

2019 Santa Clarita Valley Water Report

Santa Clarita Valley Water Agency
Los Angeles County Waterworks
District 36



**Luhdorff &
Scalmanini**
Consulting Engineers

July 2020

2019 Santa Clarita Valley Water Report

prepared for:

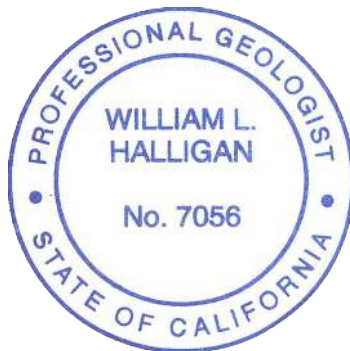
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prepared by:



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List of Abbreviations and Acronyms

af	acre-feet
afy	acre-feet per year
Basin	Santa Clara River Valley Groundwater Basin
BMPs	Best Management Practices
BiOp	Biological Opinion
BV/RRB	Buena Vista/Rosedale-Rio Bravo
BVWSD	Buena Vista Water Storage District
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CLWA	Castaic Lake Water Agency
County	Ventura County State Water Project Contractors
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DDW	Division of Drinking Water
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EIR	Environmental Impact Report
GPCD	gallons per capita per day
GRR	Groundwater Replenishment Reuse
GSA	Groundwater Sustainability Agency
GSI	GSI Water Solutions, Inc.
GSP	Groundwater Sustainability Plan
GWMP	Groundwater Management Plan
HA	Hydrologic Area
JPA	Joint Power Authority
LACFCDD	Los Angeles County Flood Control District

LACWD 36	Los Angeles County Waterworks District 36
LADPW	Los Angeles County Department of Public Works
LADWP	Los Angeles County Department of Water and Power
LSCE	Luhdorff and Scalmanini Consulting Engineers
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
MOU	Memorandum of Understanding
NCEI	National Centers for Environmental Information
NCWD	Newhall County Water District
NWD	Newhall Water Division
NMFS	National Marine Fishery Service
OU	Operating Unit
PCE	Tetrachloroethylene
PTF	Perchlorate Treatment Facility
RAP	Remedial Action Plan
RD	Remedial Design
RRWBWP	Rosedale-Rio Bravo Water Banking Program
RRBWSD	Rosedale-Rio Bravo Water Storage District
RWMP	Recycled Water Master Plan
SCV-GSA	Santa Clarita Valley Groundwater Sustainability Agency
SCVSD	Santa Clarita Valley Sanitation District of Los Angeles County
SCV Water	Santa Clarita Valley Water Agency
SCWD	Castaic Lake Water Agency's Santa Clarita Water Division
Semitropic	Semitropic Water Storage District
SGMA	Sustainable Groundwater Management Act
SOC	Synthetic Organic Chemicals
SPTF	Saugus Perchlorate Treatment Facility
sq. ft.	square feet

SVE	Soil Vapor Extraction
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWRU	Stored Water Recovery Unit
TCE	Trichloroethylene
TDS	Total Dissolved Solids
µg/L	micrograms per liter
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UWCD	United Water Conservation District
UWMP	Urban Water Management Plan
Valley	Santa Clarita Valley
VOC	Volatile Organic Compound
VWC	Valencia Water Company
VWD	Valencia Water Division
WUE SP	Water Use Efficiency Strategic Plan
WKWD	West Kern Water District
WRP	Water Reclamation Plant

Executive Summary



This annual water report, which is the twenty-second in a series that began to describe water supply conditions in 1998, provides current information about the water requirements and water supplies of the Santa Clarita Valley (Valley). Historically, this report has been prepared for the Valley’s water purveyors, currently the Santa Clarita Valley Water Agency (SCV Water) and Los Angeles County Waterworks District 36 (LACWD 36).

This report provides information about local groundwater resources, State Water Project (SWP) and other imported water supplies, treated and recycled water, and water conservation. It also includes discussion about the Valley’s Groundwater Operating Plan (2009), the Urban Water Management Plan (2015), and the development of a Groundwater Sustainability Plan in accordance with the Sustainable Groundwater Management Act of 2014. The report reviews the sufficiency and reliability of supplies in the context of existing water demand, with focus on actual conditions in 2019, and it provides a short-term outlook of water supply and demand for 2020.

ES.1 2019 Water Requirements and Supplies

2019 was characterized by above average precipitation locally and statewide, increased imported water supplies, and a slight decrease in demand from the prior year. In 2019, total water requirements in the Valley were approximately 72,600 acre-feet (af), of which approximately 60,100 af were for municipal use and the remainder (12,500 af) was for agricultural and other (miscellaneous) uses, including individual domestic uses. Total demand in 2019 was seven percent lower than in 2018, and approximately nine percent lower than the projection in the 2015 Urban Water Management Plan (UWMP). Total water requirements in 2019 were met by a combination of approximately 30,000 af from local groundwater resources (approximately 17,500 af for municipal and approximately 12,500 af for agricultural and other uses), approximately 42,100 af of SWP and other imported water, and approximately 500 af of recycled water. Water uses and supplies in 2019 are summarized in [Table ES-1](#).

Table ES-1: Santa Clarita Valley Summary of 2019 Water Supplies and Uses (af)

<i>Municipal</i>	
Imported Supplies	42,072
Groundwater (Total)	17,547
Recycled Water	458
Subtotal	60,077
<i>Agriculture/Miscellaneous</i>	
Groundwater (Total)	12,510
Subtotal	12,510
Total	72,587

ES.2 Groundwater

Out of 30,000 af of total groundwater pumping in the Valley in 2019, approximately 21,000 af were pumped from the Alluvium and 9,000 af were pumped from the Saugus Formation. Based on the groundwater basin yield, the groundwater operating plan in the 2015 UWMP includes

pumping from the Alluvium in the range of 30,000 to 40,000 acre-feet per year (afy) following wet/normal years, and slightly reduced pumping (30,000 to 35,000 afy) following dry years. Pumping from the Alluvium in 2019 was below the operating plan range for the Alluvium following dry years reflecting a management decision to increase the use of imported supplies in those years when available, as was the situation in 2019. There were no adverse effects on groundwater levels and storage in the basin that have not normally occurred during previous dry periods in the basin. On average, pumping from the Alluvium has been approximately 32,400 afy since supplemental imported water became available in 1980. That average annual amount remains near the lower end of the range of operational yield for a wet/normal year and approximately mid-range for a dry period.

In general, throughout a large part of the basin, groundwater levels in the Alluvium have generally varied within predictable ranges that are associated with climatic fluctuations during the last 35 years with short-term declines during dry periods followed by recoveries during wet periods. Above-average precipitation in late 2004 and 2005, and more recently in 2010 and early-2011, resulted in significant water level recovery in the eastern part of the basin despite the recent multi-year dry periods (2006-2009, 2011-2018), when water levels declined to the low end of the historic range. In 2019, water levels generally rose through the wetter-than-average winter. This continues the overall trend of fluctuating groundwater levels within a generally constant range over the last 35 years. These ongoing data indicate that the Alluvium remains in good operating condition and can continue to support pumping in the operating range included in the 2015 UWMP, or slightly higher, without adverse results (e.g., long-term water level decline or degradation of groundwater quality). Based on an integration of water quality records from multiple wells completed in the Alluvium, there have been historical fluctuations

in groundwater quality, typically associated with variations in precipitation and streamflow. However, like groundwater levels, there has been no long-term trend toward groundwater quality degradation; groundwater produced from the Alluvium remains a viable municipal and agricultural water supply.

The groundwater operating plan in the 2015 UWMP includes pumping from the Saugus Formation in the range of 7,500 to 15,000 afy in normal years; it also includes planned dry-year pumping from the Saugus of 15,000 to 35,000 afy for one to three consecutive dry years. Similar to the operating plan for the Alluvium, the ranges of pumping from the Saugus Formation are based on the evaluation of groundwater basin yield, which found those ranges of pumping to be sustainable on a long-term basis.

Pumping from the Saugus Formation was approximately 9,000 af in 2019; this included approximately 2,900 af that were pumped from the Saugus 1 and Saugus 2 Wells as part of the perchlorate pump and treat program. On average, pumping from the Saugus Formation has been approximately 7,400 afy since 1980. Both the 2019 amount and the long-term average rates remain near the mid to lower end of the ranges included in the groundwater operating plan. On a short-term timeframe, there have been declining trends in groundwater elevations in the Saugus Formation since 2006 that likely reflect the generally dry climatic conditions, and increased pumping from storage that have existed during that time.

SCV Water prioritizes the delivery of clean water that meets all state and federal health standards. They continue to address ongoing water quality issues and newly emerging constituents of concern. Long-term work toward the remediation of perchlorate contamination, first discovered in 1997 in several Saugus wells, continued in 2019. The objective of the perchlorate restoration and containment plan has been to stop the migration of the contaminant plume and restore the lost

well capacity through a pump and treat method. SCV Water's Saugus Perchlorate Treatment Facility (SPTF) has been online since 2011, and a second Perchlorate Treatment Facility came online in 2017, and together these facilities have now treated a combined amount of almost 32,000 af.

In 2019, the California Water Board Division of Drinking Water enacted new testing requirements for Per- and polyfluoroalkyl substances (PFAS) and established notification levels and a health advisory level for these man-made chemicals that had been commonly used in industry and consumer products until recently. Upon testing, SCV Water identified several of their wells that exceeded these new limits and immediately began to investigate and implement treatment options. Construction of a new water treatment plant began in early 2020.

ES.3 Imported Water Supplies

Historically consisting of only its SWP Table A Amount, SCV Water's imported water supply now comprises additional sources of water acquired from the SWP, the Buena Vista Water Storage District (BVWSD) and Rosedale-Rio Bravo Water Storage District (RRBWSD) in Kern County, and other sources outside of the Valley. SCV Water's contractual Table A amount is 95,200 af of water

from the SWP with a SCV Water receives 11,000 afy under the 2007 Water Acquisition Agreement with BVWSD and the RRBWSD.

SCV Water has entered into six long-term groundwater banking and water exchange programs and has, in aggregate, more than 164,000 af of recoverable water outside the local groundwater basin at the end of 2019. The first component of SCV Water's overall groundwater banking program is with Semitropic Water Storage District, now called the Stored Water Recovery Unit (SWRU) whereby, SCV Water can withdraw up to 5,000 afy from the current balance of 45,278 af of water that was stored in the SWRU to meet Valley demands when needed in dry years. The second component, the Rosedale-Rio Bravo Water Banking Program (RRBWBP) in Kern County, has a recoverable total of approximately 100,000 af in storage with a withdrawal capacity of 10,500 afy after completion of the Rosedale-Rio Bravo Drought Relief Project in 2019. The other components are the Two-For-One Exchange Programs that SCV Water initiated with RRBWSD, West Kern Water District (WKWD), Antelope Valley-East Kern Water Agency (AVEK), and United Water Conservation District (UWCD) that now have a combined amount of almost 19,200 af of recoverable water.



SCV Water's final allocation of SWP water for 2019 was 75 percent of its Table A Amount, or 71,400 af. The total imported water supply in 2019 was 86,758 af, including the Table A supply, 11,000 af purchased from BVWSD and RRBWSD, 750 af returned from the Central Coast Water Authority Exchange, and 3,608 af of 2018 SWP carryover water available in 2019. SCV Water deliveries to service connections and LACWD 36 were 42,072 af with the remaining water banked (5,002 af), exchanged in 2-for-1 programs (19,500

PFAS Water Treatment Facility Project



af), sold (9,900 af), delivered to Devil's Den (382 af), carried over to 2020 (9,013 af), and some loss through meter reading differences and use through operations.

ES.4 2020 Water Supply Outlook

In 2020, total Valley-wide water demand is projected to be approximately 82,000 af. It is expected that water demands in 2020 will continue to be met with a mix of water supplies that primarily includes local groundwater, SWP Table A and other imported supplies, and recycled water. Ongoing conservation programs are expected to continue to reduce demands on water supplies in 2020 although some increase in demands is anticipated with continued growth within the service area.

Announced on May 22, 2020, the latest allocation of water from the SWP for 2020 was 20 percent of SCV Water's Table A Amount, or 19,040 af. Combined with the total available water supplies from local groundwater from the two aquifer systems (31,000 af), carryover of SWP Table A allocation from 2019 (9,013 af), annual acquisition through the Buena Vista Water/Rosedale Rio-Bravo Water Acquisition Agreement (11,000 af), withdrawals from the Semitropic SWRU (5,000 af) and Two-for-One exchange programs (16,937 af), Yuba Accord Water (403 af), and recycled water (500 af), the total available water supplies for 2020 is approximately 92,893

af. As a result, SCV Water anticipates having more than adequate supplies to meet all water demands in 2020.

In any given year, SWP supplies may be reduced due to dry weather conditions or regulatory factors. During such an occurrence, the remaining water demands are planned to be met by a combination of alternate supplies such as returning water from SCV Water's accounts in the SWRU, the RRBWBP, and three Exchange Programs (with total banked water at more than 164,000 af), deliveries from SCV Water's flexible storage account in Castaic Lake Reservoir, local groundwater pumping, short-term water exchanges, and participation in DWR dry-year water purchase programs.

Drought periods may affect available water supplies in any single year and even for a duration that spans multiple consecutive years. It is important to note that hydrologic conditions vary from region to region throughout the state. Dry conditions in northern California affecting SWP supply may not affect local groundwater and other supplies in southern California, and the reverse situation can also occur (as it did in 2002 and 2003). For this reason, SCV Water has emphasized developing a water supply portfolio that is diverse, especially in dry years along with water conservation programs. Diversity of supply is considered a key element of reliability, giving the Agency the ability to draw on multiple sources of supply to ensure reliable service during dry years, as well as during normal and wet years.

ES.5 Water Conservation

SCV Water is committed to a water conservation program that is composed of several conservation measures that will lower projected per capita demand by 2020, building on what has already been implemented over the past two decades. The conservation measures incorporate education, incentives, and conservation mandates among all the various customers present in the Valley. As a member of the California Water Efficiency Partnership (CalWEP), SCV Water prioritizes urban water use efficiency and conservation in their management strategy and public messaging.

As described in the 2015 UWMP, the Agency must demonstrate SB X7-7 compliance by an Interim Daily Per Capita Water Use Target, and SCV Water has met that Interim Water Use Target and their 2020 Target every year through 2019. And while 2019 saw an end to eight consecutive years of dry conditions for the Valley, the residents, businesses, and city and county government agencies have continued to respond to the calls for conservation in 2019 with a total reduction in water use from 2013 of almost 26,800 af.



1 - Introduction



This report was prepared for SCV Water and LACWD 36 to provide information regarding water uses and the availability of water supplies on an annual basis, along with a brief summary of groundwater conditions. It is intended to be a helpful resource for use by water planners and local land use planning agencies. This report is complemented by the 2015 UWMP for the area, which provides longer-term water supply planning over a 35-year period, and by several other technical reports, some of which are specifically referenced herein.

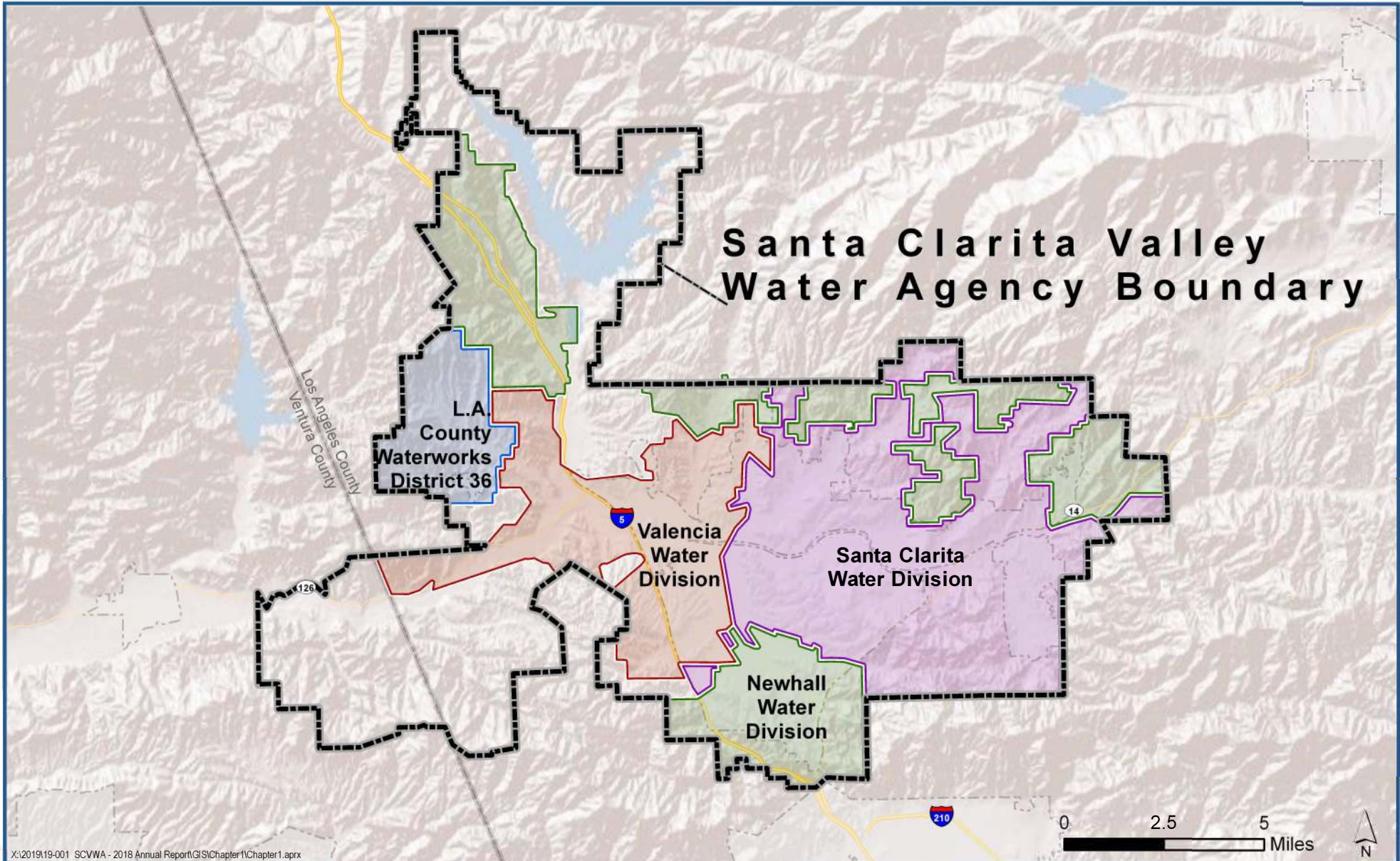
For more than 35 years, the Santa Clarita Valley Water Agency, formerly the Castaic Lake Water Agency (CLWA) and the four retail water purveyors, have reviewed and reported on the availability of water supplies to meet all water requirements in the Santa Clarita Valley. Those reports have also addressed local water resources, most notably groundwater, in the region. Past studies have assessed the condition of local groundwater aquifers, their hydrogeologic characteristics, aquifer storage capacity, operational yield and recharge rate, groundwater quality and contamination, and the ongoing conjunctive use of groundwater and imported water resources.

1.1 Background

For most residents of the Santa Clarita Valley, domestic water service is provided by the Santa Clarita Valley Water Agency and the Los Angeles County Waterworks District 36. SCV Water comprises three divisions (with separate distribution systems): Santa Clarita Water Division (SCWD), Newhall Water Division (NWD),

and Valencia Water Division (VWD). Together, SCV Water and LACWD 36 provide water to approximately 73,200 service connections. SCV Water contracts for State Water Project and other sources of imported water, which are delivered from Castaic Lake, after which it is treated, filtered, and disinfected at two SCV Water treatment plants before distribution to service connections and LACWD 36. SCV Water also contracts with the Santa Clarita Valley Sanitation District for recycled water, which is currently delivered to VWD. The SCV Water and Division service areas are shown in **Figure 1-1**.

While municipal water supply has grown to become the largest category of water use in the Valley, there remains agricultural and small private water demands that are dependent on local groundwater supplies. Accordingly, ongoing agricultural water requirements and the use of local groundwater to meet those requirements are considered in analyses of water requirements and supplies as reported herein. The information on the locations, construction details, annual pumping and other information for the small fraction of Valley residents reliant on private wells for water supply approximately are not collected by any agency. In the absence of detailed information on private wells and associated water use, pumping as reported herein includes an estimate of groundwater pumped from private wells. The estimate of private pumping reported herein will be refined as part of the Valley's compliance with the Sustainable Groundwater Management Act (SGMA).



Santa Clarita Valley Water Agency Boundary

L.A. County Waterworks District 36

Valencia Water Division

Santa Clarita Water Division

Newhall Water Division

0 2.5 5 Miles



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SCV Water and LACWD 36 Service Areas
Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 1-1

In 2009 an updated analysis of groundwater basin yield was completed to guide the ongoing use of groundwater and the associated distribution of pumping to maintain sustainable groundwater use and address localized issues such as groundwater contamination that had impacted local groundwater supplies since 1997. The results of the updated groundwater basin analysis are summarized in the groundwater basin yield discussion (Section 3.1) of this Water Report.

1.2 Purpose and Scope of the Report

The purpose of this report, which is the 22nd in a series of annual water reports that began to describe water supply conditions in 1998, is to provide current information about water requirements and available water supplies to meet the needs of the Santa Clarita Valley. The preparation of this series of reports is in response to these actions:

- ▲ a request made by the Los Angeles County Board of Supervisors in 1998;
- ▲ a Memorandum of Understanding (MOU) between the upper basin water purveyors (including LACWD 36 and former Castaic Lake Water Agency, Newhall County Water District and Valencia Water Company) and the United Water Conservation District (UWCD) in 2001;
- ▲ the Santa Clarita Valley GWMP in 2003.

With the implementation of the SGMA, a Groundwater Sustainability Plan (GSP) will replace the GWMP and the role that this annual report fulfills in the GWMP. However, this report still serves the requirements requested by the LA County Board and the MOU with the UWCD. The purpose of the MOU was to establish a joint monitoring program between the two parties to ensure that there is a continued regional understanding of water resources along the Santa Clara River. This joint monitoring program included database management, groundwater flow

modeling, basin yield estimates, and an expansion on the annual reporting which began for the Upper Santa Clara River basin in 1998. In October 2018, a new Memorandum of Understanding was entered into by SCV Water and UWCD to build upon and compliment the 2001 MOU, whereby both parties continue to enhance and maintain a productive and collaborative relationship with the purpose of exploring cooperative water resource management strategies to enhance the conjunctive use of imported water, groundwater, recycled water, and surface water within the region.

1.3 Santa Clarita Valley Water Divisions and LACWD 36

As introduced above, SCV Water along with LACWD 36 provide water service to most residents of the Santa Clarita Valley. **Figure 1-1** shows the Santa Clarita Water Division that includes a portion of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Saugus, Canyon Country, and Newhall with approximately 31,850 service connections, the Newhall Water Division includes portions of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Newhall, Canyon Country, Valencia, Tesoro and Castaic with approximately 9,700 service connections, and the Valencia Water Division with a service area which serves approximately 30,250 service connections in a portion of the City of Santa Clarita and in the unincorporated communities of Castaic, Newhall, Saugus, Stevenson Ranch, Mission Village, and Valencia. Los Angeles County Waterworks District 36 has a service area that encompasses the Hasley Canyon area and the unincorporated community of Val Verde. LACWD 36 has approximately 1,350 service connections.

1.4 The Upper Santa Clara River Hydrologic Area and East Groundwater Subbasin

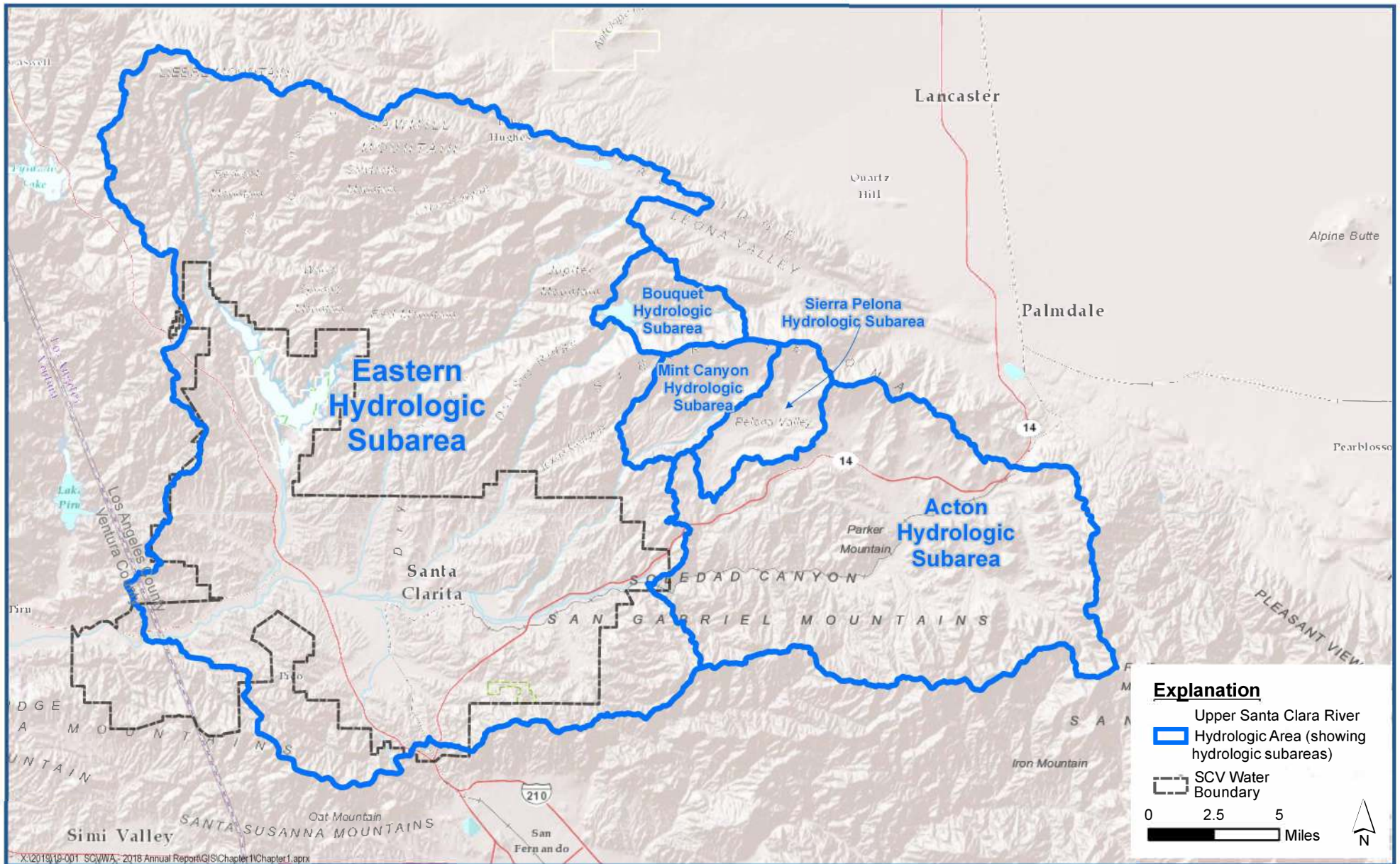
The Upper Santa Clara River Hydrologic Area (HA), as defined by the DWR, is located almost entirely in northwestern Los Angeles County (Figure 1-2). The area encompasses approximately 654 square miles of flat valley land (approximately 6 percent of the total area) and hills and mountains (approximately 94 percent of the total area) that border the valley area. The mountains include the Santa Susana and San Gabriel Mountains to the south, and the Sierra Pelona and Leibre-Sawmill Mountains to the north. Elevations range from approximately 800 feet on the valley floor to approximately 6,500 feet in the San Gabriel Mountains. The headwaters of the Santa Clara River are at an elevation of approximately 3,200 feet at the divide separating the HA from the Mojave Desert. The HA comprises four subareas as shown on Figure 1-2. Of the four, the Eastern Hydrologic Subarea has been the study area of prior investigations, and it will remain the focus of this report.

