demonstrates GSWC Barstow’s progress towards meeting the 2028 water loss standard. Apparent water losses are currently compliant with the 2028 standard, though real



water losses currently exceed the 2028 standard. GSWC Barstow has been making steady progress reducing system loss and expects to be compliant with the standards by the 2028 deadline.

TABLE 10-21: DISTRIBUTION SYSTEM LOSS, 2021 - 2025

2021	2022	2023	2024	2025
1,112	880	964	966	903
Average 2024/2025 =				935

TABLE 10-22: DISTRIBUTION SYSTEM LOSS, 2021 - 2025

PWS ID	SWRCB Standard? (y/n)	Real Water Loss					Apparent Water Loss				
		SWRCB Standard		Most Recent AWWA Water Loss Audit			SWRCB Standard		Most Recent AWWA Water Loss Audit		
		2028 Real Water Loss Standard	Real Water Loss Units	Number of Connections	AWWA Audit (AF)	Real Water Loss Per Unit per Day	2028 Apparent Water Loss Standard	Apparent Water Loss Units	Number of Connections	AWWA Audit (AF)	Apparent Water Loss Per Unit per Day
CA3610043	Yes	56.30	GPSCD	9,150	787	76.8	10.80	GPSCD	9,150	91	8.9

NOTES: GPSCD = Gallons per Service Connection per Day

10.5.2 Compliance with UWUO and SBx7-7

SB X7-7, mandated a 20% reduction in urban per-capita water use across California by 2020. To achieve this goal, SB X7-7 required each retail supplier to establish an urban water use target (2020 Target), contributing to the State’s collective efforts. Because the CWC does not set an end date for reporting progress in meeting the 2020 Target, this section demonstrates GSWC Barstow’s compliance with SB X7-7 in 2020.

GSWC Barstow achieved its 2020 Target in 2020. The data used to calculate GSWC Barstow’s 2020 Target and demonstrate compliance are documented in GSWC Barstow’s 2020 UWMP. **Table 10-23** below summarizes GSWC Barstow’s 2020 Target and actual 2020 gallons per capita per day (GPCD), confirming that GSWC Barstow met the SB X7-7 compliance requirements.



TABLE 10-23: DEMONSTRATION OF COMPLIANCE WITH GPCD TARGET

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?
No	Individual Target	236	159	Yes

In July 2024, California adopted the Making Conservation a California Way of Life (MCCWL) regulation, implementing Senate Bill (SB) 606 and Assembly Bill (AB) 1668 to support long-term conservation and drought resilience. The regulation establishes annual Urban Water Use Objectives (UWUO) for urban water suppliers and introduces Performance Measures for commercial, institutional, and industrial (CII) water users.

The UWUO is a water-budget-based framework tailored to each supplier. It consists of the following components:

- Residential indoor water use standard,
- Residential outdoor water budget,
- CII landscape outdoor water use standard (for landscapes with dedicated irrigation meters),
- Water loss standard,
- Variance, and
- Potable reuse bonus.

Beginning in 2027, suppliers must annually assess whether the sum of their regulated water uses (i.e., residential indoor and outdoor, dedicated irrigation meter use, and water loss) is at or below their UWUO. The state standards for residential indoor and outdoor water use and for CII outdoor use will become increasingly stringent over time, potentially requiring additional conservation efforts to achieve compliance.

The MCCWL regulation uses the 2020 Target as a backstop for the supplier’s UWUO. If the supplier’s UWUO is greater than its 2020 Target-based water use, after adjusting for excluded demands, its UWUO is adjusted down to its 2020 Target-based adjusted water use.

Urban retail water suppliers must report annually to the state on their water use relative to their UWUOs. GSWC Barstow’s UWUO submissions are available through DWR’s Water Use Efficiency Data Portal.

Because compliance with the UWUO requirements falls under the authority of the SWRCB, UWUO compliance projections are not required as part of an UWMP per the 2025 UWMP Guidebook. Therefore, UWUO projections are not included herein.



10.5.3 Forecasting Customer Use

This section provides an overview of projected water demands within the GSWC Barstow service area, which include retail customer demands and water losses. Projected water demands are estimated as a sum of (1) future uses from existing customers – *Section 10.5.3.1*; and (2) future uses from new customers – *Section 10.5.3.2*. These demand projections are developed as part of the RWUMP process. Detailed forecast methodologies are described in *Section 4.1 of Regional Chapter 4*. This section also includes a description of anticipated water use efficiency pursuant to CWC Section 10610.4(c).

10.5.3.1 Existing Customer Future Use

Current potable water use and gpcd for existing customers are based on 2025 production and population data, as described in *Section 4.1 of Regional Chapter 4*. For planning purposes, it is assumed that existing customers, including both residential and non-residential users, will maintain a constant demand of 139 gpcd, resulting in a total annual potable water use of 5,352 AFY, throughout the planning horizon.

10.5.3.2 New Customer Future Use

The methodology for forecasting new customer water use is described in *Section 4.1 of Regional Chapter 4*. For each Retailer, the forecast includes the following components:

- Total Residential Use
- Indoor Residential Use
- Outdoor Residential Use
- Total Non-Residential Use

As described in *Section 10.3.3*, the projected water demands presented herein incorporate anticipated growth in the City of Barstow Draft General Plan Update and BIG Specific Plan. While these planning documents are currently under public review and subject to final approval, they are considered in this UWMP for long-term planning purposes. **Table 10-24** presents the resulting customer water use forecast incorporating growth associated with these planning documents. It is anticipated that GSWC Barstow service area demands will be 7,959 AF by 2050, approximately 46% greater than 2025 demands.

It should be noted that portions of the proposed land use associated with Draft General Plan Update and BIG Specific Plan are located outside the current certificated service area of GSWC Barstow. Provision of water service to such areas would require, among other actions, expansion of GSWC Barstow’s service area, including approval by the CPUC. Accordingly, inclusion of these demands in this UWMP does not represent a commitment or obligation by GSWC to provide water service to these areas. All such service would be subject to future



regulatory approvals, environmental review, and demonstration of adequate water supply, infrastructure, and financial feasibility.

The Draft General Plan Update and BIG Specific Plan do not specify the timing of when this additional demand will come online; therefore, considering that these plans are still under review, this UWMP assumes a stepwise increase in demand, with the majority of the new demand occurring in the later years.

TABLE 10-24: FORECAST TOTAL FUTURE WATER USE (VALUES IN ACRE-FEET PER YEAR)

2025	2030	2035	2040	2045	2050
5,442	5,568	5,820	6,323	7,078	7,959

10.5.3.3 Adjusting Water Use Forecasts for Single–Dry and Multiple Dry Conditions

Because the GSWC Barstow service area is located in the high desert climate of the Mojave area with low rainfall and extreme temperatures, no adjustments are made to the forecasts presented in **Table 10–25** in single dry year and five consecutive dry years.

10.5.3.4 Climate Change Considerations

Changing climate can affect water demands, as extreme and higher temperatures can lead to increases in water use. However, as previously described, the GSWC Barstow service area is already has low rainfall and extreme temperatures. Therefore, adjustments for the near-term planning horizon are not warranted.

10.5.4 Forecasting Water Use for DRA and Annual Assessment

The California Legislature established requirements for UWMPs to help suppliers assess and prepare for drought conditions, including the DRA and the Annual Water Supply and Demand Assessment (Annual Assessment). These requirements were initially established under AB 1668 and SB 606 in response to the prolonged droughts experienced in California and anticipated hydrologic variability due to climate change.

The DRA evaluates water supply reliability over a consecutive five-year period, examining water supplies, water uses, and resulting water supply reliability under a reasonable prediction of five consecutive dry years. This provides a forward-looking perspective on how the system could perform during prolonged drought conditions. The Annual Assessment uses a similar approach but focuses on actual or anticipated conditions for the upcoming water year rather than hypothetical five-year dry conditions. The Annual Assessment is described in



further detail in Section 10.6.2 and is used to guide operational decision-making and short-term planning.

The forecasted water demand for the GSWC Barstow service area in drought conditions for the next five years is provided in **Table 10-25**.

TABLE 10-25: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (ACRE-FEET PER YEAR)

2026	2027	2028	2029	2030
5,467	5,492	5,518	5,543	5,568

10.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, retail suppliers are required to include the projected water use for lower income households in 2025 UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household has an income below 80% of area median income, adjusted for family size. The annual median income in the City of Barstow is \$53,380, which is below the statewide average of approximately \$99,000 (see Section 10.3.4) (US Census, 2025). Additionally, the entire City of Barstow is recognized by the state as a Disadvantaged Community.⁸¹ Because of this designation, the forecast water use presented in **Table 10-24** is fully inclusive of disadvantaged community use.

⁸¹ Source: DWR 2019–2023 Disadvantaged Community and Economically Distressed Area Mapping Tools, available at: <https://gis.water.ca.gov/app/dacs/>



Sub-Chapter 10.6 – Water Conservation and Shortage Response

10.6.1 Demand Management Measures

Pursuant to CWC Section 10631(e), this section provides a discussion of GSWC Barstow’s current and planned water demand management measures (DMMs) which are designed to strengthen water resiliency and support statewide conservation goals. Specifically, these DMMs will support GSWC Barstow in complying with MCCWL requirements, including achieving its UWUO, and in advancing long-term water conservation.

GSWC Barstow centrally administers its conservation programs. GSWC has implemented water waste prevention ordinances, maintains metering to accurately measure consumption, and uses conservation pricing to encourage efficient water use. Public education and outreach efforts promote customer awareness of water-saving practices, while programs to assess and manage distribution system losses help reduce real water loss. Dedicated staffing and program coordination support the planning, implementation, and monitoring of these conservation efforts.

In addition, GSWC Barstow participates in regional conservation initiatives. The Retailer is a member of the Alliance for Water Awareness and Conservation (AWAC), a coalition of more than 20 water agencies within the MWA service area that focuses on achieving water conservation targets, including GPCD goals, and promoting public education on water efficiency.

10.6.1.1 Foundational Demand Management Measures

For purposes of this chapter, GSWC Barstow’s DMMs are grouped in accordance with the DMM categories in the CWC Section 10631(e).

10.6.1.2 Water Waste Prevention Ordinances

GSWC Barstow has adopted water waste prevention measures to reduce unnecessary or inefficient water use within its service area. These measures are intended to discourage



water waste, improve overall water use efficiency, and support compliance with statewide conservation requirements.

As an investor-owned public utility, GSWC does not have rule-making authority. However, it supports member agencies and local cities in efforts to adopt ordinances that will reduce water waste. For GSWC, this provision is implemented through CPUC-approved rules, including Rule No. 14.1 (Water Conservation and Reduction Plan), Rule 20 (Water Conservation), and Rule 11 (Discontinuance and Restoration of Service).

CPUC's methodology for water utilities to implement Rule No. 14.1 is documented in Standard Practice U-40-W, "Instructions for Water Conservation, Rationing, and Service Connection Moratoria." Rule 14.1 sets forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect. Water conservation restrictions include:

- Use of potable water for more than minimal landscaping
- Use through a broken or defective water meter
- Use of potable water which results in flooding or runoff in gutters or streets
- Use of potable water for washing private cars or commercial aircrafts, cars, buses, boats, or trailers, except at a fixed location where water is properly maintained to avoid wasteful use
- Use of potable water for washing buildings, structures, driveways, street cleaning or other hard-surfaced areas
- Use of potable water to irrigate turf, lawns, gardens, or ornamental landscaping
- Use of potable water for construction purposes
- Use of potable water for filling or refilling of swimming pools

Rule No. 20 (approved by the CPUC in 2015) discourages wasteful use of water and promotes use of water saving devices. The stated purpose of the rule is to "ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water supply and service extend to the largest number of persons." Together, Rules 11, 14.1 and 20 prohibit negligent or wasteful use of water, create a process for mandatory conservation and rationing, and promote the use of water-saving devices.

These water waste prevention measures apply on an ongoing basis and may be expanded or enforced more stringently during declared water shortage conditions, as described in the WSCP (*Section 10.6.2*).

10.6.1.3 Metering

CWC §527(a) requires meters to be installed on all customer services by 2025. Metering provides the basis for accurately measuring water use, billing customers, and tracking water



demand by customer class. GSWC Barstow meters all customer connections within its service area and bills by volume monthly. GSWC follows the requirements of CPUC General Order 103-A which prescribes minimum water system design, and operation and maintenance (O&M) standards for water utilities including specifications for meter calibration, testing, and replacement activities.

10.6.1.4 Conservation Pricing

All metered customers, including customers served by GSWC Barstow, are charged volumetrically for water service. Starting on 1 September 2009, GSWC implemented a tiered conservation pricing rate structure for residential customers as approved by the CPUC for its Region III Rate Making Area that includes the GSWC Barstow. The current rate structure for residential customers includes a fixed service charge and volumetric escalating pricing tiers, based on customer usage. In contrast, non-residential customers are charged a fixed service charge and a constant volumetric rate.

The implementation of this tiered pricing policy is the result of GSWC's collaboration with CPUC to implement conservation tiered rates for residential customers of investor-owned utilities. Tiered rates are consistent with the CPUC's 2010 Water Action Plan.

GSWC is scheduled to submit a GRC filing with the CPUC in July 2026 that includes proposed rates over the next three years based on volumetric charges for customers in the Region III Rate Making Area that includes GSWC Barstow. If approved, this rate decision will allow GSWC to adjust volumetric revenues and maintain a conservation-oriented rate structure that encourages efficient water use today and in the future.

The GRC process is thorough and generally lasts 18 months with oversight from CPUC's Public Advocates Office, a division of the CPUC that scrutinizes the filing on behalf of customers. The utilities' customers have an opportunity to participate in the GRC process by attending Public Participation Hearings and/or testifying in a public proceeding before an Administrative Law Judge.

10.6.1.5 Public Education and Outreach

Public education and outreach programs in the GSWC Barstow service area consist of information distributed via a variety of public information systems, school education programs, and community workshops.

Public Information Systems

GSWC provides water conservation information to customers in the GSWC Barstow service area through a variety of public information systems. These systems are intended to provide customers with access to information regarding water conservation practices, available programs, and applicable water use requirements.



Per the 2023 GRC, GSWC is allowed to spend up to \$34,500 annually on conservation outreach and \$37,500 annually on conservation promotional items for the 2025–2027 rate cycle for the entire Region III Rate Making Area, which includes GSWC Barstow. Outreach efforts in the GSWC Barstow service area include providing free conservation literature and brochures in the customer service area office, water conservation advertisements in local publications, and participation in conservation events, as applicable.

Customers may also access rebates and other conservation information on GSWC’s website (gswater.com), which provides information on conservation programs and links to regional resources.

GSWC customer outreach efforts include online platforms such as its website and social media. Conservation messaging is provided periodically throughout the year, including during the spring and early summer months, when customers may be preparing for increased seasonal water use. Information shared with customers includes available rebate programs and general water conservation tips.

GSWC reviews customer outreach activities within the scope of programs and budgets approved by the CPUC. Public information measures include direct mail, participation in community events, website–based information, and media advertisements to promote water conservation messaging and available conservation programs. This category is capped, per the previous 2023 GRC decision.

School Education Programs

GSWC conducted school conservation education programs for an estimated 15,525 students within its entire customer base. The GSWC school education program reaches over 5,000 students in Region III elementary schools each year. GSWC sponsors the WaterWise school education program in elementary schools with a CPUC–approved budget of \$96,000 annually from 2025–2027.

Community Workshops

GSWC will sponsor community workshops to help educate both in–person and on–line customers in a hands–on environment about achieving water use efficiencies in their landscapes and homes. The curriculum will include landscape planning, efficient irrigation concepts, and proper turf reduction or removal.

10.6.1.6 Programs to Assess and Manage Distribution System Real Loss

As discussed in *Section 10.5.1.2*, suppliers will be required to start meeting individual volumetric loss standards over a three–year period beginning January 2028. GSWC Barstow conducts annual distribution system audits using AWWA M36 Standard Water Audit methodology. The approach consists of a component analysis of metered water sources,



metered water demands, quantification of water losses (apparent and real), and calculation of non-revenue water as a percentage of total system flows.

Results of GSWC Barstow's most recent water loss audit report are included in **Table 10-22**. Apparent water losses are currently compliant with the 2028 standard, though real water losses currently exceed the 2028 standard. GSWC Barstow has been making steady progress reducing system loss and expects to be compliant with the standards by the 2028 deadline.

GSWC maintains an active Water Loss Control Program, and the Operations Engineering Department monitors GSWC Barstow distribution system water losses by reviewing the annual water loss audit reports. When the Operations Engineer determines that a leak detection survey is needed, GSWC will contract with a qualified leak detection company to perform the survey using the most current leak detection technology. GSWC also maintains a comprehensive work order management system that documents leak locations and repair history, which provides a solid foundation for future water loss control actions.

10.6.1.7 Water Conservation Program Coordination and Staffing Support

GSWC maintains a Water Use Efficiency Department with a companywide Water Use Efficiency Manager and a Senior Water Use Efficiency Specialist who collectively develop and manage programs for all the GSWC systems, including GSWC Barstow. GSWC utilizes several consultants and contractors to support program development and implementation on an as-needed basis.

10.6.1.8 Other Demand Management Measures

GSWC implements other DMM programs in the GSWC Barstow service area that are consistent with the structures approved by the CPUC. Per GSWC's 2023 GRC for the 2025 – 2027 rate cycle, program offerings in the GSWC Barstow service area through 2027 include:

- **GSWC Residential Programs.** These programs include: 1) free indoor/outdoor water-use surveys to help customers understand water use and receive suggestions to use water more efficiently, and 2) indoor water conservation kits that include a high efficiency showerhead, a kitchen aerator, a bath aerator, and leak test tablets and instructions.
- **GSWC Residential Rebates.** In partnership with the California Water Efficiency Partnership (CalWEP), these rebates include: 1) Flume water flow monitoring devices that attach to water meters and provide single-family customers almost real time data on their water use and detect leaks, and 2) Rachio weather-based irrigation smart controllers. Additionally, GSWC offers rebates for: premium high efficiency toilets, high-efficiency clothes washers, weather-based irrigation controllers, soil



moisture sensors, rotating sprinkler nozzles, flow monitoring devices, drip irrigation, and rain barrels.

- **GSWC Commercial/Institutional and Large Landscape Programs.** GSWC offers a wide range of rebates for CII and large landscapes, including: free CII indoor and outdoor water use surveys, multi-family indoor conservation kits, premium high efficiency toilets, high-efficiency flush-valve toilets, high efficiency urinals, weather-based irrigation controllers, and efficient nozzles and rotors.

10.6.1.9 Planned DMM Activities

The DMMs described above have contributed to GSWC Barstow’s compliance with its 2020 Target. GSWC Barstow’s conservation programs are subject to review and approval by the CPUC through a GRC, which typically occurs every three years. Through the GRC process, conservation programs and associated funding levels are evaluated and approved by the CPUC, and any modifications to program scope, implementation, or budgets are subject to CPUC review and authorization. The CPUC approved GSWC’s 2023 GRC in January 2025 for the 2025 – 2027 rate cycle, and GSWC anticipates filing its 2026 GRC with the CPUC in July 2026 for the 2028 – 2031 rate cycle. These programs will continue to support GSWC Barstow in complying with MCCWL requirements, including achieving its UWUO, and in advancing long-term water conservation.

10.6.2 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that GSWC Barstow has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

10.6.2.1 Overview of Water Shortage Contingency Plan

GSWC Barstow’s WSCP is included in **Appendix 10A**. The WSCP addresses the requirements in CWC Section 10632 of the UWMPA. The WSCP consists of the following required elements:

- Introduction to the WSCP
- An analysis of water supply reliability
- Procedures for conducting an annual water supply and demand assessment
- Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50% shortages and greater than 50% shortage
- Shortage response actions that align with the defined shortage levels



- Communication protocols and procedures
- Customer compliance, enforcement, appeal, and exemption procedures
- A description of legal authorities
- A description of financial consequences
- Monitoring and reporting requirements
- Reevaluation and improvement procedures
- Special water feature distinction
- Plan adoption, submittal, and availability

10.6.2.2 Summary of Water Shortage Response Strategy

GSWC is an investor-owned public utility that is subject to CPUC jurisdiction. CWC Section 357 requires that suppliers subject to regulation by the CPUC secure their approval before imposing water consumption regulations and restrictions required by water supply shortage emergencies. Implementation of the actions is dependent upon approval of the CPUC. Prior to declaration of mandatory rationing, a utility may request the addition of a Schedule 14.1 – Staged Mandatory Water Rationing tariff, via a Tier 2 advice letter with full justification. The utility may not add the Schedule 14.1 until it has been authorized to do so by the CPUC as delegated to the Division of Water and Audits or other staff authorized by the CPUC.

CPUC Rule 14.1 “Water Conservation and Rationing Plan” (Rule 14.1) has specific criteria that must be integrated with the WSCP implementation procedures. Rule 14.1 requires each GSWC service area to “elect to activate voluntary conservation” or prepare a Schedule 14.1 to implement Staged Mandatory Water Conservation and Rationing. Schedule 14.1 may only be prepared as a direct response to an acute water shortage situation, and it requires CPUC deliberation and approval. Rule 14.1 has 16 voluntary conservation criteria in place that may be exercised by each GSWC system without CPUC approval should GSWC elect to do so. Alternatively, in order for GSWC to engage in mandatory water rationing, GSWC must prepare a Schedule 14.1 and submit a Tier 2 Advice Letter, with full justification for the water rationing action. Additionally, GSWC must prepare a Schedule 14.1 and submit a Tier 2 Advice Letter and receive CPUC approval to move from one water shortage stage to another and implement many of the shortage response actions associated with each water shortage stage and conduct a public hearing.

Activation Overview

Several steps must first occur before GSWC can impose measures to reduce customer water demands. Steps are taken in the context that each water shortage condition triggering stages of action is different and unique. The WSCP information below represents the proposed response for GSWC Southwest and can be updated as needed. The typical steps for activating GSWC water shortage response are as follows:



Step 1: GSWC determines water shortage conditions exist for GSWC Southwest based on the results of the AWSDA, supply shortfalls, state cutbacks, or emergency conditions.

Step 2: GSWC requests CPUC approval of Rule 14.1 to establish three (3) broad categories of conservation policy as follows:

- Rule 14.1 A. Conservation-Non-Essential or Unauthorized Water Use – Voluntary – GSWC authorized to implement without additional CPUC advice.
- Rule 14.1 A. Conservation-Non-Essential or Unauthorized Water Use – Mandatory but without fines or surcharge tariff – GSWC required to file Tier 1 Advice Letter requesting authorization to institute a Schedule 14.1 Stage.
- Rule 14.1 B. Staged Mandatory Rationing of Water Usage – Includes authorization of fines and surcharge tariff. GSWC required to file Tier 2 Advice Letter requesting authorization to institute a Schedule 14.1 Stage.

Step 3: GSWC receives CPUC approval of Schedule 14.1 and begins implementation of the response actions based on water shortage conditions and need. GSWC will request approval of Schedule 14.1 as deemed necessary to meet actual shortage condition or water use reduction targets.

Step 4: GSWC would deactivate Schedule 14.1 in effect if water shortage conditions or need no longer exist by filing a Tier 1 Advice Letter.

10.6.2.3 Water Shortage Contingency Plan Levels

The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to the normal reliability condition. These water shortage stages have been standardized to allow for a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions. GSWC Barstow's six standard WSCP levels are summarized in **Table 10-26**.



TABLE 10-26 CROSS-REFERENCE FOR STANDARD VS SUPPLIER SHORTAGE LEVELS

☒ Supplier uses the Standard six levels of water shortage.			
Standard Shortage Levels	Percent Shortage Range	GSWC Barstow’s Shortage Levels	Percent Shortage Range
1	Up to 10%	1	Up to 10%
2	Up to 20%	2	Up to 20%
3	Up to 30%	3	Up to 30%
4	Up to 40%	4	Up to 40%
5	Up to 50%	5	Up to 50%
6	>50%	6	>50%

The WSCP is required to identify locally appropriate shortage response actions that align with the defined water shortage stages and include demand reduction actions, supply augmentation actions, system operational changes, and mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions. For each response action the WSCP is to provide an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

Supply Augmentation Actions

GSWC Barstow may mitigate potential shortfalls with both supply augmentation actions. If available, GSWC Barstow will access stored groundwater assets through the carryover provisions of the Mojave Basin Adjudication, derived from GSWC Barstow’s unused FPA in each year. Additionally, GSWC Barstow may acquire replacement or make-up water in the Centro Subarea.

Demand Reduction Actions

In addition, GSWC Barstow may also mitigate supply shortfalls with demand reduction actions. GSWC has grouped the actions to be taken during a water shortage condition into the six water shortage stages in **Table 10-26**, providing flexibility to address water shortages up to and in excess of the 50% shortage level condition. The following is an overview of the staged response GSWC could follow during a given water shortage condition including sequential water shortage stages (1-6) based on shortage severity, relative supply conditions for each water shortage stage, necessity of Schedule 14.1 policy activation, and percent shortage reduction levels. The water shortage stages would be implemented based on specific conditions and need to meet water service and system revenue requirements. A water shortage declaration would be made by resolution of the American States Water Company Board, delegating to GSWC officers the authority to make decisions regarding the



need to activate Schedule 14.1 or change water shortage stages. Alternatively, an authorized government official or state agency may issue water use reduction mandates, which would be implemented by a resolution of the Board to activate an appropriate water shortage stage. The actions to be undertaken during each water shortage stage cannot be implemented until necessary Board and CPUC approvals have been executed. The following six water shortage stages list the shortage response actions:

Stage 1 (0 to 10% shortage) – Stage 1 is a “Water Alert” where voluntary conservation is encouraged. GSWC explains the drought situation to the public and governmental bodies relying on GSWC water. GSWC explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by GSWC during this stage include:

- Implement Voluntary Water Conservation Measures authorized under Rule 14.1;
- Establish a voluntary demand reduction target for each water system;
- Inform public of water shortage conditions or demand reduction targets through some or all of the following: distribution of literature, public meetings, website updates, bill inserts, digital media, conservation messages printed in local newspapers, and educational programs in schools;
- Initiate a Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency;
- Identify the year to be used for establishing the customer baseline water use; and
- Recommend voluntary customer outdoor irrigation between the hours of 7 PM and 8 AM per the following schedule. If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions.

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday, Wednesday, Friday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday, Thursday, Saturday

Stage 2 (10 to 20% shortage) – Stage 2 is a “Moderate Shortage” and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 2 will include all actions undertaken in Stage 1. GSWC will require mandatory conservation under this stage. The activities performed by GSWC during this stage include:

- Implement all measures in Stage 1;



- Restrict outdoor irrigation to between the hours of 7 PM and 8 AM per the following schedule. If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions;

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday and Wednesday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday and Saturday

- Calculate customer conservation allocation based upon the year identified in Stage 1, less 20%;
- For residential customers no allocation will be set less than eight hundred cubic feet (CCF) per monthly billing period or 16 CCF per bi-monthly billing period, unless directed otherwise by an authorized government agency;
- Water usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to \$2.50 per CCF; and
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1, C.3.

Stage 3 (20– 30% shortage) – Stage 3 is a “Severe Shortage” that will be implemented if the Stage 2 restrictions are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 3 will include all actions undertaken in Stage 2. GSWC will require mandatory conservation under this stage. The activities performed by GSWC during this stage include:

- Implement all measures in Stage 2;
- Calculate customer conservation allocation based upon the year identified in Stage 1, less 30%;
- For residential customers no allocation will be set less than eight CCF per monthly billing period or 16 CCF per bi-monthly billing period, unless directed otherwise by an authorized government agency;
- Water usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to \$5 per CCF; and
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3.



Stage 4 (30 - 40% shortage) – Stage 4 is a “Critical Shortage” that will be implemented if the Stage 3 restrictions are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 4 will include all actions undertaken in Stage 3. GSWC will require mandatory conservation under this stage. The activities performed by GSWC during this stage include:

- Implement all measures in Stage 3;
- Calculate customer conservation allocation based upon the year identified in Stage 1, less 40%;
- For residential customers no allocation will be set less than eight CCF per monthly billing period or 16 CCF per bi-monthly billing period, unless directed otherwise by an authorized government agency;
- Water usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to \$7.50 per CCF; and
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3.

Stage 5 (40 - 50% shortage) – Stage is a “Shortage Crisis” that will be implemented if the Stage 4 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 5 will include all actions undertaken in Stage 4. The activities performed by GSWC during this stage include:

- Implement all measures in Stage 4;
- Calculate customer conservation allocation based upon the year identified in Stage 1, less 50%;
- For residential customer no allocation will be set less than eight CCF per monthly billing period or 16 CCF per bi-monthly billing period, unless directed otherwise by an authorized government agency;
- Water usage in excess of customer baseline to be charged at regular rate plus a drought emergency surcharge of up to \$10 per CCF; and
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3.



Stage 6 (50 % or greater shortage) – Stage 6 is an “Emergency Shortage” condition that will be implemented if the Stage 5 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 6 will include all actions undertaken in Stage 5. GSWC will require mandatory conservation under this stage. The activities performed by GSWC during this stage include:

- Implement all measures in Stage 5;
- Calculate customer conservation allocation based upon the year identified in Stage 1, less 55%;
- For residential customers no allocation will be set less than eight CCF per monthly billing period or 16 CCF per bi-monthly billing period, unless directed otherwise by an authorized government agency;
- Water usage in excess of customer baseline to be charged at regular rate plus a drought emergency surcharge of up to \$15 per CCF; and
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3.

GSWC may update current water shortage condition response measures based on CPUC approvals and direction, state policy directives, emergency conditions, or to improve customer response.



Sub-Chapter 10.7 – Water System Reliability and Drought Risk Assessment

10.7.1 Five Year Drought Risk Assessment

The DRA requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years. The DRA is intended to inform the DMMs and water supply projects and programs to be included in the UWMP. GSWC Barstow has prepared an evaluation of its water supplies and demands to meet customer needs during this period. The utility ensures that it does not use more water than necessary in any given year and continues to encourage customers to use water efficiently.

GSWC Barstow is supplied entirely by local groundwater pumped from the Centro Subarea, which historically has been sufficient to meet retail customer demands. **Table 10-27** summarizes GSWC Barstow’s five-year DRA for 2026 through 2030, integrating system supplies as described in Section 10.4 and reflecting unconstrained water demand as described in Section 10.5. For planning purposes, the projected groundwater supplies are assumed equal to GSWC Barstow’s service area demand, not the projected total available supply identified in Section 10.4.1.1, since GSWC Barstow does not use more water than necessary in any given year. Projections indicate that groundwater supplies will remain reliable throughout the simulated five-year drought analyzed in this DRA.

TABLE 10-27: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	5,467	5,492	5,518	5,543	5,568
Demand	5,467	5,492	5,518	5,543	5,568
Difference	0	0	0	0	0



10.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to 25 years to provide a guiding document for future land use and water supply planning through the next UWMP cycle.

The GSWC Barstow long term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years through 2050.

10.7.2.1 Normal and Single Dry Conditions 2030 – 2050

Table 10-28 compares the projected supply and demand over the 25-year planning horizon under normal conditions, and **Table 10-29** compares the projected supply and demand under single dry year conditions in five-year increments through 2050. As described in Section 10.5.3.3, GSWC Barstow’s projected service area demands are not adjusted for dry year conditions since the service area is located in a high desert climate with low rainfall and extreme temperatures. Additionally, the projected groundwater supplies are assumed equal to GSWC Barstow’s service area demand, not the projected total available supply identified in Section 10.4.1.1, since GSWC Barstow does not use more water than necessary in any given year. There are no anticipated shortfalls in both normal and single years.

TABLE 10-28: NORMAL YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	5,568	5,820	6,323	7,078	7,959
Demand	5,568	5,820	6,323	7,078	7,959
Difference	0	0	0	0	0

TABLE 10-29: SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Single Dry Year	2030	2035	2040	2045	2050
Supply	5,568	5,820	6,323	7,078	7,959
Demand	5,568	5,820	6,323	7,078	7,959
Difference	0	0	0	0	0



10.7.2.2 Five Consecutive Dry Years 2030 – 2050

A five-consecutive year drought represents the driest five-year period in the historical record. **Table 10-30** compares the projected supply and demand under five year consecutive years of drought for the 25-year planning horizon. As described in Section 10.5.3.3, GSWC Barstow’s projected service area demands are not adjusted for five consecutive dry year conditions since the service area is located in a high desert climate with low rainfall and extreme temperatures. Additionally, the projected groundwater supplies are assumed equal to GSWC Barstow’s service area demand, not the projected total available supply identified in Section 10.4.1.1, since GSWC Barstow does not use more water than necessary in any given year. There are no anticipated shortfalls in five consecutive dry year conditions.

TABLE 10-30: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	5,568	5,820	6,323	7,078	7,959
	Demand	5,568	5,820	6,323	7,078	7,959
	Difference	0	0	0	0	0
Year 2	Supply	5,618	5,920	6,474	7,255	8,136
	Demand	5,618	5,920	6,474	7,255	8,136
	Difference	0	0	0	0	0
Year 3	Supply	5,669	6,021	6,625	7,431	8,312
	Demand	5,669	6,021	6,625	7,431	8,312
	Difference	0	0	0	0	0
Year 4	Supply	5,719	6,122	6,776	7,607	8,488
	Demand	5,719	6,122	6,776	7,607	8,488
	Difference	0	0	0	0	0
Year 5	Supply	5,769	6,222	6,927	7,783	8,664
	Demand	5,769	6,222	6,927	7,783	8,664
	Difference	0	0	0	0	0



10.7.3 Annual Reliability Assessment

This section describes GSWC’s procedural methodology for developing its Annual Water Supply and Demand Assessment (Annual Assessment) for GSWC Barstow. The Annual Assessment examines GSWC Barstow’s water reliability for the current year and one additional dry year to determine what, if any, water shortages stages may be triggered during the required period. For purposes of this UWMP, the “current” water use conditions as described in Section 10.5 are compared to the availability of the GSWC Barstow’s existing water supplies as described in Section 10.4. The Annual Assessment is conducted for a normal and single–dry year.

10.7.3.1 Normal Year Supply and Current Water Use

In a normal year, GSWC Barstow assumes groundwater supplies are fully available under typical hydrologic and regulatory conditions. Demand reflects current unconstrained use within the service area. **Table 10–31** presents normal–year water supply and demand conditions for the GSWC Barstow service area, under which no shortages are anticipated.

TABLE 10-31: NORMAL YEAR WATER SUPPLY AND DEMAND (AFY)

Normal Year	Current
Supply	8,068
Demand	5,442
Difference	2,626

NOTES: Supply represents GSWC Barstow’s groundwater available in a normal year based on current FPA, as summarized in **Table 10–8**, excluding carryover water supplies. Demand represents actual current water use for calendar year 2025, as summarized in **Table 10–20**.

10.7.3.2 Single Dry Year Supply and Dry–Year Current Demand

In a single dry year, GSWC Barstow assumes the groundwater supply available is 56% of the BPA, as explained in Section 10.5. Demand reflects current unconstrained use within the service area. No adjustments are made to the single dry year forecasts because the GSWC Barstow service area already experiences low rainfall and extreme temperatures. **Table 10–32** presents single dry year water supply and demand conditions for the GSWC Barstow service area, under which no shortages are anticipated.



TABLE 10-32: SINGLE DRY YEAR WATER SUPPLY AND DEMAND (AFY)

Single Dry Year	Current
Supply	8,068
Demand	5,442
Difference	2,626

NOTES: Supply represents GSWC Barstow’s groundwater available in a single dry year based on current FPA, as summarized in **Table 10-8**, excluding carryover water supplies. Demand represents actual current water use for calendar year 2025, as summarized in **Table 10-20**.

10.7.4 Water Supply Reliability Summary

As the analysis presented in this chapter demonstrates that GSWC Barstow has reliable supplies to meet its retail customer demands in normal, single dry years, and five consecutive dry year conditions through 2050.



Sub-Chapter 10.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2(a), urban water suppliers are required to report the energy required to supply water to GSWC Barstow. This energy intensity reporting enables water suppliers and the State to better understand the relationship between water use and energy consumption.

GSWC Barstow has chosen the “Total Utility Approach” to measure energy intensity. This methodology accounts for all energy consumed to operate the system, including pumping from local groundwater sources, treatment, and distribution to retail customers. Because GSWC Barstow’s system is entirely supplied by local groundwater, the majority of energy consumption is attributed to groundwater pumping.

Total energy consumed by GSWC Barstow during calendar year 2025 based on reported utility bills is 4,566,291 kilowatt hours (kWh) for retail potable water deliveries. **Table 10-33** shows the energy consumed for each AF of water entering the distribution system in GSWC Barstow, including energy associated with extracting and diverting, placing into storage, treating, conveying, and distributing drinking water, but not including energy associated with the treatment of wastewater. Based on this, the energy intensity is estimated to be 2,480 kilowatt hours per million gallons (kWh/MG), or 839 kilowatt hours per acre-foot (kWh/AF).

TABLE 10-33: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR MONTH YEAR THROUGH MONTH YEAR

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	5,442
Energy Consumed (kWh)	4,566,291
Energy Intensity (kWh/MG)	2,575
NOTES: Metered energy data during calendar year 2025 based on reported utility bills.	



Sub–Chapter 10.9 – Summary

GSWC Barstow’s service area demands are primarily comprised of residential and commercial/institutional uses. Service area demands are anticipated to increase by approximately 40% under the Draft General Plan Update, driven by growth in dwelling units, population, non-residential uses, and employment through 2048. GSWC Barstow will continue to rely solely on groundwater from the adjudicated Centro Subarea of the Lower Mojave Valley Groundwater Basin to meet future service area demands.

Water service reliability for GSWC Barstow was evaluated under normal, single dry-year, and multiple dry-year hydrologic conditions. Based on this analysis, GSWC Barstow expects available groundwater supplies to be sufficient to meet projected demands under all hydrologic conditions, including a five-year drought, while accounting for the potential effects of climate change. In addition, water quality is not expected to constrain supply reliability, as it is routinely monitored and managed to ensure compliance with drinking water standards.



GSWC-BARSTOW SYSTEM

APPENDICES

This page is reserved for GSWC-Barstow System-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to GSWC-Barstow System's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the GSWC-Barstow System retailer chapter, GSWC-Barstow System's WSCP, and applicable GSWC-Barstow System -specific appendices.



Chapter 11.0 HESPERIA WATER DISTRICT



TABLE OF CONTENTS

Sub-Chapter 11.1 – Introduction	11-7
11.1.1 Background and Purpose	11-7
11.1.2 Basis for Plan Preparation	11-8
11.1.3 Coordination and Outreach	11-8
11.1.4 RUWMP Adoption	11-9
11.1.5 Document Organization	11-10
Sub-Chapter 11.2 – Water Service and System Description	11-11
11.2.1 Service Area Climate	11-13
Sub-Chapter 11.3 – Population, Land Use, Economy, and Demographics	11-14
11.3.1 Current Population and Historic Trends	11-14
11.3.2 Projected Population	11-15
11.3.3 Current and Projected Land Use	11-16
11.3.4 Economic Trends & Other Social and Demographic Factors	11-19
Sub-Chapter 11.4 – Water Supply and Infrastructure Characterization	11-20
11.4.1 Groundwater	11-20
11.4.2 Groundwater Quality	11-24
11.4.3 Recycled Water Supplies	11-26
11.4.4 Desalination Opportunities	11-28
11.4.5 Water Transfers and Exchanges	11-28
11.4.6 Supply Summary	11-29
11.4.7 Delivery System Details	11-31
Sub-Chapter 11.5 – Water Use Characterization	11-32
11.5.1 Current Customer Water Use	11-33
11.5.2 Compliance with Water Use Targets and Objectives	11-37
11.5.3 Forecasting Customer Use	11-38
11.5.4 Forecasting Water Use for DRA and Annual Assessment	11-41
11.5.5 Projecting Disadvantaged Community Water Use	11-43
Sub-Chapter 11.6 – Water Conservation and Shortage Response	11-44
11.6.1 Demand Management Measures	11-44

11.6.2	Foundational Demand Management Measures	11-45
11.6.3	Water Shortage Contingency Plan	11-47
Sub-Chapter 11.7 – Water System Reliability and Drought Risk Assessment.....		11-50
11.7.1	Five-year Drought Risk Assessment	11-50
11.7.2	Long-Term Service Reliability	11-51
11.7.3	Annual Reliability Assessment	11-53
11.7.4	Water Supply Reliability Summary.....	11-54
Sub-Chapter 11.8 – Energy Intensity Analysis.....		11-55

LIST OF TABLES

Table 11-1: Public Water System Information.....	11-8
Table 11-2: Customer Water Service Connections.....	11-12
Table 11-3: Historical Population	11-15
Table 11-4: Population Growth Rate - 2015-2024.....	11-15
Table 11-5: Population Forecast and Growth Rate.....	11-16
Table 11-6: Known Land Use Plans in Service Area	11-17
Table 11-7: Last five years of Hesperia Water District's FPA Supply (AFY)	11-21
Table 11-8: Projected Mojave Adjudication FPA for the District through 2030 (AFY)	11-22
Table 11-9: Projected Mojave Adjudication FPA for the District through 2050 (AFY)	11-22
Table 11-10: Last five years of Replacement and Make-up Water Supplies (AFY).....	11-23
Table 11-11: Hesperia Water District Potable Water Quality	11-25
Table 11-12: Last five years of Recycled Water Supplies (AFY)	11-27
Table 11-13: Projected Recycled Water Supplies 2030 (AFY)	11-27
Table 11-14: Projected Recycled Water Supplies through 2050 (AFY)	11-28
Table 11-15: District's Managed Groundwater Production 2021-2025 (AFY)	11-29
Table 11-16: District's Projected Managed Groundwater Supply 2026-2030 (AFY)	11-30
Table 11-17: District's Projected Managed Groundwater Supply through 2050 (AFY).....	11-30
Table 11-18: Potable Customer Use 2021-2025 (AF)	11-35
Table 11-19: Non-Potable Customer Use 2021-2025 (AF).....	11-36
Table 11-20: Distribution System Loss 2021-2024	11-37
Table 11-21: Forecast Future Water Use (AFY).....	11-40
Table 11-22: Forecast DRA Water Use for 2026 through 2030 (AFY)	11-43
Table 11-23: Five-year Drought Risk Assessment (AFY).....	11-51
Table 11-24: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY)	11-52
Table 11-25: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY).....	11-53
Table 11-26: Energy Intensity - Total Utility Approach for Oct 2024 through Sept 2025.....	11-55

LIST OF FIGURES

Figure 11-1: Hesperia Water District Service Area 11-12

Figure 11-2: Known Land Use Plans in Service Area Map 11-18

Figure 11-3: Potable Water System 11-31

APPENDICES

Hesperia Water District Appendices 11-56

Sub-Chapter 11.1 – Introduction

The Hesperia Water District (District) operates as a subsidiary special district of the City of Hesperia (City), and the City Council serves as the District’s Board of Directors. The City’s Water Department includes the following divisions: Water Production, Water Distribution, Water Pipeline, Sewer and Stormwater, and Customer Service and Meters.

The City of Hesperia, known as the “Gateway to the High Desert,” is situated just north of the San Bernardino Mountains and only 35 miles from downtown San Bernardino over the Cajon Pass. The City is in the Victor Valley at the foot of the north slope of the San Bernardino Mountains at an elevation of about 3,100 feet above sea level in the northern area, to about 4,000 feet in the south at the foot of the mountains. The City’s key planning objectives include responsible growth for its rural, suburban, agricultural, commercial, and industrial land uses, paired with economic development that attracts and maintains quality business and industry while being beneficial to its residents.

The District’s water supply is sourced almost entirely from groundwater pumped from the Mojave River Groundwater Basin, with a small portion of demand met through recycled water derived from that supply. Ensuring an adequate and reliable water supply for current and future customers is fundamental to the District’s mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the District supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on District-specific system characteristics, demands, demand management measures, and reliability.

11.1.1 Background and Purpose

The District has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.⁸² The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter presents the District’s evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the District’s 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory

⁸² California Water Code Sections 10610 through 10657.

guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

11.1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code Section 116275. The District is also classified as an Urban Water Supplier pursuant to CWC Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the District and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively. Details of the District’s Public Water System are provided in **Table 11-1**.⁸³

TABLE 11-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610024	HESPERIA WATER DISTRICT	~29,125

11.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies, and regional analyses. The District actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and District-specific operations.

As required by the UWMPA, the District coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource

⁸³ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, the District encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan’s availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

11.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

11.1.4 RUWMP Adoption

The District held a public hearing regarding the 2025 RUWMP on May 19, 2026. Before the hearing, the District made a draft of the 2025 RUWMP available for public inspection at City Hall, 9700 Seventh Avenue, Hesperia, CA 92345, and on the City’s website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The District’s elected body adopted this 2025 RUWMP on May 19, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the City’s website.

The District plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- “FINAL Submittal 2025 UWMP Tables – Hesperia WD – 06.01.2026.xls”
- “Appendix F 2025 Checklist – Hesperia WD – 06.01.2026.xls”

11.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 11.2 Water Service and System Description
- Sub-Chapter 11.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 11.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 11.5 Water Use Characterization
- Sub-Chapter 11.6 Water Conservation and Shortage Response
- Sub-Chapter 11.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 11.8 Energy Intensity Analysis

Sub-Chapter 11.2 – Water Service and System Description

The Hesperia Water District provides potable water service to the residents and businesses within its service area, depicted in **Figure 11-1**, which largely coincides with the boundaries of the City of Hesperia.

Water service in the District relies entirely on groundwater extracted from wells located throughout the service area. The District manages 15 active wells that tap into local aquifers to provide the community's water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the District's 14 reservoirs, which collectively provide more than 64 million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The District's water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes over 600 miles of water mains, thousands of service connections, and thousands of valves and fire hydrants that allow the District to isolate portions of the system for maintenance or emergencies without disrupting service to the broader community. **Table 11-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the District's customer base. The District also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

The District has also developed a recycled water program to maximize local water resource resiliency. Recycled water produced within the District is treated to appropriate regulatory standards and used for non-potable purposes such as irrigation of parks, landscapes, and the Hesperia Golf Course. These efforts enhance local water reliability, conserve groundwater, and support sustainable water management throughout the community.

FIGURE 11-1: HESPERIA WATER DISTRICT SERVICE AREA

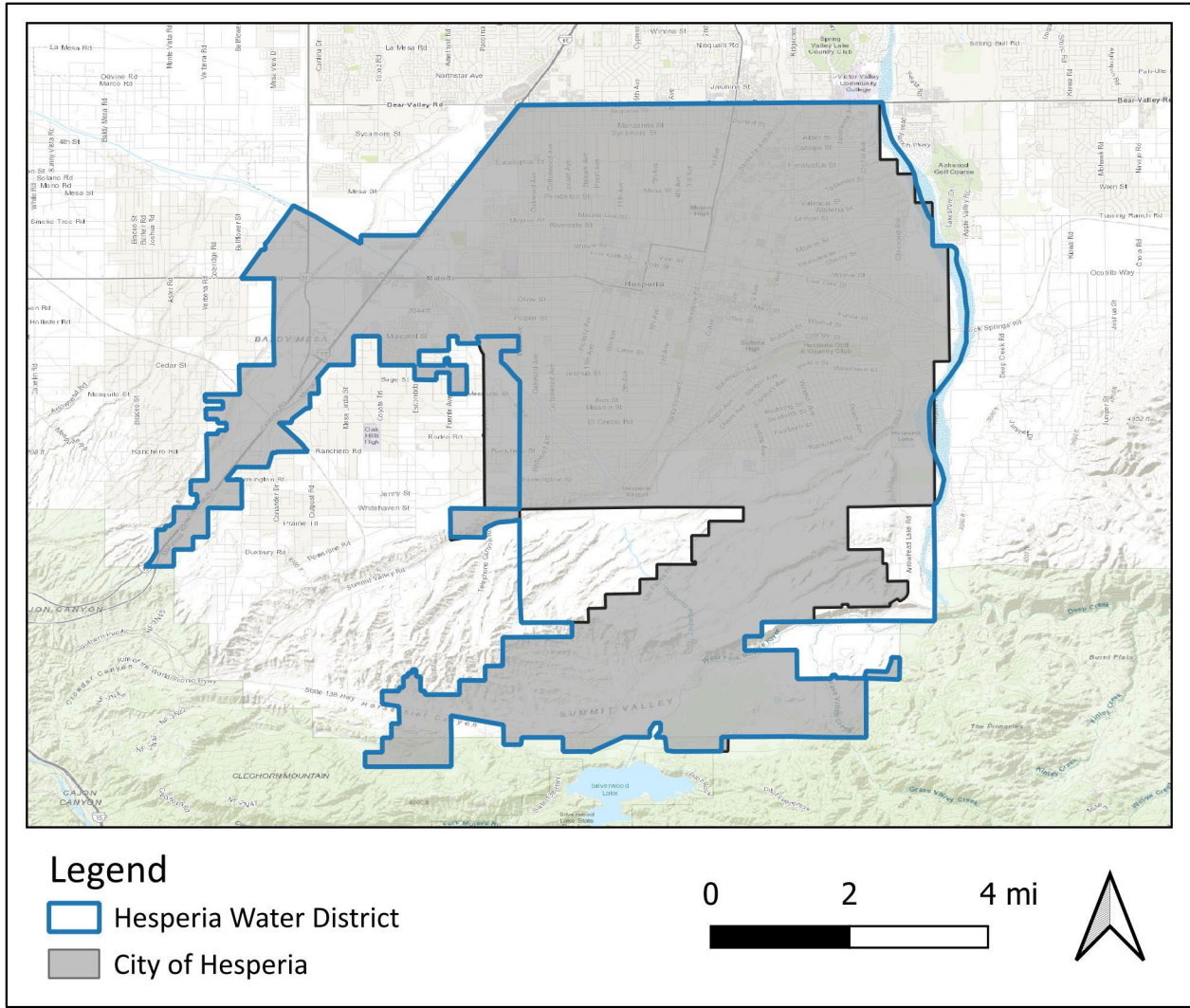


TABLE 11-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	25,639	25,875	26,054	26,237	26,802
Multi-Family Residential	528	531	532	529	527
Commercial/Institutional	1,031	1,039	1,047	1,053	1,064
Landscape Irrigation	122	129	137	143	161
Other	575	599	610	630	651
Total	27,895	28,173	28,380	28,592	29,205

11.2.1 Service Area Climate

Located in California's Mojave Basin Area, the District's service area experiences the climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and pronounced diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 8.17 inches, occurring primarily as rainfall between December and March. Precipitation generally tapers off by May. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. Although snowfall is rare, winter snowfall averages four inches annually. The annual average temperature is approximately 60 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, the District's service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of the RUWMP Planning Area's climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

11.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the District's water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 11.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area's economic, social, and demographic trends provide valuable insight into water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

11.3.1 Current Population and Historic Trends

Population estimates for the District are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA's Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study's development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the District reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Historical population trends within the District have generally followed broader regional growth patterns associated with residential development, employment opportunities, and

land availability in the High Desert. Much of the growth over the past several decades has been characterized by low-density suburban neighborhoods and expansion of retail and commercial areas to serve the needs of a growing population. Continued growth is anticipated over the planning horizon, which will influence future water demand, infrastructure requirements, and resource management strategies. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 11-3 presents the District’s historical population while **Table 11-4** presents the District’s population growth over the last decade. The population values reflect the Hesperia Water District service area, which generally corresponds to the City of Hesperia’s boundaries as shown in **Figure 11-1**, but extends beyond the City limits in some areas and excludes small portions of the City in the Oak Hills Community Plan Area.

TABLE 11-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
50,976	62,592	89,742	92,022	99,328	120,530

TABLE 11-4: POPULATION GROWTH RATE - 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	92,022	92,732	93,787	94,676	95,905	99,328	103,568	107,809	112,049	116,290
Growth Rate		0.77%	1.14%	0.95%	1.30%	3.57%	4.27%	4.09%	3.93%	3.78%

11.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

Population within the District is projected to increase steadily over the planning horizon, reflecting continued residential development, housing availability, and the community’s role as a regional population center in the High Desert. Growth is expected to occur primarily through suburban expansion supported by commercial and service development needed to accommodate new residents. While growth rates are projected to moderate over time, overall population is expected to continue increasing throughout the planning horizon. More broadly, incorporated areas served by municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial share of future regional population growth

relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 11-5 presents the District’s projected population and associated growth rates through 2060.

TABLE 11-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
Hesperia Water District	120,530	124,771	129,012	133,252	137,493	141,733	145,974	150,214
Growth Rate		3.52%	3.40%	3.29%	3.18%	3.08%	2.99%	2.90%

11.3.3 Current and Projected Land Use

Land use patterns within the District’s service area are governed primarily by the City of Hesperia General Plan, which establishes the distribution, type, and intensity of development across residential, commercial, industrial, public, and open space uses. The City adopted a comprehensive update to its General Plan in July 2025, replacing the prior 2010 plan and providing updated land use designations, policies, and growth assumptions to guide long-term development.⁸⁴

The District’s service area, which is largely governed by the City of Hesperia’s land use framework, is characterized predominantly by low-density residential development interspersed with commercial corridors, industrial areas, public facilities, and open space. Residential land uses represent the largest share of developed land and account for the majority of potable water demand, as discussed further in *Sub-Chapter 11.5 Water Use Characterization*.

Two adopted Specific Plans within the District’s service area are expected to influence future development patterns and associated water demand. These include the Main Street and Freeway Corridor Specific Plan and the Silverwood Specific Plan (formerly Tapestry Specific Plan). Specific Plans establish detailed land use regulations, phasing schedules, and infrastructure requirements for large development areas and collectively represent a substantial portion of the City’s and District’s planned growth. In particular, the Silverwood Specific Plan encompasses thousands of acres and proposes a mix of residential uses,

⁸⁴ City of Hesperia General Plan 2025 accessed at: <https://www.hesperiacalifornia.gov/409/Hesperia-General-Plan>

commercial areas, schools, parks, and open space developed over multiple phases spanning several decades. In addition to new development areas, continued infill development within existing neighborhoods is expected to contribute to future population growth. The General Plan notes that much of the existing housing stock consists of single-family detached homes on relatively large lots, with ongoing subdivision activity introducing a range of densities to accommodate diverse housing needs.

Land use planning decisions, including allowable densities, development intensity, and timing of Specific Plan buildout, will directly influence water demand, infrastructure requirements, and system operations within the District. The population projections presented in the prior subsection reflect these planned development patterns and provide the basis for estimating future water use across the service area.

