

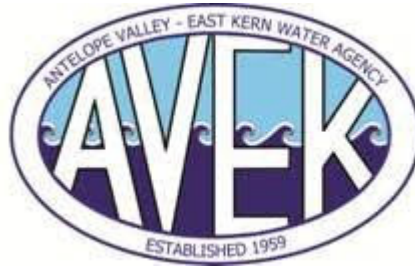
# 2020 Urban Water Management Plan

Final

AUGUST 2021

ANTELOPE VALLEY-EAST KERN WATER AGENCY





ANTELOPE VALLEY-EAST KERN WATER AGENCY

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# 2020 Urban Water Management Plan

AUGUST 2021



Prepared by Water Systems Consulting, Inc.



# ACKNOWLEDGMENTS

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This document was prepared in partnership between WSC and AVEK. WSC thanks the following people for their contributions:

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# ACRONYMS & ABBREVIATIONS

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°F	Degrees Fahrenheit
AB	Assembly Bill
AF	Acre Foot
AFY	Acre Feet per Year
CIMIS	California Irrigation Management Irrigation System
DCR	DWR SWP Delivery Capacity Report
DDW	SWRCB Division of Drinking Water
DMM	Demand Management Measure
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
ET <sub>o</sub>	Reference Evapotranspiration
GPCD	Gallons per Capita per Day
GPM	Gallons per Minute
MGD	Million Gallons per Day
RWQCB	Regional Water Quality Control Board
SBX7-7	Senate Bill 7 of Special Extended Session 7
SOI	Sphere of Influence
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

# Executive Summary

This section includes a lay description of the 2020 UWMP, which describes the fundamental determinations of the UWMP, including water supply reliability, challenges ahead, and strategies for managing reliability risks.

This section summarizes the 2020 Urban Water Management Plan (UWMP or Plan) for the Antelope Valley-East Kern Water Agency (AVEK or Agency). This UWMP was prepared in compliance with California Water Code requirements for UWMPs, following guidance from the California Department of Water Resources (DWR), and is intended to be the long-term water resources planning reference for the Agency.

AVEK is a wholesale supplier of State Water Project (SWP) water to the greater Antelope Valley region. SWP water is a secondary water source for AVEK’s customers and is used in lieu of, or in addition to, pumped groundwater.

AVEK’s service area encompasses nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties as well as a small portion of Ventura County. AVEK has played a major role in the Valley’s water system since it was granted a charter by the State Legislature in 1959 and became a SWP contractor in 1962. AVEK currently provides water to 27 retail water agencies, water companies, and agricultural customers. AVEK’s mission is to deliver reliable, sustainable, and high-quality supplemental water to the region in a cost-effective and efficient manner.

## IN THIS SECTION

- Outreach and Engagement
- Population Projections
- Water Demand Projections
- Water Sources and Uses
- Water Supply Reliability

## Outreach and Engagement

The 2020 UWMP was prepared in a transparent manner, and AVEK actively engaged stakeholders, cities, counties, water agencies, and the public to seek and distribute information about water use, supply, and reliability to strengthen the region's ability to assess and plan for the region's water future. AVEK conducted a public hearing on June 8, 2021, and notified over 40 entities, including AVEK's customers, cities, and counties within the AVEK service area, and other water and planning agencies in the region.

## Population Projections

AVEK provides service to incorporated and unincorporated areas of the greater Antelope Valley. The current and projected populations for AVEK's service area (**Table ES-1**) were based on population projections from the Southern California Association of Governments (SCAG) for Los Angeles and Ventura Counties and the Kern Council of Governments (KCOG). The combined projections result in an average annual growth rate of 1.33%, with a high growth rate initially (2020–2025) and lower rates at end of the projection (2040–2045).

**Table ES-1. AVEK Service Area Current and Projected Population (DWR UWMP Table 3-1W)**

	2020	2025	2030	2035	2040	2045
Los Angeles and Ventura Counties	270,615	288,578	306,542	324,505	342,229	359,953
Kern County	49,956	56,757	63,558	70,359	78,738	87,118
<b>TOTAL</b>	<b>320,571</b>	<b>345,335</b>	<b>370,100</b>	<b>394,864</b>	<b>420,967</b>	<b>447,071</b>

Notes:

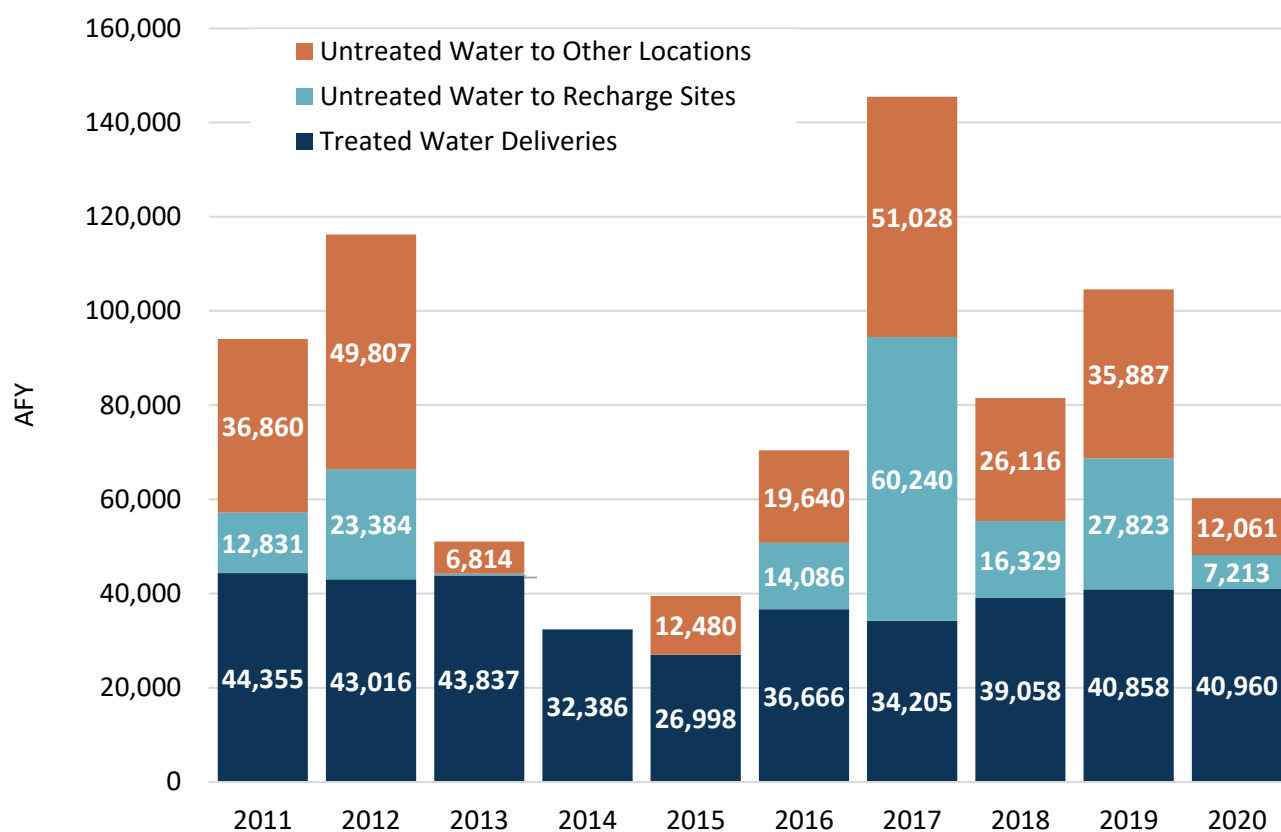
1. Data for Los Angeles and Ventura Counties from SCAG 2020 Connect SoCal Regional Transportation Plan (SCAG, 2020)
2. Data for Kern County from KCOG General Land Use Plan (KCOG, 2018).

## Water Demand Projections

AVEK delivers treated water from the SWP and groundwater to 23 customers, and untreated SWP water to four customers. In addition, AVEK delivers untreated SWP water to its groundwater "banks" by recharging SWP at recharge basins and storage in the groundwater basin so that AVEK can recover the water when needed. AVEK also occasionally transfers untreated SWP water to other water agencies when AVEK has surplus water available and the other agencies are in need of water.

As shown in **Figure ES-1**, treated water deliveries to AVEK retailers were relatively consistent compared with deliveries to recharge sites and other locations. Treated water demands have increased slightly since 2017 but have not returned to the levels observed prior to 2014 following severe drought restrictions. Both recharge water deliveries and deliveries to other locations have varied significantly based on water availability, as evidenced by the high recharge volume in 2017 that coincided with high SWP allocations. Recharge deliveries are discussed further below; however, transfers are not projected in this UWMP because they are opportunistic agreements made by willing parties dependent on each party's needs and they are the lowest priority use of AVEK's supplies.

Figure ES-1. 2011–2020 AVEK Deliveries by Type



### Treated Water Projections

To estimate demands on AVEK supplies, AVEK must first project total demand in the AVEK service area along with projected use of local supplies. The primary local supply is groundwater. AVEK developed a model to compare future supply and demand conditions under multiple supply and demand scenarios.

**AVEK considered seven primary variables and applied the following assumptions for UWMP demand projections:**

#### Population Growth

Applies the population projections presented earlier in this section using comprehensive data from SCAG and KCOG.

#### Per Capita Demand Rebound

This variable considers the extent that per capita demand, measured as gallons per capita per day (GPCD), is estimated to increase from spring 2016, which was the last year severe water use restrictions were in place by AVEK retailers. This UWMP assumes existing demands will increase from 185 GPCD in 2020 to 205 GPCD by 2030.

#### Passive Conservation

This variable considers water savings resulting from plumbing codes and other institutionalized water efficiency measures. This UWMP assumes 0.2% per year reduction in existing demand.

### Active Conservation

This variable considers water saved as a direct result of programs and practices directly funded by a water utility. As a wholesaler, AVEK has less control over conservation programs implemented by its customers. Also, the potential demand impacts are not well understood from the “Conservation as a California Way of Life” legislative mandates from 2018, which require new urban water use efficiency standards by 2022. Therefore, to be conservative in this UWMP, AVEK assumes no active conservation savings, but AVEK intends to work with its customers to understand the potential implications of meeting new urban efficiency standards and plans to adapt its projections based on this and other available information once annual water use reporting starts in 2023.

### Climate Change

This variable considers the potential change in demand from climate change. Climate models disagree on average annual precipitation projections but agree on other hydrologic metrics relevant to water resources management, including increased evapotranspiration, which would increase irrigation demands. Based on climate change projections from DWR<sup>1</sup>, by 2030, precipitation is projected to decrease by 3% and evapotranspiration is projected to increase by 4%, which roughly equates to a net irrigation demand increase of 7%. Irrigation demands may be roughly 50% of total demand, which means that increased evapotranspiration from climate change would increase demand by 3.5% — or about 3,000 acre-feet per year (AFY) over the next 25 years — compared with a more than 40% increase in demand from population growth and unit demand rebound. For this UWMP, increased evapotranspiration is not explicitly included in the demand projections because assumptions for the other variables discussed above (growth, unit demand, and conservation) have a greater impact on the demand projections, and demand impacts from climate change are within the margin of error for the projections.

### Groundwater

This variable estimates the volume of pumping by AVEK customers, which would reduce the amount of AVEK water needed to meet AVEK service area demands. For this UWMP, groundwater pumping is assumed to occur at the amount of production rights described in the Stipulated Judgment (Judgment) for the 2015 Antelope Valley Groundwater Adjudication. The Judgment stipulated production rights to each party and other methods to access additional groundwater rights, such as from imported water return flows. AVEK’s customers have 12,084 AFY of production rights and have received roughly 12,000 AFY of return flow rights since 2016. Imported water return flows are projected to increase as demands increase and imported water must be used to meet those demands.

### Recycled Water

This variable includes with and without planned recycled water use by retailers. This UWMP assumes no recycled water will be developed that offsets projected water use through 2045.

Based on the assumptions described above, AVEK estimated total service area demand projections and net demand on AVEK projections through 2045 as shown in **Table ES-2**.

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<sup>1</sup> <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer>

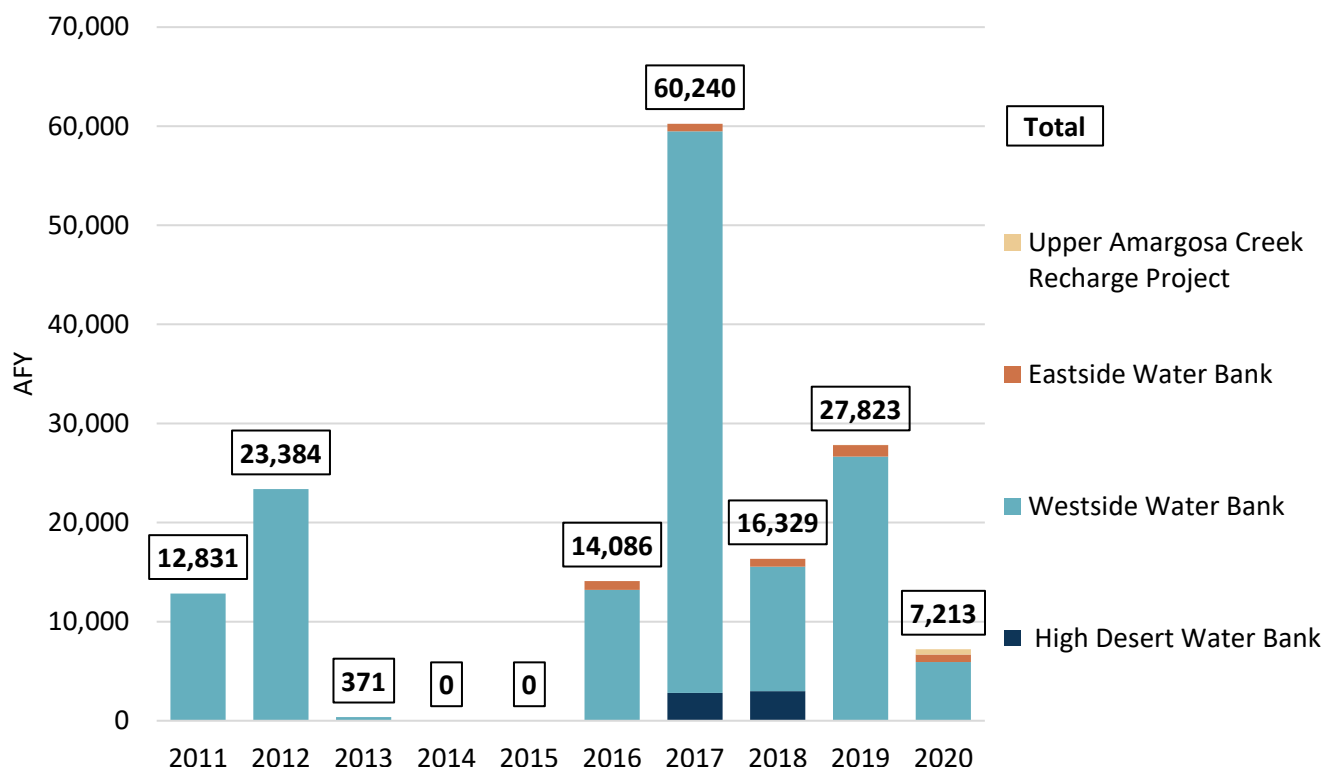
**Table ES-2. 2025-2045 AVEK Demand Projections (AFY)**

	2025	2030	2035	2040	2045
<b>TOTAL AVEK SERVICE AREA DEMAND</b>	<b>73,420</b>	<b>80,400</b>	<b>83,850</b>	<b>87,520</b>	<b>91,200</b>
<b>NON-AVEK SUPPLIES</b>					
Groundwater, Non-AVEK Production Rights	12,080	12,080	12,080	12,080	12,080
Groundwater, Non-AVEK Return Flows	16,900	17,330	19,890	20,230	21,530
<b>NON-AVEK SUPPLIES TOTAL</b>	<b>28,980</b>	<b>29,410</b>	<b>31,970</b>	<b>32,310</b>	<b>33,610</b>
<b>NET AVEK SERVICE AREA DEMAND</b>	<b>44,440</b>	<b>50,990</b>	<b>51,880</b>	<b>55,210</b>	<b>57,590</b>

### Groundwater Recharge Projections

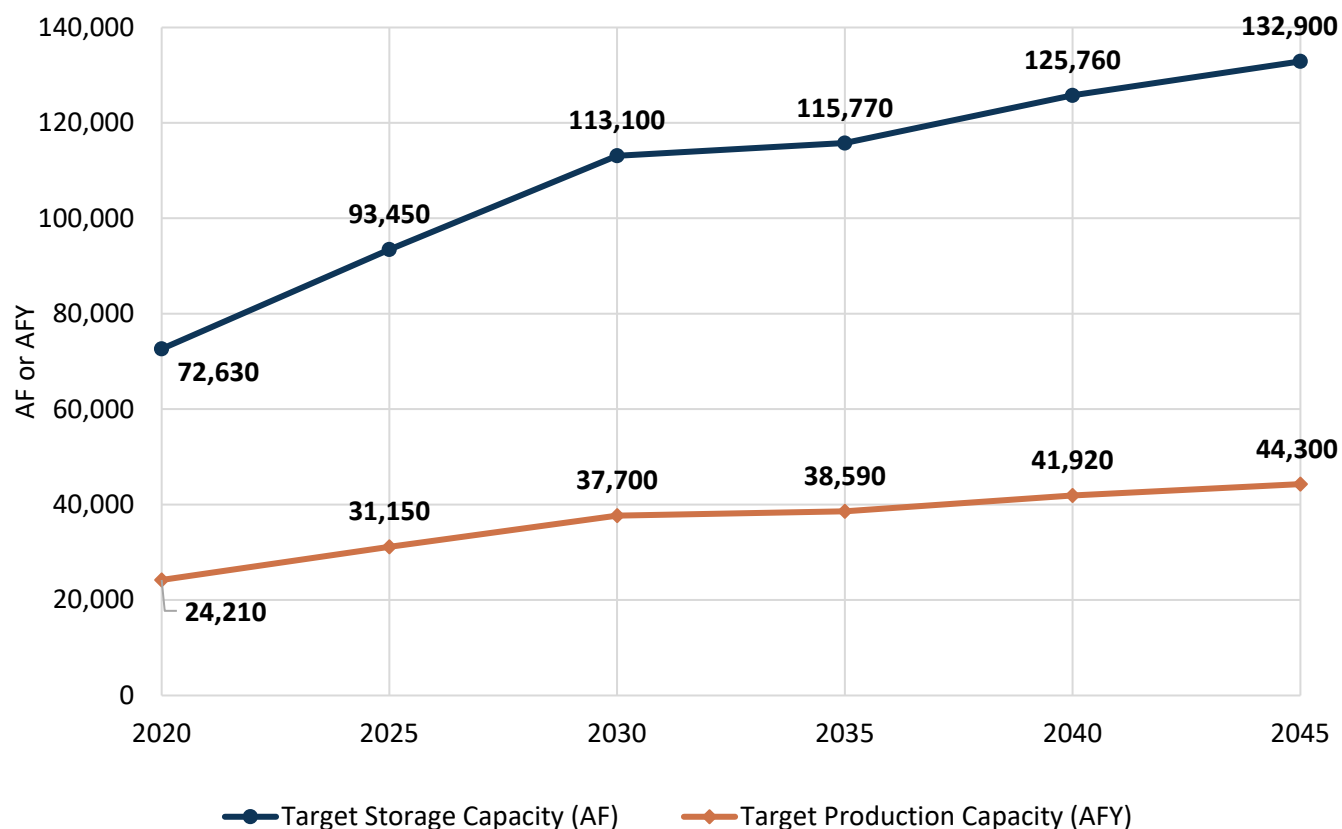
AVEK’s groundwater banking programs store surplus water available from the SWP through groundwater recharge and include recovery wells to pump stored water in times of need. AVEK’s groundwater banks include the Westside Water Bank, which started operations in 2010; the Eastside Water Bank, which started operations in 2016; the Upper Amargosa Creek Recharge Project, a partnership project that started operations in 2019; and, most recently, the High Desert Water Bank. Local recovery of imported water from the groundwater banks has become an important source of water for AVEK to supplement annual SWP water allocations. AVEK began recovering imported water from the groundwater banks in 2014 once groundwater production wells were in place. A summary of AVEK’s historical SWP deliveries to its banking sites is provided in **Figure ES-2**.

**Figure ES-2. 2011–2020 AVEK Historical Imported Water Deliveries to Groundwater Banking Sites**



AVEK’s goal is to have enough storage in the groundwater banks so that the agency is prepared to meet demands during three consecutive years of 10% Table A allocations from the SWP. AVEK currently has roughly 90,000 acre-feet (AF) of SWP water stored within its banks for future recovery and is implementing infrastructure projects to expand its capacity to recharge water, recover water, and distribute recovered water. Based on the demand projections presented above, the target groundwater bank storage capacity and annual production capacity are projected in **Figure ES-3**.

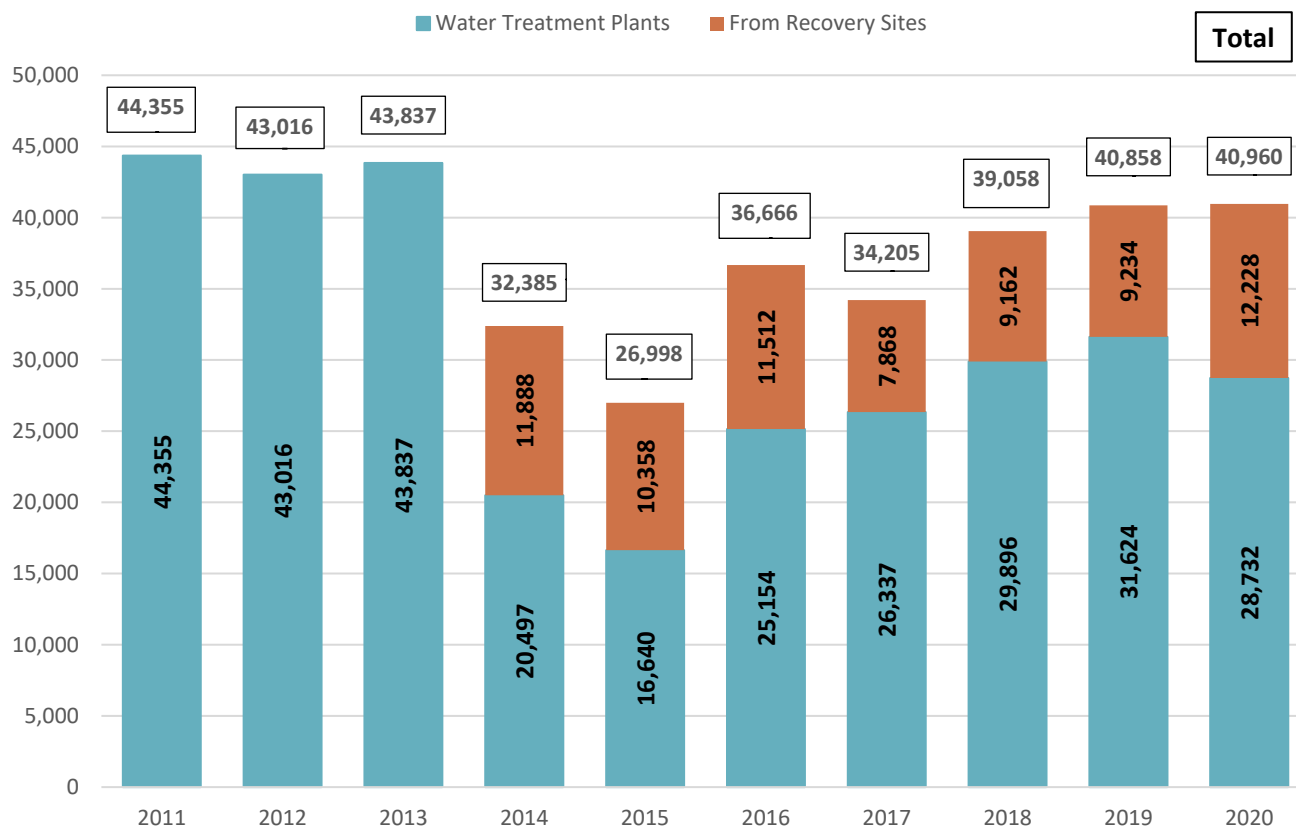
**Figure ES-3. Projected AVEK Groundwater Banking Target Sizing**



## Water Sources and Uses

As shown in **Figure ES-4**, AVEK's potable water deliveries consist of either SWP water treated at AVEK water treatment plants, or groundwater that is either recovered from recharge in previous years or part of AVEK's adjudicated groundwater production rights. Each supply is discussed further below.

**Figure ES-4. 2011–2020 AVEK Drinking Water Deliveries by Source**



### State Water Project

SWP water availability depends on rainfall, snowpack, runoff, reservoir storage, pumping capacity of SWP facilities, and regulatory and environmental mandates on SWP operations. DWR prepares a biennial report to assist SWP contractors and local planners in assessing the availability of supplies from the SWP. DWR's most recent update was the 2019 State Water Project Delivery Capability Report (DCR) (California Department of Water Resources, 2020). The 2019 DCR includes DWR's estimates of SWP water supply availability under both existing (2020) and future conditions (2040) for the SWP as a whole and specifically for AVEK.

To evaluate SWP supply availability under future conditions, the 2019 DCR included a model study representing hydrologic and sea level rise conditions in 2040. The future condition study used the same model assumptions as the study under existing conditions but reflected changes expected to occur from climate change, specifically, projected temperature and precipitation changes centered around 2035 (2020 to 2049) and a 45 cm sea level rise. For the long-term planning purposes of this UWMP, the long-term average allocations reported for the future conditions study from the 2019 DCR is the most appropriate estimate of future SWP water supply availability. AVEK assumes a straight-line reduction in long-term average allocation from 58% in 2020 to 52% in 2040. Allocation in 2045 is assumed to remain at 52%, as shown in **Table ES-3**.



**Table ES-3. SWP Average Yield Projections**

	2020	2025	2030	2035	2040	2045
Average Table A Allocation (%)	58.0%	56.5%	55.0%	53.5%	52.0%	52.0%
Average Table A Yield (AFY)	84,010	81,840	79,660	77,490	75,320	75,320

DWR's 2019 DCR indicates that the modeled single dry year SWP water supply allocation is 7% under existing conditions. However, historically, the lowest SWP allocations were 5% in 2014 and 2021 (as of May 2021). DWR's 2019 DCR indicates that the lowest consecutive five-year period occurred from 1988 to 1992, with an average allocation of 20.3% under the existing conditions. During the recent drought, Table A allocation from 2012 to 2016 averaged 37%.

### Groundwater

AVEK's groundwater wells are located within the Antelope Valley Groundwater Basin (Basin). The Basin was adjudicated in 2015 after 15 years of complex proceedings among more than 4,000 parties, including public water suppliers, landowners, small pumpers and non-pumping property owners, and the federal and state governments. The Antelope Valley Area of Adjudication covers approximately 1,390 square miles, or 90% of the groundwater basin. The Judgment determined the Basin is in a state of overdraft, established respective water rights among groundwater producers based on the Basin's Native Safe Yield, and ordered a ramp-down of production to meet the Native Safe Yield by 2023. The adjudication defined a native safe yield of 82,300 AFY. To achieve sustainable groundwater elevations, groundwater production will be reduced (ramped down) over a seven-year period (2016–2022) to a final production right.

Following the adjudication, the Antelope Valley Watermaster was formed to implement the Judgment. The Watermaster is charged with administering the adjudicated water rights and managing the groundwater resources within the adjudicated portion of the Antelope Valley.

Within AVEK's service area, groundwater production rights within the AVEK service area will decrease to 15,634 AFY by 2023, including AVEK's 3,550 AFY production right. In addition, AVEK and other pumpers receive groundwater pumping rights from imported water return flows equal to the applicable percentage multiplied by the average amount of imported water used by that party within the basin in the preceding five-year period. AVEK received 822 AF of groundwater in 2019 from imported water return flows.

In recent years, AVEK has leased a portion of its groundwater productions rights to LACWD for the districts' use.

### Non-SWP Water

In 2017, AVEK acquired non-SWP water supply through a long-term lease of annual supply originally belonging to the Nickel Family, a farming interest in Kern County. AVEK has acquired the rights to 1,700 acre-feet of water made available for a period of thirty-five years (with an option to extend for thirty-five more years), even in dry years. Gaining additional non-SWP supplies improves the Agency's reliability of its existing water supply, as well as provide additional supplies to meet future demand.

## Summary of Projected Water Supplies

Based on the supplies described above, reasonably available volumes of AVEK water supplies are projected in **Table ES-4**. In addition, AVEK can supplement supplies by recovering banked SWP water in groundwater or accessing supplies, if available, such as carryover groundwater or SWP water types other than Table A.

**Table ES-4. Projected Water Supplies**

	2025	2030	2035	2040	2045
SWP Table A	81,840	79,660	77,490	75,320	75,320
Groundwater, Production Rights	3,550	3,550	3,550	3,550	3,550
Groundwater, Imported Water Return Flows	800	800	800	800	800
Non-SWP Water	1,700	1,700	1,700	1,700	1,700
<b>TOTAL</b>	<b>87,890</b>	<b>85,710</b>	<b>83,540</b>	<b>81,370</b>	<b>81,370</b>



## Water Supply Reliability

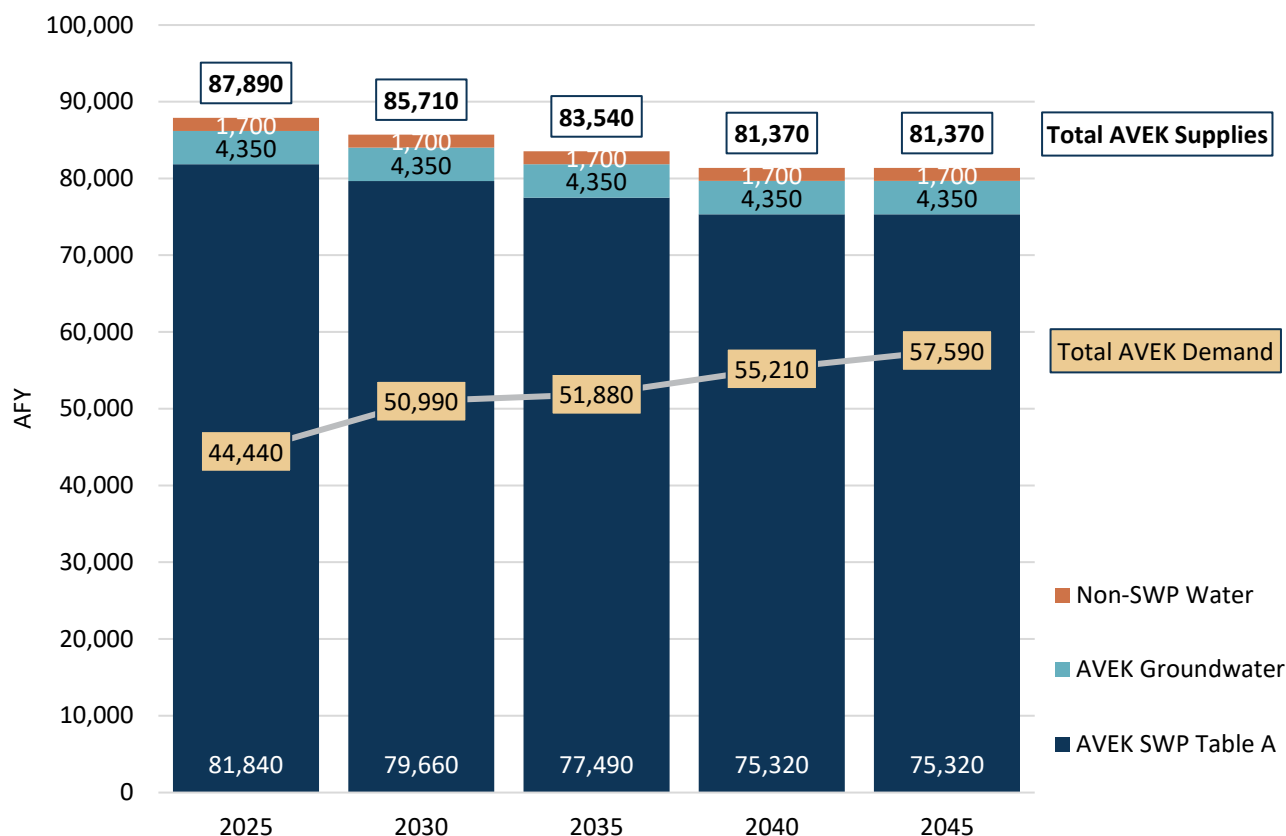
Water supply reliability reflects AVEK’s ability to meet the water needs of its customers with water supplies under varying conditions. AVEK’s water reliability goal is to provide a level of regional water reliability that supports customers’ water needs. The foundational strategy of this goal is to develop groundwater banking programs to help increase the reliability of the greater Antelope Valley region’s water supplies by storing excess SWP water during wet periods and recovering it for delivery to customers during dry and high-demand periods or during a disruption in deliveries from the SWP.

AVEK evaluated its water supply reliability for normal, single dry, and multiple dry years through 2045 and assessed the drought risk over the next five years. The analysis considered plausible hydrological and regulatory variability, climate conditions, and other factors that affect the Agency’s water supply and demand.

### Normal Year

Total normal year AVEK supplies are shown in **Figure ES-5** based on the supply projections discussed above. As shown in the figure, AVEK has sufficient supplies in normal years and could use available supplies to add to groundwater storage for dry periods. For example, SWP water could be recharged when available, or unused groundwater rights could be carried over for use in future years.

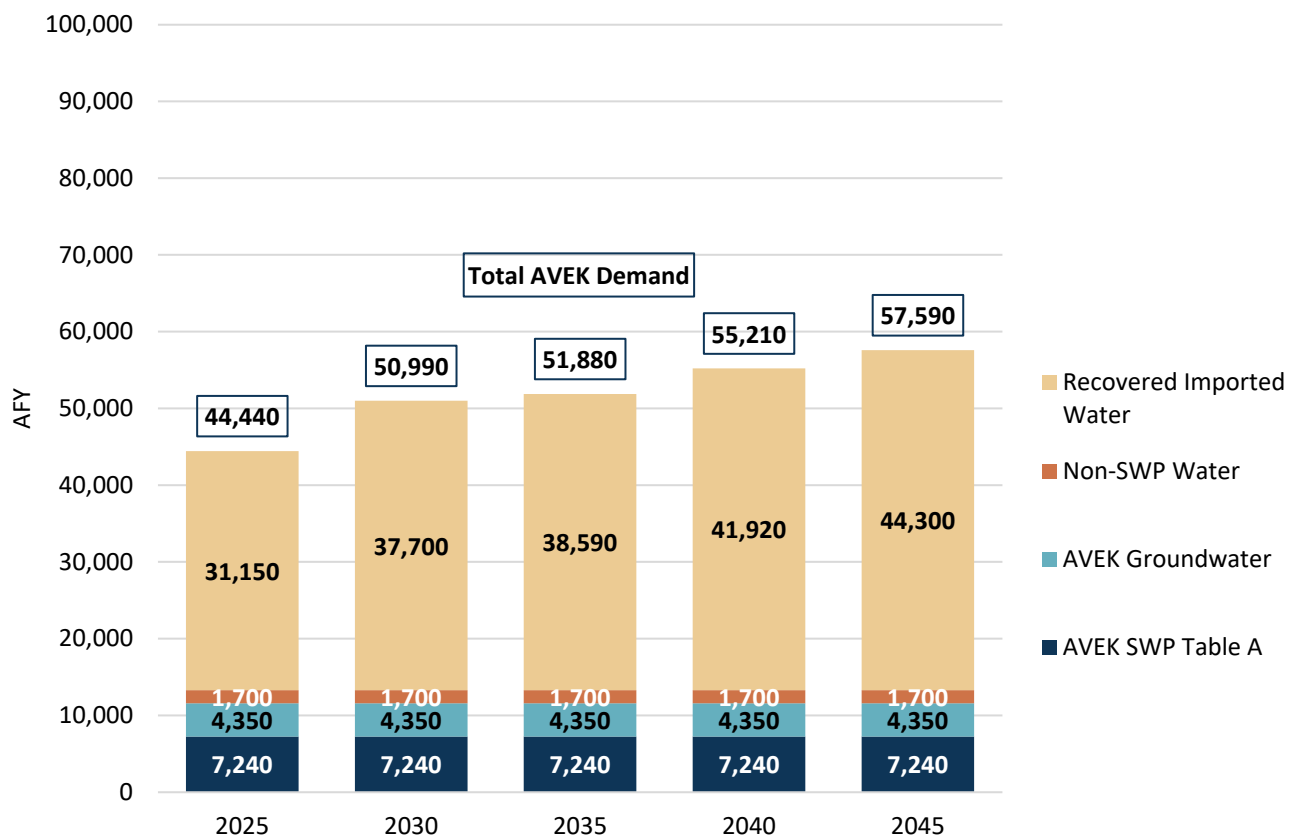
**Figure ES-5. AVEK Supply and Demand Projections, Normal Year**



### Single Dry Year

Single dry year yield for SWP water is based on actual 2014 allocation of 5% (and 2021, as of this writing). Groundwater rights and AVEK’s non-SWP water are not impacted by short-term drought conditions, so normal year supply assumptions are applied. The remainder of demand is met with groundwater in storage. As shown in **Figure ES-6**, recovered imported water from AVEK groundwater banks enable AVEK to meet its demands in a single dry year.