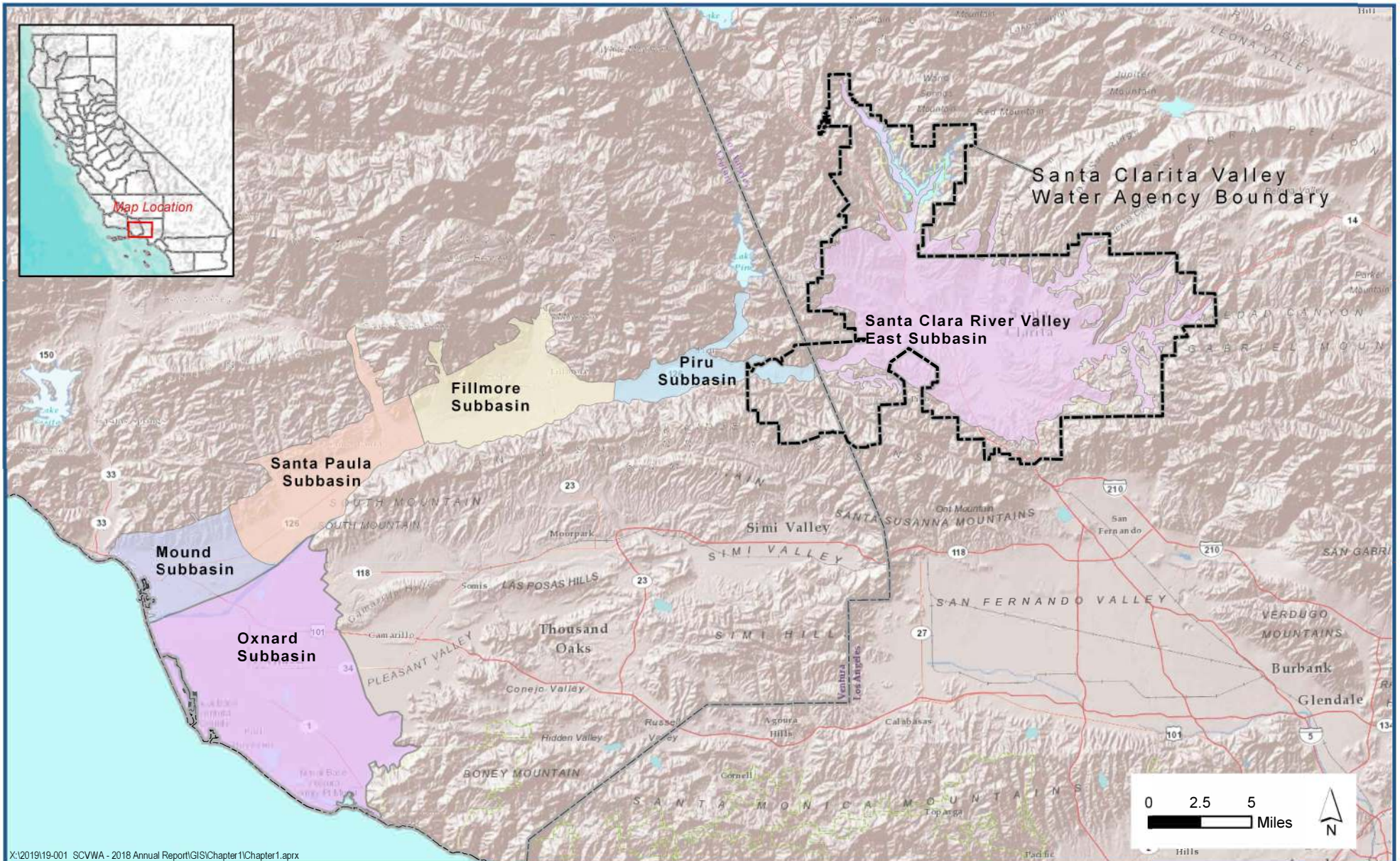
The Santa Clara River and its tributaries flow intermittently from Lang Station westward approximately 35 miles to just west of the Los Angeles-Ventura County line, where the River is the outlet from the HA. The principal tributaries of the Santa Clara River in the Santa Clarita Valley are Castaic Creek, San Francisquito Creek, Bouquet Creek, and the South Fork of the Santa Clara River. In addition to intermittent natural tributary inflow, the Santa Clara River receives treated wastewater discharge from the Saugus and Valencia Water Reclamation Plants, which are operated by the Santa Clarita Valley Sanitation District of Los Angeles County. In addition, a minor amount of groundwater treated for perchlorate removal from the Whitaker-Bermite site is also discharged into the river upstream of the WRPs. The Santa Clara River flows westward through Ventura County near Oxnard. Along that route, the River traverses

all subbasins of the Santa Clara River Valley Groundwater Basin (Basin). There are six subbasins that compose the Basin and they span across Los Angeles and Ventura counties. From east to west the subbasins are the Santa Clara River Valley East, Piru, Fillmore, Santa Paula, Mound, and Oxnard as shown in Figure 1-3. The Santa Clara River Valley East Subbasin (Subbasin), beneath the Santa Clarita Valley, is the source of essentially all local groundwater used for water supply in the Santa Clarita Valley and the focus of this report.

There are four active precipitation gages in the Subbasin. Two gages have long-term records, the Newhall Fire Station #73 gage and the SCVWA-Pine Street gage, while the other two, #204 Santa Clarita (established in 2006) and Canyon Country (established in 2010), have shorter-term records that can be used for comparative purposes (Figure 1-4). The Los Angeles County Department of Public Works (LADPW) has maintained records for the Newhall Fire Station #73 gage, while recording of precipitation began at the SCVWA-Pine Street gage in 1979 when it was part of Newhall County Water District. The cumulative records from these two gages correlate closely, although the SCVWA-Pine Street gage has historically recorded a higher amount (approximately 30 percent) than the Newhall Fire Station #73 gage over the entire SCVWA-Pine Street gage period of record (1979-2019). The overall offset is likely due to the differences in location between the two gages, with the SCVWA-Pine Street gage situated farther south in the hills rimming the southern edge of the Santa Clarita Valley at an elevation of approximately 1,390 feet, while the Newhall Fire Station #73 gage is located northwest of the SCVWA-Pine Street gage and further away from the hills at an elevation of approximately 1,330 feet.

The third gage, #204 Santa Clarita, was established in December 2006 near the Rio Vista Treatment Plant (elevation 1,410 feet) near the main Santa Clara River channel and on the north





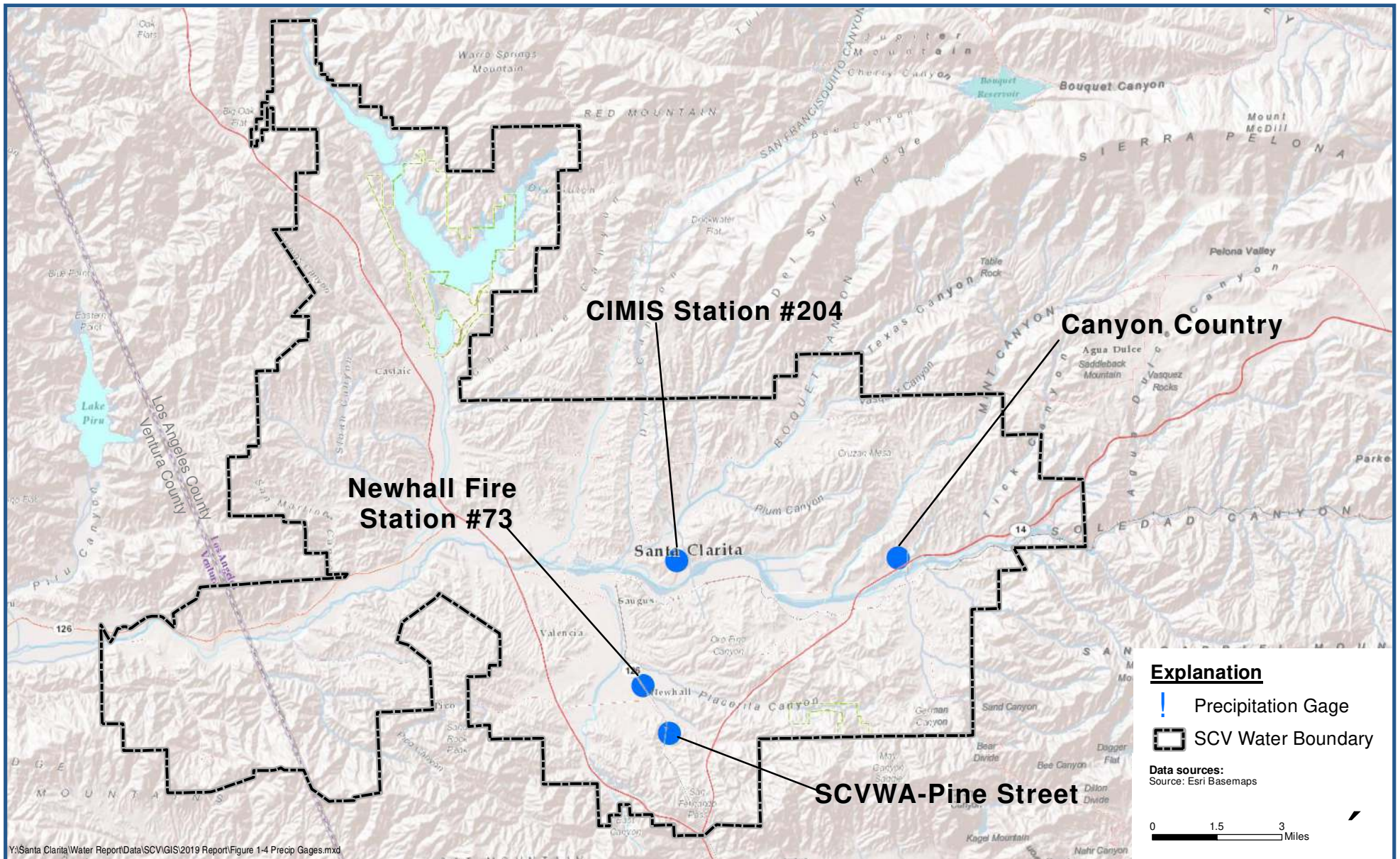
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Santa Clara River Valley Groundwater Basin and Subbasins

Santa Clarita Valley Water Report
 Santa Clarita Valley, Los Angeles County, California

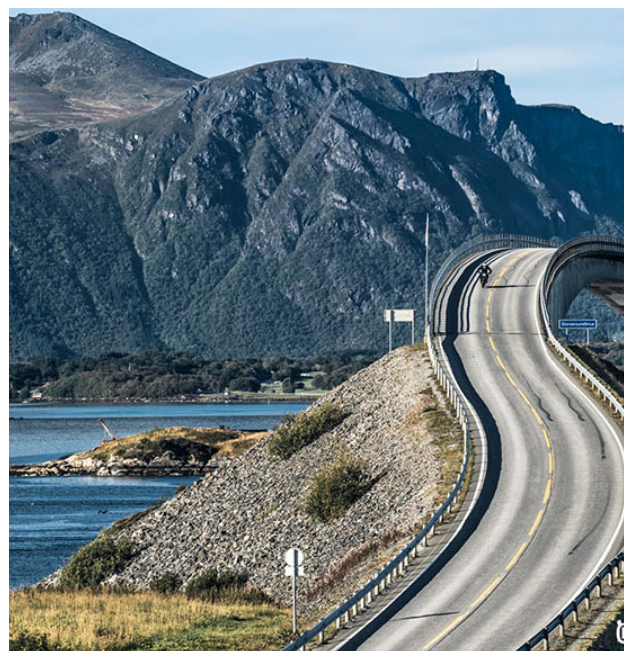
Figure 1-3

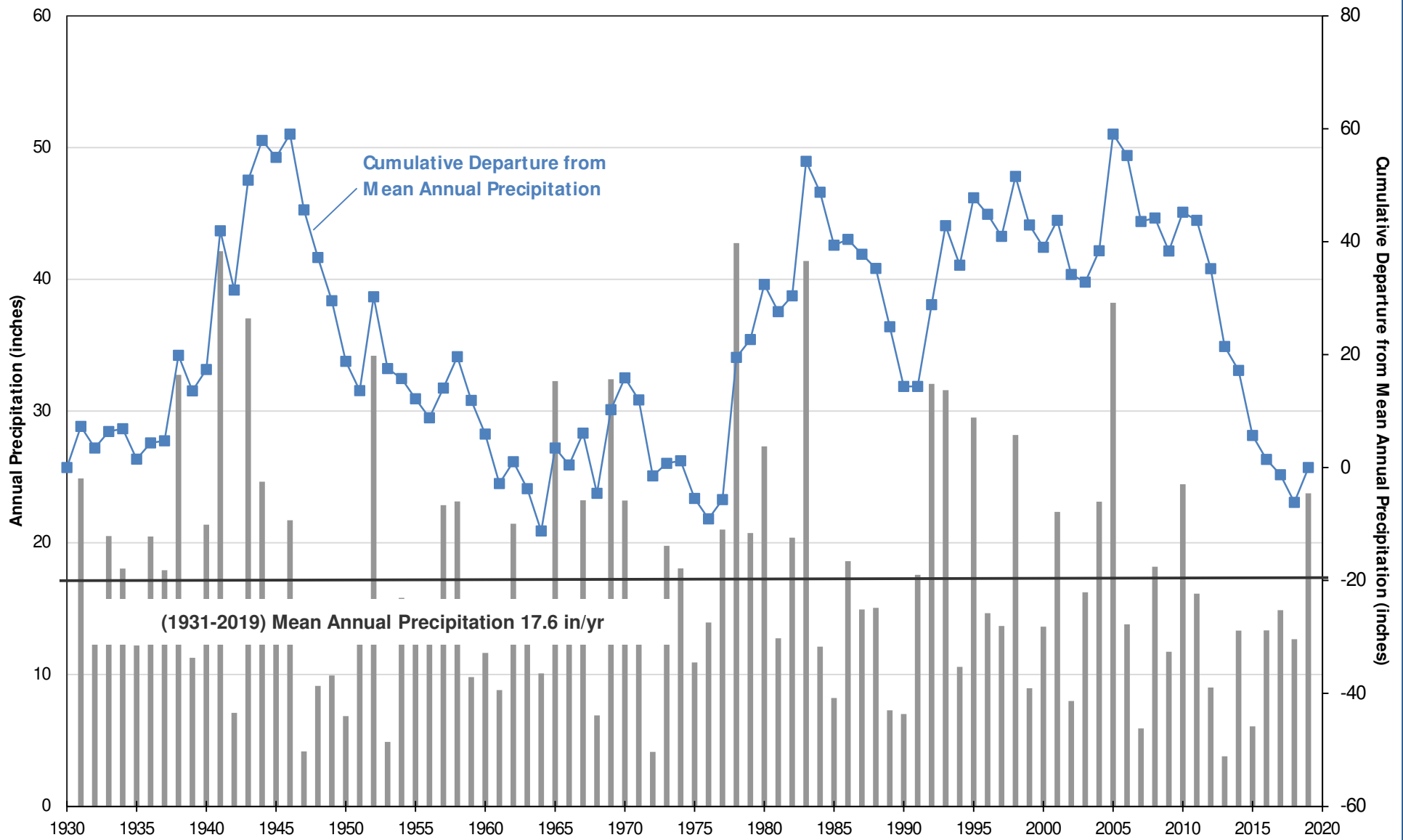


side of the Valley (**Figure 1-4**). This gage is operated by SCV Water and is part of the California Irrigation Management Information System (CIMIS) managed by DWR. Daily precipitation data at this location are available beginning in January 2008. These data correlate well with the other two precipitation gages in the Valley over the period of 2008 through 2019, with the exception of data for the month of December 2010 and January 2017. The fourth gage, Canyon Country, reported by National Centers for Environmental Information (NCEI), is located farther east in the Valley near Sand Canyon Road and the Santa Clara River. Daily precipitation data at this location are available beginning in January 2010, and these data also correlate well with the other two long-term precipitation gages in the Valley and the CIMIS gage over the period of record (2010-2019) except for November and December 2019 where some daily data were not reported. Comparison of historical data collected from all four gages between 2010 through 2019 indicates the SCVWA-Pine Street gage receives the most precipitation followed by the Newhall Fire Station Gage #73, Canyon Country, and CIMIS Station #204.

The Santa Clarita Valley is characterized as having an arid climate. Historically, intermittent periods of below-average precipitation have typically been followed by periods of above-average precipitation in a cyclical pattern, with each above average or below average period typically lasting from one to five years. The longer-term precipitation records for the Newhall Fire Station #73 gage are illustrated in **Figure 1-5**. Long-term annual (calendar year) average precipitation at that gage is 17.5 inches calculated for the 1931 through 2019 period. **Figure 1-5** also shows the cumulative departure from mean annual precipitation which shows periods of above average rainfall (increasing slope or trend with time) and below average rainfall (declining trend or slope with time). In general, periods of below-average precipitation have been longer and more moderate than periods of above average

precipitation. Historically, the periods from 1947 to 1964, 1971 to 1976, 1984 to 1991 and 1999 to 2003 have generally been drier than average; the periods from 1938 to 1946, 1965 to 1970, 1977 to 1983, 1992 to 1996, and 2004 to 2005 have been wetter than average. Recently, the dry or below average period that began in 2006, had generally persisted through 2018 with all but two of those years (2008 and 2010) having below average rainfall totals. 2012 and 2013 were significantly below average with approximately 9.0 and 3.7 inches, respectively, and 2013 experienced the lowest amount of precipitation that has been recorded since 1931. Generally, the 2006 through 2018 period has experienced the longest and most severe dry period since the 1947 to 1964 period. Precipitation in the 2019 calendar year was above the long-term average at 23.8 inches. Early 2020 has seen below average rainfall in the Santa Clarita Valley, while year-to-date demand has been greater than 2019 early year (January through April) demand. These conditions combined with water supply considerations, anticipated growth in the service area, and continued water conservation measures, discussed in Chapters 3, 4, and 5 are expected to result in 2020 water requirements being more than the water requirements in 2019.





Annual Precipitation and Cumulative Departure from Mean Annual Precipitation at Newhall Fire Station #73 Gage

*Santa Clarita Valley Water Report
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Figure 1-5

2 - 2019 Water Supplies and Use

Water supplies in the Valley are utilized for municipal, agricultural, private domestic, and miscellaneous purposes. The sources of water are varied and include imported water from the SWP and other sources, along with local supplies from groundwater, and recycled water.

2.1 2019 Water Supplies

Total water use in the Santa Clarita Valley was 72,600 af in 2019. Of the total, 60,100 af were for municipal use and the remaining 12,500 af were for agricultural and other (miscellaneous) uses, including estimated individual domestic uses (**Table 2-1**) and (**Figure 2-1**). Total water use was met by a combination of approximately 30,000 af from local groundwater resources (approximately 17,500 af for municipal supply and 12,500 af for agricultural and other uses), 42,100 af from SWP and other imported water sources, and approximately 450 af from recycled water (**Figure 2-2**).

Compared to 2018, total water use in the Santa Clarita Valley in 2019 was seven percent lower, and it was below the short-term projected water requirements estimated in the 2015 UWMP and the 2018 Water Report.

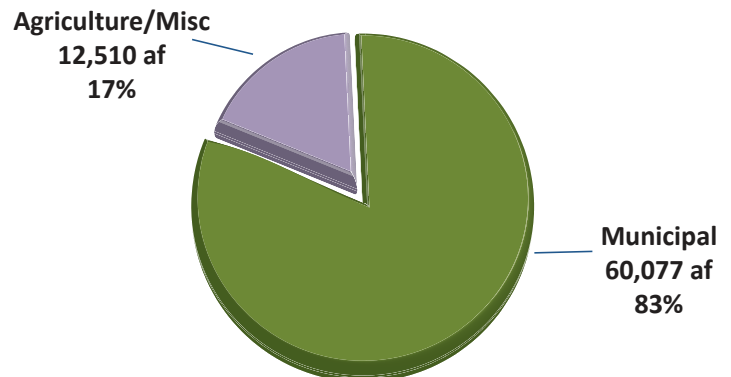


Figure 2-1: Water Use by Sector

Table 2-1: Summary of 2019 Water Supplies and Uses (af)

Municipal	
Imported Water	42,072
Groundwater	17,547
Recycled Water	458
Subtotal	60,077
Agriculture and Miscellaneous	
Groundwater	12,510
Subtotal	12,510
Total	72,587

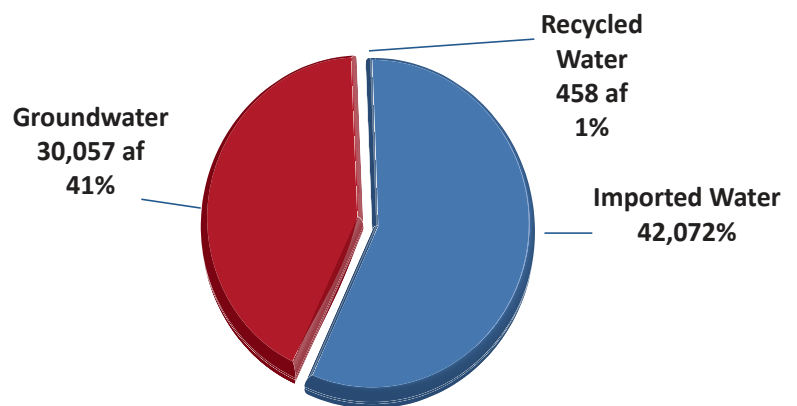


Figure 2-2: Water Use by Source

2.2 Historical Water Use Trends

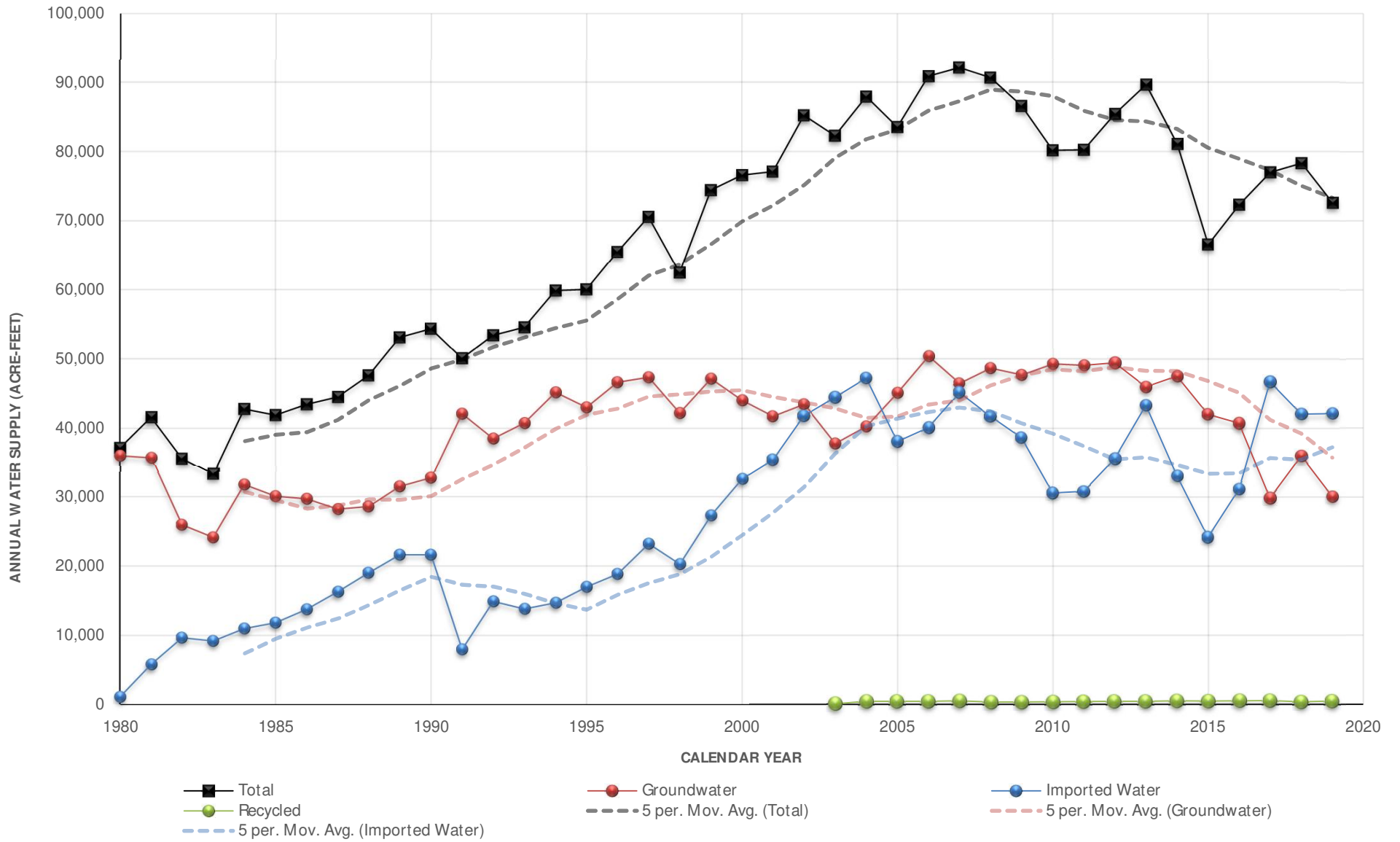
Water supply utilization for all uses in the Santa Clarita Valley for the period 2010 through 2019, is summarized in **Table 2-2**.

Table 2-2: Total Water Supply Utilization (af)

Year	Imported Water	Groundwater	Recycled Water	TOTAL
2010	30,578	49,251	336	80,165
2011	30,808	49,063	373	80,244
2012	35,558	49,420	428	85,406
2013	43,281	45,930	400	89,611
2014	33,092	47,497	474	81,063
2015	24,148	41,972	450	66,570
2016	31,130	40,688	507	72,325
2017	46,651	29,841	501	76,993
2018	41,999	35,940	352	78,291
2019	42,072	30,057	458	72,587

The annual utilization of local groundwater and imported water since 1980, complemented by the addition of recycled water, are graphically illustrated in **Figure 2-3**. Detailed summary tables of water utilization by municipal and agricultural entities over the complete record beginning in 1980 are provided in **Appendix A**. As depicted in **Figure 2-3**, total water use in the Valley was nearly linearly increasing from the early 1980s (approximately 35,000 af) through 2007 (92,000 af), with some climatic-related fluctuations in certain years. Since 2007, total water use has declined back to levels last seen in the late 1990s (73,000 af in 2019). The increasing trend between 1980 and 2007 followed by a decreasing trend since then is also seen in the trend line in **Figure 2-3**. The recent and continued decline in demand had been at least partially attributed to the economic slowdown that began in 2008, however, increasing drought awareness and increased conservation efforts since then are credited with long-term reduction in demand currently at those levels of the late 1990s.

As can also be seen by inspection of **Figure 2-3**, most of the historical increase in water demand from 1980 through 2019 has been met with generally greater proportions of imported water. Total groundwater use has generally remained constant through 2014. Since then, groundwater use has been gradually declining at a rate of about 1,500 afy and in 2019 was at the lowest level (30,000 af) of the last 30 years (1989-2019).



Total Water Supply Utilization

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Figure 2-3



2.3 Municipal Water Use

Recent municipal water use and service connections are summarized in **Table 2-3**; detailed use by SCV Water and LACWD36 over the longer-term period (1980-2019) is provided in **Appendix A**.

Table 2-3: Municipal Water Supply Utilization and Service Connections

Year	Municipal Water Use (af)	Service Connections	Use per Service Connections
2010	64,066	69,953	0.9
2011	64,805	70,313	0.9
2012	69,712	70,799	1.0
2013	73,460	71,561	1.0
2014	68,178	72,385	0.9
2015	54,491	73,115	0.7
2016	57,966	73,821	0.8
2017	63,555	74,034	0.9
2018	65,220	72,953 ¹	0.9
2019	60,077	73,161	0.8

¹ The decrease in service connections in ²⁰¹⁸ is due incorporating a similar methodology across all divisions in not counting service connections for fire service and vacant construction locations.

Since 2009, the annual increase in the number of new service connections has ranged from 200 to 800. The number of new service connections in recent years is small compared to the number added each year over the 2001 to 2009 period when the number of new service connections ranged from 1,000 to 6,000. In 2001, 52,300 service connections used 60,700 af, and in 2018, 73,000 service connections used 65,200 af (**Figure 2-4**). In 2001, the amount of water per service connection was more than 1 af, while water use has declined recently to levels that average less than 1 af per service connection.

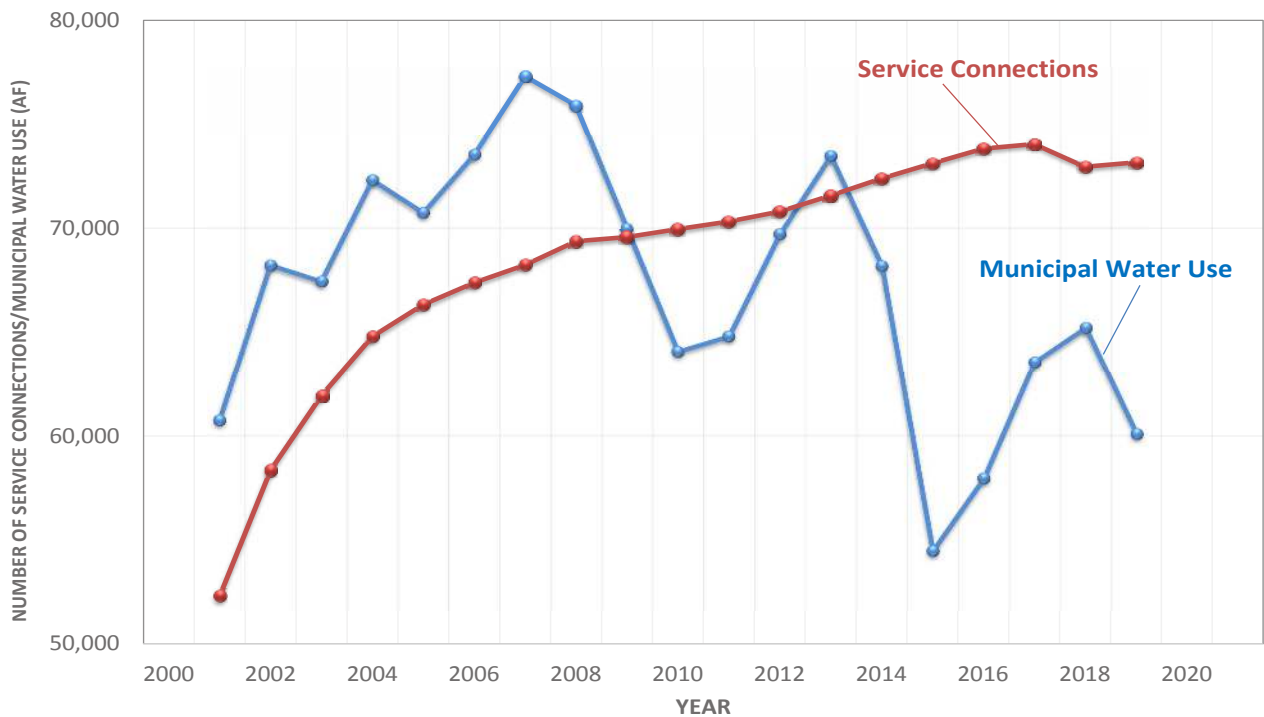


Figure 2-4: Service Connections and Municipal Water Use

2.4 Agricultural and Other Water Uses

Water supply utilization for agricultural and other non-municipal uses are summarized in **Table 2-4**. The category of Small Private Domestic, Irrigation and Golf Course Uses includes an estimated 500 afy of individual private pumping from the Alluvium. Annual water supply utilization for all agricultural and other non-municipal uses has generally remained stable and has averaged approximately 15,000 af since the mid-1990s and was approximately 12,500 af in 2019.