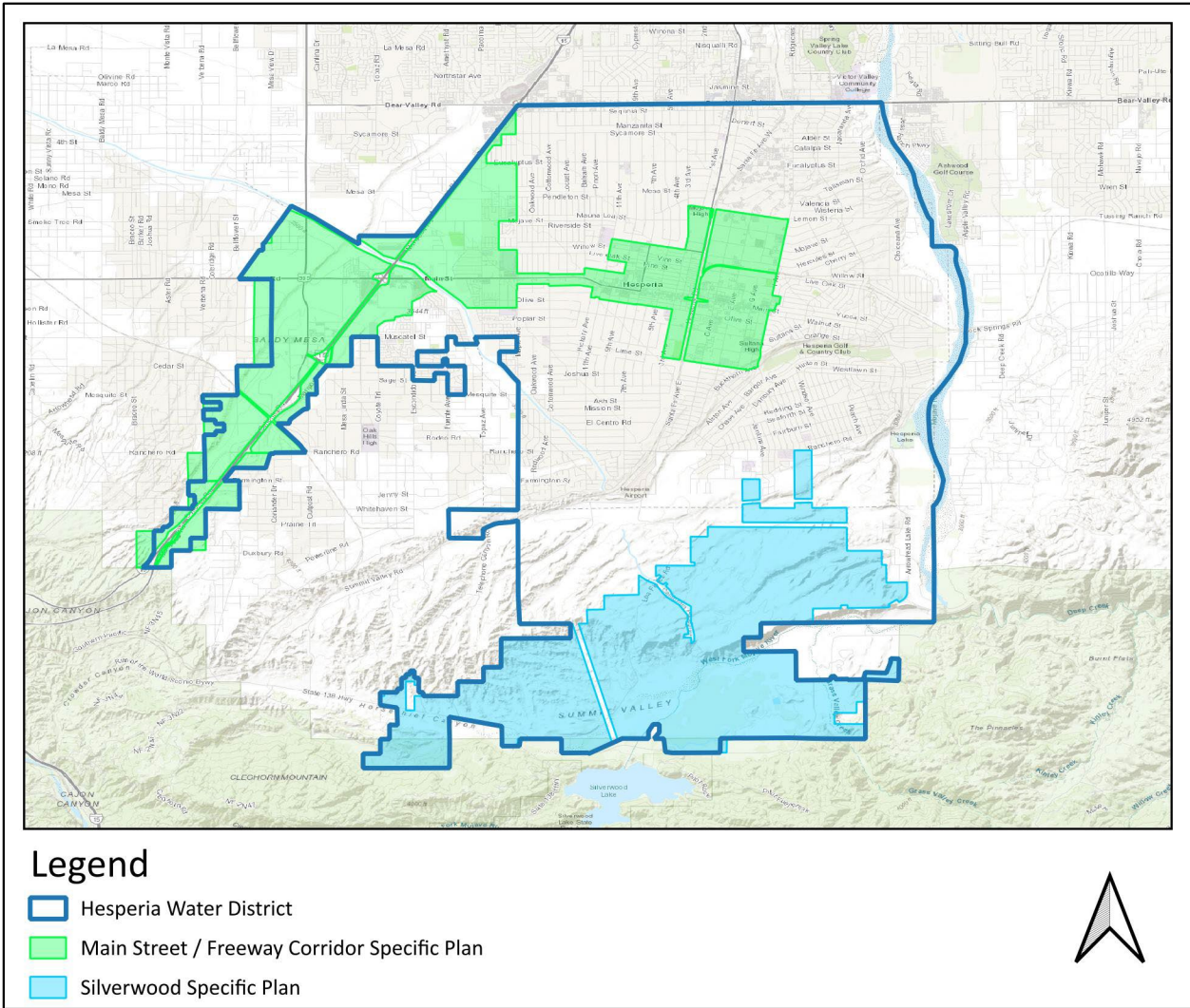
Table 11-6 summarizes the adopted Specific Plans within the District’s service area, while **Figure 11-2** illustrates their geographic distribution. Together, these areas identify the primary locations of anticipated residential, commercial, and mixed-use development that will influence future water demand and infrastructure needs.

TABLE 11-6: KNOWN LAND USE PLANS IN SERVICE AREA

Existing or Planned Project	Project Area (acres)	Residential Units
Main Street / Freeway Corridor Specific Plan	10,637	N/A ⁸⁵
Silverwood Specific Plan	9,336	16,196

⁸⁵ The Main Street / Freeway Corridor Specific Plan establishes land use designations and development standards but does not identify a fixed number of residential dwelling units.

FIGURE 11-2: KNOWN LAND USE PLANS IN SERVICE AREA MAP



11.3.4 Economic Trends & Other Social and Demographic Factors

The District’s service area encompasses a community experiencing continued economic transition and growth. The City of Hesperia promotes itself as “Strategically Located, Rapidly Growing, Open for Business,” reflecting its role as a major residential, transportation, logistics, and service-oriented center within the High Desert portion of the Inland Empire. Historically, economic growth in the area has been driven by housing affordability and suburban expansion, attracting households seeking lower-cost alternatives to coastal and metropolitan markets. These conditions continue to support population growth within the District.

In recent years, the transportation and logistics sector has emerged as a primary driver of economic development. The service area’s proximity to Interstate 15 provides regional connectivity to Southern California markets and supports distribution, warehousing, and related commercial activity. Notable developments include the Hesperia Commerce Center, which hosts major tenants such as Maersk and Modway Furniture, as well as a planned large-scale Amazon fulfillment facility. Industrial expansion is further supported by infrastructure improvements, including rail connections that enhance freight movement capabilities. These developments are expected to increase local employment opportunities and contribute to sustained economic growth within the service area.

Despite growing local employment opportunities, the community has historically functioned as a net exporter of labor, with many residents commuting to employment centers elsewhere in the Inland Empire and Southern California. Future economic development efforts are focused on expanding local job opportunities to reduce commute patterns and strengthen the local employment base. Broader regional economic conditions that influence growth within the District are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Demographically, the service area is characterized by a growing and diverse population. The community includes a substantial Hispanic/Latino population and a mix of household types, income levels, and housing tenure. According to the 2020 Census, approximately 62.7 percent of residents identify as Hispanic or Latino, 26.8 percent as White, 5.8 percent as African American, and 1.6 percent as Asian, with 20.2 percent identifying as two or more races. The median household income is approximately \$72,160, and roughly two-thirds of residents are homeowners. Approximately 16.9 percent of the population falls below the federal poverty line.

Sub-Chapter 11.4 – Water Supply and Infrastructure Characterization

The District sources its water supplies primarily from groundwater. Through a municipal network of 15 active wells, the District pumps groundwater from the underlying Alto Subarea of the Mojave Basin Area (MBA). As discussed in *Regional Chapter 3 – Regional Water Supply Characterization*, the MBA is an adjudicated basin administered by a court-appointed Watermaster. The aforementioned regional chapter describes the MBA’s water supplies and related management structures and details. Generally, the District pumps groundwater that is recharged and managed by MWA, while obtaining supplemental water supplies through recycled water obtained from capturing and locally treating some of the originally pumped groundwater.

11.4.1 Groundwater

Groundwater is the primary water supply source for all urban retail water suppliers within the MBA. Hesperia Water District, like many of the MWA’s other retail agencies, pumps groundwater from the adjudicated MBA, specifically the Alto Subarea. The basin is recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Sub-Chapter 3.1.1 Mojave Region Water Supply Sources of Regional Chapter 3 – Regional Water Supply Characterization*.

11.4.1.1 Hesperia Water District’s Free Production Allowance

Under the Judgment governing the MBA, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The District’s FPA is based on historical production coupled with evaluation of groundwater conditions, as administered by MWA in its role as the Watermaster.

The District’s FPA changes over time as the Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the MBA. The District’s FPA has continued to be significantly reduced as a percentage of the Base Annual Production (BAP) number. Hesperia’s FPA is tracked through two entries in the

Watermaster’s annual report: “Hesperia Water District” and “Hesperia, City of.” Hesperia Water District’s BAP in water year 2025 was 14,664 acre-feet per year and the City of Hesperia’s BAP was 6,736 acre-feet per year. The combined BAP for these entities in water year 2025 was 21,400 acre-feet per year.

Importantly, the City of Hesperia’s BAP and the Hesperia Water District’s BAP are still separated in the Watermaster’s annual report. The supplies for both entities have been aggregated to simplify the analysis of the available assets. Thus, the current 50.4% FPA of these sources is 10,786 acre-feet. **Table 11-7** presents the District’s FPA for the most recent five-year period pursuant to the MBA Judgment. Detailed discussion of the adjudication framework and administration of production allowances is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

TABLE 11-7: LAST FIVE YEARS OF HESPERIA WATER DISTRICT’S FPA SUPPLY (AFY)

Year	Base Annual Production	Percent FPA	FPA Supply
2021	20,907	55%	11,499
2022	21,267	50%	10,634
2023	21,267	53.3%	11,335
2024	21,277	50.4%	10,724
2025	21,400	50.4%	10,786

The 50.4% FPA represents a reduction that aligns with the long-term Production Safe Yield considered by the Watermaster. Accordingly, the District’s projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at 50.4% as shown in **Table 11-8**.

TABLE 11-8: PROJECTED MOJAVE ADJUDICATION FPA FOR THE DISTRICT THROUGH 2030 (AFY)

Year Type		Projected FPA
Normal		10,786
Single Dry Year		10,786
Multi-Year Drought	2026 (1 st Year)	10,786
	2027 (2 nd Year)	10,786
	2028 (3 rd Year)	10,786
	2029 (4 th Year)	10,786
	2030 (5 th Year)	10,786

Although the Production Safe Yield of the MBA appears to be stabilizing in the Alto Subarea, out of an abundance of caution the future FPA has been reduced to 50% to address long-term water supply planning options. **Table 11-9** presents the District’s projected FPA in a normal year, single dry year, and five consecutive dry years from 2030 through 2050 at 50%.

TABLE 11-9: PROJECTED MOJAVE ADJUDICATION FPA FOR THE DISTRICT THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		10,700	10,700	10,700	10,700	10,700
Single Dry Year		10,700	10,700	10,700	10,700	10,700
Multi-Year Drought	Year 1	10,700	10,700	10,700	10,700	10,700
	Year 2	10,700	10,700	10,700	10,700	10,700
	Year 3	10,700	10,700	10,700	10,700	10,700
	Year 4	10,700	10,700	10,700	10,700	10,700
	Year 5	10,700	10,700	10,700	10,700	10,700

A summary of long-term reliability and other factors that will affect FPA such as hydrological and regulatory issues is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

11.4.1.2 Carryover Water Supplies

The District does hold some carryover supplies as part of its overall water supply management in the Alto Subarea. Specifically, the District’s carryover supply totals 3,395 acre-feet.⁸⁶ Although these supplies may be available to meet the District’s water needs, we do not account for these supplies in the availability analysis in this sub-chapter in order to preserve these supplies for purposes of meeting emergency supply conditions.

11.4.1.3 Replacement and Make-up Water Supplies

The District has taken actions to augment its water supplies through the Watermaster’s water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed the District’s annual FPA from the Alto Subarea. Make-up water supplies, by contrast, are acquired to satisfy obligations under the Judgment to maintain flows from the Alto Subarea to downstream subareas when natural conditions and production patterns would otherwise result in a shortfall.

A detailed description of these programs, obligations, and administrative processes is provided in *Regional Chapter 3 – Regional Water Supply Characterization*. **Table 11-10** summarizes the quantities of replacement and make-up water supplied to the District during the most recent five-year period.

TABLE 11-10: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions ⁸⁷
2021	6,697
2022	5,762
2023	5,001
2024	6,357
2025	6,950

⁸⁶ Water Year 2025 Watermaster Report, Appendix H.

⁸⁷ Water Acquisitions calculated as (Verified Production – Base FPA) + Makeup Water Obligation

11.4.2 Groundwater Quality

Groundwater produced by the District is obtained from wells completed in the Mojave River Groundwater Basin and is treated as necessary to meet all applicable federal and state drinking water standards prior to delivery to customers. Water quality within the basin is influenced by natural hydrogeologic conditions as well as localized land use and recharge patterns. The District routinely monitors groundwater quality in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the District’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The District’s most recent CCR is available through the District’s website and provides the most current information on potable water quality conditions.⁸⁸

While this section focuses on groundwater quality as it pertains to the District’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 11-II presents a summary of groundwater quality constituents based on information reported in the District’s 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

⁸⁸ Hesperia Water District 2024 CCR available at:
<https://www.hesperiacalifornia.gov/DocumentCenter/View/20046/2024-Annual-Water-Quality-Report>

TABLE 11-11: HESPERIA WATER DISTRICT POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Arsenic (ppb)	0.004	10	ND - 2.4	0.29
Chromium (ppb)	100	50	ND - 1.4	0.09
Fluoride (ppm)	1	2	ND - .66	0.21
Gross Alpha Particle Activity (pCi/L)	0	15	ND - 4.88	1.4
Nitrate as N (ppm)	10	10	ND - 2.7	0.9
Total Coliform Bacteria (# of positive samples)	0	<5%	N/A	0
Fecal Coliform or E.coli (# of positive samples)	0	0	N/A	0
Chlorine (ppm)	4	4	0.2 - 1.40	0.7
Copper (ppm)	0.3	1.3	N/A	ND
Lead (ppb)	0.2	15	N/A	ND
Secondary Standards				
Chloride (ppm)	N/A	500	3.3 - 31	12.63
Foaming Agents (ppm)	N/A	500	ND - 0.27	0.02
Odor (tons)	N/A	3	ND - 1	0.93
Specific Conductance (umho/cm)	N/A	1,600	110 - 360	243.33
Sulfate (ppm)	N/A	500	1.9 - 23	10.47
Turbidity (NTU)	N/A	5	ND - 0.2	0.02
TDS (ppm)	N/A	1,000	73 - 240	151.53
Federal Unregulated Contaminates				
Alkalinity, Bicarbonate (ppm)	N/A	N/A	83 - 140	101.6
Calcium (ppm)	N/A	N/A	14 - 47	24.73
Chromium, Hex (ppb)	N/A	N/A	ND - 10	2.68
Hardness (ppm)	N/A	N/A	26 - 140	75
Magnesium (ppm)	N/A	N/A	ND - 6.9	3.35
Perfluorohexanoic Acid (PFHXA)	N/A	N/A	ND - 3.2	3.2
Perfluoropentanoic Acid (PFPEA)	N/A	N/A	ND - 2.4	2.4
pH (units)	N/A	N/A	7.1 - 8.2	7.71
Sodium (ppm)	N/A	N/A	15 - 29	21.2

11.4.3 Recycled Water Supplies

The Victor Valley Wastewater Reclamation Authority (VWVRA) is a Joint Powers Authority that provides regional wastewater treatment and recycled water services to its member agencies, including the Town of Apple Valley, the cities of Hesperia and Victorville, and San Bernardino County Service Areas 42 and 64. This section summarizes existing and projected wastewater flows within the District’s service area and identifies current and planned opportunities for use of recycled water.

A portion of wastewater generated within the District is conveyed through the City of Hesperia’s sewer collection system to VWVRA facilities for treatment, while the remaining areas continue to rely on on-site wastewater disposal systems (septic systems). Expansion of the sewer collection system over time is expected to increase the volume of wastewater available for centralized treatment and future recycled water production. Coordination among the City, the District, and VWVRA is necessary to ensure that wastewater infrastructure planning aligns with anticipated growth and supports long-term recycled water supply development. VWVRA’s regional strategy for managing wastewater flows and sustaining local water supplies includes development of subregional water reclamation plants (WRPs) located within member agency service areas. These facilities function as “scalping plants,” meaning they treat a portion of the local wastewater flow to produce recycled water for nearby uses while returning solids to the regional collection system for final treatment at VWVRA’s main plant. This approach reduces conveyance demands, lowers energy requirements associated with pumping treated water long distances, and provides locally available recycled water supplies to support community needs.

In Hesperia, a WRP located near Maple Avenue began delivering recycled water in the Spring of 2022. The facility has an initial treatment capacity of approximately 1.0 million gallons per day and produces recycled water that is conveyed to storage facilities and distribution infrastructure for non-potable uses. Current primary uses include irrigation of the Hesperia Course and nearby parks and landscaped areas. Additional recycled water use is anticipated as large planned developments are constructed. The Silverwood Specific Plan Development (formerly Tapestry Specific Plan Development) is currently under development and is expected to incorporate recycled water to meet a substantial portion of the project’s non-potable demands. According to the project’s Water Supply Assessment, approximately 40% of the project’s water demands could ultimately be supplied with recycled water once the necessary treatment and distribution infrastructure is implemented. These efforts represent a significant step toward implementing the City’s Recycled Water Master Plan and expanding recycled water use within the service area. Recycled water supplies will continue to play an important role in conserving potable groundwater resources and enhancing long-term water supply reliability for the District and the broader region. **Table 11-12** summarizes the quantities of recycled water utilized by the District during the most recent five-year period.

TABLE 11-12: LAST FIVE YEARS OF RECYCLED WATER SUPPLIES (AFY)

Year	Recycled Water Supplies
2021	0 ⁸⁹
2022	169
2023	311
2024	389
2025	240

The approach to forecasting future recycled water supplies is informed by the City of Hesperia’s 2015 Recycled Water Master Plan (RWMP), which identified potential recycled water customers and estimated long-term demand associated with expanded wastewater treatment and distribution infrastructure. Consistent with the methodology used in the District’s 2020 UWMP, recycled water supply projections are intentionally conservative relative to the long-term supply and demand estimates identified in this chapter. This approach provides a planning baseline that reflects currently available infrastructure and near-term implementation timelines while recognizing that actual recycled water deliveries could increase as additional recycled water facilities and distribution systems are developed.

Table 11-13 shows the projected recycled water in 2026–2030 in normal, single dry, and five consecutive dry years while **Table 11-14** shows the projected recycled water supplies from 2030–2050 in normal, single dry, and five consecutive dry years.

TABLE 11-13: PROJECTED RECYCLED WATER SUPPLIES 2030 (AFY)

Year Type		Projected Recycled Water Supplies
Normal		500
Single Dry Year		500
Multi-Year Drought	2026 (1st Year)	500
	2027 (2nd Year)	625
	2028 (3rd Year)	750
	2029 (4th Year)	875
	2030 (5th Year)	1,000

⁸⁹ Recycled water deliveries began in Spring 2022.

TABLE 11-14: PROJECTED RECYCLED WATER SUPPLIES THROUGH 2050 (AFY)

Projected Recycled Water Supplies		2030	2035	2040	2045	2050
Normal		1,000	1,500	2,000	2,500	3,000
Single Dry Year		1,000	1,500	2,000	2,500	3,000
Multi-Year Drought	Year 1	1,000	1,500	2,000	2,500	3,000
	Year 2	1,000	1,500	2,000	2,500	3,000
	Year 3	1,000	1,500	2,000	2,500	3,000
	Year 4	1,000	1,500	2,000	2,500	3,000
	Year 5	1,000	1,500	2,000	2,500	3,000

11.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the District due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the District has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

11.4.5 Water Transfers and Exchanges

In addition to its groundwater resources and planned alternative supplies, such as recycled water, the District continues to evaluate opportunities to acquire water supplies from other agencies and sources. Transfers, exchanges, and groundwater banking programs represent important mechanisms for enhancing the long-term reliability and flexibility of the District’s available supplies.

The District has executed numerous permanent transfers of BAP rights from other parties within the Alto subarea to increase its long-term groundwater production capacity under the MBA Judgment. These permanent transfers augment the District’s BAP and therefore increase the quantity of groundwater that may be produced annually without incurring replacement obligations. The District continues to pursue such opportunities as they become available and anticipates further augmenting its BAP over time.

In addition, the District regularly participates in temporary transfers of FPA to supplement its baseline production in a given year. These temporary transfers may occur through direct transactions with other producers or may result from replacement and makeup water

obligations administered by the Watermaster, including transactions involving other subareas. Supplies obtained through temporary transfers are incorporated into the District’s annual water supply portfolio as needed to meet demands.

The District expects to continue utilizing transfer and exchange mechanisms, when available, as part of its overall water management strategy to support both near-term operational needs and long-term supply reliability.

11.4.6 Supply Summary

Groundwater serves as the District’s principal water supply source. These supplies, pumped from the Alto Subarea of the MBA, are generally sufficient to meet existing and future demands. To enhance sustainability and reduce potable demand, the District also produces limited recycled water for irrigation at places like the Hesperia Golf Course. Additionally, the District is involved in regional initiatives with MWA exploring supplemental supplies, such as the One Water Project, which could feasibly deliver stored water from outside basins to support future growth.

The District’s water supplies are aggregated into the historical managed groundwater system. Managed groundwater consists of supplies provided through the Mojave Basin Area Adjudication, including make-up and replacement supplies as well as transfers and exchanges among producers. Under the MBA Judgment, producers in the Alto Subarea are able to meet their water supply requirements through production from the basin’s managed groundwater system. This system incorporates the natural yield of the basin along with supplies made available through regional management actions, including imported water recharge managed by MWA, conservation, water reuse, and transfers of FPA among producers. Consistent with this framework, the District’s total managed groundwater production for the historical period represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 11-15**.

TABLE 11-15: DISTRICT’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	14,253
2022	13,645
2023	12,604
2024	13,724
2025	13,852

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 11.5 Water Use Characterization*. Within the adjudicated MBA management framework, the District’s groundwater production adjusts to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 11-16** and **Table 11-17**.⁹⁰

TABLE 11-16: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026-2030 (AFY)

Year Type		Managed Groundwater Production
Normal		14,180
Single Dry Year		14,180
Multi-Year Drought	2026 (1 st Year)	14,180
	2027 (2 nd Year)	14,250
	2028 (3 rd Year)	14,320
	2029 (4 th Year)	14,390
	2030 (5 th Year)	14,435

TABLE 11-17: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

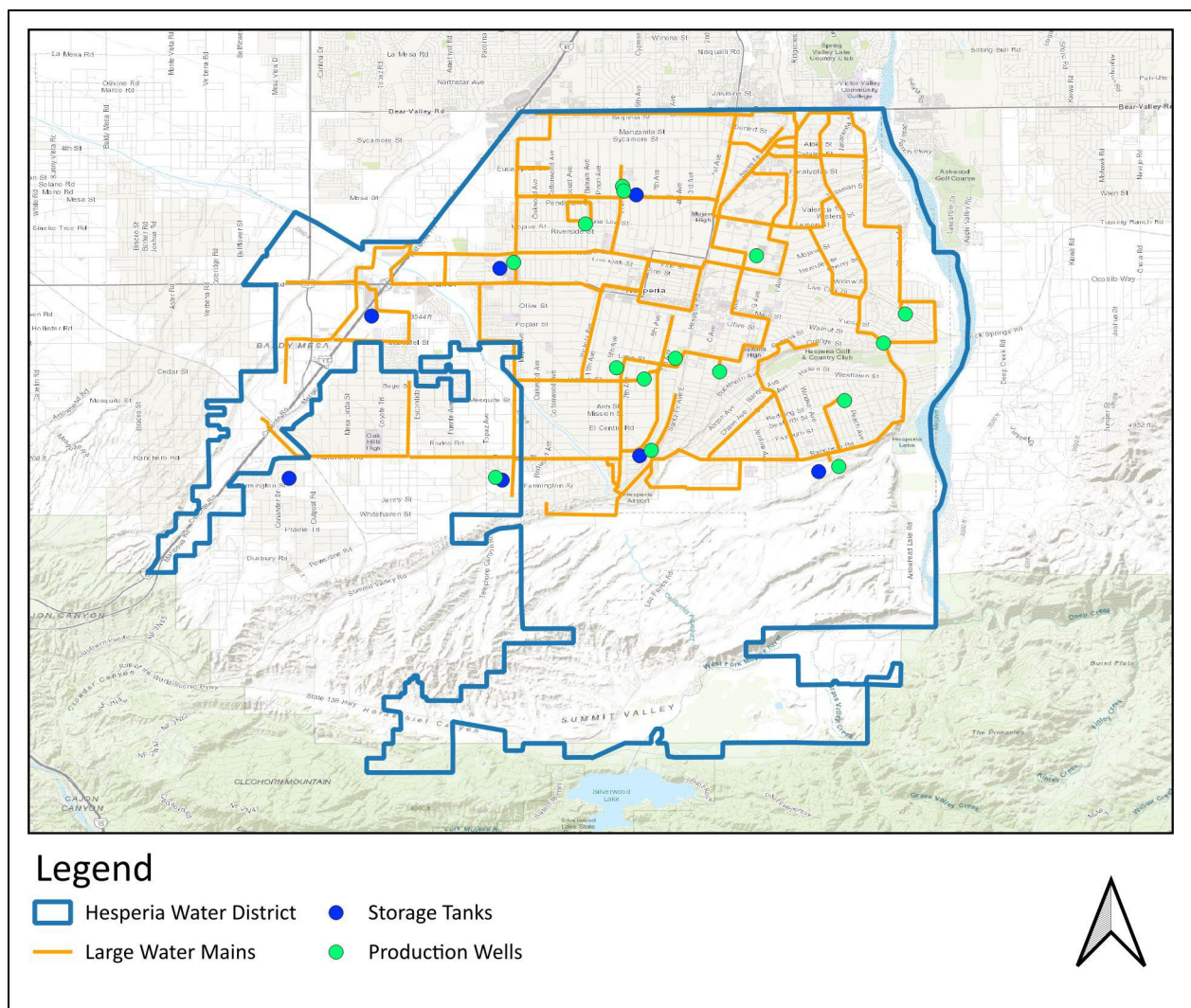
Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		14,435	14,765	15,090	15,145	15,740
Single Dry Year		14,435	14,765	15,090	15,145	15,740
Multi-Year Drought	Year 1	14,435	14,765	15,090	15,145	15,740
	Year 2	14,500	14,830	15,155	15,480	15,805
	Year 3	14,565	14,895	15,220	15,545	15,870
	Year 4	14,635	14,960	15,285	15,610	15,935
	Year 5	14,700	15,025	15,350	15,675	16,000

⁹⁰ The values presented in **Tables 11-16** and **11-17** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 11.5 Water Use Characterization*.

11.4.7 Delivery System Details

The District’s potable water system conveys groundwater produced from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the District’s storage reservoirs, which collectively provide approximately 64.5 million gallons of storage before being distributed through the pressurized potable water system. The distribution system consists of more than 600 miles of pipeline, approximately 5,000 fire hydrants, and approximately 29,205 service connections. In recent years, the District has expanded the use of Advanced Meter Infrastructure (AMI), with approximately 81% of meters converted, improving the ability to monitor system performance and customer water use. The District’s potable water distribution system is shown in **Figure 11-3**.

FIGURE 11-3: POTABLE WATER SYSTEM



Sub-Chapter 11.5 – Water Use Characterization

Understanding water use characteristics is essential for the District to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the District’s retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the District’s past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District’s water supplies, presented in *Sub-Chapter 11.4 Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 11.7 Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the District’s 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the District’s residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the District’s UWUO, comparison to the District’s actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the District’s 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the District’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the District’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

11.5.1 Current Customer Water Use

As described in *Sub-Chapter 11.2 Water Service and System Description*, the District provides water service to approximately 29,205 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the District and treated to meet all applicable state and federal drinking water standards. Information regarding the District’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provides the basis for determining the District’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

11.5.1.1 Customer Water Use 2021 – 2025

Recent customer water use data assists the District in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The District is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The District records potable water use within five primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Irrigation
- Other

Table 11-18 presents the District’s past customer potable water use by customer classification for 2021 – 2025 in acre-feet.

TABLE 11-18: POTABLE CUSTOMER USE 2021-2025 (AF)

Use Category	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	740	508	602	545	909	745	1,242	1,000	1,226	922	909	594	9,942
	2022	741	477	624	550	850	706	1,118	886	1,176	880	844	563	9,413
	2023	679	433	571	440	703	685	1,050	853	1,117	783	846	613	8,774
	2024	724	458	612	436	717	711	1,088	965	1,259	848	969	652	9,439
	2025	745	523	637	485	815	717	1,058	950	1,222	820	940	579	9,491
Multi-Family Residential	2021	92	67	71	65	97	79	119	108	115	108	93	69	1,084
	2022	92	62	73	68	93	79	113	96	117	95	104	65	1,057
	2023	93	59	77	54	84	77	111	91	120	92	96	72	1,026
	2024	95	59	81	55	86	82	110	106	126	91	110	82	1,085
	2025	95	72	85	67	95	78	111	102	124	93	104	69	1,096
Commercial/ Institutional	2021	86	41	77	39	102	50	112	64	110	64	92	43	881
	2022	93	43	85	47	90	47	102	55	103	59	86	41	851
	2023	84	41	72	44	76	45	97	51	100	56	83	49	800
	2024	88	40	79	45	78	52	92	57	107	56	98	52	843
	2025	90	45	80	40	87	47	96	61	104	61	103	46	860
Irrigation	2021	27	8	14	12	39	25	58	36	69	32	45	12	377
	2022	21	7	18	14	37	36	62	40	73	63	45	30	446
	2023	24	16	13	22	25	91	66	75	71	64	57	69	594
	2024	36	13	18	23	33	77	61	82	84	73	64	39	602
	2025	35	29	23	29	37	87	67	90	90	65	64	40	656
Other	2021	59	92	73	85	131	111	184	146	188	109	94	38	1,311
	2022	39	26	54	59	99	143	257	104	182	122	95	35	1,214
	2023	41	23	23	24	72	91	171	125	160	95	90	49	963
	2024	44	17	35	25	78	112	170	138	180	102	100	68	1,068
	2025	78	49	53	81	106	93	150	119	153	97	94	36	1,110
Total Metered Deliveries	2021	1,003	717	838	746	1,279	1,009	1,716	1,355	1,708	1,234	1,234	755	13,595
	2022	986	615	853	738	1,168	1,011	1,651	1,180	1,651	1,221	1,174	733	12,981
	2023	921	573	756	584	961	989	1,496	1,195	1,568	1,089	1,172	852	12,156
	2024	988	587	826	584	991	1,033	1,521	1,348	1,756	1,170	1,342	892	13,038
	2025	1,043	717	877	703	1,141	1,023	1,482	1,323	1,694	1,136	1,304	771	13,213

The “Other” water use category included in **Table 11-18** captures a range of small, non-standard uses related to fire and construction services. Additionally, the District supplies non-potable water for irrigation of parks, landscapes, and the Hesperia Golf Course. **Table 11-19** provides the historic monthly deliveries of non-potable water.

TABLE 11-19: NON-POTABLE CUSTOMER USE 2021-2025 (AF)

Use Category	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Non-Potable	2021	6	0	4	0	15	0	26	0	26	0	15	0	94
	2022	8	0	8	0	14	27	24	26	26	56	11	48	248
	2023	4	12	2	16	9	66	23	44	25	36	16	53	307
	2024	9	16	3	71	11	56	23	44	28	47	14	48	369
	2025	6	66	4	49	11	56	20	32	25	0	0	0	268

The single-family residential classification continues to illustrate two important characteristics of the District’s water service: (1) it represents about 72% of the District’s annual potable water demand, and (2) it has summer demands that are roughly two times the monthly volume needed in winter months. When combined with multi-family residential use, overall residential use represents over 80% of the District’s potable water service. When compared to previous use data, these water use characteristics have remained relatively consistent throughout the last 10 years, reflecting the District’s predominantly residential service area and the continued prevalence of low-density single-family housing throughout Hesperia.

11.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the District’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).⁹¹ An electronic copy of the audit in Excel format is to be submitted to DWR by October 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028,

⁹¹ Title 23 California Code of Regulations Section 638.1 et seq.

the District shall assess compliance every three years as an average of recent losses. Additionally, the District will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 11-20** summarizes the District’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 11-20: DISTRIBUTION SYSTEM LOSS 2021-2024

2021	2022	2023	2024
4.2%	15.0%	3.0%	4.2%
Average:			6.6%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the District’s distribution system loss represents about 6.6% of water entering the system.

11.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the District was developed using information submitted as part of the District’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 16.3 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 3.7%. Using the information from the same period, the average “apparent” water loss averaged 1.0% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 4.6%, although recent AWWA audits discussed above show losses closer to 7%.

11.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the District’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

11.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the District to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the District to measure progress on achieving water efficiency goals.

The District's 2020 target was established in the 2015 UWMP as 184 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The District's calculation of their 2020 actual GPCD used the same methodology: "Gross water" was defined as total water production measured and reported based upon well production records. This value, divided by the District's estimated population in 2020, resulted in a compliance value of 129 GPCD. Because this value was less than the District's established target, the District was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the District was determined to have an actual GPCD of 105, calculated using the same methodology presented above.

11.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. In each of the first three reporting years, the District submitted required annual reports to the SWRCB demonstrating that actual water use remained below its calculated UWUO, confirming compliance in 2023, 2024, and 2025.

11.5.3 Forecasting Customer Use

Future water use within the District's service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical

water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the District’s future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the District, are presented in the following subsections and corresponding tables.

11.5.3.1 Existing Customer Future Use

Future water use associated with the District’s existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 11.5.2.1*, the District’s current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the District has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the District’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the District’s existing customer demand is projected to remain at approximately 14,110 acre-feet per year, based on a representative GPCD of 105, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

11.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter*

4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization.

This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the District’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the District’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the District, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 3 GPCD
- Total Non-Residential Use: 24 GPCD
- Total Use: 74 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage has been applied to new customer demand projections.

Table 11-21 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the District’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 11.7 Water System Reliability and Drought Risk Assessment*.

TABLE 11-21: FORECAST FUTURE WATER USE (AFY)

2025	2030	2035	2040	2045	2050
14,110	14,435	14,765	15,090	15,415	15,740

11.5.3.3 Adjusting Water Use Forecasts for Single Dry and Multiple Dry Conditions

The water use forecast presented in **Table 11-21** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions.

Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 11-21** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.⁹²

11.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The District will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

11.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the District’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related but distinct analyses required

⁹² California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the District’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

11.5.4.1 Projecting Water Use for Five-year Drought Risk Assessment

The DRA requires the District to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the District’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the District’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the District’s long-term water use forecast developed for the 2025 RUWMP and the District’s retail-specific chapter and are expressed on an annual basis for each of the five-years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the District’s evaluation of water supply reliability across planning timeframes.

Table 11-22 presents the District’s projected unconstrained water demands for the DRA period (2026-2030), with values rounded to the nearest five acre-feet. These values form the basis

for the reliability analysis presented in *Sub-Chapter 11.7 Water System Reliability and Drought Risk Assessment*.

TABLE 11-22: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
14,180	14,250	14,320	14,390	14,435

11.5.4.2 Projecting Water Use for Annual Assessments

The District conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The District has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

11.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the District's sub-chapter within the 2025 RUWMP, the District's service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.⁹³ Accordingly, the water use forecast presented in **Table 11-21** is inclusive of disadvantaged community water use.

⁹³ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 11.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the District's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The District has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the District's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the District evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the District's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the District's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 11a.

11.6.1 Demand Management Measures

The District has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The District is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the District leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The District will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

11.6.2 Foundational Demand Management Measures

The District’s foundational DMMs remain unchanged from the 2020 UWMP and continue to serve as the basis for ongoing water conservation efforts. These measures include water waste prevention ordinances, metering, conservation-based rate structures, public education and outreach, programs to assess and manage distribution system losses, and coordination of conservation program implementation.

Water Waste Prevention Ordinances

The District has adopted and enforces water waste prevention ordinances that prohibit inefficient water use practices, such as excessive runoff, irrigation during inappropriate times, and other avoidable losses. These ordinances provide the regulatory framework for reducing unnecessary water use and are enforced through routine monitoring and customer outreach.

Metering

All potable water connections within the District are metered, allowing for accurate measurement of customer water use. Metering supports volumetric billing, enables customers to better understand their water use, and provides the data necessary for effective system management and demand forecasting.

Conservation Pricing

The District utilizes a conservation-oriented rate structure designed to encourage efficient water use. Water rates are structured to promote conservation by providing price signals that reflect increasing levels of water use and the cost of supplying water.

Public Education and Outreach

The District implements public education and outreach programs to inform customers about water conservation practices, available programs, and regulatory requirements. These efforts include coordination with regional partners to promote consistent conservation messaging and increase public awareness of water use efficiency.

Programs to Assess and Manage Distribution System Losses

The District conducts ongoing efforts to assess and manage distribution system losses, including leak detection, system maintenance, and infrastructure improvements. These programs support efficient system operations and help minimize real water losses within the distribution system.

Conservation Program Coordination and Staffing Support

The District supports the implementation of DMMs through dedicated staffing and coordination with regional partners. Participation in regional programs, including collaboration through the AWAC, enhances program effectiveness and allows the District to leverage shared resources and expertise.

11.6.2.1 Recent DMM Activities

The District has continued to implement and expand DMMs to improve water use efficiency and reduce system losses. Recent activities have focused on enhancing leak detection capabilities, improving customer engagement, and leveraging advanced technologies to better manage water use.

Satellite and Acoustic Leak Detection

In 2025, the District partnered with ASTERRA to perform satellite-based and acoustic leak detection across its service area. This effort identified a total of 149 leaks, including 92 leaks on the utility side of the meter, which contribute directly to non-revenue water losses. The program identified approximately 0.93 million gallons per day or 338.5 million gallons per year of potential recoverable water supply. This approach enabled the District to efficiently target areas of potential leakage using satellite-derived points of interest, reducing the need for system-wide field investigations and improving effectiveness of leak detection efforts. By identifying and repairing leaks earlier, the District is able to reduce real water losses, improve system efficiency, and recover water that would otherwise be lost.

Advanced Metering Infrastructure (AMI) and Customer Leak Detection

The District continues to expand its AMI system, with approximately 85 percent of service connections currently equipped with cellular endpoints. The AMI platform provides near real-time water use data and includes automated leak detection capabilities that identify continuous water use over a 24-hour period. District staff proactively review these alerts and contact customers to notify them of potential leaks. In 2025, the District assisted in identifying and resolving 158 customer-side leaks as of November 26. These efforts support customer awareness, reduce unnecessary water use, and help prevent prolonged water losses at the customer level.

11.6.2.2 Planned DMM Activities

At this time, the District does not anticipate implementing new demand management programs beyond those currently in place. The District's existing DMMs provide a comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. The District remains committed to efficient and responsible use of water resources and will continue to evaluate opportunities to enhance existing programs, incorporate new technologies, and improve program effectiveness over time. This includes ongoing efforts to reduce system losses, expand metering and data capabilities, and support customer awareness and conservation practices. Consistent with applicable State requirements, including UWUO provisions, the District will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

11.6.3 Water Shortage Contingency Plan

The District has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the District can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the District may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the District's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the District's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

11.6.3.1 Summary of Water Shortage Levels and Response Actions

The District's WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the District to implement proportional measures to manage water use and maintain essential public health and safety services during periods of reduced supply. The WSCP includes six shortage levels, each associated with a targeted reduction in water use relative to normal conditions. As shortage conditions

intensify, the District may implement progressively more restrictive measures to reduce demand and manage available supplies. The general framework of shortage levels and representative response actions is summarized below:

- Stage 1 – Up to 10% Shortage (Water Shortage Watch):
Increased public awareness and voluntary conservation measures, including enhanced outreach and education efforts.
- Stage 2 – Up to 20% Shortage:
Implementation of additional conservation measures and initial water use restrictions, such as limitation on outdoor irrigation and reduction of non-essential water uses.
- Stage 3 – Up to 30% Shortage:
Expansion of mandatory restrictions, including further limitations on outdoor water use, increased enforcement, and intensified conservation programs.
- Stage 4 – Up to 40% Shortage:
Implementation of significant demand reduction measures, including stricter outdoor irrigation limitations, expanded enforcement actions, and potential adjustments to system operations.
- Stage 5 – Up to 50% Shortage:
Implementation of severe restrictions on non-essential water use, increased enforcement measures, and additional operational actions to manage limited supplies.
- Stage 6 – Up to 60% Shortage:
Implementation of emergency response measures necessary to protect public health and safety, including curtailment of non-essential uses and prioritization of critical water needs.

As water supply conditions change, the District may transition between shortage levels based on ongoing evaluation of supply availability, customer demand, and system conditions.

11.6.3.2 Summary of Monitoring Procedures and Implementation

The District's WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The District monitors key indicators of water supply reliability, including groundwater production, available supply allocations, customer demand, and system conditions. This information is used to evaluate supply

availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The District’s Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of shortage response actions. Additional detail regarding the Annual Assessment is provided in *Subsection 11.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter 11.5 Water Use Characterization*.

Implementation of the WSCP includes coordination among District staff and communication with customers and regional partners. When a water shortage stage is implemented, the District provides public notification of applicable restrictions and conservation measures and monitors compliance to ensure demand reduction targets are achieved.

Sub-Chapter 11.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the District’s water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 11.4 Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 11.5 Water Use Characterization* to assess the District’s ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the District’s water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the District’s capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the District’s Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the District’s water supply reliability and inform the implementation of the District’s WSCP, as described in *Sub-Chapter 11.6 Water Conservation and Shortage Response*.

11.7.1 Five-year Drought Risk Assessment

The DRA evaluates the District’s ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the District’s unconstrained demand forecast described in *Sub-Chapter 11.5 Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the District’s managed groundwater supplies, which include groundwater production, replacement water, make-up water, and transfers and exchanges available through MWA, as described in *Sub-Chapter 11.4 Water*

Supply and Infrastructure Characterization. Under the terms of the MBA adjudication, the District has discretion in managing its groundwater production and associated supplemental supplies, allowing it to adjust its supply portfolio to meet projected demands during dry conditions.

The DRA compares projected water demands to available supplies to evaluate the District’s capacity to meet customer needs over the five-year period. **Table 11-23** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 11-23: FIVE-YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	14,180	14,250	14,320	14,390	14,435
Demand	14,180	14,250	14,320	14,390	14,435
Difference	0	0	0	0	0

11.7.2 Long-Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The District’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

11.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the District’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the District’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the District’s supplies are managed within the framework of the MBA adjudication, which provides flexibility in balancing groundwater production and supplemental supplies. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 11-24 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 11-24: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	14,435	14,765	15,090	15,415	15,740
Demand	14,435	14,765	15,090	15,415	15,740
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	14,435	14,765	15,090	15,415	15,740
Demand	14,435	14,765	15,090	15,415	15,740
Difference	0	0	0	0	0

11.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the District’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the District continues to manage its supplies within the framework of the MBA adjudication, which allows for flexibility in balancing groundwater production and supplemental supplies. This managed approach enables the District to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 11-25 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the District has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 11-25: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	14,435	14,765	15,090	15,415	15,740
	Demand	14,435	14,765	15,090	15,415	15,740
	Difference	0	0	0	0	0
Year 2	Supply	14,500	14,830	15,155	15,480	15,805
	Demand	14,500	14,830	15,155	15,480	15,805
	Difference	0	0	0	0	0
Year 3	Supply	14,565	14,895	15,220	15,545	15,870
	Demand	14,565	14,895	15,220	15,545	15,870
	Difference	0	0	0	0	0
Year 4	Supply	14,635	14,960	15,285	15,610	15,935
	Demand	14,635	14,960	15,285	15,610	15,935
	Difference	0	0	0	0	0
Year 5	Supply	14,700	15,025	15,350	15,675	16,000
	Demand	14,700	15,025	15,350	15,675	16,000
	Difference	0	0	0	0	0

11.7.3 Annual Reliability Assessment

Each year, the District considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the District’s Water Shortage Contingency Plan. The District has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

11.7.4 Water Supply Reliability Summary

The District's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 11.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the District evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The District’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the District’s service area, rather than long-distance conveyance or advanced treatment processes.

The District continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 11-26**.

TABLE 11-26: ENERGY INTENSITY - TOTAL UTILITY APPROACH FOR OCT 2024 THROUGH SEPT 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	14,123
Energy Consumed (kWh)	15,856,213
Energy Intensity (kWh/acre-foot)	1,123

HESPERIA WATER DISTRICT

APPENDICES

This page is reserved for Hesperia Water District-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to Hesperia Water District's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the Hesperia Water District retailer chapter, Hesperia Water District's WSCP, and applicable Hesperia Water District-specific appendices.

Chapter 12.0 HI-DESERT WATER DISTRICT



TABLE OF CONTENTS

Sub-Chapter 12.1 – Introduction	12-7
12.1.1 Background and Purpose.....	12-7
12.1.2 Basis for Plan Preparation	12-8
12.1.3 Coordination and Outreach.....	12-8
12.1.4 RUWMP Adoption	12-9
12.1.5 Document Organization	12-11
Sub-Chapter 12.2 – Water Service and System Description	12-12
12.2.1 Service Area Climate.....	12-14
Sub-Chapter 12.3 – Population, Land Use, Economy, and Demographics	12-16
12.3.1 Current Population and Historic Trends	12-16
12.3.2 Projected Population	12-17
12.3.3 Current and Projected Land Use.....	12-18
12.3.4 Economic Trends & Other Social and Demographic Factors.....	12-18
Sub-Chapter 12.4 – Water Supply and Infrastructure Characterization.....	12-20
12.4.1 Groundwater.....	12-20
12.4.2 Groundwater Quality.....	12-27
12.4.3 Recycled Water Supplies.....	12-30
12.4.4 Desalination Opportunities	12-30
12.4.5 Water Transfers and Exchanges	12-30
12.4.6 Supply Summary	12-31
12.4.7 Delivery System Details	12-33
Sub-Chapter 12.5 – Water Use Characterization	12-34
12.5.1 Current Customer Water Use	12-35
12.5.2 Compliance with Water Use Targets and Objectives.....	12-39
12.5.3 Forecasting Customer Use	12-40
12.5.4 Forecasting Water Use for DRA and Annual Assessment.....	12-43
12.5.5 Projecting Disadvantaged Community Water Use	12-44
Sub-Chapter 12.6 – Water Conservation and Shortage Response	12-45
12.6.1 Demand Management Measures	12-45

12.6.2	Foundational Demand Management Measures	12-46
12.6.3	Water Shortage Contingency Plan	12-48
Sub-Chapter 12.7 – Water System Reliability and Drought Risk Assessment		12-51
12.7.1	Five-Year Drought Risk Assessment	12-51
12.7.2	Long Term Service Reliability	12-52
12.7.3	Annual Reliability Assessment	12-54
12.7.4	Water Supply Reliability Summary	12-55
Sub-Chapter 12.8 – Energy Intensity Analysis		12-56

LIST OF TABLES

Table 12-1: Public Water System Information.....	12-8
Table 12-2: Customer Water Service Connections	12-14
Table 12-3: Historical population.....	12-17
Table 12-4: Population Growth Rate – 2015-2024.....	12-17
Table 12-5: Population Forecast and Growth Rate.....	12-18
Table 12-6: Last Five years of Warren Valley Basin Adjudicated Supply (AFY).....	12-22
Table 12-7: Projected Warren Valley Basin Adjudicated Supply Through 2030 (AFY)	12-22
Table 12-8: Projected Warren Valley Basin Adjudicated Supply Through 2050 (AFY).....	12-23
Table 12-9: Last Five Years of Warren Valley Basin Annual Banked Groundwater Supply (AFY).....	12-24
Table 12-10: Last Five Years of Total Cumulative Water Storage in Warren Valley Basin (AFY)	12-24
Table 12-11: Last Five Years of Ames-Reche Supply (AFY).....	12-26
Table 12-12: Projected Ames-Reche Supply Through 2030 (AFY).....	12-26
Table 12-13: Projected Ames-Reche Supply Through 2050 (AFY)	12-27
Table 12-14: Hi-Desert Water District Potable Water Quality.....	12-29
Table 12-15: District’s Managed Groundwater Production 2021-2025 (AFY).....	12-31
Table 12-16: District’s Projected Managed Groundwater Supply 2026-2030 (AFY)	12-32
Table 12-17: District’s Projected Managed Groundwater Supply Through 2050 (AFY)	12-32
Table 12-18: Potable Customer Use 2021-2025 (AF).....	12-37
Table 12-19: Distribution System Loss 2021-2024	12-38
Table 12-20: Forecast Future Water Use (AFY)	12-42
Table 12-21: Forecast DRA Water Use for 2026 through 2030 (AFY)	12-44
Table 12-22: Five-Year Drought Risk Assessment (AFY).....	12-52
Table 12-23: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY)	12-53
Table 12-24: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY)	12-54
Table 12-25: Energy Intensity – Total Utility Approach for Jan 2025 through Dec 2025.....	12-56

LIST OF FIGURES

Figure 12-1: Hi-Desert Water District Service Area..... 12-13
Figure 12-2: Potable Water System..... 12-33

APPENDICES

Hi-Desert Water District Appendices 12-57

Sub-Chapter 12.1 – Introduction

The Hi-Desert Water District (District) is one of the oldest water suppliers in California’s Mojave Desert Area. The District has developed and operates a centralized sewer system and wastewater treatment reclamation facility to protect groundwater supplies and serve its customers. It provides a safe and reliable water supply for the Town of Yucca Valley and the surrounding unincorporated areas.

The District’s service area encompasses approximately 57 square miles in the Morongo subarea of the Mojave Basin Area (MBA) in San Bernardino County, California. The area includes the Morongo Basin and the Johnson Valley Area. The District also operates in the adjacent Ames Valley Basin. The District is situated in the Little San Bernardino Mountains at an elevation of about 3,300 feet above sea level. The terrain generally slopes from the southwest to northeast.

The District meets customer demands primarily through groundwater production from the Warren Valley Basin and Ames Reche Basin. These supplies are part of an actively managed groundwater portfolio supported by native recharge, irrigation and wastewater return flows, groundwater banking, and imported State Water Project supplies managed by MWA and conveyed through the Morongo Basin Pipelines for recharge in Yucca Valley.

Ensuring an adequate and reliable water supply for current and future customers is fundamental to the District’s mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the District supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on District-specific system characteristics, demands, demand management measures, and reliability.

12.1.1 Background and Purpose

The District has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.⁹⁴ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning

⁹⁴ California Water Code Sections 10610 through 10657.

horizon. This chapter presents the District’s evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the District’s 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

12.1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code Section 116275. The District is also classified as an Urban Water Supplier pursuant to California Water Code (CWC) Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the District and the other Urban Water Suppliers within the Planning Area have elected to prepare collaboratively. Details of the District’s Public Water System are provided in **Table 12-1**.⁹⁵

TABLE 12-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610073	HI-DESERT WATER DISTRICT	~11,140

12.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies and regional analyses. The District actively participated in this collaborative process through technical

⁹⁵ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

meetings, data sharing, and review of draft materials addressing both regional conditions and District-specific operations.

As required by the UWMPA, the District coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, the District encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

12.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

12.1.4 RUWMP Adoption

The District elected to hold a public workshop on May 20, 2026, to provide information regarding the 2025 RUWMP and allow for public review and discussion before formal consideration of the plan. No action was taken at the May 20, 2026 public workshop. Prior to the workshop and public hearing, the District made a draft of the 2025 RUWMP available for public inspection at 55439 29 Palms Highway Yucca Valley, CA 92284 and on the District's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The District elected body held a public hearing regarding the 2025 RUWMP on June 3, 2026. Following the public hearing, the District's elected body adopted the 2025 RUWMP on June 3, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the District's website.

The District plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- "FINAL Submittal 2025 UWMP Tables – Hi-Desert WD – 06.01.2026.xls"
- "Appendix F 2025 Checklist – Hi-Desert WD – 06.01.2026.xls"

12.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 12.2 Water Service and System Description
- Sub-Chapter 12.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 12.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 12.5 Water Use Characterization
- Sub-Chapter 12.6 Water Conservation and Shortage Response
- Sub-Chapter 12.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 12.8 Energy Intensity Analysis

Sub-Chapter 12.2 – Water Service and System Description

The Hi-Desert Water District provides potable water service to the residents and businesses within its service area, depicted in **Figure 12-1**, which largely encompasses the Town of Yucca Valley and the surrounding unincorporated areas.

Water service in District relies entirely on groundwater extracted from wells located throughout the service area. The District manages 12 active wells that tap into local aquifers to provide the community's water supply.⁹⁶ Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the District's 16 storage tanks, which collectively provide nearly 13 million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The District's water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes over 312 miles of distribution and transmission mains, thousands of service connections, ten booster stations, and 16 pressure-reducing valves. The District also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply. **Table 12-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the District's customer base. The District also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

⁹⁶ One of the District's 12 active wells is leased to the County of San Bernardino to support a separate small water system in the Morongo Area. Production from that well is not treated as a District retail customer demand for purposes of this chapter.

FIGURE 12-1: HI-DESERT WATER DISTRICT SERVICE AREA

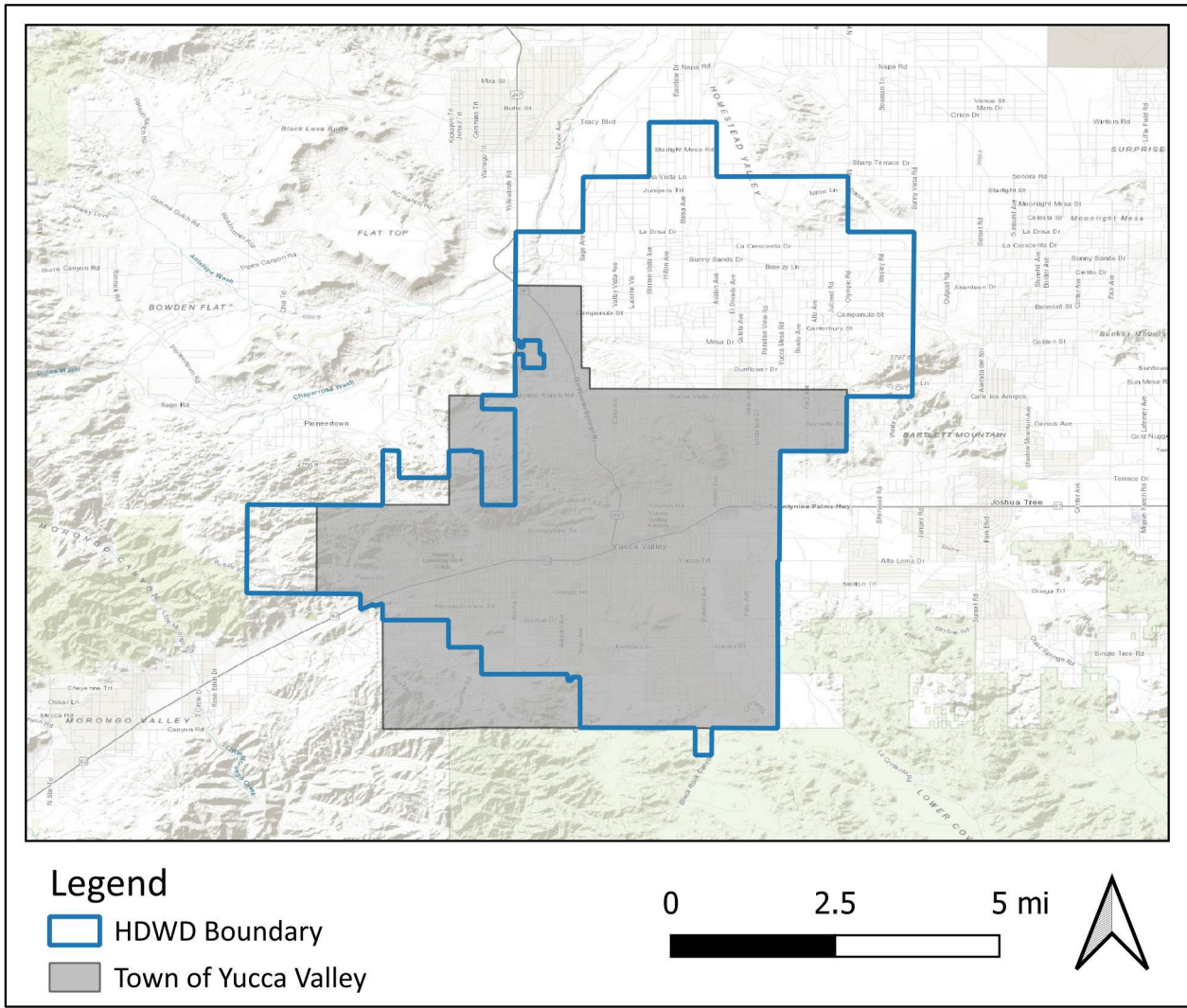


TABLE 12-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	9,987	10,047	10,094	10,126	10,140
Multi-Family Residential	294	300	303	321	328
Commercial/Institutional	552	557	561	566	547
Landscape Irrigation	108	112	112	110	110
Industrial	0	1	0	0	0
Other	13	17	0	0	15
Total	10,954	11,034	11,070	11,123	11,140

12.2.1 Service Area Climate

Located in California’s Mojave Basin, the District’s service area experiences a climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. Yucca Valley, the largest settlement in the service area, has an average elevation exceeding 3,000 feet, which significantly influences local climatic conditions, including low precipitation levels and pronounced diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 5.66 inches, occurring primarily as rainfall between December and March. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. The annual average temperature is approximately 61 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Other climate characteristics include occasional light winter snowfall at higher elevations, but this tends to melt quickly. Overall, the District’s service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of the RUWMP Planning Area’s climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

12.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate

consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the District’s water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 12.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area’s economic, social, and demographic trends give valuable insight to water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

12.3.1 Current Population and Historic Trends

Population estimates for the District are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA’s Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study’s development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the District reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

The Hi-Desert Water District’s service area is closely aligned with the municipal boundary for the Town of Yucca Valley; therefore, town population growth trends ostensibly reflect HDWD

service area growth trends. Yucca Valley initially developed after World War II as increased subdivisions and infrastructure laid the town’s foundation. Development hit its stride in 1991, when Yucca Valley officially incorporated as a town, with about 16,000 residents at the time. Since incorporation, Yucca Valley has grown steadily, but the pace of growth has slowed since major increases in the early 2000s and 2010s. The District is poised to experience modest growth over the planning horizon, which will influence future water demand, infrastructure requirements, and resource management strategies. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 12-3 presents the District’s historical population while **Table 12-4** presents the District's population growth over the last decade. The population values reflect the Hi-Desert Water District service area, which generally encompasses the Town of Yucca Valley as shown in **Figure 12-1**.