**Figure ES-6. AVEK Supply and Demand Projections, Single Dry Year**



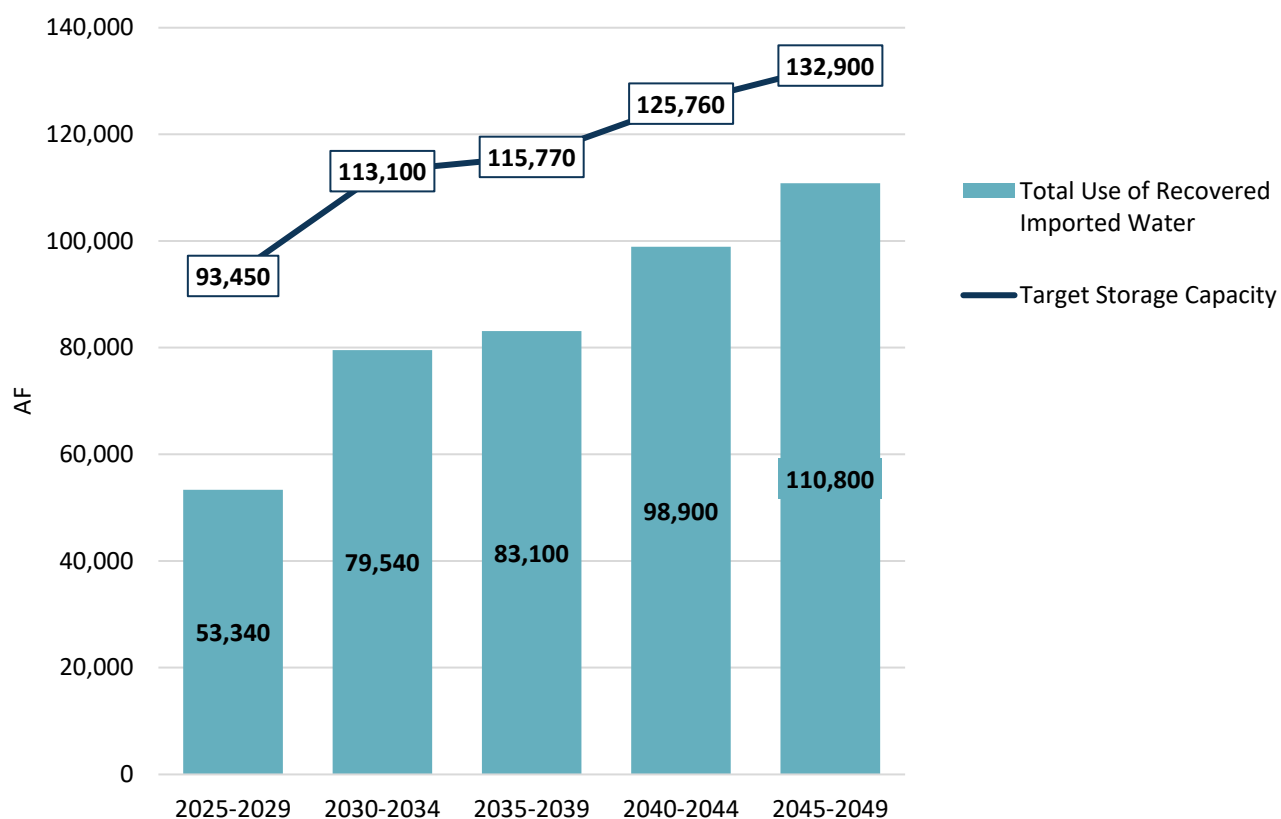
### Five Consecutive Dry Years

For multiple dry years, SWP water availability is based on 1988 to 1992 simulated yield from the 2019 SWP DCR for AVEK, which estimated the following annual Table A allocation:

- **Year 1 (1988)** 12.3%
- **Year 2 (1989)** 32.2%
- **Year 3 (1990)** 13.3%
- **Year 4 (1991)** 25.6%
- **Year 5 (1992)** 18.0%

Similar to single dry year, groundwater rights and non-SWP water are not impacted by an extended drought, and recovered imported water from AVEK groundwater banks are used to meet remaining demands. **Figure ES-7** presents the total volume of imported water recovered from AVEK groundwater banks during a multiple-year drought in comparison with the target total storage volume. As shown in the figure, additional recovery of imported water from AVEK groundwater banks would be available if the five-year drought continued.

**Figure ES-7. AVEK Groundwater Bank Storage Capacity vs. Use during Five Consecutive Dry Years**



### 2021–2025 Drought Risk Assessment

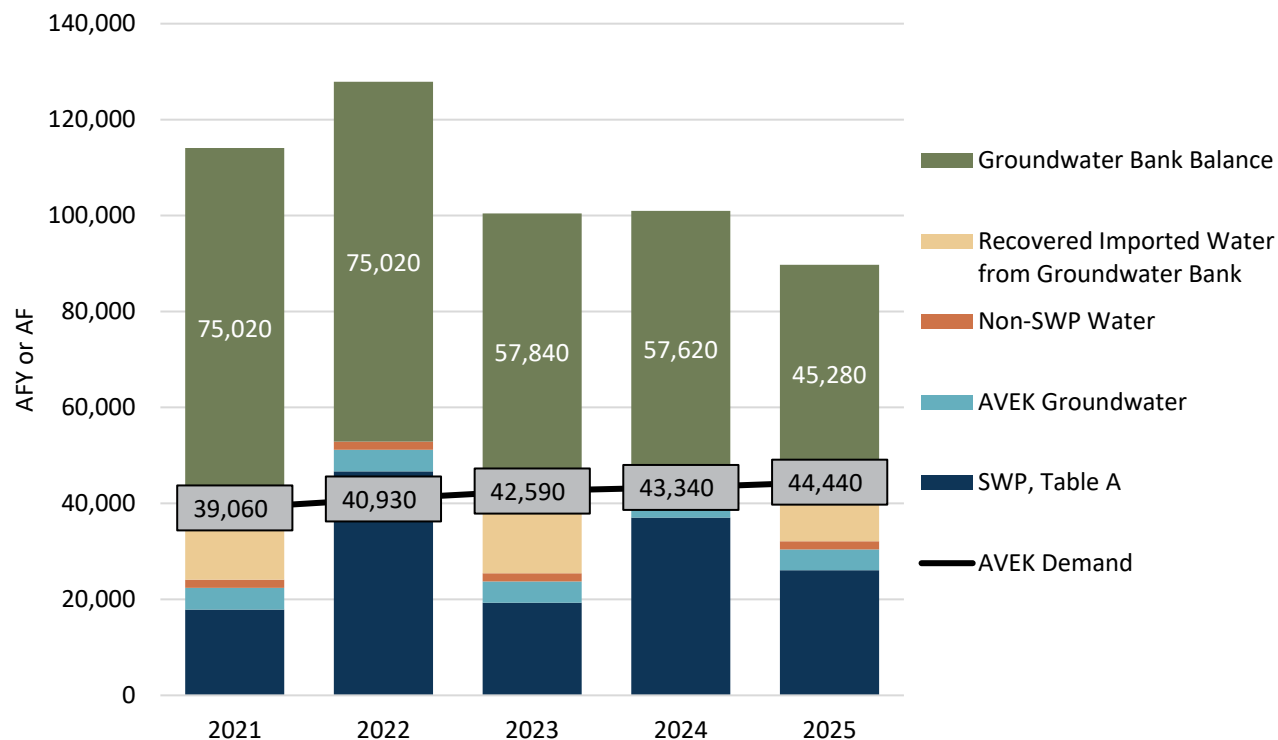
Water Code requires a Drought Risk Assessment for the upcoming five years (2021 to 2025) based on the five driest years on record. The supply assumptions are similar to the multiple dry year assumptions except that groundwater production rights are still ramping down in 2021 and 2022, so they are higher than final production rights in 2023, as shown in **Table ES-5**. AVEK currently has roughly 90,000 AF of SWP water stored within its banks for future recovery and is implementing infrastructure projects to expand its capacity to recharge water, recover water, and distribute recovered water. As shown in **Figure ES-8**, AVEK still would have over 40,000 AF of groundwater remaining in storage at the end of a five-year drought that starts in 2021.

**Table ES-5. AVEK Supply Projections for 2021–2025 Drought Risk Assessment**

SUPPLIES	2021	2022	2023	2024	2025
SWP, Table A	17,850	46,680	19,280	37,040	26,050
AVEK Groundwater	4,530	4,480	4,430	4,380	4,350
Non-SWP Water	1,700	1,700	1,700	1,700	1,700
Recovered Imported Water from Groundwater Bank	14,980	0	17,180	220	12,340
<b>TOTAL AVEK SUPPLIES</b>	<b>39,060</b>	<b>52,860</b>	<b>42,590</b>	<b>43,340</b>	<b>44,440</b>

Note: Groundwater bank supplies are used to meet balance of demand.

**Figure ES-8. 2021–2025 AVEK Drought Reliability Assessment**



## 2021 Water Shortage Contingency Plan

AVEK's 2021 Water Shortage Contingency Plan (WSCP) is a detailed plan that describes how AVEK intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time. The WSCP is used to provide guidance by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to extended drought or catastrophic supply interruptions.

The AVEK 2021 WSCP is included as **Appendix H** in the 2020 UWMP.

## Demand Management Measures

Demand management is an integral part of sustainably managing water resources in California. Implementation of demand management measures that help lower demands can improve water supply reliability and help meet both state and regional water conservation goals.

AVEK has been a leader in water use efficiency for many years and actively collaborates with local and regional agencies and the communities it serves to support innovative programs that drive change. AVEK implements demand management measures as part of its ongoing operations.

**Chapter 9** of the 2020 UWMP describes AVEK's efforts as a wholesale water supplier to promote conservation and reduce demands on water supplies.



# 1

## URBAN WATER MANAGEMENT PLAN

# Introduction

**This chapter provides a brief overview of the Antelope Valley-East Kern Water Agency and the purpose of this 2020 Urban Water Management Plan. It also describes how the Plan is organized and how it relates to other local and regional planning efforts that AVEK is involved in.**

This document presents the 2020 Urban Water Management Plan (UWMP or Plan) for the Antelope Valley-East Kern Water Agency (AVEK or Agency).

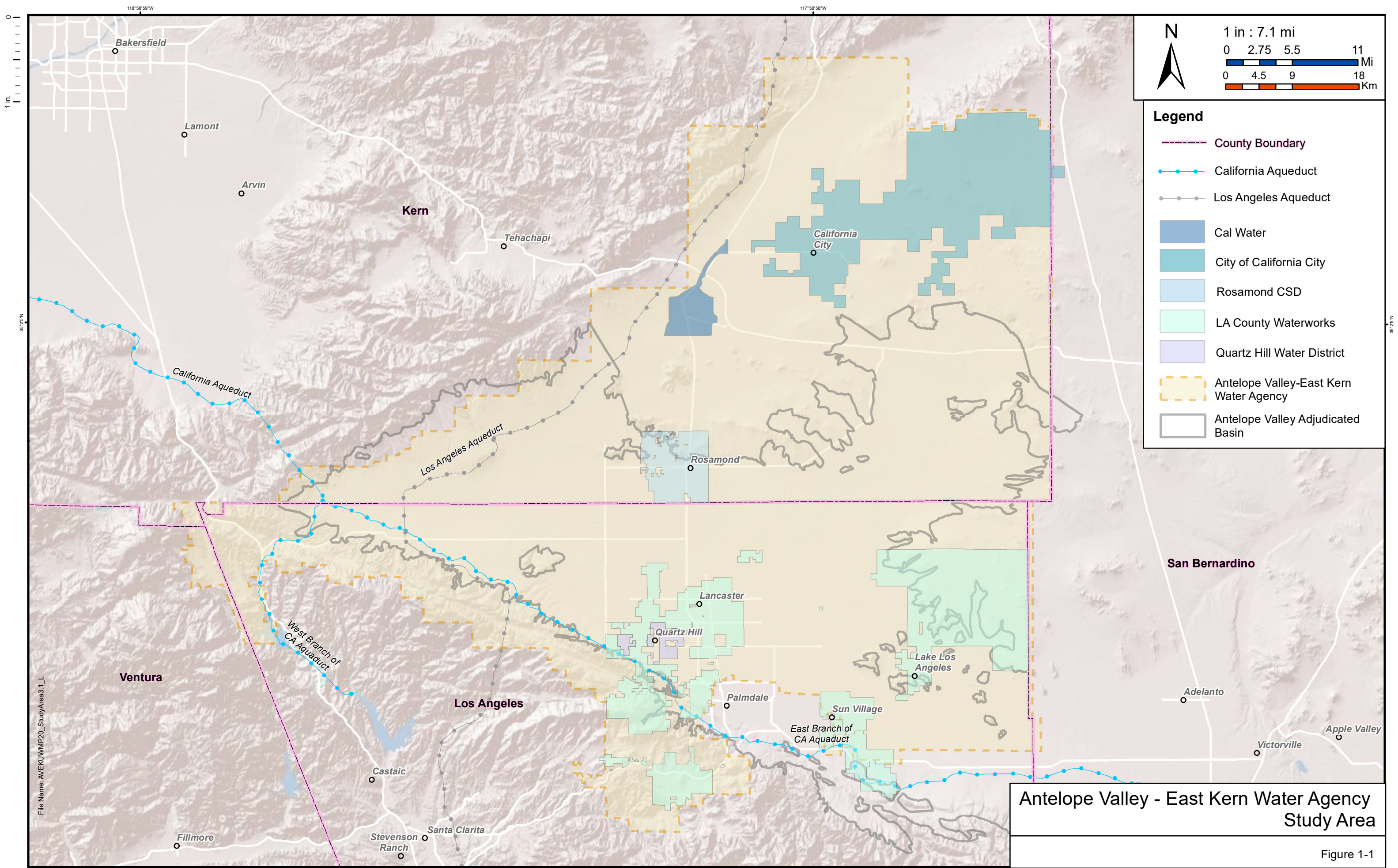
AVEK is a wholesale supplier of State Water Project (SWP) water to the greater Antelope Valley region. SWP water is a secondary water source for AVEK’s customers and is used in lieu of, or in addition to, pumped groundwater. The greater Antelope Valley is located in the western part of the Mojave Desert, approximately 50 miles northeast of Los Angeles, California.

The region is a triangle-shaped, topographically closed basin bordered on the southwest by the San Gabriel Mountains, on the northwest by the Tehachapi Mountains, and on the east by a series of hills and buttes that generally follow the Los Angeles/San Bernardino County line. AVEK’s service area encompasses nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties, as well as a small portion of Ventura County. AVEK has played a major role in the Valley’s water system since it was granted a charter by the State Legislature in 1959 and became an SWP contractor in 1962. AVEK currently provides water to 27 retail water agencies and water companies, as well as to agricultural customers. The five largest retailers are shown along with the AVEK service area in **Figure 1-1**.

### IN THIS SECTION

- About Antelope Valley-East Kern Water Agency
- Purpose of the Plan
- Plan Organization
- Relationship to Other Documents and Initiatives





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1 in : 7.1 mi

0 2.75 5.5 11 Mi

0 4.5 9 18 Km

**Legend**

- County Boundary
- California Aqueduct
- Los Angeles Aqueduct
- Cal Water
- City of California City
- Rosamond CSD
- LA County Waterworks
- Quartz Hill Water District
- Antelope Valley-East Kern Water Agency
- Antelope Valley Adjudicated Basin

File Name: AVEKUMFP20\_StudyArea3\_1\_L

**Antelope Valley - East Kern Water Agency Study Area**

Figure 1-1

## 1.1 Urban Water Management Plan Purpose and Overview

In 1983, the State of California enacted the Urban Water Management Planning Act (UWMP Act). The law required any urban water supplier providing water for municipal purposes to more than 3,000 customers, or serving more than 3,000 acre-feet per year, to adopt a UWMP every five years, demonstrating water supply reliability under normal as well as drought conditions. The Plan is required to describe and evaluate water deliveries and uses, water supply sources, demand management measures, and water shortage contingency planning.

Since the original UWMP Act was passed, it has undergone significant expansion, particularly since AVEK's previous UWMP was prepared in 2015. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of each water supplier, as well as the statewide water reliability overseen by the California Department of Water Resources (DWR) and the State Water Resources Control Board. Accordingly, the UWMP Act has grown to address changing conditions, and the current requirements are found in Sections 10610-10656 and 10608 of the California Water Code.

DWR provides guidance for urban water suppliers by preparing the UWMP Guidebook 2020 (Department of Water Resources, 2021), 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 California Water Code. Suppliers prepare their own UWMPs in accordance with the requirements and submit them to DWR. DWR then reviews the plans to make sure they have addressed the requirements identified in the California Water Code.

The purpose of this UWMP is for AVEK to evaluate 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 provide a mechanism for response during drought conditions or other water supply shortages.

### **The UWMP is a valuable planning tool used for multiple purposes, including:**

- Providing a standardized methodology for water utilities to assess their water resource needs and availability.
- Serving as a resource to the community and other interested parties regarding water supply and demand, conservation, and other water-related information.
- Providing a key source of information for cities and counties when considering approval of proposed new developments and preparing regional long-range planning documents, such as city and county General Plans.
- Informing other regional water planning efforts.

California Water Code Section 10632 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 is required to be a stand-alone document so that it can be updated independently of the UWMP, but it must be referenced in and attached to the 2020 UWMP.

## 1.2 UWMP Organization

This document was prepared in compliance with the California Water Code and the 2020 Guidelines established by DWR and constitutes AVEK's 2020 UWMP. A UWMP checklist, to ensure compliance of this Plan with the UWMP Act requirements, is provided in **Appendix A**. In addition, as required by the California Water Code, standardized tables for the reporting and submittal of UWMP data have been prepared and are included in **Appendix B**. A selection of these tables is also provided in the body of this Plan, as necessary to present supporting data.

### The UWMP is organized as follows:

- Chapter 1 – Introduction
- Chapter 2 – Plan Preparation
- Chapter 3 – System Description
- Chapter 4 – Water Use Characterization
- Chapter 5 – SBX7-7 Baseline and Targets
- Chapter 6 – Water Supply Characterization
- Chapter 7 – Water Supply Reliability and Drought Risk Assessment
- Chapter 8 – Water Shortage Contingency Plan Overview
- Chapter 9 – Demand Management Measures
- Chapter 10 – Plan Adoption, Submittal, and Implementation
- Appendices
  - A. 2020 UWMP DWR Checklist
  - B. UWMP Tables
  - C. Delta Reliance
  - D. Notifications and Notification List
  - E. Adoption Resolutions
  - F. Antelope Valley Groundwater Adjudication
  - G. Antelope Valley Watermaster 2019 Annual Report
  - H. Water Shortage Contingency Plan

## 1.3 UWMPs in Relation to Other Efforts

AVEK coordinated with multiple neighboring and stakeholder agencies to prepare this UWMP. The coordination efforts were conducted to (1) inform the agencies of AVEK's activities, (2) gather high-quality data for use in developing this UWMP, and (3) coordinate planning activities with other related regional plans and initiatives.

In addition to the 2020 UWMP, AVEK is involved in several other internal and external planning efforts, and they collaborate with a variety of stakeholders to achieve coordination and consistency between various planning documents locally and regionally.

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

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

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

Senate Bill (SB) X7-1, which was signed in 2009, reformed Sacramento-San Joaquin Delta (Delta) policy and governance, including requiring development, adoption, and implementation of a Delta Plan and establishing a statewide policy to reduce reliance on the Delta in meeting California's future water supply needs, through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency.

DWR does not review this analysis as part of the UWMP approval process; therefore, this information has been prepared as a stand-alone document and is attached as **Appendix C**. The analysis and documentation provided in the appendix include 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 covered action.

# 2 URBAN WATER MANAGEMENT PLAN

## Plan Preparation

This chapter provides information on the processes used for developing the UWMP, including efforts in coordination and outreach.

This Urban Water Management Plan (UWMP or Plan) was prepared following guidance from the California Department of Water Resources (DWR) UWMP Guidebook 2020 (Department of Water Resources, 2021) and the 2020 UWMP DWR Checklist (**Appendix A**).

### IN THIS SECTION

- Plan Preparation
- Coordination and Outreach

The 2020 UWMP was prepared in a transparent manner, and the Antelope Valley-East Kern Water Agency (AVEK or Agency) actively engaged stakeholders, cities, counties, water agencies, and the public to both seek and distribute information about water use, supply, and reliability to strengthen the region’s ability to assess and plan for the region’s water future. This chapter provides details regarding AVEK’s UWMP preparation and the coordination and outreach efforts conducted.

## 2.1 Plan Preparation

AVEK prepared this 2020 UWMP in accordance with Water Code Section 10617, which requires water suppliers with 3,000 or more service connections, or those supplying 3,000 acre-feet per year (AFY) or more to prepare a UWMP. Suppliers are required to update UWMPs at least once every five years on or before July 1 in years ending in one and six, incorporating updated and new information from the five years preceding each update. AVEK's 2020 UWMP was submitted to DWR by July 1, 2021.

## 2.2 Basis for Preparing a Plan

AVEK has prepared an individual UWMP as a wholesale agency and is not a member of a Regional UWMP or Regional Alliance. Throughout this report, water volume is represented in units of acre-feet or AFY, unless otherwise noted, and data is presented on a calendar year basis.

## 2.3 Coordination and Outreach

AVEK coordinated with multiple neighboring and stakeholder agencies to prepare the 2020 UWMP. The coordinated efforts were conducted to inform the agencies of AVEK's efforts and activities; gather high-quality data for use in developing this UWMP; and coordinate planning activities with other related regional plans and initiatives. California Water Code Section 10621(b) requires that suppliers notify cities and counties to which they serve water that the UWMP and Water Shortage Contingency Plan (WSCP) are being updated and reviewed. The Water Code specifies that this must be done at least 60 days prior to the public hearing about the updated plan. To fulfill this requirement, AVEK sent letters of notification of preparation of the 2020 UWMP, 2021 WSCP, and **Appendix J** addendum to the 2015 UWMP to the cities and counties within AVEK's service area, listed below, 60 days prior to the public hearing.

- City of California City
- City of Lancaster
- City of Palmdale
- Kern County
- Los Angeles County
- Ventura County

Copies of the 60-day notification letters are attached as Appendix D. The notifications to cities, counties, and retailers are further discussed in **Chapter 10**.

To fulfill the requirements of Water Code Section 10642 of the Urban Water Management Planning Act (UWMP Act), AVEK made the 2020 UWMP, 2021 WSCP, and Appendix J addendum to the 2015 UWMP available for public review and held a public hearing on June 8, 2021. The public review hearing was noticed on May 25, 2021; the hearing notice is attached as **Appendix D**. In addition, AVEK maintained a copy of the 2020 UWMP, 2021 WSCP, and **Appendix J** addendum to the 2015 UWMP in its office prior to the public hearing.

### 2.3.1 Wholesale and Retail Coordination

AVEK's service area includes 27 customers, and all were informed of AVEK's UWMP update and water supply projections from 2020 through 2045 for average, single, and five consecutive dry years.

**In compliance with California Water Code 10631, AVEK notified these customers:**

- Antelope Valley Country Club
- Antelope Valley Water Storage, LLC c/o WDS
- Boron Community Services District (CSD)
- California Department of Parks & Recreation (Poppy Reserve)
- California Water Service Company (Cal Water) (Antelope Valley District)
- City of California City
- Desert Lake CSD
- Desert Sage Apartments
- Edgemont Acres Mutual Water Company (MWC)
- Edwards Air Force Base
- El Dorado MWC
- Granite Construction (Shell Exploration)
- Lake Elizabeth MWC
- Landale MWC
- Los Angeles County Waterworks Districts (LACWD) No. 37 and No. 40
- Mojave Public Utility District
- Palm Ranch Irrigation District
- Quartz Hill Water District
- Rancho Vista Development
- Rio Tinto Minerals (US Borax)
- Rosamond Community Services District
- Shadow Acres MWC
- Sunnyside Farms MWC
- Tejon Ranch Co.
- Westside Park MWC
- White Fence Farms MWC
- White Fence Farms MWC #3

Copies of the 60-day notification letters are attached as **Appendix D**.

**There are five retail customers within AVEK's service area that are required to prepare an UWMP, and additional coordination occurred with these agencies:**

- California Water Service Co. (Antelope Valley District)
- City of California City
- LACWD No. 37 and No. 40
- Quartz Hill Water District
- Rosamond Community Services District

### 2.3.2 Coordination with Other Agencies and the Community

Several years ago, AVEK and 10 additional public agencies representing the broad interests of the greater Antelope Valley region formed a Regional Water Management Group. The 11 agencies signed a Memorandum of Understanding that defines roles and responsibilities to make formal decisions regarding the scope and content of the Antelope Valley Integrated Regional Water Management Plan (IRWMP). Since initial development of the IRWMP in 2007, phased efforts have been advanced to define a meaningful course of action to meet the demands for water within the greater Antelope Valley region and the shared vision within the region. AVEK remains involved in regional water management efforts and most recently participated in the 2019 update to the IRWMP (Antelope Valley Integrated Regional Water Management Group, 2019).

# 3 URBAN WATER MANAGEMENT PLAN

## System Description

This chapter describes the AVEK service area, customers, and land uses, as well as population, demographics, and climate.

Antelope Valley-East Kern Water Agency (AVEK or Agency) is a wholesale supplier of State Water Project (SWP) water to the greater Antelope Valley region. The region is located in the western part of the Mojave Desert, approximately 50 miles northeast of Los Angeles. AVEK’s service area encompasses nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties as well as a small portion of Ventura County.

AVEK has played a major role in the Valley’s water system since it was granted a charter by the State Legislature in 1959 and became a SWP contractor in 1962. AVEK’s mission is to deliver reliable, sustainable, and high-quality supplemental water to the region in a cost-effective and efficient manner. AVEK’s goals include groundwater basin stewardship, water reliability, and water quality promotion.

### IN THIS SECTION

- AVEK Service Area
- Service Area Climate, Population and Land Uses



### 3.1 General Description

In 1962, AVEK signed a water supply contract with the California Department of Water Resources (DWR) for delivery of imported water supplies from the SWP to supplement Antelope Valley region's groundwater supplies. AVEK has the third-largest allotment of the 29 SWP contractors, with a contractual Table A amount of 144,844 acre-feet per year (AFY). Only the Metropolitan Water District of Southern California (Metropolitan) and Kern County Water Agency receive a larger allotment. Table A water is a reference to the amount of water listed in "Table A" of the contract between the SWP and the contractors and represents the maximum amount of water a contractor may request each year. Table A water is the primary delivery type of imported water AVEK receives; however, additional delivery types (e.g., Article 21 Water and Carryover Water) help to make up AVEK's full imported water supply. AVEK's imported water delivery types are further described in **Chapter 6**.

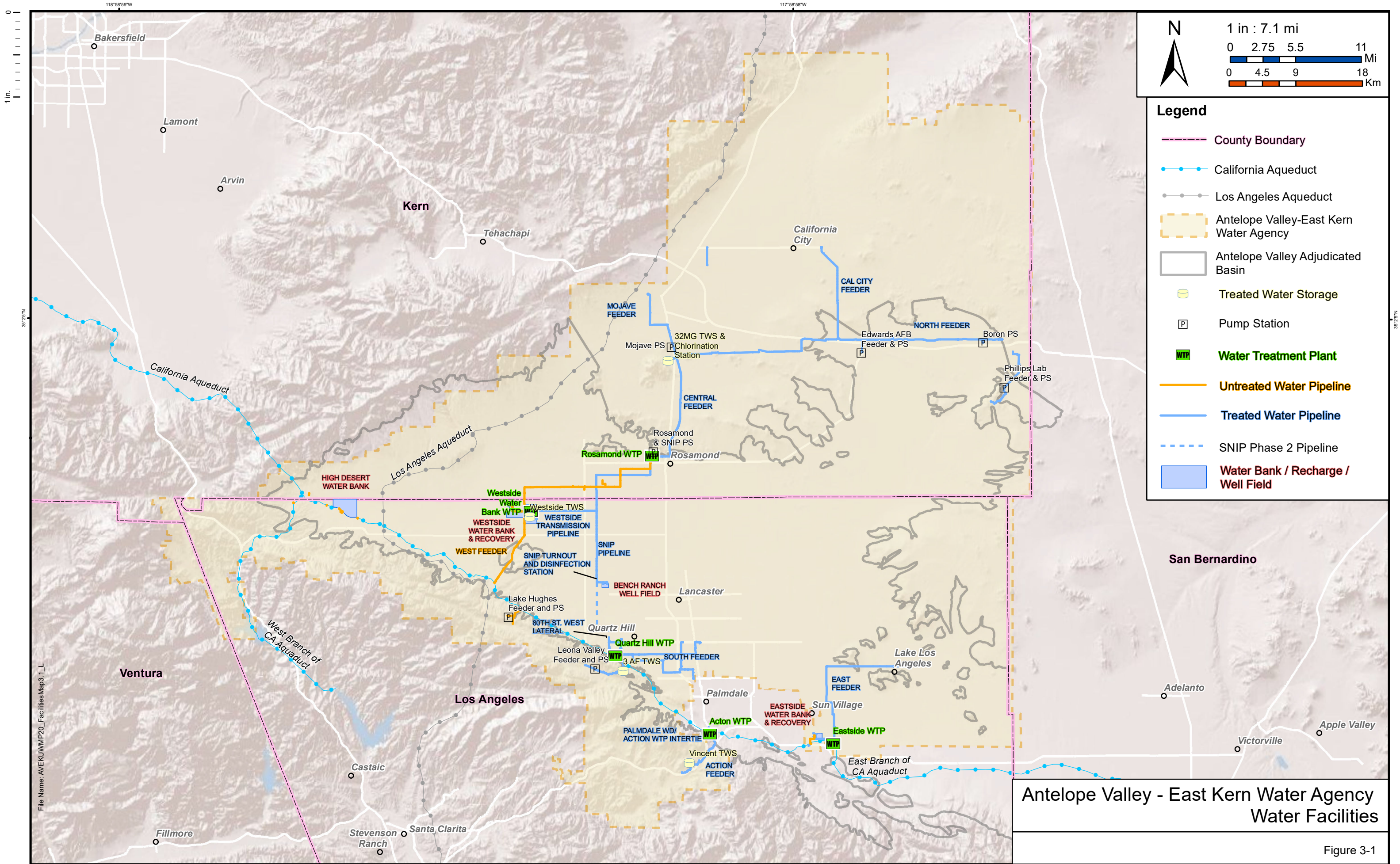
AVEK's water system is connected to the California Aqueduct at 23 different turnouts. However, only 15 of the turnouts are currently operational. AVEK's turnouts feed into six separate subsystems that are hydraulically disconnected from each other: Acton; Eastside; Rancho Vista; Rosamond; Quartz Hill; and Willow. Distribution throughout AVEK's service area is carried out through a system of approximately 184 miles of pipeline. Water travels throughout the system using booster pump stations that pump water from the lower elevations to the higher elevations. AVEK's pump stations are located at water treatment plants (WTPs) or at customer connections. There are currently 11 existing pumping stations within AVEK's system.

AVEK owns and operates four treatment plants that treat SWP water to drinking water standards from the aqueduct and deliver the treated water into the regional distribution system. The four WTPs and the year they were constructed are: Acton WTP (1991); Eastside WTP (1981); Quartz Hill WTP (1977); and Rosamond WTP (1978). AVEK's water distribution systems rely on stored water to help equalize fluctuations between supply and demand. In addition, storage is required to provide adequate water supply for emergency or unplanned outages of a major source of supply. Currently, the Agency's water system has clearwells co-located with each WTP and seven reservoirs that provide storage for the distribution system, five of which are owned and maintained by AVEK and two of which are owned by Los Angeles County Waterworks Districts (LACWD) and maintained by AVEK (Carollo, 2020).

In addition, AVEK developed groundwater banking programs to store surplus water available from the SWP during wet periods through groundwater recharge to increase water supply reliability in the greater Antelope Valley. The banking programs include recovery wells to supplement imported water during dry periods, high delivery periods, or during a disruption of SWP deliveries. Currently, AVEK's groundwater banks include the Westside Water Bank (started operations in 2010), Eastside Water Bank (started operations in 2016), Upper Amargosa Creek Recharge Project (started operations in 2019), and, most recently the High Desert Water Bank (currently in development).

AVEK has made many improvements to its water system since initially being constructed in the 1970s to allow for better distribution of water through system interconnections and expansions. The South North Intertie Pipeline and Pump Station/Turnout Project (SNIP) Phase 1 was constructed in 2011 to connect the existing Rosamond WTP and the Quartz Hill WTP by moving water through LACWD pipelines. SNIP also provides flexibility in the method of return of water banked in the Westside Water Bank (direct delivery or transfer). SNIP Phase 2 is currently in design. Other previous facility improvements include the Parallel South Feeder and the addition of 9 million gallons of storage at the Quartz Hill WTP. The Agency's major facilities are shown in **Figure 3-1**.

AVEK is currently developing a new storage program, the High Desert Water Bank, which is a partnership between AVEK and Metropolitan to increase water supply reliability by storing excess Metropolitan SWP supply in the Antelope Valley Groundwater Basin for use during periods of low SWP allocation. As the project expands and additional phases are constructed, AVEK will have dedicated capacity and the ability to recover stored imported water from the groundwater basin and pump the recovered water into the East Branch of the California Aqueduct for downstream deliveries to AVEK's existing water treatment facilities.



**Scale:** 1 in : 7.1 mi

0 2.75 5.5 11 Mi

0 4.5 9 18 Km

**Legend**

- County Boundary
- California Aqueduct
- Los Angeles Aqueduct
- Antelope Valley-East Kern Water Agency
- Antelope Valley Adjudicated Basin
- Treated Water Storage
- Pump Station
- Water Treatment Plant
- Untreated Water Pipeline
- Treated Water Pipeline
- SNIP Phase 2 Pipeline
- Water Bank / Recharge / Well Field

**Antelope Valley - East Kern Water Agency Water Facilities**

Figure 3-1

## 3.2 Service Area Climate

AVEK's service area is located in the western part of the Mojave Desert within the greater Antelope Valley. The region's elevation ranges from approximately 2,300 feet to 3,500 feet above sea level. Vegetation native to the greater Antelope Valley region is typical of the high desert and includes Joshua trees, saltbush, mesquite, sagebrush, and creosote bush. The climate is characterized by hot summer days, cool summer nights, cool winter days, and cool winter nights. Typical of a semiarid region, mean daily summer temperatures range from 64 degrees Fahrenheit (°F) to 96°F, and mean daily winter temperatures range from 35°F to 60°F (Antelope Valley Integrated Regional Water Management Group, 2019). Summer temperatures can reach 112°F, while winter temperatures can drop to about 10°F. Typical annual rainfall is 4 to 6 inches. Most rainfall occurs between December and March, with little to no precipitation falling in summer months. The perimeter of the greater Antelope Valley includes low brush-covered hills transitioning into the Tehachapi Mountains to the west and the San Gabriel Mountains to the south. Surface water drainage channels and courses are only active during times of runoff due to precipitation. The water tables are well below the levels needed to sustain year-round flowing streams. The area is known for its daily winds, primarily from the west. **Table 3-1** presents the average rates of evapotranspiration (ETo), temperature, and precipitation in the service area.

**Table 3-1. Precipitation, Evapotranspiration, and Temperature in AVEK Service Area**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Average Precipitation (inches)	1.0	0.9	1.1	0.3	0.2	0.0	0.1	0.2	0.2	0.2	0.4	0.8	0.4
Average ETo (inches)	2.3	3.1	4.9	6.5	8.2	9.2	9.8	8.9	6.5	4.6	2.9	2.0	5.8
Average Air Temp (°F)	43.3	46.2	51.2	57.0	64.3	73.2	78.4	78.1	71.3	59.8	49.8	42.2	59.8

Source: California Irrigation Management Information System (CIMIS), Station 197 Palmdale, (period of record is from April 2005 through December 2020)  
<http://www.cimis.water.ca.gov/cimis/data>

Climate change and the potential impacts within the Agency's service area are discussed in **Section 4.2.4**, climate change considerations.