Table 2-4: Water Supply Utilization by Agricultural and Other Users

Year	Five Point	Pitchess Detension Center	Small Private Domestic, Irrigation, and Golf Courses	All Agricultural Users
2010	11,138	3,446	1,515	16,099
2011	10,667	3,226	1,546	15,439
2012	11,296	2,722	1,676	15,694
2013	12,091	2,309	1,751	16,151
2014	9,262	2,082	1,541	12,885
2015	8,868	1,768	1,443	12,079
2016	11,276	1,616	1,467	14,359
2017	10,348	1,630	1,460	13,438
2018	10,231	1,611	1,229	13,071
2019	9,790	1,560	1,160	12,510

3 - Water Supplies

Prior to 1980, local groundwater extracted from the Alluvium and the Saugus Formation was the sole source of water supply in the Santa Clarita Valley. Since 1980, local groundwater supplies have been supplemented with imported SWP water supplies, augmented in 2007 by acquisition of additional supplemental water imported from the Buena Vista Water Storage District and Rosedale-Rio Bravo Water Storage District, and Yuba Accord water in 2008. Those water supplies have also been slightly augmented by deliveries from the recycled water program since 2003. This section describes the groundwater resources of the Santa Clarita Valley, SWP and other imported water supplies, and the recycled water program.

3.1 Groundwater Basin Yield

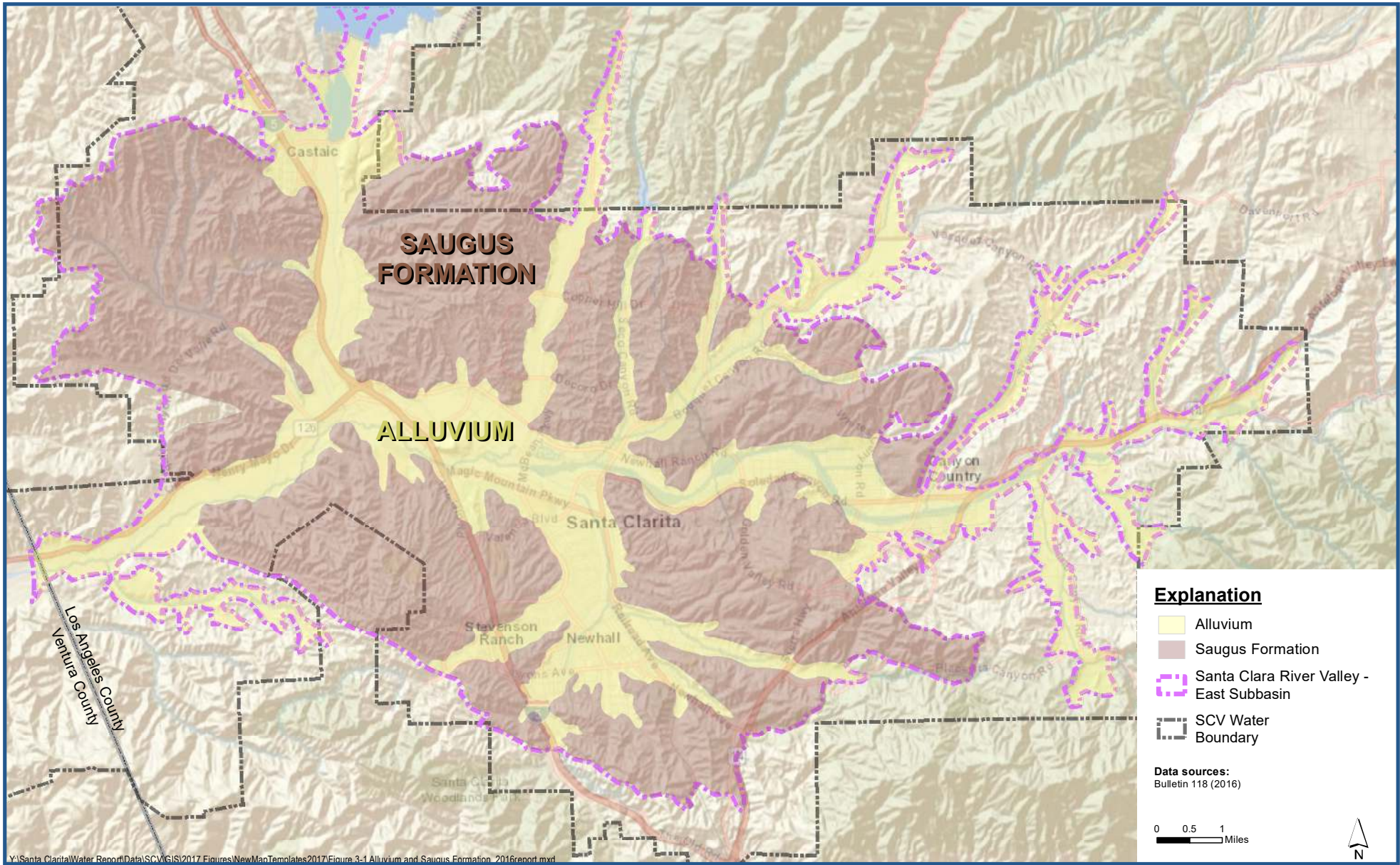
The groundwater basin beneath the Santa Clarita Valley, identified in the DWR's interim update to Bulletin 118 (DWR, 2016) as the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin No. 4-4.07), comprises two aquifers, the Alluvium and Saugus Formation. The Alluvium generally underlies the Santa Clara River and its several tributaries, and the Saugus Formation underlies practically the entire Upper Santa Clara River area. The mapped extent of the Santa Clara River Valley East Groundwater Subbasin in DWR Bulletin 118 and its relationship to the extent of the SCV Water service area are illustrated in [Figure 3-1](#). The mapped subbasin boundary approximately coincides with the outer extent of the Alluvium and Saugus Formation.



3.1.1 Historical Investigations

Since 1986, there have been several efforts which have evaluated and reported on the Alluvium and Saugus Formations, interpreted hydrologic conditions, and estimated sustainable yields from both formations (Slade, 1986; Slade, 1988; Slade & Associates, 2002; CLWA, 2003; CH2M Hill, 2004; CH2M HILL, 2005; CH2M HILL and LSCE, 2005; CLWA, 2005; and LSCE and GSI, 2009). Generally, these investigations have similar conclusions for basin conditions and yield:

- ▲ Analysis of groundwater levels and production indicates that there have been no conditions that would be illustrative of groundwater overdraft.
- ▲ The utilization of operational yield (as opposed to perennial yield) as a basis for managing groundwater production would be more applicable in this basin to reflect the fluctuating utilization of groundwater in conjunction with imported SWP water.
- ▲ The operational yield of the Alluvium would typically be 30,000 to 40,000 afy for wet and normal rainfall years, with an expected reduction into the range of 30,000 to 35,000 afy in dry years.
- ▲ The operational yield of the Saugus Formation would typically be in the range of 7,500 to 15,000 afy on a long-term basis, with possible short-term increases during dry periods into a range of 15,000 to 25,000 afy, and to 35,000 afy if dry conditions continue.



These conclusions became the foundation of the initial Groundwater Operating Plan (initial Plan) first developed in 2004 after the adoption of a formal Groundwater Management Plan (GWMP) in 2003 (CLWA, 2003). The groundwater component of overall water supply in the Valley was derived from this initial Plan to meet water requirements (municipal, agricultural and other non-municipal, and small individual domestic) while maintaining the basin in a sustainable condition (i.e., no long-term depletion of groundwater or interrelated surface water). This initial Plan also addressed groundwater contamination issues in the basin, all consistent with the GWMP. The initial Plan was based on the concept that pumping can vary from year to year to generally rely on increased groundwater use in dry periods and increased recharge during locally wet periods, and to collectively assure that the groundwater basin is adequately replenished through various wet/dry cycles.

3.1.2 Current Operating Plan

The initial Plan was updated in 2008 to evaluate the yield of the basin and present a sustainable operating plan for utilizing groundwater resources from the Alluvium and the Saugus Formation under wet, normal, and dry conditions (LSCE and GSI, 2009). The Current Operating Plan summarized in **Table 3-1** is the result of an updated analysis that further assessed groundwater development potential, effects of climate change, and possible augmentation of the initial Plan.

Table 3-1: Groundwater Operating Plan for the Santa Clarita Valley

Aquifer	Groundwater Production (af)			
	Normal Years	Dry Year 1	Dry Year 2	Dry Year 3
Alluvium	30,000 to 40,000	30,000 to 35,000	30,000 to 35,000	30,000 to 35,000
Saugus	7,500 to 15,000	15,000 to 25,000	21,000 to 25,000	21,000 to 35,000
Total	37,500 to 55,000	45,000 to 60,000	51,000 to 60,000	51,000 to 70,000

The updated basin yield analysis (LSCE and GSI, 2009), completed in August 2009, had the following conclusions:

- ▲ The Current Operating Plan, with currently envisioned pumping rates and distribution will not cause detrimental short- or long-term effects to the groundwater and surface water resources in the Valley and is, therefore, sustainable (**Table 3-1**)². Further, local conditions in the Alluvium in the eastern end of the basin can be expected to repeat historical groundwater level declines during dry periods, necessitating a reduction in desired pumping from the Alluvium due to decreased well yield. However, those reductions in pumping from the Alluvium can be made up by an equivalent amount of increased pumping on a short-term basis in other parts of the basin without disrupting basin-wide sustainability or local pumping capacity in those other areas. For the Saugus Formation, the modeling analysis indicated that it can sustain the pumping that is embedded in the Current Operating Plan.

² A Potential Operating Plan (pumping between 41,500 and 47,500 afy from the Alluvium) would result in lower groundwater levels, failure of the basin to fully recover (during wet hydrologic cycles) from depressed storage that would occur during dry periods, and generally declining trends in groundwater levels and storage. Long-term lowering of groundwater levels would also occur in the Saugus Formation (pumping between approximately 16,000 and nearly 40,000 afy) with only partial water level recovery occurring in the Saugus Formation. Thus, the Potential Operating Plan would not be sustainable over a long-term period.

▲ Several climate change models were examined to estimate the potential impacts on local hydrology in the Santa Clarita Valley. The range of potential climate change impacts extends from a possible wet trend to a possible dry trend over the long term (from 2010 through 2095). The trends that range from an approximate continuation of historical average precipitation, to something wetter than that, would appear to result in continued sustainability of the Current Operating Plan, again with intermittent constraints on full pumping in the eastern part of the basin. The potential long-term dry trend arising out of climate change would be expected to decrease local recharge to the point that lower and declining groundwater levels would render the Current Operating Plan unsustainable. Ultimately it was recognized that a wide range of potential climate change scenarios produce a range of non-unique results with respect to local hydrologic conditions and associated sustainable groundwater supply. Notable in the wide range of possibilities, however, was the output that, over the planning horizon of the 2010 and 2015 UWMP (through 2050), the range of relatively wet to relatively dry hydrologic conditions would be expected to produce sustainable groundwater conditions under the Current Operating Plan.

Based on the preceding conclusions, groundwater utilization generally has continued in accordance with the Current Operating Plan.

3.1.3 Sustainable Groundwater Management Act (SGMA)

The Sustainable Groundwater Management Act (SGMA) was passed by the State in 2014, which provided a state-wide framework for “management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results”. SGMA requires local water agencies to sustainably manage groundwater resources. By January 2022, the Santa Clarita Valley

Groundwater Sustainability Agency (SCV-GSA) will develop a Groundwater Sustainability Plan (GSP) that describes basin conditions and how SCV-GSA will sustainably manage the groundwater resources in the basin without causing significant and unreasonable undesirable results.

Sustainable groundwater management provides a buffer against drought and climate change and contributes to reliable water supplies regardless of weather patterns. Santa Clarita depends on groundwater for a portion of its annual water supply and sustainable groundwater management is essential to a reliable and resilient water system.

The SCV-GSA’s GSP will cover the East Subbasin of the Santa Clara River Groundwater Basin (**Figure 3-1**). Its western limit is near the Los Angeles-Ventura County Line and its eastern limit is generally along Highway 14. It includes the neighborhoods of Castaic, Stevenson Ranch, Valencia, Newhall, Saugus, and Canyon Country.

For information on the SGMA efforts in the Subbasin, please refer to the homepage for SCV-GSA at <https://scvgsa.org>.

3.2 Alluvium – General

The spatial extent of the aquifers used for groundwater supply in the Valley, the Alluvium and the Saugus Formation, are illustrated in **Figure 3-1**. Geologic descriptions and hydrogeologic details related to both aquifers are included in several technical reports including Slade (1986, 1988, and 2002), CH2M Hill (2005) and LSCE (2005), the 2005 UWMP (CLWA, 2005), the 2010 UWMP (CLWA, 2011), and the 2015 UWMP.

Consistent with the 2001 Update Report (Slade, 2002), the 2005 Basin Yield Report (CH2M Hill and LSCE, 2005), the 2009 Updated Basin Yield Report (LSCE and GSI, 2009), and the UWMPs (2005, 2010, and 2015), the management practice of the Agency continues to be reliance on groundwater from the Alluvium for part of the overall municipal water supply, whereby total pumping from the Alluvium (by municipal, agricultural, and private pumpers) is in accordance with the Current Operating Plan,

30,000 to 40,000 afy in wet and normal years, with possible reduction to 30,000 to 35,000 afy during multiple dry years. Such operations will maximize use of the Alluvium because of the aquifer's ability to store and produce good quality water on a sustainable basis, and because the Alluvium is capable of rapid recovery of groundwater storage in wet periods. As with many groundwater basins, it is possible to intermittently exceed a long-term average yield for one or more years without long-term adverse effects. Higher pumping for short periods may temporarily lower groundwater storage and related water levels, as has been the case in the Alluvium several times since the 1930's. However, subsequent decreases in pumping limit the amount of water level decline. Normal to wet-period recharge results in a rapid return of groundwater levels to historic highs. Historical groundwater level data collected from the Alluvium over numerous hydrologic cycles continue to provide assurance that groundwater elevations, if locally lowered during dry periods, recover in subsequent average or wet years. Such water level response to rainfall is a significant characteristic of permeable, porous, alluvial aquifer systems that occur within large watersheds. In light of these historical observations, complemented by the long-term sustainability analysis using a numerical groundwater flow model in 2008, there is ongoing confidence that groundwater will continue to be a sustainable source of water supply at the rates of pumping as described in the 2009 Updated Basin Yield Report, and incorporated in the Valley's recent UWMPs.

Long-term adverse impacts to the Alluvium could occur if the amount of water extracted from the aquifer were to exceed the amount of water that recharges the aquifer over an extended period. However, the quantity and quality of water in the Alluvium and all significant pumping from the Alluvium are routinely monitored, and no long-term adverse impacts have ever been evident. Ultimately, SCV Water has identified cooperative measures to be taken, if needed, to ensure

sustainable use of the aquifer's groundwater resources. Such measures include, but are not limited to, the continuation of conjunctive use of SWP and other imported supplemental water with local groundwater, artificial recharge of the aquifer with local runoff or other surface water supplies, expanded use of other water supplies such as recycled water, and expanded implementation of demand-side management, including conservation.

3.2.1 Alluvium – 2019 Pumpage

Total pumping from the Alluvium in 2019 was approximately 21,000 af, approximately 5,450 af less than was pumped in 2018 and below the Current Operating Plan range for a dry year. Of the total Alluvial pumping in 2019, approximately 9,050 af (43 percent) was for municipal water supply, and the balance, approximately 11,950 af (57 percent), was for agriculture and other private uses, including individual domestic uses. The decrease in groundwater pumping from the Alluvium in 2019 from 2018 was the result of a higher proportion of water demands being met by imported water supplies.

3.2.2 Alluvium – Hydrogeologic Conditions

Interpretation of longer term, historical groundwater levels and pumping indicate that the amount of groundwater pumping in 2019 was at the lower end of historically observed conditions, while recent trends in groundwater levels are consistent with dry period declines or stable conditions. Since 1980, when SWP deliveries began, there has been a change in municipal/agricultural pumping distribution toward a higher fraction for municipal water supply from approximately 50 percent to more than 65 percent of Alluvial pumpage, reflecting general land use changes in the Valley. The recent shift back to a 50 percent municipal/agricultural pumping distribution over the last few years is related to an increase in imported municipal water use and not due to changes in land use. Ultimately, on a long-term average annual basis since the initiation

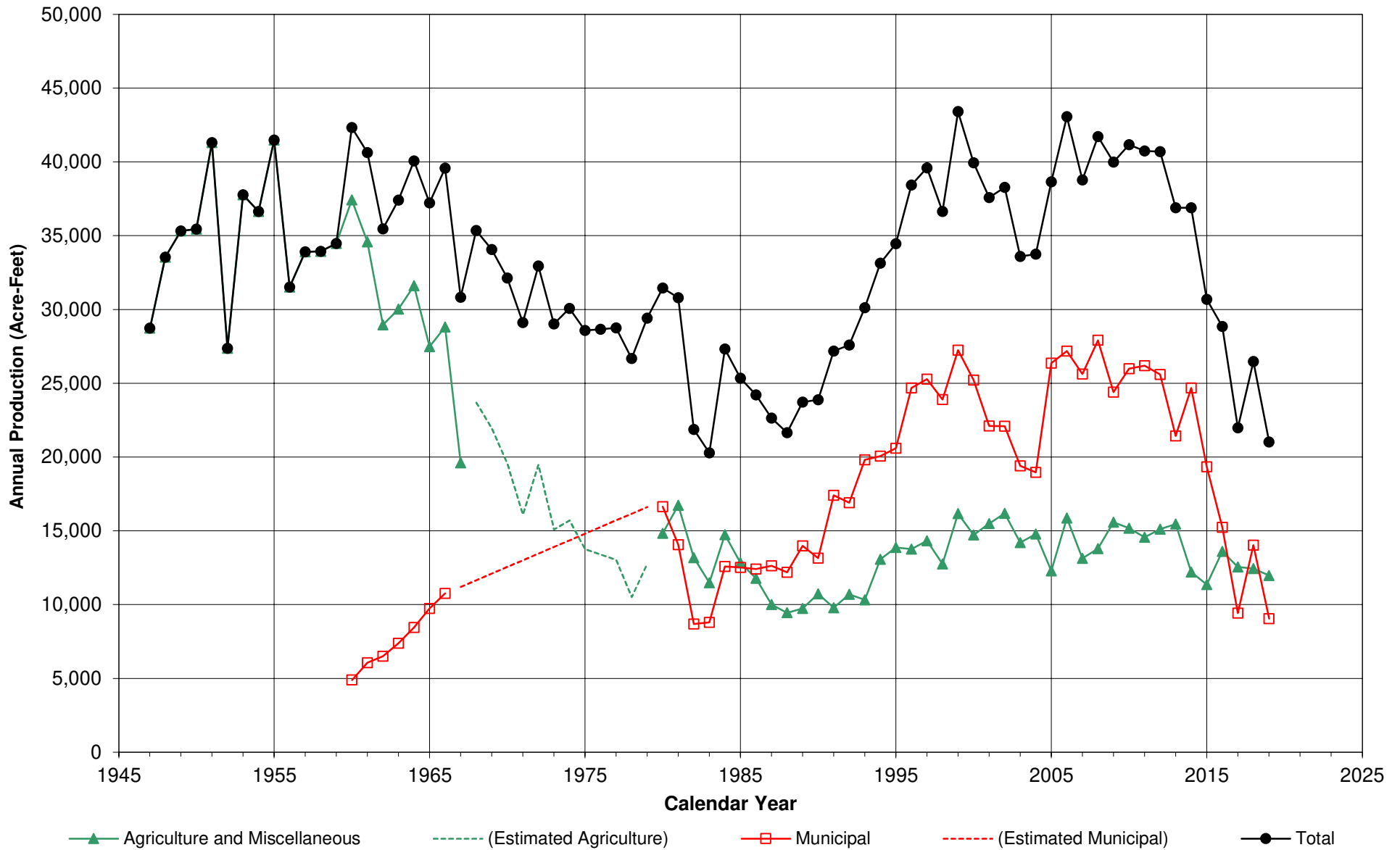
of SWP deliveries in 1980, total Alluvial pumping has been approximately 32,400 afy, which is at the lower end of the range of operational yield of the Alluvium during normal years and in the middle of the range for dry years. That annual average has been about the same over the last ten years, approximately 32,500 afy, which remains within the range of operational yield of the Alluvium on a long term annual average basis representing normal hydrologic conditions and also within the range for multiple dry year conditions. The overall historic record of Alluvial pumping is shown in **Appendix A** and illustrated in **Figure 3-2**.

Groundwater levels in various parts of the basin have historically exhibited different responses to both pumpage and climatic fluctuations. Since the 1960's, depending on location, groundwater levels in the Alluvium have remained fairly stable with small seasonal variations (generally toward the western end in the main part of the Valley), or have fluctuated from near the ground surface when the subbasin is full in wet periods, to as much as 100 feet lower during intermittent dry periods of reduced recharge (generally toward the eastern end of the subbasin). When water levels are low, well yields and pumping capacities in the eastern areas are impacted due to a reduction in the saturated thickness of the Alluvium which impacts well operations. SCV Water typically responds by decreasing or ceasing pumping from the Alluvium and increasing the use of groundwater from the Saugus Formation and imported (SWP and other) supplies, as shown in **Appendix A**. The Agency also shifts a fraction of the Alluvial pumping that would normally be supplied by the eastern areas to areas further west, where well yields and pumping capacities remain generally constant because of smaller groundwater level fluctuations in response to wet and dry hydrologic periods.

For illustration of the various groundwater level conditions in the Valley, the Alluvial wells have been grouped into areas with similar groundwater level patterns, as shown in **Figure**

3-3. The groundwater level records from many monitored wells in the Valley have been analyzed and a representative number of wells have been selected to illustrate groundwater conditions in the different areas of the Valley. The data from the representative wells have been organized into hydrograph form showing groundwater elevation on a time series basis as illustrated in **Figures 3-4** and **3-5**. Also shown on these plots is a marker indicating whether any calendar year had below-average rainfall. As shown on the figures, the Valley has experienced a long-term dry period for the most part since 2006. The plots show the range of values over time through each area and contain a sufficiently long-term record to illustrate trends over time that are typically observed in each area.

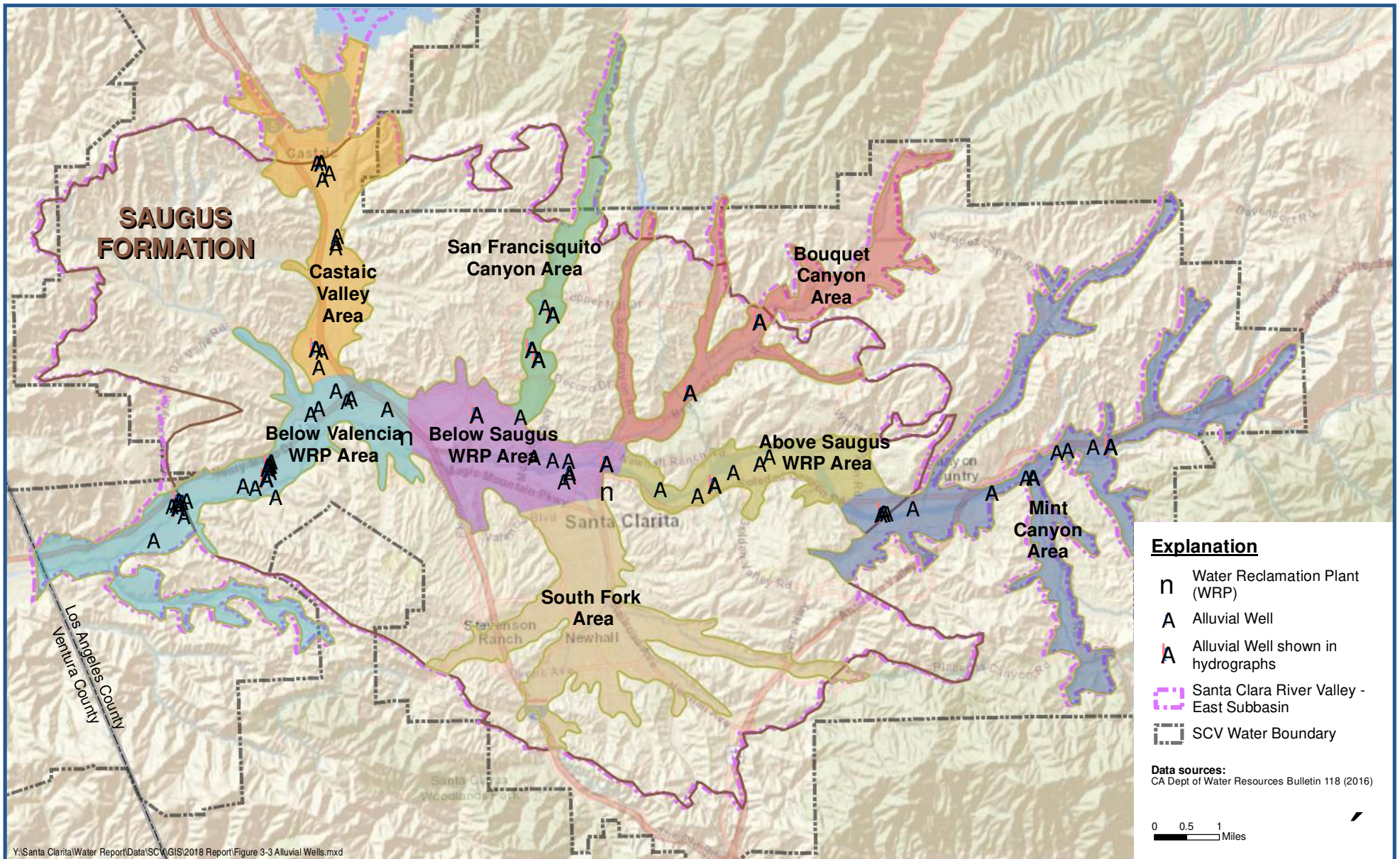
Situated along the upstream end of the Santa Clara River, the Mint Canyon area, located at the far eastern end of the Valley, and the nearby Above Saugus Water Reclamation Plant (WRP) area generally exhibit similar groundwater level responses (**Figure 3-4**) to hydrologic (local climate) and pumping conditions. Groundwater elevations in wells located in the Mint Canyon area generally show more pronounced water level recoveries during wet periods as compared to groundwater levels in the Above Saugus WRP area. These eastern parts of the Valley have historically experienced a number of alternating wet and dry hydrologic conditions during which groundwater level declines have been followed by returns to high or mid-range historic levels. Long-term pumping in the Mint Canyon area has averaged approximately 6,800 afy (1985-2019). However, since a high of over 12,000 afy in 2006, pumping in the Mint Canyon area has since generally declined, and in 2019 pumping was approximately 2,100 af. Historical wet and dry periods illustrate the groundwater level response to managed Alluvial pumping. The period from 2006 through 2010 saw water level declines on the order of 50 to 60 feet; pumping was gradually reduced, and water levels stopped declining (**Figure 3-6** and **3-4**). Subsequent wet conditions in late