TABLE 12-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
19,060	19,198	23,760	24,866	25,653	27,139

TABLE 12-4: POPULATION GROWTH RATE – 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	24,866	25,023	25,236	25,307	25,469	25,653	25,540	25,939	26,339	26,739
Growth Rate		0.63%	0.85%	0.28%	0.64%	0.72%	-0.44%	1.56%	1.54%	1.52%

12.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

Population within the District is projected to increase over the planning horizon, but at a gradually moderating rate. This tapering reflects broader demographic trends, including declining birth rates and slower net migration across the region, as well as local development characteristics. While the High Desert continues to attract growth due to relatively affordable housing, the District’s service area is characterized primarily by low-density residential development and limited large-scale economic drivers, which constrain the pace of sustained population expansion over time. More broadly, incorporated areas served by

municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 12-5 presents the District’s projected population and associated growth rates through 2060.

TABLE 12-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
Hi-Desert Water District	27,139	27,538	27,938	28,338	28,737	29,137	29,537	29,937
Growth Rate		1.47%	1.45%	1.43%	1.41%	1.39%	1.37%	1.35%

12.3.3 Current and Projected Land Use

Development in the District’s service area is largely zoned for residential and commercial uses. The majority of residential development is low-density, single-family housing, though the Town of Yucca Valley also has a number of multi-family residential buildings. This makeup is unlikely to change in the near-term or long-term.

12.3.4 Economic Trends & Other Social and Demographic Factors

The District predominantly serves the Town of Yucca Valley, whose economy is a blend of tourism, military, and local services. Tourism is a cornerstone of the local economy, with numerous hotels and vacation rentals, restaurants, and outdoor recreational businesses benefiting from the town serving as the gateway to Joshua Tree National Park. In recent years, the community has also experienced in-migration from remote workers relocating from higher cost-of-living areas in search of more affordable housing and a desert lifestyle. Another key economic anchor is the Marine Corps Air Ground Combat Center in Twentynine Palms, with military personnel and associated temporary residents living in the surrounding area.

Median household incomes in the service are generally below statewide averages, contributing to the District’s designation as a Disadvantaged Community. The population is predominantly White, with a growing Hispanic/Latino presence. According to the 2020 U.S.

Census, the ethnic composition of Yucca Valley is approximately 67% White, 25% Hispanic/Latino, 4% African American, 2% American Indian, and 2% Asian.

Overall, the economic, social and demographic trends experienced in the District’s service area mirror those of the RUWMP Planning Area. Broader regional economic conditions that influence growth within the District are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 12.4 – Water Supply and Infrastructure Characterization

The District’s water supply portfolio is centered on locally managed groundwater resources, supported by infrastructure and management programs that ensure reliable delivery to customers. This sub-chapter describes the District’s water supply sources, associated management frameworks, and the infrastructure used to extract, store, and convey water throughout the service area. Together, these elements define the operational and planning foundation for maintaining long-term water supply reliability.

12.4.1 Groundwater

Groundwater is the primary water supply source for the District. The District relies entirely on groundwater pumped from the underlying Warren Valley Basin and the Ames Valley Basin to meet potable water demands within its service area. These basins are locally managed groundwater systems that have been subject to adjudication and coordinated management actions to address historical overdraft conditions and support long-term supply reliability. The District actively manages its groundwater resources through basin management planning, storage programs, and integration of imported supplies from MWA, which are used to augment recharge and stabilize groundwater levels. Collectively, these efforts allow the District to maintain a reliable, locally controlled groundwater supply portfolio capable of meeting current and projected demands.

12.4.1.1 Warren Valley Groundwater Basin Supplies

The Warren Valley Groundwater Basin is the primary groundwater source underlying the Town of Yucca Valley and the surrounding areas served by the District. The basin encompasses approximately 17,200 acres and consists of unconsolidated to semi-unconsolidated alluvial deposits that form the principal water-bearing strata. Groundwater in the basin occurs under unconfined conditions and is stored within interbedded gravels, sands, silts, and conglomerates derived from surrounding alluvial fan systems. Natural recharge occurs through direct percolation of precipitation, ephemeral streamflow, and subsurface inflows, supplemented by managed recharge activities.

Groundwater production within the Warren Valley Basin has been subject to long-term management under a court-adjudicated framework. Following a period of sustained overdraft beginning in the mid-20th century, the basin was adjudicated in 1977 through the Warren Valley Judgment, which established groundwater production rights and imposed a

management structure to stabilize basin conditions.⁹⁷ The Warren Valley Judgment appointed the District as Warren Valley Watermaster and required implementation of a Basin Management Plan to address overdraft and ensure long-term sustainability. This management framework includes monitoring of basin conditions, regulation of production, and coordinated planning among basin users.

A key component of the Basin Management Plan is the integration of imported water supplies to augment natural recharge. Through coordination with MWA, imported State Water Project (SWP) supplies are conveyed via the Morongo Basin Pipeline to recharge facilities within the Basin. These recharge activities along with conservation efforts have contributed to stabilization and recovery of groundwater levels over time. The basin is therefore managed as an actively replenished and regulated groundwater system rather than a solely natural supply.

The District's adjudicated supply within the Warren Valley Basin is defined by its production rights and management responsibilities under the Judgment. The District owns and operates a system of wells that extract groundwater consistent with adjudicated limits and basin management objectives. In addition to its direct production rights, the District maintains stored groundwater within the Basin through recharge and banking activities, which can be utilized to meet current and future demands. Taken together, adjudicated production, stored groundwater, and imported recharge supplies comprise the District's managed groundwater supply within the Warren Valley Basin.

The District was allocated a water supply by the Warren Valley Judgment of 1,622 acre-feet per year from the Warren Valley Basin. The District continues to use this supply to serve its customers and will continue using all of this supply into the future. **Table 12-6** presents the District's Warren Valley Basin supply for the most recent five-year period pursuant to the Warren Valley Judgment.

⁹⁷ Warren Valley Judgment available at: <https://www.hdwd.com/DocumentCenter/View/273/1977-Judgment-PDF>

TABLE 12-6: LAST FIVE YEARS OF WARREN VALLEY BASIN ADJUDICATED SUPPLY (AFY)

Year	Warren Valley Basin Adjudicated Supply
2021	1,622
2022	1,622
2023	1,622
2024	1,622
2025	1,622

The District will continue to use this supply as a fundamental source of water to serve its customers. This supply is reliable in a normal year, single dry year, and five consecutive dry years through 2050 as shown in **Table 12-7** and **Table 12-8**.

TABLE 12-7: PROJECTED WARREN VALLEY BASIN ADJUDICATED SUPPLY THROUGH 2030 (AFY)

Year Type		Warren Valley Adjudicated Supply
Normal		1,622
Single Dry-Year		1,622
Multi-Year Drought	2026 (1 st Year)	1,622
	2027 (2 nd Year)	1,622
	2028 (3 rd Year)	1,622
	2029 (4 th Year)	1,622
	2030 (5 th Year)	1,622

TABLE 12-8: PROJECTED WARREN VALLEY BASIN ADJUDICATED SUPPLY THROUGH 2050 (AFY)

Total Supply		2030	2035	2040	2045	2050
Normal		1,622	1,622	1,622	1,622	1,622
Single Dry-Year		1,622	1,622	1,622	1,622	1,622
Multi-Year Drought	Year 1	1,622	1,622	1,622	1,622	1,622
	Year 2	1,622	1,622	1,622	1,622	1,622
	Year 3	1,622	1,622	1,622	1,622	1,622
	Year 4	1,622	1,622	1,622	1,622	1,622
	Year 5	1,622	1,622	1,622	1,622	1,622

The District also has its own conjunctive use program that leverages alternative water supplies to improve groundwater basin conditions. The District has three groundwater recharge sites with a total of six groundwater recharge ponds that allow it to store up to 7,000 acre-feet per year of water. In 1991, the District entered the Morongo Basin Pipeline Agreement (MBP Agreement) that allows it to access alternative supplies from MWA to improve its groundwater banking conditions. The MBP Agreement was structured for MWA to provide one-seventh of its SWP allocation to the Improvement District Morongo area. The MBP Agreement then apportions that one-seventh SWP allocation and the transmission capacity of the MBP on a pro-rata basis among the four public water purveyors in the IDM area, namely, Hi-Desert Water District (59%), Bighorn-Desert View Water Agency (9%), County Service Area No. 70 (5%), and Joshua Basin Water District (27%). The MBP Agreement allows water to come into the Warren Valley Basin and be delivered to groundwater basins for future extraction. The District’s dedicated groundwater banking program within the Warren Valley Basin ensures its water supplies remain reliable for current and future growth. **Table 12-9** presents the District’s annual banked groundwater volumes from 2021 through 2025.

TABLE 12-9: LAST FIVE YEARS OF WARREN VALLEY BASIN ANNUAL BANKED GROUNDWATER SUPPLY (AFY)

Year	Banked Groundwater
2021	2,745
2022	2,156
2023	1,971
2024	3,029
2025	2,969

The District continues to build storage reserves through its groundwater banking program. **Table 12-10** shows the total cumulative storage in the Warren Valley Groundwater Basin from 2021 through 2025.⁹⁸

TABLE 12-10: LAST FIVE YEARS OF TOTAL CUMULATIVE WATER STORAGE IN WARREN VALLEY BASIN (AFY)

Year	Total Warren Valley Basin Storage
2021	103,423
2022	104,343
2023	105,243
2024	106,780
2025	108,203

The District will continue to utilize this supply as a fundamental source of water to serve its customers and to support ongoing groundwater banking activities. This supply is available under normal, single dry, and five consecutive dry year conditions through 2050 and represents a key component of the District’s managed groundwater supply.

12.4.1.2 Ames Valley Groundwater Basin Supplies

The Ames Valley Groundwater Basin is a secondary source of groundwater available to the District and provides supplemental supply to support overall water supply reliability. The Basin encompasses approximately 169.7 square miles and is bounded by non-water-bearing geologic formations, including the San Bernardino Mountains to the west, Iron Ridge to the

⁹⁸ Annual Report of the Warren Valley Basin Watermaster for the period of October 1, 2020 through September 20, 2025 Appendix H accessed at: <https://www.hdwd.com/DocumentCenter/View/1777>

north, and Hidalgo Mountain to the northwest. Structural features such as the Emerson, Copper Mountain, and West Calico faults define portions of the Basin boundaries, while a surface water drainage divide with the Copper Mountain Valley Basin forms the southern extent. The Basin has a total estimated storage capacity of approximately 1,200,000 acre-feet and has historically experienced overdraft conditions.

Groundwater production within the Ames Valley Basin is governed by a cooperative management framework established through a series of agreements among local water purveyors. In 1991, the District and Bighorn-Desert View Water Agency (BDVWA) entered into the Ames Basin Agreement, which established terms and conditions for groundwater production from the District's Mainstream Well. Building on this framework, multiple parties, including the District, entered into the Ames/Reche Groundwater Storage and Recovery Program and Management Amended Agreement (Amended Agreement) in 2014. The Amended Agreement established a comprehensive basin management structure intended to balance supply and demand, define groundwater production rights, and provide mechanisms for storage, carryover, and use of supplemental supplies.

The Amended Agreement establishes baseline extraction amounts for participating parties and includes provisions governing groundwater production, imported water use, and long-term basin management. The total baseline production for the Ames/Reche Management Area is 1,646 acre-feet per year, with actual basin production generally remaining below this threshold in recent years. MWA provides administrative and monitoring support under the Amended Agreement, including preparation of annual monitoring reports to track basin conditions and ensure sustainable management. Since implementation of the management framework, groundwater levels within the Ames/Reche Management Area have remained relatively stable, indicating that management objectives are being achieved.

The District's supply from the Ames Valley Basin is defined by its production rights under the Amended Agreement and its operational access to groundwater through the Mainstream Well. This supply is managed in coordination with other participating agencies and is supplemented by storage and recovery provision established under the agreement. As such, the Ames Valley Basin represents a managed supplemental groundwater supply that contributes to the District's overall managed groundwater portfolio.

The District was allocated an annual baseline supply of 703 acre-feet per year under the Amended Agreement. **Table 12-11** presents the District's last five years of use of the Amended Agreement water supply.⁹⁹

⁹⁹ Annual Report for the Ames-Reche Management Area for the 2024-2025 Fiscal Year accessed at: <https://bdvwa.org/wp-content/uploads/2024-2025-Ames-Reche-Final-Report-9-10-2025.pdf>

TABLE 12-11: LAST FIVE YEARS OF AMES-RECHE SUPPLY (AFY)

Year	Ames-Reche Supply
2021	755
2022	837
2023	929
2024	521
2025	403

The District will continue to use this supply as a fundamental source of water to serve its customers. This supply is reliable in a normal year, single dry year, and five consecutive dry years through 2050 as shown in **Table 12-12** and **Table 12-13**.

TABLE 12-12: PROJECTED AMES-RECHE SUPPLY THROUGH 2030 (AFY)

Year Type		Ames-Reche Supply
Normal		703
Single Dry-Year		703
Multi-Year Drought	2026 (1 st Year)	703
	2027 (2 nd Year)	703
	2028 (3 rd Year)	703
	2029 (4 th Year)	703
	2030 (5 th Year)	703

TABLE 12-13: PROJECTED AMES-RECHE SUPPLY THROUGH 2050 (AFY)

Ames-Reche Supply		2030	2035	2040	2045	2050
Normal		703	703	703	703	703
Single Dry-Year		703	703	703	703	703
Multi-Year Drought	Year 1	703	703	703	703	703
	Year 2	703	703	703	703	703
	Year 3	703	703	703	703	703
	Year 4	703	703	703	703	703
	Year 5	703	703	703	703	703

As noted in the District’s 2020 UWMP, the Ames-Reche Groundwater Storage and Recovery Program allows for storage of imported SWP supplies through the MBP. However, these stored supplies are not separately quantified in this sub-chapter. Because the available storage accounting may overlap with other basin storage values presented in earlier in this sub-chapter, the District has conservatively excluded Ames-Reche stored imported supplies from its quantified managed groundwater supply in order to avoid potential double counting.

12.4.2 Groundwater Quality

Groundwater produced by the District is sourced from wells completed in the Warren Valley and Ames Valley Groundwater Basins and is treated, as necessary, to meet all applicable federal and state drinking water standards prior to distribution. Groundwater quality within these basins reflects a combination of natural hydrogeologic conditions and localized influences, including land use and recharge patterns. The District conducts routine groundwater quality monitoring in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the District’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The

District’s most recent CCR is available through the District’s website and provides the most current information on potable water quality conditions.¹⁰⁰

While this section focuses on groundwater quality as it pertains to the District’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 12-14 presents a summary of groundwater quality constituents based on information reported in the District’s 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

¹⁰⁰ Hi-Desert Water District 2024 CCR available at:
<https://www.hesperica.gov/DocumentCenter/View/20046/2024-Annual-Water-Quality-Report>

TABLE 12-14: HI-DESERT WATER DISTRICT POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Arsenic (ppb)	0.004	10	ND - 4.1	2.7
Chlorine (ppm)	4 (as Cl ₂)	4.0 (as Cl ₂)	0.03 - 1.21	0.79
Chromium (ppb)	100	50	N/A	ND
Fluoride (ppm)	1	2.0	0.21 - 0.53	0.27
Gross Alpha Particle Activity (pCi/L)	0	15	3.12 - 12.8	7.18
Hexavalent Chromium (ppb)	20	10	0.4 - 6.1	1.8
Nitrate as N (ppm)	10	10	0.99 - 4.1	2.5
Uranium (pCi/L)	0.43	20	4.26 - 10.5	8.2
Copper (ppm)	0.15	0.3	0.015 - 0.210	0.15
Lead (ppb)	1.7	0.2	ND - 5.7	1.7
Secondary Standards				
Chloride (ppm)	N/A	500	15 - 68	45
Color	N/A	15	ND - 3	0.03
Iron (ppb)	N/A	300	N/A	ND
Specific Conductance (umho/cm)	N/A	1,600	320 - 510	431.25
Sulfate (ppm)	N/A	500	19 - 41	33
Total Dissolved Solids (TDS) (ppm)	N/A	1,000	200 - 330	262.4
Turbidity (NTU)	N/A	5	ND - 0.73	0.08
Federal Unregulated Contaminates				
Bicarbonate (ppm)	N/A	N/A	86 - 180	108
Calcium (ppm)	N/A	N/A	25 - 54	40
Lithium (ppb)	N/A	N/A	ND - 22	14.9
Magnesium (ppm)	N/A	N/A	1.5 - 9.2	6.4
Perfluorodecanoic Acid (PFDA) (ppb)	N/A	N/A	ND - 1.4	0.45
pH (units)	N/A	N/A	7.5 - 8.2	7.9
Potassium (ppm)	N/A	N/A	ND - 2.1	1.5
Sodium (ppm)	N/A	N/A	33 - 55	41
Total Alkalinity (ppm)	N/A	N/A	86 - 182	108
Total Hardness (ppm)	N/A	N/A	68 - 170	127

12.4.3 Recycled Water Supplies

The District has developed a recycled water program as part of its broader water supply management strategy. The District’s Wastewater Reclamation Facility collects and treats wastewater from the Town of Yucca Valley and surrounding areas using a membrane bioreactor (MBR) treatment process, producing high-quality recycled water that meets applicable regulatory standards. Treated effluent is discharged to percolation ponds, where it is recharged into an isolated portion of the Warren Valley Basin for long-term storage.

As part of this program, recycled water is retained in the subsurface for a minimum period of five years prior to potential recovery and reuse. Over time, the District plans to extract a portion of the stored water and reintroduce it into active recharge facilities to supplement potable groundwater supplies. This approach represents a form of indirect potable reuse that enhances groundwater storage, improves water quality conditions, and contributes to the long-term sustainability of the District’s managed groundwater supply.

12.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the District due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the District has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

12.4.5 Water Transfers and Exchanges

In addition to its groundwater resources and planned alternative supplies, such as recycled water, the District continues to evaluate opportunities to acquire water supplies from other agencies and sources. Transfers, exchanges, and groundwater banking programs represent important mechanisms for enhancing the long-term reliability and flexibility of the District’s available supplies. The District has executed several permanent transfers and continues to evaluate additional opportunities to augment its supply portfolio. Accordingly, voluntary water transfer programs represent a viable mechanism for increasing available supplies and enhancing long-term supply reliability.

12.4.6 Supply Summary

Groundwater serves as the District’s principal water supply source. These supplies, derived from the Warren Valley and Ames Valley Groundwater Basins, are sufficient to meet existing and projected demands under a range of hydrologic conditions. To enhance long-term sustainability and improve groundwater quality, the District has also implemented a recycled water program that recharges treated effluent into the Warren Valley Basin for storage and future use. In addition, the District participates in regional programs with MWA to access imported SWP supplies, which are used to support groundwater recharge and banking activities.

The District’s water supplies are managed as an integrated groundwater system consisting of locally derived and imported supplies. This system incorporates the native yield of the Warren and Ames Valley Basins, including natural recharge from precipitation, ephemeral streamflow, and subsurface inflows, as well as incidental recharge from septic systems and irrigation return flows. These supplies are augmented through active management actions, including imported water recharge delivered via the MBP, recycled water recharge, and groundwater banking programs. Groundwater production in the Ames Valley basin is further governed by the Ames/Reche Management Agreement, which establishes baseline extraction rights and coordinated basin management among participating agencies.

Given the substantial available storage within the Warren Valley Basin and the District’s active groundwater management program, sufficient supplies are available to meet projected demands across normal, single dry year, and multiple dry year conditions. Accordingly, the District’s managed groundwater production over the planning horizon represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 12-15**.

TABLE 12-15: DISTRICT’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	2,909
2022	2,919
2023	2,800
2024	2,874
2025	2,817

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 12.5 – Water Use Characterization*. Given the District’s actively managed groundwater system, which includes substantial available storage within the Warren Valley

Basin and supplemental supplies from the Ames Valley Basin and imported recharge, groundwater production is adjusted to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 12-16** and **Table 12-17**.¹⁰¹

TABLE 12-16: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026-2030 (AFY)

Year Type		Managed Groundwater Production
Normal		2,880
Single Dry-Year		2,880
Multi-Year Drought	2026 (1 st Year)	2,880
	2027 (2 nd Year)	2,885
	2028 (3 rd Year)	2,895
	2029 (4 th Year)	2,900
	2030 (5 th Year)	2,905

TABLE 12-17: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

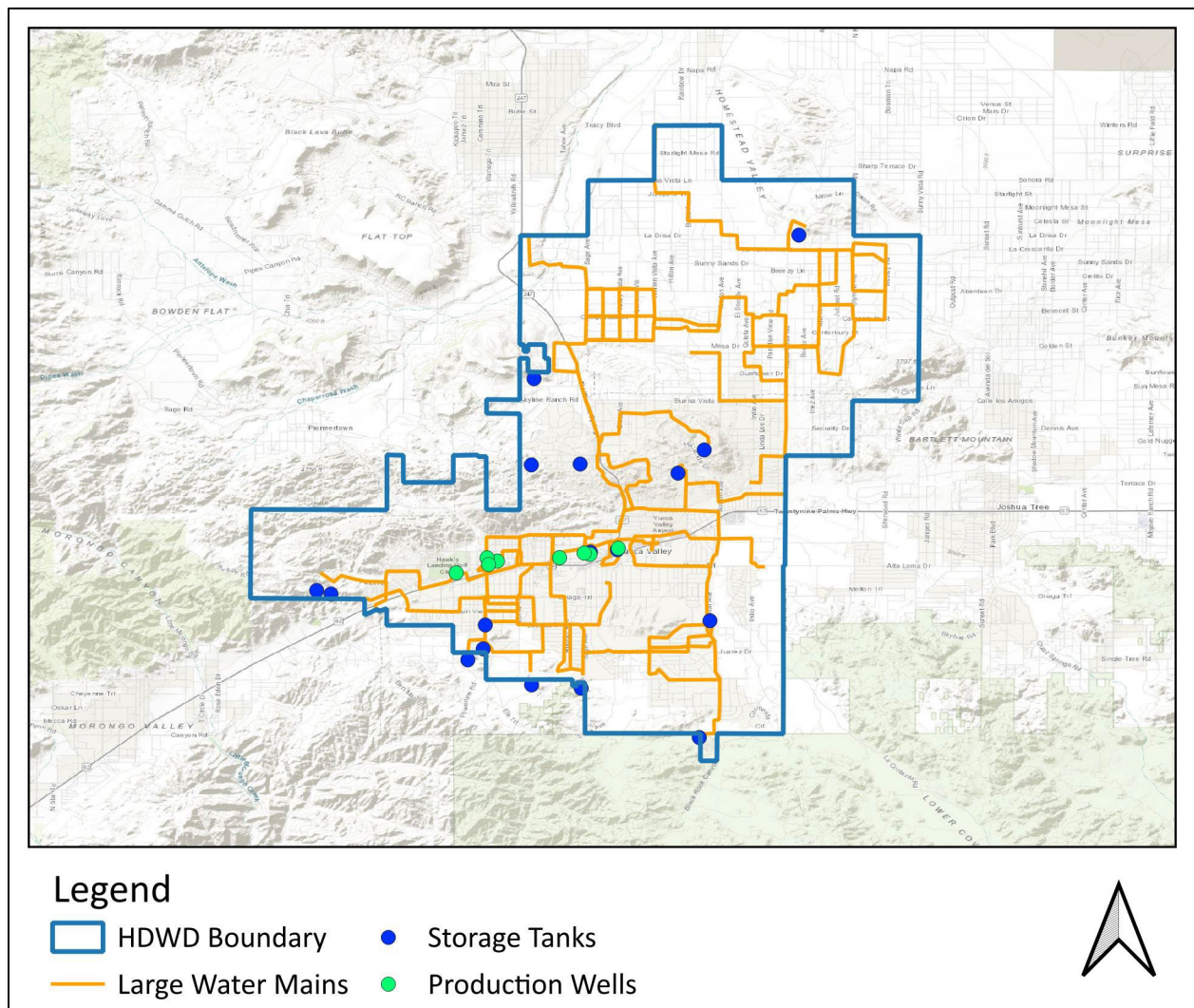
Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		2,905	2,940	2,975	3,005	3,040
Single Dry-Year		2,905	2,940	2,975	3,005	3,040
Multi-Year Drought	Year 1	2,905	2,940	2,975	3,005	3,040
	Year 2	2,915	2,945	2,980	3,015	3,045
	Year 3	2,920	2,955	2,985	3,020	3,055
	Year 4	2,925	2,960	2,995	3,025	3,060
	Year 5	2,935	2,965	3,000	3,035	3,065

¹⁰¹ The values presented in **Table 12-16** and **Table 12-17** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 12.5 – Water Use Characterization*.

12.4.7 Delivery System Details

The District’s potable water system conveys groundwater from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the District’s storage reservoirs, which collectively provide approximately 13 million gallons of storage before being distributed through pressurized potable water system. The distribution system consists of more than 312 miles of pipeline and approximately 11,140 service connections. The District’s potable water distribution system is shown in **Figure 12-2**.

FIGURE 12-2: POTABLE WATER SYSTEM



Sub-Chapter 12.5 – Water Use Characterization

Understanding water use characteristics is essential for the District to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the District’s retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the District’s past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District’s water supplies, presented in *Sub-Chapter 12.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 12.7 – Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the District’s 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the District’s residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the District’s UWUO, comparison to the District’s actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the District’s 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the District’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the District’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

12.5.1 Current Customer Water Use

As described in Sub-Chapter 12.2 – Water Service and System Description, the District provides water service to approximately 11,140 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the District and treated to meet all applicable state and federal drinking water standards. Information regarding the District’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provide the basis for determining the District’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

12.5.1.1 Customer Water Use 2021–2025

Recent customer water use data assists the District in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The District is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The District records potable water use within five primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Landscape Irrigation
- Other

Table 12-18 presents the District's past customer potable water use by customer classification for 2021 – 2025 in acre-feet.

TABLE 12-18: POTABLE CUSTOMER USE 2021-2025 (AF)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	128	120	130	145	170	194	214	206	197	171	142	130	1,948
	2022	137	122	135	150	154	187	194	170	164	158	143	128	1,843
	2023	126	110	110	124	154	167	196	186	166	153	138	129	1,760
	2024	124	116	120	125	147	185	195	195	195	172	159	129	1,862
	2025	131	230	228	146	154	171	195	196	162	148	138	123	2,022
Multi-Family Residential	2021	16	15	15	16	18	20	22	24	21	19	17	16	219
	2022	17	15	16	17	17	20	22	20	20	20	20	17	222
	2023	17	15	16	17	17	20	22	20	20	20	20	17	222
	2024	17	17	17	16	17	21	23	24	25	22	22	19	240
	2025	19	20	18	21	19	21	25	23	21	21	18	16	243
Commercial Institutional	2021	16	18	21	22	23	26	27	26	28	25	25	26	283
	2022	30	21	23	26	23	27	27	26	26	27	27	22	304
	2023	30	21	23	26	23	27	27	26	26	27	27	22	304
	2024	23	21	23	21	22	27	27	28	29	27	29	23	301
	2025	20	22	21	24	23	23	24	25	23	24	20	20	269
Landscape Irrigation	2021	6	4	4	9	17	21	25	27	25	21	10	10	179
	2022	4	4	4	10	14	21	29	25	23	17	11	5	168
	2023	4	4	4	10	14	21	29	25	23	17	11	5	168
	2024	4	4	3	5	14	22	25	31	27	20	16	7	177
	2025	5	4	5	7	14	20	24	30	22	17	7	13	169
Other	2021	2	1	1	1	1	1	2	1	2	2	1	1	15
	2022	1	1	1	1	1	2	2	2	1	1	1	1	14
	2023	0	0	0	0	0	0	0	0	0	0	0	0	0
	2024	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.2	0.1	0.1	0.1	0.1	2
	2025	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.2	0.1	0.1	0.1	0.1	2
Total Metered Deliveries	2021	167	158	171	193	230	262	291	284	273	238	194	184	2,644
	2022	189	162	180	205	209	257	274	244	234	222	201	173	2,551
	2023	177	150	154	177	208	236	274	258	235	217	196	174	2,454
	2024	168	159	164	167	201	255	270	278	276	240	226	177	2,582
	2025	175	276	273	199	211	236	268	274	228	210	183	171	2,704

The “Other” water use category included in **Table 12-18** captures a range of small, non-standard uses associated with non-residential uses and District owned accounts.

12.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the District’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).¹⁰² An electronic copy of the audit in Excel format is to be submitted to DWR by January 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the District shall assess compliance every three years as an average of recent losses. Additionally, the District will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 12-19** summarizes the District’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 12-19: DISTRIBUTION SYSTEM LOSS 2021-2024

2021	2022	2023	2024
9.1%	10.4%	11.5%	7.3%
Average:			9.6%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the District’s distribution system loss represents about 9.6% of water entering the system.

¹⁰² Title 23 California Code of Regulations Section 638.1 et seq.

12.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the District was developed using information submitted as part of the District’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 22.6 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 9.5%. Using the information from the same period, the average “apparent” water loss averaged 2.7% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 12.2%, although recent AWWA audits discussed above show losses closer to 9.6%.

12.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the District’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB x7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

12.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the District to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the District to measure progress on achieving water efficiency goals.

The District’s 2020 GPCD target was established in the 2015 UWMP as 128 GPCD, derived as the “gross water use” divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The District’s calculation of their 2020 actual GPCD used the same methodology: “Gross water” was defined as total water production measured and reported based upon well production records. This value, divided by the District’s estimated population in 2020, resulted in a compliance value of 103 GPCD. Because this value was less than the District’s established target, the District was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the District was determined to have an actual GPCD of 95, calculated using the same methodology presented above.

12.5.3 Forecasting Customer Use

Future water use within the District’s service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the District’s future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the District, are presented in the following subsections and corresponding tables.

12.5.3.1 Existing Customer Future Use

Future water use associated with the District’s existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 12.5.2.1*, the District’s current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the District has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the District’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the District’s existing customer demand is projected to remain at approximately 2,873 acre-feet per year, based on a representative GPCD of 95, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate

adjustment for the District’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

12.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the District’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the District’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the District, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 8 GPCD
- Total Non-Residential Use: 24 GPCD
- Total Use: 79 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage has been applied to new customer demand projections.

Table 12-20 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the District’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 12.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 12-20: FORECAST FUTURE WATER USE (AFY)

2025	2030	2035	2040	2045	2050
2,875	2,905	2,940	2,975	3,005	3,040

12.5.3.3 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The water use forecast presented in **Table 12-20** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions.

Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 12-20** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.¹⁰³

12.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The District will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

¹⁰³ California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

12.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the District’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related but distinct analyses required under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the District’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

12.5.4.1 Projecting Water Use for Five-Year Drought Risk Assessment

The DRA requires the District to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the District’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the District’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the District’s long-term water use forecast developed for the 2025 RUWMP and the District’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand,

including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the District’s evaluation of water supply reliability across planning timeframes.

Table 12-21 presents the District’s projected unconstrained water demands for the DRA period (2026-2030), with values rounded to the nearest five acre-feet. These values form the basis for the reliability analysis presented in *Sub-Chapter 12.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 12-21: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
2,880	2,885	2,895	2,900	2,905

12.5.4.2 Projecting Water Use for Annual Assessments

The District conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June. The District has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

12.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the District’s sub-chapter within the 2025 RUWMP, the District’s service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.¹⁰⁴ Accordingly, the water use forecast presented in **Table 12-21** is inclusive of disadvantaged community water use.

¹⁰⁴ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 12.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the District's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The District has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the District's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the District evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the District's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the District's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 12a.

12.6.1 Demand Management Measures

The District has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The District is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the District leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The District will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

12.6.2 Foundational Demand Management Measures

The District's foundational DMMs provide the core framework for promoting efficient water use and supporting long-term water supply reliability. These measures consist of established ordinances, policies, and ongoing programs that have been implemented over time and continue to be refined to meet current regulatory requirements and operational needs. As described in the District's 2020 UWMP, these foundational DMMs represent long-standing components of the District's water management approach and remain in place for the 2025 planning cycle.

Water Waste Prevention Ordinances

The District has adopted and enforces water waste prevention ordinances that prohibit inefficient water use practices. These requirements are codified in the District's Municipal Code and include restrictions on activities such as excessive runoff, irrigation during inappropriate times, and other avoidable water losses. Originally established in response to basin conditions, these ordinances continue to align with State requirements and provide the regulatory foundation for reducing unnecessary water use.

Metering

All potable water service connections within the District are metered, allowing for accurate measurement of customer water use and supporting volumetric billing. The District continues to enhance its metering capabilities through the ongoing implementation of Automated Meter Reading (AMR), which improves data accuracy, supports system monitoring, and enables identification of excessive or continuous water use.

Conservation Pricing

The District utilizes a conservation-oriented rate structure designed to promote efficient water use while ensuring adequate revenue for system operations and maintenance. The rate structure includes variable base rates and tiered usage charges that increase with higher levels of consumption, providing a price signal that encourages customers to manage water use efficiently.

Public Education and Outreach

The District implements ongoing public education and outreach programs to promote water conservation and inform customers of efficient water use practices. These efforts include educational materials, community engagement activities, and coordination with regional partners.

Programs to Assess and Manage Distribution System Losses

The District conducts ongoing efforts to assess and manage distribution system losses through annual water audits, leak detection, and repair programs. These efforts are supported by meter calibration and replacement programs for both production and distribution system meters, ensuring accurate accounting of water use and minimizing real water losses.

12.6.2.1 Recent DMM Activities

The District has continued to implement and expand DMMs to improve water use efficiency, support customer awareness, and enhance the District’s ability to monitor system and customer water use. Recent activities have focused on customer-side leak detection, improved access to water use information, and modernization of the District’s metering infrastructure.

The District has fully transitioned its customer metering system to Automated Meter Reading (AMR) meters. This transition improves the efficiency and accuracy of meter reading, supports more timely review of customer usage patterns, and enhances the District’s ability to identify unusual consumption that may indicate leaks or inefficient water use.

The District has also participated in a Flume Smart Home Water Monitor program to provide residential customers with additional tools to understand and manage water use. Through this program, the District partnered with Flume Water and DWR to support a study of indoor residential water use and make a limited number of Flume devices available to customers. The devices provide detailed water use information, including real-time water data, usage targets, leak alerts, appliance-level water use information, and outdoor water use insights. These capabilities support customer-side conservation by helping customers identify leaks, evaluate water use patterns, and make more informed decisions regarding indoor and outdoor water use.

12.6.2.2 Planned DMM Activities

At this time, the District does not anticipate implementing new demand management programs beyond those currently in place. The District’s existing DMMs provide a comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. The District remains committed to efficient and responsible use of water

resources and will continue to evaluate opportunities to enhance existing programs, incorporate new technologies, and improve program effectiveness over time. This includes ongoing efforts to reduce system losses, enhance metering and data capabilities, and support customer awareness and conservation practices. Consistent with applicable State requirements, including UWUO provisions, the District will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

12.6.3 Water Shortage Contingency Plan

The District has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the District can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the District may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the District's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the District's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

12.6.3.1 Summary of Water Shortage Levels and Response Actions

The District's WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the District to implement proportional measures to manage water use and maintain essential public health and safety services during periods of reduced supply. The WSCP includes six shortage levels, each associated with a targeted reduction in water use relative to normal conditions. As shortage conditions intensify, the District may implement progressively more restrictive measures to reduce demand and manage available supplies. The general framework of shortage levels and representative response actions is summarized below:

- **Stage 1 – Up to 10% Shortage (Water Alert):**
Increased public awareness and voluntary conservation measures, including enhanced outreach, customer engagement, and reinforcement of existing water waste prohibitions.
- **Stage 2 – Up to 20% Shortage:**
Implementation of additional conservation measures and initial mandatory water use restrictions, including limitations on outdoor irrigation and reduction of non-essential water uses.
- **Stage 3 – Up to 30% Shortage:**
Expansion of mandatory restrictions, including further limitations on outdoor water use, increased enforcement of water use prohibitions, and intensified conservation efforts.
- **Stage 4 – Up to 40% Shortage:**
Implementation of significant demand reduction measures, including stricter outdoor irrigation limitations, expanded enforcement actions, and application of water use restrictions and penalties in accordance with Municipal Code Chapter 5.70.
- **Stage 5 – Up to 50% Shortage (Water Shortage Crisis):**
Implementation of severe restrictions on water use, with reductions focused on essential uses necessary for public health and safety, along with intensified monitoring and enforcement.
- **Stage 6 – Greater than 50% Shortage (Emergency Water Shortage):**
Implementation of emergency response measures, including potential customer rationing and restriction of water use to essential health and safety needs, with continuous monitoring and enforcement of required reductions.

As water supply conditions change, the District may transition between shortage levels based on ongoing evaluation of supply availability, customer demand, and system conditions.

12.6.3.2 Summary of Monitoring Procedures and Implementation

The District’s WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The District monitors key indicators of water supply reliability, including groundwater production, available supply allocations, customer demand, and system conditions. This information is used to evaluate supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The District’s Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of shortage response actions. Additional detail regarding the Annual Assessment is provided in *Subsection 12.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter 12.5 – Water Use Characterization*.

Implementation of the WSCP includes coordination among District staff and communication with customers and regional partners. When a water shortage stage is implemented, the District provides public notification of applicable restrictions and conservation measures and monitors compliance to ensure demand reduction targets are achieved.

Sub-Chapter 12.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the District’s water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 12.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 12.5 – Water Use Characterization* to assess the District’s ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the District’s water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the District’s capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the District’s Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the District’s water supply reliability and inform the implementation of the District’s WSCP, as described in *Sub-Chapter 12.6 – Water Conservation and Shortage Response*.

12.7.1 Five-Year Drought Risk Assessment

The DRA evaluates the District’s ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the District’s unconstrained demand forecast described in *Sub-Chapter 12.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the District’s managed groundwater supplies, which include groundwater production from the Warren Valley and Ames Valley Basins, stored groundwater, imported supplies used for recharge through the MBP, and

available transfers and exchanges. As described in *Sub-Chapter 12.4 – Water Supply and Infrastructure Characterization*, the District actively manages these resources to support long-term reliability. Given the substantial available storage within the Warren Valley Basin and the District’s integrated groundwater management approach, the District has flexibility in adjusting groundwater production and use of supplemental supplies to meet projected demands under a range of hydrologic conditions.

The DRA compares projected water demand to available supplies to evaluate the District’s capacity to meet customer needs over the five-year period. **Table 12-22** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 12-22: FIVE-YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	2,880	2,885	2,895	2,900	2,905
Demand	2,880	2,885	2,895	2,900	2,905
Difference	0	0	0	0	0

12.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The District’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

12.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the District’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the District’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the District’s supplies are managed through its integrated groundwater system, which provides flexibility in balancing groundwater production, stored supplies, and supplemental recharge resources to meet projected demands. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 12-23 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 12-23: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	2,905	2,940	2,975	3,005	3,040
Demand	2,905	2,940	2,975	3,005	3,040
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	2,905	2,940	2,975	3,005	3,040
Demand	2,905	2,940	2,975	3,005	3,040
Difference	0	0	0	0	0

12.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the District’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the District continues to manage its supplies within its integrated groundwater system, which provides flexibility in balancing groundwater production, stored supplies, and supplemental recharge resources to meet projected demands. This managed approach enables the District to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 12-24 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the District has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 12-24: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	2,905	2,940	2,975	3,005	3,040
	Demand	2,905	2,940	2,975	3,005	3,040
	Difference	0	0	0	0	0
Year 2	Supply	2,915	2,945	2,980	3,015	3,045
	Demand	2,915	2,945	2,980	3,015	3,045
	Difference	0	0	0	0	0
Year 3	Supply	2,920	2,955	2,985	3,020	3,055
	Demand	2,920	2,955	2,985	3,020	3,055
	Difference	0	0	0	0	0
Year 4	Supply	2,925	2,960	2,995	3,025	3,060
	Demand	2,925	2,960	2,995	3,025	3,060
	Difference	0	0	0	0	0
Year 5	Supply	2,935	2,965	3,000	3,035	3,065
	Demand	2,935	2,965	3,000	3,035	3,065
	Difference	0	0	0	0	0

12.7.3 Annual Reliability Assessment

Each year, the District considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the District’s Water Shortage Contingency Plan. The District has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

12.7.4 Water Supply Reliability Summary

The District's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 12.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the District evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt hours per acre-foot (kWh/AF). The District’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the District’s service area, rather than long-distance conveyance or advanced treatment processes.

The District continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 12-25**.

TABLE 12-25: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR JAN 2025 THROUGH DEC 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	2,817
Energy Consumed (kWh)	3,860,890
Energy Intensity (kWh/acre-foot)	1,371

HI-DESERT WATER DISTRICT

APPENDICES

This page is reserved for Hi-Desert Water District-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to Hi-Desert Water District's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the Hi-Desert Water District retailer chapter, Hi-Desert Water District's WSCP, and applicable Hi-Desert Water District-specific appendices.

Chapter 13.0 JOSHUA BASIN WATER DISTRICT



TABLE OF CONTENTS

Sub-Chapter 13.1 – Introduction	13-7
13.1.1 Background and Purpose.....	13-7
13.1.2 Basis for Plan Preparation	13-8
13.1.3 Coordination and Outreach.....	13-8
13.1.4 RUWMP Adoption	13-9
13.1.5 Document Organization	13-10
Sub-Chapter 13.2 – Water Service and System Description	13-11
13.2.1 Service Area Climate.....	13-13
Sub-Chapter 13.3 – Population, Land Use, Economy, and Demographics	13-14
13.3.1 Current Population and Historic Trends	13-14
13.3.2 Projected Population	13-15
13.3.3 Current and Projected Land Use.....	13-16
13.3.4 Economic Trends & Other Social and Demographic Factors.....	13-16
Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization	13-18
13.4.1 Groundwater.....	13-18
13.4.2 Groundwater Quality.....	13-23
13.4.3 Recycled Water Supplies.....	13-25
13.4.4 Desalination Opportunities	13-25
13.4.5 Water Transfers and Exchanges	13-25
13.4.6 Supply Summary	13-26
13.4.7 Delivery System Details	13-28
Sub-Chapter 13.5 – Water Use Characterization	13-29
13.5.1 Current Customer Water Use	13-30
13.5.2 Compliance with Water Use Targets and Objectives.....	13-34
13.5.3 Forecasting Customer Use	13-35
13.5.4 Forecasting Water Use for DRA and Annual Assessment.....	13-38
13.5.5 Projecting Disadvantaged Community Water Use	13-40
Sub-Chapter 13.6 – Water Conservation and Shortage Response.....	13-41
13.6.1 Demand Management Measures	13-41

13.6.2 Water Shortage Contingency Plan 13-44

Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment.....13-47

13.7.1 Five Year Drought Risk Assessment13-47

13.7.2 Long Term Service Reliability 13-48

13.7.3 Annual Reliability Assessment 13-50

13.7.4 Water Supply Reliability Summary..... 13-51

Sub-Chapter 13.8 – Energy Intensity Analysis.....13-52

LIST OF TABLES

Table 13-1: Public Water System Information.....	13-8
Table 13-2: Active Customer Water Service Connections.....	13-12
Table 13-3: Historical population.....	13-15
Table 13-4: Population Growth Rate - 2015-2024.....	13-15
Table 13-5: Population Forecast and Growth Rate.....	13-16
Table 13-6: Last Five Years of Copper Mountain Valley Basin Supply (AFY).....	13-19
Table 13-7: Projected Copper Mountain Valley Basin Supply through 2030 (AFY).....	13-20
Table 13-8: Projected Copper Mountain Valley Basin Supply through 2050 (AFY).....	13-20
Table 13-9: Last Five Years of Joshua Tree Basin Supply (AFY).....	13-21
Table 13-10: Projected Joshua Tree Basin Supply through 2030 (AFY).....	13-22
Table 13-11: Projected Joshua Tree Basin Supply through 2050 (AFY).....	13-22
Table 13-12: Joshua Basin Water District Potable Water Quality.....	13-24
Table 13-13: District’s Managed Groundwater Production 2021-2025 (AFY).....	13-26
Table 13-14: District’s Projected Managed Groundwater Supply 2026 – 2030 (AFY).....	13-27
Table 13-15: District’s Projected Managed Groundwater Supply Through 2050 (AFY).....	13-27
Table 13-16: Potable Customer Use 2021-2025 (AF).....	13-32
Table 13-17: Distribution System Loss 2021-2024.....	13-33
Table 13-18: Forecast Future Water Use (Values in Acre-feet per year).....	13-37
Table 13-19: Forecast DRA Water Use for 2026 through 2030 (AFY).....	13-39
Table 13-20: Five Year Drought Risk Assessment (AFY).....	13-48
Table 13-21: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY).....	13-49
Table 13-22: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY).....	13-50
Table 13-23: Energy Intensity – Total Utility Approach for Jan 2025 through Dec 2025.....	13-52

LIST OF FIGURES

Figure 13-1: Joshua Basin Water District Service Area..... 13-12

APPENDICES

Joshua Basin Water District Appendices 13-53

Sub-Chapter 13.1 – Introduction

Joshua Basin Water District (District) was formed in 1963 as a public agency through the consolidation of several smaller water systems to provide reliable potable water service within its defined service area in San Bernardino County. The District is governed by an elected Board of Directors and operates through its core functional divisions of Operations, Finance, and Administration.

The District's service area overlies portions of the Copper Mountain and Joshua Tree groundwater subbasins and encompasses areas within and surrounding the communities of Yucca Valley and Twentynine Palms, including portions of Joshua Tree National Park and the Marine Corps Air Ground Combat Center at Twentynine Palms.

The District's water supply portfolio is comprised primarily of groundwater extracted from the Copper Mountain and Joshua Tree subbasins, which represent the predominant source of supply for meeting customer demands. To supplement local groundwater resources and support long-term basin management objectives, the District also utilizes imported water made available through the Mojave Water Agency (MWA), including supplies associated with the Morongo Basin Pipeline (MBP). Ensuring an adequate and reliable water supply for current and future customers is fundamental to the District's mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the District supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on District-specific system characteristics, demands, demand management measures, and reliability.

13.1.1 Background and Purpose

The District has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.¹⁰⁵ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single-dry years, and multiple-dry-year scenarios through a 20-year planning horizon. This chapter presents the District's evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the District's 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory

¹⁰⁵ California Water Code Sections 10610 through 10657.

guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

13.1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code Section 116275. The District is also classified as an Urban Water Supplier pursuant to California Water Code (CWC) Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in an RUWMP, which the District and the other Urban Water Suppliers within the Planning Area have elected to prepare collaboratively. Details of the District’s Public Water System are provided in **Table 13-1**.¹⁰⁶

TABLE 13-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections ¹⁰⁷
CA3610025	Joshua Basin Water District	~ 5,574

13.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and MWA, which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies and regional analyses. The District actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and District-specific operations.

¹⁰⁶ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

¹⁰⁷ The number of municipal connections presented in Table 13-1 includes both active and inactive municipal service connections.

As required by the UWMPA, the District coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

Consistent with CWC Section 10641, the District encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

13.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 - Introduction.

13.1.4 RUWMP Adoption

The District elected to hold a public workshop on May 20, 2026, to provide information regarding the 2025 RUWMP and allow for public review and discussion before formal consideration of the plan. No action was taken at the May 20, 2026, public workshop. Prior to the workshop and public hearing, the District made a draft of the 2025 RUWMP available for public inspection at 61750 Chollita Road, Joshua Tree, CA 92252. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The District's elected body held a public hearing regarding the 2025 RUWMP on June 3, 2026. Following the public hearing, the District's elected body adopted the 2025 RUWMP on June 3, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the District's website.

The District plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- "FINAL Submittal 2025 UWMP Tables – Joshua Basin WD – 06.01.2026.xls"
- "Appendix F 2025 Checklist – Joshua Basin WD – 06.01.2026.xls"

13.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 13.2 Water Service and System Description
- Sub-Chapter 13.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 13.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 13.5 Water Use Characterization
- Sub-Chapter 13.6 Water Conservation and Shortage Response
- Sub-Chapter 13.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 13.8 Energy Intensity Analysis

Sub-Chapter 13.2 – Water Service and System Description

The Joshua Basin Water District provides potable water service to the residents and businesses within its service area, depicted in **Figure 13-1**, which encompasses Joshua Tree, other census-designated places, and portions of the Joshua Tree National Park.

Water service in the District relies entirely on groundwater extracted from wells located throughout the service area. The District manages five active wells that tap into local aquifers to provide the community's water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the District's 17 reservoir tanks, which collectively provide approximately 12.3 million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The District's water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes over 300 miles of water mains, thousands of service connections, 12 booster pump stations, 12 pressure-reducing stations, and thousands of valves and fire hydrants that allow the District to isolate portions of the system for maintenance or emergencies without disrupting service to the broader community. **Table 13-2** summarizes recent historical active service connections by customer type, providing an overview of the composition of the District's customer base.¹⁰⁸ The District also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

¹⁰⁸ Active service connection counts presented in Table 13-2 reflect the customer connection data reported in the District's Electronic Annual Report (EAR) submitted annually to the State Water Resources Control Board (SWRCB).

FIGURE 13-1: JOSHUA BASIN WATER DISTRICT SERVICE AREA

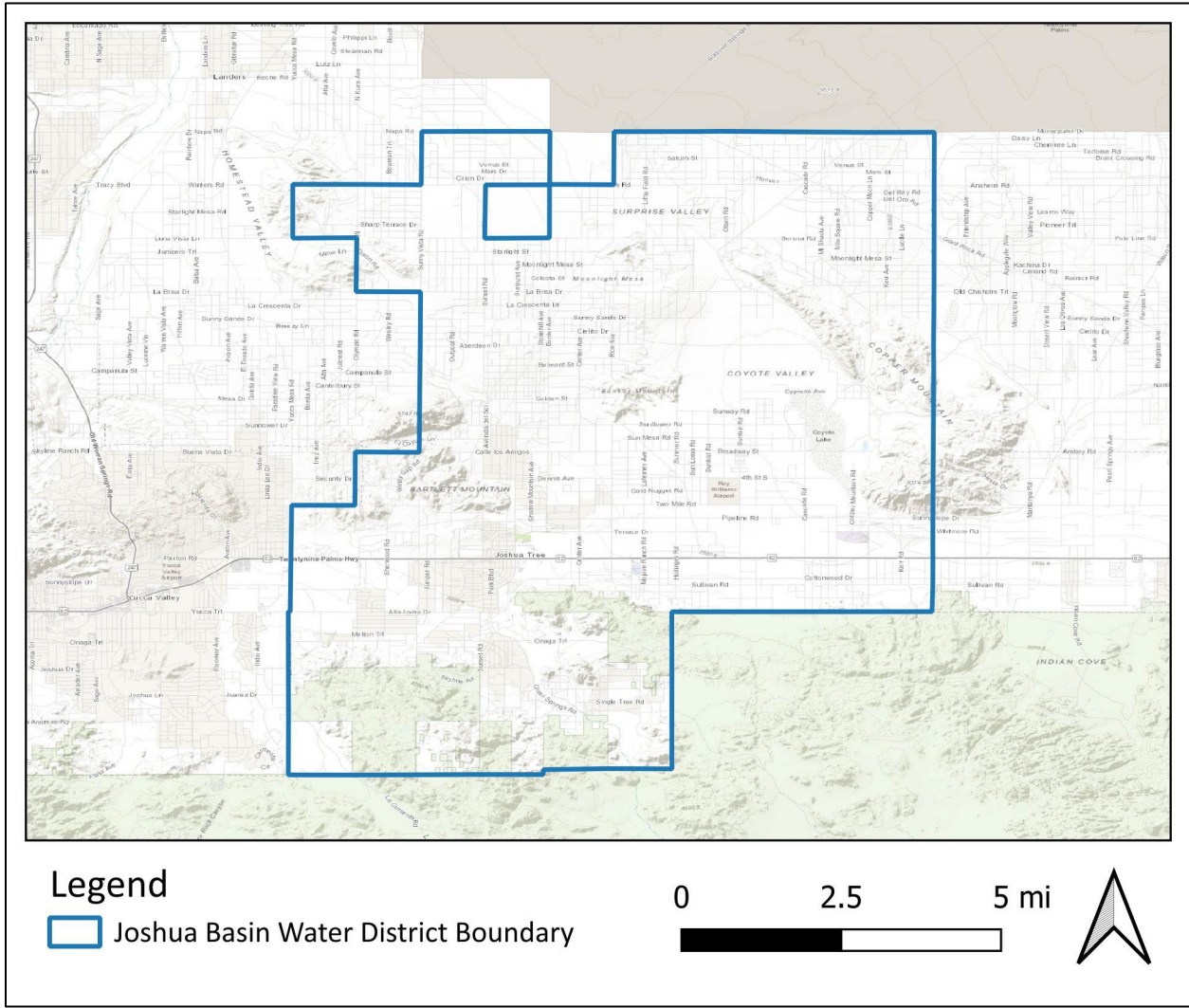


TABLE 13-2: ACTIVE CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	4,831	4,857	4,703	4,629	4,638
Multi-Family Residential	95	95	90	90	83
Commercial/Institutional	142	159	109	147	143
Landscape Irrigation	21	19	19	18	17
Total	5,089	5,130	4,921	4,884	4,881

13.2.1 Service Area Climate

Located in California’s Mojave Basin, the District’s service area experiences a climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and large diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 4.5 inches, occurring primarily as rainfall between December and March. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. The annual average temperature is approximately 61 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, the District’s service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of Planning Area’s climate characteristics is provided *in Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

13.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the District’s water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 13.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area's economic, social, and demographic trends provide valuable insight to water management and planning. This sub-chapter addresses these factors to provide a supportable basis for forecasting future water use.

13.3.1 Current Population and Historic Trends

Population estimates for the District are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA's Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study's development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the District reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Historical population trends within the District have generally followed broader regional growth patterns associated with residential development, employment opportunities, and

land availability in the High Desert. Much of the growth over the past several decades has been characterized by low-density residential development to serve the needs of a growing population. Continued growth is anticipated over the planning horizon, which will influence future water demand, infrastructure requirements, and resource management strategies. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 13-3 presents the District’s historical population while **Table 13-4** presents the District’s population growth over the last decade.