## 3.3 Service Area Population and Demographics

AVEK provides service to incorporated and unincorporated areas of the greater Antelope Valley. The current and projected population and demographic projections for AVEK's service area (**Table 3-2** and **Table 3-3**, respectively) were based on population projections from the Southern California Association of Governments (SCAG) for Los Angeles and Ventura Counties, and the Kern Council of Governments (KCOG). The SCAG projection data was last updated in December 2019 and is the projection modeling information that SCAG used in the 2020 Connect SoCal Regional Transportation Plan (Southern California Association of Governments, 2020). Population projections were calculated based on the SCAG 2019 regional growth forecast for the transportation analysis zones overlying AVEK service area.<sup>1</sup> The estimates were developed using SCAG's traffic analysis zones (TAZs), which were clipped to AVEK's service area boundary in ArcGIS. TAZs that were partially outside the service area were estimated based on the percentage of the area that lies within AVEK's service area. SCAG's 2019

<sup>1</sup> The analysis was performed by WSC based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results or the content of the documentation.

model data has estimates for 2016 (historical estimate), 2020, 2035, and 2045. Intermediate values are linear interpolations between the given SCAG values.

SCAG prepared preliminary demographic forecast estimates for each TAZ in 2017 for the 2020 Connect SoCal Plan. Between 2017 and 2019, SCAG met with each jurisdiction to review the demographic forecasts. This review process incorporated feedback from each jurisdiction, including land use planning departments, to help align the demographic forecasts with current land use and anticipated land use changes.

The KCOG population projection data is from the KCOG General Land Use Plan (Kern County Council of Governments, 2018) (KCOG, 2018). Similar to SCAG, the KCOG estimates were developed using KCOG's TAZs. The TAZs were clipped to AVEK's service area boundary in ArcGIS, and TAZs that were partially outside the service area were estimated based on the percentage of the area that lies within AVEK's service area. KCOG data is projected for 2020, 2035, and 2042. Similar to SCAG, linear interpolation was applied to intermediate values (2025, 2030, and 2040) and extrapolation for 2045.

The combined projections result in an average annual growth rate of 1.33% with a high growth rate initially (2020–2025) and lower rates at the end of the projection (2040–2045).

**Table 3-2. Current and Projected Population (DWR UWMP Table 3-1W)**

	2020	2025	2030	2035	2040	2045
Los Angeles and Ventura Counties	270,615	288,578	306,542	324,505	342,229	359,953
Kern County	49,956	56,757	63,558	70,359	78,738	87,118
<b>TOTAL</b>	<b>320,571</b>	<b>345,335</b>	<b>370,100</b>	<b>394,864</b>	<b>420,967</b>	<b>447,071</b>

Notes:

1. Data for Los Angeles and Ventura Counties from SCAG 2020 Connect SoCal Regional Transportation Plan (SCAG, 2020)
2. Data for Kern County from KCOG General Land Use Plan (KCOG, 2018).

**Table 3-3. Current and Projected Households and Employment**

	2020	2025	2030	2035	2040	2045
<b>HOUSEHOLDS</b>						
Los Angeles and Ventura Counties	85,305	94,696	104,088	113,479	121,487	129,495
Kern County	16,380	18,679	20,978	23,277	26,051	28,825
<b>TOTAL</b>	<b>101,685</b>	<b>113,375</b>	<b>125,066</b>	<b>136,756</b>	<b>147,538</b>	<b>158,320</b>
<b>EMPLOYMENT</b>						
Los Angeles and Ventura Counties	88,296	93,530	98,764	103,998	110,167	116,335
Kern County	17,745	20,342	22,940	25,537	28,496	31,456
<b>TOTAL</b>	<b>106,041</b>	<b>113,872</b>	<b>121,704</b>	<b>129,535</b>	<b>138,663</b>	<b>147,791</b>

Notes:

1. Data for Los Angeles and Ventura Counties from SCAG 2020 Connect SoCal Regional Transportation Plan (SCAG, 2020)
2. Data for Kern County from KCOG General Land Use Plan (KCOG, 2018).

# 4

## URBAN WATER MANAGEMENT PLAN

# Water Use Characterization

**This chapter summarizes AVEK’s past, current, and projected water demands through 2045.**

Antelope Valley-East Kern Water Agency (AVEK or Agency) delivers treated water and untreated water to customers within its service area. All connections are metered and are cross-checked with California Department of Water Resources (DWR) State Water Project (SWP) delivery records. In addition, AVEK delivers untreated water for recharge of the local groundwater basin and conducts exchanges or transfers for delivery of a portion of its SWP allocation to agencies with a short-term need for additional water supplies.

As an SWP contractor, AVEK provides a supplemental imported water supply from the SWP to retailers in the greater Antelope Valley region. This is a secondary water source for these suppliers and is used by these entities in lieu of, or in addition to, pumped groundwater.

Therefore, AVEK must first project total demand in the AVEK service area, along with projected utilization of local supplies, to estimate demands on AVEK supplies. The primary local supply is groundwater, but several agencies are investing in recycled water and recharge projects to diversify their water supplies.

This chapter describes recent demands in the AVEK service area and projections through 2045 for water demand in the AVEK service area, local supplies, and AVEK demands.

### IN THIS SECTION

- Past Water Use
- Current Water Use
- Projected Water Use

## 4.1 Past and Current Water Use

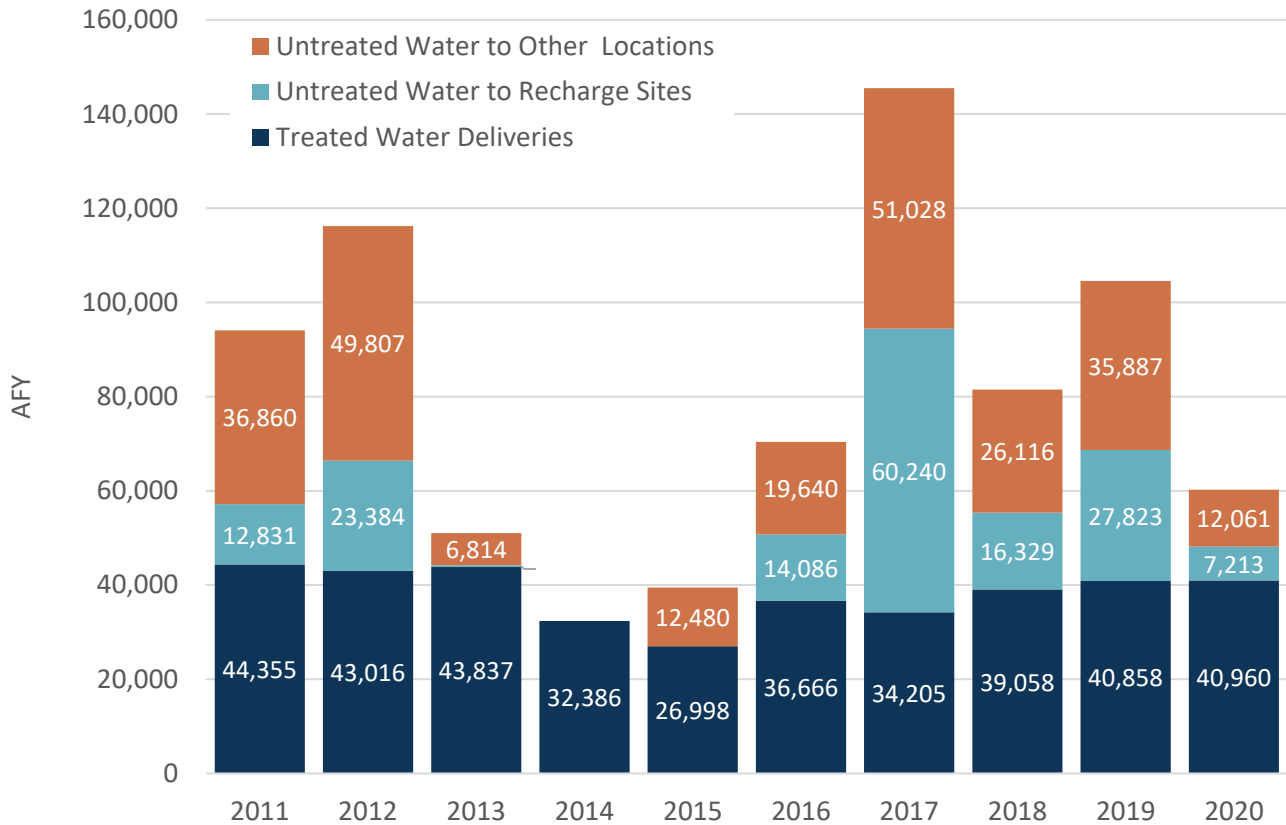
As a wholesale water supplier, AVEK reports the sale of water to other agencies; the retail water supplier is responsible for reporting the uses of their water supply by water sector. Water use sectors relevant to AVEK include sales to other agencies, groundwater recharge (groundwater banking), losses, and transfers/exchanges. Water delivery data for 2020 is summarized in **Table 4-1** and presented along with 2011–2019 deliveries in **Figure ES-1**.

**Table 4-1. AVEK 2020 Actual Demands for Water (DWR UWMP Table 4-1W) (Acre-Feet per Year)**

CUSTOMER OR USE	LEVEL OF TREATMENT WHEN DELIVERED	2020 VOLUME
Los Angeles County Waterworks Districts	Treated Water	32,847
Quartz Hill Water District	Treated Water	2,533
Rio Tinto Minerals / US Borax	Treated Water	1,503
Edwards Air Force Base	Treated Water	1,465
Other M&I Customers (19 Customers)	Treated Water	2,095
Untreated Water Deliveries (4 Customers)	Untreated Water	837
Transfers to Other Agencies	Untreated Water	11,286
Groundwater Recharge	Untreated Water	7,213
Losses	Treated and Untreated Water	457
	<b>TOTAL:</b>	<b>60,234</b>

Source: AVEK, 2020 LATIS data

**Figure 4-1. 2011–2020 AVEK Deliveries by Type**



As shown in **Figure 4-1**, treated water deliveries to AVEK retailers were relatively consistent compared with deliveries to recharge sites and other locations. Treated water demands have increased slightly since 2017 but have not returned to the levels observed prior to 2014, following severe drought restrictions. Recharge water deliveries have varied based on water availability, as evidenced by the high recharge volume in 2017 that coincided with high SWP allocations. Future use of untreated water for recharge is discussed further in **Section 6.1.2**. Similarly, yearly deliveries to other locations vary substantially and are primarily driven by the extent of exchanges or transfers conducted in those years. Exchanges and transfers are not explicitly projected in this UWMP because they are opportunistic agreements made by willing parties dependent on each party’s needs, and they are the lowest priority use of AVEK’s supplies.

The remainder of this chapter focuses on treated water demand projections.

## 4.2 Projected Water Use

AVEK developed a Supply and Demand Model (“the model”) in Microsoft Excel to compare future supply and demand conditions under multiple supply and demand scenarios. Scenario analysis allows AVEK to compare the benefits (and costs) of different long-term water resources conditions and strategies. The model is comprised of supply and demand variables, which are combined to form scenarios with different supply and demand assumptions.

**The following demand variables were considered:**

### Population Growth

Projects the number of new water users in the service area, based on planning agency projections and historical growth rates.

### Per Capita Demand Rebound

The extent that per capita demand, measured as gallons per capita per day (GPCD), is estimated to increase from spring 2016, which was the last year severe water use restrictions were in place by AVEK retailers. This variable projects the “new normal” demand for existing customers.

### Passive Conservation

Water savings resulting from plumbing codes and other institutionalized water efficiency measures.

**Also, as a SWP contractor, AVEK provides a supplemental imported water supply to retailers in the greater Antelope Valley region, which is a secondary water source for these suppliers and is used by these entities in addition to pumped groundwater; therefore, local supply variables were also considered:**

### Groundwater

Includes pumping at production rights, as well as pumping below the production rights.

### Active Conservation

Water saved as a direct result of programs and practices directly funded by a water utility.

### Climate Change

Climate models disagree on average annual precipitation projections but agree on other hydrologic metrics relevant to water resources management, including increased evapotranspiration, which would increase irrigation demands (Persad, 2020) (Partida, 2020).

### Recycled water

Includes with and without planned recycled water use by retailers

For the 2020 UWMP, AVEK made one assumption for each of the variables listed above. Each variable is discussed on the following page, along with the assumption used for this UWMP.



## 4.2.1 Population Growth

Population growth projections are based on projections from Southern California Association of Governments (SCAG) for Los Angeles and Ventura Counties and Kern County Council of Governments (KCOG) and were presented in **Section 3.3**. The combined result is an average annual growth rate of 1.33%, with a high growth rate initially (2020–2025) and lower rates at the end (2040–2045). AVEK considered both higher and lower growth rate scenarios but applies the projections from **Section 3.3** for the UWMP demand projections.

## 4.2.2 Per Capita Demand Rebound

Senate Bill (SB) X7-7 mandated reduction of per capita water demand by 20% by 2020. As a wholesaler, AVEK does not have a 2020 target, but every retailer that prepares a UWMP must have developed a 2020 target for their 2015 UWMP and must have been reporting water use monthly to the State since June 2014. Five of AVEK’s retailers—California Water Service Co., City of California City, Los Angeles County Waterworks District (LACWD), Quartz Hill Water District (QHWD), and Rosamond Community Service District (RCSD)—must prepare UWMPs and report water use to the State; they represent roughly 90% of AVEK demand and 80% of population in the AVEK service area.

### 4.2.2.1 Historical Per Capita Demand

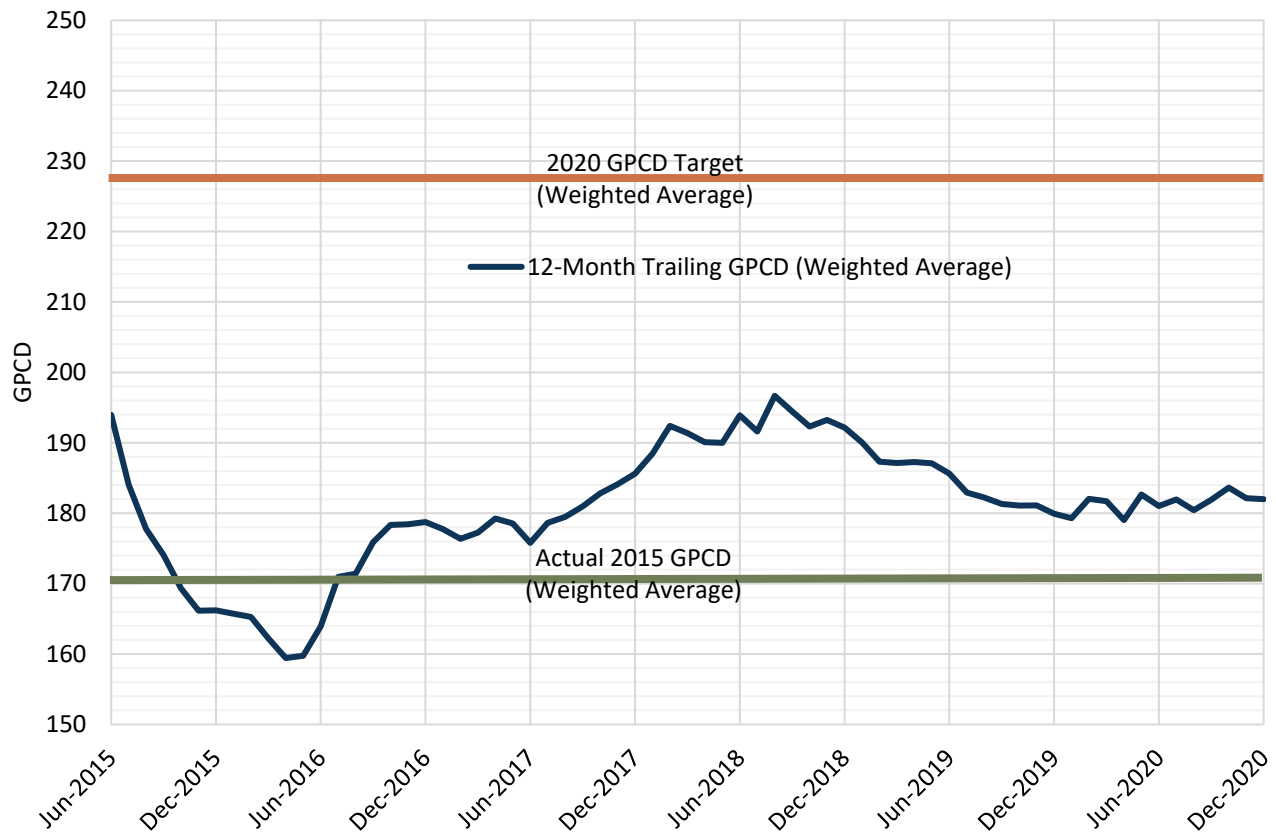
**Table 4-2** estimates per capita water demand for all AVEK customers (using AVEK billing and production data), while **Figure 4-2** includes only AVEK customers that must submit a UWMP (using required monthly water use reporting to the State Water Resources Control Board [SWRCB]). As shown in the table and figure, per capita water demand in 2020 was higher than from 2015 to 2017. There was a drop in use in 2019 that may have been caused by higher than average precipitation—the area received over 7.0 inches of precipitation, while the other years from 2015 to 2020 received from 3.6 to 4.0 inches.

**Table 4-2. 2016–2020 AVEK Service Area GPCD – All Customers**

	2016	2017	2018	2019	2020
Treated Water Deliveries by AVEK (AF)	36,666	34,205	39,058	40,858	40,960
Groundwater Pumped by Customers (AF)	24,553	26,139	26,007	20,211	20,556
<b>TOTAL USE (AF)</b>	<b>61,219</b>	<b>60,344</b>	<b>65,065</b>	<b>61,068</b>	<b>61,516</b>
Population Estimate	310,407	312,911	315,415	317,951	320,571
<b>PER CAPITA WATER DEMAND (GPCD)</b>	<b>176</b>	<b>172</b>	<b>184</b>	<b>171</b>	<b>171</b>

Source: Treated water deliveries from AVEK billing records; Groundwater pumping from annual Watermaster reports; Population estimates from SCAG and KCOG.

Figure 4-2. 2015–2020 AVEK Retailers with UWMPs GPCD for Trailing 12 Months



Source: SWRCB Monthly Water Conservation and Production Reports<sup>1</sup>

Note: The figure includes only retailers that are required to submit UWMPs, which excludes roughly 10% of demand and 20% of population in the AVEK service area. Values presented are the average from each retailer weighted by their population.

#### 4.2.2.2 Demand Rebound Estimates

AVEK considered a range of potential post-drought rebound scenarios for unit water demands, including unit demands for existing connections staying at the existing rate (roughly 185 GPCD) and unit demands increasing to the 2020 GPCD target for AVEK’s retailers that submit UWMPs (roughly 230 GPCD). For the UWMP, AVEK assumed a continued post-drought unit demand rebound to 205 GPCD by 2030, which represents 90% of the weighted average 2020 GPCD target for AVEK retailers that submit an UWMP. However, AVEK intends to monitor monthly reporting by its customers to track trends in unit water demands and plans to adapt its projections based on this and other available information.

AVEK assumed 150 GPCD for new development, based on it being more efficient than existing development.

<sup>1</sup> [https://www.waterboards.ca.gov/water\\_issues/programs/conservation\\_portal/conservation\\_reporting.html](https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html)

### 4.2.3 Passive and Active Conservation

Future demands are dependent on passive conservation, active conservation, and customer behavior. Active and passive conservation will reduce unit demand factors over time, while customer behavior could cause increased use (e.g., longer irrigation cycles) or decreased use (e.g., shorter irrigation cycles). Active conservation covers water saved as a direct result of programs and practices directly funded by a water utility, while passive conservation covers water savings resulting from plumbing codes and other institutionalized water efficiency measures. The price of water also impacts customers' water use, where increased water prices cause decreased water use.

For *existing* connections, unit demand factors will decrease slowly due to passive conservation and changes in customer water use patterns. *Future* connections are projected to be much more water efficient than existing connections due to California Plumbing Code requirements.<sup>2</sup> Unit demand factors for future connections will decrease due to passive conservation at a slower rate than existing connections because future connections will start with the latest plumbing code requirements.

Demand projections must account for conservation that may be required to meet the 2018 "Conservation as a California Way of Life" legislative mandates. Following the recent California drought, DWR and SWRCB established a conservation framework centered on "Making Water Conservation a California Way of Life" to help the State better prepare for droughts and climate change by establishing statewide water efficiency standards and incentivizing recycled water (California Department of Water Resources, November 2018). The resulting legislation of Senate Bill (SB) 606 and Assembly Bill (AB) 1668 (signed on May 31, 2018), along with future regulations, will have impacts on water providers over the coming years, requiring indoor, outdoor, and commercial, industrial, and institutional water use goals; water loss standards; annual water budgets; and documented preparation for long-term water shortages.

SB 606/AB 1668 requires the SWRCB to adopt urban efficiency standards for indoor use, outdoor use, water loss, variances, and incentives by June 30, 2022. Following the adoption of urban water use objectives in 2022, retailers will first have to report actual water use compared to objectives in 2024, and they must meet the objectives by 2027. Therefore, AVEK will see the potential impact on its customers' water use within the next decade.

AVEK considered several conservation scenarios, ranging from passive conservation only to high active conservation. To be conservative for the UWMP, AVEK is including passive conservation only in the demand projections, assuming a reduction of 0.2% per year (or 5% over 25 years) for existing connections. However, AVEK intends to work with its customers to understand the potential implications of meeting new urban efficiency standards, and plans to adapt its projections based on this and other available information once annual water use reporting starts in 2023.

### 4.2.4 Climate Change

Climate change analysis is an area of continued evolution in terms of methods, tools, forecasted datasets, and the predictions of greenhouse gas concentrations in the atmosphere. While continued warming can be expected, the extent to which climate change will impact other hydroclimatic elements such as precipitation is uncertain. Precipitation patterns are spatially and temporally more complex than warming patterns, and there is more uncertainty among these predictions, with some models showing the state becoming wetter and others showing the state becoming drier. Notably, a scenario with increased precipitation could result in more volatile precipitation patterns in which drought frequency and duration increases. Warming temperatures also increase evaporation from reservoirs and moisture loss from soils, resulting in reductions in water supply.

DWR developed a climate change resource guide to support climate change analysis for development of groundwater sustainability plans under the Sustainable Groundwater Management Act (SGMA)

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<sup>2</sup> <http://epubs.iapmo.org/2019/CPC/index.html>

(California Department of Water Resources, 2018), including a SGMA Data Viewer website.<sup>3</sup> The website includes precipitation and evapotranspiration change estimates for grids across the State for 2030 and 2070. The 2030 values were used for the UWMP, since they are roughly the midpoint of the planning period. By 2030, precipitation is projected to decrease by 3% and evapotranspiration is projected to increase by 4%, which roughly equates to a net irrigation demand increase of 7%.

Increased evapotranspiration would increase irrigation demands. AVEK does not have a reliable estimate for the portion of total demand attributed to irrigation because its supply is one of several used by its customers. Reviewing retailer monthly demand records submitted to the SWRCB,<sup>4</sup> irrigation demands appear to be roughly 50% of total demand based on the “minimum month” method (which assumes the lowest month of water use is all indoor use, and the same indoor use is assumed year-round). Based on this assumption, increased evapotranspiration from climate change would increase demand by 3.5%—or about 3,000 acre-feet per year (AFY) over the next 25 years—compared with an over 40% increase in demand from population growth and unit demand rebound. For this UWMP, increased evapotranspiration is not explicitly included in the demand projections contained herein, because assumptions for the other variables discussed above (growth, unit demand, and conservation) have a larger impact on the demand projections, and demand impacts from climate change are within the margin of error for the projections.

#### 4.2.5 Groundwater

As detailed in **Section 6.3**, a Stipulated Judgment (“Judgment”) was approved in 2015 for the Antelope Valley Groundwater Adjudication, and it governs most groundwater pumping in the AVEK service area. The Judgment stipulated production rights to each party, and other methods to access additional groundwater rights, such as from imported water return flows. AVEK’s customers have 12,084 AFY of production rights and have received roughly 12,000 AFY of return flow rights since 2016.

Pumping by AVEK customers is shown in **Table 4-2**. For the UWMP local supply projections, each customer is assumed to pump their full production rights and imported water return flows each year.

#### 4.2.6 Recycled Water

AVEK’s retailers have projected an increased use of recycled water to offset potable use, but to date little progress has been made implementing recycled water projects within AVEK’s service area. In its 2020 UWMP, LACWD is projecting increased recycled water use, but the use would not offset potable water. For the UWMP, AVEK assumes no recycled water will be developed that offsets projected water use through 2045.

#### 4.2.7 Distribution System Water Losses

Wholesale Suppliers do not have to perform water loss audits and are not required to report this information in their 2020 UWMP. However, AVEK audits its system losses monthly as a part of its normal billing procedures. Pipelines are driven regularly as a part of water sample runs, during which personnel will note leaks if observed. As shown in **Table 4-1**, 2020 losses represented roughly 1% of supplies delivered within the AVEK service area. The long-term average losses are 2% to 3%, so this value is applied to demand projections. Also, losses are already included in the unit demand estimates since they are based on water production (versus customer meters), so a separate line item for losses is not included in the demand projections.

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<sup>3</sup> <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer>

<sup>4</sup> [https://www.waterboards.ca.gov/water\\_issues/programs/conservation\\_portal/conservation\\_reporting.html](https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html)

## 4.2.8 AVEK Demand Projections

Based on the assumptions described above, AVEK estimated total service area demand projections and net demand on AVEK projections through 2045 is shown in **Table 4-3**.

**Table 4-3. 2025–2045 AVEK Demand Projections (AFY)**

	2025	2030	2035	2040	2045
<b>TOTAL AVEK SERVICE AREA DEMAND</b>	<b>73,420</b>	<b>80,400</b>	<b>83,850</b>	<b>87,520</b>	<b>91,200</b>
<i>Non-AVEK Supplies</i>					
Groundwater, Non-AVEK Production Rights	12,080	12,080	12,080	12,080	12,080
Groundwater, Non-AVEK Return Flows	16,900	17,330	19,890	20,230	21,530
<b>NON-AVEK SUPPLIES TOTAL</b>	<b>28,980</b>	<b>29,410</b>	<b>31,970</b>	<b>32,310</b>	<b>33,610</b>
<b>NET AVEK SERVICE AREA DEMAND</b>	<b>44,440</b>	<b>50,990</b>	<b>51,880</b>	<b>55,210</b>	<b>57,590</b>

## 4.2.9 Characteristic Five-Year Water Use

In **Chapter 7**, AVEK’s supplies for the next five years are compared to its demands for the next five years as part of a five-year drought risk assessment. The demand projections, shown in **Table 4-4**, are supposed to be reported without drought conditions (also known as “unconstrained demand”), so they do not account for potential water shortage measures that AVEK or its customers could enact if an extended drought emerges from recent dry water years.

**Table 4-4. 2021–2025 AVEK Demand Projections (AFY)**

	2021	2022	2023	2024	2025
<b>TOTAL AVEK SERVICE AREA DEMAND</b>	<b>67,830</b>	<b>69,230</b>	<b>70,630</b>	<b>72,030</b>	<b>73,420</b>
<i>Non-AVEK Supplies</i>					
Groundwater, Non-AVEK Production Rights	14,060	13,070	12,080	12,080	12,080
Groundwater, Non-AVEK Return Flows	14,710	15,230	15,960	16,610	16,900
<b>NON-AVEK SUPPLIES TOTAL</b>	<b>28,770</b>	<b>28,300</b>	<b>28,040</b>	<b>28,690</b>	<b>28,980</b>
<b>NET AVEK SERVICE AREA DEMAND</b>	<b>39,060</b>	<b>40,930</b>	<b>42,590</b>	<b>43,340</b>	<b>44,440</b>

Source: Note that groundwater production rights ramp down through 2023 and then stay the same after 2023.

# 5 URBAN WATER MANAGEMENT PLAN

## SBX7-7 Baseline, Targets and 2020 Compliance

With the adoption of the Water Conservation Act of 2009, also known as SBX7-7, California is required to reduce urban per capita water use by 20% by the year 2020. To achieve this statewide objective, each retailer was required to develop an urban water use target to help the State collectively achieve a 20% reduction.


As a wholesale supplier, Antelope Valley-East Kern Water Agency (AVEK) is not required to calculate baseline, targets, or compliance gallons per capita per day; therefore, this section is not required.

### IN THIS SECTION

- SBX7-7

Measures, programs, and policies that AVEK has adopted to help the retail water suppliers within its service area to achieve their SBX7-7 water use reduction targets are discussed in **Chapter 9** (Demand Management Measures). Retail water suppliers within AVEK's service area that are required to prepare and submit an Urban Water Management Plan will include their baselines, targets, and 2020 compliance in their individual Plans.

AVEK will continue to work with its retail water suppliers to implement demand management measures (discussed in **Chapter 9**) to help them achieve their 2020 targets.



URBAN WATER MANAGEMENT PLAN

# Water Supply Characterization

**This section summarizes AVEK’s water supplies and provides the basis for normal, single year, and multiple dry year supply reliability.**

The Antelope Valley-East Kern Water Agency (AVEK or Agency) provides treated (drinking) water and untreated (raw) water to a variety of customers in the greater Antelope Valley, including municipal water, agricultural water, private companies, and individual agricultural customers. AVEK primarily supplies imported water from the State Water Project (SWP); however, it also supplies local groundwater and banked SWP supplies. AVEK’s mission is to deliver reliable, sustainable, and high-quality supplemental water to the region in a cost-effective and efficient manner.

#### IN THIS SECTION

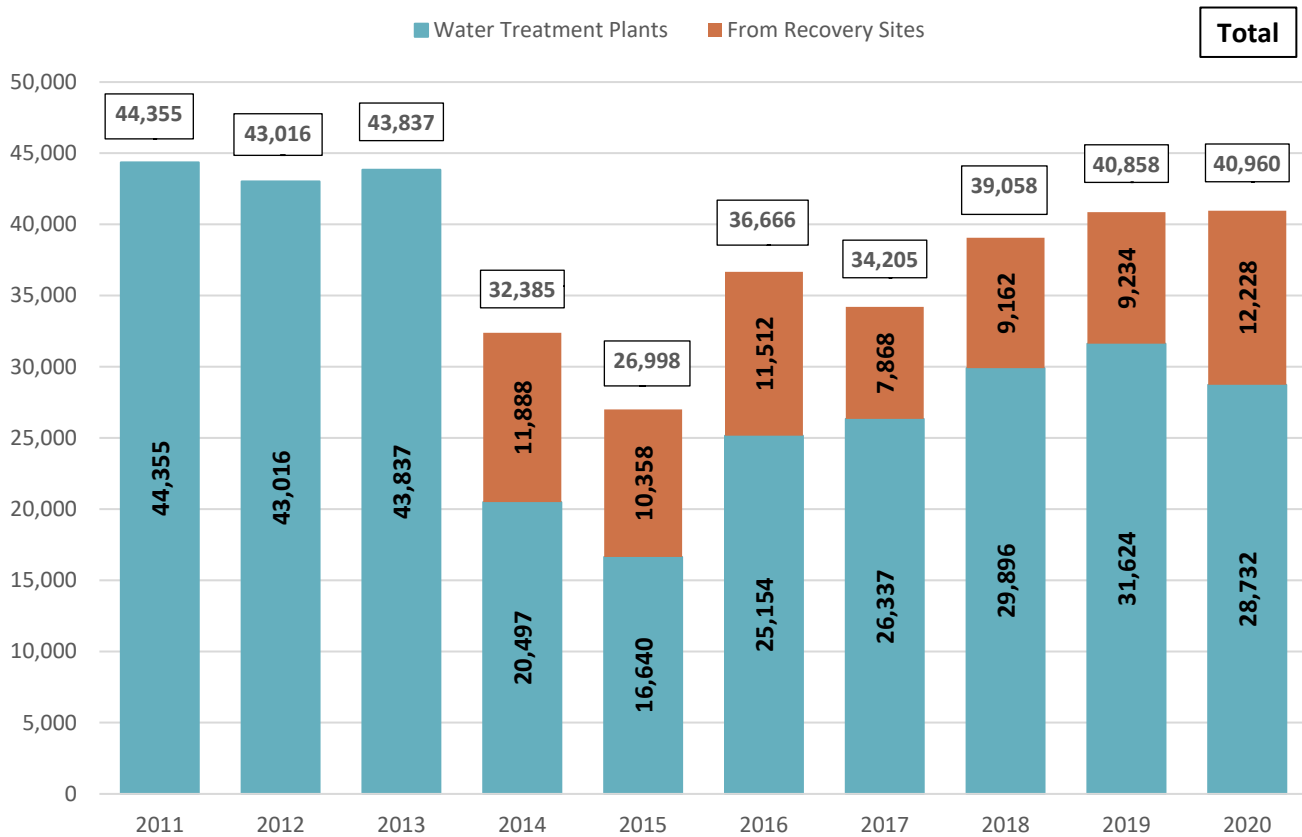
- State Water Project
- Exchanges and Transfers
- Groundwater
- Supply Characterization
- Energy Intensity

AVEK’s water reliability goal is to provide a level of regional water reliability that supports customers’ water needs. The foundational strategy of this goal is developing groundwater banking programs to help increase the reliability of the Antelope Valley region’s water supplies by storing excess SWP water during wet periods and recovering it for delivery to customers during dry and high-demand periods or during a disruption in deliveries from the SWP.

To maximize the use of its SWP supplies, AVEK has developed a water banking program and entered into various water transfer and exchange programs with other SWP contractors. In addition to SWP supplies, AVEK also has adjudicated groundwater production rights, which are available to help meet water demands in the region. Information regarding AVEK’s imported water and groundwater supplies is detailed in this chapter.

As shown in **Figure 6-1**, AVEK’s potable water deliveries consist of either SWP water treated at AVEK water treatment plants, or groundwater that is recovered from SWP water previously recharged or part of AVEK’s production rights. And, as shown in **Table 6-1**, AVEK also delivers raw (untreated) SWP water to customers for recharge locally or for transfer or exchange outside of the AVEK service area.

**Figure 6-1. 2011–2020 AVEK Drinking Water Deliveries by Source**



**Table 6-1. AVEK 2020 Actual Water Supplies (DWR UWMP Table 6-8W)**

ADDITIONAL DETAIL ON WATER SUPPLY	2020 VOLUME (AFY)
Treated Water to Retailers	28,732
Untreated Water to Retailers	775
Untreated Imported Water to Groundwater Bank	7,213
Treated Recovered Water from Groundwater Bank	12,228
Untreated Water, Transfer / Exchanges	11,286
<b>TOTAL:</b>	<b>60,234</b>

The following sections further describe each of AVEK’s existing and potential water supplies.