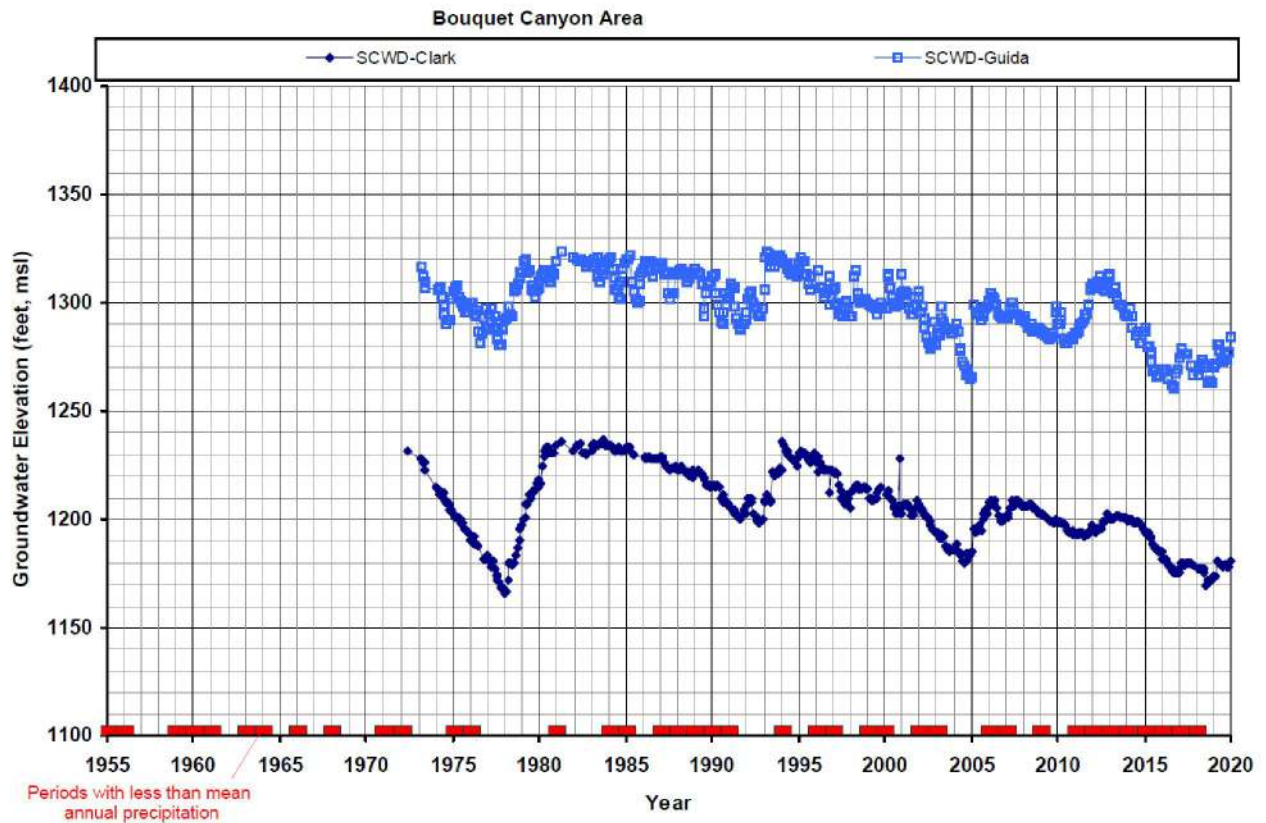
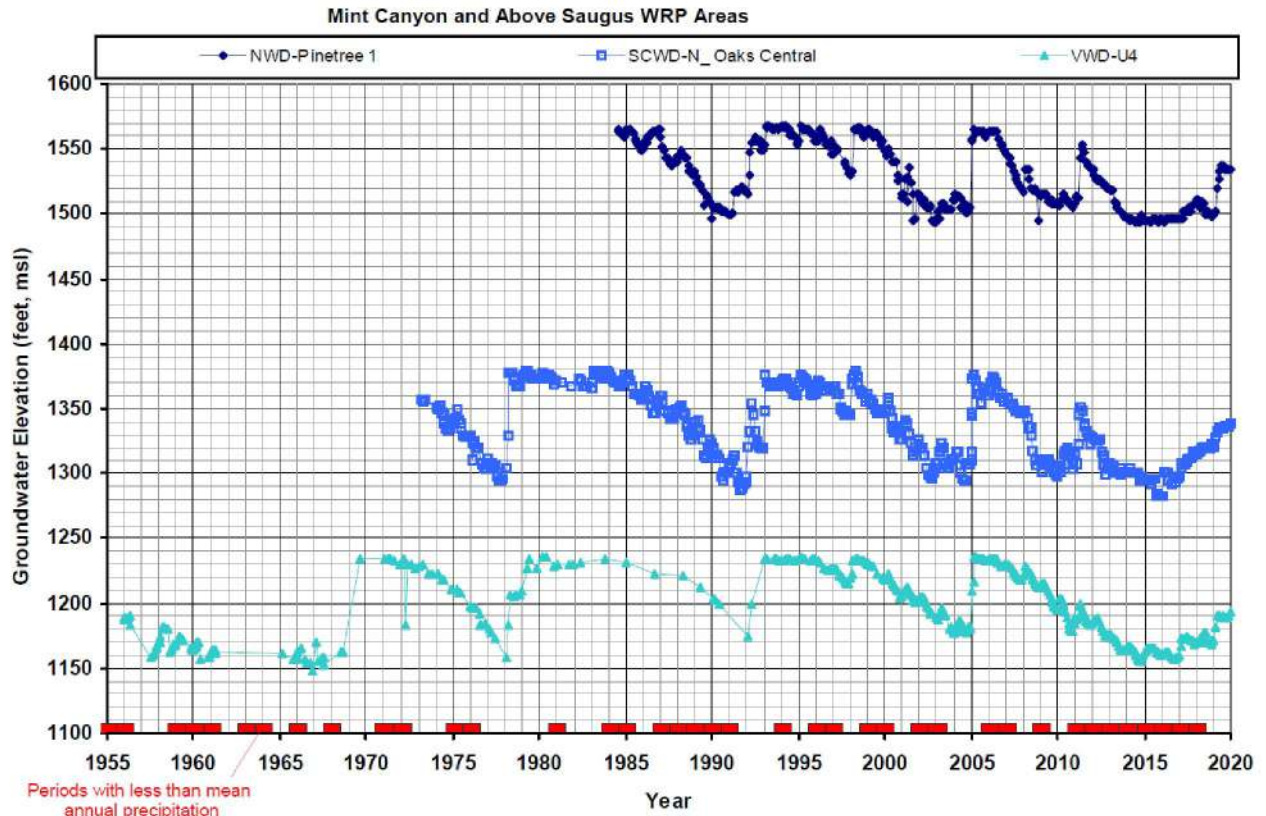


Groundwater Production - Alluvium

Santa Clarita Valley Water Report
 Santa Clarita Valley, Los Angeles County, California

Figure 3-2





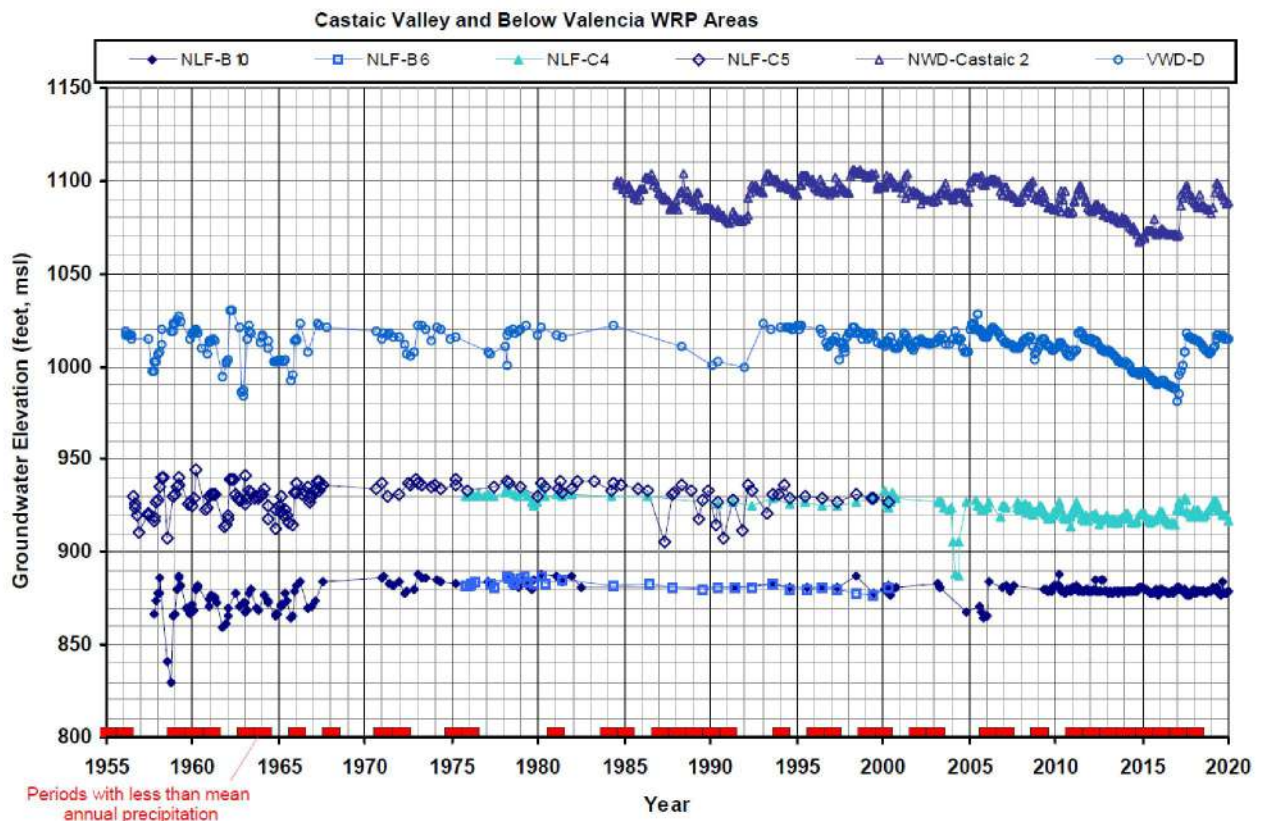
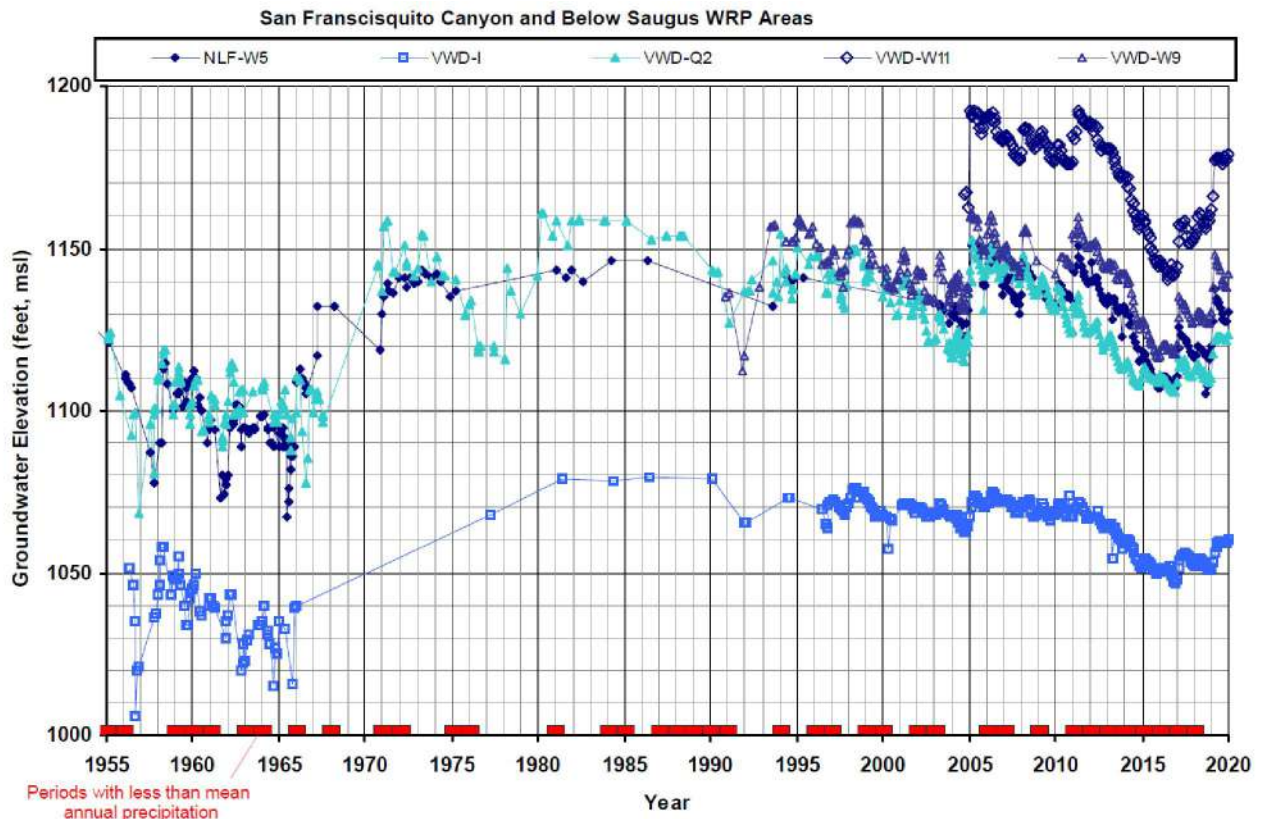
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Groundwater Elevations in Eastern Santa Clarita Valley Alluvial Wells

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Santa Clarita Valley, Los Angeles County, California

Figure 3-4



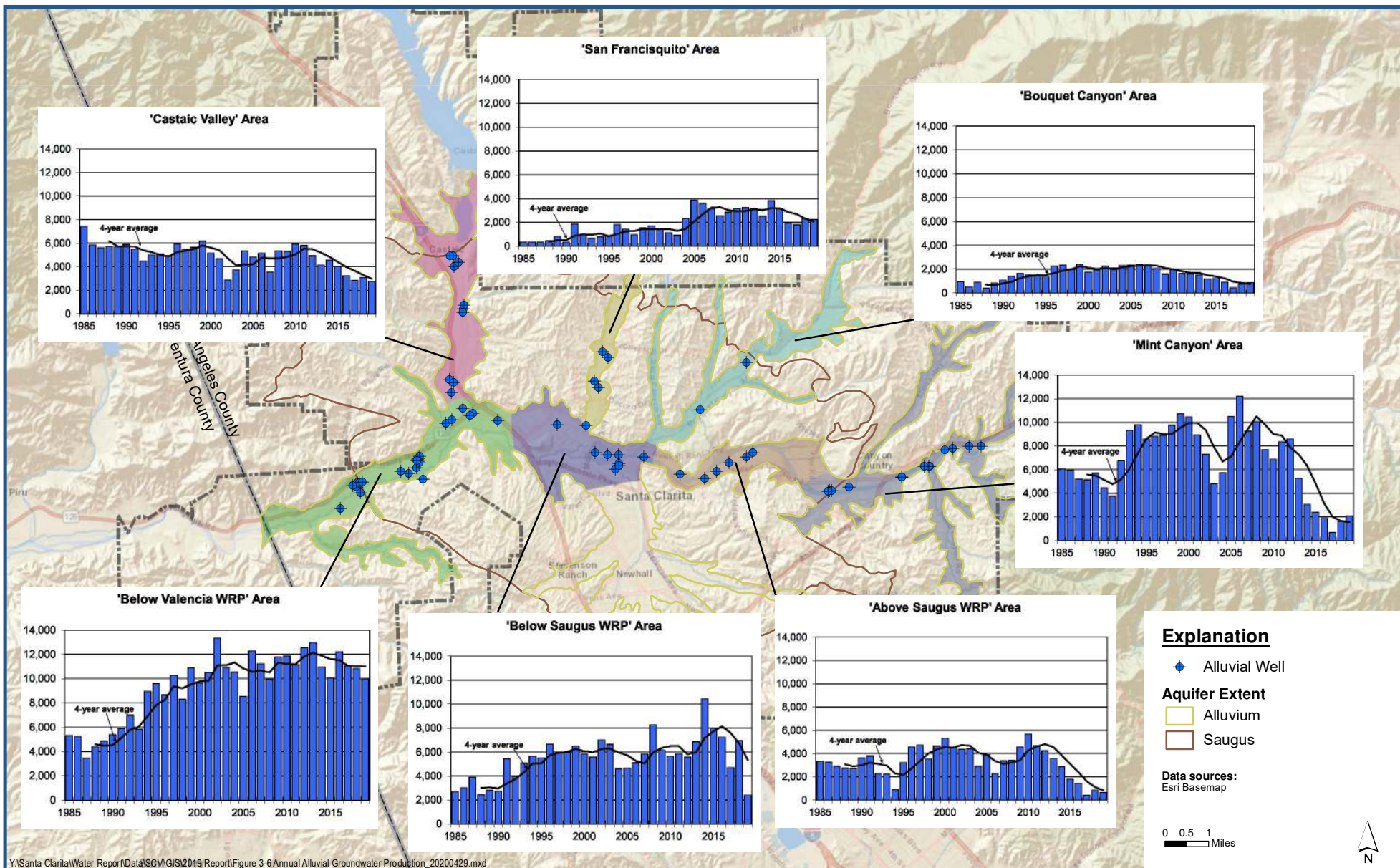
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Groundwater Elevations in Western Santa Clarita Valley Alluvial Wells

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Santa Clarita Valley, Los Angeles County, California

Figure 3-5



2010, continuing into 2011, resulted in a nearly full recovery of groundwater levels and aquifer storage dry conditions since 2012 coupled with the sustained decrease in pumping have resulted in groundwater levels stabilizing and showing slight increases in groundwater levels since 2013 in the Mint Canyon area (**Figure 3-4**). It is expected that aquifer storage and groundwater levels in the Mint Canyon area will recover once normal and/or wet conditions resume in the Valley.

Just west of the Mint Canyon area, the Above Saugus WRP area has shown similar hydrologic trends. Pumping trends are historically similar to the Mint Canyon area, with the pumping fluctuating in response to wet and dry periods. However, long-term average annual pumping in the Above Saugus WRP area has been less than half the pumping rate in Mint Canyon, as shown in **Figure 3-6**, at approximately 3,300 afy (1985-2019). Since the most recent high pumping rate of almost 6,000 af in 2010, pumping in this area has steadily declined, and in 2019 was 700 af, a slight decrease from 2018. Groundwater level response is similar to the Mint Canyon area in that groundwater levels are sensitive to variations in rainfall and pumping. Groundwater levels have exhibited a decline on the order of since 2005/2006 (except for a moderate rise in 2010/2011 in response to the above normal rainfall in that period) through 2014. Groundwater levels in the Above Saugus WRP area rose 40 to 60 feet from 2015 through 2019.

In the Bouquet Canyon area, groundwater levels, as represented by the Guida and Clark wells in **Figure 3-4**, are influenced by a number of factors, including groundwater pumping and recharge from rainfall, natural stream-flow in

Bouquet Canyon Creek and releases from Bouquet Reservoir into Bouquet Canyon Creek. Long-term annual groundwater pumping has averaged 1,600 afy (1985-2019) and has steadily declined since 2006 from a high of approximately 2,400 af to approximately 900 af in 2019 (similar to the pumping rates of the late 1980s). Groundwater elevations had increased in response to a wet rainfall year in 2005 and to resumed 'normal' releases of water from Bouquet Reservoir to Bouquet Canyon Creek that occurred in 2009 through 2011³. However, the dry conditions and a continued reduction in Bouquet Reservoir releases (related to streambed issues – not drought related) from 2012 through 2018 resulted in groundwater elevations declining a total of 30 to 45 feet. In 2019, groundwater elevation rose approximately 10 feet, but generally remained near historic lows.

Wells located in the San Francisquito Canyon area and presented in **Figure 3-5** (W5, W9 and W11 wells) generally exhibit similar long-term groundwater level trends that respond to variations in rainfall and pumpage with seasonal declines and partial recovery in dry years or full recovery to historical highs in wet years, similar in nature to other eastern areas of the Valley. In this area, groundwater levels declined approximately 50 feet from historic highs between 2011 and 2016 and have since recovered between 30 to 40 feet. The long-term average annual pumping rate has been approximately 1,800 afy (1985-2019) with a peak of approximately 3,900 af in 2005 and 2015 (and generally a higher sustained level of annual pumping through that ten-year period). Since 2015, annual pumping has gradually declined to approximately 2,300 afy, with 2,200 af pumped in 2019.

³Flow in Bouquet Canyon Creek is regulated by releases from Bouquet Reservoir, which is operated by Los Angeles Department of Water and Power. Per an agreement with United Water Conservation District, minimum releases from Bouquet Reservoir are specified. These releases had been maintained until a series of storms beginning in 2005 created substantial runoff and sediment deposition that altered the streambed so that even small amounts of flow overflows onto Bouquet Canyon Road. The flow carrying capacity of the creek was also impacted by an increase in sedimentation from runoff from areas burned by wildfires. Efforts to prevent flow onto the road while maintaining specified releases, restoring habitat and recharging domestic wells have not been completely successful, and therefore releases from Bouquet Reservoir have continued to be reduced during March through October since 2006 (except for 2009-2011). Currently, the Los Angeles County Department of Public Works is overseeing the Bouquet Canyon Creek Restoration Project with the primary objective to restore in-stream and riparian habitat by re-establishing creek flows. This project is still in the planning and implementation phases. (<http://dpw.lacounty.gov/wrd/Projects/BouquetCanyonCreek/index.cfm>).

In the western part and lower elevation portion of the subbasin, groundwater levels in the Alluvium respond to pumping and precipitation in a similar manner, but to an attenuated or limited extent compared to those situated in the eastern, higher elevation areas. As shown in the group of groundwater elevation hydrographs in **Figure 3-5** the magnitude of groundwater level fluctuations in the Below Saugus WRP area are less than those observed in the eastern areas of the Valley.

Wells located in the Below Saugus WRP area in **Figure 3-5** (VWD's I and Q2 wells), along the Santa Clara River immediately downstream of the Saugus Water Reclamation Plant generally show declining groundwater levels between 20-60 feet from 2006 through 2017, followed by a 10 to 15 foot recovery over 2018/2019. The long-term annual pumping rate in area has been about 5,500 afy (1985-2019). Pumping in this area had been sustained at approximately 6,000 afy from the mid-1990s to the early 2000s, followed by more variable (and overall increasing) annual pumping that reached a peak of 10,500 af in 2014. Since then, pumping has steadily decreased every year (except for 2018) to 2,400 af in 2019.

Groundwater levels in the Castaic Valley area, located along Castaic Creek below Castaic Lake, have been relatively stable since the 1950s through approximately 2011. Between 2011 and 2017, groundwater levels declined approximately 30 feet (**Figure 3-5**). The long-term annual pumping rate of wells in this area has been approximately 4,900 afy (1985-2019) (**Figure 3-6**). Over most of the record, groundwater pumping had been relatively stable at about 5,300 afy through 2011 (except for a brief drop in the early 2000s). A subsequent steady decline occurred between 2011 and 2015. And the last four years, pumping has stabilized again at approximately 3,000 afy. Groundwater levels in 2017 increased by 20 to 30 feet in the Castaic Valley Area and had nearly returned to historic highs. Groundwater levels decreased by about 10 feet in 2018 and subsequently rose by about 10 feet in 2019.

In the area downstream of the Valencia Water Reclamation Plant (WRP), which discharges treated effluent to the Santa Clara River, groundwater pumping has averaged 9,300 afy (1985-2019). It increased from below 5,000 afy in the 1980s to above 13,300 afy in 2002. Since then, pumping has been relatively constant at approximately 11,100 afy and was approximately 10,000 af in 2019 (**Figure 3-6**). Long-term groundwater levels in this area have generally been stable and have exhibited slight response to pumping and climatic fluctuations, although from 2008 to 2016, a slight decline of approximately 10 feet has been observed in some wells in this area due to generally dry conditions. In 2017, groundwater levels increased slightly (5-10 feet) and were subsequently stable through 2019 (**Figure 3-5**).

In summary, groundwater levels over the last 35 years in the Alluvium have exhibited historic highs as recent as 2011. In some locations, there are dry-period declines (resulting from use of some groundwater from storage) followed by wet-period recoveries of groundwater levels and storage. Since importation of supplemental SWP water beginning in 1980, or over the last 50 to 60 years (since the 1950s - 60s), groundwater levels in the Alluvium show no chronic trend toward decreasing water levels and storage (overdraft), although the recent long-term drought has had an influence on groundwater levels in many areas of the subbasin. Consequently, pumping from the Alluvium has been and continues to be sustainable, well within the operational yield of that aquifer on a long-term annual average basis. In 2019, groundwater levels were higher as compared to the previous year.

3.3 Saugus Formation – General

Wells constructed in the Saugus Formation are operated by SCV Water in a manner consistent with the Current Operating Plan and historical investigations that include the 2001 Update Report (Slade, 2002), the 2005 Basin Yield Report (CH2M Hill and LSCE, 2005), and the 2009 Updated Basin Yield Report (LSCE and GSI, 2009). These wells are primarily located in the southern and western portions of the basin (**Figure 3-7**). The Current Operating Plan targets pumping from the Saugus Formation in the range of 7,500 to 15,000 afy in average/normal years, with planned dry-year pumping of 15,000 to 35,000 afy for one to three consecutive dry years, when shortages to SWP water supplies could occur. The Current Operating Plan envisioned that high pumping during dry periods would be followed by periods of lower pumping in order to allow recovery of water levels and storage in the Saugus Formation. Maintaining the substantial volume of water in the Saugus Formation remains an important strategy to help maintain water supplies in the Santa Clarita Valley during drought periods. The ability to pump the Saugus Formation at dry-year levels has been historically impaired due to perchlorate contamination issues and resultant reduced production capacity. Both of these issues are expected to be resolved through installation of treatment and achieving containment.

3.3.1 Saugus Formation – 2019 Pumpage

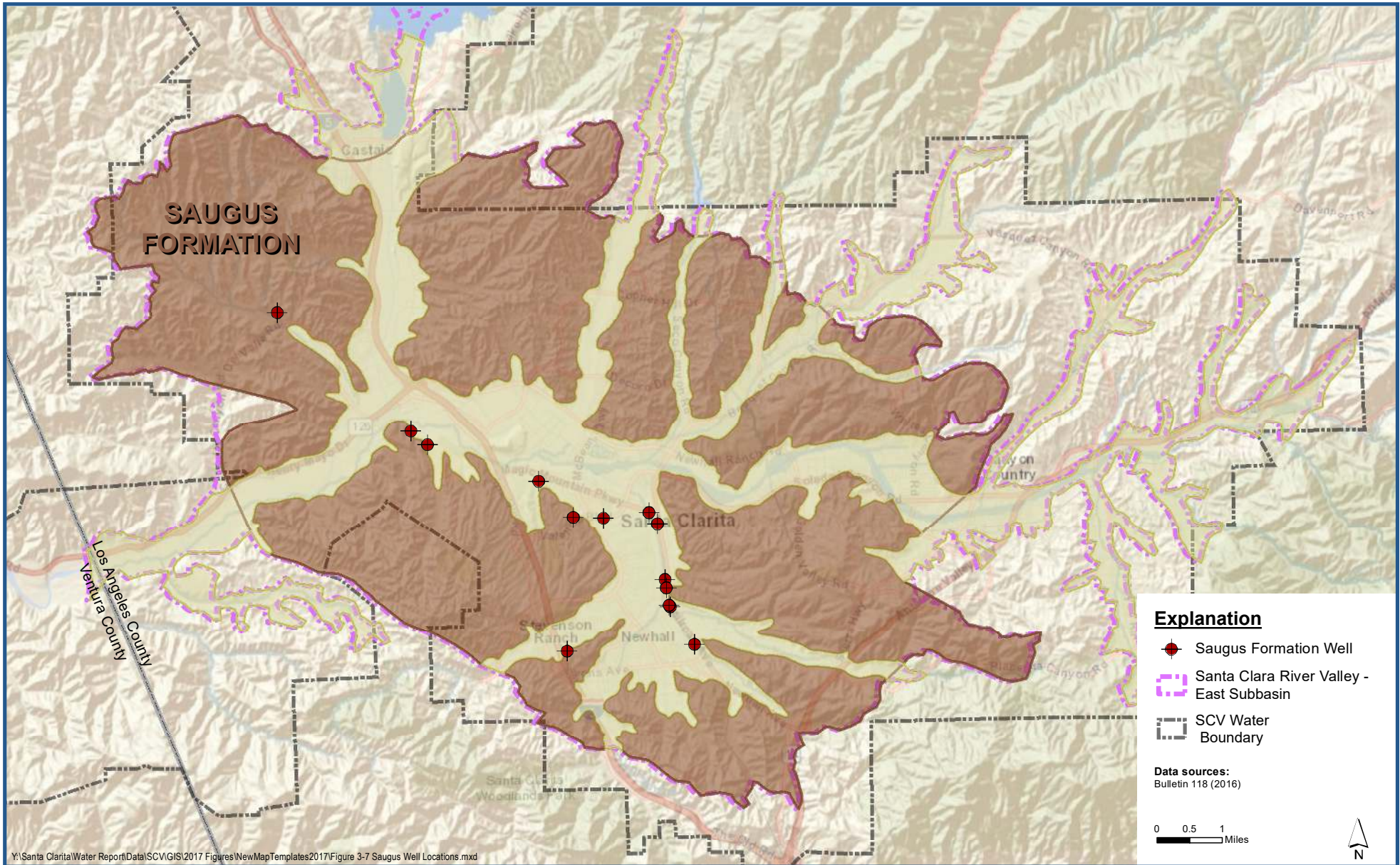
Total pumping from the Saugus Formation in 2019 was approximately 9,000 af, or approximately 400 af less than in the preceding year. This included approximately 3,200 af that were pumped from SCV Water’s Saugus 1 and Saugus 2 wells as part of the perchlorate pump and treat program as described herein. The bulk of Saugus Formation pumping in 2019 (approximately 8,500 af) was for municipal water supply, and the balance (550 af) was for agricultural and other uses.

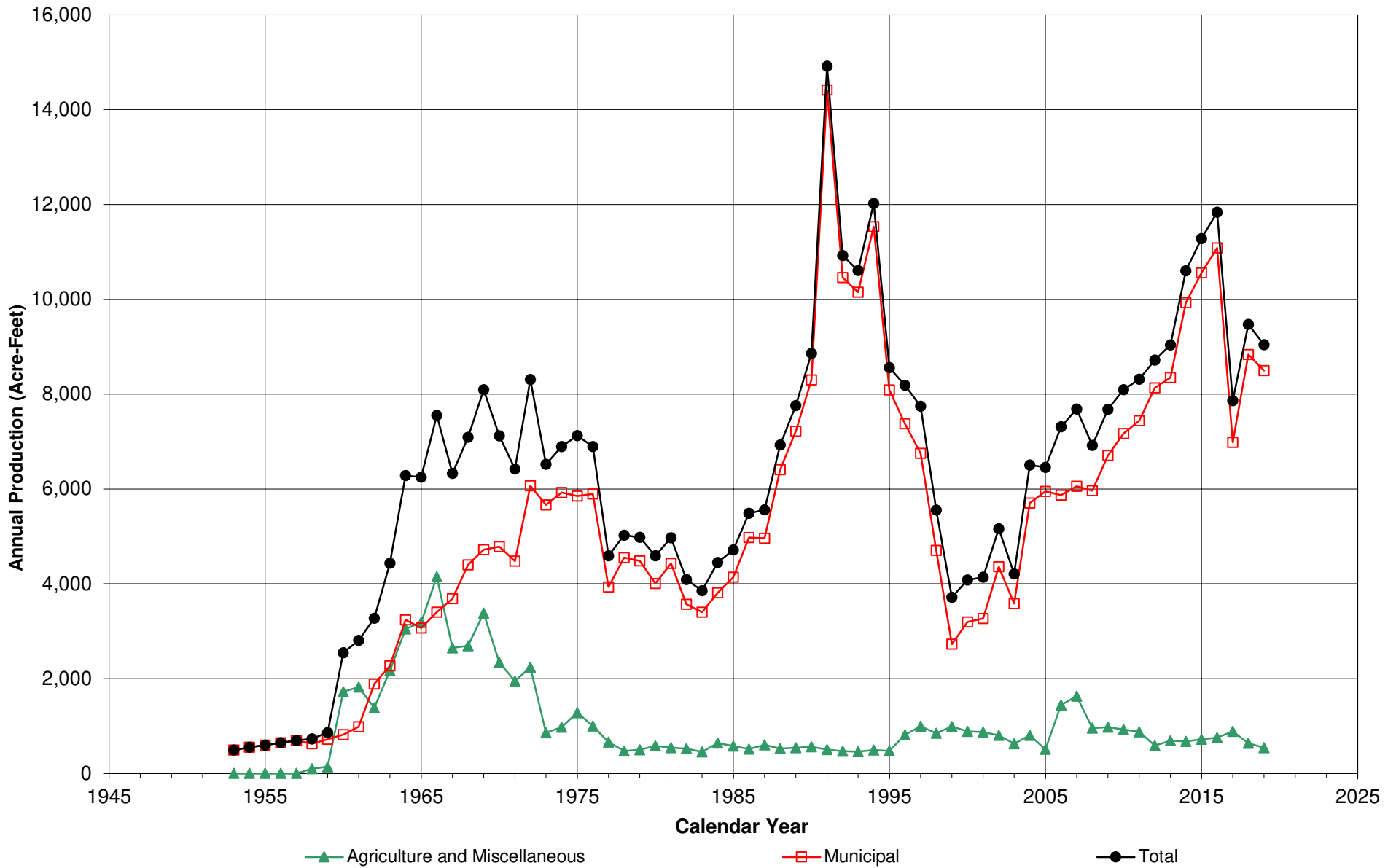
3.3.2 Saugus Formation – Hydrogeologic Conditions

Since the importation of SWP water beginning in 1980, total pumping from the Saugus Formation has ranged between 3,700 afy in 1999 to a high of nearly 15,000 af in 1991. Average annual pumping from 1980 through 2019 has been approximately 7,400 af. These pumping rates remain well within, and generally at the lower end of the range of the Current Operating Plan for the Saugus Formation. The overall historic record of pumping from the Saugus Formation is illustrated in **Figure 3-8**.