TABLE 13-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
7,515	8,062	9,534	9,929	10,227	10,375

TABLE 13-4: POPULATION GROWTH RATE - 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	9,929	10,012	10,090	10,164	10,216	10,227	10,257	10,286	10,316	10,345
Growth Rate		0.84%	0.78%	0.73%	0.51%	0.11%	0.29%	0.28%	0.29%	0.28%

13.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

Population within the District is generally stable and characterized by slow growth as compared to other Hi-Desert communities. The District’s proximity to Joshua Tree National Park attracts seasonal visitors and short term occupants who contribute to water demand, particularly during peak visitor periods, but these users do not represent permanent service area population. Similarly, the District serves a significant number of intermittently occupied connections, including second homes and short-term rental properties, which may generate demand when occupied but are not equivalent to year-round residential population.

While the Hi-Desert continues to attract modest growth the District’s service area is characterized primarily by low-density residential development and limited large-scale economic drivers, which constrain the pace of sustained population expansion over time. More broadly, incorporated areas served by municipal water providers within the RUWMP

Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 13-5 presents the District’s projected population and associated growth rates through 2060.

TABLE 13-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
JBWD	10,375	10,536	10,673	10,800	10,919	11,029	11,131	11,225
Annual Growth Rate		1.55%	1.30%	1.19%	1.10%	1.01%	0.92%	0.84%

13.3.3 Current and Projected Land Use

The predominant land use within the District’s service area is residential, consisting largely of low-density, single-family development. While substantial areas of vacant and undeveloped land remain, land use patterns reflect an emphasis on maintaining the community’s rural character and open space. In contrast to other MWA retailer service areas, the District’s proximity to Joshua Tree National Park has influenced the development of hospitality and commercial land uses that support tourism activity. In addition, several small-scale residential developments have been proposed within the service area.

13.3.4 Economic Trends & Other Social and Demographic Factors

Economic, social, and demographic conditions within the District’s service area are generally consistent with those observed throughout the RUWMP Planning Area. The local economy is influenced by a combination of tourism-related activity associated with Joshua Tree National Park, regional employment centers, and the presence of the Marine Corps Air Ground Combat Center at Twentynine Palms. These factors contribute to a mix of permanent and temporary populations, including residents, visitors, and military personnel.

Housing within the service area is predominantly composed of single-family residences, with development patterns characterized by low-density, rural residential uses. Broader economic and demographic trends, including income levels, employment patterns, and population characteristics, generally reflect those of the surrounding High Desert region. Additional discussion of regional economic, social, and demographic conditions is provided in *Sub-*

Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional
Chapter 2 – The Mojave Region.

Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization

The District’s water supply portfolio is centered on locally managed groundwater resources, supported by infrastructure and management programs that ensure reliable delivery to customers. This sub-chapter describes the District’s water supply sources, associated management frameworks, and the infrastructure used to extract, store, and convey water throughout the service area. Together, these elements define the operational and planning foundation for maintaining long-term water supply reliability.

13.4.1 Groundwater

Groundwater is the primary water supply source for the District. The District relies on groundwater pumped from the Copper Mountain Valley Groundwater Basin (DWR Basin No. 7-11) and the Joshua Tree Groundwater Basin (DWR Basin No. 7-62) to meet potable water demands within its service area. These basins are locally managed groundwater systems that serve as the foundation of the District’s water supply portfolio.

The District manages its groundwater resources through ongoing monitoring, production management, and the use of supplemental imported supplies from MWA to support groundwater recharge and long-term basin conditions. As a long-term management objective, the District seeks to offset groundwater production through recharge of supplemental supplies to the extent imported water is available, financially feasible, and operationally practical. Although recharge and production may not balance in every individual year due to hydrologic conditions, imported water availability, infrastructure capacity, and cost, this approach supports long-term basin sustainability and allows the District to maintain a reliable, locally controlled groundwater supply portfolio capable of meeting current and projected demands.

13.4.1.1 Copper Mountain Groundwater Basin Supplies

The Copper Mountain Valley Groundwater Basin underlies a substantial portion of the District’s service area and serves as a source of groundwater supply. Located in the Morongo Basin area of San Bernardino County, the basin is characterized by alluvial aquifer systems that store and transmit groundwater derived from natural recharge, subsurface inflows, and incidental recharge sources. As described in the District’s 2020 UWMP, the basin contains an estimated 264,000 acre-feet of usable groundwater in storage, representing a significant long-term water supply resource. The basin is not identified by the DWR as being in a

condition of overdraft, indicating that current basin conditions support continued groundwater use under existing management practices.

Groundwater within the Copper Mountain Valley Basin is not subject to adjudication but is managed through a combination of local and regional planning efforts. The District monitors groundwater conditions through a combination of local and regional planning efforts. The District monitors groundwater conditions and manages production to support long-term basin sustainability. In addition, the District coordinates with MWA to utilize SWP supplies delivered via the MBP. These imported supplies supplement local groundwater resources and support recharge, contributing to the long-term reliability of the basin.

Historical production from the basin reflects the District’s reliance on this resource to meet customer demands. **Table 13-6** presents the District’s recent groundwater production from the Copper Mountain Valley Basin, which serves as the basis for estimating the District’s managed groundwater supply within the basin under current and projected conditions.

TABLE 13-6: LAST FIVE YEARS OF COPPER MOUNTAIN VALLEY BASIN SUPPLY (AFY)

Year	Copper Mountain Valley Basin Supply
2021	590
2022	370
2023	117
2024	116
2025	44

The District will continue to rely on groundwater from the Copper Mountain Valley Basin as a component of its water supply portfolio. For planning purposes, projected groundwater supply from the basin is based on the District’s average production over the 2021-2025 period, as shown in **Table 13-6**. This approach provides a representative estimate of baseline production under recent production patterns and supports evaluation of supply availability under normal, single dry, and multiple dry year scenarios through 2050. However, the projections presented in **Table 13-7** and **Table 13-8** are planning estimates and are not intended to prescribe the precise volume of groundwater that must be produced from the Copper Mountain Valley Basin in any given year. Actual future production from the basin may vary based on operational needs, well availability, water quality considerations, infrastructure improvements, and other District management decisions.

TABLE 13-7: PROJECTED COPPER MOUNTAIN VALLEY BASIN SUPPLY THROUGH 2030 (AFY)

Year Type		Copper Mountain Valley Basin Supply
Normal		245
Single Dry-Year		245
Multi-Year Drought	2026 (1 st Year)	245
	2027 (2 nd Year)	245
	2028 (3 rd Year)	246
	2029 (4 th Year)	247
	2030 (5 th Year)	247

TABLE 13-8: PROJECTED COPPER MOUNTAIN VALLEY BASIN SUPPLY THROUGH 2050 (AFY)

Total Supply		2030	2035	2040	2045	2050
Normal		247	250	253	255	257
Single Dry-Year		247	250	253	255	257
Multi-Year Drought	Year 1	247	250	253	255	257
	Year 2	248	250	253	255	257
	Year 3	248	251	253	256	257
	Year 4	249	252	254	256	257
	Year 5	249	252	254	257	258

13.4.1.2 Joshua Tree Groundwater Basin Supplies

The Joshua Tree Groundwater Basin underlies a portion of the District’s service area and serves as a source of groundwater supply within the District’s water supply portfolio. The basin is located within the Morongo Basin area of San Bernardino County and is characterized by alluvial aquifer systems that store and transmit groundwater derived from natural recharge, subsurface inflows, and incidental recharge sources. As described in the District’s 2020 UWMP, the basin contains an estimated 293,000 acre-feet of usable groundwater storage, representing a substantial volume of groundwater that supports the District’s long-term water supply planning.

Groundwater within the Joshua Tree Basin is not subject to adjudication and is managed through a combination of local and regional planning efforts. The District monitors groundwater conditions and manages production to support improved groundwater management and long-term basin sustainability. In addition, the District coordinates with MWA to utilize imported SWP supplies delivered via the MBP. These imported supplies are used to supplement local groundwater resources and support groundwater replenishment efforts within the basin.

Historical production from the basin reflects its role in supporting system demands in conjunction with supplies from the Copper Mountain Valley Basin. **Table 13-9** presents the District’s groundwater production from the Joshua Tree Basin over the 2021-2025 period, which serves as the basis for estimating the District’s managed groundwater supply within the basin under current and projected conditions.

TABLE 13-9: LAST FIVE YEARS OF JOSHUA TREE BASIN SUPPLY (AFY)

Year	Joshua Tree Basin Supply
2021	722
2022	925
2023	1,155
2024	1,190
2025	1,232

The District will continue to rely on groundwater from the Joshua Tree Basin as a component of its water supply portfolio. For planning purposes, projected groundwater supply from the basin is based on the District’s average production over the 2021-2025 period, as shown in **Table 13-9**. This approach provides a representative estimate of baseline production under recent production patterns and supports evaluation of supply availability under normal, single dry, and multiple dry year scenarios through 2050. However, the projections presented in **Table 13-10** and **Table 13-11** are planning estimates and are not intended to prescribe the precise volume of groundwater that must be produced from the Joshua Tree Basin in any given year. Actual future production from the basin may vary based on operational needs, well availability, water quality considerations, infrastructure improvements, and other District management decisions.

TABLE 13-10: PROJECTED JOSHUA TREE BASIN SUPPLY THROUGH 2030 (AFY)

Year Type		Joshua Tree Basin Supply
Normal		1,045
Single Dry-Year		1,045
Multi-Year Drought	2026 (1 st Year)	1,045
	2027 (2 nd Year)	1,045
	2028 (3 rd Year)	1,049
	2029 (4 th Year)	1,053
	2030 (5 th Year)	1,053

TABLE 13-11: PROJECTED JOSHUA TREE BASIN SUPPLY THROUGH 2050 (AFY)

Total Supply		2030	2035	2040	2045	2050
Normal		1,053	1,065	1,077	1,085	1,094
Single Dry-Year		1,053	1,065	1,077	1,085	1,094
Multi-Year Drought	Year 1	1,053	1,065	1,077	1,085	1,094
	Year 2	1,057	1,065	1,077	1,085	1,094
	Year 3	1,057	1,069	1,077	1,089	1,098
	Year 4	1,061	1,073	1,081	1,089	1,098
	Year 5	1,061	1,073	1,081	1,094	1,102

13.4.2 Groundwater Quality

Groundwater produced by the District is sourced from wells completed in the Copper Mountain Valley and Joshua Tree Groundwater Basins and is treated, as necessary, to meet all applicable federal and state drinking water standards prior to distribution. Groundwater quality within these basins reflects a combination of natural hydrogeologic conditions and localized influences, including land use and recharge patterns. The District conducts routine groundwater quality monitoring in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the District’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The District’s most recent CCR is available through the District’s website and provides the most current information on potable water quality conditions.¹⁰⁹

While this section focuses on groundwater quality as it pertains to the District’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 13-12 presents a summary of groundwater quality constituents based on information reported in the District’s 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

¹⁰⁹ Joshua Basin Water District 2024 CCR available at:
<https://www.jbwd.com/files/331985fa3/CCR+ADA+2024.pdf>

TABLE 13-12: JOSHUA BASIN WATER DISTRICT POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Arsenic (ppb)	0.004	10	ND - 4.9	2.2
Chlorine (ppm)	4 (as Cl ₂)	4.0 (as Cl ₂)	0.79 - 1.01	0.91
Chromium (ppb)	100	50	12 - 37	24
Fluoride (ppm)	1	2.0	0.46 - 0.83	0.66
Gross Alpha Particle Activity (pCi/L)	0	15	2.46 - 4.3	3.38
Hexavalent Chromium (ppb)	20	10	13 - 38	22.4
Nitrate as N (ppm)	45	45	2.1 - 6.3	3.22
TTHMs [total trihalomethanes] (ppb)	N/A	80	4.3 - 26	15.15
Copper (ppm)	0.3	1.3	0.013 - 0.092	0.061
Lead (ppb)	0.2	15	ND - 1.2	ND
Secondary Standards				
Chloride (ppm)	N/A	500	7 - 17	13
Color	N/A	15	N/A	ND
Manganese (ppb)	N/A	50	N/A	ND
Specific Conductance (umho/cm)	N/A	1,600	240 - 490	335
Sulfate (ppm)	N/A	500	9.2 - 120	40.8
Total Dissolved Solids (TDS) (ppm)	N/A	1,000	130 - 180	162
Turbidity (NTU)	N/A	5	ND - 3.2	0.3
Zinc (ppm)	N/A	5	N/A	ND
Federal Unregulated Contaminates				
Bromodichloromethane (ppb)	N/A	N/A	1.1 - 4.4	2.75
Bromoform (ppb)	N/A	N/A	1.5 - 11	6.25
Chloroform (ppb)	N/A	N/A	ND - 1.5	0.75
Dibromochloromethane (ppb)	N/A	N/A	1.7 - 9.1	5.4
Sodium (ppm)	N/A	N/A	37 - 60	45.25

13.4.3 Recycled Water Supplies

The District does not currently utilize recycled water as part of its water supply portfolio and has no plans to develop recycled water supplies within the planning horizon. The development of recycled water infrastructure is constrained by the District's relatively small and dispersed customer base, limited wastewater generation, and the absence of centralized wastewater treatment facilities necessary to support recycled water production and distribution. Given these conditions, recycled water is not considered a feasible or cost-effective supply option at this time. Accordingly, no recycled water supplies are included in the District's current or projected water supply portfolio.

13.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the District due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the District has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

13.4.5 Water Transfers and Exchanges

The District does not currently participate in formal water transfer or exchange programs as part of its water supply portfolio. Unlike adjudicated basins within the MWA service area, the groundwater basins underlying the District's service area are not subject to court-ordered allocation frameworks that facilitate transfers of production rights among parties. The District's water supply is primarily derived from locally managed groundwater resources, supplemented by imported supplies made available through MWA. While the District coordinates with MWA and regional partners regarding water supply planning and use of imported supplies, these activities do not constitute formal transfer or exchange mechanisms. Accordingly, water transfers and exchanges are not included as a component of the District's current or projected water supply portfolio.

13.4.6 Supply Summary

Groundwater serves as the District’s principal water supply source. These supplies, derived from the Copper Mountain Valley and Joshua Tree Groundwater Basins, are sufficient to meet existing and projected demands under a range of hydrologic conditions. The District’s overall groundwater system benefits from substantial available storage across both basins and ongoing management actions to support long-term reliability. In addition, the District participates in regional programs with MWA, through which SWP supplies are delivered to the Morongo Basin via the MBP and recharged for storage. These recharged imported supplies augment local groundwater resources and support long-term basin conditions.

The District’s water supplies are managed as an integrated groundwater system consisting of locally derived groundwater and recharged imported supplies. This system includes native groundwater in storage within the Copper Mountain Valley and Joshua Tree Basins, supported by natural recharged from precipitation, subsurface inflows, and incidental recharge sources. These supplies are further supported by imported water delivered by MWA and recharged within the basins, which serves to offset groundwater production. The District monitors groundwater levels and manages production across both basins to maintain system reliability and respond to changing demand and hydrologic conditions.

Given the substantial volume of groundwater in storage and the District’s active groundwater management approach, sufficient supplies are available to meet projected demands under normal, single dry year, and multiple dry year conditions throughout the planning horizon. Accordingly, the District’s managed groundwater production over the planning horizon represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 13-13**.

TABLE 13-13: DISTRICT’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	1,333
2022	1,299
2023	1,276
2024	1,307
2025	1,292

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 13.5 – Water Use Characterization*. Given the District’s actively managed groundwater system, which includes substantial available storage within the Copper Mountain Valley and Joshua Tree Basins as well as imported recharge, groundwater production is adjusted to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 13-14** and **Table 13-15**.¹¹⁰

TABLE 13-14: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026 – 2030 (AFY)

Year Type		Managed Groundwater Production
Normal		1,290
Single Dry-Year		1,290
Multi-Year Drought	2026 (1 st Year)	1,290
	2027 (2 nd Year)	1,290
	2028 (3 rd Year)	1,295
	2029 (4 th Year)	1,300
	2030 (5 th Year)	1,300

TABLE 13-15: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		1,300	1,315	1,330	1,340	1,350
Single Dry-Year		1,300	1,315	1,330	1,340	1,350
Multi-Year Drought	Year 1	1,300	1,315	1,330	1,340	1,350
	Year 2	1,305	1,315	1,330	1,340	1,350
	Year 3	1,305	1,320	1,330	1,345	1,355
	Year 4	1,310	1,325	1,335	1,345	1,355
	Year 5	1,310	1,325	1,335	1,350	1,360

¹¹⁰ The values presented in **Table 13-14** and **Table 13-15** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 13.5 – Water Use Characterization*.

13.4.7 Delivery System Details

The District's potable water system conveys groundwater from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the District's storage reservoirs, which collectively provide approximately 12.3 million gallons of storage before being distributed through a pressurized potable water system. The distribution system consists of more than 300 miles of pipeline and approximately active 4,881 service connections.

Sub-Chapter 13.5 – Water Use Characterization

Understanding water use characteristics is essential for the District to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the District’s retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions, help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the District’s past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.2 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District’s water supplies, presented in *Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the District’s 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the District’s residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the District’s UWUO, comparison to the District’s actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the District’s 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the District’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the District’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

13.5.1 Current Customer Water Use

As described in *Sub-Chapter 13.2 – Water Service and System Description*, the District provides water service to approximately active 4,881 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the District and treated to meet all applicable state and federal drinking water standards. Information regarding the District’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provide the basis for determining the District’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

13.5.1.1 Customer Water Use 2021–2025

Recent customer water use data assists the District in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The District is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The District records potable water use within five primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Irrigation
- Other

Table 13-16 presents the District’s past customer potable water use by customer classification for 2021-2025 in acre-feet.

TABLE 13-16: POTABLE CUSTOMER USE 2021-2025 (AF)

Use Category	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	55	47	44	59	67	72	88	90	80	79	52	54	785
	2022	48	45	43	62	58	68	84	56	76	56	51	44	692
	2023	45	35	40	42	46	61	64	76	73	55	52	47	635
	2024	42	37	40	38	49	63	70	83	83	60	73	35	673
	2025	48	45	39	44	55	61	66	84	69	53	55	41	660
Multi-Family Residential	2021	7	6	6	7	8	7	8	9	8	8	6	6	87
	2022	7	6	6	7	6	7	8	6	8	7	6	6	79
	2023	6	6	6	6	6	8	8	8	9	6	6	5	81
	2024	6	6	6	6	6	8	7	10	9	7	8	5	84
	2025	6	6	5	5	6	7	7	9	8	8	7	6	80
Commercial/ Institutional	2021	11	9	8	12	15	16	20	23	18	21	13	12	176
	2022	11	10	10	14	14	15	23	10	18	13	13	11	160
	2023	12	9	8	9	11	15	14	17	18	14	12	11	151
	2024	9	8	8	8	10	15	16	20	21	15	14	10	153
	2025	10	10	9	10	12	15	16	20	17	15	13	11	157
Irrigation	2021	0.2	0.1	0.2	0.3	0.3	0.3	0.5	0.4	0.5	0.5	0.3	0.3	4
	2022	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	3
	2023	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	2
	2024	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	2
	2025	0.2	0.1	0.1	0.2	0.3	0.6	0.5	1.2	0.5	0.2	0.2	0.1	4
Other	2021	10	10	8	11	12	12	16	17	16	15	12	15	154
	2022	13	11	12	17	14	16	21	15	18	15	15	13	181
	2023	22	12	14	14	13	18	17	20	21	17	16	16	201
	2024	15	12	14	15	17	19	19	23	25	17	20	15	211
	2025	17	18	15	16	19	19	19	26	21	17	19	17	225
Total Metered Deliveries	2021	84	72	65	89	101	108	133	138	123	124	83	87	1,206
	2022	80	72	71	100	92	105	137	88	121	91	85	74	1,115
	2023	85	62	68	72	77	102	103	122	121	91	87	80	1,070
	2024	72	62	69	67	83	105	112	136	138	99	116	65	1,123
	2025	81	79	69	75	92	102	109	140	117	93	94	75	1,126

The “Other” water use category included in **Table 13-16** captures a range of small, non-standard uses including fire services, vacation rentals, and long-term rentals.

13.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the District’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).¹¹¹ An electronic copy of the audit in Excel format is to be submitted to DWR by January 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the District shall assess compliance every three years as an average of recent losses. Additionally, the District will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 13-17** summarizes the District’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 13-17: DISTRIBUTION SYSTEM LOSS 2021-2024

2021	2022	2023	2024
7.3%	14.3%	16.3%	12.6%
Average:			12.6%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the District’s distribution system loss represents about 12.6% of water entering the system.

¹¹¹ Title 23 California Code of Regulations Section 638.1 et seq.

13.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the District was developed using information submitted as part of the District’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 474 gallons per mile of the distribution system (i.e., mains) per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 10.6%. Using the information from the same period, the average “apparent” water loss averaged 2.5% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 13.1%, although recent AWWA audits discussed above show losses closer to 12.6%.

13.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the District’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

13.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the District to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the District to measure progress on achieving water efficiency goals.

The District’s 2020 GPCD target was established in the 2015 UWMP as 157 GPCD, derived as the “gross water use” divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The District’s calculation of their 2020 actual GPCD used the same methodology: “Gross water” was defined as total water production measured and reported based upon well production records. This value, divided by the District’s estimated population in 2020, resulted in a compliance value of 116 GPCD. Because this value was less than the District’s established target, the District was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the District was determined to have an actual GPCD of 111, calculated using the same methodology presented above.

13.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. In each of the first three reporting years, the District submitted required annual reports to the SWRCB and demonstrated that actual water use remained below its calculated UWUO, confirming compliance in 2025

13.5.3 Forecasting Customer Use

Future water use within the District's service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the District's future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the District, are presented in the following subsections and corresponding tables.

13.5.3.1 Existing Customer Future Use

Future water use associated with the District's existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in Subsection 13.5.2.1, the District's current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production

divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the District has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the District’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the District’s existing customer demand is projected to remain at approximately 1,285 acre-feet per year, based on a representative GPCD of 111, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

13.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization*. This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the District’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the District’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the District, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 0 GPCD
- Total Non-Residential Use: 47 GPCD
- Total Use: 94 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO

indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage has been applied to new customer demand projections.

Table 13-18 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the District’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 13-18: FORECAST FUTURE WATER USE (VALUES IN ACRE-FEET PER YEAR)

2025	2030	2035	2040	2045	2050
1,285	1,300	1,315	1,330	1,340	1,350

13.5.3.3 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The water use forecast presented in **Table 13-18** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions. Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 13-18** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.¹¹²

¹¹² California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

13.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The District will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

13.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the District’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related but distinct analyses required under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the District’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

13.5.4.1 Projecting Water Use for Five-Year Drought Risk Assessment

The DRA requires the District to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the District’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the District’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the District’s long-term water use forecast developed for the 2025 RUWMP and the District’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the District’s evaluation of water supply reliability across planning timeframes.

Table 13-19 presents the District’s projected unconstrained water demands for the DRA period (2026-2030), with values rounded to the nearest five acre-feet. These values form the basis for the reliability analysis presented in *Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 13-19: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
1,290	1,290	1,295	1,300	1,300

13.5.4.2 Projecting Water Use for Annual Assessments

The District conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The District has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

13.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the District's sub-chapter within the 2025 RUWMP, the District's service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.¹¹³ Accordingly, the water use forecast presented in **Table 13-19** is inclusive of disadvantaged community water use.

¹¹³ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 13.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the District's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The District has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the District's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the District evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the District's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the District's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 13a.

13.6.1 Demand Management Measures

The District has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The District is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the District leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The District will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

13.6.1.1 Foundational Demand Management Measures

The District's foundational DMMs remain generally consistent with those described in the 2020 UWMP and continue to serve as the basis for ongoing water conservation efforts. These measures include water waste prevention ordinances and prohibited provisions, universal metering, conservation-oriented pricing, public education and outreach, programs to monitor and manage distribution system losses, and coordination and staffing support for conservation program implementation through customer communication, enforcement, demand monitoring, and rate-based conservation actions.

Water Waste Prevention Ordinances

The District has adopted and enforces water waste prevention ordinances that prohibit inefficient water use practices. As reflected in the 2020 UWMP and WSCP, these provisions include restrictions on outdoor irrigation during specified hours, limitations on irrigation following measurable rainfall, prevention of runoff to adjacent properties and public rights-of-way, restrictions on washing of hard surfaces except for health and safety purposes, requirements for automatic shut-off nozzles for vehicle washing, and prompt repair of leaks. These ordinances establish the regulatory framework for reducing unnecessary water use and are implemented through monitoring, customer notifications, and enforcement actions as needed.

Metering

All potable water connections within the District are metered, allowing for accurate measurement of customer water use. Metering supports volumetric billings, enables customers to better understand and manage their water use, and provides the data necessary for system monitoring and implementation of water shortage response actions.

Conservation Pricing

The District utilizes a water rate structure designed to recover the costs of providing service across varying levels of water usage. As described in the WSCP, the District has the ability to

implement drought- or shortage- based rate adjustments during periods of constrained supply, which may incidentally encourage reductions in water demand.

Public Education and Outreach

The District implements public education and outreach programs to promote water conservation and increase customer awareness of efficient water use practices. These efforts include ongoing communication through newsletters, website updates, social media, and direct customer outreach, as well as coordination with regional partners to promote consistent conservation messaging.

Programs to Assess and Manage Distribution System Losses

The District conducts ongoing efforts to monitor and manage distribution system losses, including leak detection, routine system maintenance, and repair activities. As described in the WSCP, the District evaluates production and metered use data to identify potential losses and prioritize corrective actions to improve system efficiency and reduce real water losses.

Customer Service and Support

The District provides customer support services to assist with water use efficiency, including customer notifications for unusually high water use, assistance with identifying leaks, and access to water use information. These services enable customers to identify and address inefficiencies and support overall conservation efforts.

Conservation Program Coordination and Staffing Support

The District supports implementation of DMMs through internal staffing and coordination with regional partners, including MWA. This coordination supports consistency in conservation messaging, facilitates information sharing, and enhances the overall effectiveness of conservation program implementation.

13.6.1.2 Recent DMM Activities

Since adoption of the 2020 UWMP, the District has continued to implement its foundational demand management measures as the primary approach to water conservation. Efforts have focused on maintaining and reinforcing existing programs, including ongoing customer outreach, enforcement of water waste prevention provisions, and implementation of water shortage response actions as needed. The District continues to coordinate with regional partners and evaluate opportunities to enhance conservation program effectiveness consistent with local conditions and available resources.

13.6.1.3 Planned DMM Activities

At this time, the District does not anticipate implementing new demand management programs beyond those currently in place. The District’s existing DMMs provide a

comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. Planned activities are focused on continued implementation and enhancement of existing measures, including ongoing customer outreach and education, enforcement of water waste provisions, and monitoring of water use and system conditions to support efficient operations. The District will continue to coordinate with regional partners to maintain consistent conservation messaging and identify opportunities for program improvements, as appropriate. The District remains committed to the efficient and responsible use of water resources and will continue to support customer awareness and conservation practices. Consistent with applicable State requirements, including UWUO and water loss reporting requirements, the District will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

13.6.2 Water Shortage Contingency Plan

The District has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the District can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the District may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the District's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the District's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

13.6.2.1 Summary of Water Shortage Response Actions

The District's WSCP establishes six defined water shortage levels that correspond to increasing degrees of supply constraint, targeted demand reductions, and specific customer and District response actions. This staged framework allows the District to implement progressively more restrictive measures as conditions warrant, while maintaining essential public health, sanitation, and fire protection services. The WSCP defines shortage states ranging from up to a 10% shortage through shortages greater than 50%, and identifies

associated District actions, customer restrictions, and supply augmentation measures, outreach, and enforcement tools. The general framework of shortage levels and representative response actions is summarized below:

- **Stage 1 – Up to 10% Shortage:**

The District emphasizes voluntary conservation, expanded public information, customer education, and continued enforcement of baseline water waste prohibitions. Actions include increasing awareness of conservation measures, promoting methods to reduce water use, focused outreach to large users, and publishing WSCP stages and actions. Customers are encouraged to conserve voluntarily and comply with existing water waste restrictions.
- **Stage 2 – Up to 20% Shortage:**

The District expands public outreach and steps up enforcement of conservation measures. Stage 2 also includes mandatory restrictions such as limits on outdoor irrigation hours and reduced watering frequency. The WSCP identifies drought rate or surcharge measures and continued enforcement as tools available to help achieve the required reduction.
- **Stage 3 – Up to 30% Shortage:**

The District intensifies conservation messaging and enforcement and may provide direct notices to all customers, suspend issuance of potable construction meters, and active emergency intertie or mutual aid actions if needed. Customer restrictions become more stringent, including limiting outdoor irrigation to two days per week, prohibiting irrigation of ornamental turf on public street medians, and restricting irrigation during daytime hours.
- **Stage 4 – Up to 40% Shortage:**

Stage 4 builds on prior measures with additional mandatory restrictions and operational controls. Outdoor watering is further reduced to one day per week, customers may be required to repair leaks, breaks, or malfunctions within 48 hours, and the District may limit new meter installations and prohibit certain decorative or non-essential uses. These actions are intended to achieve significant demand reductions while preserving critical service levels.
- **Stage 5 – Up to 50% Shortage:**

The District may impose severe restrictions on non-essential uses and compel mandatory water consumption goals or allocations for customers. Outdoor irrigation with potable water may be prohibited, and stronger enforcement and pricing actions may be used to manage increasingly constrained supplies. Stage 5 reflects emergency shortage conditions in which demand management actions become substantially more restrictive.
- **Stage 6 – Greater than 50% Shortage:**

Stage 6 represents catastrophic failure or extreme shortage conditions. In addition to all prior measures, the District may activate crisis communications, coordinate with regulatory and public safety agencies, recall temporary meters, suspend new development approvals and new water connections, and restrict outdoor water use to health and safety purposes only. Customer actions at this stage focus on curtailing all non-essential uses and prioritizing critical water needs.

Response actions are cumulative across stages, such that measures implemented at earlier stages remain in effect and are intensified as shortage conditions worsen. The WSCP also provides for supply augmentation and operational adjustments, including use of additional groundwater production and, where available, SWP supplies through MWA, alongside customer demand reductions. The District determines the appropriate shortage stage based on its Annual Water Supply and Demand Assessment and may also act in response to emergency conditions, infrastructure failures, or disaster declarations.

13.6.2.2 Summary of Monitoring Procedures and Implementation

The District’s WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The District monitors key indicators of water supply reliability, including groundwater production, groundwater levels, customer demand, and overall system conditions. This information is used to evaluate supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The District’s Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of shortage response actions. Additional detail regarding the Annual Assessment is provided in *Subsection 13.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter 13.5 – Water Use Characterization*.

Implementation of the WSCP includes coordination among District staff and communication with customers and regional partners. When a water shortage stage is implemented, the District provides public notification of applicable restrictions and conservation measures and monitors compliance to ensure demand reduction targets are achieved.

Sub-Chapter 13.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the District’s water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 13.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 13.5 – Water Use Characterization* to assess the District’s ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the District’s water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the District’s capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the District’s Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the District’s water supply reliability and inform the implementation of the District’s WSCP, as described in *Sub-Chapter 13.6 – Water Conservation and Shortage Response*.

13.7.1 Five Year Drought Risk Assessment

The DRA evaluates the District’s ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA are based on the District’s unconstrained demand forecast described in *Sub-Chapter 13.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the District’s managed groundwater supplies, which include groundwater production from the Copper Mountain Valley and Joshua Tree Basins, stored groundwater, and recharged imported supplies delivered via the

MBP. As described in – *Water Supply and Infrastructure Characterization*, the District actively manages these resources as an integrated groundwater system to support long-term reliability. Given the substantial volume of groundwater in storage across both basins and the District’s groundwater management approach, the District has flexibility to adjust groundwater production and utilize available stored supplies to meet projected demands under a range of hydrologic conditions.

The DRA compares projected water demand to available supplies to evaluate the District’s capacity to meet customer needs over the five-year period. **Table 13-20** presents the results of this analysis, including projected demand, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 13-20: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	1,290	1,290	1,295	1,300	1,300
Demand	1,290	1,290	1,295	1,300	1,300
Difference	0	0	0	0	0

13.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The District’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

13.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the District’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the District’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the District’s supplies are managed through its integrated groundwater system, which provides flexibility in balancing groundwater production, stored supplies, and supplemental recharge resources to meet projected demands. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 13-21 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 13-21: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	1,300	1,315	1,330	1,340	1,350
Demand	1,300	1,315	1,330	1,340	1,350
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	1,300	1,315	1,330	1,340	1,350
Demand	1,300	1,315	1,330	1,340	1,350
Difference	0	0	0	0	0

13.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the District’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the District continues to manage its supplies within its integrated groundwater system, which provides flexibility in balancing groundwater production, stored supplies, and supplemental recharge resources to meet projected demands. This managed approach enables the District to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 13-22 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the District has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 13-22: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	1,300	1,315	1,330	1,340	1,350
	Demand	1,300	1,315	1,330	1,340	1,350
	Difference	0	0	0	0	0
Year 2	Supply	1,305	1,315	1,330	1,340	1,350
	Demand	1,305	1,315	1,330	1,340	1,350
	Difference	0	0	0	0	0
Year 3	Supply	1,305	1,320	1,330	1,345	1,355
	Demand	1,305	1,320	1,330	1,345	1,355
	Difference	0	0	0	0	0
Year 4	Supply	1,310	1,325	1,335	1,345	1,355
	Demand	1,310	1,325	1,335	1,345	1,355
	Difference	0	0	0	0	0
Year 5	Supply	1,310	1,325	1,335	1,350	1,360
	Demand	1,310	1,325	1,335	1,350	1,360
	Difference	0	0	0	0	0

13.7.3 Annual Reliability Assessment

Each year, the District considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the District’s Water Shortage Contingency Plan. The District has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

13.7.4 Water Supply Reliability Summary

The District’s water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 13.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the District evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The District’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the District’s service area, rather than long-distance conveyance or advanced treatment processes.

The District continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 13-23**.

TABLE 13-23: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR JAN 2025 THROUGH DEC 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	1,292
Energy Consumed (kWh)	35,720
Energy Intensity (kWh/acre-foot)	28

JOSHUA BASIN WATER DISTRICT

APPENDICES

This page is reserved for Joshua Basin Water District-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to Joshua Basin Water District’s adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the Joshua Basin Water District retailer chapter, Joshua Basin Water District’s WSCP, and applicable Joshua Basin Water District-specific appendices.

Chapter 14.0 LIBERTY UTILITIES – APPLE VALLEY



TABLE OF CONTENTS

Sub-Chapter 14.1 – Introduction	14-7
14.1.1 Background and Purpose	14-7
14.1.2 Basis for Plan Preparation	14-8
14.1.3 Coordination and Outreach	14-8
14.1.4 RUWMP Adoption	14-9
14.1.5 Document Organization	14-10
Sub-Chapter 14.2 – Water Service and System Description	14-11
14.2.1 Service Area Climate	14-13
Sub-Chapter 14.3 – Population, Land Use, Economy, and Demographics	14-14
14.3.1 Current Population and Historic Trends	14-14
14.3.2 Projected Population	14-15
14.3.3 Current and Projected Land Use	14-16
14.3.4 Economic Trends & Other Social and Demographic Factors	14-16
Sub-Chapter 14.4 – Water Supply and Infrastructure Characterization	14-18
14.4.1 Groundwater	14-18
14.4.2 Groundwater Quality	14-21
14.4.3 Recycled Water Supplies	14-24
14.4.4 Desalination Opportunities	14-24
14.4.5 Water Transfers and Exchanges	14-24
14.4.6 Supply Summary	14-24
14.4.7 Delivery System Details	14-26
Sub-Chapter 14.5 – Water Use Characterization	14-27
14.5.1 Current Customer Water Use	14-28
14.5.2 Compliance with Water Use Targets and Objectives	14-32
14.5.3 Forecasting Customer Use	14-33
14.5.4 Forecasting Water Use for DRA and Annual Assessment	14-36
14.5.5 Projecting Disadvantaged Community Water Use	14-38
Sub-Chapter 14.6 – Water Conservation and Shortage Response	14-39
14.6.1 Demand Management Measures	14-39

14.6.2	Foundational Demand Management Measures	14-40
14.6.3	Water Shortage Contingency Plan	14-43
Sub-Chapter 14.7 – Water System Reliability and Drought Risk Assessment.....		14-46
14.7.1	Five Year Drought Risk Assessment	14-46
14.7.2	Long Term Service Reliability	14-47
14.7.3	Annual Reliability Assessment	14-49
14.7.4	Water Supply Reliability Summary.....	14-50
Sub-Chapter 14.8 – Energy Intensity Analysis.....		14-51

LIST OF TABLES

Table 14-1: Public Water System Information.....	14-8
Table 14-2: Customer Water Service Connections.....	14-12
Table 14-3: Historical Population.....	14-15
Table 14-4: Population Growth Rate 2015-2024.....	14-15
Table 14-5: Population Forecast and Growth Rate	14-16
Table 14-6: Last Five Years of Retailer’s FPA Supply (AFY)	14-19
Table 14-7: Projected Mojave Adjudication FPA for the Company through 2030 (AFY).....	14-19
Table 14-8: Projected Mojave Adjudication FPA for the Company through 2050 (AFY)	14-20
Table 14-9: Last Five Years of Replacement and Make-up Water Supplies (AFY).....	14-21
Table 14-10: Liberty Utilities’ Potable Water Quality.....	14-23
Table 14-11: Company’s Managed Groundwater Production 2021-2025 (AFY)	14-25
Table 14-12: Company’s Projected Managed Groundwater Supply 2026-2030 (AFY).....	14-25
Table 14-13: Company’s Projected Managed Groundwater Supply Through 2050 (AFY).....	14-26
Table 14-14: Potable Customer Use 2021-2025 (AF)	14-30
Table 14-15: Wheeled Non-Potable Water Deliveries 2021-2025 (AF).....	14-31
Table 14-16: Distribution System Loss 2021 - 2025	14-32
Table 14-17: Forecast Future Water Use (AFY)	14-35
Table 14-18: Forecast DRA Water Use for 2026 through 2030 (AFY).....	14-38
Table 14-19: Five Year Drought Risk Assessment (AFY).....	14-47
Table 14-20: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY).....	14-48
Table 14-21: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY).....	14-49
Table 14-22: Energy Intensity – Total Utility Approach for Sept 2024 through Sept 2025.....	14-51

LIST OF FIGURES

Figure 14-1: Liberty Utilities – Apple Valley Service Area 14-12

APPENDICES

Liberty Utilities – Apple Valley Appendices..... 14-52

Sub-Chapter 14.1 – Introduction

Liberty Utilities (Company) is an investor-owned utility founded in 1947 by Apple Valley Ranchos Development Company, whose parent company is currently Algonquin Power and Utilities Corp. In 2016, Apple Valley Ranchos Water Company was purchased by Liberty Utilities. Beyond the Mojave Basin Adjudication area, Liberty Utilities at large provides regulated wastewater, water, natural gas, and electric utility services to more than 1.2 million customer connections through operations in North America, Bermuda, and Chile. The Company's service area spans the High Desert region of San Bernardino County (County), with the City of Victorville to the east and the City of Hesperia to the southeast. Liberty Utilities serves the Town of Apple Valley and surrounding unincorporated areas of the County. Elevations in the Company's service area vary from approximately 2,800 feet to 3,500 feet.

The Company's water supply is sourced almost entirely from groundwater pumped from the Mojave River Groundwater Basin. Ensuring an adequate and reliable water supply for current and future customers is fundamental to the Company's mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the Company supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on Company-specific system characteristics, demands, demand management measures, and reliability.

14.1.1 Background and Purpose

The Company has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.¹¹⁴ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter presents the Company's evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the Company's 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory requirements, the RUWMP serves as a comprehensive planning document describing existing

¹¹⁴ California Water Code Sections 10610 through 10657.

and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

14.1.2 Basis for Plan Preparation

Liberty Utilities operates a Public Water System as described in California Health and Safety Code Section 116275. Additionally, the Company is classified as an Urban Water Supplier as described in CWC Section 10617, providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the Company and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively. Details of the Company’s Public Water System are provided in **Table 14-1**.¹¹⁵

TABLE 14-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610003	Liberty Utilities – Apple Valley	~20,788

14.1.3 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies and regional analyses. The Company actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and Company-specific operations.

As required by the UWMPA, the Company coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

¹¹⁵ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

Consistent with CWC Section 10641, the Company encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan’s availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

14.1.3.1 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.1.3 Coordination and Outreach of Regional Chapter 1 – Introduction*.

14.1.4 RUWMP Adoption

The Company held a public hearing regarding the 2025 RUWMP on June 4, 2026. Before the hearing, the Company made a draft of the 2025 RUWMP available for public inspection at on the Company’s website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The Company’s elected body adopted this 2025 RUWMP on June 4, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the Company’s website.

The Company plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- “FINAL Submittal 2025 UWMP Tables – Liberty Utilities – Apple Valley – 06.01.2026.xls”
- “Appendix F 2025 Checklist – Liberty Utilities – 06.01.2026.xls”

14.1.5 Document Organization

This chapter is organized as follows:

- Sub-Chapter 14.2 Water Service and System Description
- Sub-Chapter 14.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 14.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 14.5 Water Use Characterization
- Sub-Chapter 14.6 Water Conservation and Shortage Response
- Sub-Chapter 14.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 14.8 Energy Intensity Analysis

Sub-Chapter 14.2 – Water Service and System Description

Liberty Utilities – Apple Valley provides potable water service to the residents and businesses within its service area, depicted in **Figure 14-1**, which largely encompasses the Town of Apple Valley and its surrounding unincorporated areas.

Water service in the Company’s service area relies entirely on groundwater extracted from wells located throughout the service area. The Company manages 21 active wells that tap into local aquifers to provide the community’s water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the Company’s 11 reservoirs, which collectively provide more than 12 million gallons of storage and tank capacity.¹¹⁶ These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The service area’s water system encompasses an extensive distribution network designed to deliver water efficiently to a variety of customers ranging from homes and businesses to fire protection systems. The system includes approximately 480 miles of water mains, thousands of service connections, and thousands of valves and fire hydrants that allow the Company to isolate portions of the system for maintenance or emergencies without disrupting service to the broader community. **Table 14-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the Company’s customer base. The Company also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

¹¹⁶ Apple Valley GRC Infrastructure Summary, 2024.

FIGURE 14-1: LIBERTY UTILITIES – APPLE VALLEY SERVICE AREA

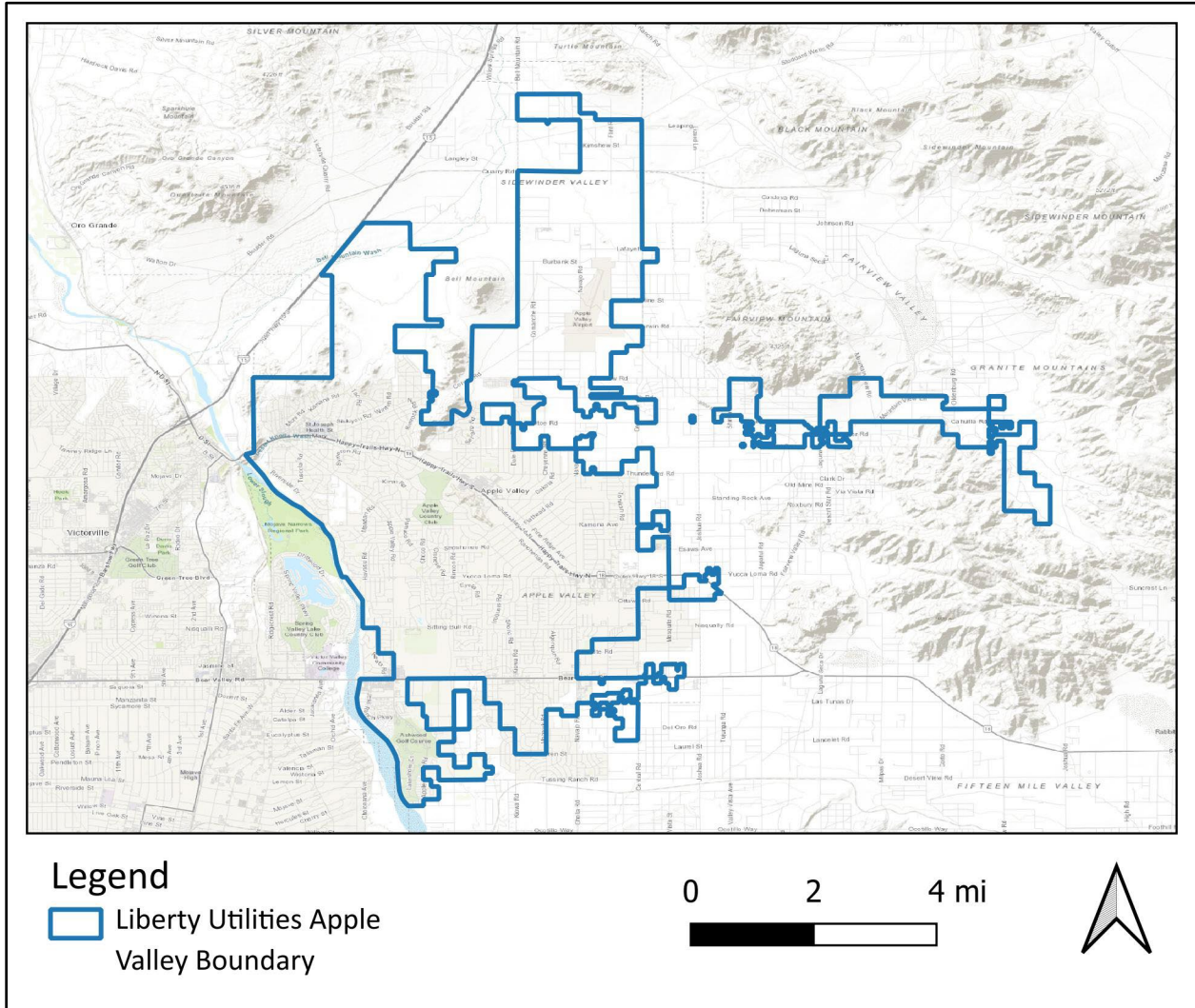


TABLE 14-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	18,852	18,850	18,847	18,844	18,868
Multi-Family Residential	0	0	662	662	662
Commercial/Institutional	1,428	1,435	787	775	786
Industrial	2	2	2	2	2
Landscape Irrigation	162	160	159	159	159
Other	285	284	302	303	311
Total	20,729	20,731	20,759	20,745	20,788

As shown in **Table 14-2**, the reported Multi-Family Residential connections reflect a change in customer classification rather than a discrete increase in connections. Prior to 2023, multi-family accounts were aggregated within the Commercial/Institutional category. Beginning in 2023, these accounts were disaggregated and reported separately, resulting in the apparent increase from zero to 662 connections. This change represents a refinement in reporting practices and does not reflect a material change in the composition of the Company's customer base. Similarly, the "Other" category includes a range of miscellaneous connections, primarily associated with public authority uses and fire protection services.

14.2.1 Service Area Climate

Located in California's Mojave Basin Area, the Company's service area experiences the climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and large diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 5.4 inches, occurring primarily as rainfall between December and March. Precipitation generally tapers off by May. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. The annual average temperature is approximately 61 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, the Company's service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of the RUWMP Planning Area's climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

14.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the Company's water supplies and demands, as well as those of the Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 14.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the service area’s economic, social, and demographic trends give valuable insight to water management and planning. This section of the RUWMP addresses these factors to provide a supportable basis for forecasting future water use.

14.3.1 Current Population and Historic Trends

Population estimates for the Company are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA’s Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study’s development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the Company reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Liberty Utilities primarily serves the Town of Apple Valley. The municipality has experienced significant population growth since its incorporation in 1988. From its agricultural roots to its

present-day status as a burgeoning suburban community, the service area hit its stride in 1980s and 1990s when its population more than tripled. This upward trajectory continued, albeit at a slower pace, through the 2000s, supported by the service area’s relative housing affordability and proximity to major regional employment centers, which sustained steady population growth in recent years. The population estimates presented in this sub-chapter provide the basis for the demand projections discussed in subsequent sub-chapters.

Table 14-3 presents the Company’s historical population while **Table 14-4** presents the Company’s population growth over the last decade.

TABLE 14-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
37,228	45,207	57,847	60,042	61,444	70,707

TABLE 14-4: POPULATION GROWTH RATE 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	60,042	60,435	60,587	60,988	61,466	61,444	64,800	66,277	67,754	69,230
Growth Rate		0.65%	0.25%	0.66%	0.78%	-0.04%	5.46%	2.28%	2.23%	2.18%

14.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

Population growth in Liberty Utility’s service area is ostensibly coterminous with the Town of Apple Valley and is projected to continue at a moderate, but steady pace, generally tracking broader growth patterns in the RUWMP Planning Area and Inland Empire, though at a smaller scale. Growth is expected to occur primarily through suburban expansion supported by commercial and service development needed to accommodate new residents. While growth rates are projected to moderate over time, overall population is expected to continue increasing throughout the planning horizon. More broadly, incorporated areas served by municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 14-5 presents the Company’s projected population and associated growth rates through 2060.

TABLE 14-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
Liberty Utilities – Apple Valley	70,707	72,184	73,661	75,138	76,615	78,092	79,569	81,045
Growth Rate		2.09%	2.05%	2.01%	1.97%	1.93%	1.89%	1.85%

14.3.3 Current and Projected Land Use

Much of the Company’s service area remains undeveloped and open-space land, with residential, commercial, and industrial uses occupying a relatively small share of total area amid large tracts of desert and public lands. Like many communities in the RUWMP Planning Area, growth within the service area has been driven by the availability of relatively affordable housing, which continues to attract residents willing to commute to employment centers in the broader Inland Empire and Los Angeles region. This dynamic has resulted in a development pattern characterized by gradual, dispersed expansion rather than concentrated or large-scale growth. These underlying growth patterns and land use characteristics are not expected to materially change prior to the next UWMP cycle (2030).

14.3.4 Economic Trends & Other Social and Demographic Factors

The Company’s service area exhibits economic and social trends characteristic of High Desert communities, including modest growth, relatively affordable housing, and a predominantly residential population. Local employment opportunities within the Town of Apple Valley are relatively limited compared to surrounding regional employment centers, with many residents commuting to nearby Victor Valley, the Inland Empire, and the broader Southern California region for work. Median household incomes are below statewide averages, and a portion of the population experiences economic constraints, contributing to the Town’s designation as a Disadvantaged Community.

The service area also reflects a diverse population, with a significant and growing Hispanic/Latino community consistent with broader regional demographic trends. Overall, the economic, social, and demographic characteristics of the Company’s service area generally mirror those observed across the RUWMP Planning Area. Broader regional economic

conditions that influence growth within the service area are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 14.4 – Water Supply and Infrastructure Characterization

The Company sources its water supplies primarily from groundwater. Through a municipal network of 21 active wells, the Company pumps groundwater from the underlying Alto Subarea of the Mojave Basin Area (MBA). As discussed in *Regional Chapter 3 – Regional Water Supply Characterization*, the MBA is an adjudicated basin administered by a court-appointed Watermaster. The aforementioned regional chapter describes the MBA’s water supplies and related management structures and details. Generally, the City pumps groundwater that is recharged and managed by MWA.

14.4.1 Groundwater

Groundwater is the primary water supply source for all urban retail water suppliers within the MBA. Liberty Utilities – Apple Valley, like many of the MWA’s other retail agencies, pumps groundwater from the adjudicated MBA, specifically the Alto Subarea. The basin is recharged through several means, including natural recharge from the Mojave River, lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water delivery systems, and treated wastewater effluent. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Sub-Chapter 3.1.1 Mojave Region Water Supply Sources of Regional Chapter 3 – Regional Water Supply Characterization*.

14.4.1.1 Liberty Utilities’ Free Production Allowance

Under the Judgment governing the MBA, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The Company’s FPA is based on historical production coupled with evaluation of groundwater conditions, as administered by MWA in its role as the Watermaster.

The Company’s FPA changes over time as the Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the MBA. The Company’s FPA has continued to be significantly reduced as a percentage of the Base Annual Production (BAP) number. The Company’s FPA is tracked as one entry in the Watermaster’s annual report as: “Liberty Utilities (Apple Valley Ranchos Water) Corp”. The Company’s BAP in water year 2025 was 13,610 acre-feet per year. The current 50.4% FPA of this

source is 6,860 acre-feet. **Table 14-6** presents the Company’s FPA for the most recent five-year period pursuant to the MBA Judgment. Detailed discussion of the adjudication framework and administration of production allowances is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

TABLE 14-6: LAST FIVE YEARS OF RETAILER’S FPA SUPPLY (AFY)

Year	Base Annual Production	Percent FPA	FPA Supply
2021	13,610	55%	7,486
2022	13,610	50%	6,805
2023	13,610	53.3%	7,254
2024	13,610	50.4%	6,859
2025	13,610	50.4%	6,859

The 50.4% FPA represents a reduction that aligns with the long-term Production Safe Yield considered by the Watermaster. Accordingly, the Company’s projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at 50.4% as shown in **Table 14-7**.

TABLE 14-7: PROJECTED MOJAVE ADJUDICATION FPA FOR THE COMPANY THROUGH 2030 (AFY)

Year Type		Projected FPA
Normal		6,859
Single Dry-Year		6,859
Multi-Year Drought	2026 (1 st Year)	6,859
	2027 (2 nd Year)	6,859
	2028 (3 rd Year)	6,859
	2029 (4 th Year)	6,859
	2030 (5 th Year)	6,859

Although the Production Safe Yield of the MBA appears to be stabilizing in the Alto Subarea, out of an abundance of caution the future FPA has been reduced to 50% to address long-term water supply planning options. **Table 14-8** presents the Company’s projected FPA in a normal year, single dry year, and five consecutive dry years from 2030 through 2050 at 50%.

TABLE 14-8: PROJECTED MOJAVE ADJUDICATION FPA FOR THE COMPANY THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		6,805	6,805	6,805	6,805	6,805
Single Dry-Year		6,805	6,805	6,805	6,805	6,805
Multi-Year Drought	Year 1	6,805	6,805	6,805	6,805	6,805
	Year 2	6,805	6,805	6,805	6,805	6,805
	Year 3	6,805	6,805	6,805	6,805	6,805
	Year 4	6,805	6,805	6,805	6,805	6,805
	Year 5	6,805	6,805	6,805	6,805	6,805

A summary of long-term reliability and other factors that will affect FPA, such as hydrological and regulatory issues, is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

14.4.1.2 Carryover Water Supplies

The Company does not currently hold carryover supplies as part of its overall water supply management in the Alto Subarea.¹¹⁷ Although such supplies may become available in the future, they are not assumed to be available for purposes of this analysis and are therefore not included in the supply availability evaluation presented in this sub-chapter, in order to preserve a conservative assessment of water supply reliability.

14.4.1.3 Replacement and Make-up Water Supplies

The Company has taken actions to augment its water supplies through the Watermaster’s water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed the Company’s annual FPA from the Alto Subarea. Make-up water supplies, by contrast, are acquired to satisfy obligations under the Judgment to maintain flows from the Alto Subarea to downstream subareas when natural conditions and production patterns would otherwise result in a shortfall.

A detailed description of these programs, obligations, and administrative processes is provided in *Regional Chapter 3 – Regional Water Supply Characterization*. **Table 14-9**

¹¹⁷ Water Year 2025 Watermaster Report, Appendix H.

summarizes the quantities of replacement and make-up water supplied to the Company during the most recent five-year period.