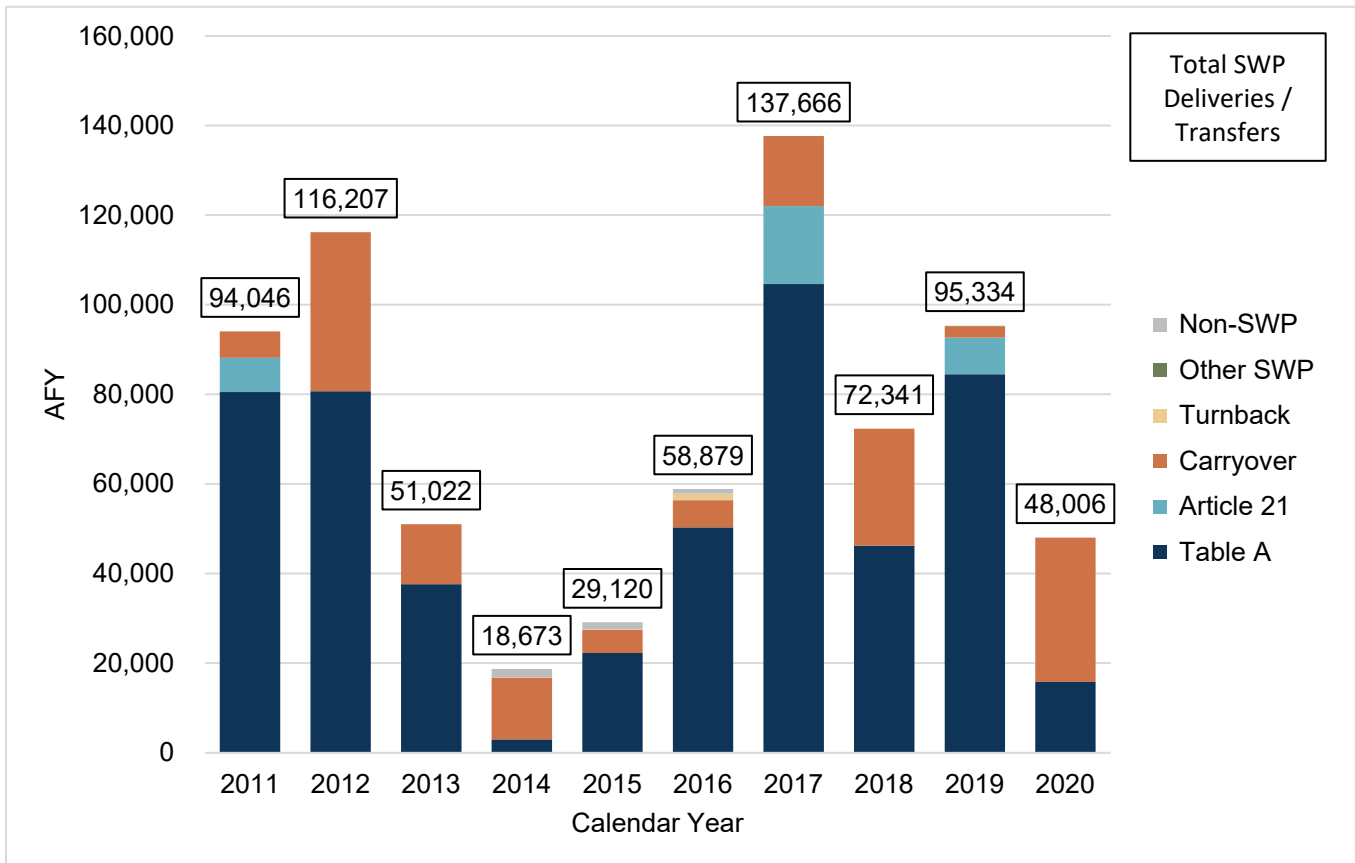
## 6.1 State Water Project

AVEK is a wholesale supplier of SWP water from the California Aqueduct. AVEK has the third-largest allotment of the 29 SWP contractors with a contractual Table A amount of 144,844 acre-feet per year (AFY). Table A water is a reference to the amount of water listed in “Table A” of the contract between the SWP and the contractors, representing the maximum amount of water a contractor may request each year. Table A water is the primary delivery type of imported water AVEK receives; however, additional delivery types help to make up AVEK’s full imported water supply.

**As listed below and shown in Figure 6-2, AVEK uses a variety of SWP water types.**

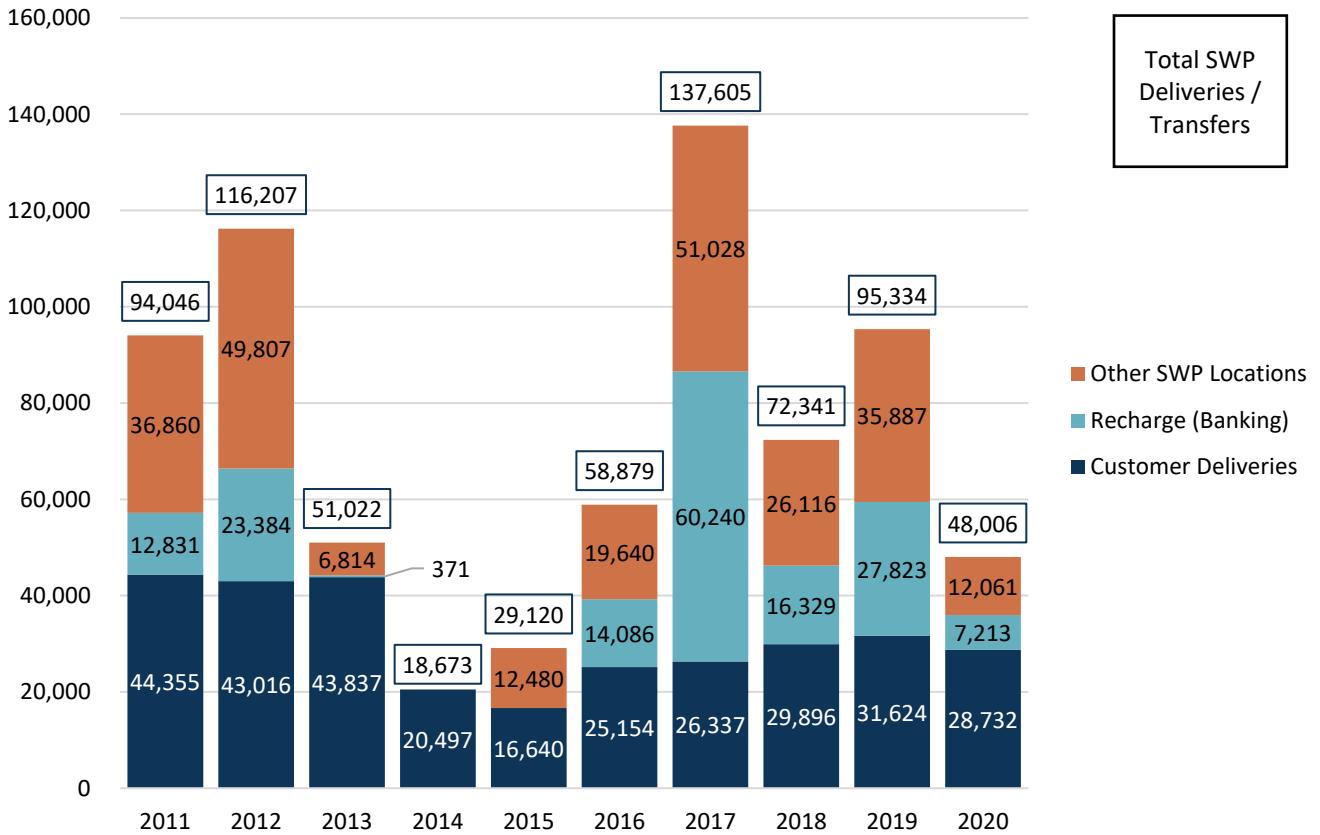
- **SWP Table A water:** Once the total amount of water to be delivered is determined for the year, all available water is allocated in proportion to each contractor’s annual maximum SWP Table A amount.
- **SWP Article 21 water:** Water that SWP contractors may receive on a short-term basis in addition to their Table A water, if requested. It is predominantly available in wet years.
- **SWP carryover water:** Water that is allocated to an SWP contractor and approved for delivery to that contractor each year, but not used by the end of the year. Instead of being delivered to the contractor, the water is stored in San Luis Reservoir, when space is available, for the contractor to use in the following year. Carryover water credit is lost when the reservoir storage space is full.
- **SWP turnback pool water:** SWP contractors may offer a portion of their Table A water that has been allocated in the current year and exceeds their needs to a “turnback pool,” where another contractor may purchase it.
- **Other SWP water:** Water from negotiated agreements with other SWP contractors.
- **Other non-SWP water:** Water from negotiated agreements with non-SWP contractors that is delivered through SWP.

**Figure 6-2. 2011–2020 AVEK SWP Deliveries by Type of Water**



As shown in **Figure 6-3**, in addition to delivering SWP water to customers, AVEK optimizes the use of available SWP water through recharge for future use or in deliveries to other SWP locations as exchanges or transfers, which are discussed in **Section 6.2**.

**Figure 6-3. 2011–2020 AVEK SWP Deliveries by Location**



### 6.1.1 SWP Water Supply Estimates

The water supply availability for delivery by the SWP depends on rainfall, snowpack, runoff, reservoir storage, pumping capacity of SWP facilities, and regulatory and environmental mandates on SWP operations. DWR prepares a biennial report to assist SWP contractors and local planners in assessing the availability of supplies from the SWP. DWR issued its most recent update, the 2019 SWP Delivery Capability Report (DCR) (California Department of Water Resources, 2020). In this update, DWR provides SWP supply estimates for SWP contractors to use in their planning efforts, including for use in their 2020 UWMPs. The 2019 DCR includes DWR’s estimates of SWP water supply availability under both existing (2020) and future (2040) conditions for the SWP as a whole and specifically for AVEK.

DWR’s estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and Central Valley Project systems. Key inputs to the model include the facilities included in the system, hydrologic inflows to the system, regulatory and operational constraints on system operations, and contractor demands for SWP water. In conducting its model studies, DWR must make assumptions regarding each of these key inputs.

In the 2019 DCR for its model study under existing conditions, DWR assumed: existing facilities; hydrologic inflows to the model based on 82 years of historical inflows (1922 through 2003); current regulatory and operational constraints, including 2018 COA Amendment, 2019 biological opinions, and 2020 Incidental Take Permit; and contractor demands at maximum Table A amounts. The long-term

average allocation reported in the 2019 DCR for the existing conditions study provides appropriate estimates of the SWP water supply availability under current conditions.

To evaluate SWP supply availability under future conditions, the 2019 DCR included a model study representing hydrologic and sea level rise conditions by 2040. The future condition study used all of the same model assumptions as the study under existing conditions, but reflected changes expected to occur from climate change, specifically projected temperature and precipitation changes centered around 2035 (2020 to 2049) and a 45 centimeter sea level rise. For the long-term planning purposes of this UWMP, the long-term average allocations reported for the future conditions study from 2019 DCR is the most appropriate estimate of future SWP water supply availability.

AVEK assumes a straight-line reduction in long-term average allocation from 58% in 2020 to 52% in 2040. 2045 is assumed to remain at 52%, as shown in **Table ES-3**.

**Table 6-2. SWP Average Yield Projections**

	2020	2025	2030	2035	2040	2045
Average Table A Allocation (%)	58.0%	56.5%	55.0%	53.5%	52.0%	52.0%
Average Table A Yield (AFY)	84,010	81,840	79,660	77,490	75,320	75,320

DWR’s 2019 DCR indicates that the modeled single dry year SWP water supply allocation is 7% under existing conditions. Historically, however, the lowest SWP allocations were 5% in 2014 and 2021 (as of May 2021). DWR’s 2019 DCR indicates that the lowest consecutive five-year period occurred from 1988 to 1992, with an average allocation of 20.3% under the existing conditions. During the recent drought, Table A allocation from 2012 to 2016 averaged 37%.

AVEK’s SWP projections for single dry year and multiple dry years is presented in **Table 6-3**.

**Table 6-3. Table A Deliveries in Selected Drought Conditions**

DROUGHT CONDITION	TABLE A ALLOCATION (%)	TABLE A ALLOCATION (AF)
<b>SINGLE DRY YEAR</b>		
2014	5.0%	7,242
<b>MULTIPLE DRY YEARS (1988-1992)</b>		
YEAR 1 (1988)	12.3%	17,854
YEAR 2 (1989)	32.2%	46,677
YEAR 3 (1990)	13.3%	19,276
YEAR 4 (1991)	25.6%	37,039
YEAR 5 (1992)	18.0%	26,048

### 6.1.2 Groundwater Banking

AVEK's groundwater banking programs store surplus imported water through groundwater recharge and include recovery wells to pump stored water in times of need. AVEK's groundwater banks include the Westside Water Bank (started operations in 2010), Eastside Water Bank (started operations in 2016), Upper Amargosa Creek Recharge Project (started operations in 2019), and most recently the High Desert Water Bank.

The Westside Water Bank has an estimated total storage capacity of 150,000 acre-feet (AF) and an estimated annual recharge capacity of 50,000 AFY. The Westside Water Bank includes 400 acres of groundwater recharge basins and 11 groundwater recovery wells. Up to 20 new wells may be constructed as a part of the Westside Water Bank project. Five irrigation wells existing on the property at the time of development may also be used in the program. AVEK meters the deliveries and recovery for the program and will not recover more than 90% of the amount recharged to account for evapotranspiration and other losses during recharge and conveyance as well as typical metering accuracy.

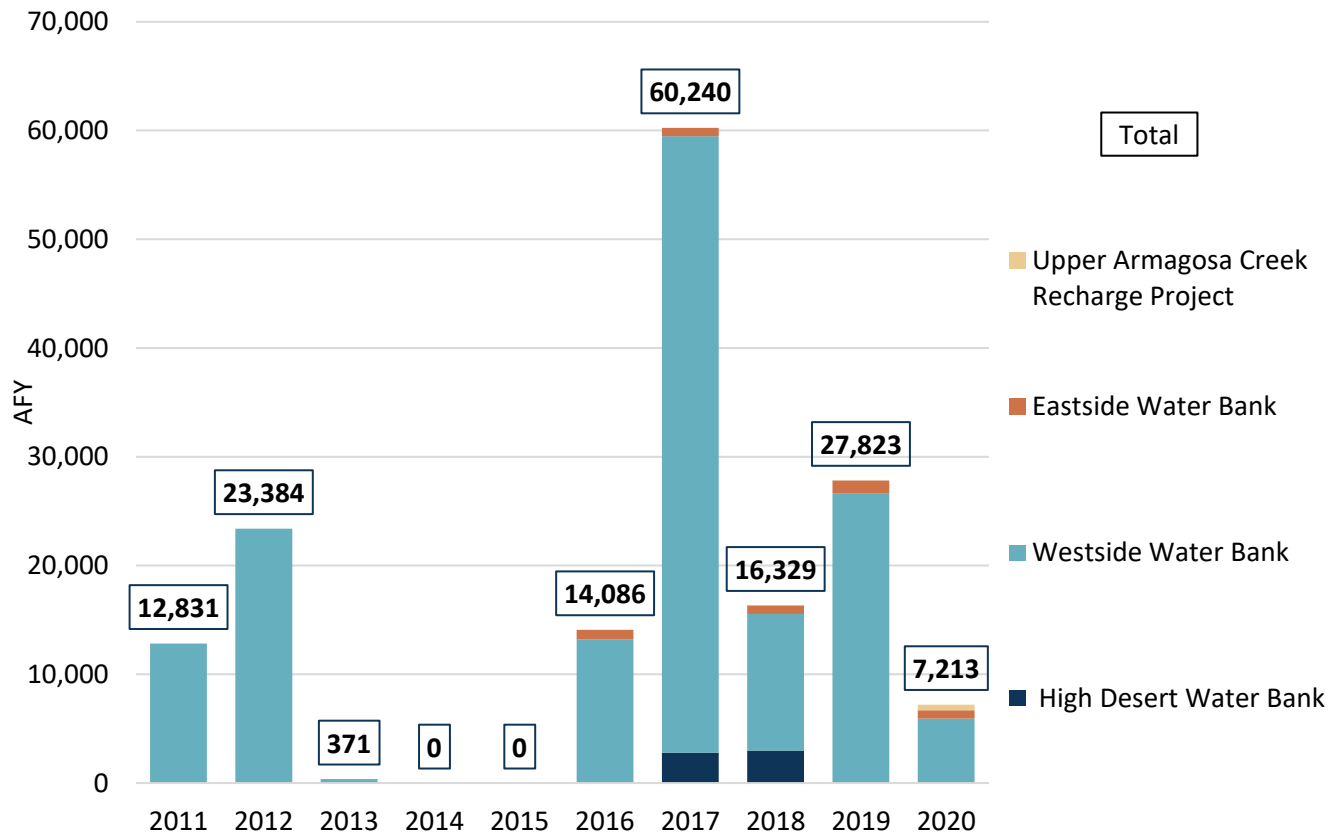
The Eastside Water Bank has an estimated total storage capacity of 6,700 AF and an estimated annual recharge capacity of 2,000 AFY. The Eastside Water Bank consists of 80 acres, with three two-acre recharge basins and three groundwater wells. The project allows for recharge of untreated water that is later recovered and blended with treated water from the Eastside Water Treatment Plant.

AVEK and partners—including Los Angeles County Waterworks Districts (LACWD), Palmdale Water District, and City of Palmdale—completed construction of the Upper Amargosa Creek Recharge Project in 2019. The project can recharge 1,600–2,350 AFY while preserving habitats for native animal species, including desert night lizards and coyotes, and providing additional flood protection. The project includes eight spreading basins, with a maximum capacity of 100 cubic feet per second during storms. The project was funded partly by Proposition 1E grant funds from DWR.

AVEK is currently developing the High Desert Water Bank in the western portion of the Antelope Valley Groundwater Basin along the East Branch of the California Aqueduct. The new groundwater storage facility is a partnership between AVEK and the Metropolitan Water District of Southern California to increase water supply reliability south of the Delta. As the project expands and additional phases are constructed, AVEK will have dedicated capacity and the ability to recover stored imported water from the groundwater basin and pump the recovered water into the East Branch of the California Aqueduct for downstream deliveries to AVEK's existing Water Treatment Facilities. The planned total storage capacity of the High Desert Water Bank will be 280,000 AF, with an estimated annual recharge capacity of 70,000 AFY. All AVEK water banks have a storage loss factor of 10%.

Local recovery of imported water from AVEK groundwater banks has become an important source of water for AVEK to supplement annual SWP water allocations. AVEK began recovering imported water from the groundwater banks in 2014, once SWP had been recharged and groundwater production wells were in place. A summary of AVEK's historical SWP deliveries to their banking sites is provided in **Figure 6-4**.

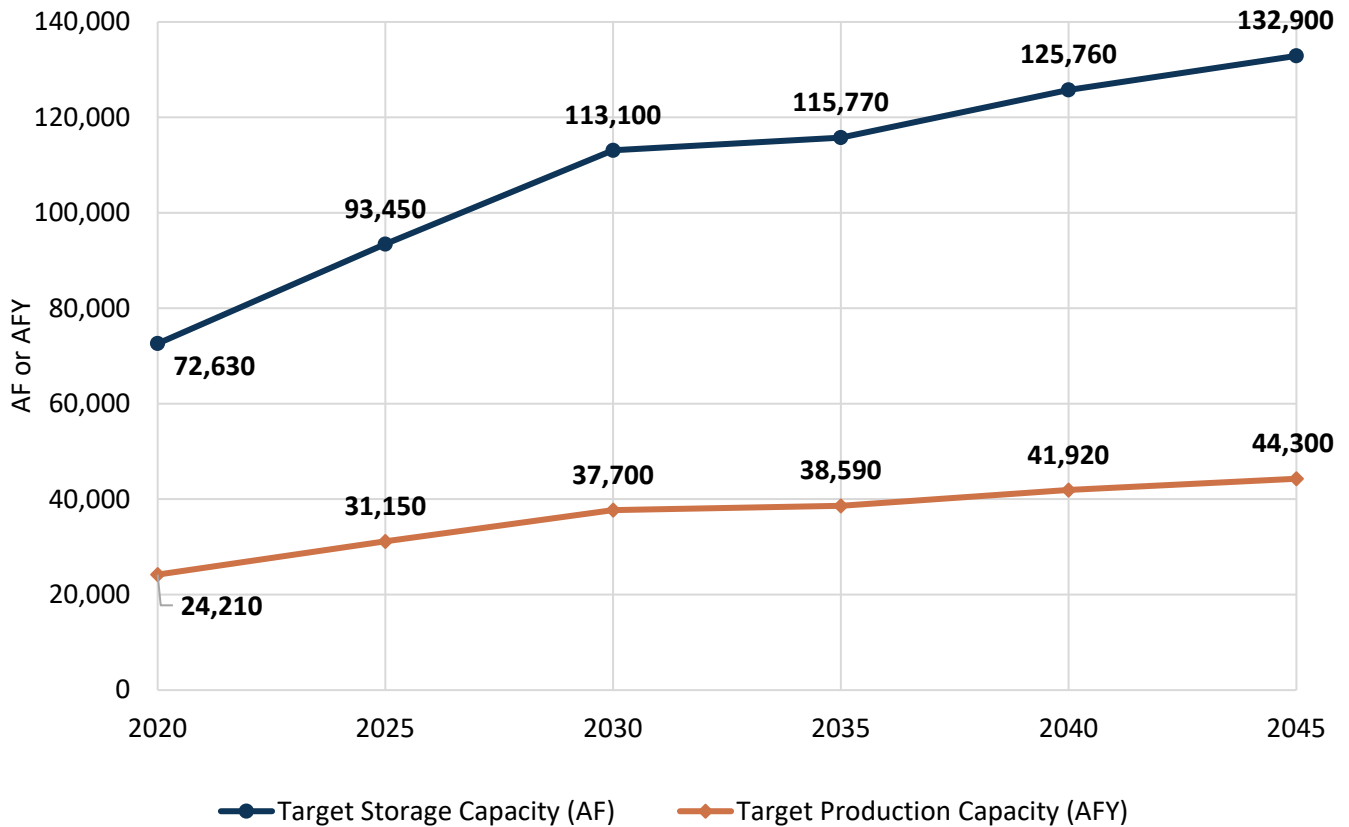
Figure 6-4. 2011–2020 AVEK Historical SWP Deliveries to Groundwater Banking Sites



AVEK’s goal is to add storage in the groundwater banks so that the Agency is prepared to meet demands during three consecutive years of 10% Table A allocations from the SWP. AVEK currently has roughly 90,000 AF of SWP water stored within their banks for future recovery and is implementing infrastructure projects to expand its capacity to recharge water, recover water, and distribute recovered water.

Based on the demand projections presented in **Section 4.2**, the target groundwater bank storage capacity and annual production capacity are projected in **Figure 6-5**.

Figure 6-5. Projected AVEK Groundwater Banking Target Sizing



### 6.1.3 Water Quality

DWR has conducted water quality monitoring for the SWP since 1968. Initially, this program sought to monitor eutrophication (an increase in chemical nutrients) and salinity in the SWP. Over time, the water quality program expanded to include parameters of concern for drinking water, recreation, and wildlife. Water quality samples are collected at regular intervals throughout the year for chemical, physical, and biological parameters. The coverage of this program includes more than 40 locations associated with the SWP, from the Feather River drainage in the north to Lake Perris in the south.

In addition, AVEK routinely monitors for contaminants in the drinking water according to Federal and State laws. AVEK prepares an annual water quality report,<sup>1</sup> which provides results of the monitoring efforts. Through monitoring and testing, AVEK has found that some contaminants exist; however, all State and Federal drinking water requirements have been met. The presence of contaminants does not necessarily pose a health risk, and all drinking water, including bottled water, may be reasonably expected to contain at least small amounts of some contaminants.

The SWP water has moderate total organic carbon levels, resulting in higher disinfection byproduct (DBP) formation, and also has some taste- and odor causing compounds. AVEK’s conventional surface water treatment plants use a treatment process of flocculation, sedimentation basins, ozone, followed by biologically active filters, and chlorination. The ozone effectively removes the taste and odor compounds, but DBP formation is a concern due to only moderate organics removal through the treatment process, followed by chlorination. AVEK uses the Eastside Water Bank to blend with water

<sup>1</sup> <https://www.avek.org/water-quality-c1200b6>

from the Eastside Water Treatment Plant (WTP) to control DBPs, and uses the Westside Water Bank to serve the Rosamond WTP system to minimize DBPs due to the long detention time of water in the system. Other than controlling DBP formation, there are no water quality parameters identified to be of special concern to AVEK at this time (Carollo, 2020).

## 6.2 Water Exchanges and Transfers

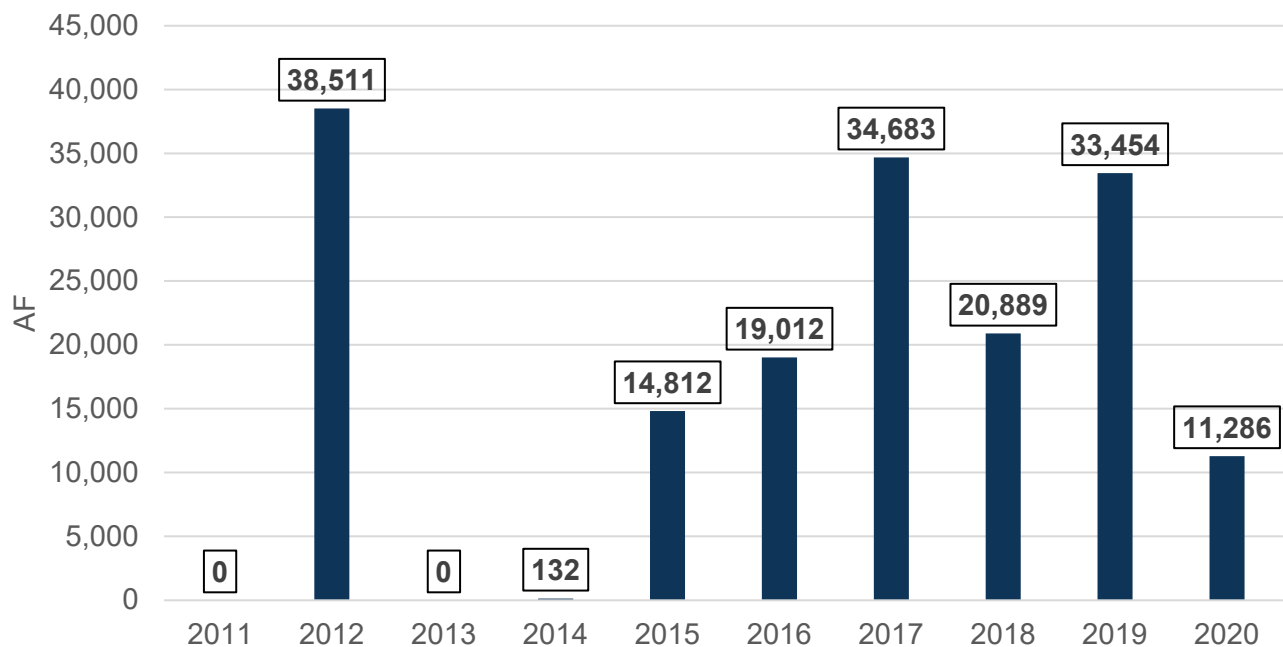
AVEK takes part in water exchanges and water transfers with other State Water Contractors, including suppliers within the greater Antelope Valley, to help meet demands within the region. A water exchange is water delivered by one water user to another, with the receiving water user providing water in return at a specified time or when conditions of the parties’ agreement are met. A water transfer is a temporary or long-term change in the point in diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights. In the past 10 years, AVEK has executed 13 exchange agreements and eight transfer agreements totaling over 170,000 AF of water. In 2020, AVEK transferred or exchanged 11,286 AF of water to four agencies, as summarized in **Table 6-4**. **Figure 6-6** summarizes exchanges and transfer volumes from 2011 to 2020.

**Table 6-4. 2020 AVEK Exchanges and Transfers**

ENTITY NAME	DESCRIPTION	DWR AGREEMENT NO. (SWPAO#)	AMOUNT FROM AVEK TO OTHER AGENCIES (AF)
Kern County WA/V Lions	Table A Transfer	20-026	7,000
Littlerock Creek ID	1:1 Table A Exchange	07-031	1,380
Palmdale WD	1:1 Table A Exchange	18-032	1,500
Santa Clarita Valley WA	2:1 Table A Exchange	19-032	1,406
<b>TOTAL</b>			<b>11,286</b>

Source: AVEK

**Figure 6-6. 2011–2020 AVEK Annual Exchanges and Transfers Volumes**



AVEK is developing a long-term exchange/storage program to further maximize the use of its SWP supplies and provide funding for purchase of additional water supplies. Other exchange programs are anticipated to be developed in the future to further secure the Agency’s water supplies. Potential exchange deliveries have not been included in AVEK’s projections of future water supplies.

AVEK also has an agreement with LACWD District 40 (LACWD No. 40) to transfer groundwater supplies, which is discussed in **Section 6.3**.

## 6.3 Groundwater

AVEK’s groundwater wells are located within the Antelope Valley Groundwater Basin (“the Basin”). The Basin is a large, topographically closed alluvial basin with an estimated total storage capacity of about 68 to 70 million acre-feet. It consists of two primary aquifers: the upper unconfined aquifer (“principal aquifer”), which is the main source of groundwater for the area, and a lower aquifer that is considered to be confined. The Basin encompasses 1,580 square miles in Los Angeles, Kern, and San Bernardino counties. The groundwater basin boundaries have been defined by the California Department of Water Resources (DWR Basin Number 6-44).

Prior to 1972, groundwater provided more than 90% of the total water supply in the Antelope Valley. Since 1972, it is estimated that between 50% to 90% of the area’s water supplies are from groundwater. Groundwater pumping peaked in the 1950s, and then declined as greater pumping lifts and increasing energy costs made the use of groundwater in the area less economical for agricultural uses. Groundwater levels in some areas have declined significantly since the early 1900s due to over-extraction. According to the US Geological Service (USGS) (2003), groundwater levels declined more than 200 feet in some parts of the Basin, resulting in increased pumping lifts, reduced well efficiency, and land subsidence of more than six feet in some areas.

The Basin was adjudicated in 2015 after 15 years of complex proceedings among more than 4,000 parties, including public water suppliers, landowners, small pumpers and non-pumping property owners, and the Federal and State governments. The Antelope Valley Area of Adjudication covers approximately 1,390 square miles, or 90% of the groundwater basin.

The Antelope Valley Groundwater Basin Adjudication Judgment (“Judgment”), included in **Appendix F**, determined the Basin is in a state of overdraft, established respective water rights among groundwater producers based on the Basin’s Native Safe Yield, and ordered a ramp-down of production to meet the Native Safe Yield by 2023. The adjudication defined a Native Safe Yield of 82,300 AFY. To achieve sustainable groundwater elevations, groundwater production will be reduced (ramped down) over a seven-year period (2016–2022) to a final Production Right. Following the adjudication, the Antelope Valley Watermaster was formed to implement the Judgment. The Watermaster is charged with administering the adjudicated water rights and managing the groundwater resources within the adjudicated portion of the Antelope Valley. **Figure 1-1** shows the adjudication boundary in relation to AVEK’s service area. As shown in **Table 6-5**, the ramp-down period from 2016 to 2022 is causing substantial reductions in pumping in the Basin.

**Table 6-5. Ramp-down Production Rights Within and Outside of AVEK’s Service Area, AFY**

	PRE-RAMP DOWN PRODUCTION RIGHTS	POST-RAMP DOWN PRODUCTION RIGHTS
AVEK	4,000.0	3,550.0
AVEK Customers	18,012.9	12,083.8
<b>SUBTOTAL WITHIN AVEK SERVICE AREA</b>	<b>22,012.9</b>	<b>15,633.8</b>
Non-AVEK Customers	114,007.3	66,666.2
<b>TOTAL</b>	<b>136,020.2</b>	<b>82,300.0</b>

Source: Judgement



There are seven potential production categories identified in the Judgment: production rights, ramp-down production, imported water return flows, carryover water, stored water, other rights to produce groundwater, and additional production. Production rights are divided into five categories: overlying production rights, non-overlying production rights, Federal Reserve water rights, small pumper class, and California production rights. Detailed information regarding each production category is available in the annual reports. The most recent available report is included in **Appendix G**.

Of most relevance to AVEK are Overlying Production Rights and Non-Overlying Production Rights within the AVEK service area, because this groundwater is the primary supply other than imported water from AVEK. AVEK has an overlying production right of 3,550 AFY.

**Table 6-6. Non-Overlying Producers' Production Rights by AVEK Customers**

<b>PRODUCER</b>	<b>PRODUCTION RIGHT (AFY)</b>
Boron Community Services District	50.0
California Water Services Company	343.1
Desert Lake Community Services District	73.5
LACWD No. 40	6,789.3
North Edwards Water District	49.0
Palm Ranch Irrigation District	465.7
Quartz Hill Water District	563.7
Rosamond Community Services District	404.4
West Valley County Water District	40.0
<b>TOTAL</b>	<b>8,778.8</b>

Note: From Judgment Table A-1 Exhibit 3. Excludes Palmdale Water District and Littlerock Creek Irrigation District. Both have their own SWP contracts.

**Table 6-7. Overlying Producers' Production Rights by AVEK Customers**

<b>PRODUCER</b>	<b>PRODUCTION RIGHT (AFY)</b>
60th Street Association Water System	2.2
Antelope Park Mutual Water Company	169.9
Antelope Valley Mobile Estates	8.8
Aqua-J Mutual Water Company	44.4
Averydale Mutual Water Company	254.4
Baxter Mutual Water Company	35.0
Bleich Flat Mutual Water Company	33.5
Evergreen Mutual Water Company	68.5
Land Projects Mutual Water Company	613.5
Landale Mutual Water Company	155.6
Llano del Rio Water Company	279.0
Llano Mutual Water Company	0.0
Miracle Improvement Corporation dba Golden Sands Mobile Home Park/Trailer Park	27.0
Shadow Acres Mutual Water Company	51.7
Sundale Mutual Water Company	472.2
Tierra Bonita Mutual Water Company	40.3
West Side Park Mutual Water Co.	276.9
White Fence Farms Mutual Water Co.	772.1
<b>NON-AVEK SUBTOTAL</b>	<b>3,305.0</b>
AVEK	3,550.0
<b>TOTAL WITHIN AVEK SERVICE AREA</b>	<b>6,855.0</b>

Note: From Table A-2 Exhibit 4

In addition, parties listed on Exhibit 8 of the Judgment have a right to imported water return flows equal to the applicable percentage multiplied by the average amount of imported water used by that party within the Basin in the preceding five-year period. AVEK has rights to the return flows used by parties not on Exhibit 8 of the Judgment. For example, AVEK received 822 AF of groundwater in 2019 from imported water return flows. Return flows from agricultural imported water use are set in the Judgment at 34%, and return flows from municipal and industrial imported water use are set in the Judgment at 39% of the amount of imported water used.

### 6.3.1 Groundwater Accounting

As shown in **Table 6-8**, AVEK has not pumped any of its production rights the last five years. The only groundwater account that AVEK has used during the last five years is recovery of stored imported water. As a result, AVEK has increased available groundwater for future years through storage of carryover water and return flows. Also, AVEK has an agreement with LACWD to transfer groundwater on a non-permanent basis from AVEK to LACWD, which helps LACWD mitigate for its wells with poor water quality.

**Table 6-8. Groundwater Volume Pumped (DWR UWMP Table 6-1W)**

LOCATION, TYPE	2016	2017	2018	2019	2020
Antelope Valley Basin, Production Rights	-	-	-	-	-
Antelope Valley Basin, Banked SWP Water	11,512	7,868	9,162	9,234	12,228
<b>TOTAL:</b>	<b>11,512</b>	<b>7,868</b>	<b>9,162</b>	<b>9,234</b>	<b>12,228</b>

### 6.3.2 Water Quality

Groundwater quality in the upper aquifer is generally suitable for domestic, agricultural, and industrial use. Total Dissolved Solids (TDS) concentrations are in the range of 200 to 800 milligrams per liter (mg/L). The deep aquifer typically has higher TDS concentrations. Hardness levels range from 50 to 200 mg/L. High fluoride, boron, nitrates, hexavalent chromium, and arsenic are found in some areas of the Basin. However, AVEK has not had and does not anticipate groundwater quality issues with its wells.

## 6.4 Non-SWP Water

On January 1, 2017, AVEK acquired an additional non-SWP water supply through a long-term lease of annual supply originally belonging to the Nickel Family, a farming interest in Kern County. AVEK has acquired the rights to 1,700 acre-feet of water made available for a period of 35 years (with an option to extend for 35 more years), even in dry years. Additional non-SWP supplies improves the Agency's reliability of its existing water supply, as well as provide additional supplies to meet future demand.

## 6.5 Wastewater and Recycled Water

AVEK does not provide supplemental treatment to recycled water and does not distribute recycled water. The Agency has no plans to provide recycled water as a part of its future deliveries. As a result, **DWR Table 6-3**, **Table 6-4**, and **Table 6-5** have not been completed and are not included in the UWMP.

Agencies within AVEK's service area do collect, treat, and distribute recycled water. In accordance with the 2020 UWMP Guidebook, information regarding wastewater facilities and recycled water use within AVEK's service area is provided below.

### 6.5.1 Recycled Water Coordination

The most recent coordination to document the collection, treatment, and distribution of recycled water in the greater Antelope Valley region occurred as part of the Antelope Valley Integrated Regional Water Management Plan (IRWMP) 2019 update.

Agencies responsible for operating, managing, and using the recycled water systems in the region are:

- Los Angeles County Sanitation Districts (LACSD) Nos. 14 & 20
- Los Angeles County Waterworks District No. 40
- Palmdale Recycled Water Authority (includes the City of Palmdale and the Palmdale Water District)
- Rosamond Community Services District (CSD)
- Edwards Air Force Base (EAFB)

### 6.5.2 Wastewater Collection, Treatment, and Disposal

The greater Antelope Valley region's municipal wastewater is generated from a combination of residential and commercial sources. The Cities of Lancaster and Palmdale own, operate, and maintain the wastewater collection systems in their respective service areas. In addition, the LACSD No. 14 and No. 20 serve the Antelope Valley. LACSD No. 14 serves a large portion of Lancaster, portions of Palmdale, and adjacent unincorporated areas of Los Angeles County. LACSD No. 20 provides wastewater management services for the Palmdale area as well as adjacent unincorporated Los Angeles County areas.