Since the early 1990s, when groundwater pumping from the Saugus Formation peaked, there had been a steady decline in pumping through the remainder of that decade. Since then, Saugus Formation pumping was trending upward from approximately 4,000 af in the early 2000s to more than 11,800 af in 2016. Pumping in the Saugus was 9,050 af in 2019, with the recent 5-year average at approximately 9,900 afy.

Unlike the Alluvium, which has an abundance of wells with extensive water level records, the water level data for the Saugus Formation are limited by both the geographic distribution of the wells in that Formation and the period of record. The number of wells has changed over the last several years with the addition of monitoring wells west of the Whittaker Bermite facility in the vicinity of wells VWD-201, VWD-205, and VWD-160. However, the wells that do have a historical water level record that exists prior to the initiation of SWP deliveries in 1980, indicate that groundwater levels in the Saugus Formation were relatively low in the 1960s and experienced a gradual increase by the mid-1980s, followed by a decline that ended in the early 1990s. Since then, groundwater levels increased over the next 10 to 15 years and over the past 8 or 9 years have experienced a decline (**Figure 3-9**). The most recent downward trend has been experienced since 2006 through 2016 (and as seen in some wells through 2018) which also corresponds to a long-term climatic dry period.

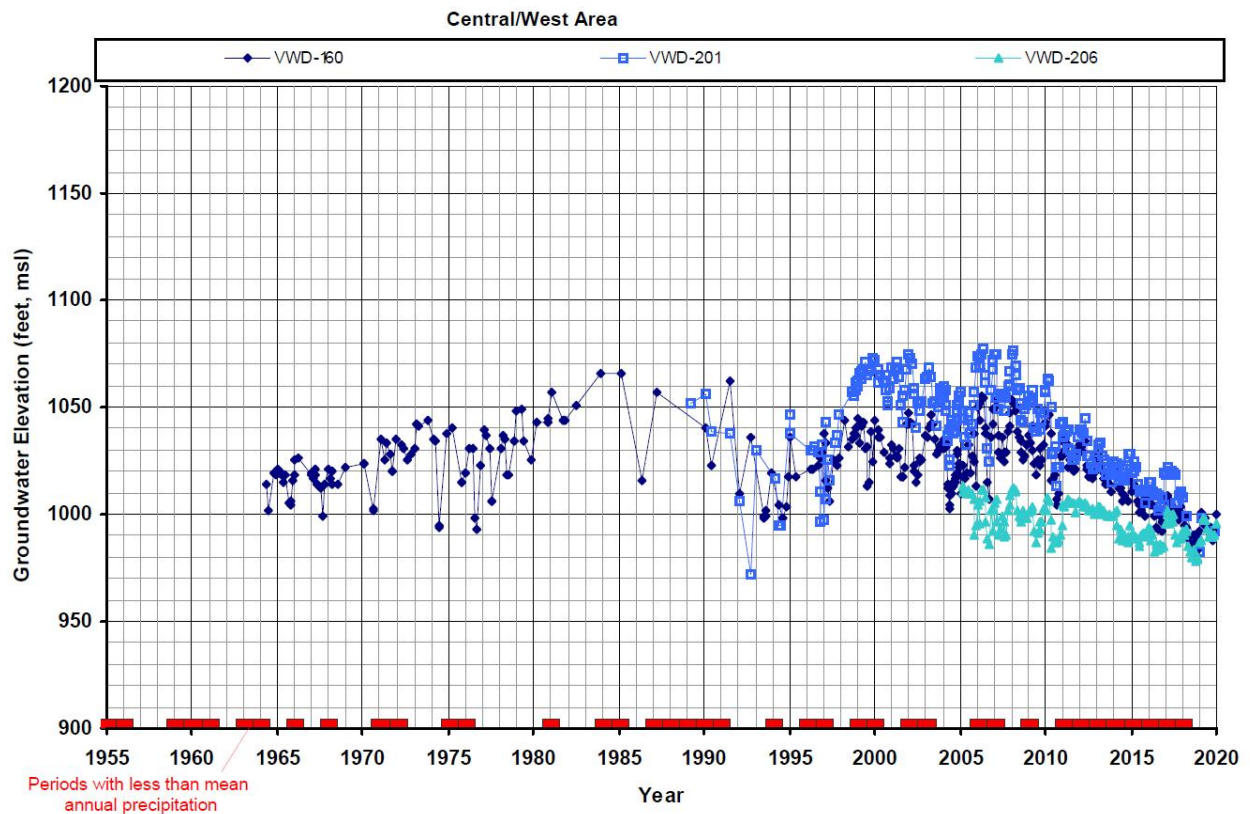
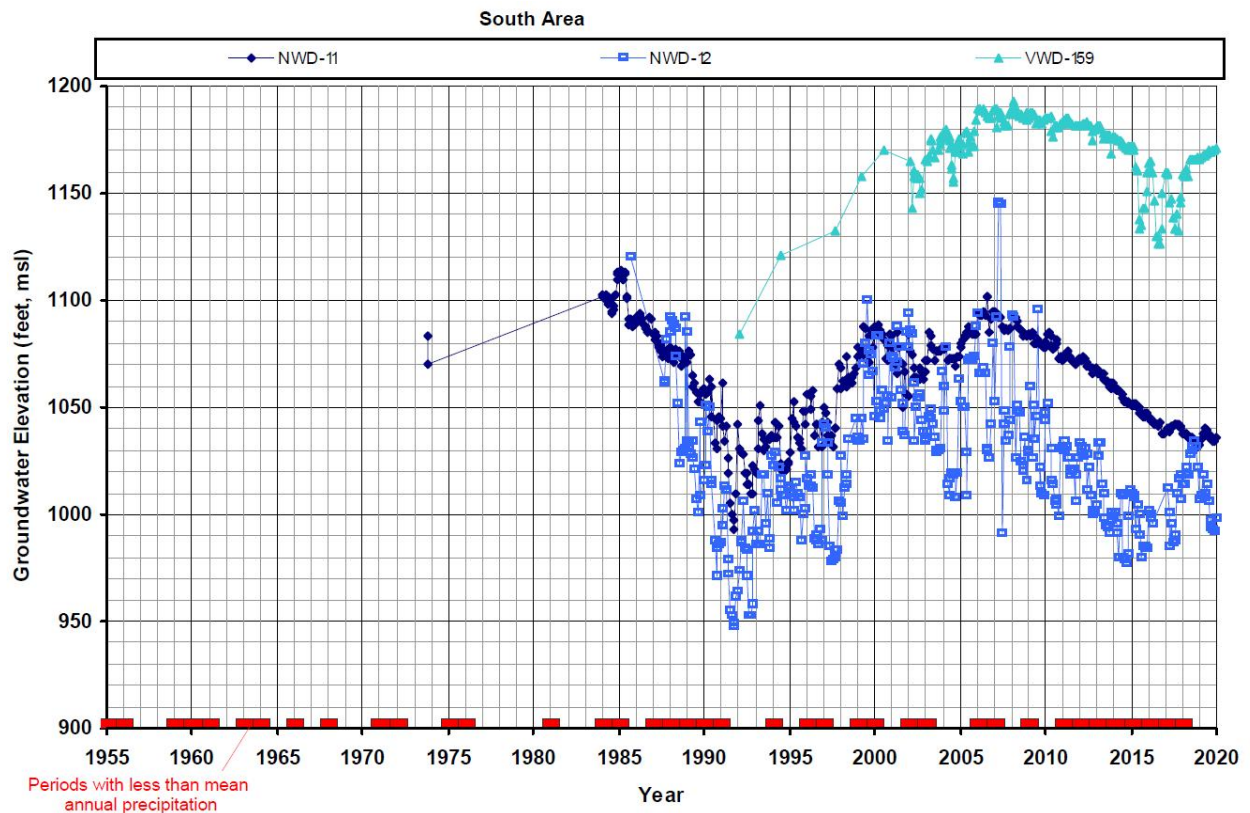




Groundwater Production - Saugus Formation

Santa Clarita Valley Water Report
 Santa Clarita Valley, Los Angeles County, California

Figure 3-8



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Groundwater Elevations in Saugus Wells

Santa Clarita Valley Water Report
 Santa Clarita Valley, Los Angeles County, California

Figure 3-9

In the southern-most Saugus Formation wells (South Fork Area plot), groundwater level declines during this dry period have ranged from 50 to 100 feet. Changes in groundwater elevations varied in 2019 for the Southern Saugus area. Water levels either rose by 10 feet or less, or at NWD-12 declined by 30 feet (probably due to returning to service after almost a year of being shut off for maintenance work). In the central and western Saugus Formation wells (Central/West Area plot), declines have ranged from 10 to 80 feet from 2006 to 2019 with the greatest declines seen at VWD-201 which is at the level of the historic low seen in 1992. At VWD-160, also near its historic low, recorded about 10 feet of recovery in 2019 (also at VWD-206). There continues to be fluctuations in groundwater levels attributed to seasonal and climatic fluctuations along with pumpage, but the prevalent long-term trend, when evaluating groundwater levels back to the 1960s is one of general stability.

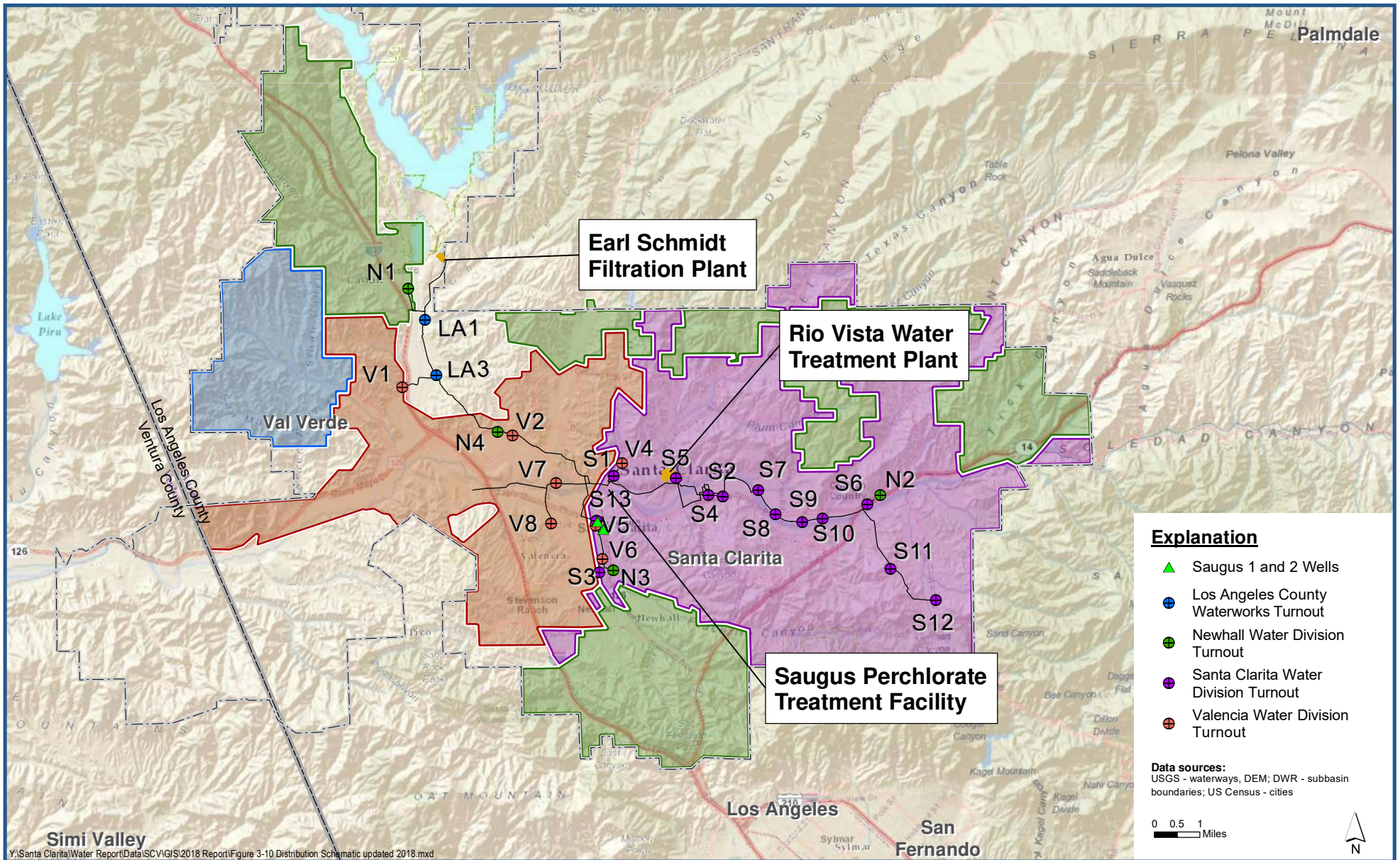
Consistent with the 2001 Update Report (Slade, 2002), the 2005 Basin Yield Report (CH2M Hill and LSCE, 2005), the 2005 UWMP, the 2009 Updated Basin Yield Report (LSCE and GSI, 2009), and the 2015 UWMP, SCV Water continues to maintain groundwater storage and associated water levels in the Saugus Formation so that supply is available during drought periods, when supplies from the Alluvium, the SWP, and/or other supplemental supplies may be reduced. The current period of increased pumping and during the early 1990s are examples of this management strategy. Most notably, in 1991, when SWP deliveries were substantially reduced, increased pumping from the Saugus Formation made up almost half of the decrease in SWP deliveries. The increased pumping over several consecutive dry years (1991-1994) resulted in short-term groundwater level declines, reflecting the use of water from storage. However, groundwater levels subsequently recovered in the Saugus Formation when pumping declined in the late 1990s to early 2000s and recharge from the Alluvium increased, reflecting

recovery of groundwater storage. It is expected that once a normal to wet climatic trend occurs in the Valley resulting in an increase in recharge from the Alluvium to the Saugus Formation that groundwater levels in the Saugus Formation will recover.

3.4 Imported Water Supplies

SCV Water obtains the majority of its imported water supplies from the SWP, which is owned and operated by the DWR. SCV Water is one of 29 contractors holding long-term SWP contracts with DWR. SWP water originates as rainfall and snow-melt in the Sacramento and Feather watersheds where the SWP's largest reservoir, Lake Oroville, is located. The water released from Lake Oroville flows down the Feather River, joins flows in the Sacramento River and enters the Sacramento-San Joaquin Delta. Water is diverted from the Delta into the Clifton Court Forebay, and then pumped into the 444-mile long California Aqueduct. A portion of SWP water delivered to southern California may temporarily be stored in San Luis Reservoir, which is jointly operated by DWR and the U.S. Bureau of Reclamation. Prior to delivery to SCV Water, SWP supplies are stored in Castaic Lake, a terminal reservoir located at the end of the West Branch of the California Aqueduct.

SCV Water's service area covers approximately 195 square miles (124,800 acres), including the City of Santa Clarita and surrounding unincorporated communities. Water from the SWP and other sources located outside the Valley is treated, filtered and disinfected at SCV Water's Earl Schmidt Filtration Plant and Rio Vista Water Treatment Plant, which have a combined treatment capacity of 122 million gallons per day. This water is delivered from the treatment plants to SCV Water and LACWD 36 through a distribution network of pipelines and turnouts. At present, SCV Water delivers water through 26 potable turnouts as schematically illustrated in [Figure 3-10](#).



In 2019, SCV Water fulfilled the following major accomplishments in order to enhance, preserve, and strengthen the quality and reliability of existing and future supplies:

- ▲ continued participation in long-term water banking programs with RRBWSD and Semitropic,
- ▲ continued to participate in two-for-one exchange programs with RRBWSD and WKWD, and initiated new Two-for-One exchange programs with Antelope Valley East Kern Water Agency and United Water Conservation District,
- ▲ continued efforts in the development of a groundwater sustainability plan (GSP) under the Sustainable Groundwater Management Act (SGMA),
- ▲ submitted a grant application for the Proposition 68 funded Round 3 Sustainable Groundwater Management Program,
- ▲ completed preliminary negotiations with DWR and other State Water Project Contractors to eventually implement a Delta Conveyance Project,
- ▲ continued with design and construction of multiple infrastructure projects including the Magic Mountain Reservoir and pipeline,
- ▲ completed Rosedale Rio Bravo Water Storage District Extraction Improvement Project,
- ▲ began design of water treatment facility at N wells to remove PFAS, and
- ▲ executed an agreement to participate in Phase 2 of Sites Reservoir planning studies.

3.4.1 State Water Project Table A and Other Imported Water Supplies

Each SWP contractor has a specified water supply amount shown in Table A of its contract that currently totals approximately 4.1 million af. SCV Water’s contractual Table A Amount is

95,200 afy of water from the SWP. The term of the SCV Water contract is through 2038. DWR released the final Environmental Impact Report (EIR) for the proposed extension in November 2018, and in January 2019, the Agency executed an amendment to extend the contract term through 2085, however, the amendment will not become effective until certain precedent conditions are met.

In addition to Table A supplies, the SWP Contract provides for additional types of water that may periodically be available, from “Article 21” water and the Turn-Back Water Pool Program. Article 21 water is made available on an unscheduled and interruptible basis and is typically available only in average to wet years, generally only for a limited time in the late winter. Turn-Back Water Pool is for SWP contractors that will not use their allocated annual entitlement and wish to sell their project water to another contractor. Sometimes water becomes available in either of these programs that SCV Water may decide to utilize.

In early 2007, SCV Water finalized a Water Acquisition Agreement with the BVWSD and the RRBWSD in Kern County. Under this Program, Buena Vista’s high flow Kern River entitlements (and other acquired waters that may become available) are captured and recharged within Rosedale-Rio Bravo’s service area on an ongoing basis. SCV Water receives 11,000 af of these supplies annually through either exchange of Buena Vista’s and Rosedale-Rio Bravo’s SWP supplies or through direct delivery of water to the California Aqueduct via the Cross Valley Canal. Other supplies that have been utilized in previous years include water from the Turn-Back Water Pool Program, “Article 21” water, the Yuba Accord Agreement, “flexible storage” in Castaic Lake (up to 6,060 afy), and Nickel water (1,607 afy) as described in Chapter 4 and previous Water Reports. In 2008, SCV Water entered into the Yuba Accord Agreement, which allows for the purchase

of water from the Yuba County Water Agency through the Department of Water Resources to 21 State Water Project contractors (including SCV Water) and the San Luis and Delta-Mendota Water Authority. This non-SWP supply is available to SCV Water in certain years depending on hydrology. Under certain hydrologic conditions, additional water may be available to SCV Water from this program.

3.4.2 2019 Imported Water Supply and Disposition

As mentioned above, SCV Water has a contractual Table A Amount of 95,200 af of water from SWP. As shown in **Table 3-2**, the allocation process proceeded as follows: the initial allocation for 2019 was announced as 10 percent on November 30, 2018. Allocation increases occurred on January 25, February 20, March 20, and the final allocation was announced on June 19, 2019. SCV Water’s final allocation of Table A Amount for 2019 was 75 percent, or 71,400 af. Additional supply in 2019 included 3,608 af of SWP carryover from 2018, the return of 750 af from the Central Coast Water Authority Exchange, and 11,000 af from Buena Vista/Rosedale-Rio Bravo. SCV Water’s total available imported supply in 2019 was 86,758 af.

Table 3-2 2019 SCVWA Imported Water Supply and Disposition (acre-feet)

<i>Supply</i>	
2019 Final SWP Table A Allocation ¹	71,400
Total SWP Carryover to 2019 ²	3,608
Central Coast Water Authority Exchange ³	750
Buena Vista/Rosedale Rio-Bravo	11,000
Total 2019 Imported Water Supply	86,758
<i>Disposition</i>	
Service Deliveries	42,072
SCVWA/DWR/Purveyor Metering ⁴	889
Deliveries to Devil’s Den	382
Kern Westside District Sale	9,900
Semitropic SWRU Bank	5,002
Rosedale – Rio Bravo Two -for-One Exchange Program	11,000
Antelope Valley East Kern Two-for-One Exchange Program	7,500
United Water Conservation District Two-for-One Exchange Program	1,000
Total Carryover to 2020 ⁵	9,013
Total 2019 Imported Water Disposition	86,758

¹ Final 2019 allocation was 75% of contractual Table A amount of 95,200 af, which progressed as follows:

Initial allocation, November 30, 2018	10%	9,520 af
Allocation increase, January 25, 2019	15%	14,240 af
Allocation increase, February 20, 2019	35%	33,320 af
Allocation increase, March 20, 2019	70%	66,640 af
Final allocation, June 19, 2019	75%	71,400 af

² Total carryover from 2018 available in 2019 was 39,211 af. Of that amount, 3,608 af were delivered between January and March 2019, with the remaining “spilling” back into the DWR SWP system.

³ Return of 2016 exchange in August 2019.

⁴ Reflects water loss, use by the Rio Vista Water Treatment Plant (including 323 af in 2019 for Water Conservation Garden), and meter reading differences.

⁵ Total Table A carryover from 2019 available in 2020.

The disposition of water by SCV Water in 2019 to various entities included delivery to SCV Water customers and LACWD 36 and sales of water to other entities is summarized in **Table 3-2**. The largest portion of supplies were delivered to SCV Water customers and LACWD 36 (42,072 af), 19,500 af were exchanged through Two-for-One programs, including Antelope Valley East Kern (7,500 af), United Water Conservation District (1,000 af), and Rosedale-Rio Bravo (11,000 af). 9,900 af were sold to Kern County Water Agency's westside member units, 5,002 af were banked in the Semitropic SWRU Bank, 382 af were delivered to Devil's Den, and 889 af reflect water loss (323 af by the Rio Vista Treatment Plant for the conservation garden and the remainder from meter reading differences). The remaining 9,013 af were carried over in SWP storage for potential use in 2020.

3.4.3 Water Banking and Exchange Supplies

SCV Water maintains supply in various banking programs in the Kern Basin, and thereby has diverse supply options when needed. In 2005, CLWA completed an agreement to participate in a long-term water banking program with RRBWSD in Kern County. This long-term program allows

storage of up to 100,000 af at any one time, and with subsequent withdrawals and banking over the last 15 years, the balance at the end of 2019 is 100,000 af. Prior to 2019, SCV Water's withdrawal capacity was limited to 3,000 afy. In 2019, additional extraction facilities was completed to increase that capacity by 7,500 afy for a total withdrawal capacity of approximately 10,500 afy.

In 2011, SCV Water (formerly CLWA) executed a Two-for-One Exchange Program with RRBWSD whereby SCV Water can recover one acre-foot of water for each two acre-feet delivered (less losses). After exchanging water in 2011, 2012 and 2019, SCV Water has almost 14,500 af of recoverable water. Separately, SCV Water also has additional dry year supply in Two-for-One Exchange Programs with the West Kern Water District (500 af), Antelope Valley East Kern (3,750 af), and United Water Conservation District (500 af).

Other components of SCV Water's imported water supply reliability program include its banking agreements with Semitropic originally composed of two agreements with Semitropic whereby SCV Water's predecessor, CLWA, banked surplus Table A water supply in 2002 and 2003 (24,000 af and 32,522 af, respectively). Semitropic had recently expanded its groundwater banking program to

incorporate its Stored Water Recovery Unit (SWRU). The term of the Semitropic Banking Program extends through 2035 with the option of a 10-year renewal. SCV Water may withdraw up to 5,000 afy from its account. The recoverable balance in this account at the end of 2019 stands at 45,278 af.



Rosedale- Rio Bravo Drought Relief Project

Also, in 2016, an additional 1,500 af were transferred to Central Coast Water Authority, and the last 750 af were returned to SCV Water in 2019.

3.5 Other Water Sources

3.5.1 Recycled Water

Recycled water is an important and reliable source of additional water; the use and planned expansion of existing facilities enhances water supply reliability in that it provides an additional source of supply and allows for more efficient utilization of groundwater and imported water supplies. Deliveries of recycled water in the Valley began in 2003 for irrigation water supply at a golf course and in roadway median strips and has expanded somewhat since then, with recent uses that include additional irrigation sites and supply for grading operations via water trucks. Recycled water use has remained low, yet relatively constant over the last sixteen years at approximately 400 afy, and in 2019, recycled water deliveries were approximately 460 af.

Recycled water is currently produced at two water reclamation plants (WRPs) operated by the Santa Clarita Valley Sanitation District of Los Angeles County (SCVSD): the Valencia WRP and the Saugus WRP with respective average annual production of 15,500 afy and 6,100 afy, respectively. Most of the treated effluent from these two plants is discharged to the Santa Clara River.

SCV Water is working with SCVSD and other SCV stakeholders on the best path forward to expand the Valley's recycled water resources. In addition, Vista Canyon Water Factory is anticipated to come online in 2020 and eventually produce up to 440 afy of recycled water for new and existing users in the SCWD service area. The proposed Newhall Ranch WRP is anticipated to produce 4,200 afy at buildout, meeting more than half of the anticipated non-potable demands for the development.

An update to the 2002 Recycled Water Master

Plan (RWMP) was conducted in 2016 (Kennedy/Jenks Consultants, 2016). The updated RWMP included near-term, mid-term, and long-term objectives for increasing the use of recycled water where it was economically feasible. The previous and current master plans considered various factors affecting recycled water sources, supplies, users and demands so that CLWA (now SCV Water) could develop a cost-effective recycled water system within its service area. The 2016 update remained a draft pending completion of a CEQA document.

One of the types of water reuse that was considered in the updated RWMP was groundwater replenishment, which represents an opportunity to recharge the underlying aquifer. Two recharge feasibility studies were recently completed for SCV Water as it advances efforts to utilize recycled water. These studies looked to evaluate the maximum potential recharge with a source of approximately 5,000 afy of recycled water from Valencia WRP. The first study looked at a recharge area in the northwest portion of the subbasin near Castaic Lake (Geosyntec, 2016) and recommended further geotechnical, geochemical, and modeling analysis of the proposed site as the initial analysis concluded that the retention time of recharged recycled water was less than the regulatory requirements.

The second study was conducted in the eastern part of the subbasin and recommended pilot studies at the proposed recharge sites to improve hydrogeologic understanding and evaluation of additional sources of diluent (Trussell and GSI, 2017).

3.5.2 Perchlorate - Treated Water

As part of the operation of SCV Water's Saugus Perchlorate Treatment Facility (SPTF), numerous monitoring tests are performed on a continuous basis in order to ensure the safety of the treated water leaving the SPTF. Groundwater samples are collected semi-weekly at several locations,

including at the Saugus 1 and Saugus 2 wells, both at the influent and effluent water points, at the lead and lag vessels, and at several distribution locations. The samples are analyzed at different frequencies for numerous constituents, including chlorate, perchlorate, chloride, nitrate, nitrite and sulfate. In addition, samples are analyzed for microbiological growth, radiological and volatile organic compounds. In 2019, 3,186 af of groundwater were pumped from Saugus 1 and Saugus 2. After treatment for perchlorate removal, the groundwater was blended with treated imported water and delivered to the Water Divisions through the SCV Water distribution system. To date, more than 28,600 af of groundwater have been extracted and treated from Saugus 1 and Saugus 2 in this manner, of which 26,800 af have been used for water supply.

In 2017, a Perchlorate Treatment Facility (PTF) was constructed at VWD-201. In November 2017, the VWD-201 PTF came online to remove perchlorate from the well and provide containment. The water being pumped through the PTF is being discharged in accordance with a National Pollutant Discharge Elimination System permit until the PTF is permitted through DDW for drinking water. Since treatment began at VWD-201, 3,087 af have been pumped and treated and discharged to the river through 2019.

The Saugus Aquifer Treatment Plant (SATP) on the former Whittaker Bermite Facility was completed in June 2017 near the northern boundary of the Facility and began operating in August 2017. The system includes 8 extraction well clusters along the western border of the Facility where groundwater is pumped from the Saugus and treated to remove perchlorate whereupon the water is discharged to the River (DTSC, 2019). The current permitted discharge rate from the SATP to the River is up to 1,000,000 gallons per day or 1,100 afy. The pump-and-treat system currently treats about 300 gallons of groundwater per minute, and as of the end of 2019, 732 af have

been extracted and treated (AECOM, 2020).