TABLE 14-9: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions ¹¹⁸
2021	1,909
2022	2,272
2023	1,298
2024	2,138
2025	2,154

14.4.2 Groundwater Quality

Groundwater produced by the Company is obtained from wells completed in the Mojave River Groundwater Basin and is treated as necessary to meet all applicable federal and state drinking water standards prior to delivery to customers. Water quality within the basin is influenced by natural hydrogeologic conditions as well as localized land use and recharge patterns. The Company routinely monitors groundwater quality in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the Company’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The Company’s most recent CCR is available through the Company’s website and provides the most current information on potable water quality conditions.¹¹⁹

¹¹⁸ Water Acquisitions calculated as (Verified Production – Base FPA) + Makeup Water Obligation

¹¹⁹ Liberty Utilities – Apple Valley 2024 CCR available at:
https://california.libertyutilities.com/uploads/Apple%20Valley_CCR.pdf

While this section focuses on groundwater quality as it pertains to the Company’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 14-10 presents a summary of groundwater quality constituents based on information reported in the Company’s 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

TABLE 14-10: LIBERTY UTILITIES’ POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Chlorine (ppm)	4	4	0.04 - 1.97	0.92
TTHMs (ppb)	N/A	80	13	13
HAA5 (ppb)	N/A	60	13	1
Copper (ppm)	0.3	1.3	ND - 0.4	0.1
Lead (ppb)	0.2	15	ND - 40	ND
Arsenic (ppb)	0.004	10	ND - 40	2
Fluoride (ppm) [Naturally occurring]	1	2	0.2 - 0.8	0.6
Hexavalent Chromium (ppm)	0.02	10	ND - 6	3
Nitrate as N (ppm)	10	10	1 - 4	1
Secondary Standards				
Chloride (ppm)	N/A	500	5 - 92	28
Specific Conductance (uS/cm)	N/A	1600	200 - 920	432
Sulfate (ppm)	N/A	500	9 - 220	84
Total Dissolved Solids (ppm)	N/A	1,000	120 - 580	265
Gross Alpha Activity (pCi/L)	0	15	ND - 3	1
Uranium (pCi/L)	0.43	20	1	1
Federal Unregulated Contaminates				
Alkalinity as CaCO ₃ (ppm)	N/A	N/A	68 - 80	76
Calcium (ppm)	N/A	N/A	11 - 62	31
Hardness as CaCO ₃ (ppm)	N/A	N/A	27 - 200	97
Hardness as CaCO ₃ (grains/gal)	N/A	N/A	1.6 - 11.7	5.7
Magnesium (ppm)	N/A	N/A	ND - 11	4.8
pH	N/A	N/A	7.8 - 8.4	8.1
Potassium (ppm)	N/A	N/A	ND - 3.4	1.5
Sodium (ppm)	N/A	N/A	14 - 110	45
Manganese (ppb)	N/A	500	ND - 6	2
Lithium (ppb)	N/A	N/A	ND - 20	12.1

14.4.3 Recycled Water Supplies

The Company does not currently utilize recycled water within its service area. Recycled water supplies may become available in the future through facilities operated by the Victor Valley Wastewater Reclamation Authority. While this represents a potential future supplemental supply source for non-potable uses such as irrigation and landscaping, recycled water is not currently a component of the Company’s water supply portfolio.

14.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the Company due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the Company has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

14.4.5 Water Transfers and Exchanges

The Company’s water supply portfolio is primarily managed through groundwater production in accordance with the MBA adjudication, supplemented as needed through replacement and make-up water. While transfers and exchanges represent a potential mechanism to augment supplies under certain conditions within the MBA, the Company does not rely on such activities as part of its current or projected water supply strategy. Accordingly, no water supplies associated with transfers or exchanges are assumed in the analyses presented in this sub-chapter.

14.4.6 Supply Summary

Groundwater serves as the Company’s principal water supply source. These supplies, pumped from the Alto Subarea of the MBA, are generally sufficient to meet existing and future demands. The Company is also involved in regional initiatives with MWA exploring supplemental supplies, such as the One Water Project, which could feasibly deliver stored water from outside basins to support future growth.

The Company’s water supplies are aggregated into the historical managed groundwater system. Managed groundwater consists of supplies provided through the MBA Adjudication, including make-up and replacement supplies as well as transfers and exchanges among producers. Under the MBA Judgment, producers in the Alto Subarea are able to meet their water supply requirements through production from the basin’s managed groundwater system. This system incorporates the natural yield of the basin along with supplies made available through regional management actions, including imported water recharge

managed by MWA, conservation, water reuse, and transfers of FPA among producers. Consistent with this framework, the Company’s total managed groundwater production for the historical period represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 14-11**.

TABLE 14-11: COMPANY’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	10,014
2022	9,538
2023	9,399
2024	9,698
2025	9,642

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 14.5 – Water Use Characterization*. Within the adjudicated MBA management framework, the Company’s groundwater production adjusts to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 14-12** and **Table 14-13**.¹²⁰

TABLE 14-12: COMPANY’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026-2030 (AFY)

Year Type		Managed Groundwater Production
Normal		9,825
Single Dry-Year		9,825
Multi-Year Drought	2026 (1 st Year)	9,825
	2027 (2 nd Year)	9,855
	2028 (3 rd Year)	9,885
	2029 (4 th Year)	9,915
	2030 (5 th Year)	9,940

¹²⁰ The values presented in **Table 14-12** and **Table 14-13** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 14.5 – Water Use Characterization*.

TABLE 14-13: COMPANY’S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		9,940	10,090	10,235	10,385	10,530
Single Dry-Year		9,940	10,090	10,235	10,385	10,530
Multi-Year Drought	Year 1	9,940	10,090	10,235	10,385	10,530
	Year 2	9,970	10,115	10,265	10,410	10,560
	Year 3	10,000	10,145	10,295	10,440	10,590
	Year 4	10,030	10,175	10,325	10,470	10,620
	Year 5	10,060	10,205	10,355	10,500	10,650

14.4.7 Delivery System Details

The Company’s potable water system conveys groundwater produced from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the Company’s storage reservoirs, which collectively provide approximately 12 million gallons of storage before being distributed through the pressurized potable water system. The distribution system consists of more than 480 miles of pipeline, and approximately 20,788 service connections.

Sub-Chapter 14.5 – Water Use Characterization

Understanding water use characteristics is essential for the Company to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the Company's retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the Company's past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the Company's water supplies, presented in *Sub-Chapter 14.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 14.7 – Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the Company's 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the Company's residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the Company's UWUO, comparison to the Company's actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the Company's 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the Company’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the Company should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the Company’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

14.5.1 Current Customer Water Use

As described in *Sub-Chapter 14.2 – Water Service and System Description*, the Company provides water service to approximately 20,788 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the Company and treated to meet all applicable state and federal drinking water standards. Information regarding the Company’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provide the basis for determining the Company’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

14.5.1.1 Customer Water Use 2021 – 2025

Recent customer water use data assists the Company in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The Company is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The Company records potable water use within six primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Industrial
- Landscape Irrigation

- Other

Table 14-14 presents the Company’s past customer potable water use by customer classification for 2021 – 2025 in acre-feet.

TABLE 14-14: POTABLE CUSTOMER USE 2021-2025 (AF)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	438	369	365	426	539	598	713	725	724	642	553	440	6,531
	2022	420	363	385	425	502	560	633	653	657	594	521	405	6,120
	2023	387	341	324	352	373	559	564	703	639	549	532	435	5,757
	2024	434	347	329	329	410	522	619	669	728	616	574	452	6,030
	2025	423	379	372	366	439	504	611	647	688	599	550	410	5,987
Multi-Family Residential	2021	-	-	-	-	-	-	-	-	-	-	-	-	0
	2022	-	-	-	-	-	-	-	-	-	-	-	-	0
	2023	-	-	-	-	35	82	45	101	51	87	39	77	516
	2024	49	73	36	73	34	92	50	89	61	94	45	73	767
	2025	52	68	46	72	42	81	49	93	70	78	50	77	778
Commercial/ Institutional	2021	96	154	82	194	105	232	164	266	139	284	115	177	2,007
	2022	96	169	89	197	111	235	127	250	131	232	113	167	1,917
	2023	94	149	77	163	46	101	64	108	64	130	56	82	1,134
	2024	58	55	71	68	47	73	90	135	75	108	66	65	911
	2025	90	56	56	57	83	90	71	106	84	94	65	80	932
Industrial	2021	-	0	-	0	-	0	-	0	-	0	-	0	2
	2022	-	0	-	0	-	0	-	1	-	1	-	0	2
	2023	-	0	-	0	-	0	-	0	-	0	-	0	1
	2024	0	0	-	0	-	0	-	1	-	1	-	0	2
	2025	-	0	-	0	-	0	-	1	-	280	-	162	443
Landscape Irrigation	2021	26	4	18	10	47	24	89	23	106	25	77	19	468
	2022	24	5	20	11	48	15	83	23	95	24	64	12	426
	2023	21	3	14	5	32	15	98	116	93	35	47	22	502
	2024	29	4	9	5	30	17	85	28	144	26	28	14	419
	2025	35	6	9	6	38	15	79	29	99	28	69	13	426
Other	2021	14	17	16	23	35	54	66	80	66	82	34	38	527
	2022	19	19	16	36	37	55	62	73	63	61	33	38	511
	2023	18	18	16	24	26	79	41	143	44	108	22	72	609
	2024	29	9	39	31	31	99	59	139	67	117	21	44	685
	2025	25	24	25	35	42	96	61	142	70	99	44	40	705
Total Metered Deliveries	2021	573	544	481	653	726	909	1,032	1,094	1,036	1,033	778	674	9,536
	2022	559	558	511	669	697	866	903	1,000	946	912	732	622	8,976
	2023	520	511	430	544	512	836	811	1,171	890	909	696	688	8,520
	2024	599	488	484	506	552	803	903	1,060	1,075	962	733	649	8,815
	2025	625	534	508	536	644	787	871	1,017	1,012	1,178	778	782	9,272

The “Other” water use category presented in **Table 14-14** captures a range of small, non-standard uses including fire protection and public authority-related demands. In addition, beginning in May 2023, multi-family water use data became available as a distinct dataset, separate from commercial and institutional use classifications.

TABLE 14-15: WHEELED NON-POTABLE WATER DELIVERIES 2021-2025 (AF)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Non-Potable Water	2021	430	245	328	263	573	389	591	395	570	392	940	389	5,506
	2022	484	350	439	369	584	361	703	361	743	361	646	361	5,761
	2023	416	334	425	378	396	585	671	405	751	407	685	406	5,858
	2024	526	355	423	387	539	384	391	390	1,141	414	624	383	5,956
	2025	509	321	434	368	529	241	506	225	630	220	586	510	5,079

Table 14-15 identifies raw water pumped for agricultural irrigation from two groundwater wells that are separate from the Company’s potable water system. This raw water does not enter the Company’s potable water distribution system and is associated with a third-party producer that maintains their own adjudicated supplies and applicable reporting obligations under the MBA Judgment. Accordingly, these deliveries, are not part of the Company’s potable water supply portfolio, and are not treated as retail customer demands for the purposes of this 2025 RUWMP.

14.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the Company’s water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the Company has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).¹²¹ An electronic copy of the audit in Excel format is to be submitted to DWR by October 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the Company shall assess compliance every three years as an average of recent

¹²¹ Title 23 California Code of Regulations Section 638.1 et seq.

losses. Additionally, the Company will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 14-16** summarizes the Company’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

TABLE 14-16: DISTRIBUTION SYSTEM LOSS 2021 - 2025

2021	2022	2023	2024
5.0%	6.9%	9.1%	9.6%
Average:			7.6%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the Company’s distribution system loss represents about 7.6% of water entering the system.

14.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the Company was developed using information submitted as part of the Company’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 32.8 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 8%. Using the information from the same period, the average “apparent” water loss averaged 1.1% (of total water supplied). The total water loss estimated as a percentage of total water supplied is 9.2%, although recent AWWA audits discussed above show losses closer to 7.6%.

14.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the Company’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

14.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the Company to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the Company to measure progress on achieving water efficiency goals.

The Company's 2020 GPCD target was established in the 2015 UWMP as 142 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The Company's calculation of their 2020 actual GPCD used the same methodology: "Gross water" was defined as total water production measured and reported based upon well production records. This value, divided by the Company's estimated population in 2020, resulted in a compliance value of 74 GPCD. Because this value was less than the Company's established target, the Company was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the Company was determined to have an actual GPCD of 124, calculated using the same methodology presented above.

14.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. In each of the first three reporting years, the Company submitted required annual reports to the SWRCB demonstrating that actual water use remained below its calculated UWUO, confirming compliance in 2023, 2024, and 2025.

14.5.3 Forecasting Customer Use

Future water use within the Company's service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical

water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the Company’s future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the Company, are presented in the following subsections and corresponding tables.

14.5.3.1 Existing Customer Future Use

Future water use associated with the Company’s existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 14.5.2.1*, the Company’s current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the Company has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the Company’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the Company’s existing customer demand is projected to remain at approximately 9,793 acre-feet per year, based on a representative GPCD of 124, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the Company’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

14.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter*

4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization.

This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the Company’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the Company’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the Company, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 7 GPCD
- Total Non-Residential Use: 40 GPCD
- Total Use: 94 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecast Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the Company’s representative loss percentage has been applied to new customer demand projections.

Table 14-17 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the Company’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 14.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 14-17: FORECAST FUTURE WATER USE (AFY)

2025	2030	2035	2040	2045	2050
9,795	9,940	10,090	10,235	10,385	10,530

14.5.3.3 Adjusting Water Use Forecasts for Single Dry and Multiple Dry Conditions

The water use forecast presented in **Table 14-17** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions.

Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 14-17** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.¹²²

14.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The Company will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

14.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the Company’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related but distinct analyses required

¹²² California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the Company’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

14.5.4.1 Projecting Water Use for Five Year Drought Risk Assessment

The DRA requires the Company to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the Company’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the Company’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the Company’s long-term water use forecast developed for the 2025 RUWMP and the Company’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the Company’s evaluation of water supply reliability across planning timeframes.

Table 14-18 presents the Company’s projected unconstrained water demands for the DRA period (2026–2030), with values rounded to the nearest five acre-feet. These values form the

basis for the reliability analysis presented in *Sub-Chapter 14.7 – Water System Reliability and Drought Risk Assessment*.

TABLE 14-18: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
9,825	9,855	9,885	9,915	9,940

14.5.4.2 Projecting Water Use for Annual Assessments

The Company conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The Company has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

14.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the Company’s sub-chapter within the 2025 RUWMP, the Company’s service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.¹²³ Accordingly, the water use forecast presented in **Table 14-18** is inclusive of disadvantaged community water use.

¹²³ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 14.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the Company's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The Company has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the Company's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the Company evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the Company's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the Company's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 14a.

14.6.1 Demand Management Measures

The Company has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The Company is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the Company leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The Company will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

14.6.2 Foundational Demand Management Measures

The Company's foundational DMMs remain generally consistent with those described in its 2020 UWMP and continue to serve as the basis for ongoing water conservation efforts. These measures include water waste prevention ordinances, universal metering, conservation-based rate structures, public education and outreach, programs to assess and manage distribution system losses, conservation program coordination and staffing support, and other supplemental conservation programs intended to reduce customer demand and improve water use efficiency.

Water Waste Prevention Ordinances

The Company supports and implements water waste prevention requirements applicable within its service area through a combination of local ordinances and CPUC rules. The Town of Apple Valley has adopted ordinances addressing water conservation and water-efficient landscape practices, while the Company's CPUC Rule No. 20 and Schedule 14.1 provide an additional regulatory framework to discourage wasteful water use and support mandatory restrictions during shortage conditions.

Metering

All customer connections within the Company's service are metered, including separate metering for single-family residential, commercial, industrial, and landscape customers. New development is individually metered, and the Company uses an Automatic Meter Reading system to improve reading accuracy and support more effective monitoring and management of customer use.

Conservation Pricing

The Company uses a conservation-oriented rate structure approved by the CPUC to promote efficient water use. Residential and non-residential customers are subject to tiered volumetric pricing, and residential accounts are billed using an inclining block structure with fixed services charges based on meter size. In addition, Schedule 14.1 authorizes drought

emergency surcharges when activated, providing an added pricing signal during shortage conditions.

Public Education and Outreach

The Company implements public education and outreach programs to inform customers about water conservation practices, available rebates, and other efficiency programs. Conservation messaging is delivered through press releases, newsletters, bill inserts, email, social media, outreach materials, presentations, workshops, and community events. Liberty also provides direct customer education through school and class presentations and hosts a conservation event featuring workshops, education presentations, and plumbing retrofit demonstrations. Through participation in the AWAC, the Company also supports regional speakers, water smart landscaping information, water-saving tips, plant-of-the-month messaging, and water-smart landscaping workshops for landscape professionals.

Programs to Assess and Manage Distribution System Losses

The Company conducts ongoing efforts to assess and manage distribution system losses through annual water loss audits, customer leak awareness materials, and customer assistance related to leaks or higher-than-expected use. The Company's AMR system also supports these efforts by improving meter reading accuracy and helping identify unusual use patterns. These actions support efficient system operation and help minimize real and apparent losses within the distribution system.

Conservation Program Coordination and Staffing Support

The Company supports implementation of its DMMs through dedicated conservation staffing and coordination with regional partners. In its 2020 UWMP, Liberty identified a full-time conservation coordinator and has since expanded its program to include a water efficiency manager, water efficiency program manager, and water efficiency coordinator. The Company also coordinates with MWA, whose conservation staff support joint outreach events, promotion of conservation issues, and broader conservation program implementation.

14.6.2.1 Recent DMM Activities

Since 2020, the Company has continued to implement a range of DMMs to promote water conservation and improve water use efficiency within its service area. These efforts are built upon the foundational DMMs and include a combination of direct customer programs, rebates, and outreach initiatives. Key recent activities are summarized below:

Conservation Kits

The Company distributes indoor and outdoor conservation kits to customers, which include water-saving devices such as faucet aerators, leak detection tablets, and irrigation-related components to support efficient water use.

Weather-Based Irrigation Controllers (WBIC) and Irrigation Efficiency Programs

The Company provides rebates and incentives for installation of weather-based irrigation controllers and high-efficiency irrigation nozzles to improve outdoor water use efficiency and reduce landscape-related demand.

Indoor Fixture Efficiency Programs

The Company offers rebates and direct distribution programs for high-efficiency indoor fixtures, including toilets and showerheads, to reduce indoor water use and achieve permanent water savings.

Water Audits

The Company conducts water audits for residential and non-residential customers to identify opportunities for water savings, including indoor fixture efficiency and outdoor irrigation improvements.

Rain Barrel Distribution Program

The Company supports rainwater capture through distribution events and rebates for rain barrels, encouraging customers to supplement outdoor water use with captured rainfall.

Hot Water Recirculating Pump Rebates

The Company provides incentives for installation of hot water recirculating systems, which reduce water waste associated with waiting for hot water delivery.

School and Community Outreach Programs

The Company implements targeted outreach programs, including school-based initiatives and community engagement efforts, to promote water conservation awareness and encourage long-term behavioral changes.

These programs are implemented through a combination of Company-led efforts and coordinated with regional partners, and the Company tracks participation and estimated water savings associated with each measure to inform ongoing program evaluation and refinement.

14.6.2.2 Planned DMM Activities

At this time, the Company does not anticipate implementing new demand management programs beyond those currently in place. The Company's existing programs, including indoor fixture efficiency programs, irrigation efficiency initiatives, conservation kits, water audits, and customer outreach efforts, provide a comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary. The Company remains committed to the efficient and responsible use of water resources and will

continue to evaluate opportunities to enhance existing programs, incorporate emerging technologies, and improve overall program effectiveness. This includes exploration of additional commercial, industrial, and institutional (CII) programs and support for evolving State policy initiatives. Consistent with applicable State requirements, including UWUO provisions, the Company will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

14.6.3 Water Shortage Contingency Plan

The Company has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the Company can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the Company may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the Company's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the Company's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

14.6.3.1 Summary of Water Shortage Levels and Response Actions

The Company's WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the Company to implement proportional measures based on the severity of water supply conditions, consistent with CPUC requirements and applicable conservation regulations. Each shortage level is associated with a defined range of shortage conditions and includes a combination of mandatory restrictions, operational adjustments, and customer outreach measures designed to reduce water use and maintain system reliability. The Company's shortage levels and corresponding response actions are summarized below:

- Stage 1 – Up to 10% Shortage (Voluntary Conservation):

The Company implements voluntary conservation measures focused on increasing public awareness and encouraging reduced water use. Actions include enhanced outreach, customer education, and promotion of existing conservation programs.

- Stage 2 – Up to 20% Shortage:

Mandatory conservation measures are implemented, including restrictions on outdoor water use such as limits on days and times of irrigation, prohibition of water waste (e.g., runoff, overspray), and increased enforcement of existing conservation rules.

- Stage 3 – Up to 30% Shortage:

Additional mandatory restrictions are implemented to further reduce water use, including expanded limitations on landscape irrigation, restrictions on non-essential water use, and increased enforcement actions. Conservation messaging and outreach efforts are intensified.

- Stage 4 – Up to 40% Shortage:

The Company implements more stringent restrictions, including further reductions in allowable outdoor water use, limitations on certain commercial and institutional uses, and potential operational adjustments to maintain system reliability.

- Stage 5 – Up to 50% Shortage:

Severe shortage conditions result in significant restrictions on both outdoor and indoor water uses, with strict limitations on non-essential uses and increased enforcement. Additional emergency measures may be implemented as necessary to protect public health and safety.

- Stage 6 – Greater than 50% Shortage:

In extreme shortage conditions, the Company implements maximum conservation measures, including potential curtailment of water use to essential needs only, along with all feasible operational and regulatory actions to maintain critical water service.

As water supply conditions change, the Company may transition between shortage levels based on ongoing evaluation of supply availability, customer demand, and system conditions.

14.6.3.2 Summary of Monitoring Procedures and Implementation

The Company's WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The Company monitors key indicators of water supply reliability, including groundwater production, available supply allocations, customer demand, and system conditions. This information is used to evaluate

supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The Company's Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of shortage response actions. Additional detail regarding the Annual Assessment is provided in *Subsection 14.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter 14.5 – Water Use Characterization*.

Implementation of the WSCP includes coordination among Company staff, MWA, and other regional partners, as well as communication with customers. When a water shortage stage is implemented, the Company provides public notification of applicable restrictions and conservation measures, consistent with CPUC requirements, and monitors compliance to ensure demand reduction targets are achieved.

Sub-Chapter 14.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the Company's water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 14.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 14.5 – Water Use Characterization* to assess the Company's ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the Company's water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the Company's capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the Company's Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the Company's water supply reliability and inform the implementation of the Company's WSCP, as described in *Sub-Chapter 14.6 – Water Conservation and Shortage Response*.

14.7.1 Five Year Drought Risk Assessment

The DRA evaluates the Company's ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the Company's unconstrained demand forecast described in *Sub-Chapter 14.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the Company's managed groundwater supplies, which include groundwater production, replacement water, make-up water, and transfers and exchanges available through MWA, as described in *Sub-Chapter 14.5 – Water*

Use Characterization. Under the terms of the MBA adjudication, the Company has discretion in managing its groundwater production and associated supplemental supplies, allowing it to adjust its supply portfolio to meet projected demands during dry conditions.

The DRA compares projected water demands to available supplies to evaluate the Company’s capacity to meet customer needs over the five-year period. **Table 14-19** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 14-19: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	9,825	9,855	9,885	9,915	9,940
Demand	9,825	9,855	9,885	9,915	9,940
Difference	0	0	0	0	0

14.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The Company’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

14.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the Company’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the Company’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the Company’s supplies are managed within the framework of the MBA adjudication, which provides flexibility in balancing groundwater production and supplemental supplies. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 14-20 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 14-20: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	9,940	10,090	10,235	10,385	10,530
Demand	9,940	10,090	10,235	10,385	10,530
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	9,940	10,090	10,235	10,385	10,530
Demand	9,940	10,090	10,235	10,385	10,530
Difference	0	0	0	0	0

14.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the Company’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the Company continues to manage its supplies within the framework of the MBA adjudication, which allows for flexibility in balancing groundwater production and supplemental supplies. This managed approach enables the Company to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 14-21 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the Company has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 14-21: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	9,940	10,090	10,235	10,385	10,530
	Demand	9,940	10,090	10,235	10,385	10,530
	Difference	0	0	0	0	0
Year 2	Supply	9,970	10,115	10,265	10,410	10,560
	Demand	9,970	10,115	10,265	10,410	10,560
	Difference	0	0	0	0	0
Year 3	Supply	10,000	10,145	10,295	10,440	10,590
	Demand	10,000	10,145	10,295	10,440	10,590
	Difference	0	0	0	0	0
Year 4	Supply	10,030	10,175	10,325	10,470	10,620
	Demand	10,030	10,175	10,325	10,470	10,620
	Difference	0	0	0	0	0
Year 5	Supply	10,060	10,205	10,355	10,500	10,650
	Demand	10,060	10,205	10,355	10,500	10,650
	Difference	0	0	0	0	0

14.7.3 Annual Reliability Assessment

Each year, the Company considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the Company’s Water Shortage Contingency Plan. The Company has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

14.7.4 Water Supply Reliability Summary

The Company's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 14.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the Company evaluates the energy intensity of its water supply distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The Company’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the Company’s service area, rather than long-distance conveyance or advanced treatment processes.

The Company continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 14-22**.

TABLE 14-22: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR SEPT 2024 THROUGH SEPT 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	9,801
Energy Consumed (kWh)	7,673,322
Energy Intensity (kWh/acre-foot)	783

LIBERTY UTILITIES – APPLE VALLEY

APPENDICES

This page is reserved for Liberty Utilities – Apple Valley-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to Liberty Utilities – Apple Valley’s adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the Liberty Utilities – Apple Valley retailer chapter, Liberty Utilities – Apple Valley’s WSCP, and applicable Liberty Utilities – Apple Valley-specific appendices.

Chapter 15.0 PHELAN PIÑON HILLS COMMUNITY SERVICES DISTRICT



TABLE OF CONTENTS

Sub-Chapter 15.1 – Introduction	15-7
15.1.1 Background and Purpose.....	15-7
15.1.2 Basis for Plan Preparation.....	15-8
15.1.3 RUWMP Adoption.....	15-9
15.1.4 Document Organization.....	15-10
Sub-Chapter 15.2 – Water Service and System Description	15-11
15.2.1 Service Area Climate.....	15-13
Sub-Chapter 15.3 – Population, Land Use, Economy, and Demographics	15-14
15.3.1 Current Population and Historic Trends.....	15-14
15.3.2 Projected Population.....	15-15
15.3.3 Current and Projected Land Use.....	15-16
15.3.4 Economic Trends & Other Social and Demographic Factors.....	15-16
Sub-Chapter 15.4 – Water Supply and Infrastructure Characterization	15-17
15.4.1 Groundwater.....	15-17
15.4.2 Groundwater Quality.....	15-22
15.4.3 Recycled Water Supplies.....	15-24
15.4.4 Desalination Opportunities.....	15-24
15.4.5 Water Transfers and Exchanges.....	15-24
15.4.6 Antelope Valley Adjudication Area Supplies.....	15-25
15.4.7 Supply Summary.....	15-26
15.4.8 Delivery System Details.....	15-28
Sub-Chapter 15.5 – Water Use Characterization	15-29
15.5.1 Current Customer Water Use.....	15-30
15.5.2 Compliance with Water Use Targets and Objectives.....	15-33
15.5.3 Forecasting Customer Use.....	15-34
15.5.4 Forecasting Water Use for DRA and Annual Assessment.....	15-37
15.5.5 Projecting Disadvantaged Community Water Use.....	15-39
Sub-Chapter 15.6 – Water Conservation and Shortage Response	15-40
15.6.1 Demand Management Measures.....	15-40

15.6.2	Water Shortage Contingency Plan.....	15-44
Sub-Chapter 15.7 – Water System Reliability and Drought Risk Assessment		15-47
15.7.1	Five Year Drought Risk Assessment.....	15-47
15.7.2	Long Term Service Reliability.....	15-48
15.7.3	Annual Reliability Assessment.....	15-50
15.7.4	Water Supply Reliability Summary	15-51
Sub-Chapter 15.8 – Energy Intensity Analysis		15-52

LIST OF TABLES

Table 15-1: Public Water System Information.....	15-8
Table 15-2: Customer Water Service Connections.....	15-12
Table 15-3: Historical Population.....	15-15
Table 15-4: Population Growth Rate – 2015-2024.....	15-15
Table 15-5: Population Forecast and Growth Rate	15-16
Table 15-6: Last Five Years of Phelan Piñon Hills CSD’s FPA Supply (AFY)	15-19
Table 15-7: Projected Mojave Adjudication FPA for the District through 2030 (AFY)	15-20
Table 15-8: Projected Mojave Adjudication FPA for the District through 2050 (AFY).....	15-20
Table 15-9: Last Five Years of Replacement and Make-up Water Supplies (AFY).....	15-21
Table 15-10: Phelan Piñon Hills CSD Potable Water Quality	15-23
Table 15-11: District’s AVAA Groundwater Production 2021-2024 (AFY).....	15-26
Table 15-12: District’s Managed Groundwater Production 2021-2025 (AFY).....	15-27
Table 15-13: District’s Projected Managed Groundwater Supply 2026 – 2030 (AFY).....	15-27
Table 15-14: District’s Projected Managed Groundwater Supply Through 2050 (AFY).....	15-28
Table 15-15: Potable Customer Use 2021 – 2025 (Values in Acre-Feet).....	15-31
Table 15-16: Distribution System Loss 2021 – 2024	15-33
Table 15-17: Forecast Future Water Use (AFY)	15-36
Table 15-18: Forecast DRA Water Use for 2026 through 2030 (AFY).....	15-39
Table 15-19: Five Year Drought Risk Assessment (AFY).....	15-48
Table 15-20: Normal and Single Dry Year Water Supply and Demand through 2050 (AFY).....	15-49
Table 15-21: Five Consecutive Dry Years Water Supply and Demand through 2050 (AFY).....	15-50
Table 15-22: Energy Intensity – Total Utility Approach for Jan 2025 through Dec 2025.....	15-52

LIST OF FIGURES

Figure 15-1: Phelan Piñon Hills CSD Water Service Area 15-12

APPENDICES

Phelan Piñon Hills CSD Appendices 15-53

Sub-Chapter 15.1 – Introduction

The Phelan Piñon Hills Community Services District (District) was formed to consolidate three Special Districts: the County Service Districts of Area 70 Zone L, Area 9 Phelan Parks and Street Lighting, and Area 56-F1 Piñon Hills Parks. This consolidation upholds the served communities' ability of self-governance and individual rural integrity. A five-member Board of Directors was elected to administrate the District. The District has the following service departments: the Water Department, Parks and Recreation, Solid Waste and Recycling, and Street Lighting.

The District is situated in the Mojave Desert, north of the San Gabriel Mountains and 10 miles west of the Cajon Pass. The populated area in the District's service area encompasses the communities of Phelan and Piñon Hills. Elevations in the District's service area vary from approximately 4,900 feet in the southwestern portion to 3,050 feet in the northern portion.

The District's water supply is sourced entirely from groundwater pumped from the Mojave River Groundwater Basin, with a small contribution (less than 1%) from the Antelope Valley Groundwater Basin. Ensuring an adequate and reliable water supply for current and future customers is fundamental to the District's mission. Through participation in the 2025 Mojave RUWMP (2025 RUWMP), the District supports coordinated, basin-wide planning. Regional conditions and assumptions are presented in the 2025 RUWMP regional chapters, while this chapter focuses on District-specific system characteristics, demands, demand management measures, and reliability.

15.1.1 Background and Purpose

The District has ensured compliance with the Urban Water Management Plan Act (UWMPA) requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this retail-specific chapter.¹²⁴ The UWMPA requires urban water suppliers to evaluate the adequacy of their water supplies to meet projected demands under average conditions, single dry years, and multiple dry year scenarios through a 20-year planning horizon. This chapter presents the District's evaluation of these requirements and demonstrates its ability to meet anticipated demands under normal and drought conditions.

The 2025 RUWMP, together with this retail-specific chapter, updates the District's 2020 Urban Water Management Plan (UWMP) and incorporates new data, analyses, and regulatory guidance issued since 2020 by the California Department of Water Resources (DWR) pursuant to the California Water Code (CWC). In addition to satisfying statutory

¹²⁴ California Water Code Sections 10610 through 10657.

requirements, the 2025 RUWMP serves as a comprehensive planning document describing existing and future water supplies, projected water demands, demand management progress, and actions necessary to maintain long-term supply reliability. The regional plan also documents cooperative efforts among participating agencies to efficiently manage shared resources and address future water needs across the RUWMP Planning Area.

15.1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code Section 116275. The District is also classified as an Urban Water Supplier pursuant to CWC Section 10617, as it provides water for municipal purposes to more than 3,000 service connections and supplies more than 3,000 acre-feet of water annually. These qualifications require the preparation and adoption of a UWMP every five years. Under CWC Section 10620 (d)(1), these requirements may be satisfied through participation in a RUWMP, which the District and the other Urban Water Suppliers within the RUWMP Planning Area have elected to prepare collaboratively. Details of the District’s Public Water System are provided in **Table 15-1**.¹²⁵

TABLE 15-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610120	Phelan Piñon Hills Community Services District	~7,427

15.1.2.1 Coordination and Outreach

Preparation of the 2025 RUWMP involved coordination among the participating Urban Water Suppliers and the Mojave Water Agency (MWA), which serves as the region’s wholesale water supplier. This coordination ensured consistency in assumptions, methodologies, and regional analyses. The District actively participated in this collaborative process through technical meetings, data sharing, and review of draft materials addressing both regional conditions and District-specific operations.

As required by the UWMPA, the District coordinated with nearby agencies during development of this chapter to ensure consistency with related land use and water resource planning efforts, including City General Plans, Water Master Plans, and Specific Plans associated with anticipated development.

¹²⁵ Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

Consistent with CWC Section 10641, the District encouraged active participation from a broad cross-section of the community representing diverse social, cultural, and economic interests within its service area during preparation of this chapter. Public notice of the plan's availability and the scheduled public hearing was provided, and a public hearing was conducted prior to adoption to solicit input from customers, stakeholders, and interested parties.

Comprehensive documentation of the regional planning process, including interagency coordination, formal notifications provided in accordance with CWC Section 10621(b), stakeholder engagement, and outreach activities conducted on behalf of all participating agencies, is provided in *Sub-Chapter 1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

15.1.2.2 Water Supplier Information Exchange

Compliance with CWC Section 10631 is described in *Sub-Chapter 1.3 Coordination and Outreach of Regional Chapter 1 - Introduction*.

15.1.3 RUWMP Adoption

The District held a public hearing regarding the 2025 RUWMP on June 10, 2026. Before the hearing, the District made a draft of the 2025 RUWMP available for public inspection at 4128 Warbler Road, Phelan, CA 92371 and on the District's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the local press as required under the UWMPA.

The District's elected body adopted this 2025 RUWMP on June 10, 2026. A copy of the 2025 RUWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto the District's website.

The District plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption, including the on-line submittal of information associated with the following DWR Excel workbooks:

- "FINAL Submittal 2025 UWMP Tables – Phelan Piñon Hills CSD – 06.01.2026.xls"
- "Appendix F 2025 Checklist – Phelan Piñon Hills CSD – 06.01.2026.xls"

15.1.4 Document Organization

This chapter is organized as follows:

- Sub-Chapter 15.2 Water Service and System Description
- Sub-Chapter 15.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 15.4 Water Supply and Infrastructure Characterization
- Sub-Chapter 15.5 Water Use Characterization
- Sub-Chapter 15.6 Water Conservation and Shortage Response
- Sub-Chapter 15.7 Water System Reliability and Drought Risk Assessment
- Sub-Chapter 15.8 Energy Intensity Analysis

Sub-Chapter 15.2 – Water Service and System Description

The Phelan Piñon Hills Community Services District provides potable water service to the residents and businesses within its service area, depicted in **Figure 15-1**, which coincides with the communities of Phelan and Piñon Hills.

Water service in the District relies entirely on groundwater extracted from wells located throughout the service area. The District manages 15 active wells that tap into local aquifers to provide the community's water supply. Once extracted, water is treated to meet all applicable federal and state water quality standards and is either directed into the distribution system or stored in one of the District's 35 reservoirs, which collectively provide approximately 11.3 million gallons of storage. These reservoirs help ensure that the community has access to adequate water during periods of high demand, particularly in the summer months.

The District's water system encompasses an extensive distribution network designed to deliver water efficiently to homes, businesses, and fire protection systems. The system includes approximately 353 miles of water mains, thousands of service connections, 32 pressure reducing stations, and 63 booster pump stations. **Table 15-2** summarizes recent historical service connections by customer type, providing an overview of the composition of the District's customer base. The District also engages in regular inspection, maintenance, and replacement of system components to ensure long-term reliability and safety of the water supply.

FIGURE 15-1: PHELAN PIÑON HILLS CSD WATER SERVICE AREA

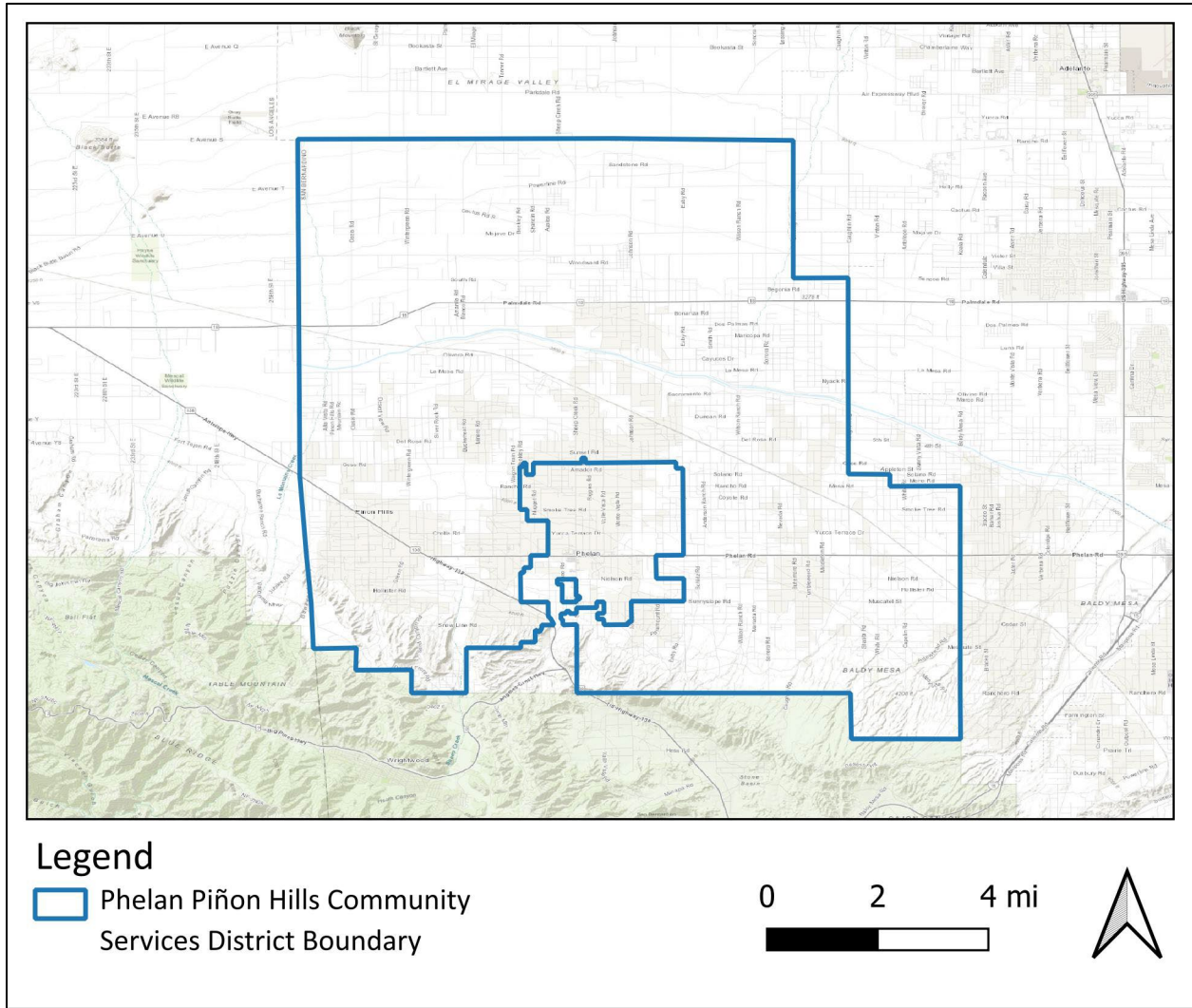


TABLE 15-2: CUSTOMER WATER SERVICE CONNECTIONS

Customer Class	2021	2022	2023	2024	2025
Single-Family Residential	7,053	7,141	7,198	7,261	7,331
Multi-Family Residential	5	5	5	5	5
Commercial	51	52	53	53	53
Institutional	37	37	37	37	37
Other	1	1	1	1	1
Total	7,147	7,236	7,294	7,357	7,427

15.2.1 Service Area Climate

Located in California's Mojave Basin Area, the District's service area experiences the climate characteristic of the High Desert. The region is highly arid due to the rain shadow effects of surrounding mountain ranges and is marked by hot summers and relatively cool winters. This results in low precipitation and pronounced diurnal temperature variations throughout the year. Average annual precipitation is minimal, with a 30-year average of 5.35 inches, occurring primarily as rainfall between December and March. Precipitation generally tapers off by May. While late summer monsoonal thunderstorms may contribute episodic precipitation, these events typically account for only a small portion of total annual precipitation. Although snowfall is rare, winter snowfall averages four inches annually. The annual average temperature is approximately 61 degrees Fahrenheit; however, the High Desert climate produces substantial seasonal extremes, with summer temperatures frequently exceeding 100 degrees and winter lows occasionally falling below freezing. Overall, the District's service area climate is generally consistent with climatic conditions across the RUWMP Planning Area. A more detailed discussion of the RUWMP Planning Area's climate characteristics is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

15.2.1.1 Climate Change

Climate change is driven by increasing concentrations of atmospheric carbon dioxide and other greenhouse gases, resulting in rising temperatures and greater hydrologic variability. These effects underscore the importance of considering climate change in this 2025 RUWMP. While the CWC does not prescribe specific climate change planning or management measures for retail water suppliers, it emphasizes that climate change is an appropriate consideration for general water management and planning. Accordingly, climate change is a critical factor in assessing the availability and reliability of water supplies, as well as future demand projections. A detailed discussion of climate change impacts on the District's water supplies and demands, as well as those of the RUWMP Planning Area at-large, is provided in *Sub-Chapter 2.1.5 Climate of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 15.3 – Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the District's economic, social, and demographic trends give valuable insight into water management and planning. This section of the RUWMP addresses these factors to provide a supportable basis for forecasting future water use.

15.3.1 Current Population and Historic Trends

Population estimates for the District are based on the population forecast prepared in 2020 by the Center for Economic Forecasting and Development at the University of California, Riverside (UCR Study), which was commissioned by MWA as part of the 2020 Urban Water Management Plan cycle. The UCR Study developed population estimates for the entire MWA service area as well as for individual retailer water supplies using a comprehensive economic and demographic modeling approach.

In 2023, as part of MWA's Master Plan development, the agency reviewed and refined the UCR Study population projections using updated information not available during the study's development, including 2020 Census data and other available demographic indicators, to ensure that near-term population levels and growth patterns were accurately represented. Where appropriate, adjustments were applied to align study estimates with observed population totals while maintaining the long-term growth trajectory established by the UCR Study.

Population projections for the District reflect these regionally refined UCR Study estimates and therefore align with those used by the other retailers participating in the 2025 RUWMP. This approach ensures that demand projections developed for participating parties are consistent with basin-wide planning assumptions and analyses. Detailed methodologies used to develop and refine the regional population projections included in the UCR Study are presented in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

The District serves a predominantly low-density, rural population. Early settlement was driven by agriculture, with homesteads established on large parcels made possible by abundant

open land. Over time, the area evolved into a low-density residential community as affordable land attracted lower- and middle-income households and those seeking rural lifestyles, while improved highway access enabled commuting to employment centers in Victor Valley and the broader Inland Empire. Phelan Piñon Hills has retained a dispersed development pattern as evident by its modest population.

Table 15-3 presents the District’s historical population while **Table 15-4** presents the District’s population growth over the last decade. The population values reflect the District’s service area, which generally corresponds to the communities of Phelan and Piñon Hills.

TABLE 15-3: HISTORICAL POPULATION

1990	2000	2010	2015	2020	2025
9,688	13,770	19,423	20,229	20,836	21,136

TABLE 15-4: POPULATION GROWTH RATE – 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	20,229	20,398	20,557	20,706	20,813	20,836	20,896	20,956	21,016	21,076
Growth Rate		0.84%	0.78%	0.72%	0.52%	0.11%	0.29%	0.29%	0.29%	0.29%

15.3.2 Projected Population

CWC Section 10631(a) requires urban retail water suppliers to evaluate projected service area populations while considering past growth rates, economic conditions, and anticipated land use changes. Coordination with local land use planning efforts helps ensure that anticipated development patterns are appropriately represented in long-term demand forecasting.

The District is dominated by low-density, single-family homes, often situated on multi-acre parcels. The projected population will be largely linked to the expansion of single-family homes as the rural community attracts more households. Population is projected to steadily increase over the planning horizon reflecting continued low-density residential development. By 2065, the District’s population is projected to reach 23,000, while the annual growth rate over the 45-year period is 0.24%. More broadly, incorporated areas served by municipal water providers within the RUWMP Planning Area are projected to accommodate a substantial share of future regional population growth relative to unincorporated areas as illustrated in *Sub-Chapter 2.1.6 Current and Projected Population of Regional Chapter 2 – The Mojave Region*.

Table 15-5 presents the District’s projected population and associated growth rates through 2060.

TABLE 15-5: POPULATION FORECAST AND GROWTH RATE

	2025	2030	2035	2040	2045	2050	2055	2060
Phelan Piñon Hills Community Services District	21,136	21,465	21,744	22,003	22,245	22,469	22,676	22,869
Annual Growth Rate		1.56%	1.30%	1.19%	1.10%	1.01%	0.92%	0.85%

15.3.3 Current and Projected Land Use

The predominant land use in the District’s service area is low-density residential. Commercial and institutional land uses are limited as the service area is largely composed of residential communities. This makeup is unlikely to change in the near-term or long-term.

15.3.4 Economic Trends & Other Social and Demographic Factors

The District’s service area exhibits economic and social trends typical of rural High Desert communities, characterized by modest growth, affordable housing, and a dispersed population. Economically, local employment opportunities are limited, with most residents commuting to nearby Victor Valley or the Inland Empire for work in logistics, healthcare, or service sectors. Median household incomes generally fall below statewide averages, despite housing costs remaining comparatively affordable. Generally, economic, social and demographic trends experienced in the District’s service area mirror those of the RUWMP Planning Area. Broader regional economic conditions that influence growth within the District are discussed in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social Demographic Factors of Regional Chapter 2 – The Mojave Region*.

Sub-Chapter 15.4 – Water Supply and Infrastructure Characterization

The District sources its water supplies primarily from groundwater. Through a municipal network of 15 active wells, the District pumps groundwater from the underlying Alto and Oeste Subareas of the Mojave Basin Area, with a small contribution from the Antelope Valley Groundwater Basin. As discussed in *Regional Chapter 3 – Regional Water Supply Characterization*, the Mojave Basin Area (MBA) is an adjudicated basin administered by a court-appointed Watermaster. The aforementioned regional chapter describes the MBA's water supplies and related management structures and details.

This sub-chapter focuses first on the District's primary water supply portfolio within the MBA, which represents the substantial majority of available supply. A limited groundwater supply from the Antelope Valley Groundwater Basin is described separately at the end of this sub-chapter.

15.4.1 Groundwater

Groundwater is the primary water supply source for all urban retail water suppliers within the MBA. Phelan Piñon Hills Community Services District, like many of the MWA's other retail agencies, pumps groundwater from the adjudicated MBA, specifically the Alto and Oeste Subareas. The basins are recharged through several means, including natural recharge from the Mojave River (primarily influencing the Alto Subarea), lateral subsurface groundwater movement from the adjacent San Gabriel mountains, imported water from the State Water Project (managed by MWA), and other sources like irrigation runoff, return flows from septic systems and water delivery systems. A detailed description of the MBA, Subareas, aquifer characteristics, adjudication, management areas, and other adjudicated basins is presented in *Sub-Chapter 3.1 Mojave Region Water Supply Sources of Regional Chapter 3 – Regional Water Supply Characterization*.

15.4.1.1 Phelan Piñon Hills CSD's Free Production Allowance

Under the Judgment governing the MBA, each producer is assigned a Free Production Allowance (FPA), representing the annual quantity of groundwater that may be extracted without replacement obligations. The District's FPA is based on historical production coupled with evaluation of groundwater conditions, as administered by MWA in its role as the Watermaster.

The District's FPA changes over time as the Watermaster assesses supply availability for all adjudicated purveyors against the long-term health and production safe yield of the MBA. The District's FPA has continued to be significantly reduced as a percentage of the Base Annual Production (BAP) number. Because the District's service area spans both the Alto and Oeste Subareas, its FPA is reported as two separate entries in the Watermaster's annual report, one under the Alto Subarea and one under the Oeste Subarea, both listed as "PHELAN PIÑON HILLS COMMUNITY SERVICES DISTRICT." The District's reported BAP in water year 2025 for the Alto subarea was 355 acre-feet per year. The current 50.4% FPA of this source is 179 acre-feet. The District's reported BAP in water year 2025 for the Oeste subarea was 4,680 acre-feet per year. The current 45% FPA of this source is 2,106 acre-feet. **Table 15-6** presents the District's FPA for the most recent five-year period pursuant to the MBA Judgment. Detailed discussion of the adjudication framework and administration of production allowances is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

TABLE 15-6: LAST FIVE YEARS OF PHELAN PIÑON HILLS CSD'S FPA SUPPLY (AFY)

Alto Subarea	Year	Base Annual Production	Percent FPA	FPA Supply
	2021	355	55.0%	195
	2022	355	50.0%	178
	2023	355	53.3%	189
	2024	355	50.4%	179
	2025	355	50.4%	179

Oeste Subarea	Year	Base Annual Production	Percent FPA	FPA Supply
	2021	4,680	55.0%	2,574
	2022	4,680	50.0%	2,340
	2023	4,680	50.0%	2,340
	2024	4,680	45.0%	2,106
	2025	4,680	45.0%	2,106

Alto + Oeste	Year	Base Annual Production	FPA Supply
	2021	5,035	2,769
	2022	5,035	2,518
	2023	5,035	2,529
	2024	5,035	2,285
	2025	5,035	2,285

The 50.4% FPA represents a reduction that aligns with the long-term Production Safe Yield of the Alto Subarea considered by the Watermaster, while the 45.0% FPA represents a reduction that aligns with the long-term Production Safe Yield of the Oeste Subarea considered by the Watermaster. Accordingly, the District's projected FPA in a normal year, single dry year, and five consecutive dry years through 2030 is set at the combined 2025 FPA supply value as shown in **Table 15-7**.

TABLE 15-7: PROJECTED MOJAVE ADJUDICATION FPA FOR THE DISTRICT THROUGH 2030 (AFY)

Year Type		Projected FPA
Normal		2,285
Single Dry-Year		2,285
Multi-Year Drought	2026 (1 st Year)	2,285
	2027 (2 nd Year)	2,285
	2028 (3 rd Year)	2,285
	2029 (4 th Year)	2,285
	2030 (5 th Year)	2,285

Although the Production Safe Yield of the MBA appears to be stabilizing in the Alto Subarea, out of an abundance of caution the future FPA has been reduced to 50% to address long-term water supply planning options while the FPA for the Oeste Subarea has been maintained at 45%. **Table 15-8** presents the District’s projected FPA in a normal year, single dry year, and five consecutive dry years from 2030 through 2050.

TABLE 15-8: PROJECTED MOJAVE ADJUDICATION FPA FOR THE DISTRICT THROUGH 2050 (AFY)

Projected FPA		2030	2035	2040	2045	2050
Normal		2,284	2,284	2,284	2,284	2,284
Single Dry-Year		2,284	2,284	2,284	2,284	2,284
Multi-Year Drought	Year 1	2,284	2,284	2,284	2,284	2,284
	Year 2	2,284	2,284	2,284	2,284	2,284
	Year 3	2,284	2,284	2,284	2,284	2,284
	Year 4	2,284	2,284	2,284	2,284	2,284
	Year 5	2,284	2,284	2,284	2,284	2,284

A summary of long-term reliability and other factors that will affect FPA, such as hydrological and regulatory issues, is provided in *Regional Chapter 3 – Regional Water Supply Characterization*.

15.4.1.2 Carryover Water Supplies

The District does hold some carryover supplies as part of its overall water supply management in the Alto and Oeste Subareas. Specifically, the District’s combined carryover supply totals 2,511 acre-feet.¹²⁶ Although these supplies may be available to meet the District’s water needs, we do not account for these supplies in the availability analysis in this sub-chapter in order to preserve these supplies for purposes of meeting emergency supply conditions.

15.4.1.3 Replacement and Make-up Water Supplies

The District has taken actions to augment its water supplies through the Watermaster’s water replacement water supply program and by acquiring make-up water supplies. Replacement water supplies are those supplies acquired by the Watermaster in order to replace supplies pumped from the Basin that exceed the District’s annual FPA from the Alto and Oeste Subareas. Make-up water supplies, by contrast, are acquired to satisfy obligations under the Judgment to maintain flows from the Alto Subarea to downstream subareas when natural conditions and production patterns would otherwise result in a shortfall.

A detailed description of these programs, obligations, and administrative processes is provided in *Regional Chapter 3 – Regional Water Supply Characterization*. **Table 15-9** summarizes the quantities of replacement and make-up water supplied to the District during the most recent five-year period.

TABLE 15-9: LAST FIVE YEARS OF REPLACEMENT AND MAKE-UP WATER SUPPLIES (AFY)

Year	Water Acquisitions ¹²⁷
2021	0
2022	0
2023	0
2024	242
2025	540

¹²⁶ Water Year 2025 Watermaster Report, Appendix H.

¹²⁷ Water Acquisitions calculated as (Verified Production – Base FPA) + Makeup Water Obligation

15.4.2 Groundwater Quality

Groundwater produced by the District is obtained from wells completed in the Mojave River Groundwater Basin and is treated as necessary to meet all applicable federal and state drinking water standards prior to delivery to customers. Water quality within the basin is influenced by natural hydrogeologic conditions as well as localized land use and recharge patterns. The District routinely monitors groundwater quality in accordance with regulatory requirements to ensure the continued safety and reliability of its potable water supply.

Detailed information regarding the quality of water delivered to customers, including detected constituents, regulatory compliance status, and treatment practices, is provided annually in the District’s Consumer Confidence Report (CCR). The most recent available report is the 2024 CCR, published in June 2025, which reflects water quality data from the 2024 calendar year in accordance with state reporting requirements that mandate annual preparation and distribution of CCRs by July 1 of the following year. The CCR summarizes monitoring results for the most recent reporting year and demonstrates compliance with primary drinking water standards established by the U.S. Environmental Protection Agency and the State Water Resources Control Board Division of Drinking Water (SWRCB). The District’s most recent CCR is available through the District’s website and provides the most current information on potable water quality conditions.¹²⁸

While this section focuses on groundwater quality as it pertains to the District’s supply sources, a broader discussion of water quality conditions throughout the Mojave Region, including basin-wide characteristics, regulatory considerations, and regional management issues, is presented in *Sub-Chapter 3.1.2 of Regional Chapter 3 – Regional Water Supply Characterization*.

Table 15-10 presents a summary of groundwater quality constituents based on information reported in the District’s 2024 CCR. The table reflects a subset of reported constituents and has been adapted for clarity and relevance to this UWMP.