Recycled water in the greater Antelope Valley is available from two primary sources, the Lancaster Water Reclamation Plant (WRP) and the Palmdale WRP. The LACSD owns and operates the Lancaster WRP and Palmdale WRP, which collect wastewater from the Cities of Palmdale and Lancaster. Wastewater is treated to tertiary levels that are suitable for non-potable uses and groundwater recharge. The Lancaster WRP has a permitted capacity of 18.0 million gallons per day (MGD) and in 2019 treated 15,052 AF, which is used for irrigation, agriculture, urban reuse, wildlife habitat, maintenance, and recreational impoundments. The Palmdale WRP has a permitted capacity of 12.0 MGD and in 2019 treated 9,021 AF of wastewater for agricultural and urban reuse. The Lancaster WRP collects most of the wastewater produced within the AVEK service area.

The Rosamond CSD owns and operates the Rosamond Wastewater Treatment Plant (WWTP) located in the town of Rosamond. The Rosamond WWTP has a permitted capacity of 1.27 MGD and in 2019 treated 1,222 AF. The Rosamond WWTP currently produces secondary-treated water. In 2008, Rosamond CSD developed a plan to build a tertiary treatment plant with a potential for future expansion. However, construction to complete the upgrades is on hold indefinitely due to lack of funding and other economic considerations.

EAFB has two treatment plants that distribute recycled water to the base. The EAFB Air Force Research Laboratory Treatment Plant is a secondary wastewater treatment plant that discharges all of its effluent to evaporation ponds at the base. In 2019, approximately 34 AF was sent to the evaporation ponds. The EAFB Main Base WWTP produces tertiary treated effluent for landscape irrigation at the base golf course, and excess effluent is discharged to the evaporation ponds, which totaled approximately 387 AF in 2019.

The majority of the wastewater currently collected from within the LACWD No. 40 service area is treated and discharged outside its service area. However, recycled water from the Palmdale and Lancaster WRPs is projected to be a potential source of supply for LACWD No. 40 with completion of the Antelope Valley Backbone project. This project will provide the necessary distribution infrastructure to convey recycled water from the two WRPs to additional users in the Antelope Valley. To date, only a portion of the Antelope Valley Backbone has been constructed.

AVEK's retailers have projected increased use of recycled water to offset potable use, but to-date little progress has been made implementing recycled water projects within AVEK's service area. **Table 6-9** summarizes recycled water use projections from LACWD No. 40. For supply and demand analysis in this UWMP, no additional recycled water is assumed to be developed through 2045.

**Table 6-9. Retail Recycled Water Projection Within AVEK Service Area**

RETAILER	2020	2025	2030	2035	2040
LACWD No. 40	0	13,500	15,200	17,000	18,700

Source: LACWD No. 40 Draft 2020 UWMP (Brown & Caldwell, 2021).

## 6.6 Surface Water

AVEK does not have sources of surface water supply other than imported SWP water.

## 6.7 Stormwater

AVEK does not intentionally divert stormwater for beneficial use.

## 6.8 Desalinated Water Opportunities

AVEK has no plans for the development of desalinated water supplies within the planning horizon of this UWMP.

## 6.9 Future Water Projects

**A description of future projects that AVEK may implement to increase water supplies is provided below.**

### Westside Water Bank Improvements

Construction of permanent underground piping. The project includes the replacement of temporary irrigation piping with permanent buried pipelines and appurtenances, which will improve the ability to achieve the recharge goals at the bank during wet years.

### Eastside Water Bank Expansion

The expansion project will significantly increase the recharge capacity of the bank by building 85 acres of recharge basins, providing 10,400 AFY of additional capacity (for a total capacity of 11,600 AFY). The project also includes well equipping to provide an additional 300 gpm of recovery capacity.

### Enterprise / High Desert Water Bank Expansion

Development of a new groundwater recharge and recovery facility, including recharge basins and pipelines, groundwater recovery wells, well collection system, and transmission and pumping facilities to deliver water from the bank

to the California Aqueduct for delivery to the AVEK’s banking partners. As the program expands, the Agency will also have recharge and recovery capacity in the Bank to meet increase local demands and improve water supply resiliency.

### South-North Intertie Pipeline Phase 2

The South-North Intertie Pipeline Phase II Project includes the construction of a 6.5 mile 48-inch diameter potable water pipeline and equipping the existing pump station with new pumps. The new pipeline will tie into AVEK’s existing South North Intertie Pipeline and connect the Westside Water Bank to the Quartz Hill Water Treatment Plant. Environmental review, feasibility study, and property acquisition are complete. Final design is nearly complete (90%). Construction of the pipeline will allow access to up to 75,000 AF of water currently stored in the Westside Water Bank and enable delivery throughout the AVEK service area.

## 6.10 Summary of Projected Water Supplies

AVEK's primary water supplies consist of the following sources:

### SWP, Table A Allocation

Average yield based on DWR 2019 DCR and presented in **Table 6-2**.

### Antelope Valley Groundwater Basin Production Rights

Based on the Judgment.

### Antelope Valley Groundwater Basin Imported Water Return Flows

Estimate based on projected imported water demands for parties not on Exhibit 8 of the Judgment.

### Non-SWP Water

Estimate based on reliable supply of 1,700 AFY, as described in **Section 6.4**.

The projected reasonably available volumes summarized in **Table 6-10**. In addition, AVEK can supplement supplies by recovering banked SWP water in groundwater or accessing supplies, if available, such as carryover groundwater or SWP water types other than Table A.

**Table 6-10. Projected Water Supplies (DWR UWMP Table 6-9W)**

	2025	2030	2035	2040	2045
SWP Table A	81,840	79,660	77,490	75,320	75,320
Groundwater, Production Rights	3,550	3,550	3,550	3,550	3,550
Groundwater, Imported Water Return Flows	800	800	800	800	800
Non-SWP Water	1,700	1,700	1,700	1,700	1,700
<b>TOTAL</b>	<b>87,890</b>	<b>85,710</b>	<b>83,540</b>	<b>81,370</b>	<b>81,370</b>

### 6.10.1 Climate Change Effects

Climate models disagree on average annual precipitation projections but agree on other hydrologic metrics relevant to water resources management, including (Persad, 2020) (Partida, 2020):

- Snowpack declines
- Increased fraction of precipitation on extreme rainfall days
- Shorter, sharper rainy season
- Increased evapotranspiration
- Higher frequency of extremely wet and extremely dry years
- Higher incidence of extremely dry year followed an extremely wet year, or vice versa

As discussed at greater length in the 2019 Antelope Valley IRWMP (Antelope Valley Integrated Regional Water Management Group, 2019), climate change is expected to increase average temperature by at least 5 degrees Fahrenheit by 2100. Despite the potential minimal impact on total

annual precipitation, climate change is expected to result in a larger proportion of precipitation coming in the form of intense single-day events.

The largest impact of climate change on AVEK will likely be seen from SWP availability. The DWR 2019 DCR included a model study representing hydrologic and sea level rise conditions at 2040 to evaluate SWP supply availability under future conditions. The future condition study used the same model assumptions as the study under existing conditions but reflected changes expected to occur from climate change, specifically projected temperature and precipitation changes centered around 2035 (2020 to 2049) and a 45 centimeter sea level rise.

The long-term average allocations reported for the future conditions study from 2019 DCR is applied starting in 2040, with a straight-line decrease from existing conditions, as described in **Section 6.1.1** and presented in **Table 6-2**.

### 6.1.1 Energy Intensity

AVEK must include information that could be used to calculate the energy intensity of their water service per Water Code Section 10631.2.(a). AVEK water service energy intensity was estimated based on readily available electrical billing data and water production data. AVEK compiled electrical billing records from 2017 through 2020 and calculated the annual electrical consumption for its treatment plants and distribution system combined. The analysis focused on treated water deliveries because untreated water deliveries are typically via gravity from the California Aqueduct, and AVEK transfers and exchanges are outside of its service area. Based on this information, AVEK’s average water service energy intensity was 261 kilowatt hours per AF (kWh/AF) of treated water delivered, as shown in **Table 6-11**.

**Table 6-11. 2017–2020 AVEK Energy Intensity Estimates**

	2017	2018	2019	2020	2017-2020 TOTAL
Electricity (kWh)	8,616,000	9,909,000	10,941,000	11,031,000	40,497,000
Treated Water Deliveries (AF)	34,205	39,058	40,858	40,960	155,082
<b>ENERGY INTENSITY (KWH/AF)</b>	<b>252</b>	<b>254</b>	<b>268</b>	<b>269</b>	<b>261</b>



# Water Supply Reliability and Drought Risk Assessment

This chapter evaluates AVEK’s water supply reliability under various drought and non-drought conditions and shows the benefits of AVEK’s investment in groundwater banking to manage the high variability of SWP water.

This chapter describes the reliability of the Antelope Valley-East Kern Water Agency (AVEK or Agency) water supply. It presents 25-year projections for normal, single dry, and multiple dry years, and assesses the drought risk over the next five years. Water supply reliability reflects AVEK’s ability to meet the water needs of its customers with water supplies under varying conditions. The analysis considers plausible hydrological and regulatory variability, climate conditions, and other factors that affect the Agency’s water supply and demand.

## IN THIS SECTION

- Water Supply Reliability Assessment
- Drought Risk Assessment

AVEK’s water sources and their constraints are described in detail in **Chapter 6**. The primary constraint on availability of State Water Project (SWP) supplies has been extreme drought conditions, and SWP availability depends on rainfall, snowpack, runoff, reservoir storage, pumping capacity of SWP facilities, and regulatory and environmental mandates on SWP operations. The 2019 SWP Delivery Capability Report (DCR) (California Department of Water Resources, 2020) provides SWP water supply availability under both existing (2020) and future (2040) conditions.

AVEK has invested in its groundwater banking programs to stabilize the swings in SWP water availability by storing surplus SWP water through groundwater recharge and pumping from recovery wells in times of need. The following sections analyze the performance of AVEK’s supplies under different conditions.



## 7.1 Water Supply Reliability Assessment

This section presents AVEK’s expected water supply reliability for a normal year, single dry year, and five consecutive dry years, including projections for 2025, 2030, 2035, 2040, and 2045.

**AVEK’s supplies for this assessment include:**

### SWP Table A Allocation

Yield based on the California Department of Water Resources (DWR) 2019 DCR, described in **Section 6.1.1** and summarized below.

### Antelope Valley Groundwater Basin Production Rights

3,550 acre-feet per year (AFY) based on the Stipulated Judgment (Judgment) for the 2015 Antelope Valley Groundwater Adjudication.

### Antelope Valley Groundwater Basin Imported Water Return Flows

800 AFY based on projected imported water demands for parties not on Exhibit 8 of the Judgment.

### Non-SWP Water

1,700 AFY based on existing agreement and the supplies have high reliability, as described in **Section 6.4**.

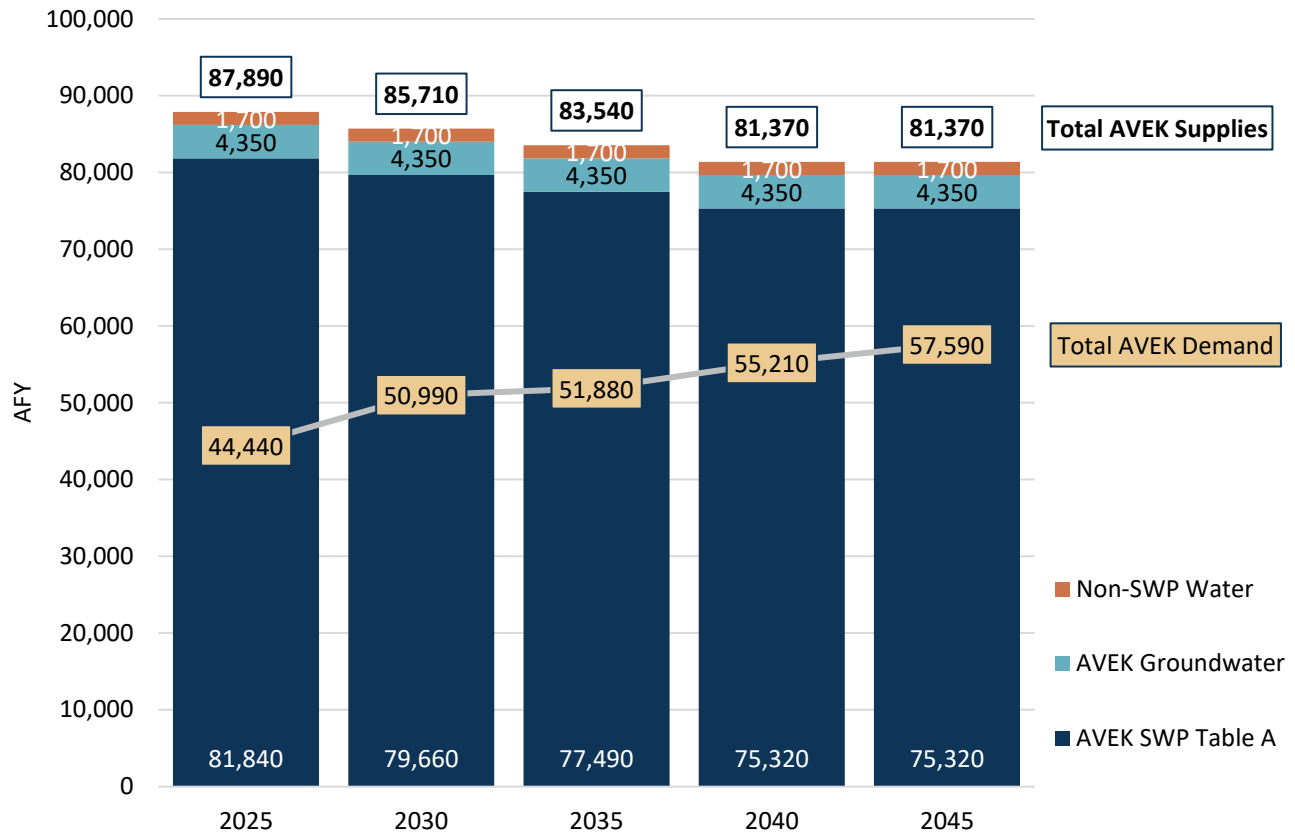
### 7.1.1 Water Supply Reliability – Normal Year

Average SWP Table A allocation is projected to decrease from 58% in 2020 to 52% in 2040 as shown in **Table 7-1**. Total normal year AVEK supplies are shown in **Figure 7-1** and, based on these assumptions, AVEK has sufficient supplies in normal years and could use available supplies to add groundwater storage for dry periods. For example, SWP water could be recharged when available, or unused groundwater rights can be carried over for use in future years.

**Table 7-1. SWP Average Yield Projections**

	2020	2025	2030	2035	2040	2045
Average Table A Allocation (%)	58.0%	56.5%	55.0%	53.5%	52.0%	52.0%
Average Table A Yield (AFY)	84,010	81,840	79,660	77,490	75,320	75,320

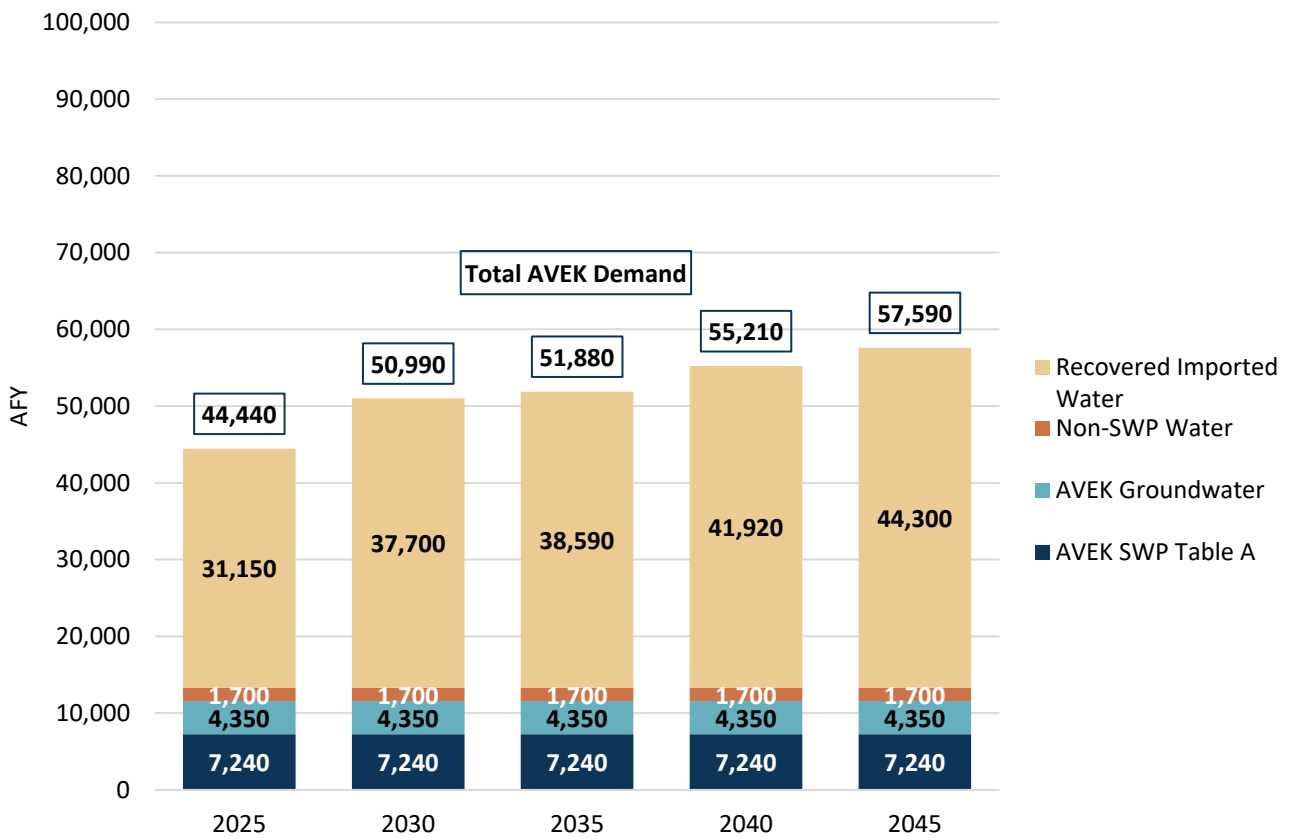
Figure 7-1. AVEK Supply and Demand Projections, Normal Year



### 7.1.2 Water Supply Reliability – Single Dry Year

Single dry year yield for SWP water is based on actual 2014 and 2021 (as of May 2021) allocation of 5%. Groundwater rights and non-SWP water are not impacted by short-term drought conditions, so normal year supply assumptions are applied. The remainder of demand is met with groundwater in storage. As discussed in **Section 6.1.2**, AVEK’s annual banking recovery target is to produce at least enough groundwater to meet demand with 10% Table A allocations from the SWP. As shown in **Figure 7-2**, recovered imported water from AVEK groundwater banks enable AVEK to meet its demands in a single dry year.

**Figure 7-2. AVEK Supply and Demand Projections, Single Dry Year**



### 7.1.3 Water Supply Reliability – Five Consecutive Dry Years

For multiple dry years, SWP water availability is based on 1988 to 1992 simulated yield from the 2019 SWP DCR, which estimated the following annual Table A allocation:

- **Year 1 (1988)** 12.3%
- **Year 2 (1989)** 32.2%
- **Year 3 (1990)** 13.3%
- **Year 4 (1991)** 25.6%
- **Year 5 (1992)** 18.0%

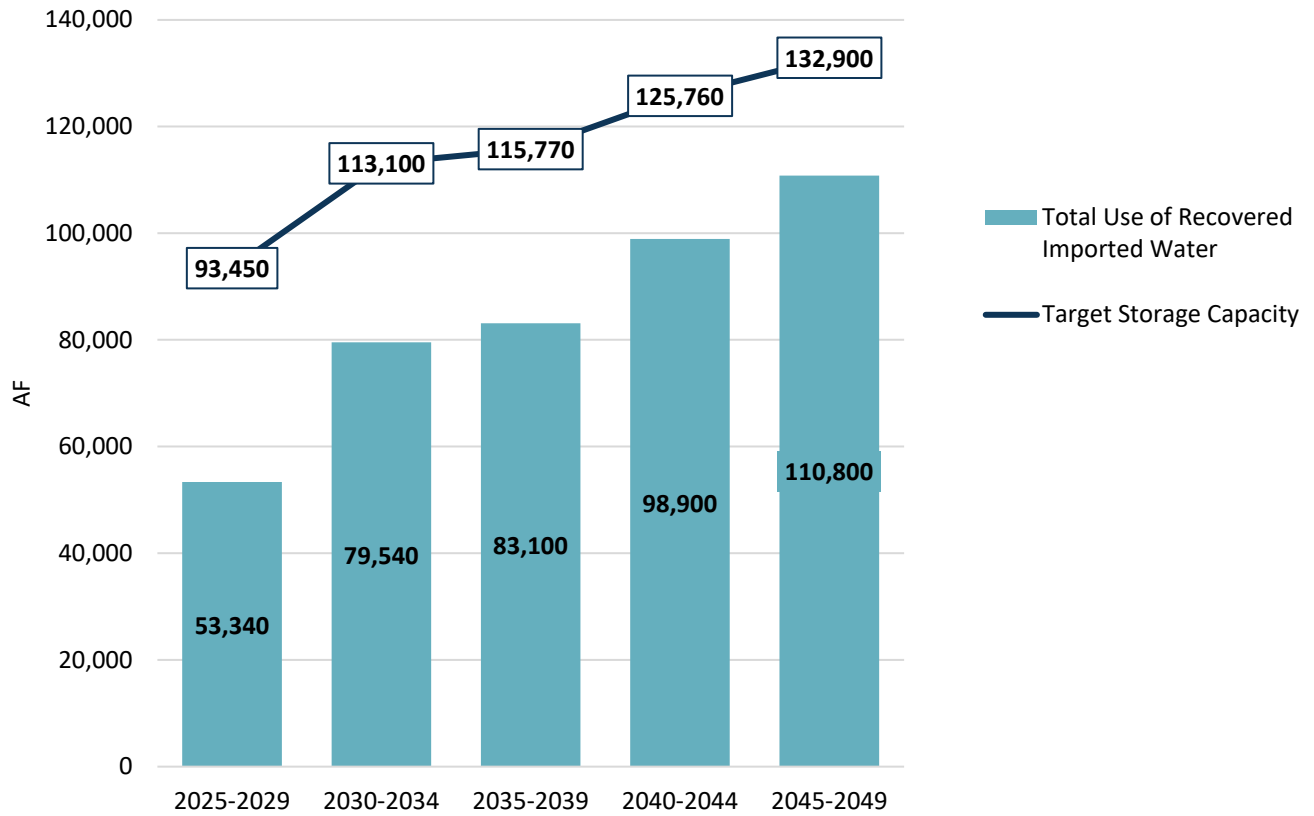
Similar to single dry year, groundwater rights and non-SWP water are not impacted by an extended drought, and recovered imported water from AVEK groundwater banks are used to meet remaining demands. **Table 7-2** summarizes AVEK supply and demand totals for the multiple dry year scenario.

**Table 7-2. Multiple Dry Years Supply and Demand Comparison (DWR UWMP Table 7-4W)**

		2025	2030	2035	2040	2045
First Year	Supply Totals	44,440	50,990	51,880	55,210	57,590
	Demand Totals	44,440	50,990	51,880	55,210	57,590
	<b>DIFFERENCE</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Second Year	Supply Totals	52,730	52,730	52,730	55,210	57,590
	Demand Totals	44,440	50,990	51,880	55,210	57,590
	<b>DIFFERENCE</b>	<b>8,290</b>	<b>1,740</b>	<b>850</b>	<b>0</b>	<b>0</b>
Third Year	Supply Totals	44,440	50,990	51,880	55,210	57,590
	Demand Totals	44,440	50,990	51,880	55,210	57,590
	<b>DIFFERENCE</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Fourth Year	Supply Totals	44,440	50,990	51,880	55,210	57,590
	Demand Totals	44,440	50,990	51,880	55,210	57,590
	<b>DIFFERENCE</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Fifth Year	Supply Totals	44,440	50,990	51,880	55,210	57,590
	Demand Totals	44,440	50,990	51,880	55,210	57,590
	<b>DIFFERENCE</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

As discussed in **Section 6.1.2**, AVEK’s total banking storage target is at least enough groundwater to meet demand with 10% Table A allocations from the SWP for three consecutive years. **Figure 7-3** presents the total volume imported water recovered water from AVEK groundwater banks during a multiple year drought compared with the target total storage volume. As shown in the figure, additional recovery of imported water from AVEK groundwater banks would be available if the five-year drought continued.

**Figure 7-3. AVEK Groundwater Bank Storage Capacity vs. Use During Five Consecutive Dry Years**



## 7.2 2021–2025 Drought Risk Assessment

Water Code Section 10635(b) is a new provision of the Water Code that requires a Drought Risk Assessment (DRA) for the upcoming five years (2021 to 2025) based on the five driest years on record.

**The supply assumptions are similar to the multiple dry year assumptions in the previous section:**

### SWP Table A Allocation

Yield based on five years with lowest yield from the DWR 2019 DCR, 1988 to 1992.

### Antelope Valley Groundwater Basin Production Rights

Reducing ramp-down production rights from 3,730 AFY in 2021 to 3,550 AFY production rights in 2023.

### Antelope Valley Groundwater Basin Imported Water Return Flows

800 AFY based on projected imported water demands for parties not on Exhibit 8 of the Judgment. (This value is a rough estimate because it can change over time).

### Non-SWP Water

Same value (1,700 AF) in each year.

### AVEK Groundwater Bank

Used to meet remaining demand and sized to meet demands in a year with SWP Table A 5% allocation.

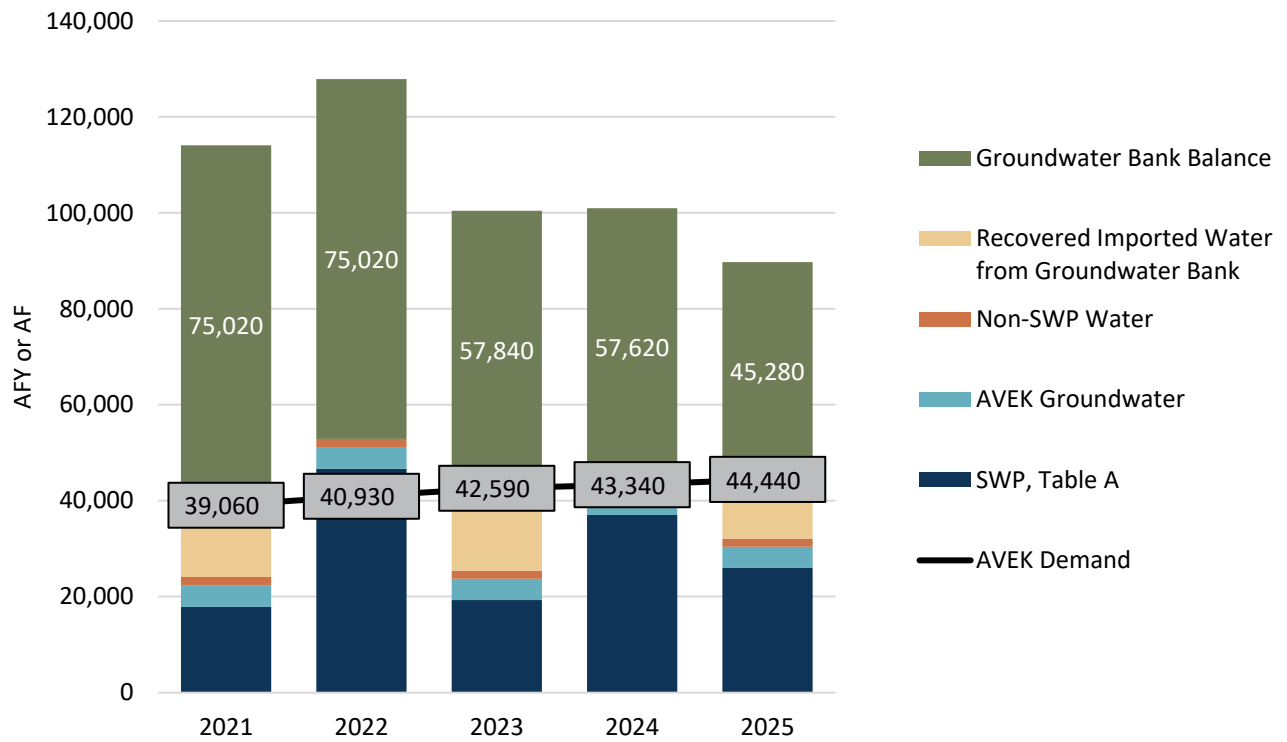
AVEK currently has roughly 90,000 AF of imported water stored within its groundwater banks for future recovery and is implementing infrastructure projects to expand its capacity to recharge water, recover water, and distribute recovered water. As shown in **Table 7-3**, AVEK still would have over 45,000 AF of groundwater remaining in storage at the end of a five-year drought that starts in 2021.

**Table 7-3. AVEK Supply Projections for 2021–2025 Drought Risk Assessment**

SUPPLIES	2021	2022	2023	2024	2025
SWP, Table A	17,850	46,680	19,280	37,040	26,050
AVEK Groundwater	4,530	4,480	4,430	4,380	4,350
Non-SWP Water	1,700	1,700	1,700	1,700	1,700
Recovered Imported Water from Groundwater Bank	14,980	0	17,180	220	12,340
<b>TOTAL AVEK SUPPLIES</b>	<b>39,060</b>	<b>52,860</b>	<b>42,590</b>	<b>43,340</b>	<b>44,440</b>

Note: Groundwater bank supplies are used to meet balance of demand.

Figure 7-4. 2021–2025 AVEK Drought Reliability Assessment





URBAN WATER MANAGEMENT PLAN

# Water Shortage Contingency Plan

**This Water Shortage Contingency Plan describes how AVEK intends to respond to foreseeable and unforeseeable water shortages. This chapter provides an overview. The full plan is in Appendix H.**

This Water Shortage Contingency Plan (WSCP) is a detailed plan for how the Antelope Valley-East Kern Water Agency (AVEK or Agency) intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time. The WSCP provides guidance by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. The tools in the WSCP enable AVEK to maintain reliable supplies and reduce the impact of supply interruptions due to extended drought or catastrophic supply interruptions.



**The WSCP describes the following:**

1. **Water supply reliability analysis:** Summarizes AVEK's water supply analysis and reliability, and identifies any key issues that may trigger a shortage condition.
2. **Annual water supply and demand assessment procedures:** Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions.
3. **Standard 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, and to minimize social and economic impacts to the community.
5. **Communication protocols:** Describes communication protocols under each stage to ensure customers, the public, and government agencies are informed of shortage conditions and requirements.
6. **Compliance and enforcement:** This section is not applicable to wholesalers such as AVEK.
7. **Legal authority:** Lists the legal ordinance that grants AVEK the authority 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 to offset financial burdens.
9. **Monitoring and reporting:** This section is not applicable to wholesalers such as AVEK.
10. **WSCP refinement procedures:** Describes the factors that may trigger updates to the WSCP and outlines how to complete an update.
11. **Special water features distinctions:** This section is not applicable to wholesalers such as AVEK.
12. **Plan adoption, submittal, and availability:** Describes the process for the WSCP adoption, submittal, and availability after each revision.

The 2021 WSCP is a stand-alone document that can be modified as needed. It is included as **Appendix H**.

# 9

## URBAN WATER MANAGEMENT PLAN

# Demand Management Measures

**This chapter describes AVEK’s implementation of wholesale demand management measures intended to promote water use efficiency and partner with retail agencies to support sustainable management of regional water supplies.**

Demand management is an integral part of sustainably managing water resources in California. Implementation of demand management measures (DMMs) that help lower demand can improve water supply reliability and help meet both state and regional water conservation goals. This chapter describes the Antelope Valley-East Kern Water Agency’s (AVEK or Agency) efforts as a wholesale water supplier to promote conservation and reduce demands on water supplies.

AVEK has been a leader in water use efficiency for many years. The Agency actively collaborates with local and regional agencies and the communities it serves to support innovative programs that drive change. AVEK implements DMMs as part of its ongoing operations, which are detailed in the following sections.

### IN THIS SECTION

- Metering
- Public Education and Outreach
- Conservation Staffing
- Asset Management

## 9.1 Demand Management Measures for Wholesale Suppliers

AVEK's system is fully metered, and unmetered connections have never been operated. AVEK charges all customers based on metered readings and established rate schedules. All current and new connections, including temporary connections, are required to be metered and billed per volume of use. Existing meters are regularly checked for leakage and accuracy.

## 9.2 Public Education and Outreach

**A summary of public education and outreach measures implemented by AVEK are as follows:**

- AVEK was the lead agency in the formation of the Antelope Valley Water Conservation Coalition (AVWCC). The AVWCC includes water districts, cities, builders, landscapers, designers, legislators, and other interested parties within the region. Water conservation in the greater Antelope Valley region is discussed during regular meetings, and the coalition provides periodic public education messaging regarding water conservation issues.
- AVEK was the lead agency and principal funding source for the development of the website AVSavesWater.com, which provided information on water conservation, water smart landscaping, resources, and rebate opportunities. The content is now hosted at avswca.org.
- AVEK sponsored water conservation grant programs in 2014 and 2015 to supporting customer conservation projects, focusing on turf buyback programs. A total of \$430,000 was made available to the grant programs in fiscal years 2014 and 2015.
- AVEK was the lead agency and principal funding source for the Antelope Valley State Water Contractors Association's Water Conservation/SMART Landscaping Expos, which were held from 2014 to 2019. (The 2020 event was canceled due to COVID-19 safety restrictions.)

## 9.3 Water Conservation Program Coordination and Staffing

AVEK has designated a Water Conservation Program Coordinator and has established a water conservation group as part of their Board of Directors' Public Information Committee, which meets regularly. The program coordinator leads implementation of ongoing water conservation efforts described in this chapter and the Water Shortage Contingency Plan in **Appendix H**.

## 9.4 Asset Management

AVEK maintains its facilities according to the operations and maintenance manuals for its various facilities and equipment. In addition, AVEK conducts periodic inspections to assess the conditions of facilities and recommend needed repairs or improvements. AVEK audits system losses monthly as a part of its normal billing procedures. Pipelines are driven regularly as part of water sample runs, during which personnel will note leaks if observed. The Agency repairs leaks promptly, on average about twice per year. The Agency's average long-term system loss is about 2% to 3%, which is considered to be within the margin of error and normal.

**AVEK understands the importance of maintaining its capital facilities and has included the development of a formal asset management plan under the Capital and Human Resources Stewardship Goal of its 2015 Five-Year Strategic Plan as shown below:**

- **Goal 5:** Capital and Human Resources Stewardship — AVEK will be efficient and thoughtful stewards of our human and capital resource assets.
  - **Strategy 2:** Maintain capital facilities to ensure optimum facility life:
    - **Objective 1:** Develop an Asset Management Plan
    - **Objective 2:** Maintain facilities operational support

AVEK is in the process of completing a Water System Management Plan (WSMP). The WSMP will evaluate the performance and condition of AVEK's potable water system under existing conditions and future conditions. The WSMP is intended to be a strategic document that guides AVEK with prioritization and decision-making regarding future water system improvements through the planning horizon of 2040 and build-out conditions. The goal of the WSMP is to assist AVEK in the planning and development of potable water system facilities to allow the Agency to reliably and efficiently serve water to its current customers, meet future growth, and respond to emergencies. **Chapter 7** of the WSMP specifically describes the capacity evaluations of the water system under existing and future delivery needs, water system hydraulics under existing and future delivery needs, and existing system replacement.

## 9.5 Wholesale Supplier Assistance Programs

AVEK's Wholesale Supplier Assistance Programs are described in **Section 9.2**.

# 10 URBAN WATER MANAGEMENT PLAN

## Plan Adoption, Submittal, and Implementation

This chapter describes the steps taken to adopt, submit, and make publicly available the 2020 UWMP, 2021 WSCP, and Appendix J addendum to the 2015 UWMP.

The 2020 Urban Water Management Plan (UWMP), 2021 Water Shortage Contingency Plan (WSCP), and 2015 UWMP addendum were prepared in a transparent manner, and the Antelope Valley-East Kern Water Agency (AVEK or Agency) actively engaged stakeholders, cities, counties, water agencies, and the public to both seek and distribute information about water use, supply, and reliability to strengthen the region's ability to assess and plan for its water future.

### IN THIS SECTION

- UWMP Preparation and Adoption Notification
- Public Hearing and Adoption
- Plan Submittal to the State

## 10.1 Notifications

Water Code Section 10621(b) requires that suppliers notify cities and counties in which they serve water that the UWMP and WSCP are being updated and reviewed at least 60 days prior to the public hearing.