3.6 Water Quality

Water delivered by SCV Water consistently meets drinking water standards set by the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW). An annual Water Quality Report is provided prior to July 1st to all Santa Clarita Valley residents who receive water from the Water Divisions or LACWD 36. There is detailed information in that report summarizing the results of water quality testing of the groundwater and treated SWP water supplied to the residents of the Santa Clarita Valley. The report can be accessed at the following link: <https://yourscvwater.com/index.php/water-quality/#waterqualityreports>

3.6.1 Water Quality – General

3.6.1.1 Perchlorate

Perchlorate is a regulated chemical in drinking water. In October 2007, the California Department of Public Health (CDPH), which currently is the State Water Resources Control Board Division of Drinking Water (DDW), established a maximum contaminant level (MCL) for perchlorate of 6 micrograms per liter ($\mu\text{g/L}$). Perchlorate has been a water quality concern in the Valley since 1997 when it was originally detected in four wells operated by the purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility. In late 2002, perchlorate was detected in a fifth municipal well, in this case an Alluvial well (SCWD's Stadium Well), also located near the former Whittaker-Bermite site. Two of those wells (VWD's Well 157 and SCWD's Stadium Well) were sealed and replaced by new wells, and two wells (Saugus 1 and 2 Wells) were returned to service with treatment in January 2011. NWD's Well NC-11 has remained out of service with a portion of its capacity replaced by a combination of imported water and treated water from the Saugus Perchlorate Treatment Facility (described

further below) through a SWP turnout. In early 2005, perchlorate was detected in a second Alluvial well (VWD's Well Q2) near the former Whittaker-Bermite site. Following the installation of wellhead treatment for the removal of perchlorate in the same year, the well was returned to regular water supply service. After two years of subsequent operation with no detections of perchlorate, the wellhead treatment was removed and the well has since remained in active water supply service. In 2019, perchlorate was again detected in Q2 at the MCL. It was taken out of service, and plans are underway for treatment to be in place with the well back in service by Fall 2020.

In 2006, perchlorate was detected in low concentrations below the MCL of 6 µg/L and the analytical laboratory's Detection Limit for Reporting (less than 4.0 µg/l) in another Saugus well (NWD's Well 13), near one of the originally impacted wells. NWD-13 has remained in service with regular sampling per the DDW requirements and no subsequent detections of perchlorate. In August 2010, perchlorate was detected further down gradient in an eighth well, VWD's Well 201 that is completed in the Saugus Formation. While the initial detection was below the MCL, the well was immediately taken out of active supply service. Since then, VWD (now SCV Water) has been pursuing restoration alternatives at VWD-201. Currently, SCV Water is revising the 97-005 Document for VWD-201 following DDW's comments from mid-2018. It is anticipated that DDW will issue a permit to return VWD-201 to active service in 2020. Following the detection of perchlorate in VWD Well 201 in 2010, VWD elected to minimize pumping from Well 205 through 2011. And the well was taken out of service in April 2012 when perchlorate was detected at 6 µg/l. Treatment plans for VWD-205 are under consideration and will mostly likely be similar to those employed at VWD-201. As described in the 2015 UWMP, the replacement and reactivation of the impacted wells, augmented by planned and funded replacement wells, adds to the overall

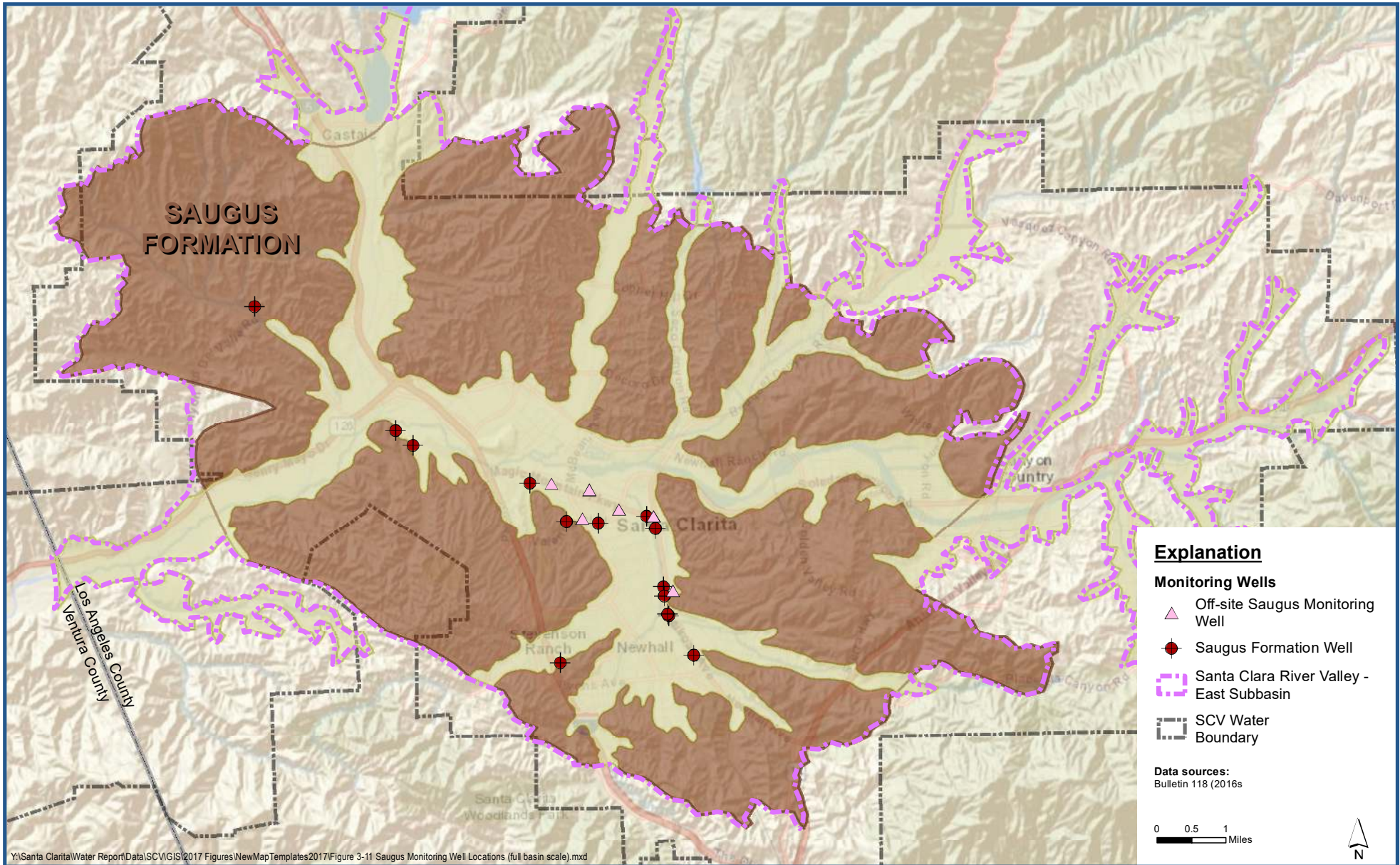
ability to meet the groundwater component of total water supply in the Valley.

The cleanup plan for the Whittaker-Bermite site and the impacted groundwater has been coordinated among SCV Water, Whittaker Corporation, the State DTSC, and U.S. Army Corps of Engineers. These entities have also coordinated to extend targeted monitoring of the Alluvium and Saugus Formation off-site of the former Whittaker Bermite Facility, including to locations west of Saugus 1 and 2 and VWD's Well 201 as shown in [Figure 3-11](#). Off-site monitoring wells were installed near Saugus 1 and 2 between 2006 and 2009; two more were installed in 2012, and another two in 2015. Monitoring and sampling of these wells occurs on a regular basis, and the data are being evaluated to assess groundwater conditions west of Whittaker-Bermite and to monitor the effectiveness of perchlorate containment. Additionally, SCV Water's basin groundwater model that was developed for use in analyzing the basin yield and sustainability of the Current Operating Plan was also updated and used to assess off-site perchlorate containment. Onsite soil remediation was completed in 2019.

3.6.1.2 *Per and Polyfluoroalkyl Substances (PFAS)*

Per- and polyfluoroalkyl substances (PFAS) are a group of man made chemicals found in a wide range of products used by consumers and industry. These chemicals are known to be resistant to grease, oil, water, and heat. There are nearly 5,000 types of PFAS that have been used in the production of stain- and water-resistant fabrics and carpeting, cleaning products, paints, fire-fighting foams, cookware, food packaging and processing. The use of these chemicals has been reduced in industrial processes since the early 2000s.

Accumulation of certain PFAS has occurred in humans and animals, and toxicological studies



in animals indicate potential harmful effects, yet the understanding of those effects are still being investigated.

In 2018, DDW initially established an interim Notification Levels (NL) for Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) of 13 nanograms per liter (ng/L) and 14 ng/L, and these were lowered to 6.5 ng/L and 5.1 ng/L respectively in August 2019 (SWRCB, 2020). The Response Level (RL) for PFAS (PFOS + PFOA) initially was set at 70 ng/L and remained at that level until it was lowered in early 2020. SCV Water began the required PFAS testing in May 2019, whereupon 8 wells were found to exceed the interim Notification Level. One well was found to exceed the Response Level and was immediately taken out of service. Subsequent sampling in 2019 identified more wells that exceeded the NL but no more with RL exceedances.

To address these concerns, SCV Water has formed a PFAS Strike Team consisting of key SCV Water staff and expert consultants to determine next steps for treatment and other strategies. Construction of a water treatment facility at the N wells site (VWD-N, N7, N8) near the William S. Hart Baseball/Softball League ballfields began in February 2020 with completion expected later this year. The project will provide water treatment at a rate of up to 6,250 gpm.

3.6.1.3 Volatile Organic Compounds

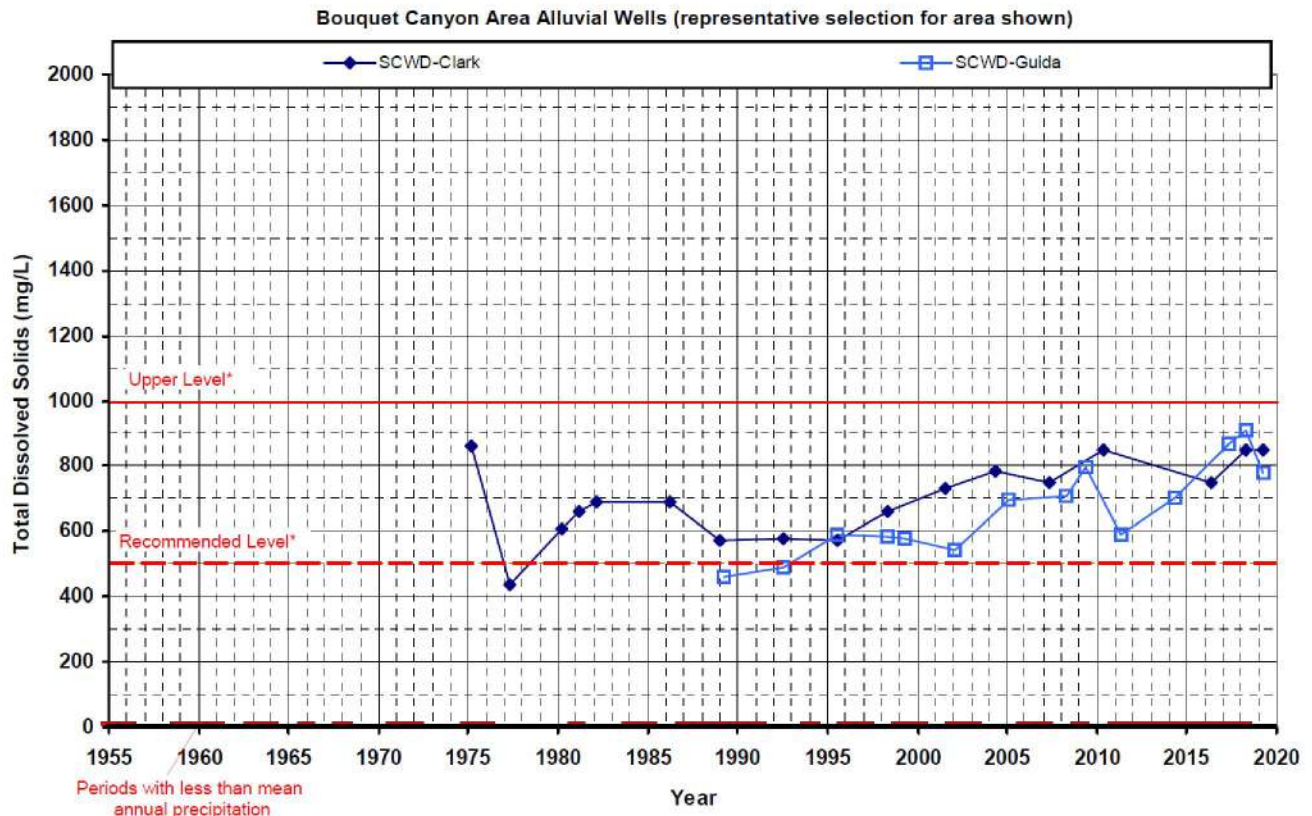
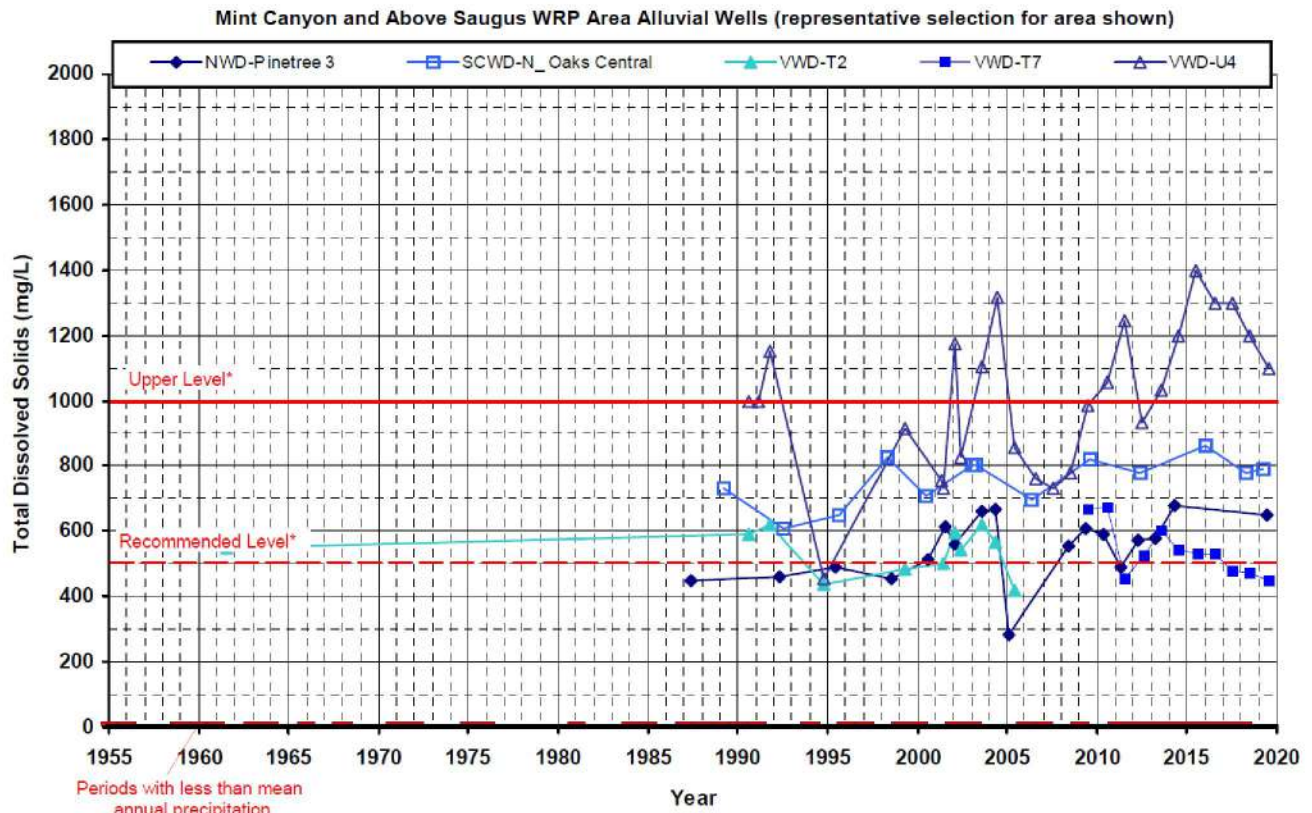
Organic chemical contaminants, including synthetic and volatile organic chemicals (SOC and VOCs), are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems. Organic compounds also include pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses. Local supply wells are tested at least annually for VOCs (Saugus 1 and Saugus 2 and VWD-201 are tested weekly) and periodically for SOCs, and Castaic

Lake water is checked annually for VOCs and SOCs. Trichloroethylene (TCE) and Tetrachloroethylene (PCE) have been detected in trace amounts in some Saugus wells, however there have not been any VOC or SOC detections above the MCLs and therefore, the Valley's water supply complies with state and federal drinking water standards.

Because SCV Water's Water Supply Permit sets an operational goal of no VOCs above the detection limit for reporting in its distribution system and because SCV Water is concerned about any detection of VOCs, SCV Water performed a VOC source identification study (CH2MHill, 2015). This study concluded that the likely source was either the Whittaker-Bermite site or the Saugus Industrial Center and additional monitoring would be necessary to identify the specific source. During start up and discharge of the VWD-201 Perchlorate Treatment Facility, positive results of TCE were detected slightly above the Detection Limit for Reporting (DLR). Therefore, TCE will be addressed as part of the drinking water permitting process of this well with DDW.

3.6.2 Groundwater Quality – Alluvium

Groundwater quality is a key factor in assessing the Alluvium as a source for municipal and agricultural water supply. Groundwater quality details and long-term conditions, examined by integration of individual records from several wells completed in the same aquifer materials and in close proximity to each other, have been discussed in previous annual Water Reports and in the 2015 UWMP. Historical groundwater quality, including available 2019 data, is illustrated in **Figures 3-12 and 3-13**. These figures show historical total dissolved solids (TDS) concentrations, which is a measure of the amount of dissolved minerals and salts in water expressed in milligrams per liter (mg/L) as a unit of measure. These plots include the historical records for wells with water quality that are representative of each area of the Valley, the DDW Secondary MCL (which are the aesthetic based standards "Recommended and Upper



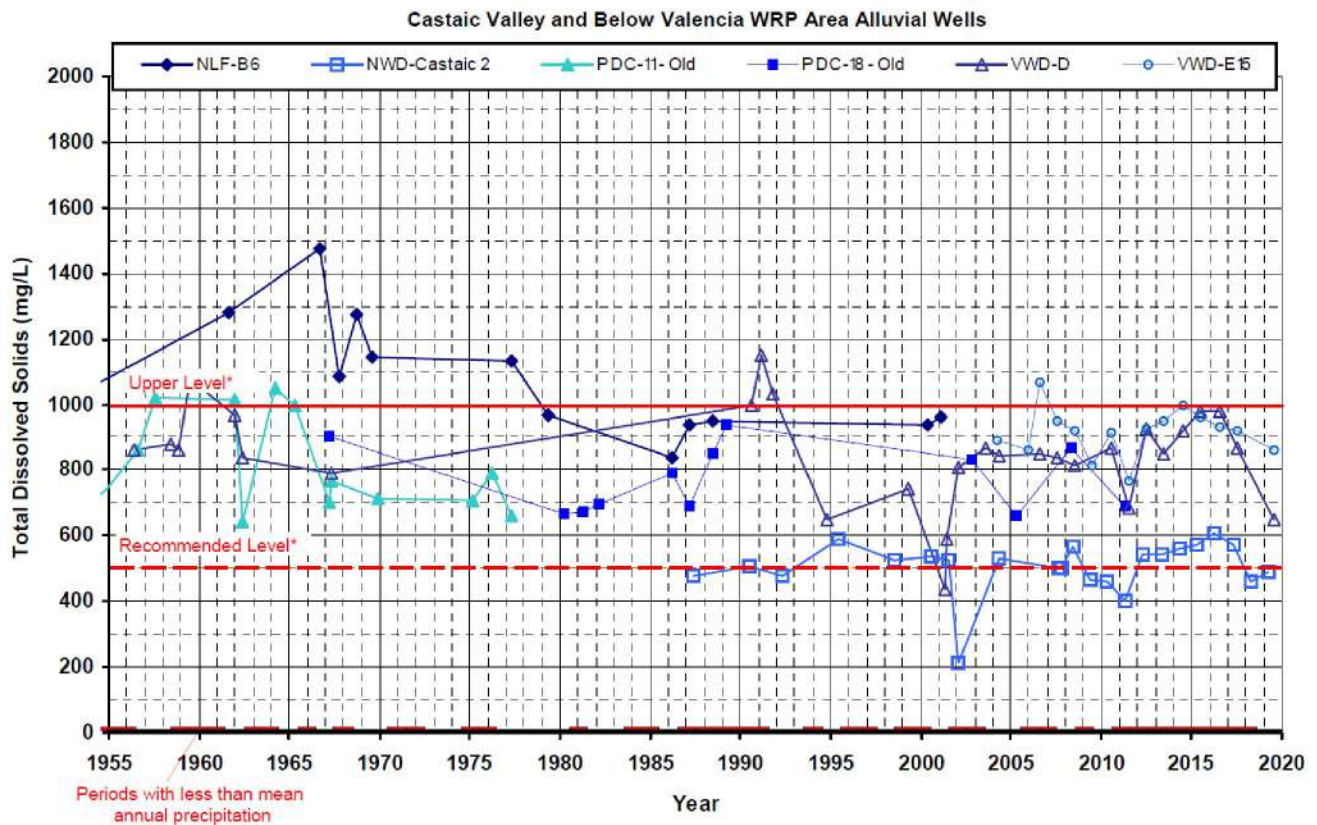
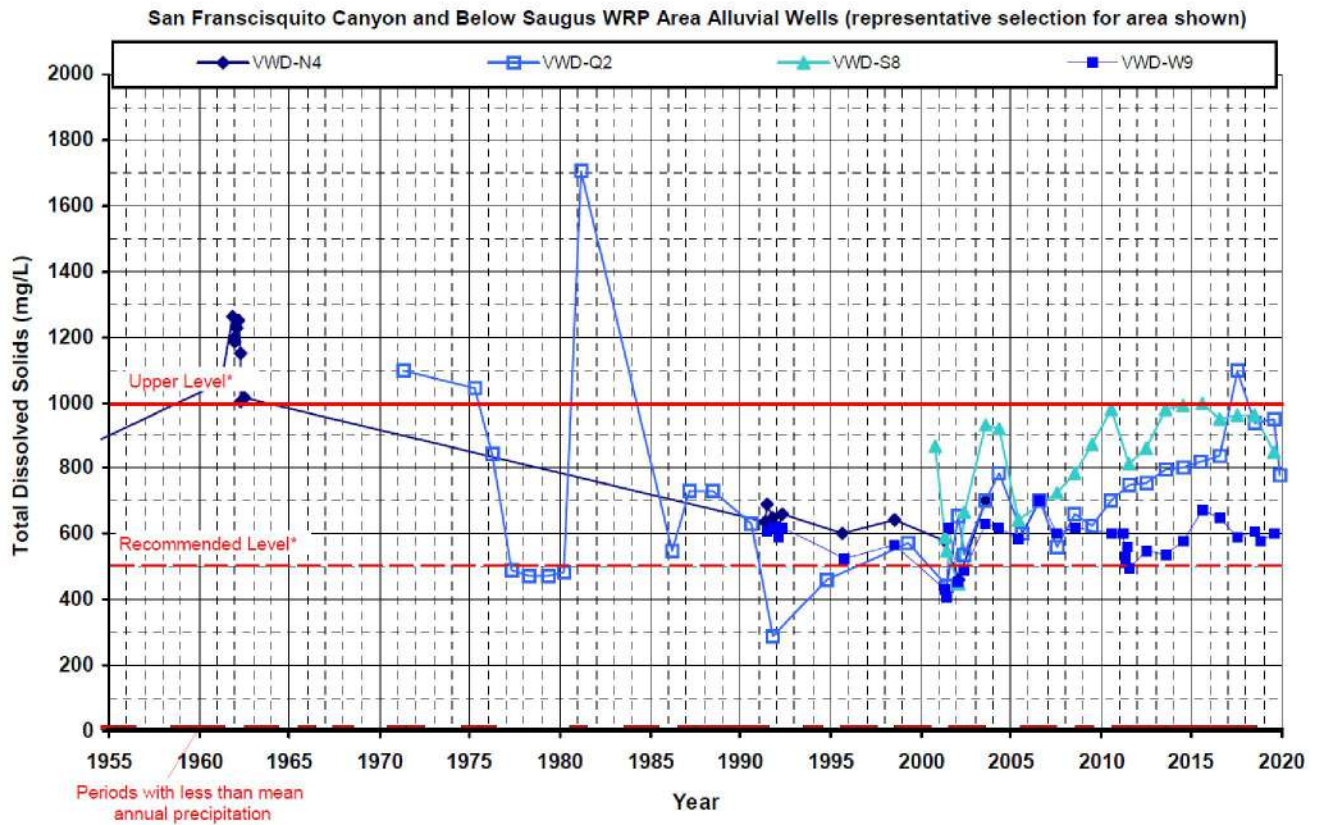
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Groundwater Quality in Eastern Santa Clarita Valley Alluvial Wells

Santa Clarita Valley Water Report
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Figure 3-12



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Groundwater Quality in Western Santa Clarita Valley Alluvial Wells

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Santa Clarita Valley, Los Angeles County, California

Figure 3-13

Levels”) for reference. Concentrations of TDS generally respond to wet periods by exhibiting a downward trend, followed by an increasing trend during dry periods.

In the Mint Canyon and Above Saugus WRP areas (Figure 3-12), TDS concentrations have experienced a long-term stable trend over the past 30 years with variation in TDS concentrations during wet and dry periods that range from 300 to 800 mg/L. Generally, TDS concentrations are between the recommended and upper levels of the TDS secondary MCL. VWD-U4 has exhibited short-term increases above the secondary MCL upper level, but concentrations have decreased over the past four years. In 2019, TDS ranged from 450 to 1,100 mg/L.

In Bouquet Canyon, variations in historical TDS concentrations are more gradual than those in Mint Canyon and may be correlated with periods of flow in Bouquet Canyon Creek (Figure 3-12). TDS concentrations in Bouquet Canyon have ranged from approximately 400 to almost 900 mg/L historically. In 2019, TDS concentrations were within the historical range for both SCWD’s Guida well and Clark well with values of 780 mg/L and 850 mg/L, respectively.

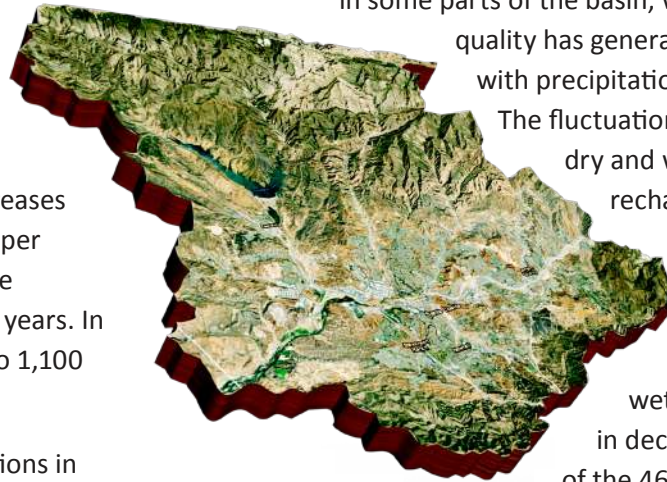
TDS concentrations in the western areas of the Valley exhibited similar patterns and responses to wet and dry periods as those observed in the eastern portions of the Valley (Figure 3-13). TDS concentrations in San Francisquito Canyon and Below Saugus WRP areas historically have ranged from approximately 300 to 1,100 mg/L. In 2019, TDS concentrations were within historical ranges and ranged from approximately 600 to 950 mg/L.

In Castaic Valley and Below Valencia WRP areas, TDS concentrations have historically ranged between 300 to 1,100 mg/L. At times, variations

in TDS concentrations appear to be related to wet and dry periods along with discharge from Castaic Lake. In 2019, TDS concentrations ranged between 490 to 860 mg/L, which remain within the historic range.

In summary, water quality in the Alluvium exhibits no long-term increasing trends. TDS concentrations in 2019 are within historical ranges. There have been periodic fluctuations in some parts of the basin, where groundwater quality has generally inversely varied with precipitation and stream-flow. The fluctuations often occur during dry and wet periods when recharge decreases during dry periods, resulting in increased salinity and higher amounts of recharge during wet periods which results in decreased salinity. In 2019, of the 46 sampled alluvial wells throughout the Valley, two were found to be in exceedance of the DDW Secondary MCL upper level for TDS located in the above Saugus WRP area. For both of these wells (VWD-U4 and VWD-U6), this is the sixth consecutive year TDS values have been at or exceeded the Secondary MCL upper level. Both of these wells are located in the above Saugus WRP area. Testing by SCV Water in accordance with DDW requirements demonstrates that groundwater with the exception of occasional variances above the secondary MCL for TDS, meets acceptable drinking water standards.

The presence of long-term consistent water quality patterns, although intermittently affected by wet and dry cycles, supports the conclusion that the Alluvium remains a viable ongoing water supply source in terms of groundwater quality even with short-term exceedances in a few of the wells.