¹²⁸ Phelan Piñon Hills Community Service District 2024 CCR available at:
https://www.pphcsd.org/files/f68353659/2024_CCR.pdf

TABLE 15-10: PHELAN PIÑON HILLS CSD POTABLE WATER QUALITY

Water Quality Standards	Goal Level	Max Level	Range	Amount Detected
Primary Standards				
Arsenic (ppb)	0.004	10	ND - 8.60	2.15
Fluoride (ppm)	1	2	0.21 - 0.52	0.31
Gross Alpha Particle Activity (pCi/L)	N/A	15	N/A	ND
Uranium (pCi/L)	20	N/A	N/A	ND
Nitrate as N (ppm)	45	45	ND - 3.6	1.26
THMS (Total Trihalomethanes) (ppb)	N/A	80	N/A	0
Total Chromium (ppb)	100	50	N/A	3.5
Hexavalent Chromium (Chromium 6) (ppb)	0.02	10	0.22 - 19.75	7.42
TCPI23 (1,2,3, Trichloropropane) (ppt)	0.0007	0.005	N/A	0
PFAS (ppt)	0.007	4	N/A	0
PFOS (ppt)	0.01	4	N/A	0
Secondary Standards				
Turbidity (NTU)	N/A	5	ND - 1.20	0.38
Color	N/A	15	ND - 10.00	2.5
Odor - Threshold	N/A	3	ND - 1.00	1
Chloride (ppm)	N/A	500	2.20 - 2.7	2.5
Specific Conductance (umho/cm)	N/A	490 - 1,600	390 - 550	500
Total Dissolved Solids (TDS) (ppm)	N/A	1,000	260 - 380	407.5
Sulfate (ppm)	N/A	500	92 - 170	143
Iron (ppb)	N/A	300	ND - 210	52.5
Zinc (ppm)	N/A	500	N/A	0
Lead (ppb)	N/A	0.015	N/A	0.00
Federal Unregulated Contaminates				
Vanadium (ppb)	N/A	0 - 54	ND - 54	19.6

15.4.3 Recycled Water Supplies

The District does not currently utilize recycled water within its service area. Due to the absence of a centralized wastewater collection and treatment system, wastewater is primarily managed through on-site septic system, limiting opportunities for recycled water production and reuse. As a result, recycled water is not included as part of the District's existing or projected water supply portfolio.

15.4.4 Desalination Opportunities

The UWMPA requires urban water suppliers to evaluate potential opportunities for the use of desalinated water CWC Section 10631[i]. Based on current conditions, desalination is not considered a viable supply option for the District due to the absence of suitable source waters and the substantial cost associated with treatment, conveyance, and disposal. Therefore, the District has no plans to develop desalination facilities, and desalinated supplies are not incorporated into the supply projections presented in this sub-chapter.

15.4.5 Water Transfers and Exchanges

The District does not currently rely on water transfers or exchanges, including transfers of BAP or FPA, as a component of its routine water supply portfolio. Water supplies are primarily managed through groundwater production within the Alto and Oeste Subareas in accordance with the MBA adjudication. While transfers and exchanges are not assumed under normal operating conditions, these mechanisms may provide an additional source of supply during emergency or shortage conditions. In addition, the District maintains limited emergency interconnections with neighboring systems that may be utilized during system outages or other supply interruptions to support short-term operational reliability.

15.4.6 Antelope Valley Adjudication Area Supplies

The Antelope Valley Groundwater Basin is located in the western Mojave Desert and encompasses approximately 1,580 square miles. Approximately two-thirds of the basin lies within Los Angeles County, with smaller portions extending into San Bernardino and Kern Counties. The basin is an undrained, closed system composed of two primary aquifers: the upper (principal) aquifer and the lower (deep) aquifer. The principal aquifer is generally unconfined and historically supported artesian conditions in localized areas due to perched groundwater, though these conditions are no longer present due to long-term groundwater extraction. The deeper aquifer is separated from the principal aquifer by laterally extensive clay layers and is generally considered confined. Based on hydrogeologic conditions, including faulting, groundwater flow patterns, recharge characteristics, and geographic features, the United States Geological Survey (USGS) has divided the basin into 12 subbasins. Natural recharge primarily occurs through deep percolation of precipitation and runoff from surrounding mountains and upland areas, while groundwater discharge occurs predominantly through pumping.

Groundwater levels in portions of the basin have declined significantly due to long-term overdraft conditions that became pronounced in the early 1990s. In response, the basin was adjudicated under the Antelope Valley Groundwater Basin Adjudication Judgment (AVGBA Judgment) in 2015 following approximately 15 years of complex litigation involving more than 4,000 parties. Approximately 90 percent of the basin (about 1,390 square miles) was adjudicated and is referred to as the Antelope Valley Area of Adjudication (AVAA). The AVGBA Judgment determined that the basin was in a state of overdraft, established groundwater production rights based on the basin's Native Safe Yield (NSY), and required a ramp down in groundwater production to achieve sustainability by 2023. The Antelope Valley Watermaster was established to administer the Judgment, including allocation of production rights, enforcement of compliance, and overall management of groundwater resources within the AVAA. The adjudicated area is divided into five management areas: the Central Antelope Valley, West Antelope Valley, Southeast, Willow Springs, and Rogers Lake Subareas.

The AVGBA Judgment established a Native Safe Yield (NSY) of 82,300 acre-feet per year (AFY) and a Total Safe Yield (TSY) of 110,000 AFY for the AVAA. The NSY represents natural recharge and return flows, while the TSY includes additional return flows associated with imported water. Groundwater production rights were allocated among producers and are subject to a ramp down schedule designed to align long-term extraction with sustainable yield conditions.

The District is classified under "Other Rights to Produce Groundwater," meaning it does not hold a production right but is permitted to extract up to 1,200 AFY from Well 14¹²⁹, provided that

¹²⁹ Well 14 is the only one of the District's 17 wells located within the AVAA.

such pumping does not result in material injury to other producers. The District is required to pay a Replacement Water Assessment, along with any additional costs necessary to protect adjudicated production rights, on all groundwater produced and exported from the basin. The District’s groundwater production from the AVAA for 2021 through 2024 is presented in **Table 15-11**.

TABLE 15-11: DISTRICT’S AVAA GROUNDWATER PRODUCTION 2021-2024 (AFY)¹³⁰

Year	Groundwater Production
2021	120
2022	6
2023	8
2024	0

15.4.7 Supply Summary

Groundwater serves as the District’s principal water supply source. These supplies, pumped from the Alto and Oeste Subareas of the MBA and the Antelope Valley Groundwater Basin are generally sufficient to meet existing and future demands. To enhance sustainability and reduce potable demand, the District is involved in regional initiatives with MWA exploring supplemental supplies.

The District’s water supplies are aggregated into the historical managed groundwater system. The District’s managed groundwater consists of supplies provided through the MBA and AVAA adjudications, including make-up and replacement supplies as well as transfers and exchanges among producers. Under the MBA Judgment, producers in the Alto and Oeste Subareas are able to meet their water supply requirements through production from the basin’s managed groundwater system. This system, which provides the majority of the District’s water supplies, incorporates the natural yield of the basin along with supplies made available through regional management actions, including imported water recharge managed by MWA, conservation, and transfers of FPA among producers. Consistent with this framework, the District’s total managed groundwater production for the historical period represents the supply available to meet system demands. Total managed groundwater production from 2021 through 2025 is shown in **Table 15-12**.

¹³⁰ The values presented in Table 16-11 have been rounded to the nearest acre-foot.

TABLE 15-12: DISTRICT’S MANAGED GROUNDWATER PRODUCTION 2021-2025 (AFY)

Year	Groundwater Production
2021	3,094
2022	2,863
2023	2,555
2024	2,674
2025	2,725

Projected groundwater supplies are derived from the demand projections described in *Sub-Chapter 15.5 – Water Use Characterization*. Within the adjudicated MBA management framework, the District’s groundwater production adjusts to meet water demands through the managed groundwater system. Accordingly, projected groundwater supplies for the planning horizon are shown in **Table 15-13** and **Table 15-14**.¹³¹

TABLE 15-13: DISTRICT’S PROJECTED MANAGED GROUNDWATER SUPPLY 2026 – 2030 (AFY)

Year Type		Managed Groundwater Production
Normal		2,730
Single Dry-Year		2,730
Multi-Year Drought	2026 (1 st Year)	2,730
	2027 (2 nd Year)	2,735
	2028 (3 rd Year)	2,745
	2029 (4 th Year)	2,750
	2030 (5 th Year)	2,755

¹³¹ The values presented in **Table 15-13** and **Table 15-14** have been rounded to reflect congruency with the projected demands presented in *Sub-Chapter 15.5 Water Use Characterization*.

TABLE 15-14: DISTRICT'S PROJECTED MANAGED GROUNDWATER SUPPLY THROUGH 2050 (AFY)

Managed Groundwater Production		2030	2035	2040	2045	2050
Normal		2,755	2,785	2,815	2,840	2,865
Single Dry-Year		2,755	2,785	2,815	2,840	2,865
Multi-Year Drought	Year 1	2,755	2,785	2,815	2,840	2,865
	Year 2	2,765	2,795	2,820	2,845	2,870
	Year 3	2,770	2,800	2,825	2,850	2,875
	Year 4	2,775	2,805	2,830	2,855	2,880
	Year 5	2,780	2,810	2,835	2,860	2,885

15.4.8 Delivery System Details

The District's potable water system conveys groundwater produced from wells located throughout the service area to storage and distribution facilities that deliver water to customers. Extracted groundwater is conveyed to one of the District's storage reservoirs, which collectively provide approximately 11.3 million gallons of storage before being distributed through the pressurized potable water system. The distribution system consists of more than 353 miles of pipeline, and approximately 7,427 service connections.

Sub-Chapter 15.5 – Water Use Characterization

Understanding water use characteristics is essential for the District to reliably and cost-effectively manage its water supplies and meet the needs of customers within its service area. This sub-chapter characterizes the District’s retail customer water needs – current and forecast over the next few decades. Characteristics regarding how water use varies amongst different land use classifications, throughout the year, and under differing hydrologic conditions help to bolster that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the District’s past and current water use, in addition to considerations of anticipated growth, new regulations, climate change conditions and trends in customer water use behaviors. The analysis presented in this sub-chapter utilizes the water use forecast methodology presented in *Sub-Chapter 4.1 of Regional Chapter 4 – Water Use Characterization* which examines each water use sector for a variety of factors before aggregating the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District’s water supplies, presented in *Sub-Chapter 15.4 – Water Supply and Infrastructure Characterization*, to assess long-term water system reliability, presented in *Sub-Chapter 15.7– Water System Reliability and Drought Risk Assessment*.

As discussed in *Regional Chapter 1 – Introduction*, there have been no legislative changes to the UWMPA since the adoption of the District’s 2020 UWMP; however, updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This section is organized as follows:

- Current Customer Water Use – This subsection presents actual water use data reflecting the District’s residential and non-residential customers for 2021 through 2025 as well as distribution system losses for this same period.
- Compliance with Urban Water Use Objectives and past urban water use efficiency efforts – This subsection documents the derivation of the District’s UWUO, comparison to the District’s actual water use, UWUO reporting process, and past urban water use efficiency efforts, including the District’s 2020 GPCD target.

- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the District’s service area and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the five-year Drought Risk Assessment (DRA) and defining the “unconstrained demand” for purposes of the District’s annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC Section 10631.1.

15.5.1 Current Customer Water Use

As described in *Sub-Chapter 15.2 – Water Service and System Description*, the District provides water service to approximately 7,427 service connections within its service area. Under normal operating conditions, customers are served groundwater supplies pumped from wells located throughout the District and treated to meet all applicable state and federal drinking water standards. Information regarding the District’s current customers, recent water use patterns, and expected trends in water demand provides the basis for developing the water use forecasts presented in this 2025 RUWMP. Furthermore, annual records of actual water use provide the basis for determining the District’s compliance with its UWUO, reported annually to DWR beginning in January of 2024.

15.5.1.1 Customer Water Use 2021–2025

Recent customer water use data assists the District in understanding water use trends, effects of any temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. The District is also required to quantify past customer water use pursuant to CWC Section 10631(d)(1). The District records potable water use within four primary categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial and Institutional
- Other

TABLE 15-15: POTABLE CUSTOMER USE 2021 – 2025 (VALUES IN ACRE-FEET)

Use Category	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	124	112	153	180	210	296	285	306	254	190	149	154	2,413
	2022	138	106	148	171	195	231	243	267	204	186	134	133	2,155
	2023	136	107	132	121	182	216	259	240	174	192	141	125	2,025
	2024	136	106	130	124	193	220	321	221	223	218	133	145	2,171
	2025	139	113	127	171	181	226	278	231	213	188	135	144	2,145
Multi-Family Residential	2021	0.17	0.19	0.24	0.21	0.22	0.27	0.22	0.21	0.19	0.19	0.16	0.17	2
	2022	0.19	0.14	0.18	0.18	0.21	0.32	0.22	0.21	0.12	0.14	0.13	0.15	2
	2023	0.17	0.11	0.17	0.14	0.16	0.16	0.19	0.20	0.24	0.25	0.21	0.20	2
	2024	0.28	0.20	0.25	0.23	0.26	0.22	0.31	0.26	0.30	0.29	0.22	0.24	3
	2025	0.23	0.21	0.23	0.27	0.27	0.33	0.34	0.26	0.28	0.30	0.26	0.25	3
Commercial/ Institutional	2021	14	4	10	8	34	38	35	40	32	19	12	11	257
	2022	5	7	11	23	22	27	27	30	21	16	9	5	203
	2023	3	3	3	5	18	24	31	26	19	15	7	5	159
	2024	4	2	5	9	16	24	26	19	16	14	8	4	146
	2025	4	4	8	12	14	18	27	20	17	14	8	7	154
Other	2021	3	1	3	7	14	15	9	2	5	3	2	2	67
	2022	1	1	3	7	6	2	2	3	2	12	8	9	57
	2023	1	1	4	3	5	3	5	15	4	6	2	1	50
	2024	2	1	2	3	5	5	4	8	6	4	4	1	46
	2025	3	4	3	4	8	5	6	4	6	4	3	2	53
Total Metered Deliveries	2021	141	116	166	196	259	349	330	348	290	212	163	167	2,739
	2022	143	114	162	201	222	261	273	301	227	214	151	148	2,417
	2023	140	111	139	130	204	243	295	282	198	213	151	131	2,236
	2024	142	109	137	136	214	250	352	249	245	236	145	150	2,366
	2025	146	121	138	188	203	249	312	256	237	206	146	154	2,355

The “Other” water use category included in **Table 15-15** captures a range of small, non-standard uses including a community water fill station, district metered usage, and temporary construction-related water use. The single-family residential and multi-family residential classifications continue to represent the primary components of the District’s water service, accounting for approximately 82% of the District’s annual potable water demand. When compared to previous use data, these water use characteristics have remained relatively consistent throughout the last 10 years, reflecting the District’s predominantly residential service area and the continued prevalence of low-density single family housing.

15.5.1.2 Existing Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the District’s water distribution system up to the point of delivery to the customer’s system (e.g. up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association Method (AWWA).¹³² An electronic copy of the audit in Excel format is to be submitted to DWR by October 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to California Code of Regulations (CCR) Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB’s April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to CCR Section 996, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit. After 2028, the District shall assess compliance every three years as an average of recent losses. Additionally, the District will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

Consistent with DWR’s 2025 UWMP guidance, distribution system losses are reported using values submitted through DWR’s Water Loss Audit Program. **Table 15-16** summarizes the District’s reported losses for 2021 through 2024. 2025 data was not available at the time this 2025 RUWMP was prepared due to the reporting schedule associated with the AWWA water loss audit process.

¹³² Title 23 California Code of Regulations Section 638.1 et seq.

TABLE 15-16: DISTRIBUTION SYSTEM LOSS 2021 - 2024

2021	2022	2023	2024
14.3%	12.7%	15.0%	11.6%
Average:			13.4%

Due to the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year to year and month to month. On average, however, the District’s distribution system loss represents about 13.4% of water entering the system.

15.5.1.3 Water Loss Control Standard

CWC Section 10608.34 required the SWRCB to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the District was developed using information submitted as part of the District’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 865 gallons per mile of the distribution system (i.e., mains) per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 12.5%. Using the information from the same period, the average “apparent” water loss averaged 0.9% (of total water supplied). The total water loss estimate as a percentage of total water supplied is 13.4%, which is consistent with recent AWWA audits as discussed above.

15.5.2 Compliance with Water Use Targets and Objectives

This subsection examines the District’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020 and beyond.

15.5.2.1 Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the District to make incremental progress in reducing per capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the District to measure progress on achieving water efficiency goals.

The District’s 2020 GPCD target was established in the 2015 UWMP as 162 GPCD, derived as the “gross water use” divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC Section 10608.20(b). The District’s calculation of their 2020 actual GPCD used the same methodology: “Gross water” was defined as total water production measured and reported based upon well production records. This value, divided by the District’s estimated population in 2020, resulted in a compliance value of 126 GPCD. Because this value was less than the District’s established target, the District was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the UWMPA, in 2025, the District was determined to have an actual GPCD of 115, calculated using the same methodology presented above.

15.5.2.2 Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as “Making Conservation a California Way of Life,” was adopted in 2024, establishing individualized UWUO for each urban retail water supplier. In contrast to the SB X7-7 per capita targets, this legislation functions as a water budget tailored to a supplier’s service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. In each of the first three reporting years, the District submitted required annual reports to the SWRCB demonstrating that actual water use remained below its calculated UWUO, confirming compliance in 2023, 2024, and 2025.

15.5.3 Forecasting Customer Use

Future water use within the District’s service area is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP. As described in *Sub-Chapter 4.1.2 Future Regional Use of Regional Chapter 4 – Water Use Characterization*, this methodology integrates population and land use projections, historical water use trends, and demand management assumptions to estimate future water demands across participating agencies.

Consistent with this approach, the District’s future water use projections reflect both anticipated changes in customer demand and continued implementation of water use efficiency measures. Forecasts are developed by considering existing customer use characteristics, projected growth in population and service connections, and expected changes in per capita water use over the planning horizon.

The results of this regional forecasting framework, as applied to the District, are presented in the following subsections and corresponding tables.

15.5.3.1 Existing Customer Future Use

Future water use associated with the District’s existing customer base is projected based on current potable water use characteristics and representative GPCD values. As described in *Subsection 15.5.2.1*, the District’s current GPCD, derived from recent water production and population data, reflects the combined water use of all customer sectors, including both residential and non-residential demands.

The methodology used to develop the representative GPCD value for existing customers is fully described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. In general, this approach utilizes total annual potable water production divided by the corresponding service area population to establish a baseline GPCD value representative of current conditions.

For purposes of projecting future demand associated with existing customers, the District has assumed that current water use levels will remain constant over the planning horizon. This assumption reflects observed demand conditions within the District’s service area, where water use has stabilized following prior conservation efforts, regulatory requirements, and long-term demand management measures. As such, existing customer demand is considered “hardened” and no additional reductions in per capita water use have been applied to this customer group.

Accordingly, the District’s existing customer demand is projected to remain at approximately 2,722 acre-feet per year, based on a representative GPCD of 115, for the duration of the planning horizon. Because the representative GPCD is derived from total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage, as described in the prior subsection, has been applied to the existing customer demand projections.

15.5.3.2 New Customer Future Use

Future water use associated with new customers is projected using a regionally consistent forecasting methodology developed as part of the 2025 RUWMP as described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. This approach applies representative water use factors to projected population growth to estimate incremental demand associated with new development within the District’s service area.

Unlike existing customer demand, which is based on observed production, the new customer forecast is developed by aggregating the individual components of the District’s GPCD to reflect anticipated water use characteristics for future growth and development. These components distinguish between residential indoor and outdoor use, as well as non-residential demands, and are applied to projected population growth to estimate future demand.

For the District, the representative GPCD components applied to new customers are as follows:

- Indoor Residential Use: 47 GPCD
- Outdoor Residential Use: 31 GPCD
- Total Non-Residential Use: 23 GPCD
- Total Use: 101 GPCD

As with the existing customer demand GPCD, the resulting new GPCD represents total potable water production. However, the composition of this GPCD differs for new customers, as residential indoor water use is reduced over time to reflect compliance with applicable UWUO indoor standards, while outdoor residential and non-residential (CII) components are assumed to remain constant. The specific implementation schedule and applicable indoor water use standards are described in *Sub-Chapter 4.1.2 Forecasting Regional Water Use of Regional Chapter 4 – Water Use Characterization*. Accordingly, the aggregate GPCD applied to new customers declines over the planning horizon as indoor efficiency requirements are incrementally achieved. Because the representative GPCD is based on total potable water production, it inherently includes distribution system losses; therefore, no separate adjustment for the District’s representative loss percentage has been applied to new customer demand projections.

Table 15-17 presents the resulting combined existing and future customer water use forecast, with values rounded to the nearest five acre-feet, which serves as the basis for evaluating the District’s ability to meet projected demands under normal and drought conditions as described in *Sub-Chapter 15.7– Water System Reliability and Drought Risk Assessment*.

TABLE 15-17: FORECAST FUTURE WATER USE (AFY)

2025	2030	2035	2040	2045	2050
2,720	2,755	2,785	2,815	2,840	2,865

15.5.3.3 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The water use forecast presented in **Table 15-17** represents expected water needs under normal climatic conditions. In some regions, adjustments to this forecast may be warranted under drier conditions to reflect increased irrigation resulting from reduced rainfall. However, within the High Desert climate of the RUWMP Planning Area, urban water use is not typically influenced by variations in rainfall. Landscape and agricultural irrigation demands are not dependent on precipitation to meet water needs; therefore, reduced rainfall does not result in increased water use as it might in more temperate or rainfall-dependent regions.

Accordingly, no adjustments have been made to the forecast to account for single dry or multiple dry year conditions. The values presented in **Table 15-17** represent unconstrained demand and are assumed to be consistent across all hydrologic year types.¹³³

15.5.3.4 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The District will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

15.5.4 Forecasting Water Use for DRA and Annual Assessment

This subsection presents the subset of the District’s customer water use forecast that is used to evaluate short-term water supply reliability under drought and operational planning conditions. Specifically, this subsection supports two related, but distinct analyses required

¹³³ California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment. This reflects the expected demand prior to implementing shortage response actions as detailed in a Water Shortage Contingency Plan.

under California Water Code: the five-year Drought Risk Assessment (DRA) and the Annual Water Supply and Demand Assessment (Annual Assessment).

The DRA evaluates projected water demand over a five-year planning horizon under a sequence of dry conditions to assess potential supply shortfalls. The Annual Assessment, by contrast, is conducted each year and evaluates water supply and demand conditions over a rolling twelve-month period spanning July through June, incorporating both current year conditions and near-term projections. Together, these analyses rely on a consistent representation of “unconstrained demand” derived from the District’s long-term water use forecast presented in the preceding subsections. The following subsections describe the methodology and results used to develop water demand projections for each of these planning efforts.

15.5.4.1 Projecting Water Use for Five-Year Drought Risk Assessment

The DRA requires the District to evaluate water supply reliability over a five-year planning horizon under a sequence of dry conditions. Consistent with CWC Section 10635 and guidance provided in the 2025 UWMP Guidebook, this assessment is based on a projection of “unconstrained demand” representing anticipated customer water use absent shortage response actions.

For the purposes of the DRA, the District’s projected water demands are derived directly from the long-term water use forecast described in the preceding subsections. This forecast incorporates projected changes in population, service connections, and per capita water use, as well as the effects of ongoing water use efficiency measures and regulatory requirements. Because the DRA is intended to evaluate baseline system reliability, no additional demand reductions associated with the District’s Water Shortage Contingency Plan (WSCP) are applied.

Projected demands for the DRA are derived from the District’s long-term water use forecast developed for the 2025 RUWMP and the District’s retail-specific chapter and are expressed on an annual basis for each of the five years within the planning horizon. No additional adjustments are applied; the annual values reflect the same underlying methodology and assumptions used to develop the five-year planning increment forecasts presented elsewhere in this sub-chapter. These demand projections reflect total potable water demand, including residential, commercial, institutional, and other customer uses, as well as distribution losses. The demand projections used for the DRA are consistent with those used in the Annual Assessment to ensure alignment in the District’s evaluation of water supply reliability across planning timeframes.

Table 15-18 presents the District’s projected unconstrained water demands for the DRA period (2026-2030), with values rounded to the nearest five acre-feet. These values form the basis

for the reliability analysis presented in *Sub-Chapter 15.7– Water System Reliability and Drought Risk Assessment*.

TABLE 15-18: FORECAST DRA WATER USE FOR 2026 THROUGH 2030 (AFY)

2026	2027	2028	2029	2030
2,730	2,735	2,745	2,750	2,755

15.5.4.2 Projecting Water Use for Annual Assessments

The District conducts an Annual Water Supply and Demand Assessment each year in accordance with CWC requirements. These assessments are prepared and submitted to DWR by July 1 and evaluate anticipated water supply and demand conditions over a rolling twelve-month period spanning July through June.

The District has completed and submitted an Annual Assessment each year since 2022, as required by statute. While the results of these assessments are not included in this UWMP, the methodology and demand assumptions applied are consistent with those presented in this sub-chapter.

15.5.5 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, urban retail water suppliers are required to include projected water use for lower income households in their UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household is defined as one with an income below 80 percent of the area median income, adjusted for family size. For the purposes of the District’s sub-chapter within the 2025 RUWMP, a portion of the District’s service area is recognized as a Disadvantaged Community, and median income assumptions are consistent with those presented in *Sub-Chapter 2.1.7.2 Economic Trends and Other Social and Demographic Factors of Regional Chapter 2 – The Mojave Region*.¹³⁴ Accordingly, the water use forecast presented in **Table 16-17** is inclusive of disadvantaged community water use.

¹³⁴ California Department of Water Resources, Disadvantaged Communities Mapping Tool, available at: <https://gis.water.ca.gov/app/dacs/>

Sub-Chapter 15.6 – Water Conservation and Shortage Response

Pursuant to CWC Sections 10631(e) and 10632, this sub-chapter summarizes the District's demand management measures and water shortage response framework. These efforts support efficient use of available water supplies and provide the foundation for managing water use under both normal and shortage conditions.

The District has historically implemented a range of demand management measures aimed at improving water use efficiency, reducing long-term demand, and supporting compliance with applicable State requirements. These measures include ongoing programs, policies, and regional coordination efforts designed to manage existing customer use and guide future water use patterns.

This sub-chapter also highlights key components of the District's Water Shortage Contingency Plan (WSCP), including shortage levels, response actions, monitoring procedures, and communication strategies. The WSCP establishes the framework through which the District evaluates water supply conditions and implements staged response actions during periods of constrained supply. No substantive changes have been made to the District's 2020 WSCP, and the shortage levels, response actions, monitoring procedures, and communication protocols described therein remain applicable; however, water supply reliability information has been updated and is presented in the 2025 RUWMP and this chapter, reflecting current data, assumptions, and planning conditions.

A complete description of the District's WSCP, including detailed implementation procedures and supporting documentation, is provided in Appendix 15a.

15.6.1 Demand Management Measures

The District has implemented a comprehensive set of demand management measures (DMMs) to promote the efficient use of water and support long-term water supply reliability. These measures are consistent with the requirements of CWC Section 10631(e) and are designed to reduce water use, improve system efficiency, and support compliance with State water use objectives.

The District is a member of the Alliance for Water Awareness and Conservation (AWAC), a regional partnership of water agencies within the Mojave Water Agency service area focused on promoting water conservation, public outreach, and coordination of demand management efforts. Through its participation in AWAC and collaboration with regional partners, the District leverages shared resources and consistent messaging to enhance the effectiveness of its conservation programs.

The District will continue to implement and refine its DMMs to support efficient water use and meet applicable regulatory requirements. Additional information regarding recent and planned demand management activities is provided in the following subsections.

15.6.1.1 Foundational Demand Management Measures

The District's foundational DMMs remain unchanged from the 2020 UWMP and continue to serve as the basis for ongoing water conservation efforts. These measures include water waste prevention ordinances, metering, conservation-based rate structures, public education and outreach, programs to assess and manage distribution system losses, and coordination of conservation program implementation.

Water Waste Prevention Ordinances

The District has adopted and enforces water waste prevention ordinances that prohibit inefficient water use practices. These include restrictions on outdoor irrigation during specified daytime hours, prohibition of irrigation within 48 hours of measurable rainfall, prevention of runoff to adjacent properties and public rights-of-way, limitations on washing of hard surfaces except for health and safety purposes, requirements for use of automatic shut-off nozzles for vehicle washing, and prompt repair of leaks upon identification. These ordinances provide the regulatory framework for reducing unnecessary water use and are enforced through routine monitoring and customer outreach.

Metering

All potable water connections within the District are metered, allowing for accurate measurement of customer water use. Metering supports volumetric billing, enables customers to better understand their water use, and provides the data necessary for effective system management and demand forecasting.

Conservation Pricing

The District utilizes a conservation-oriented rate structure designed to encourage efficient water use and discourage excessive consumption. This rate structure provides a direct economic incentive for customers to reduce water use and supports long-term demand management objectives.

Public Education and Outreach

The District implements public education and outreach programs to promote water conservation and increase customer awareness of efficient water use practices. These efforts include coordination with regional partners to promote consistent conservation messaging and increase public awareness of water use efficiency.

Programs to Assess and Manage Distribution System Losses

The District conducts ongoing efforts to assess and manage distribution system losses, including leak detection, system maintenance, and infrastructure improvements. These efforts are supported by operational programs such as service line replacement and advanced metering, which improve system efficiency and reduce real water losses over time.

Customer Service and Support

The District provides customer support services to assist with water use efficiency, including leak detection assistance, irrigation troubleshooting, water use data access, and customer notifications for unusually high water use. These services enable customers to identify and address inefficiencies and support overall conservation efforts.

Conservation Program Coordination and Staffing Support

The District supports the implementation of DMMs through dedicated staffing and coordination with regional partners. Participation in regional conservation programs, including AWAC, allows the District to leverage shared resources, improve program effectiveness, and maintain consistency with broader regional water conservation efforts.

15.6.1.2 Recent DMM Activities

The District has continued to implement and expand DMMs to improve water use efficiency, reduce system losses, and enhance overall system performance. Recent activities have focused on infrastructure improvements, advanced metering, customer engagement, and evaluation of emerging technologies.

Service Line Replacement Program

The District has prioritized reduction of real water losses through its ongoing Service Line Replacement Program, initiated in 2018. This program targets aging and leak-prone service lines throughout the distribution system and has resulted in the replacement of approximately one-third of all service lines to date. These improvements have contributed to measurable reductions in system losses and improved overall system reliability, even as the number of service connections has increased.

District-Wide Meter Replacement Program (AMI Implementation)

In 2024, the District completed a system-wide transition from Automated Meter Reading (AMR) to Advanced Metering Infrastructure (AMI). The AMI system provides near real-time

water use data, enhances billing accuracy, and enables automated leak detection through continuous flow monitoring. Customers are able to track their water use and receive alerts for potential leaks through an online portal, while District staff utilize system analytics to identify abnormal usage patterns and potential system inefficiencies.

Customer Conservation Outreach and High Usage Notifications

The District continues to implement targeted customer outreach efforts to promote water conservation and improve water use efficiency. These efforts include direct engagement with high-use customers, provision of water use data and conservation guidance, and coordination with regional program through AWAC. The District also provides customer support services such as water audits, leak detection assistance, and irrigation troubleshooting to help customers identify and address inefficiencies.

Landscape Conservation and Turf Policies

Consistent with the District’s rural, desert service area, landscape irrigation demand is limited relative to more urbanized regions. The District promotes desert-friendly landscaping and discourages installation of high-water-use turf; however, enforcement of landscape ordinances, including the Model Water Efficient Landscape Ordinance (MWELO), is administered by San Bernardino County. As a result, landscape-related demand management measures are primarily implemented through outreach and customer education rather than regulatory enforcement.

Emerging Strategies and Technologies

The District continues to evaluate and implement new strategies to further improve system efficiency and reduce water losses. Planned and ongoing efforts include development of District Metered Areas (DMAs) to improve system-level monitoring and leak detection, as well as evaluation of advanced technologies such as satellite-based and synthetic aperture radar methods for identifying subsurface leaks. These approaches are expected to enhance the District’s ability to proactively manage water use and maintain system reliability.

15.6.1.3 Planned DMM Activities

At this time, the District does not anticipate implementing new demand management programs beyond those currently in place. The District’s existing DMMs provide a comprehensive framework for promoting efficient water use and will continue to be implemented and refined as necessary to meet evolving regulatory requirements and operational needs. Planned activities are primarily focused on expanding and enhancing existing programs, including continued reduction of distribution losses, optimization of AMI data for leak detection and customer engagement, and implementation of DMAs to improve system-level monitoring and operational efficiency. The District will also continue to evaluate emerging technologies to support proactive system management and water loss control.

The District remains committed to efficient and responsible use of water resources and will continue to support customer awareness and conservation practices through targeted outreach and regional coordination. Consistent with applicable State requirements, including UWUO provisions and forthcoming water loss performance standards, the District will continue to monitor water use and adjust its demand management approach as needed to support long-term water use efficiency and regulatory compliance.

15.6.2 Water Shortage Contingency Plan

The District has adopted a Water Shortage Contingency Plan (WSCP) in accordance with CWC Section 10632. The WSCP establishes a structured framework for managing water supply shortages through defined shortages levels, corresponding response actions, and ongoing monitoring of water supply and demand conditions. The WSCP is designed to ensure that the District can respond effectively to a range of water shortage conditions, from minor supply constraints to more severe drought scenarios. The plan identifies stages of water shortage based on severity of supply conditions and outlines the actions the District may implement to reduce demand, manage available supplies, and maintain essential public health and safety services.

The WSCP also incorporates procedures for evaluating water supply reliability, including coordination with the District's Annual Water Supply and Demand Assessment, which serves as the primary mechanism for identifying and responding to changing water supply conditions on an ongoing basis. Public communication and outreach are integral components of the WSCP and are used to inform customers of water supply conditions, required conservation actions, and applicable restrictions during shortage events. The following subsections summarize key components of the District's WSCP, including shortage levels, response actions, and monitoring and implementation procedures.

15.6.2.1 Summary of Water Shortage Response Actions

The District's WSCP establishes a series of defined water shortage levels that correspond to increasing degrees of supply constraint, associated demand reduction targets, and specific response actions. This staged framework enables the District to implement proportional measures to manage water use and maintain essential public health and safety services during periods of reduced supply. The WSCP includes six shortage levels, each associated with a targeted reduction in water use relative to normal conditions. As shortage conditions intensify, the District may implement progressively more restrictive measures to reduce demand and manage available supplies. The general framework of shortage levels and representative response actions is summarized below:

- Stage 1 – Up to 10% Shortage (Water Shortage Watch):
Increased public awareness and outreach, along with continued enforcement of existing water waste prohibitions and encouragement of voluntary conservation.

- Stage 2 – Up to 20% Shortage:
Implementation of mandatory conservation measures, including increased enforcement of existing water use restrictions and limitations on outdoor irrigation and other non-essential uses.
- Stage 3 – Up to 30% Shortage:
Expansion and intensification of mandatory restrictions, including further limitations on outdoor water use, increased enforcement, and enhanced conservation efforts to achieve additional demand reductions.
- Stage 4 – Up to 40% Shortage:
Implementation of significant demand reduction measures through stricter enforcement of water use restrictions, additional limitations on outdoor irrigation, and operational adjustments to manage available supplies.
- Stage 5 – Up to 50% Shortage:
Implementation of severe restrictions on non-essential water use, increased enforcement, and additional operational actions to manage increasingly limited supplies.
- Stage 6 – Up to 60% Shortage:
Implementation of emergency response measures necessary to protect public health and safety, including curtailment of non-essential uses, potential customer-specific limitations, and prioritization of critical water needs.

Response actions are cumulative across stages, such that measures implemented in earlier stages remain in effect and are intensified as needed in subsequent stages. As water supply conditions change, the District may transition between shortage levels based on ongoing evaluation of supply availability, customer demand, and system conditions.

15.6.2.2 Summary of Monitoring Procedures and Implementation

The District’s WSCP includes procedures for monitoring water supply and demand conditions and implementing appropriate response actions based on observed and anticipated conditions. These procedures ensure that shortage response actions are timely and commensurate with the severity of supply constraints. The District monitors key indicators of water supply reliability, including groundwater production, available supply allocations, customer demand, and system conditions. This information is used to evaluate supply availability and inform decisions regarding the initiation, modification, and termination of water shortage stages.

The District’s Annual Water Supply and Demand Assessment serves as the primary mechanism for evaluating near-term supply reliability and informing implementation of

shortage response actions. Additional detail regarding the Annual Assessment is provided in *Subsection 15.5.4 Forecasting Water Use for DRA and Annual Assessment of Sub-Chapter 15.5- Water Use Characterization*.

Implementation of the WSCP includes coordination among District staff and communication with customers and regional partners. When a water shortage stage is implemented, the District provides public notification of applicable restrictions and conservation measures and monitors compliance to ensure demand reduction targets are achieved.

Sub-Chapter 15.7 – Water System Reliability and Drought Risk Assessment

This sub-chapter evaluates the reliability of the District’s water supplies to meet projected demands under a range of hydrologic conditions, consistent with CWC Sections 10631 (c) and 10635. The analysis integrates the water supply characterization presented in *Sub-Chapter 15.4 – Water Supply and Infrastructure Characterization* with the water use projections developed in *Sub-Chapter 15.5 – Water Use Characterization* to assess the District’s ability to meet customer demands during normal, single dry, and multiple dry year conditions.

The reliability analysis considers the availability of the District’s water supplies, including groundwater production and supplemental supplies, in relation to projected customer demands over the planning horizon. This evaluation is intended to identify potential supply shortfalls and assess the District’s capacity to maintain reliable water service under varying conditions. In addition to the long-term reliability analysis, this sub-chapter incorporates the District’s Drought Risk Assessment, which evaluates water supply reliability over a five-year planning horizon under a sequence of dry conditions.

The results of this analysis provide the basis for evaluating the District’s water supply reliability and inform the implementation of the District’s WSCP, as described in *Sub-Chapter 15.6 – Water Conservation and Shortage Response*.

15.7.1 Five Year Drought Risk Assessment

The DRA evaluates the District’s ability to meet projected water demands over a five-year planning horizon under a sequence of dry conditions. This assessment provides a forward-looking evaluation of water supply reliability and is intended to identify potential supply-demand imbalances under extended drought scenarios. Projected water demands for the DRA as based on the District’s unconstrained demand forecast described in *Sub-Chapter 15.5 – Water Use Characterization* and are expressed on an annual basis over the five-year planning period. These demands reflect anticipated customer use absent implementation of shortage response actions.

Available water supplies are evaluated based on the District’s managed groundwater supplies, which include groundwater production within the MBA, limited groundwater production from the AVAA, and supplemental supplies such as replacement water, make-up

water, and transfers and exchanges available through MWA, as described in *Sub-Chapter 15.4 – Water Supply and Infrastructure Characterization*. Under the terms of the MBA adjudication, the District has discretion in managing its groundwater production and associated supplemental supplies, which comprise the majority of its water supply, allowing it to adjust its supply portfolio to meet projected demands during dry conditions.

The DRA compares projected water demands to available supplies to evaluate the District’s capacity to meet customer needs over the five-year period. **Table 15-19** presents the results of this analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the DRA planning horizon, with values rounded to the nearest five acre-feet.

TABLE 15-19: FIVE YEAR DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	2,730	2,735	2,745	2,750	2,755
Demand	2,730	2,735	2,745	2,750	2,755
Difference	0	0	0	0	0

15.7.2 Long Term Service Reliability

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The District’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 – 2050.

15.7.2.1 Normal and Single Dry Conditions 2030 – 2050

The following analysis evaluates the District’s availability to meet projected water demands under normal and single dry year conditions for the 2030 through 2050 planning horizon. This evaluation compares available water supplies to projected customer demands to assess the District’s capacity to reliably meet water needs under varying hydrologic conditions. Under both normal and single dry year conditions, the District’s supplies are managed within the framework of the MBA adjudication, which provides flexibility in balancing groundwater production and supplemental supplies. As a result, available supplies are sufficient to meet projected demands throughout the planning horizon.

Table 15-20 presents the results of the normal and single dry year reliability analyses, including projected demands, available supplies, and resulting surplus or shortage for each timestep from 2030 through 2050. Values are rounded to the nearest five acre-feet.

TABLE 15-20: NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

Normal Year	2030	2035	2040	2045	2050
Supply	2,755	2,785	2,815	2,840	2,865
Demand	2,755	2,785	2,815	2,840	2,865
Difference	0	0	0	0	0

Single Dry Year	2030	2035	2040	2045	2050
Supply	2,755	2,785	2,815	2,840	2,865
Demand	2,755	2,785	2,815	2,840	2,865
Difference	0	0	0	0	0

15.7.2.2 Five Consecutive Dry Years 2030 – 2050

The following analysis evaluates the District’s ability to meet projected water demands over a five-year period of consecutive dry conditions for the 2030 through 2050 planning horizon. This assessment provides a more conservative evaluation of water supply reliability by examining the potential effects of extended drought conditions on available supplies. Under multiple dry year conditions, the District continues to manage its supplies within the framework of the MBA adjudication, which allows for flexibility in balancing groundwater production and supplemental supplies. This managed approach enables the District to adjust its supply portfolio over time to meet projected demands, even during extended periods of drought.

Table 15-21 presents the results of the multiple dry year reliability analysis, including projected demands, available supplies, and any resulting surplus or shortage for each year of the five-year dry sequence. Values are rounded to the nearest five acre-feet.

Together, the available supplies, when paired against projected demand conditions, demonstrate that the District has sufficient supplies to meet water demands under five consecutive dry year conditions through 2050.

TABLE 15-21: FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (AFY)

		2030	2035	2040	2045	2050
Year 1	Supply	2,755	2,785	2,815	2,840	2,865
	Demand	2,755	2,785	2,815	2,840	2,865
	Difference	0	0	0	0	0
Year 2	Supply	2,765	2,795	2,820	2,845	2,870
	Demand	2,765	2,795	2,820	2,845	2,870
	Difference	0	0	0	0	0
Year 3	Supply	2,770	2,800	2,825	2,850	2,875
	Demand	2,770	2,800	2,825	2,850	2,875
	Difference	0	0	0	0	0
Year 4	Supply	2,775	2,805	2,830	2,855	2,880
	Demand	2,775	2,805	2,830	2,855	2,880
	Difference	0	0	0	0	0
Year 5	Supply	2,780	2,810	2,835	2,860	2,885
	Demand	2,780	2,810	2,835	2,860	2,885
	Difference	0	0	0	0	0

15.7.3 Annual Reliability Assessment

Each year, the District considers current supply and demand conditions and performs an Annual Water Supply and Demand Assessment pursuant to CWC Section 10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the District’s Water Shortage Contingency Plan. The District has conducted the assessment as required by the CWC and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

15.7.4 Water Supply Reliability Summary

The District's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

Sub-Chapter 15.8 – Energy Intensity Analysis

Pursuant to CWC Section 10631.2, the District evaluates the energy intensity of its water supply and distribution system. Energy intensity is defined as the amount of energy used to extract, treat, and deliver water to customers and is typically expressed in kilowatt-hours per acre-foot (kWh/AF). The District’s water supply portfolio is primarily comprised of locally produced groundwater. As a result, energy use is largely associated with groundwater extraction and distribution within the District’s service area, rather than long-distance conveyance or advanced treatment processes.

The District continues to monitor energy use associated with its water system operations and will evaluate opportunities to improve operational efficiency where feasible. Total energy intensity is reported in **Table 15-22**.

TABLE 15-22: ENERGY INTENSITY – TOTAL UTILITY APPROACH FOR JAN 2025 THROUGH DEC 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	2721.71
Energy Consumed (kWh)	2,936,657.31
Energy Intensity (kWh/acre-foot)	1,078.98

PHELAN PIÑON HILLS CSD

APPENDICES

This page is reserved for Phelan Piñon Hills CSD-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to Phelan Piñon Hills CSD's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the Phelan Piñon Hills CSD retailer chapter, Phelan Piñon Hills CSD's WSCP, and applicable Phelan Piñon Hills CSD-specific appendices.

Chapter 16.0 VICTORVILLE WATER DISTRICT



TABLE OF CONTENTS

Sub-Chapter 16.1 – Introduction	16-7
16.1.1 Chapter Organization	16-7
16.1.2 Background and Purpose	16-7
16.1.3 Basis for Plan Preparation.....	16-9
16.1.4 Coordination and Outreach	16-9
16.1.5 RUWMP Adoption	16-9
Sub-Chapter 16.2 – Water Service Area Description	16-11
16.2.1 General Description	16-11
16.2.2 Service Area Climate	16-11
Sub-Chapter 16.3 – Population, Land Use, Economy, and Demographics	16-13
16.3.1 Population.....	16-13
16.3.2 Current and Projected Land Use	16-14
16.3.3 Economic Trends & Other Social and Demographic Factors	16-16
Sub-Chapter 16.4 – Water Use Characterization	16-17
16.4.1 Current Customer Water Use	16-17
16.4.2 Projected Water Use.....	16-22
16.4.3 Compliance with SBx7-7 and Future Water Use Efficiency Requirements.....	16-25
Sub-Chapter 16.5 – Water Supply Characterization	16-27
16.5.1 Purchased or Imported Water	16-27
16.5.2 Groundwater	16-28
16.5.3 Groundwater Quality	16-29
16.5.4 Surface Water	16-29
16.5.5 Stormwater	16-29
16.5.6 Wastewater and Recycled Water	16-30
16.5.7 Desalination	16-35
16.5.8 Water Transfers and Exchanges	16-36
16.5.9 Future Water Projects	16-36
16.5.10 Supply Summary	16-36
Sub-Chapter 16.6 – Water Service Reliability and Drought Risk Assessment.....	16-38



16.6.1 Water Service Reliability Assessment..... 16-38
16.6.2 Drought Risk Assessment 16-41
Sub-Chapter 16.7 – Demand Management Measures 16-43
16.7.1 Existing Demand Management Measures 16-43
16.7.2 Reporting Implementation16-47
Sub-Chapter 16.8 – Water Shortage Contingency Plan..... 16-48
Sub-Chapter 16.9 – Energy Intensity Analysis..... 16-50



LIST OF TABLES

Table 16-1: Public Water System Information.....	16-9
Table 16-2: Historical and Current Population	16-14
Table 16-3: Projected Population.....	16-14
Table 16-4: VWD 2021–2025 Connections by Use Type.....	16-17
Table 16-5. Historical Potable Water Use by Customer Class (AFY).....	16-18
Table 16-6: DWR 4–5R Water Loss Audit Reporting.....	16-19
Table 16-7: DWR 4–6R Progress Towards 2028 Water Loss Standard.....	16-21
Table 16-8: Connection Growth Assumptions.....	16-23
Table 16-9: Projected Potable Demands for Water (AFY).....	16-24
Table 16-10: DWR 4–3R Inclusion in Water Use Projections.....	16-24
Table 16-11: SBx7–7 2020 Target Progress.....	16-25
Table 16-12: VWD Historical R–Cubed Purchases	16-27
Table 16-13: Groundwater Pumped Last Five Years.....	16-29
Table 16-14: DWR 6–2R Wastewater Collected within Service Area in 2025 (AF)	16-31
Table 16-15: DWR 6–3R: Wastewater Treatment and Outcomes within UWMP Service Area in 2025, AFY.....	16-32
Table 16-16: Recycled Water Connections, 2021–2025.....	16-33
Table 16-17: Historic RW Demand, AFY.....	16-33
Table 16-18: DWR Table 6–5R 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual.....	16-34
Table 16-19: Projected RW Use, AFY	16-34
Table 16-20: DWR 6–8R Actual Water Supplies in 2025 (AF)	16-36
Table 16-21: Projected Supply, AFY.....	16-37
Table 16-22: Supply and Demand Comparison for Normal, Single–Dry, and Multiple–Dry Year Scenarios, AFY.....	16-40
Table 16-23. Five Consecutive Dry Years Water Supply and Demand Comparison, AFY	16-41
Table 16-24: Drought Risk Assessment (AFY).....	16-42
Table 16-25: DMMs Implemented over the Past Five Years	16-47
Table 16-26: 2025 Energy Intensity.....	16-50



LIST OF FIGURES

Figure 16-1: Victorville Water District Service Area..... 16-12
Figure 16-2: Victorville General Plan Land Use Map..... 16-15
Figure 16-3: Baseline, Historic, and Projected GPCD..... 16-26



APPENDICES

Victorville Water District Appendices..... 16-51



Sub-Chapter 16.1 – Introduction

This section provides a brief overview of Victorville Water District (VWD) and evaluates its long-term resource planning and establishes management measures to ensure adequate water supplies are available to meet existing and future demands. This plan constitutes the 2025 UWMP for VWD.

16.1.1 Chapter Organization

This chapter is organized as follows:

- Sub-Chapter 16.1 Background and Purpose
- Sub-Chapter 16.2 Water Service Area Description
- Sub-Chapter 16.3 Population, Land Use, Economy, and Demographics
- Sub-Chapter 16.4 Water Use Characterization
- Sub-Chapter 16.5 Water Supply Characterization
- Sub-Chapter 16.6 Water Service Reliability and Drought Risk Assessment
- Sub-Chapter 16.7 Demand Management Measures
- Sub-Chapter 16.8 Water Shortage Contingency Plan
- Sub-Chapter 16.9 Energy Intensity Analysis

16.1.2 Background and Purpose

VWD has ensured compliance with the UWMPA requirements for urban water suppliers through its participation in the 2025 RUWMP and preparation of this chapter.¹³⁵

The purpose of a UWMP is for water suppliers to evaluate their long-term resource planning and establish management measures to ensure adequate water supplies are available to meet existing and future demands. The UWMP provides a framework to help water suppliers maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and

¹³⁵ California Water Code Sections 10610 through 10657.

provide a mechanism for response during drought conditions or other water supply interruptions. The UWMP is a valuable planning tool used for multiple purposes, including:

- Provide a standardized methodology for water utilities to assess their water resource needs and availability.
- Serve as a resource to the community and other interested parties regarding water supply and demand, conservation, and other water related information.
- Provide a key source of information for cities and counties when they are considering approval of proposed new developments and preparing regional long-range planning documents, such as City and county General Plans.
- Inform other regional and statewide water planning efforts, such as Integrated Regional Water Management Plans and the California Water Plan.

The 2025 RUWMP provides an update to VWD’s 2020 UWMP and presents new data and analysis since 2020. The 2025 RUWMP is also a comprehensive regional water planning document that describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use for all urban water suppliers and water users within the RUWMP plan area.

DWR provides guidance for urban water suppliers by preparing an UWMP Guidebook 2025 (California Department of Water Resources, January 2026), conducting workshops, developing tools, and providing program staff to help water suppliers prepare comprehensive and useful water management plans, implement water conservation programs, and understand the requirements in the CWC. Suppliers prepare their own UWMPs in accordance with the requirements and submit them to DWR. DWR then reviews the plans to make sure they address the requirements identified in the CWC and submits a report to the Legislature summarizing the status of the plans for each five-year cycle. The 2025 DWR UWMP Guidebook, finalized in January 2026, was used to complete this 2025 UWMP.

CWC 10632 also includes updated requirements for suppliers to prepare a Water Shortage Contingency Plan (WSCP). The WSCP documents a supplier’s plans to manage and mitigate an actual water shortage condition, should one occur because of drought or other impacts on water supplies. In the 2015 UWMP cycle, the WSCP was part of the UWMP. For the 2020 update, the WSCP was required to be a standalone document so that it can be updated independently of the UWMP, but it must be referenced in and attached to the 2020 UWMP. Similar to the 2020 UWMP, VWD’s WSCP has been reviewed and updated as part of the 2025 UWMP update. An overview of the WSCP is described in this chapter, and the standalone WSCP is attached as Appendix 16a.

Additional details regarding the background and purpose of the RUWMP are provided in *Section 1.1 of Regional Chapter 1*.



16.1.3 Basis for Plan Preparation

VWD provides water to a service area that includes most of the City of Victorville (Victorville) and areas of unincorporated San Bernardino County. VWD operates a single public water system. VWD’s current connections and water supplied are presented in **Table 16-1**. The District is classified as an Urban Water Supplier as described in CWC Section 10617, providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. Throughout this RUWMP chapter, water volume is represented in units of AFY, unless otherwise noted, and data are presented on a calendar year basis.

TABLE 16-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections
CA3610052	Victorville water District	39,037

16.1.4 Coordination and Outreach

VWD coordinated with neighboring agencies and relevant public entities, as required by the UWMPA to ensure consistency with related land use and water resource planning efforts. This coordination included agencies that share common water sources, regional water management entities, and local governments with land use authority. VWD also met the requirements of CWC Section 10621(b) by conducting a public hearing to encourage community participation. As part of 2025 RUWMP development, these coordination and outreach activities were carried out at the regional level. More information on these efforts is provided in *Sub-Chapter 1.3 Coordination and Outreach of Regional Chapter 1*.

16.1.5 RUWMP Adoption

16.1.5.1 Notice of Public Hearing and Adoption

To fulfill the requirements of CWC Section 10642 of the UWMP Act, VWD made the 2025 RUWMP and the VWD WSCP available for public review online and at the main VWD office located at 14343 Civic Drive, Victorville, CA 92392, during normal business hours prior to the public hearing.

As part of the RUWMP, MWA, on behalf of the water suppliers, noticed the public hearing in a local newspaper to solicit input from the public regarding the draft RUWMP and WSCP for the participating agencies. A copy of the public outreach materials, including newspaper notices and invitation letters, are included in Appendix 16c.



VWD held a public hearing regarding its UWMP and WSCP on June 16, 2026, prior to their adoption. The UWMP and WSCP were publicly reviewed during the June 16, 2026 public hearing. This hearing provided the cities, counties, and members of the public a chance to review the staff reports and to attend the hearing to provide comment. The public hearing took place before the adoption, allowing opportunity for the reports to be modified in response to public input. Following the closing of the public hearing, the WSCP and UWMP were adopted by VWD on June 16, 2026.

A copy of the Resolution of Plan Adoption signed by the VWD council members is included as Appendix 16d of this UWMP. The UWMP includes all applicable information necessary to meet the requirements of the CWC. The 2025 UWMP and WSCP were submitted to the DWR within 30 days of adoption (electronically using the WUEdata reporting tool) and an electronic copy was sent to the California State Library. Electronic copies were provided to all cities and counties within VWD's service area via email and posted on the VWD website within 30 days of adoption.

16.1.5.2 Amending an Adopted UWMP or WSCP

Amendments to the VWD portions of the 2025 RUWMP and VWD WSCP will be made on an as-needed basis. Should VWD need to amend the adopted 2025 RUWMP or WSCP in the future, VWD will hold a public hearing for review of the proposed amendments to the document and send a 60-day notification letter to all cities and counties within its service area and notify the public in the same manner as set forth in this RUWMP. Once the amended document is adopted, a copy of the finalized version will be distributed to the California State Library, DWR (electronically using the WUEdata reporting tool), and all cities and counties within VWD's service area within 30 days of adoption. The finalized version will also be made available to the public both online on VWD's website and in person at VWD's office during normal business hours.



Sub-Chapter 16.2 – Water Service Area Description

This section describes the VWD’s water system, service area, and local climate. VWD’s service area is shown in **Figure 16-1**.

16.2.1 General Description

VWD is located in the southwest region of San Bernardino County, California. VWD lies north of the San Bernardino Mountains in the Mojave Desert, approximately 90 miles northeast of Los Angeles. VWD’s service area encompasses 85 square miles and includes the entire City of Victorville as well as areas within Victorville’s sphere of influence. VWD is bounded by the City of Adelanto to the west and the City of Hesperia to the south. The City of Apple Valley, Spring Valley Lake, and the Mojave Narrows Regional Park lie to the east. VWD’s service area also includes the Southern California Logistics Airport (SCLA), comprising approximately 14 square miles.