**To fulfill this requirement, AVEK sent letters of notification of preparation to the following cities and counties within AVEK’s service area 60 days prior to the public hearing:**

**City of California City**

**City of Palmdale**

**Los Angeles County**

**City of Lancaster**

**Kern County**

**Ventura County**

In addition, AVEK notified their retail customers. Copies of the 60-day notification letters are attached as **Appendix D**.

## 10.2 Notice of Public Hearing

AVEK made the 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum available for public review on May 25, 2021, and held a public hearing on June 8, 2021. The notice to the public was made once a week for two successive weeks. The public hearing was first noticed in the Valley Press on May 26, 2021, and noticed again on June 2, 2021. The hearing notices are attached as **Appendix D**. Prior to the public hearing, AVEK maintained a copy of the 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum in its office and on the Agency’s website at [www.avek.org](http://www.avek.org).

The 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum were included as separate agenda items, noticed, and reviewed in a public hearing at the regularly scheduled AVEK Board of Directors meeting on June 8, 2021. This hearing provided cities, counties, and members of the public a chance to review the report and provide comment. The public hearing took place before the adoption, allowing opportunity for the report to be modified in response to public input.

The 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum were adopted by AVEK’s Board of Directors on August 10, 2021. A copy of the Resolution of Adoption is included as **Appendix E**.

## 10.3 Submittal of the UWMP and WSCP

The 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum were submitted to the California Department of Water Resources (DWR) by August 13, 2021 using the DWR Water Use Efficiency Data Portal. The documents were also sent to the California State Library and to all cities and counties within AVEK’s service area within 30 days of adoption.

## 10.4 Public Availability

AVEK will have a copy of the 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum available for public review at the AVEK office (see address below) during normal business hours.

**Antelope Valley-East Kern Water Agency**

**6500 W. Avenue N**

**Palmdale, CA 93551**

The documents also will be posted on the Agency’s website at [www.avek.org](http://www.avek.org).

# 11 URBAN WATER MANAGEMENT PLAN

## References

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# A

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## Appendix A: 2020 UWMP DWR Checklist



2020 Guidebook Location	Summary as Applies to UWMP	Subject	2020 UWMP Location
Chapter 1	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Executive Summary
Chapter 1	Each plan shall include a simple description of the supplier’s plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
Section 2.2	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	N/A
Section 2.6	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.3
Section 2.6.2	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Appendix D
Section 2.6	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	DWR Table 2-4W
Section 3.1	Describe the water supplier service area.	System Description	Section 3.1
Section 3.3	Describe the climate of the service area of the supplier.	System Description	Section 3.2
Section 3.4	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.3
Section 3.4.2	Describe other social, economic, and demographic factors affecting the supplier’s water management planning.	System Description	Section 3.3
Sections 3.4 and 5.4	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.3
Section 3.5	Describe the land uses within the service area.	System Description	Section 3.4
Section 4.2	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Chapter 4
Section 4.2.4	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2.7
Section 4.2.6	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Section 4.2
Section 4.2.6	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2
Section 4.5	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.2.4

2020 Guidebook Location	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 5.1	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Chapter 5
Sections 6.1 and 6.2	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Chapter 6
Sections 6.1	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, <i>including changes in supply due to climate change.</i>	System Supplies	Section 6.9.1
Section 6.1	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Chapter 6 introduction
Section 6.1.1	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
Section 6.2.8	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9
Section 6.2	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.3
Section 6.2.2	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.3
Section 6.2.2	Describe the groundwater basin.	System Supplies	Section 6.3
Section 6.2.2	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.3
Section 6.2.2.1	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	N/A
Section 6.2.2.4	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.3
Section 6.2.2	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.3
Section 6.2.7	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.2
Section 6.2.5	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)	N/A
Section 6.2.5	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.4
Section 6.2.5	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)	N/A

2020 Guidebook Location	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 6.2.5	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	N/A
Section 6.2.5	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	N/A
Section 6.2.5	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	N/A
Section 6.2.6	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.7
Section 6.2.5	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)	N/A
Section 6.2.8, Section 6.3.7	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8
Section 6.4 and Appendix O	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.10
Section 7.2	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	Chapter 6
Section 7.2.4	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Chapter 6
Section 7.3	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1
Section 7.3	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2
Section 7.3	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.2
Section 7.3	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.1
Section 7.3	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.1

2020 Guidebook Location	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 7.3	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	Section 7.1
Chapter 8	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix H
Chapter 8	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix H Section 1.1
Section 8.10	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix H Section 1.8
Section 8.2	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	Appendix H Section 1.2
Section 8.2	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	Appendix H Section 1.1
Section 8.3	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix H Section 1.3
Section 8.3	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix H Section 1.3
Section 8.4	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix H Section 1.4
Section 8.4	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix H Section 1.4
Section 8.4	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix H Section 1.4
Section 8.4	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	Appendix H Section 1.4
Section 8.4	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix H Section 1.4
Section 8.4.6	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix H Section 1.4
Section 8.5	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix H Section 1.5

2020 Guidebook Location	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 8.5 and 8.6	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	Appendix H Section 1.5
Section 8.7	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix H Section 1.6
Section 8.7	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	Appendix H Section 1.6
Section 8.8	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix H Section 1.7
Section 8.8	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix H Section 1.7
Sections 8.12 and 10.4	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix H Section 1.9
Section 8.14	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix H Section 1.9
Sections 9.1 and 9.3	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Chapter 9
Section 10.2.1	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	DWR Table 10-1
Section 10.4	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.3
Sections 10.2.2, 10.3, and 10.5	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.2
Section 10.2.2	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.1
Section 10.3.2	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix D
Section 10.4	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.3

2020 Guidebook Location	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 10.4	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.3
Sections 10.4.1 and 10.4.2	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	N/A
Section 10.5	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.3
Section 10.5	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.3
Section 10.6	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
Section 10.7.2	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	N/A



# B

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## Appendix B: 2020 UWMP DWR Tables



## 2-2 | Public Water Systems

Type of Plan	Member of RUWMP	Member of Regional Alliance	Name of RUWMP or Regional Alliance
Individual UWMP	No	No	NA

## 2-3 | Agency Identification

Type of Supplier	Year Type	First Day of Year		Unit Type
Wholesaler	Calendar Years	DD	MM	Acre Feet (AF)

**Conversion to Gallons:** 325851  
**Conversion to Gallons per Day:** 892.7425

## 2-4W | Water Supplier Information Exchange

**Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional.**

*If not completed, include a list of the water suppliers that were informed.*

Location of List:

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### 3-1W | Current & Projected Population

<b>Population Served</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>
<b>Los Angeles and Ventura Counties</b>	270,615	288,578	306,542	324,505	342,229	359,953
<b>Kern County</b>	49,956	56,757	63,558	70,359	78,738	87,118
<b>Total</b>	<b>320,571</b>	<b>345,335</b>	<b>370,100</b>	<b>394,864</b>	<b>420,967</b>	<b>447,071</b>

Notes:  
 1. Data for Los Angeles and Ventura Counties from SCAG 2020 Connect SoCal Regional Transportation Plan (SCAG, 2020)  
 2. Data for Kern County from KCOG General Land Use Plan (KCOG, 2018a).

### 4-1W | Actual Demands for Water

Use Type	Additional Description	Level of Treatment When Delivered	2020 Volume
Sales/Transfers/Exchanges to Other Agencies	Los Angeles County Waterworks District	Drinking Water	32,847
Sales/Transfers/Exchanges to Other Agencies	Quartz Hill Water District	Drinking Water	2,533
Sales/Transfers/Exchanges to Other Agencies	Rio Tinto Minerals / US Borax	Drinking Water	1,503
Sales/Transfers/Exchanges to Other Agencies	Edwards Air Force Base	Drinking Water	1,465
Sales/Transfers/Exchanges to Other Agencies	Other M&I Customers (19 Customers)	Drinking Water	2,095
Sales/Transfers/Exchanges to Other Agencies	Raw Water Deliveries (4 Customers)	Raw Water	837
Sales/Transfers/Exchanges to Other Agencies	Transfers to Other Agencies	Raw Water	11,286
Groundwater Recharge	Groundwater Recharge	Raw Water	7,213
Losses	Losses	Drinking Water	457
<b>Total:</b>			<b>60,234</b>
Source: AVEK, 2020 LATIS data			

### 4-2W | Projected Demands for Water

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045
Sales/Transfers/Exchanges to Other Agencies		44,440	50,990	51,880	55,210	57,590
<b>Total:</b>		<b>44,440</b>	<b>50,990</b>	<b>51,880</b>	<b>55,210</b>	<b>57,590</b>



### 4-3W | Total Water Use

	2020	2025	2030	2035	2040	2045
<b>Potable and Raw Water</b> From Table 4-1W and 4-2W	60,234	44,440	50,990	51,880	55,210	57,590
<b>Recycled Water Demand*</b> From Table 6-4W	-	-	-	-	-	-
<b>Total Water Demand:</b>	<b>60,234</b>	<b>44,440</b>	<b>50,990</b>	<b>51,880</b>	<b>55,210</b>	<b>57,590</b>

## 6-1W | Groundwater Volume Pumped

Select One						
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	AV Basin, Production Rights	-	-	-	-	-
Alluvial Basin	AV Basin, Banking	11,512	7,868	9,162	9,234	12,228
<b>Total:</b>		<b>11,512</b>	<b>7,868</b>	<b>9,162</b>	<b>9,234</b>	<b>12,228</b>

**6-3W | Wastewater Treatment & Discharge Within Service Area in 2020**

Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The supplier will not complete the table.											
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal	Plant Treats Wastewater Generated Outside the Service Area	Treatment Level	2020 Volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
<b>Total:</b>							-	-	-	-	-

**6-4W | Current & Projected Retailers Provided Recycled Water within Service Area**

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

## **6-5W | 2015 Recycled Water Use Projection Compared to 2020 Actual**

**Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020. The supplier will not complete the table.**

**6-7W | Expected Future Water Supply Projects or Programs**

<p>Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.</p>						
<p>Page Location for Narrative in UWMP:</p>				<p>Section 6.8</p>		
<p>Name of Future Projects or Programs</p>	<p>Joint Project with Other Suppliers</p>	<p>Agency Name</p>	<p>Description</p>	<p>Planned Implementation Year</p>	<p>Planned for Use in Year Type</p>	<p>Expected Increase in Water Supply to Supplier</p>
<p>Note: Refer to 2020 UWMP Section 6.8</p>						

**6-8W | Actual Water Supplies**

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield
Purchased or Imported Water	To Retailers - Treated Water	28,732	Drinking Water	
Purchased or Imported Water	To Retailers - Untreated Water	775	Other Non-Potable Water	
Purchased or Imported Water	To GW Bank - Untreated Water	7,213	Other Non-Potable Water	
Groundwater (not desalinated)	From GW Bank - Treated Water	12,228	Drinking Water	
Purchased or Imported Water	Transfer / Exchanges - Untreated Water	11,286	Other Non-Potable Water	
<b>Total:</b>		<b>60,234</b>		<b>-</b>

## 6-8DS | Source Water Desalination

Neither groundwater nor surface water are reduced in salinity prior to distribution. The supplier will not complete the table.



**6-9W | Projected Water Supplies**

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Purchased or Imported Water	SWP Table A	81,840		79,660		77,490		75,320		75,320	
Groundwater (not desalinated)	Production Rights	3,550		3,550		3,550		3,550		3,550	
Groundwater (not desalinated)	Imported Water Return Flows	800		800		800		800		800	
Purchased or Imported Water	Non-SWP Water	1,700		1,700		1,700		1,700		1,700	
<b>Total:</b>		<b>87,890</b>	<b>-</b>	<b>85,710</b>	<b>-</b>	<b>83,540</b>	<b>-</b>	<b>81,370</b>	<b>-</b>	<b>81,370</b>	<b>-</b>

## 7-1W | Basis of Water Year Data (Reliability Assessment)

**Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.**

Page Location for Narrative in UWMP:

Page 7-2

### 7-2W | Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
<b>Supply Totals</b> From Table 6-9W	87,890	85,710	83,540	81,370	81,370
<b>Demand Totals</b> From Table 4-3W	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>	<b>43,450</b>	<b>34,720</b>	<b>31,660</b>	<b>26,160</b>	<b>23,780</b>

### 7-3W | Single Dry Year Supply & Demand Comparison

	2025	2030	2035	2040	2045
<b>Supply Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Demand Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Note: Supply equals demand because AVEK would extract groundwater stored in local groundwater banks to meet supply shortfalls.					

### 7-4W | Multiple Dry Years Supply & Demand Comparison

		2025	2030	2035	2040	2045
<b>First Year</b>	<b>Supply Totals</b>	44,440	50,990	51,880	55,210	57,590
	<b>Demand Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Second Year</b>	<b>Supply Totals</b>	52,730	52,730	52,730	55,210	57,590
	<b>Demand Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>		<b>8,290</b>	<b>1,740</b>	<b>850</b>	<b>0</b>	<b>0</b>
<b>Third Year</b>	<b>Supply Totals</b>	44,440	50,990	51,880	55,210	57,590
	<b>Demand Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Fourth Year</b>	<b>Supply Totals</b>	44,440	50,990	51,880	55,210	57,590
	<b>Demand Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Fifth Year</b>	<b>Supply Totals</b>	44,440	50,990	51,880	55,210	57,590
	<b>Demand Totals</b>	44,440	50,990	51,880	55,210	57,590
<b>Difference:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Sixth Year</b>	<b>Supply Totals</b>					
	<b>Demand Totals</b>					
<b>Difference:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Note: Supply equals demand because AVEK would extract groundwater stored in local groundwater banks to meet supply shortfalls.						

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

2021	Gross Water Use	39,060
	Total Supplies	24,080
	Surplus/Shortfall without WSCP Action	-14,980
	<b>Planned WSCP Actions (Use Reduction and Supply Augmentation)</b>	
	WSCP (Supply Augmentation Benefit)	14,980
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	<b>0</b>
Resulting Percent Use Reduction from WSCP Action	<b>0%</b>	
2022	Gross Water Use	40,930
	Total Supplies	52,860
	Surplus/Shortfall without WSCP Action	<b>11,930</b>
	<b>Planned WSCP Actions (Use Reduction and Supply Augmentation)</b>	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	<b>11,930</b>
Resulting Percent Use Reduction from WSCP Action	<b>0%</b>	
2023	Gross Water Use	42,590
	Total Supplies	25,410
	Surplus/Shortfall without WSCP Action	-17,180
	<b>Planned WSCP Actions (Use Reduction and Supply Augmentation)</b>	
	WSCP (Supply Augmentation Benefit)	17,180
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	<b>0</b>
Resulting Percent Use Reduction from WSCP Action	<b>0%</b>	
2024	Gross Water Use	43,340
	Total Supplies	43,120
	Surplus/Shortfall without WSCP Action	-220
	<b>Planned WSCP Actions (Use Reduction and Supply Augmentation)</b>	
	WSCP (Supply Augmentation Benefit)	220
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	<b>0</b>
Resulting Percent Use Reduction from WSCP Action	<b>0%</b>	
2025	Gross Water Use	44,440
	Total Supplies	32,100
	Surplus/Shortfall without WSCP Action	-12,340
	<b>Planned WSCP Actions (Use Reduction and Supply Augmentation)</b>	
	WSCP (Supply Augmentation Benefit)	12,340
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	<b>0</b>
Resulting Percent Use Reduction from WSCP Action	<b>0%</b>	
WSCP (Supply Augmentation Benefit) is AVEK pumping from its local groundwater banks		

## 8-1 | Water Shortage Contingency Plan Levels

<b>Shortage Level</b>	<b>Percent Shortage Range<sup>1</sup> (Numerical Value as a Percent)</b>	<b>Shortage Response Actions</b>
1	Up to 50%	Reduction in SWP Allocation below Current Demand
2	>50%	Catastrophic water supply shortage
<sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		

## 8-2 | Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement
All	Expand Public Information Campaign	up to 50%		



### 8-3 | Supply Augmentation & Other Actions

<b>Shortage Level</b>	<b>Supply Augmentation Methods and Other Actions by Water Supplier</b>	<b>How much is this going to reduce the shortage gap?</b>	<b>Additional Explanation or Reference</b>
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## 10-1W | Notification to Cities & Counties

<p><b>Supplier has not notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. Completion of the table is required.</b></p>			
<b>City</b>	<b>60 Day Notice</b>	<b>Notice of Public Hearing</b>	<b>Other</b>
<b>City of California City</b>	Yes	Yes	
<b>City of Lancaster</b>	Yes	Yes	
<b>City of Palmdale</b>	Yes	Yes	
<b>County</b>	<b>60 Day Notice</b>	<b>Notice of Public Hearing</b>	<b>Other</b>
<b>Kern County</b>	Yes	Yes	
<b>Los Angeles County</b>	Yes	Yes	
<b>Ventura County</b>	Yes	Yes	
<b>Other</b>	<b>60 Day Notice</b>	<b>Notice of Public Hearing</b>	<b>Other</b>
<p>Note: See Appendix D for notices.</p>			



# C

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## Appendix C: Delta Reliance



# Technical Memorandum



**Date:** 8/24/2021

**To:** Matt Knudson  
Antelope Valley – East Kern Water Agency (AVEK)

**CC:** Tom Barnes (AVEK)

**Prepared by:** Rob Morrow, P.E.

**Project:** 2020 UWMP

**SUBJECT: QUANTIFYING REGIONAL SELF-RELIANCE AND REDUCED RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED**

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## 1 Background

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

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

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

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

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

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

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

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

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

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

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

*(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The analysis and documentation provided below include all 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 covered action.

## 2 Methodology

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for improved regional self-reliance and measurable reduction in Delta reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta. The expected outcomes for AVEK regional self-reliance and reduced Delta reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 issued in March 2020 (Guidebook Appendix C).

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

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of AVEK and its customers as well as their customers.

To calculate the expected outcomes for improved regional self-reliance and reduced Delta reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from AVEK's 2005 UWMP as the UWMPs generally do not provide normal water year data for the year that they are adopted (i.e., 2005 UWMP forecasts begin in 2010, 2010 UWMP forecasts begin in 2015, and so on).

Consistent with the 2010 baseline data approach, the expected outcomes for improved regional self-reliance and reduced Delta reliance for 2015 and 2020 were taken from AVEK’s 2010 and 2015 UWMPs, respectively. Expected outcomes for 2025-2045 are from the current 2020 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

### 3 Demonstration of Regional Self-Reliance

#### *Service Area Demands without Water Use Efficiency*

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

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as AVEK that do not explicitly quantify water use efficiency savings in their UWMPs can calculate their embedded water use efficiency savings based on changes in forecasted per capita water use since the baseline.

Agencies that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. Table 1 shows the results of this adjustment for AVEK. Supporting narratives and documentation for all the data shown in Table 1 are provided below.

#### Service Area Demands with Water Use Efficiency

The service area demands shown in Table 1 represent the total water demands for AVEK’s service area. The demand data shown in Table 1 were collected from the following sources:

- Baseline (2010): AVEK 2005 UWMP, Table 7 and Table 8
- 2015: AVEK 2010 UWMP, Table 4 and Table 5
- 2020: AVEK 2015 UWMP, Table 4-2
- 2025-2045: AVEK 2020 UWMP, Table ES-2

#### Service Area Population

The population data shown in Table 1 were collected from the following sources:

- Baseline (2010): AVEK 2010 UWMP, Table 2
- 2015: AVEK 2015 UWMP, Table 3-1
- 2020-2045: AVEK 2020 UWMP, Table ES-1

#### Estimated Water Use Efficiency Since Baseline



Calculated using “Potable Service Area Demands with Water Use Efficiency” divided by “Service Area Population” and then calculating Estimated Water Use Efficiency Since Baseline by comparing with 2010 Per Capita Water Use.

#### Service Area Water Demands without Water Use Efficiency

Add “Service Area Demands with Water Use Efficiency” to “Estimated Water Use Efficiency Since Baseline.”

#### *Supplies Contributing to Regional Self-Reliance*

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

#### Water Use Efficiency

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

#### Local and Regional Water Supply and Storage Programs

The local and regional water supply and storage programs data shown in Table 2 represent groundwater pumping estimates by AVEK and entities within AVEK’s service area. The estimates were complicated because the Antelope Valley Groundwater Basin Judgment (Judgment) did not go into effect until 2016 and roughly half of annual pumping rights are associated with imported water return flows, which is dependent on total demands in the AVEK service area. Now that the Judgment is in place, the following categories were totaled to estimate annual pumping rights

- Exhibit 3 – Non-Overlying Producers Production Rights
  - Production Rights
  - Rights from Return Flows
- Exhibit 4 – Overlying Producers Production Rights
  - Production Rights
  - Rights from Return Flows

Based on this information, groundwater pumping data was estimated from the following sources:

- Baseline (2010): Prior to the Judgment, there were not estimates of groundwater pumping within AVEK service area so the 2010 pumping value was assumed to be equivalent to the 2015 estimate
- 2015: Groundwater accounting for the Judgment started in 2016 so the 2016 production rights values for 2016 from the 2016 Annual Report from the Antelope Valley Watermaster were used for 2015 values
- 2020: 2020 groundwater sources from the Annual Report from the Antelope Valley Watermaster
- 2025-2045: Judgment production rights plus estimated return flows based on projected AVEK demands presented in the 2020 UWMP

### Other Programs and Projects that Contribute to Regional Self-Reliance

Other Programs and Projects that Contribute to Regional Self-Reliance includes non-SWP water supply acquired by AVEK in 2017 through a long-term lease of annual supply originally belonging to the Nickel Family, a farming interest in Kern County. AVEK acquired the rights to 1,700 acre-feet of water made available for a period of 35 years (with an option to extend for 35 more years), even in dry years.

### *Conclusions*

The results shown in Table 2 demonstrate that AVEK's service area is measurably improving its regional self-reliance. In the near-term (2025), the expected outcome for normal water year regional self-reliance is expected to increase by 57,500 AFY from the 2010 baseline; this represents an increase of about 39 percent of 2025 normal water year retail demands. In the long-term (2045), the expected outcome for normal water year regional self-reliance is expected to increase by more than 83,100 AFY from the 2010 baseline, this represents an increase of about 38 percent of 2045 normal water year retail demands (Table 2). The results show that as a region, AVEK and its customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

## **4 Demonstration of Reduced Reliance on the Delta**

AVEK's service area reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. For reduced reliance on supplies from the Delta Watershed, the data used in this analysis represent the total regional efforts of AVEK and its customers, and were developed in conjunction with AVEK customers as part of the UWMP coordination process (as described in Chapter 2 of AVEK's 2020 UWMP). In accordance with UWMP requirements, several of AVEK's customers also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in AVEK's UWMP, rather their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta.

### *Calculation of Reliance on Water Supplies from the Delta Watershed*

The calculation of reliance on water supplies from the Delta watershed, shown in Table 3, is based on the following assumptions. AVEK water supplies from the Delta watershed include "CVP/SWP Contract Supplies."

### CVP/SWP Contract Supplies

The supply data shown in Table 3 is for AVEK's SWP Table A allocation and were collected from the following sources:

- Baseline (2010): AVEK 2005 UWMP, Table 10
- 2015: AVEK 2010 UWMP, Table 6
- 2020: AVEK 2015 UWMP, Table 6-9
- 2025-2045: AVEK 2020 UWMP, Table ES-3

### Total Water Supplies from the Delta Watershed

Total Water Supplies from the Delta Watershed is equivalent to CVP/SWP Contract Supplies.

### Change in Supplies from the Delta Watershed

Calculates changes in Total Water Supplies from the 2010 baseline value with future values.

### Percent Change in Supplies from the Delta Watershed

Divides “Water Supplies from the Delta Watershed” by “Service Area Demands without Water Use Efficiency” and calculates changes from the 2010 baseline.

### *Conclusions*

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for AVEK’s Delta reliance on supplies from the Delta watershed:

- Near-term (2025) – Normal water year reliance on supplies from the Delta watershed decreased by 18,600 AF from the 2010 baseline, this represents a decrease of 28 percent of 2025 normal water year demands without water use efficiency (Table 3).
- Long-term (2045) – Normal water year reliance on supplies from the Delta watershed decreased by 25,100 AF from the 2010 baseline, this represents a decrease of 46 percent of 2025 normal water year demands without water use efficiency (Table 3).

The results show that as a region, AVEK and its customers (including AVEK) as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

## **5 UWMP Implementation**

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

*(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[.]*

In accordance with Water Code Section 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Chapter 6 of AVEK’s 2020 UWMP summarizes the implementation plan and continued progress in developing a diversified water portfolio to meet the region’s water needs.

## 6 2015 UWMP Appendix J

The information contained in this appendix is also intended to be a new Appendix J attached to AVEK’s 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). AVEK provided notice of the availability of the draft 2020 UWMP, 2021 WSCP, and a new Appendix J to the 2015 UWMP and the public hearing to consider adoption of the documents in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix J to the 2015 UWMP, and the 2021 WSCP were posted on AVEK’s website, [avek.org](http://avek.org), on April 6, 2021, more than 60 days in advance of the public hearing on June 8, 2021. The notice of availability of the documents was sent to AVEK’s customers, as well as cities and counties in AVEK’s service area. Copies of the notification letter sent to the customers and cities and counties in AVEK’s service area are included in the 2020 UWMP Appendix D. Thus, this Appendix C to AVEK’s 2020 UWMP, which was adopted with AVEK’s 2020 UWMP, will also be recognized and treated as Appendix J to AVEK’s 2015 UWMP.

AVEK held the public hearing for the draft 2020 UWMP, draft Appendix J to the 2015 UWMP, and draft 2021 WSCP on June 8, 2021, at a regular Board of Directors meeting, held online due to COVID-19 concerns. On August 24, 2021, AVEK’s Board of Directors determined that the 2020 UWMP and the 2021 WSCP accurately represent the water resources plan for AVEK’s service area. In addition, AVEK’s Board of Directors determined that Appendix J to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier’s UWMP to support a certification of consistency for a future covered action. As stated in Resolution No. R-21-08, the AVEK Board of Directors adopted the 2020 UWMP, Appendix J to the 2015 UWMP, and the 2021 WSCP and authorized their submittal to the State of California. Copies of the resolutions are included in the 2020 UWMP Appendix E.

**Table 1. Calculation of Service Area Water Demands without Water Use Efficiency (UWMP Table C-1 and Table C-2)**

<b>Table C-1: Optional Calculation of Water Use Efficiency -To be completed if Water Supplier does not specifically estimate Water Use Efficiency as a supply</b>								
<b>Service Area Water Use Efficiency Demands (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Service Area Water Demands with Water Use Efficiency Accounted For	111,031	91,075	83,680	73,420	80,400	83,850	87,520	91,200
Non-Potable Water Demands								
Potable Service Area Demands with Water Use Efficiency Accounted For	111,031	91,075	83,680	73,420	80,400	83,850	87,520	91,200
<b>Total Service Area Population</b>								
	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Service Area Population	291,063	359,500	320,571	345,335	370,100	394,864	420,967	447,071
<b>Water Use Efficiency Since Baseline (Acre-Feet)</b>								
	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Per Capita Water Use (GPCD)	341	226	233	190	194	190	186	182
Change in Per Capita Water Use from Baseline (GPCD)		(114)	(108)	(151)	(147)	(151)	(155)	(158)
Estimated Water Use Efficiency Since Baseline		46,062	38,607	58,314	60,781	66,778	73,065	79,343
<b>Table C-2: Calculation of Service Area Water Demands Without Water Use Efficiency</b>								
	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
<b>Total Service Area Water Demands (Acre-Feet)</b>								
Service Area Water Demands with Water Use Efficiency Accounted For	111,031	91,075	83,680	73,420	80,400	83,850	87,520	91,200
Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline		46,062	38,607	58,314	60,781	66,778	73,065	79,343
Service Area Water Demands without Water Use Efficiency Accounted For	111,031	137,137	122,287	131,734	141,181	150,628	160,585	170,543

**Table 2. Calculation of Supplies Contributing to Regional Self-Reliance (UWMP Table C-3)**

<b>Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Water Use Efficiency		46,062	38,607	58,314	60,781	66,778	73,065	79,343
Water Recycling								
Stormwater Capture and Use								
Advanced Water Technologies								
Conjunctive Use Projects								
Local and Regional Water Supply and Storage Projects	35,870	35,870	33,280	33,330	33,760	36,320	36,660	37,960
Other Programs and Projects the Contribute to Regional Self-Reliance			1,700	1,700	1,700	1,700	1,700	1,700
<b>Water Supplies Contributing to Regional Self-Reliance</b>	<b>35,870</b>	<b>81,932</b>	<b>73,587</b>	<b>93,344</b>	<b>96,241</b>	<b>104,798</b>	<b>111,425</b>	<b>119,003</b>

<b>Service Area Water Demands without Water Use Efficiency (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Service Area Water Demands without Water Use Efficiency Accounted For	111,031	137,137	122,287	131,734	141,181	150,628	160,585	170,543

<b>Change in Regional Self Reliance (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Water Supplies Contributing to Regional Self-Reliance	35,870	81,932	73,587	93,344	96,241	104,798	111,425	119,003
Change in Water Supplies Contributing to Regional Self-Reliance		46,062	37,717	57,474	60,371	68,928	75,555	83,133

<b>Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Percent of Water Supplies Contributing to Regional Self-Reliance	32.3%	59.7%	60.2%	70.9%	68.2%	69.6%	69.4%	69.8%
Change in Percent of Water Supplies Contributing to Regional Self-Reliance		27.4%	27.9%	38.6%	35.9%	37.3%	37.1%	37.5%

**Table 3. Reliance on Water Supplies from the Delta Watershed (UWMP Table C-4)**

<b>Water Supplies from the Delta Watershed (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
CVP/SWP Contract Supplies	100,394	87,688	85,460	81,840	79,660	77,490	75,320	75,320
Delta/Delta Tributary Diversions								
Transfers and Exchanges								
Other Water Supplies from the Delta Watershed								
<b>Total Water Supplies from the Delta Watershed</b>	<b>100,394</b>	<b>87,688</b>	<b>85,460</b>	<b>81,840</b>	<b>79,660</b>	<b>77,490</b>	<b>75,320</b>	<b>75,320</b>

<b>Service Area Water Demands without Water Use Efficiency (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Service Area Water Demands without Water Use Efficiency Accounted For	111,031	137,137	122,287	131,734	141,181	150,628	160,585	170,543

<b>Change in Supplies from the Delta Watershed (Acre-Feet)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Water Supplies from the Delta Watershed	100,394	87,688	85,460	81,840	79,660	77,490	75,320	75,320
Change in Water Supplies from the Delta Watershed		(12,706)	(14,934)	(18,554)	(20,734)	(22,904)	(25,074)	(25,074)

<b>Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)</b>	<b>Baseline (2010)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045 (Optional)</b>
Percent of Water Supplies from the Delta Watershed	90.4%	63.9%	69.9%	62.1%	56.4%	51.4%	46.9%	44.2%
Change in Percent of Water Supplies from the Delta Watershed		-26.5%	-20.5%	-28.3%	-34.0%	-39.0%	-43.5%	-46.3%





# D

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## Appendix D: Notifications and Notification List

OFFICERS

DWAYNE CHISAM, P.E.  
General Manager  
and Chief Engineer

MATTHEW KNUDSON  
Assistant General Manager

HOLLY H. HUGHES  
Secretary-Treasurer

BOARD OF DIRECTORS

KEITH DYAS  
Division 2  
President

FRANK S. DONATO  
Division 3  
Vice President

SHELLEY SORSABAL  
Division 1

GEORGE M. LANE  
Division 4

ROBERT A. PARRIS  
Division 5

AUDREY T. MILLER  
Division 6

GARY VAN DAM  
Division 7

April 6, 2021

**NOTICE OF PUBLIC HEARING ON THE ANTELOPE VALLEY-EAST KERN WATER AGENCY DRAFT 2020 URBAN WATER MANAGEMENT PLAN, DRAFT 2021 WATER SHORTAGE CONTINGENCY PLAN, AND DRAFT APPENDIX J TO THE 2015 UWMP**

Dear Recipient,

The Antelope Valley-East Kern Water Agency (AVEK) is in the process of preparing its 2020 Urban Water Management Plan (UWMP) and 2021 Water Shortage Contingency Plan (WSCP) as required by the Urban Water Management Planning Act (Act). In addition, AVEK is preparing an Appendix to both the 2015 UWMP and 2020 UWMP to demonstrate consistency with the Delta Plan Policy WR P1, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit.23, §5003). The 2015 UWMP is being amended only to report reduced reliance on the Delta and this action is separate from adoption of the 2020 UWMP and adoption of the 2021 WSCP.

AVEK is required to notify its retailers as well as cities, and counties within its service areas that it is preparing its 2020 UWMP, 2021 WSCP, and Appendix J of the 2015 UWMP at least 60 days prior to holding a public hearing. The public hearing is scheduled as part of a regularly scheduled AVEK Board meeting on **June 8, 2021 at 5:30 p.m.**

This serves as your official public hearing notice and intent to adopt the 2020 UWMP, 2021 WSCP and Appendix J of the 2015 UWMP before the July 1, 2021 deadline. A draft of each document will be available for review by May 25, 2021. AVEK will distribute a public draft review notification on or before May 25, 2021 with information on how to access the draft documents. Until that time, if you have any questions or comments regarding the documents or this process, please contact me at (661) 943-3201 or [mknudson@avek.org](mailto:mknudson@avek.org).

Very truly yours,

Matthew Knudson,  
Assistant General Manager

**From:** Tom Barnes <[tbarnes@avek.org](mailto:tbarnes@avek.org)>

**Date:** May 25, 2021 at 6:52:00 PM PDT

**Subject:** AVEK Water Agency 2020 UWMP-Notice of Public Hearing/Public Draft Documents

May 25, 2021

RE: NOTICE OF PUBLIC HEARING AND RELEASE OF PUBLIC DRAFT OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY DRAFT 2020 URBAN WATER MANAGEMENT PLAN, DRAFT 2021 WATER SHORTAGE CONTINGENCY PLAN, AND DRAFT APPENDIX J TO THE 2015 UWMP

Dear Recipient,

The Antelope Valley-East Kern Water Agency (AVEK) is releasing its Public Draft 2020 Urban Water Management Plan (UWMP) and 2021 Water Shortage Contingency Plan (WSCP) as required by the Urban Water Management Planning Act (Act). In addition, AVEK has prepared an Appendix to both the 2015 UWMP and 2020 UWMP to demonstrate consistency with the Delta Plan Policy WR P1, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit.23, §5003). The 2015 UWMP is being amended only to report reduced reliance on the Delta and this action is separate from adoption of the 2020 UWMP and adoption of the 2021 WSCP.

AVEK is notifying its retailers as well as cities, and counties within its service areas that it is releasing its 2020 UWMP, 2021 WSCP, and Appendix J of the 2015 UWMP for public review and comment prior to holding a public hearing. The public hearing is scheduled as part of a regularly scheduled AVEK Board meeting on June 8, 2021 at 5:30 p.m. online via teleconference.

A copy of the Public Draft 2020 UWMP and mentioned documents will also be made available for public review on the Agency website at: [www.avek.org](http://www.avek.org)<<http://www.avek.org>>.

This notice serves as your official public hearing notice and intent to adopt the 2020 UWMP, 2021 WSCP and Appendix J of the 2015 UWMP before the July 1, 2021 deadline. If you have any questions or comments regarding the documents or this process, please contact Matt Knudson/Tom Barnes at 661-943-3201 or [info@avek.org](mailto:info@avek.org)<<mailto:info@avek.org>>.