3.6.3 Groundwater Quality – Saugus Formation

As discussed above for the Alluvium, groundwater quality is also a key factor in assessing the Saugus Formation as a source for municipal and agricultural water supply. As with groundwater level data, long-term Saugus Formation groundwater quality data are not sufficiently extensive to permit any sort of basin-wide analysis or assessment of pumping-related impacts on quality. However, integration of individual records from several wells has been used to examine general water quality trends. Based on those records, water quality in the Saugus Formation has not historically exhibited the recharge-related fluctuations seen in the Alluvium. Based on available data over the last 50 years, groundwater quality in the Saugus Formation has exhibited stable to slightly increasing trends in TDS concentrations as illustrated in **Figure 3-14**. Beginning in 2000, several wells within the Saugus Formation have exhibited an increase in TDS concentrations, similar to short-term changes in the Alluvium, possibly as a result of decreased recharge to the Saugus Formation from the Alluvium. Since 2006, however, these concentrations had been steadily declining through 2010, followed by a stable trend in NWD-12 and separately an increasing trend (through 2016) and then a decreasing trend through 2019 in the other Saugus wells. TDS concentrations in the Saugus Formation remain within the range of historic concentrations and below the Secondary MCL upper level. Groundwater quality within the Saugus Formation will continue to be monitored to ensure that degradation to the long-term viability of the Saugus Formation as a component of overall water supply does not occur.

3.6.4 Imported Water Quality

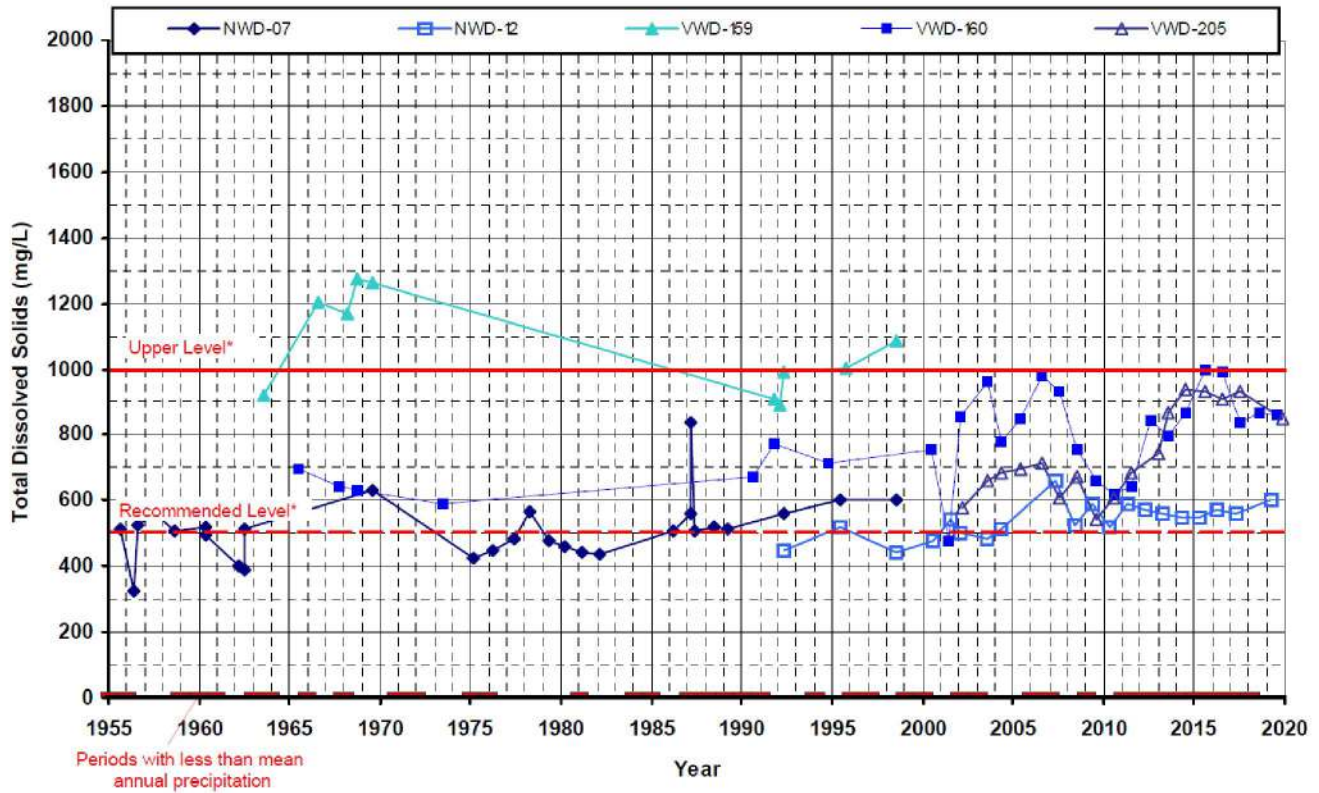
SCV Water operates two surface water treatment plants, the Earl Schmidt Filtration Plant located near Castaic Lake and the Rio Vista Water Treatment Plant located in Saugus.

SCV Water produces water that meets drinking water standards set by the USEPA and DDW. SWP water has different aesthetic characteristics than groundwater with lower TDS concentrations of approximately 250 to 400 mg/L.

Historically, the SWP delivered only surface water from northern California through the Sacramento-San Joaquin River Delta. However, with the increase in conjunctive use and integrated water supply planning to minimize impacts on available water supplies during periods of drought, SCV Water and other SWP contractors began “water banking” programs where SWP water could be stored or exchanged during wet years and withdrawn in dry years. During the dry-year periods, a greater portion of water in the SWP includes banked water supplies. The banked water has met all water quality standards established by DWR under its pump-in policy for the SWP.

3.7 Santa Clara River

The Memorandum of Understanding (MOU) between the SCV Water and the United Water Conservation District (UWCD), which manages surface and groundwater resources in seven groundwater subbasins in the Lower Santa Clara River Valley Area, was a significant accomplishment when it was initially prepared and executed in 2001 and later updated and renewed in 2018. The MOU initiated a collaborative and integrated approach to data collection; database management; groundwater flow modeling; assessment of groundwater basin conditions, including determination of basin yield amounts; and preparation and presentation of reports. The preparation and presentation of reports included continued annual reports such as this one for current planning and consideration of development proposals, and more technically detailed reports on geologic and hydrologic aspects of the overall stream-aquifer system.



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Groundwater Quality in Saugus Wells

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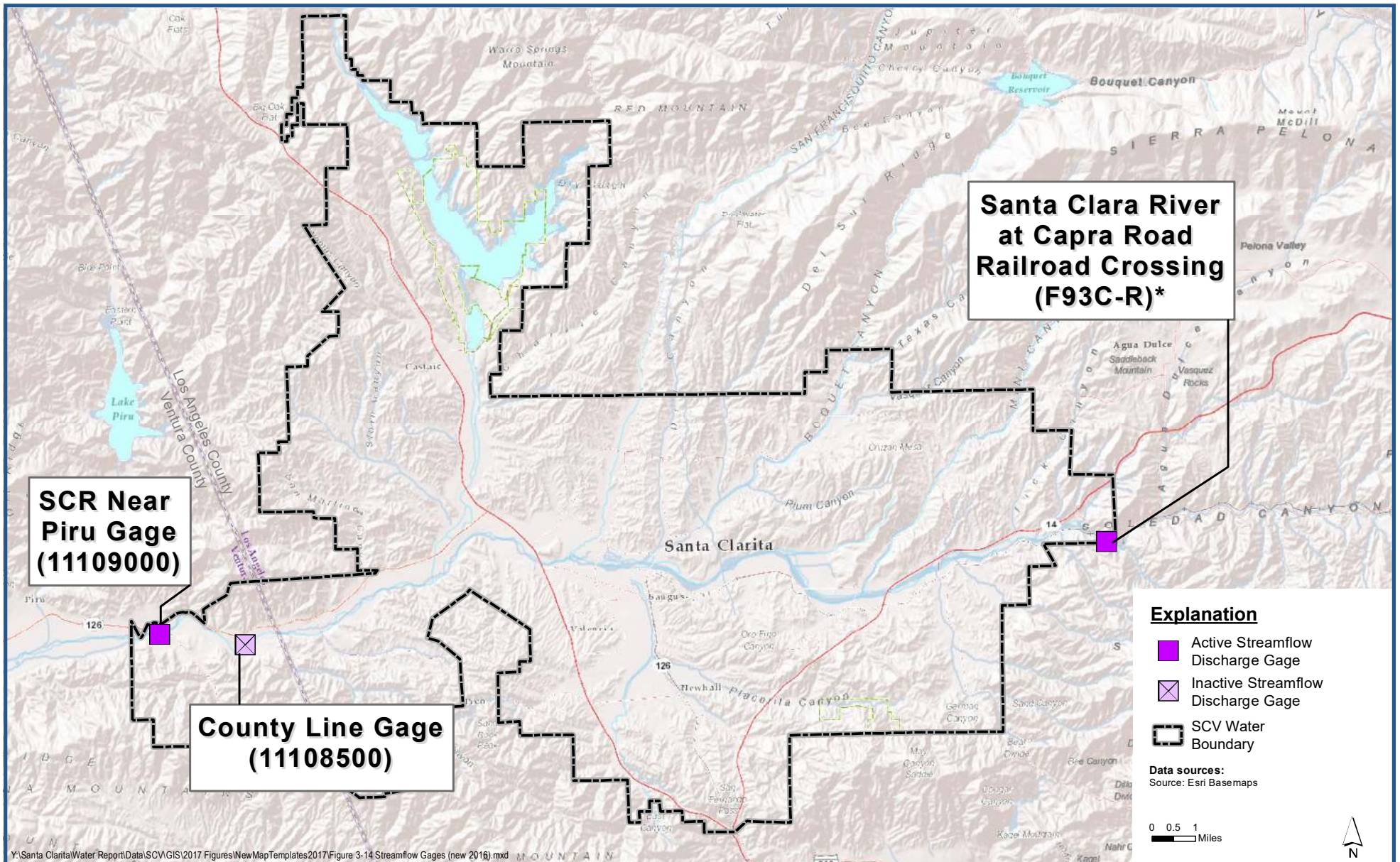
Figure 3-14

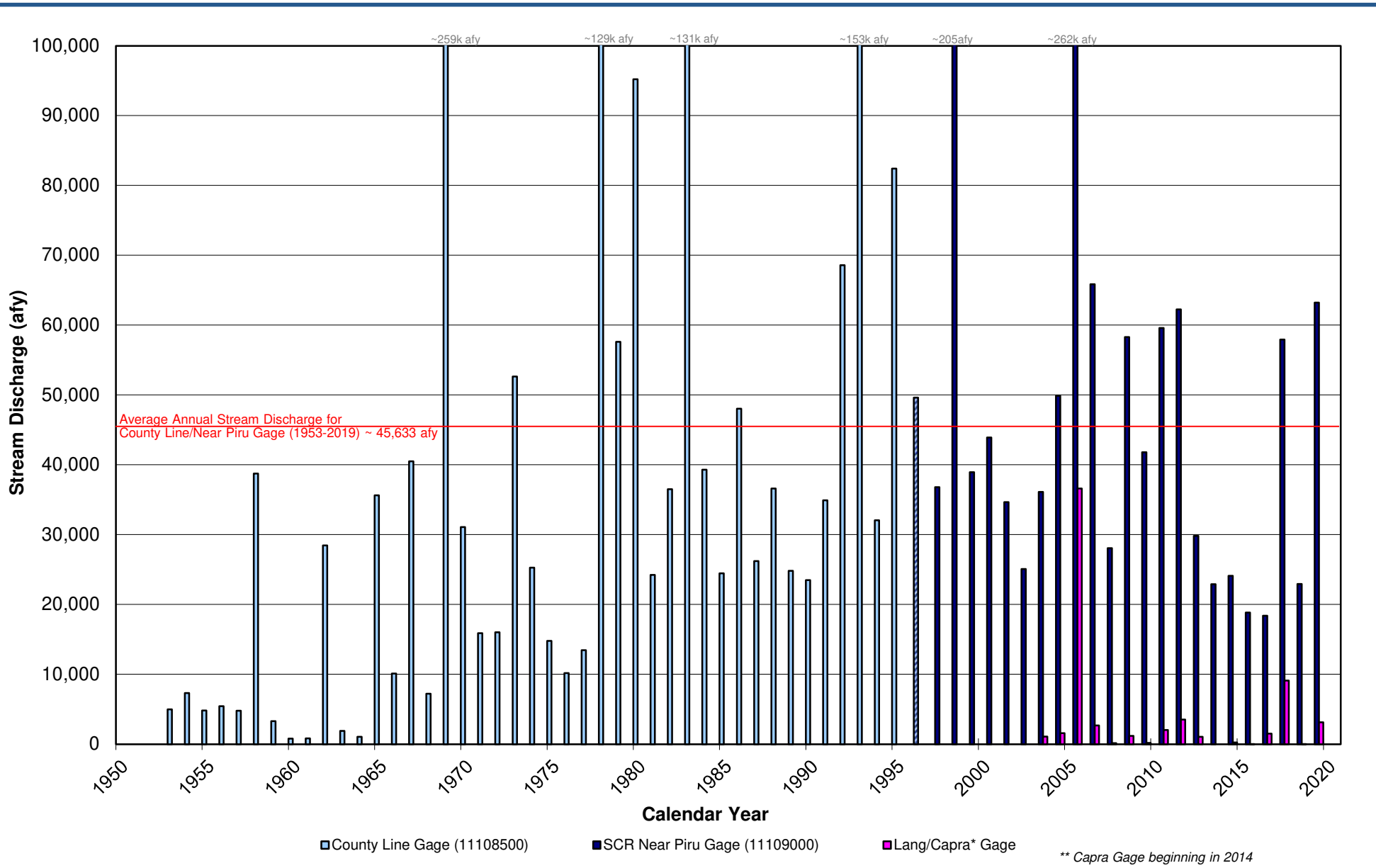
On occasion, public comments have been raised on whether use and management of groundwater in the Santa Clarita Valley have adversely impacted surface water flows into Ventura County. Part of the groundwater modeling work has addressed the surface water flow question as well as groundwater levels and storage. While the sustainability of groundwater has logically derived primarily from projected long-term stability of groundwater levels and storage, it has also derived in part from modeled simulations of surface water flows and stream-aquifer interactions from groundwater pumping in the central and western portions of the Valley. In addition, the long-term history of groundwater levels in the western and central part of the Valley, as illustrated in **Figures 3-4 and 3-5**, supports the modeled analysis and suggests that groundwater levels have not declined to a degree in which recharge from the Santa Clara River has impacted stream-flow to Ventura County.

Historical annual stream-flow in the Santa Clara River, into and out of the Santa Clarita Valley has been monitored at an upstream gage at Santa Clara River above Lang Railroad Station at Lang gage and Capra Road Railroad Crossing and two downstream gages (County Line and SCR at Piru) (**Figure 3-15**). The Lang gage (F93B-R) shows a wide range of average annual stream-flow into the basin; however, the data from the gage has not always been accurate because the gage's location limited the ability to record stream-flow. In 2010, Los Angeles County Department of Public Works (LADPW) removed the transducer that previously collected stream-flow data due to operational problems with the transducer and the location of the gage not being adequate to allow for accurate stream-flow measurements. Between 2010 and 2012, LADPW has conducted manual measurements of stream-flow, however, the measurements were not frequent enough to account for the range of stream-flows that likely occurred. In June 2013, LADPW relocated the Lang gage to a more suitable location 150 feet upstream on the Santa Clara River, and it was renamed Capra Road Railroad Crossing (F93C-R).

The downstream gage, County Line gage (11108500), was moved in 1996 to its present location near Piru and renamed SCR at Piru (11109000), approximately two miles downriver. The combined record (1953-2019) of the two downstream gages indicates an annual stream discharge of approximately 45,600 afy (**Figure 3-16**). These data recorded near the County line show notably higher flows from the Santa Clarita Valley into the uppermost downstream subbasin, the Piru subbasin, over the last 35 to 40 years, likely the result of WRP discharges and releases from Castaic Lake, thereby benefiting downstream users that benefit from groundwater recharge from the Santa Clara River.

Water quality in the upper Santa Clara River is affected by natural and urban runoff, WRP discharges and source water quality from reservoir releases and potentially groundwater inflow. Annually, during the dry summer season, the composition of the stream-flow in the Santa Clara River in the Upper Santa Clara River is predominantly composed of WRP discharges, and the TDS concentrations are generally higher compared to the wet winter/spring periods. During the wet season, stream-flow in the river is composed of runoff from the watershed and urban areas, along with WRP discharges resulting in relatively lower TDS concentrations. Water quality data from surface flows in the River in the central part of the Valley (Mass Emission Station located near the I-5 overpass) were obtained from surface water monitoring by the Upper Santa Clara River Watershed Management Group as required for the region's municipal stormwater permit. Preliminary review of those results from the 2003-2019 period indicate that TDS concentrations vary from about 800 to 900 mg/L during the dry summer season and about 100 to 300 mg/L during the wet winter/spring season. Comparison with alluvial groundwater quality plots from Section 3.6.2 indicates that this range of concentrations is comparable to the range of TDS concentrations observed in the alluvial aquifer.





Annual Stream Discharge

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Figure 3-16

4 - Summary Of 2019 Water Supply and 2020 Outlook

As discussed in the preceding chapters, total water demands in the Santa Clarita Valley were 72,600 af in 2019, or about seven percent lower than in 2018. Of the total demand in 2019, approximately 60,100 af were for municipal water supply (a decrease of 5,100 af from 2018), and the balance (12,500 af, a decrease of approximately 600 af from 2018) was for agricultural and other uses, including estimated individual domestic uses. As detailed in Chapter 2, the total demand in 2019 was met by a combination of local groundwater, SWP and other imported water, and a small amount of recycled water.

4.1 2019 Water Demand

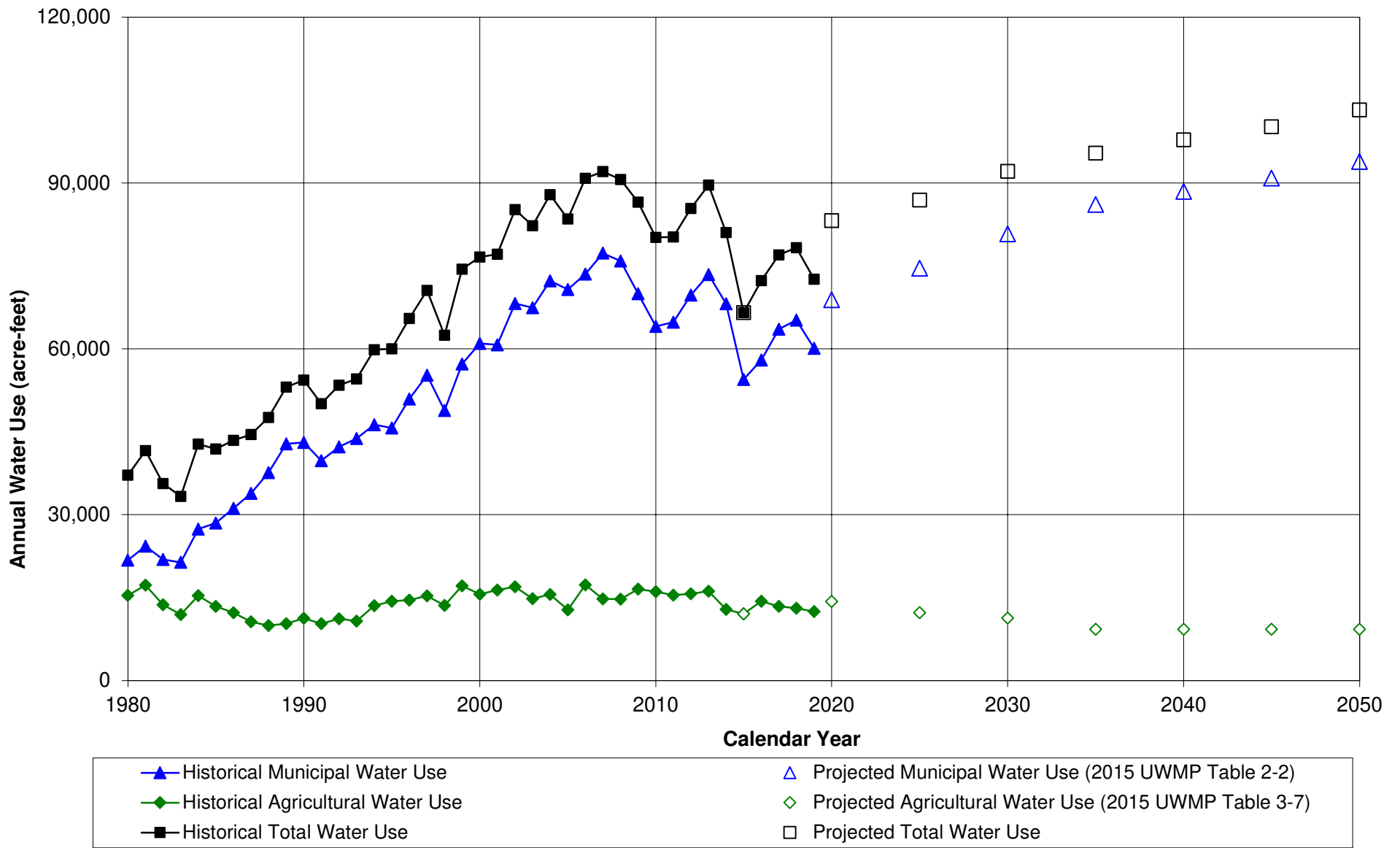
The total water demand in 2019 was below the projected water demand in the 2015 UWMP (79,900 af), and below the short-term projected demand that was estimated in the 2018 Water Report (80,000 af). For a long-term illustration of demand, historical water use from 1980 through 2019 is plotted in [Figure 4-1](#) along with the currently projected municipal and agricultural water demands in the 2015 UWMP through 2050. Historically, the primary factors causing year-to-year fluctuations in water demands have been related to weather, implementation of conservation efforts, economic conditions and variations in the number of service connections. In the short term, wet years have typically resulted in decreased water demand, and dry years have typically resulted in higher water demand. Extended dry periods, however, have resulted in decreases in demand due to conservation and water shortage awareness related to outreach by the water suppliers. The decline in water demand toward the end of the 1989 to 1992 drought is a good example. Similarly, over the recent multi-year dry period beginning in 2006, total water demands progressively declined from a historical high in 2007 to the lowest in nearly two decades in 2015 (except for a couple of interim wet years that saw a corresponding increase). These low demand levels were influenced in part from a slowing in the rate of growth in service connections that started in 2008, but they were primarily the result of intense conservation efforts following state mandated conservation measures in 2014.

4.2 Projected 2020 Water Demand and Supplies

With the below average rainfall conditions in early 2020, municipal water requirements in the first quarter of 2020 were greater than first quarter demand in 2019. Recognizing those early-year conditions, and continued growth in the Valley, total water demand in 2020 is estimated to be about 82,000 af.

It is expected that both municipal and agricultural water demands in 2020 will continue to be met with a mix of water supplies as in previous years, notably local groundwater, SWP and other supplemental imported water supplies, complemented by recycled water that will continue to supply a small fraction of total water demand.

As detailed in [Table 4-1](#), the 2020 SWP allocation schedule has proceeded as follows: on December 2, 2019, the initial allocation was 10% of water from the SWP. On January 24, 2020, it was increased to 15 percent. On May 22nd, the allocation was increased to 20 percent (19,040 af) of its total Table A Amount of 95,200 af. Combined with local groundwater from the two aquifer systems (approximately 31,000 af), carryover SWP water from 2019 (9,013 af), annual acquisition from BVWSD and RRBWSD (combined 11,000 af), purchase of Yuba Accord Water (403 af), withdrawal from the Semitropic SWRU (5,000 af), withdrawal from the Rosedale-Rio Bravo Water Storage District (14,437 af), the West Kern Water District (500 af) and Antelope Valley East Kern (2,000 af) Two-for-One Exchange Programs,



Historical and Projected Water Use

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 Santa Clarita Valley, Los Angeles County, California

Figure 4-1

Table 4-1 2020 Water Demand and Water Resources (acre-feet)

Projected 2020 Demand ¹		82,000
Available 2020 Water Supplies		
Local Groundwater		31,000
Alluvium ²	21,000	
Saugus Formation ³	10,000	
Imported Water		61,393
Table A Amount ⁴	19,040	
Total Carryover from 2019 ⁵	9,013	
Buena Vista/Rosedale-Rio Bravo Annual Supply	11,000	
Semitropic SWRU Groundwater Banking Program	5,000	
RRBWSD 2-for-1 Exchange Program	14,437	
Antelope Valley East Kern 2-for-1 Exchange Program	2,000	
West Kern Water District 2-for-1 Exchange Program	500	
Yuba Accord	403	
Recycled Water		500
Total Available 2020 Supplies		92,893
Balance of Banking and Exchange Programs ⁶		
Semitropic (SWRU) Groundwater Banking Program		45,278
Rosedale-Rio Bravo Water Banking Program		100,000
Two-for-One Exchange Programs		19,187
Rosedale-Rio Bravo Water Storage District	14,437	
Antelope Valley East Kern	3,750	
West Kern Water District	500	
United Water Conservation District	500	
Total Additional Dry Year Supplies		164,465

¹Estimate based on 2020 year-to-date actual use through April, with demand for the rest of 2020 similar to recent years, with increase to account for growth under the Current Operating Plan described in the Updated Basin Yield Analysis, August 2009.

²The Alluvium normally represents 30,000 to 40,000 afy of available supply under local wet-normal conditions, and 30,000 to 35,000 afy under local dry conditions as indicated in the Current Operating Plan described in the Updated Basin Yield Analysis, August 2009. Despite 2019 being a wet year, well capacity is reduced due to the temporary shutoff of wells that are pending treatment for PFAS.

³The Saugus Formation represents 7,500 – 15,000 afy of available water supply under non-drought conditions, and up to 35,000 afy under dry conditions, dependent on available well capacity. Estimated supply for 2020 takes into consideration current reduction in available capacity due to perchlorate contamination.

⁴SCV Water’s SWP Table A amount is 95,200 af. The initial 2020 allocation on December 2, 2019 was 10 percent (9,520 af). On January 24, 2020, the allocation was increased to 15 percent (14,280 af). On May 22, 2020, the allocation was increased to 20% (19,040 af).

⁵At the beginning of 2020, a total of 9,013 af of carryover supplies were available. 3,036 af were delivered in early 2020, and the rest was saved for carryover into 2021.

⁶ Described in Section 3.4.3. The programs reflect balances at the end of 2019; some of this water will be used in 2020.

and recycled water (500 af), the total available water supplies for 2020 are potentially 92,893 af. Due to continuing water conservation efforts and diversified sources of water supply, SCV Water anticipates having more than adequate supplies to meet all water demands in 2020. Projected 2020 demand, available water supplies, and banked water supplies are summarized in **Table 4-1**.

4.3 Supplemental Water Supply Sources

In addition to the water supplies described above, and as described in Chapter 3, SCV Water has dry-year supplemental water supply of more than 164,000 af of recoverable water outside the groundwater basin at the end of 2019. Through five long-term groundwater banking and exchange programs, as itemized in the lower half of **Table 4-1**, these additional dry-year supplies include: more than 45,000 af of recoverable water stored in the Semitropic Groundwater Storage Bank (SWRU) in Kern County, 100,000 af in the RRBWSD, a separate two-for-one exchange with RRBWSD with more than 14,400 af of total recoverable water, and another two-for-one exchange program with the WKWD in Kern County that has 500 af of recoverable water, and the third exchange program with Antelope Valley East Kern Water District (3,750 af) at the end of 2019. These components of overall water supply are separately reflected in **Table 4-1** because they are intended as a future dry-year supply. There are anticipated extractions from the Rosedale-Rio Bravo, and Semitropic exchange programs in 2020 in the amounts of 14,437 af and a maximum of 5,000 af, respectively.

4.4 Water Supply Reliability

4.4.1 SWP Delivery Capability

A federal court in August 2007 ruled that certain operational changes were required of the SWP in order to protect endangered species. With the objective of protecting endangered fish such as the Delta smelt and spring-run salmon, the court order resulted in the preparation of Biological Opinions (BiOps) requiring DWR to implement

mitigation requirements with resultant impacts on SWP water supply reliability. The current SWP Draft Delivery Capability Report 2017 (DWR, 2017), maintains the restrictions on SWP operations according to the BiOps of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fishery Service (NMFS) issued in December 2008 and June 2009, respectively. The operational rules defined in these BiOps continue to be legally required and were used by DWR in the analyses supporting its SWP Draft Delivery Capability Report 2017.

In October 2019, the USFWS and NMFS released their latest Biological Opinions based upon the USBR's new operations plans for the Central Valley Project (operated jointly with the SWP) which involves a combination of habitat restoration measures and flow requirements. Both agencies found that the proposed operations plans will not jeopardize threatened or endangered species or adversely affect habitat. The State of California has filed litigation challenging the Biological Opinions and in March of 2020 the California Department of Fish and Wildlife issued a ten year Interim Take Permit for operation of the SWP that did not incorporate many of the provisions of the new Federal Biological Opinions.

The SWP Draft Delivery Capability Report 2017 also considers the impacts on SWP delivery reliability due to climate change, sea level rise, and multiple Delta-specific concerns. Further consideration is also given to the major Delta policy planning efforts currently underway: The Delta Plan and the Bay Delta Conservation Plan (in 2018 called CA Water Fix). With these factors, the Delivery Capability Report projects that the average annual delivery of Table A water is estimated at 62 percent (unchanged from the 2015 estimate). SCV Water staff has assessed the impact of the current SWP Draft Delivery Capability Report 2017 on the SCV Water reliability analysis contained in the Agency's 2015 UWMP that current and anticipated supplies are available to meet projected water supply needs through the

year 2050. The preceding discussion of SWP supply should be considered by noting that, while the SWP Capability Report represents a reasonable scenario with respect to long term reliability, recent reductions in supply reduce the difference between available supply and demand in the future, thereby making the SCV Water service area more subject to shortages in certain dry years. Accordingly, the reduction in SWP supply reinforces the need to continue diligent efforts to conserve potable water and increase the use of recycled water to maximize utilization of potable water supplies.

More recently, DWR has entered into a revised SWP-CVP Coordinated Operating Agreement and is advancing a Voluntary Settlement Agreement relating to the State Water Resources Control Board's Bay-Delta Water Quality process. Further, under the direction of Governor Newsom, DWR recently took formal steps to withdraw proposed permits for the California Water Fix (twin tunnels) and begin a renewed environmental review and planning process for a smaller, single tunnel Delta Conveyance project. The outcome of these efforts is not known but is not expected to result in reliability outcomes below the range of those that have been modeled and will be reflected in the 2019 SWP Delivery Capability Report due out in the summer of 2020.