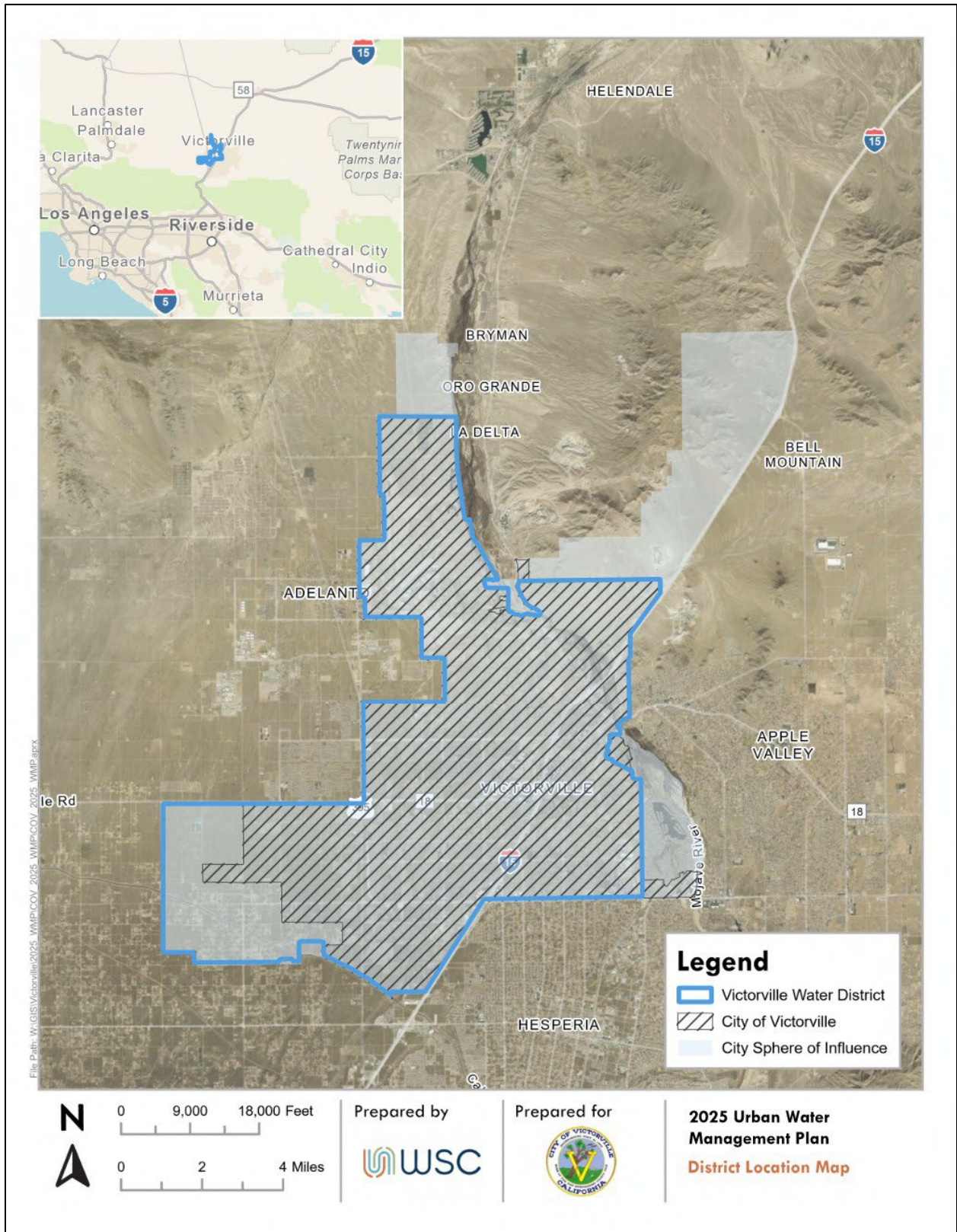
VWD provides water services to approximately 39,000 customer connections, serving a population of approximately 148,300 people. VWD’s water enterprise includes approximately 694 miles of distribution and transmission mains, 34 active wells, 4 booster pumping stations, 26 water storage reservoirs, 1 recycled water storage tank, and 25 pressure-regulating stations.

16.2.2 Service Area Climate

VWD’s is located in the High Desert region of San Bernardino County and tends to experience more extreme variations in climate throughout the year. Details regarding the regional climate and climate change are discussed in Sub-Chapters 2.1.5 and 2.1.6 of Regional Chapter 2 – The Mojave Region.



FIGURE 16-1: VICTORVILLE WATER DISTRICT SERVICE AREA



Sub-Chapter 16.3 – Population, Land Use, Economy, and Demographics

16.3.1 Population

Population estimates for VWD are based on data from the U.S. Census Bureau (Census) and the Southern California Association of Governments (SCAG). A geographic information systems (GIS) analysis of 2020 Census data was used to determine VWD’s 2020 service area population of 141,104. The 2020 population and the number of residential connections served by VWD in 2020 were used to derive a 2020 persons per residential connection factor of 4.1. This factor was then multiplied by VWD’s number of residential connections in 2025 to estimate 2025 population serviced by VWD. In 2025, it is estimated that 148,323 people were served by VWD.

To project future population served by Victorville from 2030 to 2050, the 2020 persons per residential connection factor and estimates of future residential connections were used. The projected number of future residential connections was developed as part of the water demand projection approach, described in Section 16.4.2. To estimate future population, the number of persons per residential connection of 4.1 was assumed to remain constant through 2050. This approach may be conservative because SCAG forecasts indicate that the number of persons per household will decline over time. VWD’s historic connection and population data does not currently indicate a declining trend, but VWD will continue to monitor trends as demand forecasts are updating in the future. The resulting population projections are shown in **Table 16-3**.

SCAG’s demographics and growth forecast for the 2024 Connect SoCal Regional Transportation Plan (2024 Connect SoCal RTP) was also considered. The 2024 Connect SoCal RTP includes estimated population, households, and employment for the years 2019, 2035, and 2050 by traffic analysis zones (TAZs) within the SCAG region. SCAG develops such forecasts in collaboration with local jurisdictions to project future population, housing, and employment values. To determine the SCAG based future population, housing, and employment for VWD, SCAG data for the VWD water service area was analyzed using a combination of GIS tools and a spreadsheet analysis. The resulting SCAG population projections for VWD were slightly lower than the connection-based approach described above but were generally in agreement and within a few percent.

The current and historical population is provided in **Table 16-2** and projected population for the VWD service is provided in **Table 16-3**.



TABLE 16-2: HISTORICAL AND CURRENT POPULATION

2000	2005	2010	2015	2020	2025
69,095	91,832	122,051	128,005	141,104	148,323

TABLE 16-3: PROJECTED POPULATION

	2030	2035	2040	2045	2050
Population	157,229	166,135	175,042	183,948	192,855

16.3.2 Current and Projected Land Use

The City of Victorville’s land use framework is defined by its 2045 General Plan Land Use Element, which establishes the planned distribution and intensity of residential, commercial, industrial, public, and open space uses within the City and its Sphere of Influence. The General Plan Land Use Map is shown in **Figure 16-2**. Residential land uses represent the largest share of developed land (approximately 48%), 31% is designated as specific plan, 9% is commercial, and less than 5% each is designated as industrial, mixed use, agriculture, open space, or undeveloped/protected land.

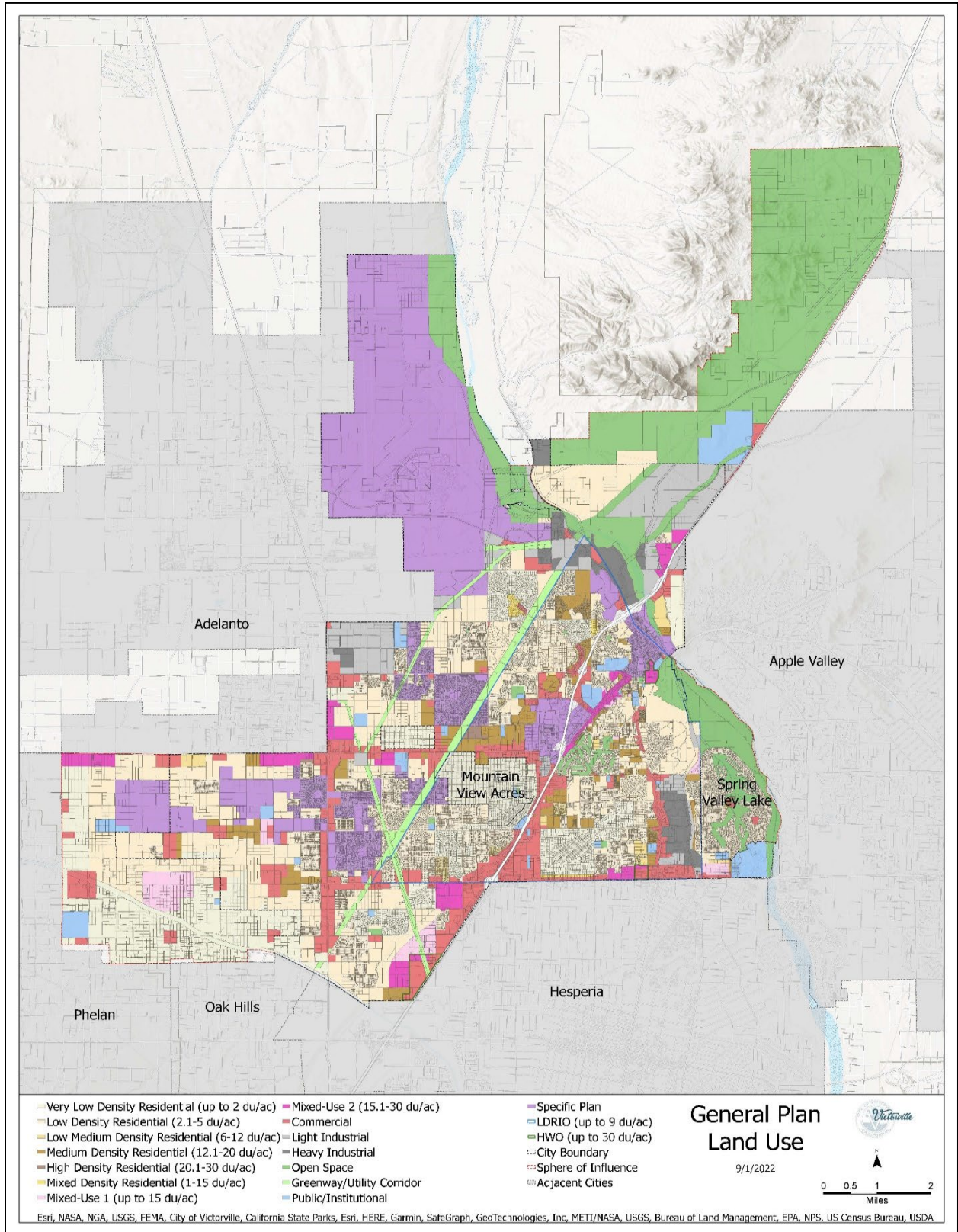
The Land Use Element provides a broad range of residential densities (from very low density to high-density multi-family), along with mixed-use areas that integrate housing with commercial and employment uses, particularly along key corridors and activity centers. Commercial and industrial uses are concentrated in areas with regional access to support economic activity, while public, institutional, and open space designations preserve resources and provide recreational opportunities.

The City’s growth strategy emphasizes smart growth principles, including compact development, multi-modal connectivity, and water-efficient landscaping practices, which are relevant considerations for long-term water demand planning.

The water demand forecasts prepared for the VWD UWMP are based on historic and expected development and water use trends, in alignment with the City’s General Plan.



FIGURE 16-2: VICTORVILLE GENERAL PLAN LAND USE MAP



16.3.3 Economic Trends & Other Social and Demographic Factors

Demographic factors that can influence future water demand include land use, relative proportion of single-family residences to multifamily residences, population density, economic characteristics (e.g., income levels, employment rate), and the composition of customer types.

Census data reported that 29% of residents within the City of Victorville identified as White, 18% identified as Black and 46% identified as Two or More Races or Some Other Race Alone. Out of the total population, 55% were of Hispanic origin. Census data also reported that approximately 65% of residents are homeowners and the average median household income is \$80,407.

With relatively more affordable housing compared to areas closer to the coast, a large commuter population also works in nearby Los Angeles and Orange counties. The number of residents commuting to jobs in nearby counties is expected to increase in the near term as housing prices continue to rise and supply remains constrained (UCR School of Business, 2020). Based on Census data, approximately 78% of people drive alone to work, and an additional 9% carpool. The average travel time to work is approximately 40 minutes (United States Census Bureau, 2026).

SCAG also projects employment rate as part of its forecasts. For the VWD service area, the employees annual growth rate is projected as 1.09% through 2035 and projected to decrease to 0.65% for 2035 through 2050.



Sub-Chapter 16.4 – Water Use Characterization

This section describes potable historical and current water use and presents projected potable demands within VWD’s service area. Water use is presented by customer class, including residential, commercial, institutional, landscape, and other purposes. Recycled water historic and projected uses are discussed in Section 16.6.

16.4.1 Current Customer Water Use

VWD categorizes its water customers as single-family residential, multi-family residential, commercial/institutional, and landscape. The number of active connections in each category from 2021 to 2025 is shown in **Table 16-4**.

TABLE 16-4: VWD 2021-2025 CONNECTIONS BY USE TYPE

Use Type	2021	2022	2023	2024	2025
Single Family Residential	33,709	34,071	34,585	35,091	35,575
Multi-Family Residential	762	762	763	764	785
Commercial	2,178	2,202	2,220	2,227	2,252
Landscape	386	387	408	419	425
Total	37,035	37,422	37,976	38,816	39,037

VWD’s actual water use by customer class for 2021–2025 is shown in **Table 16-5**. In 2025, approximately 59% of VWD’s potable water deliveries were to single-family residential, 9% were to multifamily residential, 25% were to commercial and institutional, and 6% were to landscape deliveries.

VWD has emergency connections with the Phelan/Piñon Hills Community Services District, Adelanto Public Utilities Authority (PUA), and Liberty Utilities Apple Valley to deliver water in emergencies. Water deliveries were made to Adelanto PUA most years from 2021 to 2025 and a small amount was sold to Liberty Apple Valley in 2025. As these connections are intended for emergency use, VWD does not intend to regularly sell water to these agencies in the future.



TABLE 16-5. HISTORICAL POTABLE WATER USE BY CUSTOMER CLASS (AFY)

Use Type	2021	2022	2023	2024	2025
Single-Family Residential	12,679	12,332	11,221	11,464	12,072
Multi-Family Residential	1,929	1,939	1,805	1,819	1,877
Commercial	5,703	5,590	4,901	5,157	5,031
Landscape	1,244	1,360	1,202	1,196	1,316
Water Losses	1,242	565	1,361	1,820	1,098
Sales to Other Agency	157	0	137	163	7
Total Potable Demand	22,953	21,879	20,627	21,618	21,402

16.4.1.1 Existing Distribution System Losses

Distribution system water losses are the potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. VWD monitors its water loss and prepares an annual AWWA Water Audit to estimate the volume of water loss. VWD has submitted all required water loss audits to the State, as shown in **Table 16-6**.

TABLE 16-6: DWR 4-5R WATER LOSS AUDIT REPORTING

Public Water System ID # Reported in Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA3610052	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes
2020 AWWA: Victorville_FWAS v6.0_CY20_v2.xlsx 2021 AWWA: Victorville_CY21_v2.xls 2022 AWWA: CA3610052-Victorville-CY2022_LIV.xlsx 2023 AWWA: CA3610052_CY23_LIV.xlsx 2024 AWWA: CA3610052_CY24_LIV v6.1.xlsx		

CWC Section 10608.34 required the State Water Board to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Water Board and the supplier’s own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier’s baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpm�), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier’s real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier’s water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show the supplier’s progress toward meeting its State Water Board water loss performance standard.

Based on data released by the State on January 30, 2026, VWD’s baseline real water loss is 36.9 gpscd and the real water loss standard is 28.0 gpscd, and the apparent loss standard is the baseline of 4.9 gpscd. As shown in **Table 16-7**, based on the most recent water loss audit from 2024, VWD has met the real water loss standard, but is currently exceeding the apparent



water loss performance standard. VWD is working toward full compliance by 2028. Section 16.7.1 discusses VWD's programs to assess and manage distribution system real loss.



TABLE 16-7: DWR 4-6R PROGRESS TOWARDS 2028 WATER LOSS STANDARD

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units (Connections or Miles corresponding with units selected)	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	Apparent Water Loss per Unit per Day
CA3610052	Yes	28.0	gpscd	39,037	415	9.5	4.9	gpscd	39,037	614	14.0



16.4.2 Projected Water Use

16.4.2.1 Projected Potable Water Demands

As shown in **Table 16-5**, water demand has generally remained consistent since 2021, which is most likely due to permanent conservation in response to droughts, state mandated water use reduction targets, more efficient appliances and plumbing, and conservation efforts made by VWD and its customers. Historic demand trends and water use per connection for each connection type (single family residential, multifamily residential, commercial, etc.) were assessed along with expected growth rates to project demand through 2050. The major assumptions used to develop demand projections are described below:

Baseline Water Use: A historic baseline period is used to approximate “normal” demand patterns representative of what is expected in the future given normal conditions for influential factors impacting demand, known as “demand drivers”. A key demand driver is rainfall. Baseline years incorporate impacts of dry and wet years since demand typically fluctuates with rainfall due to the need for more irrigation in dry years and less in wet years. For this analysis, a baseline period of 2021-2024 is used, which captures two average rainfall years (2022 and 2024), one wet year (2023), and one dry year (2021). This baseline period captures a wide range of demand drivers to approximate an average or normal demand pattern. A baseline water use per connection was established for each connection type.

Future % Reduction: Based on the State’s indoor water use standard of 42 gallons per capita per day, it was assumed that new residential connections would be more efficient and meet this standard once constructed. Additionally, suppliers are required to reduce water demands in alignment with “Making Conservation a California Way of Life Regulation” over the next 30 years. Therefore, it was assumed that existing residential customers will reduce indoor water demands by 2% over the planning period, while new connections are anticipated to have 25% less indoor water use than existing customers based on newer efficient technology and alignment with the latest energy efficient plumbing codes, as well as assumed to meet Urban Water Use Objective Indoor GPCD targets. Similarly, existing landscape connections are assumed to reduce water demand by 2% throughout the planning period, while new landscape connections are anticipated to use 10% less water per connection than existing connections. As a result, **Table 16-9** satisfies the requirement to include anticipated water conservation savings when developing future demand projections.

Growth Rate: Projected connection growth for each use type varies and is based on historic growth rates and current development activity. A summary of connection growth by use type is provided in **Table 16-8**.

TABLE 16-8: CONNECTION GROWTH ASSUMPTIONS

Use Type	Future Connection Estimates Assumptions	Connection Increase Every 5 Years	Average Annual % Change
Single Family Residential	Based on current and expected single family residential development activity. VWD tracks proposed developments and their estimated timing to estimate the number of connections expected in each five year period.	2,150	1.2%
Multi-Family Residential	Average historical growth rate (2020-2024); aligns with expected developments	3	0.1%
Commercial / Industrial / Institutional (CII)	Average historical growth rate (2018-2024); aligns with expected developments	54	0.6%
Landscape	Based on 1 connection per CII development + 20 landscape meters for greenbelts around residential developments	74	3.4%

Water Loss: VWD’s water loss audits for 2021-2024 were reviewed to estimate potential future losses. Between 2021 and 2024, water losses remained consistent, ranging between 5% to 8%, with an average of 7%. Projected future water losses are assumed to be 7% of potable system demand.

Total Projected Demand: For each connection type, the baseline water use per connection for existing and future connections was multiplied by the projected future number of connections to estimate future water use by connection type. The water loss percent was applied to the subtotal of demand for all connection types to determine the total projected future demand. **Table 16-9** presents projected potable demand through 2050.



TABLE 16-9: PROJECTED POTABLE DEMANDS FOR WATER (AFY)

Use Type	2030	2035	2040	2045	2050
Single Family Residential	12,671	13,144	13,605	14,055	14,495
Multi-Family Residential	1,859	1,842	1,826	1,810	1,794
Commercial	5,520	5,651	5,782	5,912	6,043
Landscape	1,496	1,679	1,862	2,046	2,231
Water Losses	1,508	1,562	1,615	1,668	1,719
Total	23,054	23,878	24,690	25,491	26,282

16.4.2.2 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households. SCAG published the Regional Housing Needs Allocation Progress 6th Cycle Regional Housing Needs Assessment Final Allocation Plan (RHNA Housing Needs Assessment) (Southern California Association of Governments, March 2021), which assessed the cities in Southern California to determine the percent of individuals living in the community that are very low income, low income, moderate income, and above moderate income. For the City of Victorville, the RHNA Housing Needs Assessment determined that 21% are very low income and 14% are low income, for a combined total of 35%. These lower-income water demands are included in the future demand projections.

TABLE 16-10: DWR 4-3R INCLUSION IN WATER USE PROJECTIONS

Are Future Water Savings Included in Projections?	Yes; Section 14.4.2
Are Lower Income Residential Demands Included in Projections?	Yes

16.4.2.3 Climate Change Considerations

Incorporating climate change considerations into water use analysis can help inform long-term planning by identifying potential shifts in demand patterns, such as increased landscape irrigation associated with hotter and drier conditions. However, within the High Desert climate of the RUMWP Planning Area, baseline conditions are already characterized by low precipitation and high evapotranspiration rates. As a result, near-term climate change is not expected to materially alter water use behavior or increase demand beyond levels already reflected in existing conditions. Accordingly, no adjustments have been made to the water use forecast to account for climate change. While long-term climate change may



incrementally increase evapotranspiration, such effects are expected to be nominal relative to current conditions. The District will continue to evaluate potential climate-related impacts in future UWMP updates and through ongoing regional water planning efforts.

16.4.3 Compliance with SBX7-7 and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (State of California Department of Water Resources, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target and the 2020 urban water use target for VWD as described in the 2020 UWMP. This section also demonstrates that VWD achieved its 2020 water use target.

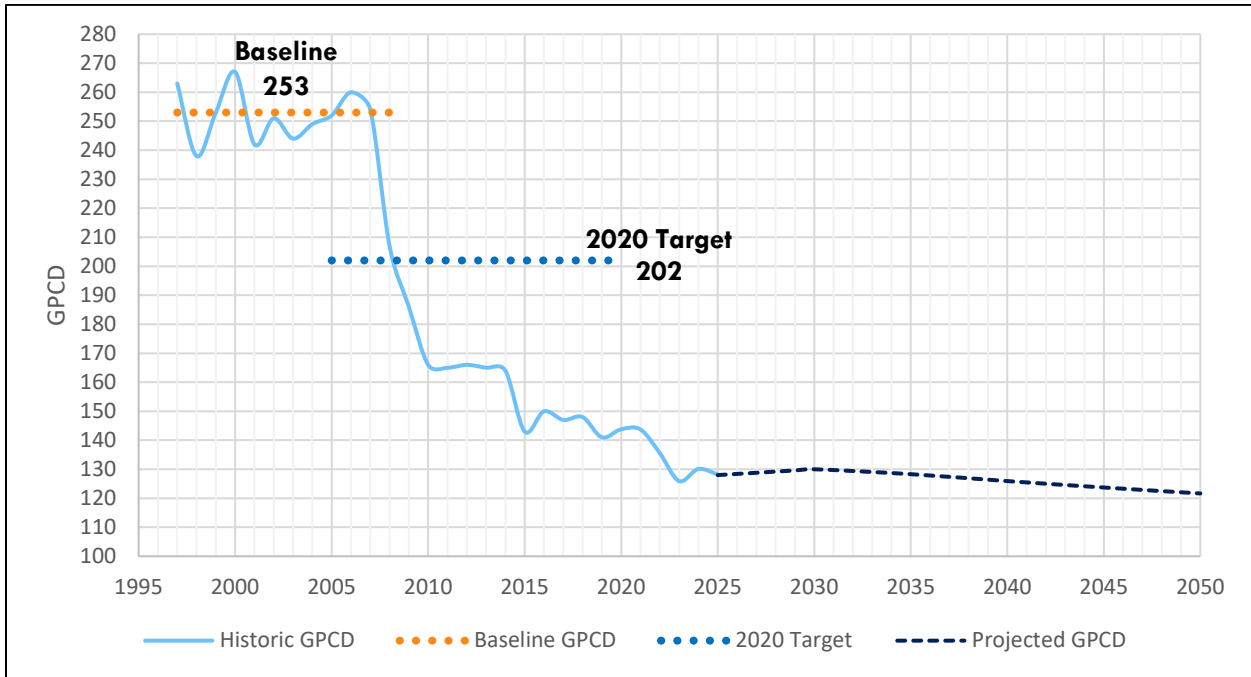
Table 16-11 below establishes VWD's 2020 actual and 2020 target GPCD. As shown, VWD far exceeded its 2020 target. Most recently, in 2025, the water use was 128 GPCD, which is well below the 2020 target of 202 GPCD. VWD's historical GPCD from 1995 through 2025 and the projected GPCD through 2050, along with the baseline and target GPCD are shown in **Figure 16-3**.

TABLE 16-11: SBX7-7 2020 TARGET PROGRESS

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
202	145	Yes



FIGURE 16-3: BASELINE, HISTORIC, AND PROJECTED GPCD



New water use efficiency standards from the Making Conservation a California Way of Life Regulation supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the “2018 Water Conservation Legislation.” Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its UWUO. DWR and the State Water Resources Control Board (State Board) have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP incorporate portions of the UWUO, such as the indoor residential standard, as described in Section 16.4.2. VWD will plan and implement necessary demand management measures (described in Section 16.7.1) to support meeting the UWUO. DMMs and UWUO compliance planning enhance resiliency for drought and other water shortage conditions.



Sub-Chapter 16.5 – Water Supply Characterization

This section describes the existing and projected supplies for VWD. VWD currently pumps potable water supplies from groundwater in the Mojave Groundwater Basin and purchases additional groundwater from MWA’s Regional Recharge and Recovery Project (R3), when available. VWD also serves RW to customers at SCLA.

16.5.1 Purchased or Imported Water

VWD purchases water from R-Cubed when it is available but does not rely on purchased water as a future potable water supply. Through R-Cubed, MWA delivers SWP water to recharge sites located along the Mojave River in Hesperia and southern Apple Valley. MWA recovers the recharged water at wells downstream and delivers through pipelines directly to retail water agencies. This project provides an alternate source of supply that enables agencies to reduce pumping and maintain groundwater water levels in the vicinity of their wells. The project enables MWA to use SWP water beneficially by recharging the water when supplies exceed demand. VWD began receiving water from R-Cubed in 2013 and has an agreement to purchase up to 6,800 AFY, when available. The recharge sites, recovery wells, and distribution pipeline for the R-Cubed project are discussed in Sub-Chapter 2.1.4.2 of Regional Chapter 2.

Water supply from R-Cubed is interruptible because it depends on the amount of SWP available for storage as well as other operational constraints. VWD intends to continue maximizing purchases of water from R-Cubed when available, but because this is an interruptible source of supply, VWD does not rely on this source to meet its demands. For the purposes of this UWMP, it is assumed that VWD will meet all current and future demands through its own groundwater production, so purchased water is not included in future supply projections. **Table 16-12** shows VWD historical R-Cubed purchases over the last five years.

TABLE 16-12: VWD HISTORICAL R-CUBED PURCHASES

	2021	2022	2023	2024	2025
R-Cubed Purchase	1,797	2,811	3,641	2,982	4,305



16.5.1.1 High Desert Power Plant Imported Water Supply

Victorville also has a connection from the MWA Mojave River Pipeline to provide untreated SWP water for cooling for the High Desert Power Plant (HDPP). HDPP also stores SWP water in the Basin and later extracts it for use when SWP water is not available to HDPP. VWD operates the pipeline that provides SWP water to HDPP as well as extraction facilities on behalf of HDPP. HDPP has its own water rights and storage account in the groundwater basin, so the HDPP's imported water supply is not considered a supply for VWD and is not included in the data presented in this UWMP. The VWD also delivers RW to HDPP as a supplemental supply for cooling.

16.5.2 Groundwater

Groundwater is the primary water supply source for VWD, like all Retailers within the Mojave Basin Area. A detailed description of the Mojave Basin Area, subareas, aquifer characteristics, adjudication, and management areas is provided in Sub-Chapter 2.3 Groundwater Basins of Regional Chapter 2.

VWD has 34 active groundwater wells within its distribution system that are used to pump groundwater from the Mojave Basin. Groundwater production over the past five years is shown in **Table 16-13**.

The Mojave Basin is managed by MWA. MWA has both the authority and the obligation to secure supplemental supplies as part of the solution to overdraft within the Mojave River Basin. Although the increased groundwater pumping in excess of natural supplies over the past 50 years has resulted in a decline in groundwater elevations, the groundwater basins remain capable of meeting annual water demands through dry years and consecutive multiple-dry years.

To maintain water balance within each subarea, producers that exceed their Free Production Allowance (FPA) must replace the excess amount by purchasing or leasing additional water rights from other producers or paying a Replacement Water Assessment (RWA) to MWA to acquire replacement water. The RWA amount is calculated as the volume of excess production multiplied by the annual rate adopted by the Mojave Basin Area Watermaster. Based on the current municipal allocation, VWD's FPA is 13,651 AFY, which serves as its available supply without incurring RWA and is subject to future ramp-down under the Judgment.

Producers in the Mojave Basin Area are allowed to produce as much water as they need annually to meet their requirements, according to the Judgment. An underlying assumption of the Judgment is that sufficient water will be made available to meet the needs of the basin in the future from a combination of natural supply, imported water, water conservation, water reuse, and transfers of FPA among parties. MWA supports this framework through active recharge operations along the Mojave River Pipeline, Oro Grande Wash Pipeline, Morongo



Basin Pipeline, and at Silverwood Dam. These facilities enable recharge of State Water Project supplies in subareas where replacement water is required and allow for storage of excess supplies in wet years for use during dry periods. In addition, MWA’s R-Cubed program facilitates conjunctive use by delivering stored groundwater to reduce local pumping, helping manage groundwater levels.

VWD will continue aggressive water conservation efforts and increase the use of RW to offset potable water demand in an effort to balance supplies and demands into the future. Pumping beyond the FPA is anticipated to continue as needed to meet water demands and will require VWD to continue to pay the RWA to support additional water supply projects MWA is implementing or to purchase water rights from other agencies in the subbasin.

TABLE 16-13: GROUNDWATER PUMPED LAST FIVE YEARS

	2021	2022	2023	2024	2025
Mojave River Basin	21,156	19,068	16,986	18,636	17,097

16.5.3 Groundwater Quality

Detailed groundwater quality for the Basin is described in Sub-Chapter 3.2.2 of Regional Chapter 3. This section describes specific groundwater quality at VWD facilities.

Many of VWD’s groundwater wells meet state and federal drinking water standards without treatment. These wells receive wellhead chlorination for disinfection and pump directly into the distribution system or into storage tanks.

VWD operates three Arsenic Treatment Plants and an Arsenic Blending Pipeline. The Balsam and El Evado Arsenic Treatment Plants are coagulation/filtration treatment plants, and the La Mesa Arsenic Treatment Plant is an ion exchange plant. The Arsenic Blending Pipeline is used to blend water from a portion of the VWD’s wells to produce a blended water quality that meets the maximum contaminant level (MCL) before entering the distribution system.

16.5.4 Surface Water

VWD does not use surface water supplies.

16.5.5 Stormwater

The Judgment included an injunction against diverting stormwater flow away from downstream users of the Mojave River. Therefore, no stormwater capture projects are planned to increase water supplies.



16.5.6 Wastewater and Recycled Water

16.5.6.1 Wastewater

The wastewater that is generated within the service boundary of VWD is collected through a gravity sewer system owned and operated by the City of Victorville. A portion of the collection system conveys wastewater to the Industrial Wastewater Treatment Plant (IWWTP) that is owned and operated by VWD. A portion of the collection system discharges to a regional interceptor, which conveys the wastewater flows to a regional wastewater treatment plant (WWTP) owned and operated by the Victor Valley Wastewater Reclamation Authority (VWVRA).

In 2010, VWD began operation of the IWWTP, a domestic and industrial wastewater treatment plant at the Southern California Logistics Airport (SCLA) with a design capacity of 2.5 million gallons per day (MGD). The IWWTP is designed to treat wastewater using both anaerobic (for high-strength industrial wastewater) and aerobic (for sanitary wastewater) treatment processes. The combined flows then undergo a complete-mix activated-sludge treatment and solids-separation process using membrane bioreactor (MBR) technology. The final process is ultraviolet disinfection, resulting in tertiary treated RW that meets Title 22 requirements. Sludge from the facility is currently discharged to VWVRA's WWTP for treatment and disposal. The portion of treated effluent from the IWWTP that is not reused at the SCLA is currently conveyed to the VWVRA WWTP site for disposal at Percolation Pond 14, which the VWD owns and operates, or discharged to the VWVRA WWTP. The City is in the process of pursuing additional disposal options and recycled water uses.

VWVRA is a Joint Powers Authority consisting of the Town of Apple Valley, City of Hesperia, City of Victorville, and County Service Areas of Oro Grande (Number 42) and Spring Valley Lake (Number 64). The regional plant has a current capacity of 14 MGD and is located approximately 7 miles north of Victorville, between SCLA and the Mojave River. VWVRA's regional WWTP discharges disinfected tertiary effluent to the Mojave River and supplies RW to VWD. In 2003, VWVRA executed a memorandum of understanding (MOU) with the California Department of Fish and Game (now California Department of Fish and Wildlife [CDFW]), which requires VWVRA to discharge 9,000 AFY of available treated effluent to the Mojave River. The MOU includes a provision to allow reduced discharges as long as a minimum flow of 15,000 AFY is measured at the Lower Narrows gage. In 2005, VWVRA and Victorville executed a Second Amended and Restated Agreement for Reclaimed Water Service with a perpetual term that entitles Victorville to take delivery of all the treated effluent from VWVRA's WWTP in excess of the amount required to be discharged under the MOU. Treated effluent that is not discharged to the Mojave River or purchased by Victorville is disposed of through onsite percolation ponds.

Wastewater collected, treated, and disposed of within VWD's service area in 2025 is summarized in **Table 16-14** and **Table 16-15**.

TABLE 16-14: DWR 6-2R WASTEWATER COLLECTED WITHIN SERVICE AREA IN 2025 (AF)

WASTEWATER COLLECTION					
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2025	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITH UWMP AREA
City of Victorville	Metered	2,511	Victorville Water District	Industrial Wastewater Treatment Plant	Yes
City of Victorville	Metered	8,572	Victor Valley Water Reclamation Authority	VVWRA Regional Plant	Yes
TOTAL:		11,083			



TABLE 16-15: DWR 6-3R: WASTEWATER TREATMENT AND OUTCOMES WITHIN UWMP SERVICE AREA IN 2025, AFY

WASTEWATER TREATMENT PLANT NAME & PLACE ID NUMBER	DOES THIS PLANT TREAT WASTEWATER GENERATED OUTSIDE THE UWMP SERVICE AREA	2025 VOLUME OF WASTEWATER RECEIVED FROM UWMP SERVICE AREA	TOTAL 2025 VOLUME OF WATER TREATED	2025 OUTCOMES OF TREATED WASTEWATER										
				WATER RECYCLED WITHIN UWMP SERVICE AREA		WATER RECYCLED OUTSIDE OF UWMP SERVICE AREA		EFFLUENT DISCHARGE THAT IS NOT A PERMITTED RECYCLED WATER USE		REQUIRED DISCHARGE FOR INSTREAM FLOW		DELIVERED TO ANOTHER ENTITY FOR ADDITIONAL TREATMENT		
				TREATMENT LEVEL	VOLUME	TREATMENT LEVEL	VOLUME	TREATMENT LEVEL	VOLUME	TREATMENT LEVEL	VOLUME	TREATMENT LEVEL	VOLUME	NAME OF OTHER ENTITY
Industrial Wastewater Treatment Plant	No	2,511	2,511	Tertiary	544	N/A	0	Tertiary	769	N/A	0	Tertiary	1,088	VVWRA
VVWRA Regional Plant	Yes	8,572	14,337	Tertiary	0	N/A	0	Tertiary	14,337	Tertiary	9,000	N/A	0	N/A
Total		11,083	16,848		544		0		15,106		9,000		1,088	



16.5.6.2 Recycled Water

Currently, VWD serves RW to HDPP for cooling water and irrigation to existing customers in the SCLA area. The total number of RW connections within VWD is shown in **Table 16-16**.

RW was historically applied at the Westwinds Golf Course for irrigation; however, the golf course is now closed, and this use has been discontinued. VWD also has RW fill stations to provide water for dust control at the SCLA airfield and construction sites located at SCLA and High Desert Solar site. VWD is not currently serving RW from its RW fill stations but can issue permits and begin doing so when the demand arises. Historic RW demand is provided in **Table 16-17**.

TABLE 16-16: RECYCLED WATER CONNECTIONS, 2021-2025

Use Type	2021	2022	2023	2024	2025
Recycled Water Connection	6	6	7	7	7

TABLE 16-17: HISTORIC RW DEMAND, AFY

Use Type	2021	2022	2023	2024	2025
Industrial (HDPP)	714	833	683	681	489
Landscape	433	37	62	56	55
Total RW Demand	1,148	871	746	737	544
RW for landscape reduced due to closure of Westwinds Golf Course in 2021.					

Current flows at the IWWTP are approaching the existing plant capacity so VWD has begun the process of planning for expansion of the treatment capacity. As part of the preliminary design for the IWWTP capacity increase, recent and future flow and load conditions were evaluated to determine appropriate design parameters for capacity expansion. Based on this effort, total projected RW supply available from the IWWTP in 2040 is estimated to be in the range of 2.4 MGD (low range sanitary flows + current industrial flow) to 4.2 MGD (higher range sanitary flows + maximum industrial flow). As VWD works to comply with the current water use efficiency regulations and updates its water and sewer master plans, additional clarity on the total RW supply available from the IWWTP will become available and may ultimately be lower than assumed in this Plan. Victorville will update its RW supply projections and future IWWTP capacity as part of the subsequent RWFMP.

The annual volume of RW supply available to VWD from VVWRA is assumed to include only flows contributed by Victorville and adjusted to account for the required discharges to the Mojave River under the MOU with CDFW.

RW used in 2025 is summarized in **Table 16-18** and compared with the projected 2020 RW use from the 2015 UWMP.

TABLE 16-18: DWR TABLE 6-5R 2020 UWMP RECYCLED WATER USE PROJECTION COMPARED TO 2025 ACTUAL

Use Type	2020 Projection for 2025	2025 Actual Use
Irrigation	885	55
Industrial	0	489
Total	885	544

16.5.6.3 Projected RW Demand

VWD completed a Citywide Recycled Concept Study (RW Concept Study) in September 2025 to identify potential opportunities for VWD to put its RW to beneficial use. As part of the RW Concept Study, a range of potential RW customers and their demands were identified. Additional opportunities planned for further evaluation in an upcoming Recycled Water Facilities Master Plan include extension of the RW system to the City of Victorville downtown area and Green Tree Golf Course. The total projected potable demand that could be served by extending the RW system to the downtown area and Green Tree Golf Course are included in the RW projections for VWD. Service to this area is expected to begin by 2035.

For the purposes of projected RW demand for this UWMP, it assumed that RW service for existing customers and expansion of the VWD RW system to the downtown area and Green Tree Golf Course is the most likely path forward and within VWD’s control to implement and therefore included in the RW demand projection, shown in **Table 16-19**.

TABLE 16-19: PROJECTED RW USE, AFY

Customer	Use Type	2030	2035	2040	2045	2050
HDPP Existing Use	Industrial (Cooling)	771	771	771	771	771
SCLA Existing RW Demand	Irrigation	98	98	98	98	98
SCLA Future RW Demand	Irrigation	135	229	325	399	399
Victorville Irrigation Customers	Irrigation		640	640	640	640
Total		1,004	1,738	1,834	1,908	1,908



16.5.6.4 Actions to Encourage and Optimize Future Recycled Water Use

The RW Concept Study evaluated multiple opportunities at a conceptual level and recommended a path forward to help VWD narrow in on and advance concepts that best align with Victorville’s goals. In the near term, VWD plans to pursue the following RW opportunities:

- Continue to expand its RW system at SCLA as development occurs (such expansion is included in the RW demand projections presented above).
- Negotiate potential RW agreement with a local cement plant
- Expand RW service to HDPP, if possible.
- Pursue an NPDES and/or WDR discharge permit for additional effluent disposal locations.

Additional concepts evaluated in the RW Concept Study may be reevaluated as conditions change. Such concepts include adding new customers to the recycled water system, and indirect and direct potable reuse opportunities.

16.5.7 Desalination

“Desalination” refers to treatment processes that remove salts from water to achieve salinity concentrations that are acceptable for municipal and agricultural uses. The desalination strategy covers treatment of seawater as well as brackish water. Desalination technologies may also be used to treat wastewater to produce high quality RW. In California, the principal method for desalination is reverse-osmosis. This process can be used to remove salt as well as specific contaminants in water, such as disinfection byproduct precursors, volatile organic compounds, nitrates, and pathogens. As summarized below, there is no opportunity for desalination of any kind by VWD.

16.5.7.1 Brackish Water and/or Groundwater Desalination

The groundwater basins located under or near the VWD are not brackish and do not require desalination. Therefore, there is no water of this nature available to VWD for direct use.

16.5.7.2 Seawater Desalination

Because VWD is not located in a coastal area, it is neither practical nor economically feasible for VWD to implement a seawater desalination program.

16.5.8 Water Transfers and Exchanges

Regional water transfer and exchange opportunities are described in Chapter 6, MWA’s 2025 UWMP.

VWD frequently executes temporary transfers of FPA or carryover water from other parties in the Alto subarea to offset a portion of excess groundwater production.

16.5.9 Future Water Projects

At the time of this UWMP, no potable water supply projects are planned.

16.5.9.1 RW Supply – IWWTP Expansion

As mentioned above, current flows to the IWWTP are approaching the existing plant capacity so the City has begun the process of planning for expansion of the treatment capacity. The IWWTP Capacity Increase Preliminary Design evaluated multiple treatment process options and selected a concept that would provide 5 MGD of sanitary treatment capacity and 1 MGD industrial treatment capacity, for a total of 6 MGD in the near term with the ability to expand to 7 MGD sanitary and maintain the 1 MGD industrial capacity, for a total of 8 MGD in the future, when needed.

16.5.10 Supply Summary

VWD’s potable water supply is comprised entirely of local groundwater. VWD also provides recycled water for industrial and irrigation uses. The volume of water used to meet demands in 2025 is provided in **Table 16-20** and projected supplies are shown in **Table 16-21**. These quantities are based on projected demands discussed in Section 16.4.2. VWD has the ability to extract additional groundwater, if needed, to meet demands and has excess recycled water supply available for use.

TABLE 16-20: DWR 6-8R ACTUAL WATER SUPPLIES IN 2025 (AF)

Supply	2025 Actual Volume	Water Quality
Groundwater	17,097	Potable
Purchased or Imported Water	4,305	Potable
Recycled Water	544	Recycled Water
TOTAL	21,946	

TABLE 16-21: PROJECTED SUPPLY, AFY

Supply	2030	2035	2040	2045	2050
Groundwater	23,054	23,878	24,690	25,491	26,282
Recycled Water	1,004	1,738	1,834	1,908	1,908
TOTAL	24,058	25,616	26,524	27,399	28,190



Sub-Chapter 16.6 – Water Service Reliability and Drought Risk Assessment

This section considers VWD’s water supply reliability during average, single-dry, and multiple-dry water years. The supply reliability assessment discusses factors (i.e., climatic, environmental, water quality, and legal) that could potentially limit the expected quantity of water available from VWD’s current sources of supply through 2050.

Multiple drought scenarios are considered and the quantitative impacts of the aforementioned factors on water supply and demand are discussed as well as possible methods for addressing these issues. The management tools that VWD has implemented to maximize current resources, identify supplemental sources of supply, and minimize the need to import water from other regions are also discussed.

16.6.1 Water Service Reliability Assessment

16.6.1.1 Constraints on Water Sources

Per the Judgment, producers in the Mojave Basin Area are allowed to produce as much water as they need annually to meet their requirements. An underlying assumption of the Judgment is that sufficient water will be made available to meet the needs of the basin in the future from a combination of natural supply, imported water, water conservation, water reuse, and transfers of FPA among parties.

Portions of the Mojave Basin Area contain numerous, naturally occurring contaminants, including arsenic, nitrates, iron, manganese, Chromium VI, and excess TDS. VWD operates several treatment and blending facilities to ensure that water delivered to its customers meets the drinking water standards. VWD will continue to monitor groundwater quality and implement additional treatment and blending as needed to maintain the quality of the water supply.

Climate change impacts that may have a long-term effect on water supplies include increased temperatures; sea level rise; reduced winter snowpack; and altered precipitation patterns, including more frequent and intense storm events. Mitigation and adaptation strategies are being investigated and implemented by VWD and MWA to address the effects that climate change will have on their future water supply.



Additional details on the water quality of the Mojave Basin Area as it pertains to VWD and climate change's effect on VWD's supply are provided in Sub-Chapters 3 3.1.2. and 3.1.5 of Regional Chapter 3.

16.6.1.2 Year Type Characterization

In general, groundwater and RW supplies are less vulnerable to seasonal and climatic changes than surface water (local or imported) supplies. Natural groundwater supply estimates are based on long-term averages, which account for inconsistency in natural supplies (i.e., historic periods of drought are included in the long-term average). Therefore, VWD does not have any inconsistent water sources that result in reduced supplies in dry or multiple-dry years. MWA is actively operating recharge sites for conjunctive use along the Mojave River Pipeline, Oro Grande Wash Pipeline, Morongo Basin Pipeline, and Silverwood Dam. Recharge sites enable MWA to recharge SWP water into the subareas where replacement water is purchased. These sites also enable MWA to bank excess SWP water when available in wet years for storage to be used in dry years. R3 facilities allow MWA to manage the groundwater basins surrounding VWD by delivering imported SWP water stored in upper Mojave River recharge areas to purveyors, which can then reduce pumping from their wells when taking R3 water, facilitating partial recovery of local pumping depressions. For these reasons, supplies are considered unchanged in average, dry, and multiple-dry years.

The basis for the "year type" is determined from the single-driest and multiple-driest years using precipitation data (1940-2020) from National Ocean and Atmospheric Administration Station 049325 in Victorville. Even though precipitation is variable, however, groundwater supply estimates are based on long-term averages, which account for these variabilities so that groundwater is assumed to be 100% available in single-dry and multiple-dry year conditions.

Per UWMP requirements, VWD has evaluated reliability for an average year, single-dry year, and a five-consecutive-dry-years period. The UWMP Act defines these years as:

- **Average Year.** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single-Dry Year.** The single dry year is recommended to be the year that represents the lowest water supply available. The single lowest year of precipitation was 1953, with 1.3 inches per year.
- **Five-Consecutive-Years Drought.** The driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row. The lowest five years of precipitation was 2013 to 2017, with an average of 3.5 inches per year.

16.6.1.3 Water Service Reliability

Demand during dry years was assumed to remain constant because of ongoing state and local conservation programs. Additionally, demands within the High Desert region are not typically influenced significantly by variations in rainfall. Groundwater supply is assumed to remain 100% available because the long-term average of the groundwater basin includes dry periods, and no single or multiple-year dry cycle affects the long-term yield of the basin. Supplies are sufficient to meet average, single-dry year, and multiple-dry years demands through year 2050, as shown in **Table 16-22** and **Table 16-23**.

TABLE 16-22: SUPPLY AND DEMAND COMPARISON FOR NORMAL, SINGLE-DRY, AND MULTIPLE-DRY YEAR SCENARIOS, AFY

	2030	2035	2040	2045	2050
Supply Total	23,054	23,878	24,690	25,491	26,282
Demand Total	23,054	23,878	24,690	25,491	26,282
Difference	-	-	-	-	-



TABLE 16-23. FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND COMPARISON, AFY

		2030	2035	2040	2045	2050
Year 1	Supply	23,054	23,878	24,690	25,491	26,282
	Demand	23,054	23,878	24,690	25,491	26,282
	Difference	-	-	-	-	-
Year 2	Supply	23,216	24,038	24,848	25,647	26,282
	Demand	23,216	24,038	24,848	25,647	26,282
	Difference	-	-	-	-	-
Year 3	Supply	23,380	24,200	25,007	25,805	26,282
	Demand	23,380	24,200	25,007	25,805	26,282
	Difference	-	-	-	-	-
Year 4	Supply	23,545	24,362	25,168	25,963	26,282
	Demand	23,545	24,362	25,168	25,963	26,282
	Difference	-	-	-	-	-
Year 5	Supply	23,711	24,525	25,329	26,122	26,282
	Demand	23,711	24,525	25,329	26,122	26,282
	Difference	-	-	-	-	-

According to Chapter 5 of the 2025 RUWMP, MWA has adequate supplies to meet the region’s demands and replacement water needs during average, single-dry year, and five consecutive dry years from 2030 to 2065. VWD’s demand projections were provided to MWA for inclusion in its analysis; therefore, it is concluded that VWD has adequate supplies to meet demands during average, single-dry year, and five consecutive dry years throughout the 25-year planning period. VWD will continue aggressive water conservation efforts, increased use of RW to offset potable water demand, and participation in new water supply projects with MWA to ensure that it has enough supply to continue to meet demands.

16.6.2 Drought Risk Assessment

The Drought Risk Assessment (DRA) considers a drought period that lasts five consecutive years, starting from the year following when the assessment is conducted. For this UWMP, the DRA considers five consecutive dry years from 2026 through 2030. VWD may conduct an interim update or updates to this DRA within the five-year cycle of its UWMP update.



The DRA analysis enables VWD to examine the management of its supplies during stressed hydrologic conditions and an opportunity to evaluate whether it may need to enact its WSCP during the next actual drought period lasting at least five years. The projected gross water use for the five-year DRA is based on unrestricted potable demand. **Table 16-24** compares the total projected supply and demand for the five-year DRA for 2026 through 2030. As shown, VWD does not expect to enact its WSCP for a five-year consecutive year drought based on the unrestricted potable demand projections and the current supply portfolio and reliability.

Although projections in this UWMP show that VWD's water supplies are sufficient to meet the demands even during a 5-year drought, VWD remains committed to water conservation and to being a good steward of local water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this UWMP.

TABLE 16-24: DROUGHT RISK ASSESSMENT (AFY)

	2026	2027	2028	2029	2030
Supply	21,723	22,048	22,379	22,714	23,054
Demand	21,723	22,048	22,379	22,714	23,054
Difference	-	-	-	-	-



Sub-Chapter 16.7 – Demand Management Measures

This section provides a comprehensive description of the water conservation programs that VWD has implemented for the past five years, is currently implementing, and plans to implement in the future.

16.7.1 Existing Demand Management Measures

16.7.1.1 Water Waste Prevention Ordinances

VWD Ordinance Number A-101-89 adopted a program of voluntary water conservation and restrictions on water use during water supply shortages and emergencies. VWD promotes and advertises a water waste hotline number for anyone to report water waste in neighborhoods within Victorville’s boundaries (1-866-955-4H2O). Staff rearrange hours to conduct nightly, after-hours, and weekend canvassing of the entire water system during which they survey for violations of the ordinance. Door-tag flyers have been made to proactively notify customers of the watering restrictions, including bill inserts, envelope sniping, etc.

On May 19, 2015, Ordinance No. VWD-012 (“VWD-012”) was adopted, establishing Chapter 10.05 of the Victorville Municipal Code, which serves as the VWD standards, guidelines, and procedures for year-round water conservation to prevent the waste or unreasonable use of water. It also specifies restrictions, prohibitions, and limitations on water use pursuant to the State Water Board final regulations implemented in response to the Governor’s Executive Order B-29-15. This order calls for action to address the State’s escalating drought and water shortage conditions.

To promote flexibility and provide for increasingly more stringent water use prohibitions and conservation requirements when drought and water supply shortage conditions intensify, VWD-2338 contains one year-round conservation stage (Stage 1) and three Water Supply Shortage Stages (Shortage Stages 2, 3, and 4). These stages can be activated by resolutions adopted by the City Council when the VWD General Manager so recommends (following noticed public hearings). These shortage stages can likewise be deactivated in the same fashion when drought and water supply shortage conditions cease or become less severe.



16.7.1.2 Metering

VWD meters and bills 100% of existing accounts by volume of use. VWD performs meter reading on a monthly basis and bills customers on a monthly basis. All customers are billed a meter charge and a consumption charge for each unit of water consumed. More details on rate structures are provided in VWD's WSCP.

VWD has installed advanced metering infrastructure (AMI) that continuously collects data from its customers.. This is faster, more accurate, and more cost-effective than hand reading. The meter-reading system also archives consumption information. The data are used to identify leaks, address customer consumption concerns, and monitor water conservation efforts.

16.7.1.3 Conservation Pricing

VWD adopted new water rates on July 1, 2019. The rate structure collects the projected water supply costs from volumetric charges (consumption rate) and the remaining revenue requirement from fixed (meter) charges. The volumetric rate is uniform for all customers and does not include a tiered rate.

The new volumetric rate is set to the marginal cost of water, meaning that changes in consumption would cause corresponding changes in revenue and expenses. The rate structures include drought rates to ensure VWD collects sufficient revenue to cover costs if water sales continue to decline.

16.7.1.4 Public Education and Outreach

Public Information Programs: Public information programs include development of educational resources and outreach to promote water use efficiency. Public information programs include:

- Distribution of conservation information via brochures, videos, digital media, bus shelter posters, and bill inserts.
- Maintenance of a water conservation webpage with indoor and outdoor efficiency guidance.
- Interactive plant database (410 species) searchable by water requirements, sun exposure, plant type, bloom season, and mature size.
- Printable water-wise plant lists and instructional materials.
- Periodic workshops, and community outreach events.
- Coordination with regional partners, including MWA.



VWD also provide direct technical assistance through the Conservation Division, including conducting water audits, irrigation assessments, and installation of Smart Weather Based Irrigation Controllers (WBICs) and Conservation Kits (discussed below).

School Education Program: VWD Conservation Division staff continue to conduct a program among students to foster long-term water-efficient behaviors. The VWD School Education Program includes:

- Annual participation in the City of Victorville’s Public Works Day, including a hands-on workshop for fourth-grade students.
- Indoor water audit demonstrations and water cycle presentations.
- Participation in the High Desert Water Summit, sponsored by MWA, to inform water conservation among middle and high school students.

VWD plans to continue participation in the School Education Program for the foreseeable future, as this program reinforces long-term water efficient behaviors that support reduced water use.

16.7.1.5 Programs to Assess and Manage Distribution System Real Losses

VWD staff performs the following steps to minimize water losses from the distribution system:

- Regularly inspects for leaks in pipeline and production/distribution facilities.
- Provides adequate staff on duty to respond quickly to pipe ruptures, leaks, and repairs. Staff is available for service laterals inspections.
- Supports an ongoing valve-exercising program by regularly exercising all control and shut-off valves so that leaks can be corrected in a timely manner.

VWD also actively monitors its water distribution system through annual completion of AWWA water audits, providing water audit training, and annual calibration and testing of 42 source production meters (33 potable well meters, 7 non-potable well meters, and two turnout meters).