Sincerely,

Dwayne Chisam  
General Manager

Tom Barnes | Resources Manager  
Antelope Valley-East Kern Water Agency  
6450 West Avenue N, Palmdale, CA 93551  
Main: 661-943-3201 | fax: 661-943-3204  
Direct: 661-234-8437 | mobile: 661-810-9440  
Email: [tbarnes@avek.org](mailto:tbarnes@avek.org)<<mailto:tbarnes@avek.org>> | website: [www.avek.org](http://www.avek.org)<<http://www.avek.org>>

**AVEK 2020 UWMP, 2021 WSCP, and 2015 UWMP Appendix J  
PUBLIC HEARING NOTIFICATION (April 5, 2021)  
PUBLIC DRAFT NOTIFICATION (May 25, 2021)  
RECIPIENT LIST**

**Water Retailer Notification Letter:**

- Antelope Valley Country Club
- Boron Community Services District
- California Water Service Company  
Antelope Valley District
- City of California City
- Desert Lake Community Services  
District
- Desert Sage Apartments c/o Rex  
Nishimura
- Edgemont Acres Mutual Water Co.
- Edwards Air Force Base
- El Dorado Mutual Water Co.
- Lake Elizabeth Mutual Water Co.
- Landale Mutual Water Co.
- Los Angeles County Waterworks  
Districts - Alhambra
- Los Angeles County Waterworks  
Districts - Lancaster
- Mojave Public Utility District
- Palm Ranch Irrigation District
- Quartz Hill Water District
- Rosamond Community Services  
District
- Shadow Acres Mutual Water Co.
- Sunnyside Farms Mutual Water Co.
- West Side Park Mutual Water Co.
- White Fence Farms Mutual Water  
Co.
- White Fence Farms Mutual Water  
Co. #3

**Customer Notification Letter:**

- Antelope Valley Water Storage, LLC  
c/o WDS
- CA Dept of Parks & Recreation  
(Poppy Reserve)
- Rancho Vista Golf Club
- Tejon Ranch Company
- US. Borax (Rio Tinto Minerals)

**Public Notification Letter:**

- Antelope Valley Watermaster
- Building Industry Association
- Littlerock Creek Irrigation District
- Mojave Water Agency
- North Edwards Water District
- Palmdale Water District

**Cities/Counties Notification Letter:**

- City of Lancaster Planning Division
- City of Lancaster City Manager
- City of Palmdale Planning Division
- City of Palmdale Public Works
- Kern County Planning Department
- Los Angeles County Department of  
Regional Planning Division
- Supervisor Kathryn Barger Antelope  
Valley Field Office
- Ventura County Resource  
Management Agency Planning  
Division

**Valley Press Ad****NOTICE OF PUBLIC HEARING  
ANTELOPE VALLEY-EAST KERN WATER AGENCY**

NOTICE is hereby given that a Public Hearing will be held by the Antelope Valley-East Kern Water Agency (AVEK) on Tuesday, June 8, 2021 at 5:30 PM, as part of a regularly scheduled AVEK Board meeting on-line via teleconference.

The Board of Directors of AVEK will receive public comment regarding the Agency's adoption of its 2020 Urban Water Management Plan (2020 UWMP) and 2021 Water Shortage Contingency Plan (WSCP), which have been prepared in compliance with the Urban Water Management Planning Act. In addition, Appendix J of the AVEK 2015 UWMP, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit.23, §5003), will be amendment. A Draft copy of the 2020 UWMP and related documents are available for public review on the Agency website at: [www.avek.org](http://www.avek.org).  
Publish: May 26 and June 2, 2021



# E

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## Appendix E: Adoption Resolution





**RESOLUTION NO. R-21-08**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF ANTELOPE VALLEY-EAST KERN WATER AGENCY (“AVEK”) ADOPTING, DIRECTING THE FILING OF, AND IMPLEMENTING THE ANTELOPE VALLEY-EAST KERN WATER AGENCY 2020 URBAN WATER MANAGEMENT PLAN, 2021 WATER SHORTAGE CONTINGENCY PLAN, AND APPENDIX J AS AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN**

**WHEREAS**, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK’s powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the “AVEK Enabling Act”); and

**WHEREAS**, AVEK’s jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Section 3 and Figure 3-1 of the 2020 Urban Water Management Plan (“AVEK’s Jurisdictional Boundaries”); and

**WHEREAS**, AVEK was formed for the purpose of providing water received from the State Water Project (“SWP”) as a supplemental source of water to retail water purveyors and other water interests within AVEK’s Jurisdictional Boundaries on a wholesale basis; and

**WHEREAS**, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources (“DWR”), which operates the SWP, in order for AVEK to receive water from the SWP (“SWP Water”); and

**WHEREAS**, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK’s Jurisdictional Boundaries that govern AVEK’s delivery of SWP Water to those purveyors and other water interests (the “AVEK’s Water Supply Contracts”); and

**WHEREAS**, AVEK has developed and does operate water banking facilities within AVEK’s Jurisdictional Boundaries, and has right to produce waters from these facilities for the purpose of providing groundwater as a supplemental source of water to retail water purveyors and other water interests within AVEK’s Jurisdictional Boundaries on a wholesale basis; and

**WHEREAS**, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.) known as the Urban Water Management Plan Act (the Act).

**WHEREAS**, the Act mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare, and every five (5) years thereafter update, its Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water; and

**WHEREAS**, the California Water Code Section 10632 requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP); and

**WHEREAS**, the WSCP is consistent with the California Water Code Sections 350 through 359 and Section 10632 and guidance provided by the California Department of Water Resources 2020 UWMP Guidebook; and

**WHEREAS**, Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs., tit. 23, § 5003, subdivision (c)(1)) need to be included in a water supplier's urban water management plan to support a certification of consistency for one or more future water supply covered actions in the Sacramento-San Joaquin Delta; and

**WHEREAS**, the 2020 UWMP, 2021 WSCP, and Appendix J as an Addendum to the 2015 UWMP (together known as the Plans) must be adopted by July 1, 2021 and filed with the California Department of Water Resources and entities specified in the UWMP Act within thirty days of adoption; and

**WHEREAS**, AVEK has circulated drafts of its proposed Plans for public review and comment; and

**WHEREAS**, AVEK's Board of Directors ("AVEK Board") held a duly noticed public hearing on its proposed Plans on June 8, 2021; and


**WHEREAS**, the AVEK Board received no written or verbal comment from the public or others concerning its proposed Plans; and

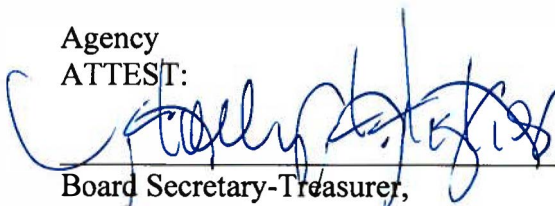
**WHEREAS**, AVEK retained technical and legal consultants to provide expert assistance concerning its Plans; and

**NOW, THEREFORE, BE IT RESOLVED** by the Board of the Directors of the Antelope Valley-East Kern Water Agency as follows:

1. The 2020 Urban Water Management Plan, the 2021 Water Shortage Contingency Plan, and Appendix J as an Addendum to the 2015 UWMP are hereby approved and adopted.
2. The General Manager is authorized and directed to file the Plans with the entities specified in the UWMP Act by the dates specified therein.



**PASSED AND ADOPTED** at the Regular Meeting of the Antelope Valley-East Kern Water Agency Board of Directors held on August 24, 2021.

  
\_\_\_\_\_  
Keith Dyas, President of the Board of  
Directors of Antelope Valley-East Kern Water

Agency  
ATTEST:  
  
\_\_\_\_\_  
Board Secretary-Treasurer,  
Antelope Valley-East Kern Water Agency



# STAFF REPORT

To: Board of Directors	Date: August 20, 2021
From: Dwayne Chisam, General Manager 	Prepared By: Matthew Knudson, Assistant GM 
Subject: Consideration and possible action on Resolution No. R-21-08 – Approving and adopting the 2020 Urban Water Management Plan, 2021 Water Shortage Contingency Plan, and Appendix J as an Addendum to the 2015 Urban Water Management Plan	
Meeting Date: August 24, 2021    Agenda Items: 7 (b-1)    Attachment(s): <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

## **Recommendations:**

Staff recommends that the Board:

1. Approve Resolution No. R-21-08 adopting, directing the filing of, and implementing the Antelope Valley-East Kern Water Agency 2020 Urban Water Management Plan (UWMP), the 2021 Water Shortage Contingency Plan (WSCP), and Appendix J as an Addendum to the 2015 Urban Water Management Plan.

## **Background:**

The California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.) known as the Urban Water Management Plan Act that mandates every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare, and every five (5) years thereafter update, its UWMP, the primary objective of which is to plan for the conservation and efficient use of water.

Also, the California Water Code Section 10632 requires that every urban water supplier shall prepare and adopt a WSCP.

Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs., tit. 23, § 5003, subdivision (c)(1)) need to be included in a water supplier's urban water management plan to support a certification of consistency for one or more future water supply covered actions in the Sacramento-San Joaquin Delta.

Agency staff and consultants have prepared the 2020 UWMP, 2021 WSCP, and Appendix J as an Addendum to the 2015 UWMP. Water Code 10642 requires that prior to adoption, an urban water supplier shall make the plan available for public inspection and shall hold at least one public hearing. The subject documents were posted on the Agency's website on Tuesday, May 25, 2021, for public review and comment. Staff and the Agency's consultant (Water Systems Consulting, Inc.) also presented an overview of the documents at the June 8, 2021 Board Meeting / Public Hearing.

No public comments have been received to date.

### **Strategic Plan Element:**

The 2020 UWMP and related documents will assist AVEK in meeting the following Strategic Plan Goals and Objectives:

- Goal 2 – Water Reliability
- Goal 6 - Communications

### **Supporting Documents:**

- Resolution No. R-21-08 adopting, directing the filing of, and implementing the Antelope Valley-East Kern Water Agency 2020 Urban Water Management Plan (UWMP), the 2021 Water Shortage Contingency Plan (WSCP), and Amendment to Appendix J of the 2015 Urban Water Management Plan.
- 2020 Urban Water Management Plan (UWMP)
- 2021 Water Shortage Contingency Plan
- Appendix J as an Addendum to the 2015 UWMP

**RECOMMENDED BOARD ORDER 7(b-1)**

To the Board of Directors

**FOR BOARD ACTION**

**ADOPT RESOLUTION NO. R-21-08**  
**2020 URBAN WATER MANAGEMENT PLAN, 2021 WATER**  
**SHORTAGE CONTINGENCY PLAN, AND AMENDMENT TO APPENDIX**  
**J OF THE 2015 URBAN WATER MANAGEMENT PLAN**

The Board of Directors adopted the following board order on August 24, 2021:

To adopt Resolution No. R-21-08, approving the 2020 Urban Water Management Plan, 2021 Water Shortage Contingency Plan, and Amendment to Appendix J of the 2015 Urban Water Management Plan, as presented and recommended.

Motion by Donato  
Second by Parris  
Carried 6-0-0-1 - Aye  
(No response from G. Lane)

**BOARD ORDER 7(b-1)**

08-24-21



# F

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## Appendix F: Antelope Valley Groundwater Adjudication

The judgement can be found at:

<https://avwatermaster.net/resources/exhibits-charts/>







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## Appendix G: Antelope Valley Watermaster 2019 Annual Report

Each annual report can be found at:  
<https://avwatermaster.net/new-annual-report/>

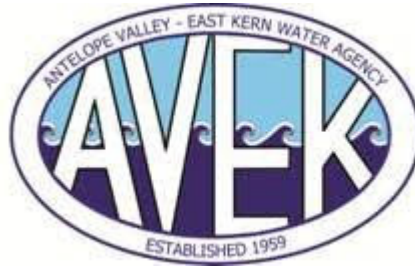


# H

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## Appendix H: Water Shortage Contingency Plan





ANTELOPE VALLEY-EAST KERN WATER AGENCY

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# 2021 Water Shortage Contingency Plan

**AUGUST 2021**



Prepared by Water Systems Consulting, Inc.



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# Water Shortage Contingency Plan

This WSCP is a detailed plan for how AVEK intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time.

The Water Shortage Contingency Plan (WSCP) is used to provide guidance by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. The tools in the WSCP enable the Antelope Valley-East Kern Water Agency (AVEK or Agency) to maintain reliable supplies and reduce the impact of supply interruptions due to extended drought or catastrophic supply interruptions.

## The WSCP describes the following:

- **Water supply reliability analysis:** Summarizes the AVEK water supply analysis and reliability, and identifies any key issues that may trigger a shortage condition.
- **Annual water supply and demand assessment procedures:** Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions.
- **Standard shortage stages:** Establishes water shortage levels to clearly identify and prepare for shortages.
- **Shortage response actions:** Describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand as well as minimize social and economic impacts to the community.
- **Communication protocols:** Describes communication protocols under each stage to ensure customers, the public, and government agencies are informed of shortage conditions and requirements.
- **Legal authority:** Lists the legal ordinance that grants AVEK the authority to declare a water shortage and implement and enforce response actions.
- **Financial consequences of WSCP implementation:** Describes the anticipated financial impact of implementing water shortage stages and identifies mitigation strategies to offset financial burdens.
- **WSCP refinement procedures:** Describes the factors that may trigger updates to the WSCP and outlines how to complete an update.
- **Plan adoption, submittal, and availability:** Describes the process for the WSCP adoption, submittal, and availability after each revision.

This WSCP was prepared in conjunction with AVEK's 2020 Urban Water Management Plan (UWMP) and is a stand-alone document that can be modified as needed. This document is compliant with California Water Code (CWC) Section 10632 and incorporates guidance from the State of California Department of Water Resources (DWR) UWMP Guidebook. The plan is intended to provide guidance, rather than absolute direction, for action in response to water shortages and provide options to responsibly manage water shortages.



## 1.1 Water Supply Reliability

Water supply reliability reflects the Agency's ability to meet the water needs of its retailers with water supplies under varying conditions. The analysis considers plausible hydrological and regulatory variability, climate conditions, and other factors that affect water supply and demand. The following is a concise narrative of the water supply reliability assessment. Chapter 7 of AVEK's 2020 UWMP describes the reliability of the water supply by comparing supply and demand projections through 2045 for normal, single dry, and multiple dry years. The section also assesses the drought risk over the next five years (2021 to 2025) assuming the driest five-year period is repeated over the next five years. Refer to the 2020 UWMP for the full assessment. As demonstrated in this section, AVEK has sufficient supplies to meet demand in normal year, single dry, and multiple dry years.

**As a wholesale water supplier, AVEK provides water to retail water suppliers in the Antelope Valley. AVEK's supplies for this assessment consist of:**

- The State Water Project (SWP), which is managed by DWR.
- Antelope Valley Groundwater Basin adjudicated rights, including production rights and imported water return flows, which are managed by the Antelope Valley Groundwater Basin Watermaster.
- Non-SWP water, from a 2017 long-term lease for 1,700 acre-feet, even in dry years.

AVEK's water reliability goal is to provide a level of regional water reliability that supports customers' water needs by developing groundwater banking programs to help increase the reliability of the Antelope Valley region's water supplies. This is achieved by storing excess SWP water during wet periods in the local groundwater basin and recovering it for delivery to customers during dry and high-demand periods or during a disruption in deliveries from the SWP.

**For the water supply reliability analysis, the following supply availability assumptions were applied for SWP Table A allocation for normal, single dry year, and multiple dry conditions for each of the City's supplies:**

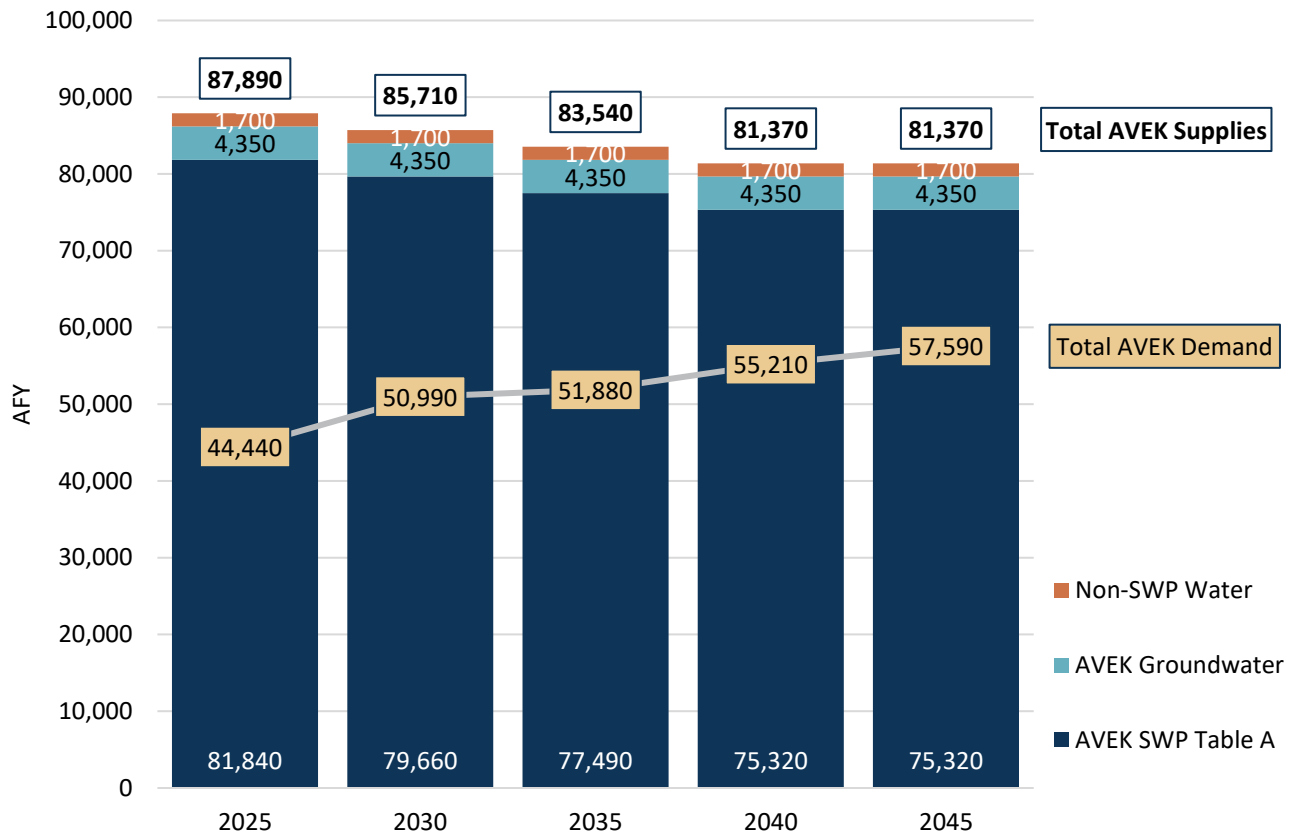
- **Normal Year:** Average yield based on DWR 2019 SWP Delivery Capability Report (DCR) (California Department of Water Resources 2020).
- **Single Dry Year:** The lowest Table A allocation was 5% in 2014 and 2021 (as of June 2021).
- **Multiple Dry Year:** The five-year historical sequence with the lowest available supply in the 2019 DCR was 1988 to 1992.

AVEK groundwater supplies are assumed to consist of 3,550 acre-feet per year (AFY) of production rights from the adjudication and 800 AFY of imported water return flows based on 2016 to 2020 return flows. Groundwater rights are not impacted by short-term drought conditions, so normal year groundwater yield assumptions are applied. In years with low SWP Table A allocations, the remainder of demand is met with groundwater bank supplies.

### 1.1.1 Normal Year

Average SWP Table A allocation is projected to decrease from 58% in 2020 to 52% in 2040 (California Department of Water Resources, 2020). Total normal year AVEK supplies are shown in **Figure 1**. Based on these assumptions, AVEK has sufficient supplies in normal years and could use available supplies to build groundwater storage for dry periods. For example, SWP water could be recharged when available, or unused groundwater rights can be carried over for use in future years.

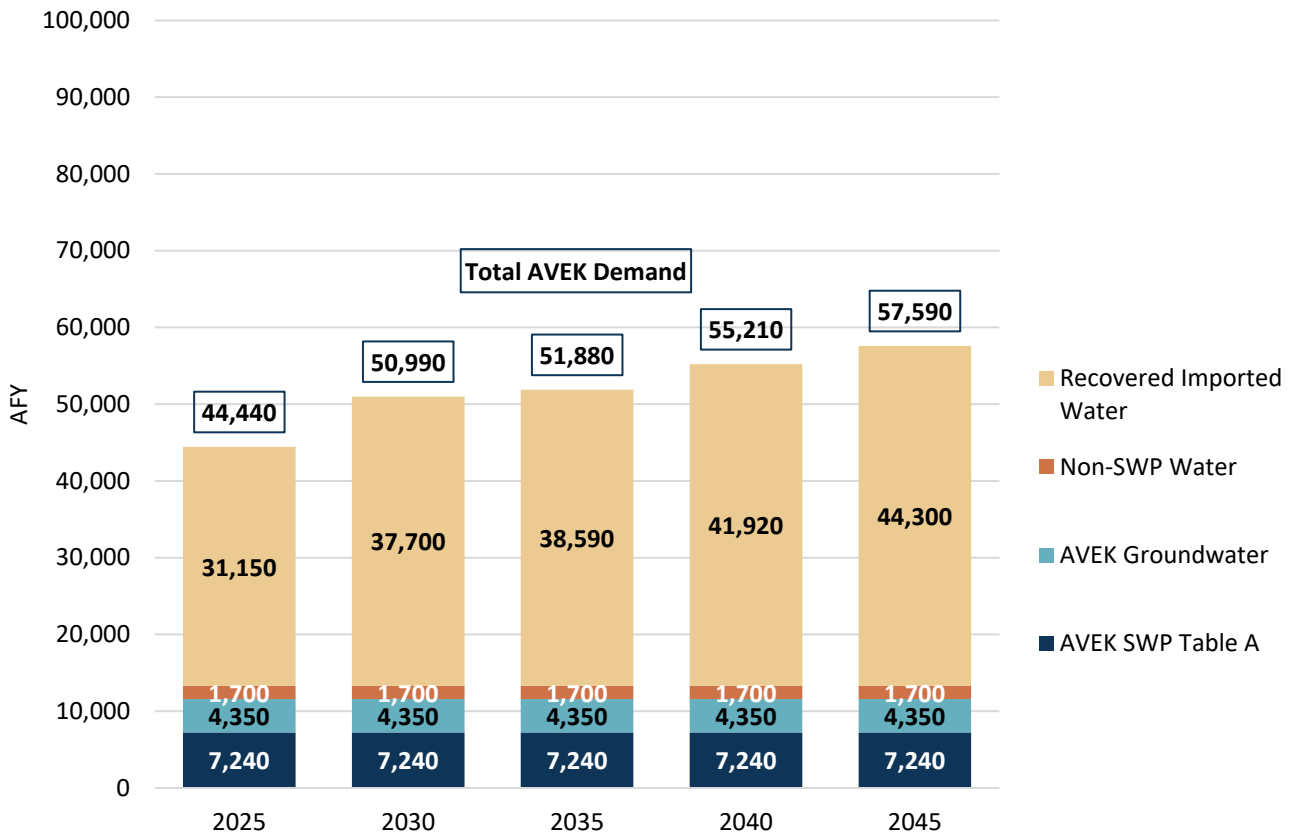
**Figure 1. AVEK Supply and Demand Projections, Normal Year**



### 1.1.2 Single Dry Year

Single dry year yield for SWP water is based on actual 2014 and 2021 allocations (as of June 2021) of 5%. Groundwater rights and non-SWP water are not impacted by short-term drought conditions, so normal year supply assumptions are applied. The remainder of demand is met with groundwater in storage. As shown in **Figure 2**, recovered imported water from AVEK groundwater banks enable AVEK to meet its demands in a single dry year.

**Figure 2. AVEK Supply and Demand Projections, Single Dry Year**



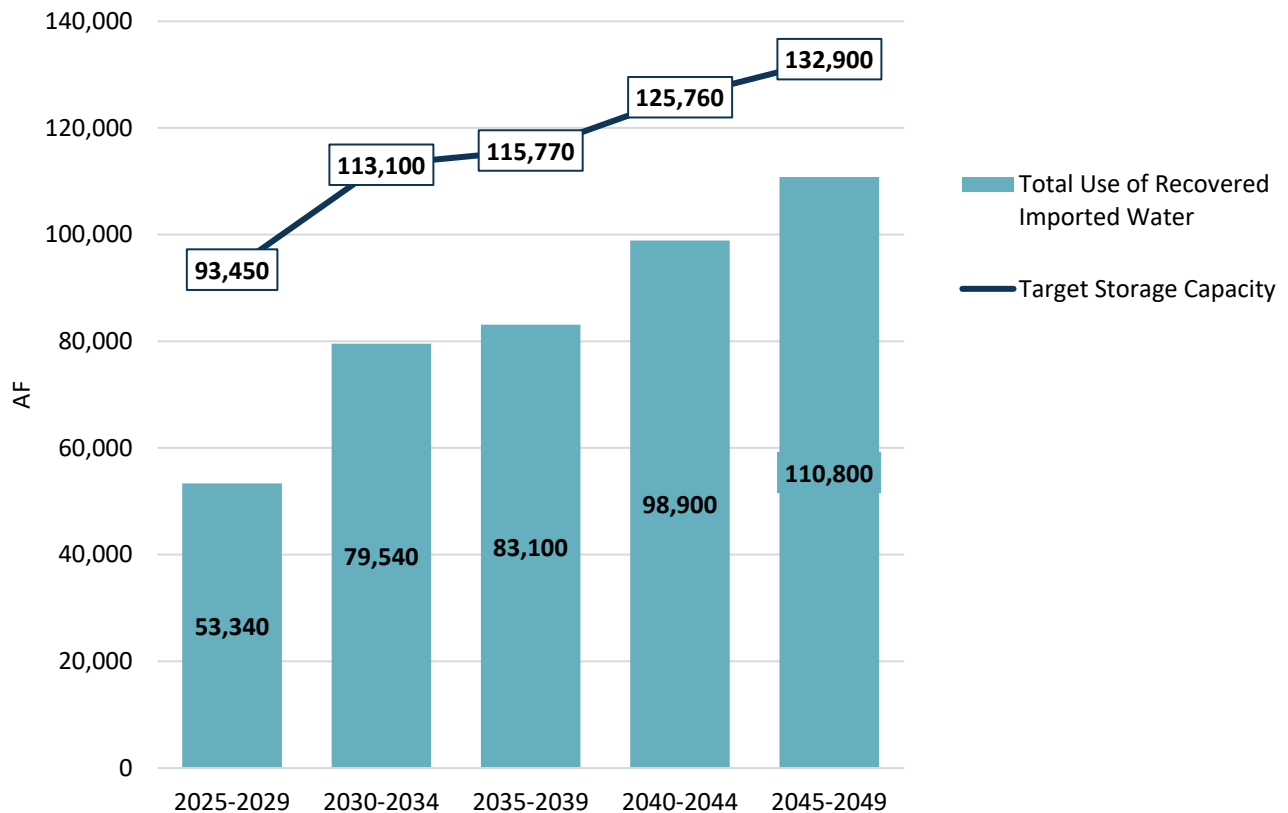
### 1.1.3 Five Consecutive Dry Years

For multiple dry years, SWP water availability is based on the five-year period with the lowest SWP simulated yield from the 2019 SWP DCR (1988–1992) and the following annual Table A allocation:

- **Year 1 (1988)** 12.3%
- **Year 2 (1989)** 32.2%
- **Year 3 (1990)** 13.3%
- **Year 4 (1991)** 25.6%
- **Year 5 (1992)** 18.0%

Similar to single dry year, groundwater rights and non-SWP water are not impacted by an extended drought, and recovered imported water from AVEK groundwater banks are used to meet remaining demands. **Figure 3** presents the total volume of imported water recovered from AVEK groundwater banks during a multiple-year drought in comparison with the target total storage volume. As shown in the figure, additional recovery of imported water from AVEK groundwater banks would be available if the five-year drought continued.

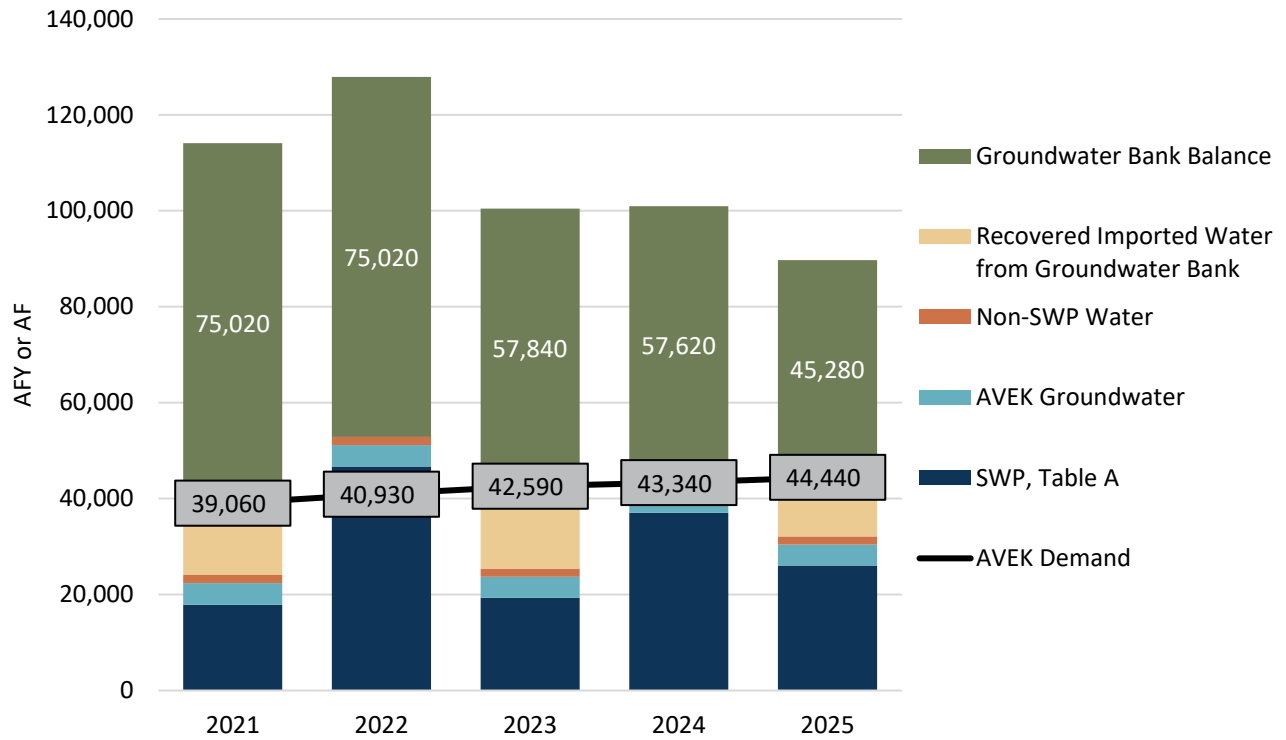
**Figure 3. AVEK Groundwater Bank Use vs. Storage Capacity during Five Consecutive Dry Years**



### 1.1.4 2021-2025 Drought Risk Assessment

The Drought Risk Assessment for the upcoming five years (2021–2025) is based on the five-year period with the lowest SWP simulated yield from the 2019 SWP DCR (1988–1992). **Figure 4** presents the projected supplies used to meet demands and the remaining available supply each year. AVEK currently has roughly 90,000 acre-feet (AF) of imported water stored within its banks for future recovery and is implementing infrastructure projects to expand its capacity to recharge water, recover water, and distribute recovered water. As shown in the figure, AVEK still would have over 45,000 AF of imported water remaining in storage at the end of a five-year drought that starts in 2021.

**Figure 4. 2021–2025 AVEK Drought Reliability Assessment**



## 1.2 Annual Water Supply and Demand Assessment

As established by CWC Section 10632.1, urban water suppliers must conduct annual water supply and demand assessments, and submit an annual water shortage assessment report to DWR with information on anticipated shortages, triggered shortage response actions, and compliance and enforcement actions consistent with the WSCP. Beginning July 1, 2022, AVEK must prepare its annual water supply and demand assessment and submit an Annual Water Shortage Assessment Report to DWR. The Annual Water Shortage Assessment Report will be due by July 1 of every year.

**Per CWC, the annual assessment must include:**

- The written decision-making process AVEK will use each year to determine its water supply reliability.
- The key data inputs and assessment methodology used to evaluate the supplier's water supply reliability for the current year and one dry year, including:
  - Current year unconstrained demand
  - Current year available supply in the current year and one dry year
  - Existing infrastructure capabilities and plausible constraints
  - A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment
  - A description and quantification of each source of water supply

**AVEK regularly assess its water supply and demands. The following are AVEK's targets and goals when making decisions on managing AVEK's water supplies:**

- Storage goals
  - SWP carryover goal of 15,000 to 20,000 AF in the event the following water year is below average or dry
  - Local groundwater storage goal to have enough local groundwater storage to meet customer demands for three years with a 10% SWP allocation for those three years
- During the fourth quarter of each year, AVEK requests a five-year demand projection from each of its customers. AVEK uses this information to calculate what the projected annual demand will be for AVEK and tracks the projected versus actual demand to adjust the plan for that year.
- AVEK's General Manager, Assistant General Manager, Water Resources Manager, and Operations Manager meet regularly to review the available water supplies and sources, customer demands, and transfer/exchange statuses. Decisions are discussed and made as to which water sources will be used and what facilities will be used to treat/distribute the water to meet the demands of its customers.

### 1.3 Water Shortage Stages

In the event of water supply shortages, the Agency will make water delivery reductions per this WSCP. The stages of action are summarized in **Table 1**. Actions to be taken as a result of a catastrophic water supply shortage are discussed in **Section 1.4.4**.

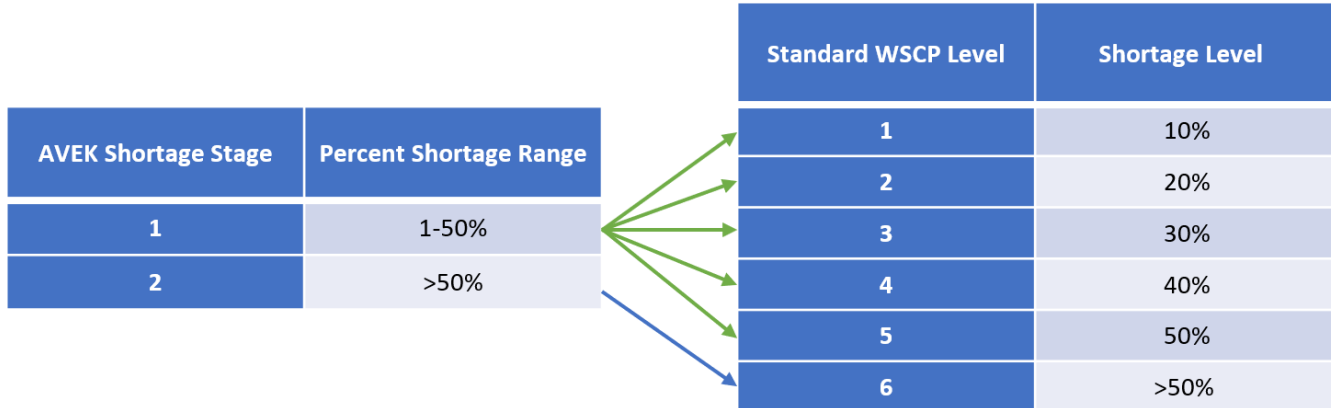
**Table 1. WSCP Levels (DWR Table 8-1)**

Shortage Level	Percent Shortage Range (Numerical Value as a Percent)	Water Supply Condition
1	Up to 50%	Reduction in SWP Allocation below Current Demand
2	>50%	Reduction in SWP Allocation below Current Demand or Catastrophic water supply shortage

#### 1.3.1 Standard Water Shortage Level Crosswalk

CWC Section 10632(a)(3)(A) includes six standard water shortage levels corresponding to progressive ranges of up to 10%, 20%, 30%, 40%, and 50% shortages and greater than 50% shortages. If the supplier’s water shortage levels do not correspond with the six standard levels, a crosswalk between the supplier’s stages and the standard levels is required for compliance, as shown in **Figure 5**.

**Figure 5. Water Shortage Level Crosswalk**



## 1.4 Shortage Response Actions

CWC Section 10632 (a)(4) requires the WSCP to specify shortage response actions that align with the defined shortage levels. The Agency has defined specific shortage response actions that align with the defined shortage levels in **Table 1** and **Figure 5**. These shortage response actions were developed with consideration to the system infrastructure and operations changes, supply augmentation responses, customer-class- or water-use-specific demand reduction initiatives, and increasingly stringent water use prohibitions.

### 1.4.1 Demand Reduction

Although AVEK does not have the authority to implement consumer-level reduction methods, the Agency has adopted some consumption reduction measures to help retail water suppliers reduce water usage. These are listed in **Table 2** and described in more detail in the 2020 UWMP Chapter 9, Demand Management Measures.

**Table 2. Demand Reduction Actions (DWR 8-2)**

SHORTAGE LEVEL	DEMAND REDUCTION ACTIONS	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP? <sup>1</sup>	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT
All	Expand Public Information Campaign	Up to 50%	Community outreach that includes educational information and water conservation tips	No

Note:

1. Reduction in the shortage gap is estimated and can vary significantly.

### 1.4.2 Supply Augmentation

The SWP conveyance infrastructure enables AVEK to convey supplemental water purchases to augment drought year supplies. Refer to the 2020 UWMP Section 6.2 for more information on supplemental water purchases and transfers. Supply augmentation actions are described in **Table 3**. These augmentations represent short-term management objectives triggered during a water shortage and do not overlap with the long-term new water supply development or supply reliability enhancement projects.