16.7.1.6 Water Conservation Program Coordination and Staffing Support

Conservation Program funding is provided through water rates and includes the budget for a Water Use Efficiency Supervisor and two Water Efficiency Specialists. The Water Conservation Department provides direct technical assistance to customers and supports implementation of the DMMs described in this section. Services include indoor and outdoor water audits offered to commercial, industrial, and institutional accounts through their Free Water Audit



program, as well as guidance on water-saving devices, irrigation efficiency, and fixture retrofits.

16.7.1.7 Other Demand Management Measures

VWD's current rebate program(s) are described below.

Water Surveys

VWD conducts water surveys for high usage customers to identify opportunities to reduce water consumption. In 2025, 254 water use surveys were conducted. Majority of the water surveys are conducted at residential and commercial services.

Toilet Retrofit Program

VWD's Toilet Retrofit Program reduces indoor water waste by repairing and optimizing existing residential toilets to reduce leaks and replace high flush toilets by:

- Replacement of leaking or worn flappers.
- Adjustment or replacement of floats and fill valves.
- Correction of continuously running toilets.
- Adjustment of high-volume flush settings to lower, more efficiency flush volumes.

VWD Conservation Division staff coordinated a toilet retrofit program to repair forty five (45) toilets throughout its service area. Nearly all of these repairs resulted in fixing leaky toilets. VWD estimates that these repairs result in approximately 46 AFY of water savings. All toilet exchanges/repair programs were halted in 2020 due to COVID-19, but the toilet retrofit program restarted again in 2024.

Irrigation Controller Program

The irrigation controller program provides and installs irrigation controllers selected to match each customer's irrigation system. In 2025, eighteen (18) irrigation controllers were installed through the program and eight (8) sprinkler timers were reprogrammed.

Hose Timers Program

The hose timers program adds timers to control water use based on the need of the customer. Two customers participated in this program in 2025 to support water needs on their properties.

Conservation Kits Program

Conservation kits have been distributed to customers to support water conservation efforts. Each customer received five kit types: indoor, leak, outdoor, irrigation, and weatherization. A total of eight hundred ten (810) kits were distributed.

16.7.2 Reporting Implementation

16.7.2.1 Implementation Over the Past Five Years

VWD maintains records for each of the programs described above, including the extent of each program and the expenditures. As described above, Victorville implemented several conservation-based programs for the public over the past five years to assist in reducing demands. Conservation efforts are expected to continue with the Water Use Surveys, Toilet Repair Program, Irrigation Controller Program, Hose Timers Program, and Conservation Kits Program. **Table 16-25** provides a summary of the DMMs implemented since 2020.

TABLE 16-25: DMMs IMPLEMENTED OVER THE PAST FIVE YEARS

DMM	Implementation Between 2020-2025
On-Site Customer Visits	Over 4,300
Water Audits	1,689
Irrigation Retrofits	223
Weather Based Irrigation Controllers Installation	220
Conservation Kits Distributed	3,665

16.7.2.2 Implementation to Achieve Water Use Targets

VWD's current per-capita consumption is less than its 2020 compliance target. VWD expects to continue to implement its current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

Sub-Chapter 16.8 – Water Shortage Contingency Plan

This section provides a summary of VWD’s Water Shortage Contingency Plan (WSCP). The WSCP is a detailed plan for how VWD intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the supply is reduced to a level that cannot support the normal demand at any given time or if the State mandates a cutback regardless of supplies.

The intent of the WSCP is to provide guidance to VWD’s governing body, its staff, and the public by identifying anticipated water shortages and response actions to allow for efficient management of any water shortage with predictability and accountability. Good preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions resulting from extended drought or catastrophic supply interruptions.

VWD’s WSCP describes the following:

1. **Water Supply Reliability Analysis.** Identifies the key issues that may trigger a shortage condition within the service area.
2. **Annual Water Supply and Demand Assessment Procedures.** Describes the methodology for assessing the system’s reliability for the coming year and the steps to formally approve any water shortage levels and response actions.
3. **Standard Water Shortage Stages.** Establishes water shortage levels to clearly identify and prepare for shortages.
4. **Shortage Response Actions.** Describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand.
5. **Communication Protocols.** Describes communication protocols to inform customers, the public, and government agencies of shortage conditions and requirements.
6. **Compliance and Enforcement.** Defines compliance and enforcement actions available to administer demand reductions.



7. **Legal Authority.** Lists the legal authorities available to declare a water shortage and implement and enforce response actions.
8. **Financial Consequences of WSCP Implementation.** Describes the anticipated financial impact of implementing water shortage stages and identifies mitigation strategies.
9. **Monitoring and Reporting.** Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation; results are used to determine whether additional shortage response actions should be activated or if efforts are successful and response actions should be adjusted.
10. **WSCP Refinement Procedures.** Discusses the factors that may trigger updates to the WSCP as new information becomes available.
11. **Special Water Features Distinctions.** Defines special water features, which are separate from pools and spa.
12. **Plan Adoption, Submittal, and Availability.** Describes the process for WSCP adoption, submittal, and availability after each revision.

The WSCP is a standalone document that can be modified as needed and is included as Appendix 16a.



Sub-Chapter 16.9 – Energy Intensity Analysis

“Water energy intensity” is the total amount of energy, calculated on a whole-system basis, required for the use of a given amount of water in a given location. This calculation is intended to report energy use for facilities within VWD’s operational control for extraction, diversion, conveyance, treatment, and distribution for one year. Energy that others use to supply water to VWD, such as to produce and deliver water from the R³, is not included. Energy data for June 2024 through May 2025 was readily accessible and used to estimate this analysis. Reporting water energy intensity has many benefits for water utilities and their customers, including:

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

VWD’s energy intensity is provided in **Table 16-26**.

TABLE 16-26: 2025 ENERGY INTENSITY

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	17,097
Energy Consumed (kWh)	13,686,697
Energy Intensity (kWh/acre-foot)	801



VICTORVILLE WATER DISTRICT

APPENDICES

This page is reserved for Victorville Water District-specific appendices. Retailer-specific appendices are not reproduced in this compilation of the 2025 Mojave RUWMP. Readers seeking these materials should refer to Victorville Water District's adopted 2025 Mojave RUWMP package; which includes Regional Chapters 1 through 5, MWA Chapter 6, the Victorville Water District retailer chapter, Victorville Water District's WSCP, and applicable Victorville Water District-specific appendices.



APPENDIX 1 – NOTICES



August 27, 2025

Notice of Intent to Prepare a Regional Urban Water Management Plan for the Mojave Region

This notice is to inform you that the urban water suppliers within the greater Mojave region are preparing a 2025 Regional Urban Water Management Plan (UWMP) pursuant to the California Water Code (CWC). All wholesale and retail urban water suppliers serving more than 3,000 customer connections are required to prepare an UWMP every five (5) years. The following urban water suppliers are collectively preparing this Regional UWMP:

- | | |
|---------------------------------------|--|
| City of Adelanto Water District | Golden State Water Company – Barstow System |
| County Service Area 64 | Joshua Basin Water District |
| County Service Area 70 J | Liberty Utilities – Apple Valley Water Company |
| Helendale Community Services District | Mojave Water Agency |
| Hesperia Water District | Phelan Piñon Hills Community Services District |
| Hi-Desert Water District | Victorville Water District |

The purpose of a Regional UWMP is to allow the urban water suppliers to coordinate and efficiently address the State’s requirements as mandated in the CWC through a regional representation of water supply reliability. While the Regional UWMP will provide overarching and consistent information on water supplier reliability, each urban retail supplier will also update its unique Water Shortage Contingency Plan (WSCP), tailored to its specific service area and operations. Each urban supplier will separately adopt the Regional UWMP and its unique WSCP by July 1, 2026.

In accordance with CWC Section 10642, which encourages “active involvement of diverse social, cultural, and economic elements of the populations” in preparing a UWMP, the public will, at a minimum, have the opportunity to participate in the planning process through public hearings anticipated to occur in April or May of 2026 as part of each urban supplier’s adoption process. A draft copy of the 2025 Regional UWMP will be made available for review prior to hearings, providing an opportunity for (1) Community input regarding water supply reliability; (2) Consideration of the economic impacts of complying with CWC status governing the Regional UWMP; and (3) Discussion of each agency’s WSCP.

Detailed information, including contacts for each agency, future public hearing notices, schedules, and draft plan materials, will be available at the Mojave Water Agency’s website at <https://www.mojavewater.org/basin-management/regional-planning/urban-water-management-plan/>, or at similar links hosted by each urban retail water supplier.

Questions regarding this notice or the 2025 Regional UWMP process may be directed to the appropriate retail agency using the contact information found on the website.



NOTICE OF PUBLIC HEARINGS

ON THE 2025 MOJAVE REGIONAL URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Mojave Water Agency (MWA) and the ten urban water suppliers participating in the 2025 Mojave Regional Urban Water Management Plan (2025 RUWMP), as listed in **Table 1**, will hold public hearings to receive comments on the proposed 2025 RUWMP, including each participating agency’s specific chapter contained within the 2025 RUWMP and each agency’s Water Shortage Contingency Plan (WSCP).

The 2025 RUWMP is a regional planning document prepared collaboratively by MWA and participating urban water suppliers within the Mojave Region in accordance with the California Urban Water Management Planning Act.

The 2025 RUWMP includes:

- Regional chapters addressing Region-wide water supplies, water demands, and water service reliability;
- A chapter addressing MWA’s role as the Region’s wholesale water supplier, including its water supply and management responsibilities; and
- Retailer-specific chapters for each participating urban water supplier.

Each retailer-specific chapter addresses conditions within the respective agency’s service area, including water service and system description, population and land use, water supply and infrastructure, water use characterization, water conservation and shortage response, and water system reliability. Each participating agency’s WSCP describes the actions that may be implemented to respond to water shortage conditions and maintain water service reliability within its service area.

The urban water suppliers participating in the 2025 RUWMP, along with their respective public hearing dates and proposed dates to consider adoption, are presented in **Table 1**.

TABLE 1: PARTICIPATING AGENCIES AND HEARING INFORMATION

Agency	Public Hearing	Adoption
Hesperia Water District		June 2nd 2026
Hi-Desert Water District		June 3rd 2026
Joshua Basin Water District		June 3rd 2026
Golden State Water Company - Barstow		May 27th 2026
Liberty Utilities - Apple Valley		June 4th 2026
San Bernardino County Service Area 64		June 23rd 2026
San Bernardino County Service Area 70J		June 23rd 2026
Phelan Pinion Hills CSD		June 10th 2026
City of Adelanto Water District		June 10th 2026
Mojave Water Agency		June 11th 2026
Victorville Water District		June 16th 2026

Each participating agency will hold its own public hearing to consider adoption of the 2025 RUWMP as it applies to its service area, including the applicable regional chapters, its respective retailer-specific chapter, its WSCP and all applicable appendices. MWA will separately consider adoption of the entirety of the 2025 RUWMP and its WSCP.

Draft documents will be made available in advance of each agency's public hearing in accordance with applicable noticing requirements. At the time of the hearing, all interested parties may appear and provide comments.

Hesperia Water District

The Hesperia Water District will hold a public hearing as follows:

Date: May 19, 2026

Time: 6:30 PM

Location: City Council Chambers 9700 Seventh Ave., Hesperia CA, 92345

Copies of the draft 2025 RUWMP, including the Hesperia Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 9700 Seventh Ave., Hesperia CA, 92345 during regular business hours and online at

<https://hesperia.legistar.com/Calendar.aspx>

Hi-Desert Water District

The Hi-Desert Water District will hold a public hearing as follows:

Date: June 3, 2026

Time: 4:00 PM

Location: 55439 29 Palms Highway Yucca Valley, CA 92284

Copies of the draft 2025 RUWMP, including the Hi-Desert Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 55439 29 Palms Highway Yucca Valley, CA 92284 during regular business hours and online at www.hdwd.com

Joshua Basin Water District

The Joshua Basin Water District will hold a public hearing as follows:

Date: June 3, 2026

Time: 5:00 PM

Location: 61750 Chollita Road Joshua Tree CA 92252

Copies of the draft 2025 RUWMP, including the Joshua Basin Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 61750 Chollita Rd., Joshua Tree, CA during regular business hours and online at www.jbwd.com

Golden State Water Company – Barstow

Golden State Water Company – Barstow will hold a public hearing as follows:

Date: May 27, 2026

Time: 11:00 AM

Location: <https://us06web.zoom.us/j/81445290033?pwd=UijEvrlofbbXI4bRWJDhDO3PRaXi0J.1>

Passcode: 757372

Copies of the draft 2025 RUWMP, including the Golden State Water Company – Barstow retailer-specific chapter and the Company's WSCP and applicable appendices, will be available for public review online at <https://www.gswater.com/>

Liberty Utilities – Apple Valley

Liberty Utilities – Apple Valley will hold a public hearing as follows:

Date: June 4, 2026

Time: 9:00 AM

Location: <https://teams.microsoft.com/meet/284381397435981?p=HKnyBIDhSKyaciZB6S>

Passcode: uc3Ee7km

Copies of the draft 2025 RUWMP, including the Liberty Utilities – Apple Valley retailer-specific chapter and Liberty Utilities – Apple Valley WSCP and applicable appendices, will be available for public review online at <https://libertyutilities.com/>

San Bernardino County Service Area 64

The San Bernardino County Service Area 64 will hold a public hearing as follows:

Date: June 23, 2026

Time: 10:00 AM

Location: 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415

Copies of the draft 2025 RUWMP, including the San Bernardino County Service Area 64 retailer-specific chapter and the CSA's WSCP and applicable appendices, will be available for public review at 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415 during regular business hours and online at <https://sanbernardino.legistar.com/Calendar.aspx>

San Bernardino County Service Area 70J

The San Bernardino County Service Area 70J will hold a public hearing as follows:

Date: June 23, 2026

Time: 10:00 AM

Location: 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415

Copies of the draft 2025 RUWMP, including the San Bernardino County Service Area 70J retailer-specific chapter and the CSA's WSCP and applicable appendices, will be available for public review at 385 North Arrowhead Avenue, First Floor, San Bernardino, CA, 92415 during regular business hours and online at <https://sanbernardino.legistar.com/Calendar.aspx>

Phelan Pinion Hills Community Services District

The Phelan Pinion Hills Community Services District will hold a public hearing as follows:

Date: June 10, 2026

Time: 5:00 PM

Location: 4176 Warbler Road, Phelan, CA 92371

Copies of the draft 2025 RUWMP, including the Phelan Pinion Hills Community Services District retailer-specific chapter and the CSD's WSCP and applicable appendices, will be available for public review at 4176 Warbler Road, Phelan, CA 92371 during regular business hours and online at www.pphcsd.org

City of Adelanto Water District

The City of Adelanto Water District will hold a public hearing as follows:

Date: June 10, 2026

Time: 11:00 AM

Location: Stadium - Conference Room 12000 Stadium Way Adelanto, CA, 92301

Copies of the draft 2025 RUWMP, including the City of Adelanto Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at 11600 Air Expressway Adelanto, CA 92301 during regular business hours and online at

https://adelantoca.gov/services/water_sewer/index.php

Mojave Water Agency

The Mojave Water Agency will hold a public hearing as follows:

Date: June 11, 2026

Time: 9:30 AM

Location: MWA Board Room 13846 Conference Center Drive Apple Valley, CA 92307

Copies of the draft 2025 RUWMP and the Agency's WSCP and applicable appendices, will be available for public review at 13846 Conference Center Drive Apple Valley, CA 92307 during regular business hours and online at <https://www.mojavewater.org/about-mwa/agency-calendar/meetings/>

Victorville Water District

The Victorville Water District will hold a public hearing as follows:

Date: June 16, 2026

Time: 6:00 PM

Location: City Hall 14343 Civic Drive Victorville, CA 92392

Copies of the draft 2025 RUWMP, including the Victorville Water District retailer-specific chapter and the District's WSCP and applicable appendices, will be available for public review at City Hall 14343 Civic Drive Victorville, CA 92392 during regular business hours and online at

<https://www.victorvilleca.gov/Government/City-Departments/City-Clerk/Agendas-Meetings-Minutes>

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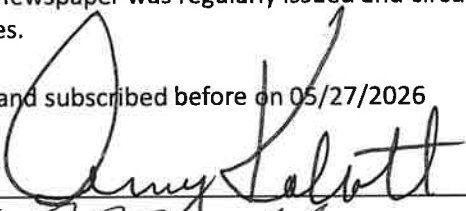
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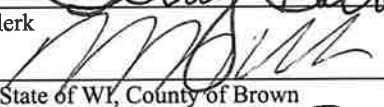
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APPENDIX 2 – REDUCED DELTA RELIANCE

Appendix 2

Mojave Region Delta Reliance

This Appendix provides the Delta Reliance assessment for the Mojave Water Agency (MWA) and the RUWMP participating retail water service agencies located within the Mojave Region. These retail agencies in the Mojave Region covered by this RUWMP assessment include: Liberty Utilities – Apple Valley Water Company, City of Adelanto Water District, San Bernardino County Service Area 64, San Bernardino County Service Area 70J, Golden State Water Company – Barstow System, Hesperia Water District, Hi-Desert Water District, Joshua Basin Water District, Phelan Piñon Hills Community Services District, and Victorville Water District. These retail agencies are subject to the minimum threshold requirements of the Urban Water Management Planning Act (UWMP Act) and work with MWA on managing regional water supplies as described more thoroughly in the 2025 RUWMP. Additional entities that are not currently subject to the UWMP Act but may be subject to the UWMP Act in the future and that rely upon water supplies derived from MWA’s and the retail agencies’ management are also considered in this assessment. Last, this assessment is consistent with all applicable water management activities within the Region including the Mojave Basin Area Adjudication Judgment, the Warren Valley Basin Judgment, and the Ames/Reche Groundwater Storage and Recovery Program Management Agreement.

A.1 Delta Reform Act and Certification of Consistency

The Delta Reform Act of 2009 required state and local agencies to prepare a written certification of consistency with Delta Plan policies before initiating a covered action in the Delta.¹ The written certification of consistency must be submitted to the Delta Stewardship Council and include detailed findings as to whether the covered action is consistent with applicable Delta Plan policies.² The submitted certification of consistency may be appealed by any person and the Delta Stewardship Council may grant the appeal to address contested issues.³ In short, water suppliers that anticipate participating in a proposed covered action must comply with the requirements of the Delta Reform Act.

¹ California Water Code section 85057.5.

² California Water Code section 85225.

³ California Water Code section 85225.10-85225.25.

Proposed covered actions may include a conveyance facility or a new diversion that involves transferring water through, exporting water from, or using water in the Delta. For urban purveyors that may participate in a proposed covered action, should provide information in their Urban Water Management Plans (UWMP) that can be used to demonstrate consistency with the Delta Plan. Specifically, the urban purveyors need to demonstrate consistency with Delta Plan Policy WR P1 – Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).⁴ WR P1 subsection (a) states that:

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

- (1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
- (2) That failure has significantly caused the need for the export, transfer, or use; and*
- (3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

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

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

- (A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
- (B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

⁴ Cal. Code Regs., tit. 23 section 5003.

(C) Included in the Plan, commencing with 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).

The analysis in this RUWMP Appendix includes all of the elements described in WR P1(c)(1) that need to be included in a water supplier’s UWMP to support a certification of consistency for a future proposed covered action.

A.2 Expected Outcomes for Reduced Delta Reliance and Regional Self Sufficiency

The expected outcomes for this Delta reliance and improved regional self-reliance assessment were developed using guidance described in Appendix C of DWR’s Urban Water Management Plan Guidebook 2025, issued in January 2026 (Guidebook 2025), which generally reflected the guidebook issued in March 2021 (Guidebook 2020). The data used in this assessment represent the total regional efforts of MWA and the retail agencies and were developed as part of a region-wide coordination process to prepare the 2025 Regional Urban Water Management Plan (RUWMP). Table 1 shows the expected outcomes for reduced Delta reliance within the Mojave Region.

TABLE 1: EXPECTED OUTCOMES FOR REDUCED RELIANCE ON THE DELTA

Year	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Water Supplies from the Delta Watershed	34.2%	34.2%	31.0%	26.1%	24.6%	23.5%	22.9%	22.3%	21.7%
Change in Water Supplies from the Delta Watershed		-0.1%	-3.3%	-8.2%	-9.6%	-10.7%	-11.4%	-12.0%	-12.5%

The methodology for demonstrating reduced reliance on the Delta is consistent with DWR’s Guidebook 2020 and Guidebook 2025. MWA calculated its expected outcomes for reduced Delta reliance by measuring its current and anticipated water use against a baseline condition. MWA chose 2010 normal water year as its baseline. Data for the 2010 baseline

were taken from relevant regional planning documents. MWA then assessed its Delta Reliance against the 2010 baseline for years 2015 through 2050.

The analysis uses normal water year demands to assess the supplies that would be used in the future. In addition, because WR PI considers water use efficiency savings as a source of supply, prior the UWMP Act water conservation mandates (e.g. 20% by 2020) and more recent requirements that help support water use efficiency quantification in the Region.⁵ Table 2 shows the Region’s water demands without water use efficiency and the reported water use efficiency.

TABLE 2: DEMANDS WITHOUT WATER USE EFFICIENCY

Total Service Area Water Demands (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040	2045	2050
Water Demands with Water Use Efficiency	145,066	138,009	129,595	121,700	123,400	125,000	126,500	128,800	130,700
Reported Water Use Efficiency	-	17,735	38,571	72,800	77,112	81,378	85,682	89,024	92,557
Water Demands without Water Use Efficiency	145,066	155,744	168,166	194,500	200,512	206,378	212,182	217,824	223,257

MWA and the participating retail urban water suppliers must also report the expected outcomes for measurable improvement in regional self-reliance. Given water management within the Region as described throughout the 2025 RUWMP, Table 3 shows the expected outcomes for supplies contributing to regional self-reliance for the Region as a whole.

⁵ In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized Urban Water Use Objectives for each urban retail water supplier. In contrast to the SB X7-7 per-capita targets, this legislation functions as a water budget tailored to a supplier’s service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation establishes performance measures for commercial, industrial, and institutional sectors. The standards become progressively more stringent through 2040.

The data presented in this section demonstrate the expected outcomes for reduced Delta reliance and regional self-sufficiency. The information has been noticed and presented in accordance with applicable law.

TABLE 3: SUPPLIES CONTRIBUTING TO REGIONAL SELF-RELIANCE

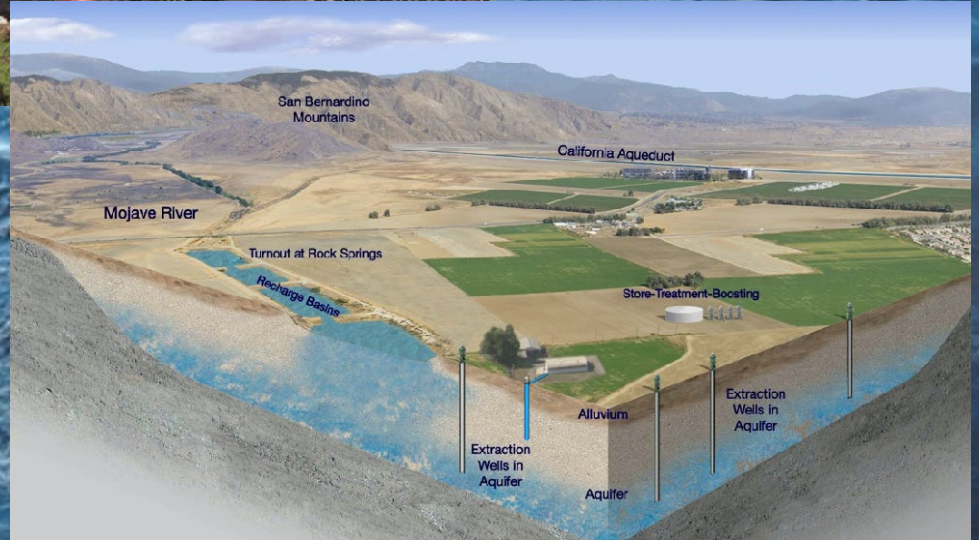
Water Supplies Contributing to Regional Self-Reliance	2010	2015	2020	2025	2030	2035	2040	2045	2050
Water Use Efficiency	0	17,735	38,571	72,800	77,112	81,378	85,682	89,024	92,557
Water Recycling	62,000	47,825	52,536	47,495	49,699	50,930	52,172	53,559	53,560
Conjunctive Use Projects	54,045	57,349	57,349	57,349	57,349	57,349	57,349	57,349	57,350
Water Supplies Contributing to Regional Self-Reliance	116,045	122,909	148,456	177,644	184,160	189,658	195,203	199,932	203,466
Service Area Water Demands without Water Use Efficiency	2010	2015	2020	2025	2030	2035	2040	2045	2045
Service Area Water Demands without Water Use Efficiency	145,066	155,744	168,166	194,500	200,512	206,378	212,182	217,824	223,257
Change in Regional Self Reliance (Acre-Feet)	2010	2015	2020	2025	2030	2035	2040	2045	2045
Water Supplies Contributing to Regional Self-Reliance	116,045	122,909	148,456	177,644	184,160	189,658	195,203	199,932	203,466
Change in Water Supplies Contributing to Regional Self-Reliance		6,864	32,411	61,599	68,115	73,613	79,158	83,887	87,421
Percent Change in Regional Self Reliance	2010	2015	2020	2025	2030	2035	2040	2045	2045
Water Supplies Contributing to Regional Self-Reliance	80.0%	78.9%	88.3%	91.3%	91.8%	91.9%	92.0%	91.8%	91.1%
Change in Water Supplies Contributing to Regional Self-Reliance		-1.1%	8.3%	11.3%	11.9%	11.9%	12.0%	11.8%	11.1%

APPENDIX 3 – MWA REGIONAL DWR CHECKLIST

Retail (x = required)	Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location	Chapter Location
x	x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Chapter 3, 4, 6	n/a
x	x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Chapter 6	Beginning of each sub-chapter
x	x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Chapter 6	6.1
x	n/a	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Chapter 6	Table 6-1
x	x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Chapter 1	1.1
x	x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Chapter 6	6.1
x	x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Chapter 6	6.1
x	x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Chapter 6	6.1
x	n/a	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R		
n/a	x	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	Chapters 3, 4, 5	n/a
x	x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Chapters 2, 3, 4	n/a
x	x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Chapter 6	
x	x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Chapter 6	6.3
x	x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Chapter 6	6.3
x	x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area... include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Chapter 6	6.3
x	Optional	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Chapter 4	n/a
x	Optional	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5		
x	n/a	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6		
x	n/a	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3		
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3		
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3		
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)(i)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall... Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3		
x	x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Chapter 5	n/a
n/a	x	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	Chapter 4	n/a
x	n/a	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020. - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1		
x	x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Chapters 3 and 4	n/a
x	x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Chapter 5	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water... (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Chapter 3	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Chapter 2	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Chapter 2	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Chapter 2	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins... (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin...	Water supplies and recycled water	n/a	n/a	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins... describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	n/a	n/a
x	x	6.2	Section 6.2.2	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water... (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Chapters 3 and 6	6.5
x	x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Chapters 3 and 6	6.5
x	x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Chapter 3	n/a
x	x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Chapter 3	n/a
x	n/a	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2		
x	x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Chapter 3	n/a
x	x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Chapter 3	n/a
x	x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Chapter 3	n/a
x	x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Chapter 3	3.1
x	x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System supplies, energy intensity	O-1A, O-1B, O-1C, and O-2	Chapter 6	6.9

x		7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Chapter 3	n/a
x	x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Chapter 6	6.5
x	x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Chapter 5	n/a
x	x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Chapter 6	6.8
x	x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Chapter 6	6.5
x	x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Chapter 6	6.5, 6.8
x	x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Chapter 3, 4, 5	n/a
x	x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Chapter 3, 4, 5	n/a
x	x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Chapter 6	6.7
x	x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Chapter 6	6.7
x	x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Chapter 6	6.7
x	x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a		
x	x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3, Water Shortage Emergencies .	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions .	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, Excessive Residential Water Use During Drought .	Water shortage contingency planning	n/a		
x	n/a	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a		
x	x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a		
x	x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Chapter 6	6.7
x	n/a	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a		
n/a	x	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	Chapter 6	6.7
x	n/a	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a		
x	x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Chapter 6	6.1
x	x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Chapter 6	6.1
x	x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Appendices	n/a
x	x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Appendices	n/a
x	x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Chapter 6	6.1
x	x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Appendices	n/a
x	x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Appendices	n/a
x	x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Appendices	n/a
x	x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Appendices	n/a

APPENDIX 4 – MWA WSCP



Mojave Water Agency Water Shortage Contingency Plan



Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) addresses the plan preparation requirements in Water Code Section 10632 of the Urban Water Management Planning Act (The Act). The WSCP is incorporated into the 2025 Urban Water Management Plan (UWMP) and used by Mojave Water Agency (MWA) to respond to water shortage contingencies in the MWA service area as they may arise.

MWA provides wholesale water to retail agencies within its service area. The retail agencies are the direct purveyor of water service to retail customers. As such, MWA relies on a coordinated approach to water shortage management with the retail water agencies within its service area. MWA's efforts in Water Shortage Contingency Planning are focused on maintaining and augmenting groundwater supplies in order to mitigate against extended drought conditions and catastrophic water outages. And because MWA is a wholesale urban water supplier, elements that pertain only to retail water suppliers are not addressed in this WSCP.¹ This chapter will address all aspects of MWA's WSCP actions and address specific outage scenarios that MWA's water management actions alleviate.

Section 10631 of the Urban Water Management Plan Act lists the following required elements for wholesale water purveyors:

1. An analysis of water supply reliability
2. Procedures for conducting an annual water supply and demand assessment
3. Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage and the shortage response actions that align with the defined shortage levels.
4. Communication protocols and procedures
5. A description of legal authorities
6. A description of financial consequences
7. Reevaluation and improvement procedures
8. Special Water Feature Distinction (10632(b))

¹ Water Code sections 10632(a)(6), 10632(a)(8)(C), and 10632(a)(9) apply exclusively to retail urban purveyors.

9. Plan Adoption, Submittal, and Availability

This WSCP is a stand-alone plan that may be adopted independently from the UWMP and may be amended or refined and readopted as needed over coming months and years independently from the UWMP.

1.1 Water Supply Reliability Analysis

Mojave Water Agency is a special act district created in 1960 under Chapter 97 of the California Water Code Water Appendices. MWA service area covers 4,900 square miles in San Bernardino County and delivers water for regional groundwater management that is used by numerous retail water purveyors, ten of which are required to prepare an UWMP under the Urban Water Management Planning Act. Regional water supplies consist of naturally recharged groundwater, return flows, wastewater imports and imported State Water Project supplies. These supplies are discussed in greater detail in Chapter 4.

The water demands in the MWA service area currently serve a population approaching 600,000 people that is expected to grow to nearly 700,000 people by 2065.² MWA's service area demand analysis includes both the population assessment and relevant land use information provided by each retail provider. In short, the MWA service area demands are set to increase from 121,250 acre-feet per year in 2030 to over 126,000 acre-feet per year in 2045. Moreover, MWA's regional demands projection for 2050 exceed 127,270 acre-feet. These long-term demands are included in the 2025 UWMP in order to improve long-term water management and planning actions. These demands are discussed in detail in Chapter 6.

MWA has sufficient available regional supplies to meet the regional demands through 2050. These supplies include not only the sources noted above, but also stored water within the SWP system and groundwater storage within the MWA service area. In concert with the supplies noted above, these stored supplies allow MWA to provide reliable water supplies to retail agencies in dry year conditions. Accordingly, as shown in Chapter 4, MWA has reliable water supplies available to meet normal, single dry, and five consecutive dry year water demands through 2065.

² *Mojave Water Agency Population Forecast, 2020 Edition*, August 2020, UC Riverside School of Business Center for Economic Forecasting and Development

1.2 Annual Water Supply and Demand Assessment Procedures

The WSCP describes MWA's procedural methodology for managing shortages and developing its Annual Water Supply and Demand Assessment (Annual Assessment). The Annual Assessment will be submitted to DWR by July 1 each year with the first Annual Assessment due July 1, 2022. The Annual Assessment examines MWA's anticipated water reliability for the current year and one additional dry year to determine what, if any, water shortages stages may be triggered during the required period. The Annual Assessment will be used by MWA decisionmakers to prepare for and initiate implementation of any needed response actions, as well as to inform customers, the general public, interested parties, and local, regional, and state government entities to prepare for such required actions, if necessary.

1.2.1 Analytical and Decision-making Processes

MWA plans to conduct its Annual Assessment according to the following timeline and process:

By February 1 Initial data collection, analysis, and coordination with retail agencies

By March 1 Preliminary Draft Annual Assessment subject to internal review

By April 1 Draft Annual Assessment and results briefing for MWA decision-makers

By May 1 Approval of Annual Assessment to MWA Decision-makers

By June 1 Public Release of Annual Assessment and Public Notifications

By July 1 Submit Annual Assessment to DWR in advance of July 1 deadline

MWA will prepare its Annual Assessment using the following key data and analytical methods:

- Prepare supply estimates for each water source for the analysis period.
- Update unconstrained regional demand and estimate anticipated actual water use for the analysis period.
- Update infrastructure assessment, including estimated water supply production capability on a monthly basis for the analysis period.
- Identify and quantify any locally applicable factors that may influence or disrupt supplies during the analysis period.

For the purposes of conducting the Annual Assessment, MWA’s definition of “dry year” mimics characteristics of 2021–2022 water year where SWP allocation was 5%.

1.2.2 Submittal Procedure

MWA will submit its Annual Assessment to DWR via email by July 1 each year. At the time of DWR submittal, MWA will also notify all retail water agencies, the public, and other stakeholders concerning the results of the Annual Assessment and where it is available for review.

1.3 Six Standard Water Shortage Stages and Shortage Response Actions

The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% percent shortage) as compared to the normal reliability condition. These water shortage stages have been standardized to allow for a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions. Changes in supply availability will trigger an appropriate water shortage stage. MWA will then implement the response actions as specified below.

The WSCP is required to identify locally appropriate shortage response actions that align with the defined shortage stages and include demand reduction actions, supply augmentation actions, system operational changes, and mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions. For each response action the WSCP is to provide an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

MWA has grouped the actions to be taken during a water shortage condition into six stages, providing flexibility to address water shortages up to and exceeding the 50 percent shortage level condition. The following is an overview of the staged response MWA could follow during a given water shortage condition including sequential Stages (1–6) based on shortage severity, relative supply conditions for each stage, and percent shortage reduction levels. MWA will adopt the six standard water shortage stages for this 2025 WSCP as shown in Table 1 below.

Table 1: Shortage Stages and Response Actions

Shortage Stage	Shortage Percentage	Shortage Response	
1	Up to 10%	<ul style="list-style-type: none"> • Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction 	<ul style="list-style-type: none"> • 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-10% met by communicating voluntary demand reduction
2	10%-20%	<ul style="list-style-type: none"> • Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R³ Deliveries 	<ul style="list-style-type: none"> • 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-20% met by communicating voluntary demand reduction • 0-20% through reduced R³ deliveries
3	20%-30%	<ul style="list-style-type: none"> • Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R³ Deliveries 	<ul style="list-style-type: none"> • 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R³ deliveries
4	30%-40%	<ul style="list-style-type: none"> • Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R³ Deliveries 	<ul style="list-style-type: none"> • 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R³ deliveries
5	40%-50%	<ul style="list-style-type: none"> • Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R³ Deliveries 	<ul style="list-style-type: none"> • 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R³ deliveries
6	More than 50%	<ul style="list-style-type: none"> • Access Stored Supplies, as needed • Access Flexible Supplies, as needed • Implement Voluntary Demand Reduction • Reduce R³ Deliveries 	<ul style="list-style-type: none"> • 0-100% met by Storage • 0-100% met by Flexible Supplies • 0-30% met by communicating voluntary demand reduction • 0-30% through reduced R³ deliveries

Stage 1 (up to 10 percent shortage) – When Stage 1 is implemented, voluntary water conservation is encouraged. The drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the retail agencies. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 10% water conservation savings.
- Public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Initiating a Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed

Stage 2 (11 - 20 percent shortage) – When Stage 2 is implemented, voluntary water conservation is strongly encouraged. MWA coordinates actions with regional retail water purveyors. The drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 20% water conservation savings.
- Public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed

- Reduce R3 deliveries as appropriate with retail agencies

Stage 3 (21 – 30 percent shortage) – When Stage 3 is implemented, voluntary water conservation is strongly encouraged and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and emphasizes MWA’s ability to assist with supply re-allocation. The seriousness of the drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

Stage 4 (31 – 40 percent shortage) – When Stage 4 is implemented, voluntary water conservation is strongly encouraged and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and assesses opportunities for supply reallocation among participating retail water purveyors. The seriousness of the drought situation is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.

- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

Stage 5 (41 - 50 percent shortage) – When Stage 5 is implemented, voluntary water conservation is stressed to all regional purveyors and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and assesses opportunities for supply reallocation among participating retail water purveyors. The dire situation caused by the water shortage is explained to the public and governmental bodies. MWA explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

Stage 6 (greater than 50 percent shortage) – When Stage 6 is implemented, voluntary water conservation is stressed to all regional purveyors and demand reduction measures are repeatedly communicated. MWA coordinates actions with regional retail water purveyors and assesses opportunities for supply reallocation among participating retail water purveyors. The emergency situation caused by the water shortage is explained to the public and governmental bodies. MWA explains conditions leading to supply reductions to all retail purveyors. The activities performed by MWA during this stage include, but are not limited to:

- Implementation of all Voluntary Water Conservation Measures to a level addressing up to 30% water conservation savings.
- Aggressive public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers.
- Educational programs in area schools.
- Expanding the Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency.
- Access stored supplies to address supply deficits, as needed
- Access alternative water supplies to address supply deficits, as needed
- Reduce R3 deliveries as appropriate with retail agencies

1.3.1 Supply Augmentation Actions

The following water supply augmentation actions may be used as response actions for the appropriate Water Shortage Stage. MWA may access its stored water sources in various locations inside and outside its service area. This storage occurs as carryover water in the SWP as well as groundwater storage within the MWA Service Area. These stored supplies may be transferred or exchanged with other purveyors that can assist in providing water supplies to MWA's service area. In addition, MWA will work with the California Department of Water Resources (DWR) to access supplies that may be made available in the statewide conveyance systems. Lastly, MWA may take additional supply augmentation actions that become available during the identified water shortage condition like acquiring water from other entities through transfers or exchanges that may be delivered into MWA's service area.

1.3.2 Operational Changes

The following water system operational changes may be used as response actions for the appropriate Water Shortage Stage. MWA may use its water storage and conveyance facilities to expedite water acquisitions, transfers, and exchanges that may alleviate identified water shortage conditions. MWA will assess the utility associated with full operational capacity at its R³ facility and coordinate operational actions with retail agencies that will help address water shortage conditions. Moreover, where operational flexibility exists in MWA's six turnouts from the East Branch of the State Water Project, MWA may exercise operational options to facilitate water shortage mitigation actions.

1.3.3 Emergency Response Plan for Catastrophic Water Shortages

This section identifies actions to be undertaken by MWA to prepare for, and implement during, a catastrophic interruption of water supplies. A catastrophic interruption could result from natural and man-made events that causes a water shortage severe enough to trigger a Stage 1-6 water supply shortage condition. In addition, MWA's SWP water supplies are conveyed through the California Aqueduct system operated by DWR, and DWR has created several emergency plans to address catastrophic outages. This section addresses the catastrophic outage scenarios and relevant actions that MWA will undertake should a catastrophic outage occur.

Earthquakes are an issue of concern in the Mojave Basin region. The southern portion of the San Andreas Fault borders the western edge of Mojave Water Agency's Service Area and an earthquake on that fault could significantly impact water service and infrastructure. The California Department of Water Resources (DWR) has noted that an earthquake could damage the California Aqueduct conveyance system through structural damage or electrical failures which could potentially halt water deliveries to MWA. In short, an earthquake may create regional turmoil that could impact local infrastructure or cause power outages for extended periods of time.

DWR has a contingency California Aqueduct outage plan for restoring the California Aqueduct to service should a major break occur because of an earthquake or other catastrophic reason. DWR estimates that a major break in the California Aqueduct would take approximately four months to repair. Although extended water supply shortages may manifest for MWA's imported water supplies, the retail agencies and MWA have alternative water supplies available to meet fundamental customer demands. Retail agencies have access to managed groundwater throughout the MWA Service Area and MWA has stored imported water supplies that could be used to meet crisis conditions. Local effects of a catastrophic outage on local water systems may require additional cooperative efforts among regional water purveyors.

In addition to earthquakes, the SWP could experience other emergency outage scenarios. Past examples include slippage of aqueduct side panels into the California Aqueduct near Patterson in the mid-1990s, the Arroyo Pasajero flood event in 1995 (which also destroyed part of Interstate 5 near Los Baños), flood damage to the East Branch of the Aqueduct in 2015, and historic subsidence and leakage repairs needed along the Main Branch and East Branch of the Aqueduct since the 1980s, and potential for further subsidence issues being identified as recently as 2025. All of these outages were short-term in nature (on the order of weeks to several months), and DWR's Operations and Maintenance Division worked diligently to devise methods to keep the Aqueduct in operation and continue SWP deliveries while repairs were

made. Thus, the SWP contractors generally experienced no interruption in total annual deliveries but local actions to mitigate the outage were implemented.

It is important to note that all of MWA's SWP imported supply is used to replenish groundwater recharge facilities. These groundwater augmentation efforts insulate regional purveyors against an outage of the SWP system. As noted in Chapter 4, MWA has over 200,000 acre-feet of stored water available for extraction and use in the MWA service area. Combining this stored water with other stored supplies by the local retail agencies as well as the existing groundwater supplies in the region, MWA and its wholesale member agencies may sustain water supplies in a catastrophic outage of the SWP delivery systems. Even an interruption in SWP supplies for several months would not provide any immediate threat to potable water deliveries from groundwater production wells.

MWA developed its Regional Recharge and Recovery Project, known as "R³," to increase flexibility in its water system. The R³ project is a basin management tool and conjunctive use project that distributes stored water via groundwater wells pumping from the Mojave Basin to local retail water purveyors. This groundwater pumping production is done to benefit each of the retail water agencies and in lieu of pumping from other groundwater production facilities of these retail agencies. This groundwater management project allows water to be pumped in a portion of the basin to be used in lieu of other groundwater production in other portions of the basin so that the various areas of the basin can be actively managed. The R³ project includes groundwater recharge facilities, groundwater production wells, booster pumps, storage reservoirs, interconnections to the retail customer water system, water meters, and chlorination facilities. The R³ facilities provide redundant capacity to the retail agencies during catastrophic outage events. Although MWA may stop deliveries in the R³ facilities to the retail agencies at any time, the facilities may help provide water supplies during crisis conditions. In short, working in parallel with the retail agencies, the R³ facilities can be used to supplement the facilities that each retail water agency may have to handle catastrophic outages.

The R³ facilities also have a separate Emergency Response Plan (ERP).³ This ERP identifies emergency procedures, response actions, and responsible personnel that would be activated in the event of an emergency with the R³ facilities. Specifically, the ERP addresses responses to leaks or service interruptions, low pressure, power outage, contamination, and physical destruction of the R³ facilities.⁴ Accordingly, MWA's R³ ERP provides an additional buffer against emergency and catastrophic outage that may impact Statewide, regional, or local water distribution and treatment facilities.

³ R³ System Emergency/Disaster Response Plan Update 2019, Mojave Water Agency.

⁴ ERP at 2-3.

The area's water sources are generally of good quality, and no insurmountable problems resulting from industrial or agricultural contamination are foreseen. If contamination did result from a toxic spill or similar problematic event, the contamination would be isolated and should not significantly impact the total water supply in the region. In addition, such an event would be addressed in the retailers' emergency response plan as well as the R³ ERP.

1.3.4 SWP Emergency Outage Scenarios

There are numerous events that could result in significant outages and potential interruption of service. Examples of possible nature-caused events include a levee breach in the Delta near the Harvey O. Banks Pumping Plant, a flood, an earthquake event that severely damages the California Aqueduct along its San Joaquin Valley traverse, or an earthquake event along the East Branch of the California Aqueduct. Such events could impact some or all SWP contractors south of the Delta.

The response of DWR, MWA, and other SWP contractors to such events would be highly dependent on the type and location of any such event. In typical SWP operations, water flowing through the Delta is diverted at the SWP's main pumping facility, located in the southern Delta, and is pumped into the California Aqueduct. During the relatively heavier runoff period in the winter and early spring, Delta diversions generally exceed SWP contractor demands, and the excess is stored in San Luis Reservoir. The SWP California Aqueduct terminal reservoirs, such as Pyramid and Castaic Lakes, are also replenished during these periods. During the summer and fall, when diversions from the Delta are generally more limited and less than contractor demands, releases from San Luis Reservoir are used to make up the difference in deliveries to contractors. The SWP share of storage capacity at San Luis Reservoir is 1,062,000 AF.

MWA receives its SWP deliveries through the East Branch of the California Aqueduct. The other contractors receiving deliveries from the East Branch are Metropolitan Water District, Antelope Valley-East Kern Water Agency, Palmdale Water District, Crestline-Lake Arrowhead Water Agency, Desert Water Agency, San Gabriel Valley Municipal Water District, San Bernardino Valley Municipal Water District, San Geronio Pass Water Agency, and Coachella Valley Water District. The East Branch has two terminal reservoirs, Silverwood Lake and Lake Perris, which were designed to provide emergency storage and regulatory storage (i.e., storage to help meet peak summer deliveries) for several of the East Branch contractors. However, MWA does not have contract rights to storage capacity in those reservoirs. Silverwood Lake is within the MWA service area and releases from the lake flow into the primary groundwater basins within the MWA service area. In addition to SWP storage south of the Delta in San Luis Reservoir and the terminal reservoirs, a number of contractors have stored water in groundwater banking programs in the San Joaquin Valley and more recently

along the East Branch, and many also have surface and groundwater storage within their own service areas.

Three scenarios that could impact the delivery to MWA of its SWP supply or other supplies delivered to it through the California Aqueduct are described below. For each of these scenarios, it was assumed that an outage of six months could occur. MWA's ability to meet demands during the worst of these scenarios is presented following the scenario descriptions.

Scenario 1: Levee Breach near the Sacramento-San Joaquin Delta

The California Department of Water Resources (DWR) has estimated that in the event of a major earthquake in or near the Delta, regular water supply deliveries from the SWP could be interrupted for up to three years, posing a substantial risk to the California business economy. Accordingly, a post-event strategy has been developed which would provide necessary water supply protections. The plan has been coordinated through DWR, the Army Corps of Engineers (Corps), Bureau of Reclamation, California Office of Emergency Services (Cal OES), the Metropolitan Water District of Southern California, and the State Water Contractors. Full implementation of the plan would enable resumption of at least partial deliveries from the SWP in less than six months.

DWR Delta Flood Emergency Management Plan (“Emergency Pathway”). DWR has developed the Delta Flood Emergency Management Plan to provide strategies for a response to Delta levee failures, which addresses a range of failures up to and including earthquake-induced multiple island failures during dry conditions when the volume of flooded islands and saltwater intrusion are large. Under such severe conditions, the plan includes a strategy to establish an emergency freshwater pathway from the central Delta along Middle River and Victoria Canal to the export pumps in the south Delta. The plan includes the pre-positioning of emergency construction materials at existing and new stockpiles and warehouse sites in the Delta, and development of tactical modeling tools (DWR Emergency Response Tool) to predict levee repair logistics, water quality conditions, and timelines of levee repair and suitable water quality to restore exports. The Delta Flood Emergency Management Plan has been extensively coordinated with state, federal and local emergency response agencies. DWR, in conjunction with local agencies, the Corps and Cal OES, regularly conduct simulated and field exercises to test and revise the plan under real time conditions.

DWR and the Corps provide vital Delta region response to flood and earthquake emergencies, complementary to an overall Cal OES structure. Cal OES is preparing its Northern California Catastrophic Flood Response Plan that incorporates the DWR Delta Flood Emergency Management Plan. These agencies utilize a unified command structure and response and

recovery framework. DWR and the Corps, through a Delta Emergency Operations Integration Plan, would integrate personnel and resources during emergency operations.

Levee Improvements and Prioritization. The DWR Delta Levees Subvention Program has prioritized, funded, and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta region. These efforts have been complementary to the DWR Delta Flood Emergency Management Plan, which along with use of pre-positioned emergency flood fight materials in the Delta, relies on pathway and other levees providing reasonable seismic performance to facilitate restoration of the freshwater pathway after a severe earthquake. Together, these two DWR programs have been successful in implementing a coordinated strategy of emergency preparedness for the benefit of SWP and CVP export systems. Moreover, levee improvements along the pathway and Old River levees consisting of crest raising, crest widening, landside slope fill and toe berms meet the needs of local reclamation districts and substantially improve seismic stability to reduce levee slumping and create a more robust flood-fighting platform. Many urban water supply agencies have participated or are currently participating in levee improvement projects along the Old and Middle River corridors.

Scenario 2: Complete Disruption of the California Aqueduct in the San Joaquin Valley

The 1995 flood event at Arroyo Pasajero demonstrated vulnerabilities of the California Aqueduct (the portion that traverses the San Joaquin Valley from San Luis Reservoir to Edmonston Pumping Plant). Should a similar flood event or an earthquake damage this portion of the California Aqueduct, deliveries from San Luis Reservoir could be interrupted. DWR has informed the SWP contractors that a four-month outage could be expected in such an event. MWA's assumption is a six-month outage.

Arroyo Pasajero is located downstream of San Luis Reservoir and upstream of the primary groundwater banking programs in the San Joaquin Valley. Assuming an outage at a location near Arroyo Pasajero that resulted in the California Aqueduct being out of service for six months, supplies from San Luis Reservoir would not be available to those SWP contractors located downstream of that point. This would include MWA.

Scenario 3: Complete Disruption of the East Branch of the California Aqueduct

The East Branch of the California Aqueduct begins at a bifurcation of the California Aqueduct south of Edmonston Pumping Plant, which pumps SWP water through and across the Tehachapi Mountains. From the point of bifurcation, the East Branch is an open canal. If a major earthquake (e.g., an event similar to or greater than the 1994 Northridge Earthquake)

were to damage a portion of the East Branch, deliveries could be interrupted. The exact location of such damage along the East Branch would be key to determining emergency operations by DWR and the East Branch SWP contractors. Specifically, MWA's six turnouts on the system could all be differently impacted, and some potentially not impacted at all. For this scenario, it was assumed that the East Branch would suffer a single-location break and deliveries of SWP water from north of the Tehachapi Mountains or of contractor water stored in groundwater banking programs in the San Joaquin Valley would not be available. It was also assumed that Silverwood and Perris dams would not be damaged by the event and that water in Silverwood and Perris Lakes would be available to the East Branch SWP contractors.

In any of these three SWP emergency outage scenarios, DWR and the SWP contractors would coordinate operations to minimize supply disruptions. Depending on the particular scenario or outage location, some or all of the SWP contractors south of the Delta might be affected. But even among those contractors, potential impacts would differ given each contractor's specific mix of other supplies and available storage. During past SWP outages, the SWP contractors have worked cooperatively to minimize supply impacts among all contractors. Past examples of such cooperation have included certain SWP contractors agreeing to rely more heavily on alternate supplies, allowing more of the outage-limited SWP supply to be delivered to other contractors, and exchanges among SWP contractors, allowing delivery of one contractor's SWP supply or other water to another contractor, with that water being returned after the outage was over.

Of these three SWP outage scenarios, the scenario of an East Branch outage along with no delivery of stored water from Silverwood Lake presents the worst-case scenario for MWA. In this scenario, MWA and retail agencies would continue to rely solely on local managed groundwater supplies (native water, natural recharge, return flow, and stored imported water).

Seismic Risk Assessment and Hazard Mitigation Plan

Beginning January 2020, CWC Section 10632.5 mandates urban water suppliers include in their UWMP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. This requirement can be met by submittal of a copy of the most recent adopted local hazard mitigation plan (LHMP) or multi-hazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multi-hazard mitigation plan addresses seismic risk. MWA has submitted a copy of the San Bernardino County Multi-

Jurisdictional Hazard Mitigation Plan, approved by the Federal Emergency Management Agency (FEMA) on December 3, 2022 (HMP).⁵

The fundamental hazards identified in this plan include Earthquake, Wildfire, Flood, Drought, Terrorism and Climate Change. The HMP addresses the vulnerabilities associated with these items, the other plans and financial issues that impact implementation of the HMP, as well as a comprehensive mitigation strategy. Accordingly, the HMP is incorporated by reference into MWA's WSCP.

1.4. Communication Protocols

MWA will engage in specific communication protocols in developing and implementing the WSCP and coordinate with the Regional Water Purveyors and neighboring public agencies to communicate water shortage conditions. MWA will seek to engage customers and provide notice with locally relevant actions that further the water shortage response actions. These actions may include:

- Publishing information on MWA's website.
- Establishing a telephone hotline.
- Coordinating through direct correspondence with local agencies on water supply management
- Preparing social media posts to communicate MWA actions.
- Advertising actions on other local audio and video media.
- Coordinating voluntary and mandatory water shortage condition activities with other local agencies.

Taken together, these communication actions will result in a more effective implementation of MWA's WSCP.

1.5 Legal Authorities

MWA is empowered to implement and enforce its water shortage response actions specified in this section through the following legal authorities: California Water Code Water Appendix, Chapter 97, the Mojave Basin Area Adjudication, and the Warren Valley Judgment. MWA has authorities to manage water supplies in its service area, including management of SWP supplies and R³ facilities. MWA's role as Watermaster under the Mojave Basin Area Adjudication empower it with the authorities to address excessive water use among

⁵ <https://oes.sbcounty.gov/wp-content/uploads/sites/110/2024/06/HMP-2022.pdf>

participating agencies. The Warren Valley Judgment addresses unauthorized or excessive use issues among the participating agencies. However, MWA does not have direct authority to limit groundwater pumping within its service area.

1.6 Financial Consequences of WSCP

MWA has assessed the financial conditions associated with developing and delivering water supplies within its service area boundary. As shown in Chapter 4, MWA has developed alternative water supplies that can be accessed to continue water deliveries during extended dry conditions. Accordingly, although MWA may experience minor financial fluctuations due to water shortage conditions, the redundancy in its water storage systems as well as its coordinated approach to managing dry conditions with the retail agencies will insulate MWA from significant financial consequences. Therefore, this WSCP does not anticipate that implementation of MWA's WSCP will create financial conditions that are detrimental to MWA.

1.7 Re-evaluation and Improvement Procedures

MWA will continually review and assess its procedures for implementing the WSCP. Specifically, MWA will use the monitoring and reporting protocols identified above as a quality assurance and quality control measure to understand the effectiveness of water shortage activities. These re-evaluation and improvement procedures will include developing reports, memoranda, and presentations that assess the effectiveness of water shortage actions and the WSCP. These protocols will be continually assessed and updated by MWA management staff.

1.8 Special Water Feature Distinction

MWA's water shortage response actions focus on health and safety issues and working with retail agencies to manage available supplies. MWA will work with the retail agencies on communicating and implementing those agencies' special water feature distinction issues that may arise during critical water shortage conditions.

1.9 Plan Adoption, Submittal, and Availability

The WSCP has been adopted, submitted, and is available as required by the Urban Water Management Planning Act. As a stand-alone document, the WSCP is also subject to separate adoption, submittal, and availability processes, and whenever it is separately amended or revised in the future. MWA has followed all applicable law in adopting the WSCPs. The current adopted WSCP for the shall be available to its customers and to the to all

local agencies in Mojave Water Agency's service area within San Bernardino County no less than 30 days before its adoption. A copy of the current WSCP is available for public inspection during business hours at www.mojavewater.org and is available for download at www.mojavewater.org/planning.html