**Table 3. Supply Augmentation & Other Actions (DWR 8-3W)**

SHORTAGE LEVEL	SUPPLY AUGMENTATION METHODS AND OTHER ACTIONS BY WATER SUPPLIER	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?	ADDITIONAL EXPLANATION OR REFERENCE
Agency Discretion	Water Purchases and Transfers	Varying	Supplemental water purchases from SWP

### 1.4.3 Emergency Response Plan

AVEK maintains emergency plans for activities required in the event there is an interruption in the SWP water supply or there is a major mechanical or electrical failure in one of the water treatment plants. In September 2020, AVEK adopted an Emergency Response Plan (ERP) in alignment with America’s Water Infrastructure Act of 2018. An ERP describes strategies, resources, plans, and procedures



## Water Shortage Contingency Plan

utilities can use to prepare for and respond to an incident, natural or man-made, that threatens life, property, or the environment. The ERP is not attached to this WSCP due to sensitive information included, but key aspects are summarized in this section.

The emergency activities undertaken by AVEK depend upon the severity of the problem and how quickly it can be remedied. Response to a catastrophic event will always include contact and coordination with AVEK's customers. If the emergency can be resolved within the available water storage time frame, only a few of the larger customers need to be notified of the temporary decrease in water supply. If there will be a stoppage in the raw water deliveries to the various water treatment plants, all customers (Municipal and Industrial (M&I) and agriculture) will be notified of the stoppage and how soon water deliveries may be resumed.

### **Possible catastrophes affecting water supply may include:**

- Widespread power outage
- Local earthquake
- Agency treatment plant shutdown due to vital component failure
- Aqueduct failure due to earthquake or other circumstances
- Delta levee failure

In the event of power loss, AVEK has permanent emergency power generation equipment that automatically starts to maintain water treatment operations. In the event of an earthquake, AVEK personnel will survey and assess damage and respond accordingly with shutdowns and repairs. Damaged Agency treatment plant components, whether mechanical or electrical, may be able to be circumvented due to the duplication of pumping and operations systems or the availability of manual override controls.

If raw water deliveries to water treatment plants are temporarily stopped, treated water from other plants may be able to be rerouted to the affected areas via interconnecting pipeline systems. Recovery of previously banked groundwater can be used to supply water in the event of SWP outages. The magnitude of reduced water deliveries and length of time before resumption of full water availability will determine the extent of customer (M&I and agriculture) notification and activities required by AVEK staff. In the event of a long-term outage of SWP supplies, AVEK will coordinate with the retail water agencies to develop and implement appropriate regional water conservation measures.

Failure of the aqueduct or Delta levees could result in significant outages and potential interruption in SWP service to AVEK for six months or longer. 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), Metropolitan Water District of Southern California, and 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 has developed the Delta Flood Emergency Management Plan to provide strategies for a response to Delta levee failures, addressing 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 is 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.

## Water Shortage Contingency Plan

DWR, in conjunction with local agencies, the Corps, and Cal OES, regularly conducts 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, complementing an overall Cal OES structure. Cal OES is preparing its Northern California Catastrophic Flood Response Plan, which incorporates the DWR Delta Flood Emergency Management Plan. These agencies use a unified command structure and response and recovery framework. DWR and the Corps, through a Draft Delta Emergency Operations Integration Plan (April 2015), would integrate personnel and resources during emergency operations.

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 the 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 Central Valley Project (CVP) export systems.

Significant improvements to the central and south Delta levee systems along the Old and Middle Rivers began in 2010 and are continuing to the present time at Holland Island, Bacon Island, Upper and Lower Jones Tracts, Palm Tract, and Orwood Tract. This complements substantially improved levees at Mandeville and McDonald Islands and portions of Victoria and Union Islands. Together, 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.

### 1.4.4 Seismic Risk Assessment and Mitigation Plan

AVEK completed a Risk and Resilience Assessment (R.E. Patterson and Associates, March 2020) in 2020 in alignment with America's Water Infrastructure Act of 2018 and conducted a focused seismic assessment as part of the 2020 AVEK Water System Master Plan (Carollo, September 2020). These documents, along with the AVEK ERP (discussed in the previous section) address the risk assessment and emergency response requirements for UWMPs in the water code.

## 1.5 Communication Protocols

AVEK strives to be proactive in communicating work strategy and conservation efforts with its retail customers. To support these efforts, AVEK developed a Strategic Communications Plan in 2020. For water shortages, AVEK would focus on key stakeholders, which include AVEK customers (public agencies, agricultural entities, water purveyors, and individuals), agency directors and staff, and State Water Contractors. AVEK would also engage with secondary stakeholders, such as constituents, government agencies (local, state, and federal), and elected officials (local, state, and federal).

Engagement would occur through owned media and earned media. Owned media is any communication channel that the Agency has control over, such as its website, social media pages, newsletters, or e-mail outreach. Owned media can be used to disseminate information and resonate messages.

### **The following media outlets have been identified and prioritized:**

- Website, including news bulletins, press releases, news stories, and newsletter
- Newsletter
- Videos and photos
- Social media channels, including Facebook, Twitter, and LinkedIn

In addition, AVEK would emphasize water shortage conditions and measures at events. Earned media refers to publicity that is gained through unpaid promotional efforts, such as press placements or social media content shared by others. The Agency maintains a media distribution list.

## 1.6 Legal Authorities

In the event of water supply shortages, the Agency will make water delivery reduction per the Agency law for allocations and the Agency's water shortage contingency ordinance (Ordinance O-07-2), which is included in **Attachment 1**.

AVEK can declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1 general provision regarding water shortage emergencies. AVEK will coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency under California Government Code, California Emergency Services Act (Article 2, Section 8558).

## 1.7 Financial Consequences of WSCP

Revenues collected by the Agency are currently used to fund operation and maintenance of the existing facilities and fund new capital improvements. In dry years, the Agency will estimate a projected range of water sales versus shortage stage to quantify the impact the shortage stage may have on projected revenues and expenses.

Revenue reductions and an increase in expenses may occur during implementation of the water shortage contingency plan. The magnitude of the revenue reduction and expenditure increase will depend on the severity of the shortage. In some cases, AVEK may be able to absorb the revenue shortfall/expenditure increase by reallocating existing funds, such as delaying some capital projects. For more severe events, the Agency may enact a rate adjustment to its customers.

## 1.8 WSCP Refinement Procedures

AVEK intends to use this WSCP as an adaptive management plan to respond to foreseeable and unforeseeable water shortages. The WSCP is used to provide guidance to the Agency, its staff, and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. To maintain a useful and efficient standard of practice in water shortage conditions, the requirements, criteria, and response actions need to be continuously evaluated and improved upon to make sure the WSCP provides the tools to maintain reliable supplies and reduce the impacts of supply shortages.

AVEK deliveries are entirely metered. The meter readings will be used to monitor the actual reductions in deliveries to AVEK's customers in accordance with the water shortage contingency plan to measure effectiveness of implemented strategies.

## 1.9 Plan Adoption, Submittal, and Availability

Per CWC Section 10632 (a)(c), AVEK sent letters of notification of preparation of the 2021 WSCP to all necessary cities, counties, retail water agencies, and interested parties within its service areas 60 days prior to the public hearing. Copies of the notification letter and distributions list is included in **Attachment 2**. AVEK made the draft 2021 WSCP available for public review and held a public hearing on June 8, 2021. The notice of the public review hearing (**Attachment 2**) was advertised in the Valley Press on May 26, 2021 and June 2, 2021. The 2020 UWMP, 2021 WSCP, and 2015 UWMP addendum were adopted by AVEK's Board of Directors on June 22, 2021. A copy of the Resolution of Adoption is included as Attachment 3.

Once the 2021 WSCP is adopted, a copy will be submitted to the California State Library, DWR, and all cities and counties within 30 days of adoption. The Agency will also have a physical copy of the 2021 WSCP available for public review at the AVEK Office (see address below) during normal business hours.

The WSCP also will be posted on the Agency's website at [www.avek.org](http://www.avek.org).

**Antelope Valley-East Kern Water  
Agency 6500 W. Avenue N  
Palmdale, CA 93551**

Based on DWR's review of the WSCP, AVEK may make any amendments in its adopted WSCP as required and directed by DWR. If AVEK revises its WSCP after it is approved by DWR, an electronic copy of the revised WSCP will be submitted to DWR within 30 days of its adoption.

## 1.10 References

California Department of Water Resources. (2020). *2019 State Water Project Delivery Capability Report*.

Carollo. (September 2020). *DRAFT AVEK Water System Master Plan*.

R.E. Patterson and Associates. (March 2020). *AVEK Risk and Resilience Assessment*.

# 1

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## Attachment 1: AVEK Water Shortage Contingency Ordinance

**ORDINANCE O-07-2: AVEK WATER SHORTAGE CONTINGENCY PLAN**

**ANTELOPE VALLEY-EAST KERN WATER AGENCY  
ORDINANCE NO. O-07-2**

**AN ORDINANCE OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY  
TO ADOPT A WATER SHORTAGE CONTINGENCY PLAN**

**WHEREAS**, the Board of Directors of the Antelope Valley-East Kern Water Agency ("AVEK") hereby finds:

**I.  
RECITALS**

**WHEREAS**, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK's powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the "AVEK Enabling Act"); and

**WHEREAS**, AVEK's jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Appendix E in the 2005 Urban Water Management Plan ("AVEK's Jurisdictional Boundaries"); and

**WHEREAS**, AVEK was formed for the purpose of providing water received from the State Water Project ("SWP") as a supplemental source of water to retail water purveyors and other water interests with AVEK's Jurisdictional Boundaries on a wholesale basis; and

**WHEREAS**, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources ("DWR"), which operates the SWP, in order for AVEK to receive water from the SWP ("SWP Water"); and

**WHEREAS**, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK's Jurisdictional Boundaries that govern AVEK's delivery of SWP Water to those purveyors and other water interests (the "AVEK's Water Supply Contracts"). Article 19 in those contracts provides that "substantial uniformity" in those contracts is "desirable" and that AVEK will attempt to maintain such "uniformity" between such contracts; and

**WHEREAS**, AVEK does not provide SWP Water directly to any person or entity for domestic or municipal purposes; and

**WHEREAS**, AVEK does not own or operate any facilities that can produce reclaimed water or native groundwater from any area in AVEK's Jurisdictional Boundaries, and neither does AVEK possess any contractual right or matured water right to produce such waters; and

**WHEREAS**, the Urban Water Management Planning Act, California Water Code Section 10610 *et seq.* ("UWMP Act") provides that urban water management plans shall include a resolution or ordinance by the supplier that sets forth a water shortage contingency plan; and

**WHEREAS**, Section 61.1 of the AVEK Enabling Act sets forth guiding principles for AVEK's distribution of SWP Water, which principles can be drawn upon in allocating such water in times of shortage (the provisions of Section 61.1 of the AVEK Enabling Act are set forth in Exhibit A to this Ordinance); and

**WHEREAS**, real property related taxes have been paid to AVEK since 1959 by entities in AVEK's Jurisdictional Boundaries.

**WHEREAS**, AVEK has circulated drafts of its proposed 2005 UWMP and the water shortage contingency plan set forth in this Ordinance ("WSC Plan") to the public for review and comment; and

**WHEREAS**, AVEK's Board of Directors ("AVEK Board") held duly noticed public hearings on its proposed 2005 UWMP on November 15, 2005 and December 20, 2005, and a public meeting on the WSC Plan on December 20, 2005; and

**WHEREAS**, the AVEK Board received written and verbal testimony and evidence from the public and others concerning its proposed 2005 UWMP and WSC Plan.

## **II. FINDINGS**

**THEREFORE**, AVEK finds as follows:

1. AVEK finds that there is a need to adopt a water shortage contingency plan given, among other things, the requirements of the UWMP Act and the potential that the amount of SWP Water made available to AVEK by DWR may not satisfy the demands for SWP Water by AVEK's customers (even though such demand for SWP water has only exceeded the available supply of SWP Water once since AVEK was formed).

2. The WSC Plan complies with all applicable laws and regulations, including but not limited to the UWMP Act, the AVEK Enabling Act, and the Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan issued by

DWR and dated as of January 18, 2005.

3. AVEK finds that the WSC Plan is fair and equitable.
4. The WSC Plan is consistent with the intent and terms of the AVEK's Water Supply Agreement and the AVEK Enabling Act.
5. Each of the recitals contained in the Ordinance is approved as a finding of fact.

**III.  
ADOPTION OF WATER SHORTAGE CONTINGENCY PLAN**

**Therefore,** be it resolved and ordained by the AVEK Board as follows:

1. AVEK adopts a WSC Plan that would be implemented when the aggregate amount of SWP Water reasonably ordered by AVEK's customers in any water year exceeds the amount of SWP Water that DWR makes available to AVEK on that same water year (a "SWP Water Shortage Year"). When that contingency occurs (which contingency will be deemed to occur under both stages listed in Appendix 1 hereto), AVEK plans to allocate that amount of available SWP Water as follows:

(a) The available SWP Water shall first be allocated per each county (the "County Allocation of SWP Water") in AVEK's Jurisdictional Boundaries based on a running historical average of the amount of taxes paid to AVEK by entities in each particular county since the formation of AVEK in 1959. (Attached as Exhibit B to this Ordinance is the historical amount of such taxes paid by county through June 30, 2005.) AVEK shall annually update and publish that running historical average of taxes paid to AVEK by county.

(b) Each County's Allocation of SWP Water shall be further allocated to each AVEK customer within that particular county based on its average annual percentage of SWP Water received in the two water years prior to the SWP Water Shortage Year relative to the amount of SWP Water received by all other AVEK customers in that particular county in those two prior water years. (For illustrative purposes, attached as Exhibit C to this Ordinance is a list of such relative percentages by AVEK customers by county for 2004.)

(c) In determining the amount of SWP Water that should be delivered by AVEK to any customer in any SWP Water Shortage Year, AVEK will fill orders for SWP Water that will be used by the AVEK customer(s) for consumptive or agricultural uses in



that same water year prior to filling any order for SWP Water that would be used by an AVEK customer for banking or storage purposes.

(d) AVEK reserves the right to allocate SWP Water that it receives from DWR in a SWP Water Shortage Year in a manner that differs from the provisions of this WSC Plan based on a finding by the AVEK Board of unique or unusual circumstances or needs.

This Ordinance shall be in full force and effect upon the date of adoption, and shall be published in full in a newspaper of general circulation within ten (10) days from the date of adoption.

Passed and adopted this 19<sup>th</sup> day of June, 2007, by the following vote:

AYES: 6 NOES: 0 ABSENT: 1 ABSTAIN: 0

  
Andy D. Rutledge, President  
Board of Directors  
Antelope Valley-East Kern Water Agency

ATTEST:  
  
Agency Secretary

## EXHIBIT A

**§ 61.1 Distribution and apportionment of water purchased from State, etc.** The agency shall whenever practicable, distribute and apportion the water purchased from the State of California or water obtained from any other source as equitably as possible on the basis of total payment by a district or geographical area within the agency regardless of its present status, of taxes, in relation that such payment bears to the total taxes and assessments collected from all other areas. It is the intent of this section to assure each area or district its fair share of water based upon the amounts paid into the agency, as they bear relation to the total amount collected by the agency.

**EXHIBIT B**

**AVEK Water Agency  
Taxes Collected from Inception through 06/30/07**

Description	Los Angeles City	Kern Cty	Ventura County	TOTALS
	Taxes collected by Fiscal Year	Taxes collected by Fiscal Year	Taxes collected by Fiscal Year	
FYE 06/30/1961	58,306.69	20,846.13		79,152.82
FYE 06/30/1962	55,138.24	19,372.90		74,511.14
FYE 06/30/1963	156,220.27	53,806.15		210,126.42
FYE 06/30/1964	221,386.82	81,444.27		302,841.09
FYE 06/30/1965	174,560.93	69,835.70		244,396.63
FYE 06/30/1966	195,498.90	87,105.93		292,604.83
FYE 06/30/1967	417,054.54	234,620.40	201.75	651,876.69
FYE 06/30/1968	787,195.00	371,132.00	3,066.00	1,161,393.00
FYE 06/30/1969	969,673.00	396,253.00	3,319.00	1,369,245.00
FYE 06/30/1970	1,227,682.00	547,964.00	4,642.00	1,780,288.00
FYE 06/30/1971	1,233,111.00	600,115.00	3,555.00	1,836,781.00
FYE 06/30/1972	1,825,460.00	854,408.00	4,560.00	2,684,426.00
FYE 06/30/1973	1,848,561.00	862,025.00	2,512.00	2,813,098.00
FYE 06/30/1974	2,047,586.00	806,490.00	2,309.00	2,856,385.00
FYE 06/30/1975	2,586,924.00	890,533.00	9,386.00	3,486,853.00
FYE 06/30/1976	2,029,787.00	862,676.00	3,821.00	2,896,284.00
FYE 06/30/1977	1,720,809.00	721,466.00	3,770.00	2,446,045.00
FYE 06/30/1978	1,607,785.00	774,212.00	5,121.00	2,387,118.00
FYE 06/30/1979	1,784,843.00	997,383.00	3,663.00	2,785,669.00
FYE 06/30/1980	4,171,081.00	892,189.00	3,511.00	5,066,781.00
FYE 06/30/1981	4,995,491.00	1,351,056.00	4,854.00	6,351,381.00
FYE 06/30/1982	3,115,496.00	1,222,927.00	6,514.00	4,344,967.00
FYE 06/30/1983	4,311,370.00	1,722,635.00	8,186.00	6,042,201.00
FYE 06/30/1984	6,689,690.00	1,501,127.00	4,279.00	7,195,096.00
FYE 06/30/1985	9,769,574.00	3,575,437.00	13,208.00	13,363,219.00
FYE 06/30/1986	12,776,020.00	3,633,507.00	13,154.00	16,422,681.00
FYE 06/30/1987	12,790,936.00	3,073,228.00	10,767.00	15,874,931.00
FYE 06/30/1988	12,076,802.00	2,805,666.00	5,427.00	14,887,895.00
FYE 06/30/1989	13,700,634.00	2,928,709.00	48,066.00	16,677,409.00
FYE 06/30/1990	16,387,060.00	2,921,143.00	3,950.00	19,311,153.00
FYE 06/30/1991	14,757,446.00	3,236,690.00	0	17,994,136.00
FYE 06/30/1992	14,730,588.00	2,887,854.00	722.00	17,719,164.00
FYE 06/30/1993	14,795,789.00	2,895,327.00	722.00	17,691,838.00
FYE 06/30/1994	10,374,528.00	2,408,372.00	732.00	12,783,630.00
FYE 06/30/1995	11,757,593.00	2,215,878.00	747.00	13,974,218.00
FYE 06/30/1996	11,705,148.00	1,445,898.00	730.00	13,151,776.00
FYE 06/30/1997	9,078,884.00	1,843,601.00	721.00	10,923,206.00
FYE 06/30/1998	10,297,808.00	1,800,125.00	734.00	12,108,667.00
FYE 06/30/1999	8,893,825.00	2,623,064.00	674.00	11,517,563.00
FYE 06/30/2000	15,687,808.00	2,084,870.00	676.00	17,783,352.00
FYE 06/30/2001	10,233,359.00	2,184,568.00	685.00	12,418,602.00
FYE 06/30/2002	10,098,249.00	2,069,703.00	353.00	12,168,305.00
FYE 06/30/2003	10,853,001.00	3,394,512.00	269.00	14,247,782.00
FYE 06/30/2004	12,011,832.00	1,987,130.00	280.00	13,999,242.00
FYE 06/30/2005	12,275,847.00	2,290,255.00	0.00	14,566,102.00
FYE 06/30/2006	12,375,800.89	2,467,682.61	0.00	14,843,483.50
FYE 06/30/2007	12,548,965.69	2,783,514.23	260.29	15,332,740.21
FYE 06/30/2008	13,061,271.22	3,259,389.60	263.62	16,320,924.44
FYE 06/30/2009	14,860,938.81	3,615,857.26	269.44	18,277,065.51
FYE 06/30/2010	11,621,706.76	3,347,303.49	230.39	14,969,242.64
	<u>362,591,932.76</u>	<u>86,933,874.67</u>	<u>186,040.49</u>	<u>449,711,847.92</u>

**EXHIBIT C**

Kern County	%
Billiton Exploration U.S.A.	0.24
Boron CSD	4.66
City of California City	9.88
Desert Lake CSD	1.47
Desert Sage Apartments	0.09
Edgemont Acres MWC	0.31
Edwards AFB	37.79
Mojave Public Utility District	1.01
Rosamond CSD	17.88
US Borax	26.67

Los Angeles County	%
Antelope Valley Country Club	0.35
California Water Service Co	0.58
Landale MWC	0.13
Los Angeles County Waterworks Districts	84.98
Palm Ranch Irrigation District	0.71
Quartz Hill Water District	8.42
Shadow Acres MWC	0.61
Sunnyside Farms MWC	0.59
White Fence Farms MWC	1.71
Lake Elizabeth MWC	1.91

**Appendix 1 to the Water Shortage Contingency Plan**

Water Supply Shortage Stages and Conditions

Stage No.	Water Supply Conditions	% Shortage
1	Reduction in SWP Allocation Below Current Demand	1 %
2	Reduction in SWP Allocation Below Current Demand	50%

# 2

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## Attachment 2: Notifications and Notification List

OFFICERS

DWAYNE CHISAM, P.E.  
General Manager  
and Chief Engineer

MATTHEW KNUDSON  
Assistant General Manager

HOLLY H. HUGHES  
Secretary-Treasurer

BOARD OF DIRECTORS

KEITH DYAS  
Division 2  
President

FRANK S. DONATO  
Division 3  
Vice President

SHELLEY SORSABAL  
Division 1

GEORGE M. LANE  
Division 4

ROBERT A. PARRIS  
Division 5

AUDREY T. MILLER  
Division 6

GARY VAN DAM  
Division 7

April 6, 2021

**NOTICE OF PUBLIC HEARING ON THE ANTELOPE VALLEY-EAST KERN WATER AGENCY DRAFT 2020 URBAN WATER MANAGEMENT PLAN, DRAFT 2021 WATER SHORTAGE CONTINGENCY PLAN, AND DRAFT APPENDIX J TO THE 2015 UWMP**

Dear Recipient,

The Antelope Valley-East Kern Water Agency (AVEK) is in the process of preparing its 2020 Urban Water Management Plan (UWMP) and 2021 Water Shortage Contingency Plan (WSCP) as required by the Urban Water Management Planning Act (Act). In addition, AVEK is preparing an Appendix to both the 2015 UWMP and 2020 UWMP to demonstrate consistency with the Delta Plan Policy WR P1, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit.23, §5003). The 2015 UWMP is being amended only to report reduced reliance on the Delta and this action is separate from adoption of the 2020 UWMP and adoption of the 2021 WSCP.

AVEK is required to notify its retailers as well as cities, and counties within its service areas that it is preparing its 2020 UWMP, 2021 WSCP, and Appendix J of the 2015 UWMP at least 60 days prior to holding a public hearing. The public hearing is scheduled as part of a regularly scheduled AVEK Board meeting on **June 8, 2021 at 5:30 p.m.**

This serves as your official public hearing notice and intent to adopt the 2020 UWMP, 2021 WSCP and Appendix J of the 2015 UWMP before the July 1, 2021 deadline. A draft of each document will be available for review by May 25, 2021. AVEK will distribute a public draft review notification on or before May 25, 2021 with information on how to access the draft documents. Until that time, if you have any questions or comments regarding the documents or this process, please contact me at (661) 943-3201 or [mknudson@avek.org](mailto:mknudson@avek.org).

Very truly yours,

Matthew Knudson,  
Assistant General Manager

**From:** Tom Barnes <[tbarnes@avek.org](mailto:tbarnes@avek.org)>

**Date:** May 25, 2021 at 6:52:00 PM PDT

**Subject:** AVEK Water Agency 2020 UWMP-Notice of Public Hearing/Public Draft Documents

May 25, 2021

RE: NOTICE OF PUBLIC HEARING AND RELEASE OF PUBLIC DRAFT OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY DRAFT 2020 URBAN WATER MANAGEMENT PLAN, DRAFT 2021 WATER SHORTAGE CONTINGENCY PLAN, AND DRAFT APPENDIX J TO THE 2015 UWMP

Dear Recipient,

The Antelope Valley-East Kern Water Agency (AVEK) is releasing its Public Draft 2020 Urban Water Management Plan (UWMP) and 2021 Water Shortage Contingency Plan (WSCP) as required by the Urban Water Management Planning Act (Act). In addition, AVEK has prepared an Appendix to both the 2015 UWMP and 2020 UWMP to demonstrate consistency with the Delta Plan Policy WR P1, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit.23, §5003). The 2015 UWMP is being amended only to report reduced reliance on the Delta and this action is separate from adoption of the 2020 UWMP and adoption of the 2021 WSCP.

AVEK is notifying its retailers as well as cities, and counties within its service areas that it is releasing its 2020 UWMP, 2021 WSCP, and Appendix J of the 2015 UWMP for public review and comment prior to holding a public hearing. The public hearing is scheduled as part of a regularly scheduled AVEK Board meeting on June 8, 2021 at 5:30 p.m. online via teleconference.

A copy of the Public Draft 2020 UWMP and mentioned documents will also be made available for public review on the Agency website at: [www.avek.org](http://www.avek.org)<<http://www.avek.org>>.

This notice serves as your official public hearing notice and intent to adopt the 2020 UWMP, 2021 WSCP and Appendix J of the 2015 UWMP before the July 1, 2021 deadline. If you have any questions or comments regarding the documents or this process, please contact Matt Knudson/Tom Barnes at 661-943-3201 or [info@avek.org](mailto:info@avek.org)<<mailto:info@avek.org>>.

Sincerely,

Dwayne Chisam  
General Manager

Tom Barnes | Resources Manager  
Antelope Valley-East Kern Water Agency  
6450 West Avenue N, Palmdale, CA 93551  
Main: 661-943-3201 | fax: 661-943-3204  
Direct: 661-234-8437 | mobile: 661-810-9440  
Email: [tbarnes@avek.org](mailto:tbarnes@avek.org)<<mailto:tbarnes@avek.org>> | website: [www.avek.org](http://www.avek.org)<<http://www.avek.org>>



**AVEK 2020 UWMP, 2021 WSCP, and 2015 UWMP Appendix J  
PUBLIC HEARING NOTIFICATION (April 5, 2021)  
PUBLIC DRAFT NOTIFICATION (May 25, 2021)  
RECIPIENT LIST**

**Water Retailer Notification Letter:**

- Antelope Valley Country Club
- Boron Community Services District
- California Water Service Company  
Antelope Valley District
- City of California City
- Desert Lake Community Services  
District
- Desert Sage Apartments c/o Rex  
Nishimura
- Edgemont Acres Mutual Water Co.
- Edwards Air Force Base
- El Dorado Mutual Water Co.
- Lake Elizabeth Mutual Water Co.
- Landale Mutual Water Co.
- Los Angeles County Waterworks  
Districts - Alhambra
- Los Angeles County Waterworks  
Districts - Lancaster
- Mojave Public Utility District
- Palm Ranch Irrigation District
- Quartz Hill Water District
- Rosamond Community Services  
District
- Shadow Acres Mutual Water Co.
- Sunnyside Farms Mutual Water Co.
- West Side Park Mutual Water Co.
- White Fence Farms Mutual Water  
Co.
- White Fence Farms Mutual Water  
Co. #3

**Customer Notification Letter:**

- Antelope Valley Water Storage, LLC  
c/o WDS
- CA Dept of Parks & Recreation  
(Poppy Reserve)
- Rancho Vista Golf Club
- Tejon Ranch Company
- US. Borax (Rio Tinto Minerals)

**Public Notification Letter:**

- Antelope Valley Watermaster
- Building Industry Association
- Littlerock Creek Irrigation District
- Mojave Water Agency
- North Edwards Water District
- Palmdale Water District

**Cities/Counties Notification Letter:**

- City of Lancaster Planning Division
- City of Lancaster City Manager
- City of Palmdale Planning Division
- City of Palmdale Public Works
- Kern County Planning Department
- Los Angeles County Department of  
Regional Planning Division
- Supervisor Kathryn Barger Antelope  
Valley Field Office
- Ventura County Resource  
Management Agency Planning  
Division

**Valley Press Ad****NOTICE OF PUBLIC HEARING  
ANTELOPE VALLEY-EAST KERN WATER AGENCY**

NOTICE is hereby given that a Public Hearing will be held by the Antelope Valley-East Kern Water Agency (AVEK) on Tuesday, June 8, 2021 at 5:30 PM, as part of a regularly scheduled AVEK Board meeting on-line via teleconference.

The Board of Directors of AVEK will receive public comment regarding the Agency's adoption of its 2020 Urban Water Management Plan (2020 UWMP) and 2021 Water Shortage Contingency Plan (WSCP), which have been prepared in compliance with the Urban Water Management Planning Act. In addition, Appendix J of the AVEK 2015 UWMP, Reduced Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit.23, §5003), will be amendment. A Draft copy of the 2020 UWMP and related documents are available for public review on the Agency website at: [www.avek.org](http://www.avek.org).  
Publish: May 26 and June 2, 2021

# 3

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## Attachment 3: Resolution of Adoption



**RESOLUTION NO. R-21-08**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF ANTELOPE VALLEY-EAST KERN WATER AGENCY (“AVEK”) ADOPTING, DIRECTING THE FILING OF, AND IMPLEMENTING THE ANTELOPE VALLEY-EAST KERN WATER AGENCY 2020 URBAN WATER MANAGEMENT PLAN, 2021 WATER SHORTAGE CONTINGENCY PLAN, AND APPENDIX J AS AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN**

**WHEREAS**, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK’s powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the “AVEK Enabling Act”); and

**WHEREAS**, AVEK’s jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Section 3 and Figure 3-1 of the 2020 Urban Water Management Plan (“AVEK’s Jurisdictional Boundaries”); and

**WHEREAS**, AVEK was formed for the purpose of providing water received from the State Water Project (“SWP”) as a supplemental source of water to retail water purveyors and other water interests within AVEK’s Jurisdictional Boundaries on a wholesale basis; and

**WHEREAS**, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources (“DWR”), which operates the SWP, in order for AVEK to receive water from the SWP (“SWP Water”); and

**WHEREAS**, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK’s Jurisdictional Boundaries that govern AVEK’s delivery of SWP Water to those purveyors and other water interests (the “AVEK’s Water Supply Contracts”); and

**WHEREAS**, AVEK has developed and does operate water banking facilities within AVEK’s Jurisdictional Boundaries, and has right to produce waters from these facilities for the purpose of providing groundwater as a supplemental source of water to retail water purveyors and other water interests within AVEK’s Jurisdictional Boundaries on a wholesale basis; and

**WHEREAS**, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.) known as the Urban Water Management Plan Act (the Act).

**WHEREAS**, the Act mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare, and every five (5) years thereafter update, its Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water; and

**WHEREAS**, the California Water Code Section 10632 requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP); and

**WHEREAS**, the WSCP is consistent with the California Water Code Sections 350 through 359 and Section 10632 and guidance provided by the California Department of Water Resources 2020 UWMP Guidebook; and

**WHEREAS**, Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs., tit. 23, § 5003, subdivision (c)(1)) need to be included in a water supplier's urban water management plan to support a certification of consistency for one or more future water supply covered actions in the Sacramento-San Joaquin Delta; and

**WHEREAS**, the 2020 UWMP, 2021 WSCP, and Appendix J as an Addendum to the 2015 UWMP (together known as the Plans) must be adopted by July 1, 2021 and filed with the California Department of Water Resources and entities specified in the UWMP Act within thirty days of adoption; and

**WHEREAS**, AVEK has circulated drafts of its proposed Plans for public review and comment; and

**WHEREAS**, AVEK's Board of Directors ("AVEK Board") held a duly noticed public hearing on its proposed Plans on June 8, 2021; and


**WHEREAS**, the AVEK Board received no written or verbal comment from the public or others concerning its proposed Plans; and

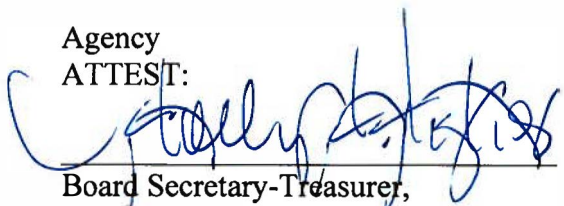
**WHEREAS**, AVEK retained technical and legal consultants to provide expert assistance concerning its Plans; and

**NOW, THEREFORE, BE IT RESOLVED** by the Board of the Directors of the Antelope Valley-East Kern Water Agency as follows:

1. The 2020 Urban Water Management Plan, the 2021 Water Shortage Contingency Plan, and Appendix J as an Addendum to the 2015 UWMP are hereby approved and adopted.
2. The General Manager is authorized and directed to file the Plans with the entities specified in the UWMP Act by the dates specified therein.



**PASSED AND ADOPTED** at the Regular Meeting of the Antelope Valley-East Kern Water Agency Board of Directors held on August 24, 2021.

  
\_\_\_\_\_  
Keith Dyas, President of the Board of  
Directors of Antelope Valley-East Kern Water

Agency  
ATTEST:  
  
\_\_\_\_\_  
Board Secretary-Treasurer,  
Antelope Valley-East Kern Water Agency



# STAFF REPORT

To: Board of Directors	Date: August 20, 2021
From: Dwayne Chisam, General Manager 	Prepared By: Matthew Knudson, Assistant GM 
Subject: Consideration and possible action on Resolution No. R-21-08 – Approving and adopting the 2020 Urban Water Management Plan, 2021 Water Shortage Contingency Plan, and Appendix J as an Addendum to the 2015 Urban Water Management Plan	
Meeting Date: August 24, 2021    Agenda Items: 7 (b-1)    Attachment(s): <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

## **Recommendations:**

Staff recommends that the Board:

1. Approve Resolution No. R-21-08 adopting, directing the filing of, and implementing the Antelope Valley-East Kern Water Agency 2020 Urban Water Management Plan (UWMP), the 2021 Water Shortage Contingency Plan (WSCP), and Appendix J as an Addendum to the 2015 Urban Water Management Plan.

## **Background:**

The California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.) known as the Urban Water Management Plan Act that mandates every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare, and every five (5) years thereafter update, its UWMP, the primary objective of which is to plan for the conservation and efficient use of water.

Also, the California Water Code Section 10632 requires that every urban water supplier shall prepare and adopt a WSCP.

Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs., tit. 23, § 5003, subdivision (c)(1)) need to be included in a water supplier's urban water management plan to support a certification of consistency for one or more future water supply covered actions in the Sacramento-San Joaquin Delta.

Agency staff and consultants have prepared the 2020 UWMP, 2021 WSCP, and Appendix J as an Addendum to the 2015 UWMP. Water Code 10642 requires that prior to adoption, an urban water supplier shall make the plan available for public inspection and shall hold at least one public hearing. The subject documents were posted on the Agency's website on Tuesday, May 25, 2021, for public review and comment. Staff and the Agency's consultant (Water Systems Consulting, Inc.) also presented an overview of the documents at the June 8, 2021 Board Meeting / Public Hearing.

No public comments have been received to date.

**Strategic Plan Element:**

The 2020 UWMP and related documents will assist AVEK in meeting the following Strategic Plan Goals and Objectives:

- Goal 2 – Water Reliability
- Goal 6 - Communications

**Supporting Documents:**

- Resolution No. R-21-08 adopting, directing the filing of, and implementing the Antelope Valley-East Kern Water Agency 2020 Urban Water Management Plan (UWMP), the 2021 Water Shortage Contingency Plan (WSCP), and Amendment to Appendix J of the 2015 Urban Water Management Plan.
- 2020 Urban Water Management Plan (UWMP)
- 2021 Water Shortage Contingency Plan
- Appendix J as an Addendum to the 2015 UWMP



**RECOMMENDED BOARD ORDER 7(b-1)**

To the Board of Directors

**FOR BOARD ACTION**

**ADOPT RESOLUTION NO. R-21-08**  
**2020 URBAN WATER MANAGEMENT PLAN, 2021 WATER**  
**SHORTAGE CONTINGENCY PLAN, AND AMENDMENT TO APPENDIX**  
**J OF THE 2015 URBAN WATER MANAGEMENT PLAN**

The Board of Directors adopted the following board order on August 24, 2021:

To adopt Resolution No. R-21-08, approving the 2020 Urban Water Management Plan, 2021 Water Shortage Contingency Plan, and Amendment to Appendix J of the 2015 Urban Water Management Plan, as presented and recommended.

Motion by Donato  
Second by Parris  
Carried 6-0-0-1 - Aye  
(No response from G. Lane)

**BOARD ORDER 7(b-1)**

08-24-21