As discussed in Chapter 5, SCV Water has worked with Los Angeles County and the City of Santa Clarita to aggressively implement water conservation in the SCV Water service area. In terms of short-term water supply availability, however, SCV Water has determined that even with operational changes of the SWP in effect, there are sufficient supplemental water supplies, including SWP water, to augment local groundwater and other water supplies such that overall water supplies will be sufficient to meet projected water requirements. SCV Water, Los Angeles County, and the City of Santa Clarita have formed the Santa Clarita Valley Water Committee (formerly convened as the Santa Clarita Drought Committee). The specific purpose of the

committee is to work collaboratively to manage the conjunctive use of the Valley's water supplies, respond to drought conditions and ensure the progressive implementation of water use efficiency programs in the Santa Clarita Valley.

4.4.2 Water Supply Reliability Plan

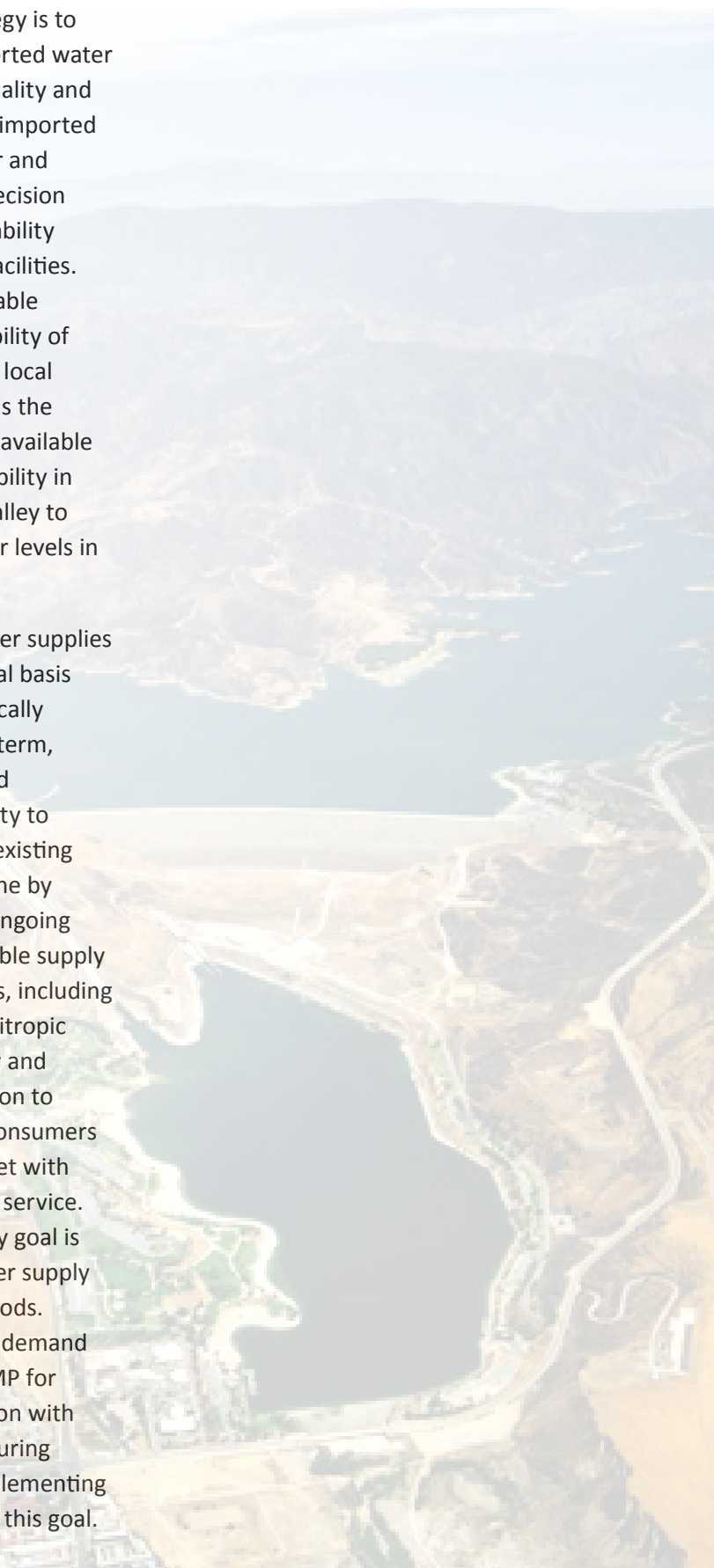
In addition to the 2015 UWMP water supply analysis, SCV Water undertook an update of the CLWA 2011 Water Supply Reliability Plan. Completed in 2017, the report (conducted by Nancy Clemm and Kennedy/Jenks Consultants) analyzed and modeled four different supply and demand scenarios from 2017 to 2050 to determine the overall reliability of the water supply in the Santa Clarita Valley. The scenarios reflect a wide range of water supply assumptions on the availability of groundwater for pumping, imported water deliveries, planned increases in recycled water, and potential California Water Fix facilities. Under the most challenging scenario, SWP and groundwater supplies were reduced and improvements in Rosedale Banking Program and Saugus dry-year pumping were suspended. Under such reduced supply conditions, the analysis concluded that planned improvements to the Rosedale Banking Program as well as conjunctive use of Saugus Formation storage were necessary.

4.5 Water Supply Strategy

SCV Water has implemented a number of projects that are part of an overall program to provide facilities needed to firm up imported water supplies during times of drought. These involve water conservation, surface and groundwater storage, water transfers and exchanges, water recycling, additional short-term pumping from the Saugus Formation, and increasing the reliability of SCV Water's imported supply. This overall strategy is designed to meet increasing water demands while assuring a reasonable degree of supply reliability.

Part of the overall water supply strategy is to conjunctively use groundwater and imported water to area residents to ensure consistent quality and reliability of service. The actual blend of imported water and groundwater in any given year and location in the Valley is an operational decision and varies over time due to source availability and operational capacity of SCV Water facilities. The goal is to conjunctively use the available water resources so that the overall reliability of water supply is maximized while utilizing local groundwater at a sustainable rate. Such is the case in 2019, where the large amount of available SWP supplies, provided operational flexibility in reducing groundwater pumping in the Valley to address drought impacts on groundwater levels in the eastern portion of the subbasin.

For long-term planning purposes, water supplies and facilities are added on an incremental basis and ahead of need. It would be economically unsound to immediately, or in the short term, install and implement all the facilities and water supplies needed for the next twenty to thirty years. This would unfairly burden existing customers with costs that should be borne by future customers. There are numerous ongoing efforts to produce an adequate and reliable supply of good quality water for Valley residents, including increased recovery capacity at both Semitropic and RRBWSD Banking Programs and new and replacement wells in the Saugus Formation to increase groundwater recovery. Water consumers expect their needs will continue to be met with a high degree of reliability and quality of service. To that end, SCV Water's stated reliability goal is to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions contained in the 2015 UWMP for a planning horizon to 2050, in combination with conservation of non-essential demand during certain dry years, SCV Water believe implementing their water plan will successfully achieve this goal.



5 - Water Conservation

As California continues to manage its valuable water resources through the challenges of climate change and water reliability issues, SCV Water is committed to a water conservation program comprising several measures that incorporate education, incentives, and conservation mandates among all the various customers present in the Valley. As a member of the California Water Efficiency Partnership (CalWEP), SCV Water prioritizes urban water use efficiency and conservation in their management strategy and public messaging.

5.1 Recent Conservation Efforts

The Santa Clarita Valley Water Use Efficiency Strategic Plan (2008 SCVWUESP) is a comprehensive long-term conservation plan for the Santa Clarita Valley with objectives, policies, and programs designed to promote proven and cost-effective conservation practices. The preparation of the 2008 SCVWUESP included input from stakeholders and the community at large and provided a detailed study of residential and commercial water use, and recommended programs designed to reduce overall Valley-wide water demand by ten percent by 2030. Following the completion of the 2008 SCVWUESP, Senate Bill SB X7-7 was passed in November 2009. SB X7-7 included requirements for reductions in per capita water use by 2020 of 20 percent which exceeded the targets outlined in the 2008 SCVWUESP.

In January 2014, as a response to drought conditions, the Governor of the State of California declared a drought emergency and asked that all Californians take voluntary action to reduce their 2013 water use by 20 percent. In February 2014, the Santa Clarita Valley Family of Water Suppliers approved the Water Conservation Action Plan that provided a series of water conservation guidelines customers could implement to reduce their water use by 20 percent. In July 2014, the SWRCB adopted temporary emergency water conservation regulations that required water agencies to implement the actions of their water shortage contingency plans that imposed multiple mandatory restrictions on indoor and outdoor water use. These orders were modified by the

Governor in 2016 to allow for local management needs while also directing the state to develop state-wide plans for long-term conservation goals and water use efficiency.

In 2015, an updated Water Use Efficiency Strategic Plan (WUE SP) that incorporated the SB X7-7 targeted reductions was finalized. The updated WUE SP was supported by a thorough economic analysis that will guide local water conservation efforts planned and implemented by SCV Water in the coming years. The economic analysis concluded that water conservation measures are more economically feasible as compared to the economic benefit of adding recycled water infrastructure in meeting a portion of future water demands. The WUE SP is consistent with SCV Water's Strategic Plan Objectives including:

- ▲ Ensure long-term average water supply meets current and future demand.
- ▲ Meet local water demands.
- ▲ Achieve the water conservation target of 20 percent per capita by 2020.

As described in the 2015 UWMP, each retail purveyor (now division) must demonstrate SB X7-7 compliance by an interim Daily Per Capita Water Use Target. As summarized in [Table 5-1](#), SCV Water met their 2019 Interim Water Use Target in addition to their 2020 Target. LA36 met the 2020 GPCD (gallons per capita by day) target in 2017.

Table 5-1: 20x2020 Compliance GPCD Targets and current levels

Division	Baseline ^a	2020 Target ^a	Actual 2019	Percentage Reduction
LA36 ^b	235	188	138	41%
Newhall	238	190	153	36%
Santa Clarita	251	201	166	34%
Valencia	335	268	236	30%
SCV Water (combined) ^c	277	218	189	32%

a. Targets are consistent with 2015 UWMP (2016). GPCD values represent potable per capita water use only and do not include any recycled water use. Recycled water is included in VWC total production and demand graphs. However, for potable GPCD calculations and associated GPCD graphs, recycled water is not included to allow for comparison with potable GPCD water use targets mandated per the definition provided in SB X7-7.

b. Since Los Angeles County Waterworks District 36 does not have 3,000 AF served or 3,000 connections, SB X7-7 does not apply.

c. Valley-wide GPCD values are based on a weighted average using population estimates as reported in the 2015 UWMP. Though SB X7-7 does not apply to LACWD, the valley-wide GPCD calculation includes both water production and population from the LACWD service area to examine the regional water use.

SCV Water provides additional information on their website regarding water conservation tips, gardening classes, and rebates. The agency website provides steps residents can take to conserve water for both indoor and outdoor use, along with a calendar for upcoming gardening classes. Rebates for water efficient products and services are provided for individual residence, businesses, and areas with large landscapes or HOA's. This includes pool covers, soil moisture sensors, smart irrigation controllers, and lawn replacement.

More information on these services and rebates can be found on the SCV Water website (https://yourscvwater.com/save-water-money/#_rebates).

5.2 2019 Water Use

2019 put an end to eight consecutive years of dry conditions for the Valley, and despite a continued growth in service connections, there has been a long-term overall decrease in water consumption over that time. As detailed in **Table 2-2** and **Appendix Table A1**, the total reduction from 2013 water use in 2019 was almost 26,800 af. The breakdown of water savings over that period by service area included:

- ▲ VWD – 5,337 af (1,739 million gallons)
- ▲ SCWD –5,500 af (1,792 million gallons)
- ▲ NWD –2,229 af (726 million gallons)
- ▲ LAC36 –317 af (103 million gallons)

As noted in **Table 5-1**, each division in the Valley is on track to meet its respective SB X7-7 20 percent by 2020 reduction in GPCD requirement. However, changes to the State's overall conservation strategy have been approved and are currently in development.

In 2018, the State Legislature and Governor Brown enacted AB 1668 and SB 606 in support of continuing efforts to "make water conservation a California way of life." The legislation recognizes that the efficient use of water is both cost-effective and critical to ensuring water supply reliability during drought and non-drought conditions. Water

agencies are developing a series of long-term urban water use efficiency standards including indoor and outdoor efficiency targets, with consideration for local weather conditions, and distribution system water losses. Beginning in 2023, SCV Water will be required to comply with its urban water use objective on an annual basis. The SWRCB may issue informational or conservation orders to agencies failing to meet their objectives. Details specific to AB 1668 and SB 606 standards and protocols are scheduled for release in 2022.



6 - References

AECOM, Bouquet Canyon Creek Restoration Project – Draft Initial Study/Mitigated Negative Declaration, August 2016.

AECOM, Fourth Quarter 2019 SATP NPDES Self Monitoring Report, February 2020, https://www.envirostor.dtsc.ca.gov/esi/uploads/geo_report/8283353507/SATP%20NPDES%20SMR%202019%204Q.pdf

California Department of Water Resources (DWR), California’s Groundwater, Bulletin 118 – Update 2016, December 2016.

California Department of Water Resources (DWR), The State Water Project Draft Delivery Capability Report 2017, December 2017.

California Department of Toxic Substances Control. (October 2019). Whittaker Bermite Community Update [Fact Sheet], https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/5905445933/Whittaker_Community%20Update_1019.pdf

California State Water Resource Control Board, Public Water System Information and Resources. June 2020. https://www.waterboards.ca.gov/pfas/drinking_water.html

Castaic Lake Water Agency (CLWA), Groundwater Management Plan, Santa Clara River Valley Groundwater Basin, East Subbasin, Los Angeles County, California, December 2003.

Castaic Lake Water Agency (CLWA), CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, 2005 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, November 2005.

Castaic Lake Water Agency (CLWA), CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, 2010 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, June 2011.

Castaic Lake Water Agency (CLWA), CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, 2015 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, June 2016.

CH2M Hill, Evaluation of Historical and Projected Future Flows to Ventura County Resulting From Importation of State Project Water to the Santa Clara River Watershed, July, 1998.

CH2M Hill, Evaluation of Historical and Projected Future Flows to Ventura County Resulting From Importation of State Project Water to the Santa Clara River Watershed, Update 2001.

CH2M Hill Regional Groundwater Flow Model for the Santa Clarita Valley, Model Development and Calibration, April 2004.

CH2M Hill, Analysis of Perchlorate Containment in Groundwater Near the Whittaker-Bermite Property, Santa Clarita, California, Prepared in support of the 97-005 Permit Application, December 2004.

CH2M Hill, Technical Memorandum, Calibration Update of the Regional Groundwater Flow Model for

the Santa Clarita Valley, Santa Clarita, California, August 2005.

CH2M Hill and Luhdorff & Scalmanini, Consulting Engineers, Analysis of Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin, Los Angeles County, California, prepared for Upper Basin Water Purveyors, August 2005.

CH2M Hill, Saugus Formation Volatile Organic Compound Investigation Report, Santa Clarita, California, prepared for Castaic Lake Water Agency, October 2015.

Executive Department State of California, Executive Order B-29-15, April 2015.

Executive Department State of California, Executive Order B-37-16 Making Water conservation a California Way of Life, May 2016

Kennedy/Jenks Consultants, Draft Report, Recycled Water Master Plan, Castaic Lake Water Agency, May 2002.

Geosyntec Consultants, Technical Memorandum, Castaic Conceptual Feasibility Study for Infiltration of Recycled Water, Castaic, California, January 2016.

Kennedy/Jenks Consultants, Recycled Water Master Plan, Castaic Lake Water Agency, September 2016.

Luhdorff and Scalmanini, Consulting Engineers (LSCE), Impact and Response to Perchlorate Contamination, Valencia Water Company Well Q2, prepared for Water Company, April 2005.

Luhdorff and Scalmanini, Consulting Engineers (LSCE), 2018 Santa Clarita Valley Water Report, prepared for Santa Clarita Valley Water Agency and Los Angeles County Waterworks District 36, May 2019.

Luhdorff and Scalmanini, Consulting Engineers and GSI Water Solutions, Analysis of Groundwater Supplies and Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin, prepared for Santa Clarita Valley Municipal Water Purveyors, August 2009.

Maddaus Water Management, (MWM) Inc., SCV Family of Water Supplies Water Use Efficiency Strategic Plan, June 2015.

Memorandum of Understanding between the Santa Clara River Valley Upper Basin Water Purveyors and United Water Conservation District, August 2001. Memorandum of Understanding between Castaic Lake Water Agency, CLWA Santa Clarita Water Division, Newhall County Water District and Valencia Water Company, December 2006.

Memorandum of Understanding between the Santa Clarita Valley Water Agency and United Water Conservation District, October 2018.

Nancy Clemm and Kennedy/Jenks Consultants, Final Report, 2017 Water Supply Reliability Plan-Updated, November 2017

Richard C. Slade & Associates, LLC, 2001 Update Report, Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems, prepared for Santa Clarita Valley Water Purveyors, July 2002.

Sanitation Districts of Los Angeles County (LACSD), 2013. Santa Clarita Valley Sanitation District Chloride Compliance Facilities Plan and Environmental Impact Report – Final. SCH# 2012011010. October 2013

Santa Clarita Valley Family of Water Suppliers, et al., Water Use Efficiency Strategic Plan, June 24, 2015.

Slade, R. C., Hydrogeologic Assessment of the Saugus Formation in the Santa Clara Valley of Los Angeles County, California, Vols. I and II, prepared for Castaic Lake Water Agency, 1988.

Slade, R. C., Hydrogeologic Investigation of Perennial Yield and Artificial Recharge Potential of the Alluvial Sediments in the Santa Clarita River Valley of Los Angeles County, California, Vols. I and II, prepared for Upper Santa Clara Water Committee, 1986.

Trussell Technologies and GSI Water Solutions, Upper Santa Clara River Water Recharge Feasibility Study, Prepared for Newhall County Water District, Castaic Lake Water Agency, CLWA Santa Clarita Water Division, and Valencia Water Company, September 2017

Appendix A
Historical Water Supply and Utilization Tables for
Municipal and Agricultural/Other Users

Appendix A
Table 1
Water Supply Utilization by Santa Clarita Valley Water Agency and Los Angeles County Waterworks District 36
Santa Clarita Valley Water Report
(Acre-Feet)

Year	Santa Clarita Water Division					Los Angeles County Waterworks District 36			Newhall Water Division					Valencia Water Division					All Municipal Divisions and LACWD 36						
	SCV Water		Local Production		Total	SCV Water	Local Production		Total	SCV Water		Local Production		Total	SCV Water	Local Production		Other	Total	SCV Water		Local Production		Other	Total
	Imported Water ¹	Treated Groundwater ²	Alluvium	Saugus Formation			Imported Water ¹	Alluvium ³		Saugus Formation ⁴	Imported Water ¹	Treated Groundwater ²	Alluvium			Saugus Formation	Imported Water ¹			Alluvium	Saugus Formation	Recycled Water ⁵	Imported Water ¹		
1980	1,126	-	9,467	0	10,593	0	-	-	0	0	-	1,170	2,363	3,533	0	5,995	1,644	-	7,639	1,126	-	16,632	4,007	-	21,765
1981	4,603	-	7,106	0	11,709	0	-	-	0	0	-	1,350	2,621	3,971	1,214	5,597	1,808	-	8,619	5,817	-	14,053	4,429	-	24,299
1982	6,454	-	4,091	0	10,545	145	-	-	145	0	-	1,178	2,672	3,850	3,060	3,415	897	-	7,372	9,659	-	8,684	3,569	-	21,912
1983	5,214	-	4,269	0	9,483	207	-	-	207	0	-	1,147	2,787	3,934	3,764	3,387	611	-	7,762	9,185	-	8,803	3,398	-	21,386
1984	6,616	-	6,057	0	12,673	240	-	-	240	0	-	1,549	2,955	4,504	4,140	4,975	854	-	9,969	10,996	-	12,581	3,809	-	27,386
1985	6,910	-	6,242	0	13,152	272	-	-	272	0	-	1,644	3,255	4,899	4,641	4,633	885	-	10,159	11,823	-	12,519	4,140	-	28,482
1986	8,366	-	5,409	0	13,775	342	-	-	342	0	-	1,842	3,548	5,390	5,051	5,167	1,427	-	11,645	13,759	-	12,418	4,975	-	31,152
1987	9,712	-	5,582	0	15,294	361	-	-	361	22	-	2,127	3,657	5,806	6,190	4,921	1,305	-	12,416	16,285	-	12,630	4,962	-	33,877
1988	11,430	-	5,079	63	16,572	434	-	-	434	142	-	2,283	4,041	6,466	7,027	4,835	2,300	-	14,162	19,033	-	12,197	6,404	-	37,634
1989	12,790	-	5,785	0	18,575	457	-	-	457	428	-	2,367	4,688	7,483	7,943	5,826	2,529	-	16,298	21,618	-	13,978	7,217	-	42,813
1990	12,480	-	5,983	40	18,503	513	-	-	513	796	-	1,936	4,746	7,478	7,824	5,232	3,516	-	16,572	21,613	-	13,151	8,302	-	43,066
1991	6,158	-	5,593	4,781	16,532	435	-	-	435	675	-	1,864	4,994	7,533	700	9,951	4,642	-	15,293	7,968	-	17,408	14,417	-	39,793
1992	6,350	-	8,288	2,913	17,551	421	-	-	421	802	-	1,994	5,160	7,956	6,338	6,615	2,385	-	15,338	13,911	-	16,897	10,458	-	41,266
1993	3,429	-	12,016	2,901	18,346	465	-	-	465	1,075	-	1,977	5,068	8,120	8,424	5,815	2,182	-	16,421	13,393	-	19,808	10,151	-	43,352
1994	5,052	-	10,996	3,863	19,911	453	-	-	453	906	-	2,225	5,103	8,234	7,978	6,847	2,565	-	17,390	14,389	-	20,068	11,531	-	45,988
1995	7,955	-	10,217	1,726	19,898	477	-	-	477	1,305	-	1,675	4,775	7,755	7,259	8,698	1,586	-	17,543	16,996	-	20,590	8,087	-	45,673
1996	9,385	-	10,445	2,176	22,006	533	-	-	533	1,213	-	1,803	4,871	7,887	6,962	12,433	326	-	19,721	18,093	-	24,681	7,373	-	50,147
1997	10,120	-	11,268	1,068	22,456	785	-	-	785	1,324	-	2,309	5,168	8,801	9,919	11,696	516	-	22,131	22,148	-	25,273	6,752	-	54,173
1998	8,893	-	11,426	0	20,319	578	-	-	578	1,769	-	1,761	4,557	8,087	9,014	10,711	149	-	19,874	20,254	-	23,898	4,706	-	48,858
1999	10,772	-	13,741	0	24,513	654	-	-	654	5,050	-	1,676	2,622	9,348	10,806	11,823	106	-	22,735	27,282	-	27,240	2,728	-	57,250
2000	13,751	-	11,529	0	25,280	800	-	-	800	6,024	-	1,508	2,186	9,718	12,004	12,179	1,007	-	25,190	32,579	-	25,216	3,193	-	60,988
2001	15,648	-	9,941	0	25,589	907	-	-	907	5,452	-	1,641	2,432	9,525	13,362	10,518	835	-	24,715	35,369	-	22,100	3,267	-	60,736
2002	18,916	-	9,513	0	28,429	1,069	-	-	1,069	5,986	-	981	3,395	10,362	15,792	11,603	965	-	28,360	41,763	-	22,097	4,360	-	68,220
2003	20,665	-	6,424	0	27,089	1,175	-	-	1,175	6,572	-	1,266	2,513	10,351	16,004	11,707	1,068	50	28,829	44,416	-	19,397	3,581	50	67,444
2004	22,045	-	7,146	0	29,191	854	380	-	1,234	5,896	-	1,582	3,739	11,217	18,410	9,862	1,962	420	30,654	47,205	-	18,970	5,701	420	72,296
2005	16,476	-	12,408	0	28,884	857	343	-	1,200	5,932	-	1,389	3,435	10,756	14,732	12,228	2,513	418	29,891	37,997	-	26,368	5,948	418	70,731
2006	16,548	-	13,156	0	29,704	1,289	-	-	1,289	5,898	-	2,149	3,423	11,470	16,313	11,884	2,449	419	31,065	40,048	-	27,189	5,872	419	73,528
2007	20,488	-	10,686	0	31,174	1,406	-	-	1,406	6,478	-	1,806	3,691	11,975	16,779	13,140	2,367	470	32,756	45,151	-	25,632	6,058	470	77,311
2008	18,598	-	11,878	0	30,476	1,354	-	-	1,354	5,428	-	1,717	4,195	11,340	16,325	14,324	1,770	311	32,730	41,705	-	27,919	5,965	311	75,900
2009	17,739	-	10,077	0	27,816	1,243	-	-	1,243	4,832	-	1,860	3,868	10,559	14,732	12,459	2,836	328	30,355	38,546	-	24,396	6,704	328	69,974
2010	15,188	-	10,607	0	25,795	1,141	-	-	1,141	3,035	-	2,323	4,173	9,531	11,214	13,054	2,995	336	27,599	30,578	-	25,984	7,168	336	64,066
2011	13,593	2,038	10,195	0	25,826	1,172	-	-	1,172	1,325	746	3,216	4,389	9,676	14,718	12,775	265	373	28,131	30,808	2,784	26,186	4,654	373	64,805
2012	15,600	2,164	10,192	0	27,956	471	-	794	1,265	2,965	792	2,631	4,081	10,469	16,522	12,770	302	428	30,022	35,558	2,956	25,593	5,177	428	69,712
2013	20,059	2,275	7,262	0	29,596	485	-	811	1,296	4,488	833	1,405	3,835	10,561	18,249	12,764	594	400	32,007	43,281	3,108	21,431	5,240	400	73,460
2014	21,478	1,832	4,220	0	27,530	4	-	1,238	1,242	3,942	671	1,383	3,849	9,845	7,668	19,080	2,339	474	29,561	33,092	2,503	24,683	7,426	474	68,178
2015	15,019	2,167	4,597	0	21,783	3	-	973	976	2,478	794	1,131	3,697	8,100	6,648	13,605	2,929	450	23,632	24,148	2,961	19,333	7,599	450	54,491
2016	17,943	2,494	3,485	0	23,922	3	0	1,047	1,050	2,876	913	626	3,842	8,257	10,308	11,133	2,789	507	24,737	31,130	3,407	15,244	7,678	507	57,966
2017	23,257	2,191	907	0	26,355	1	0	1,093	1,094	5,831	802	780	1,523	8,936	17,562	7,737	1,370	501	27,170	46,651	2,993	9,424	3,986	501	63,555
2018	21,611	2,136	2,465	0	26,212	5	0	1,204	1,209	5,583	782	728	1,880	8,973	14,800	10,837	2,837	352	28,826	41,999	2,918	14,030	5,921	352	65,220
2019	19,002	2,332	2,762	0	24,096	7	0	972	979	3,770	854	1,044	2,664	8,332	19,293	5,243	1,676	458	26,670	42,072	3,186	9,049	5,312	458	60,077

1. Reflects State Water Project through 2006; includes imported water from State Water Project and Buena Vista WSD Agreement beginning in 2007 and continuing through the present year.
2. In January 2011, SCV Water began operation of the Saugus groundwater containment project as part of municipal water supply. After treatment for perchlorate removal, that water was blended with treated imported water and delivered through the SCV Water distribution system. The amounts of treated groundwater from Saugus 1 and 2 utilized by SCWD and NWD reflect the estimated distribution to each Division consistent with the proportions in the December, 2006 MOU that establishes amounts to be delivered to SCWD and NWD. Although the MOU indicates all the treated Saugus 1 and 2 water is delivered to NWD and SCWD, a minor, unquantifiable amount of the water may have been delivered to the other purveyors as a result of varying distribution system operations.
3. Groundwater purchased from Pitchess Detention Center.
4. Groundwater production began at a new LA County Waterworks District 36 Saugus well in December 2011.
5. Recycled water totals for 2012 and 2013 are estimates based on the water treatment plant production meter; estimates were necessary due to customer meter failure.

Appendix A
Table 2
Individual Water Supply Utilization by Agricultural and Other Users
Santa Clarita Valley Water Report
(Acre-Feet)

Year	Five Point			Pitchess Detention Center ¹			Small Private Domestic, Irrigation, and Golf Course Uses			All Agricultural and Other Users			
	Local Production		Total	Purchased from SCV Water	Local Production	Total	Local Production		Total	Purchased from SCV Water	Local Production		Total
	Alluvium	Saugus Formation		Imported Water ²	Alluvium		Alluvium ³	Saugus Formation ⁴		Imported Water ²	Alluvium	Saugus Formation	
1980	11,331	20	11,351	0	3,000	3,000	500	562	1,062	0	14,831	582	15,413
1981	13,237	20	13,257	0	3,000	3,000	500	521	1,021	0	16,737	541	17,278
1982	9,684	20	9,704	0	3,000	3,000	500	501	1,001	0	13,184	521	13,705
1983	7,983	20	8,003	0	3,000	3,000	500	434	934	0	11,483	454	11,937
1984	11,237	20	11,257	0	3,000	3,000	500	620	1,120	0	14,737	640	15,377
1985	9,328	20	9,348	0	3,000	3,000	500	555	1,055	0	12,828	575	13,403
1986	8,287	20	8,307	0	3,000	3,000	500	490	990	0	11,787	510	12,297
1987	6,512	20	6,532	0	3,000	3,000	500	579	1,079	0	10,012	599	10,611
1988	5,951	20	5,971	0	3,000	3,000	500	504	1,004	0	9,451	524	9,975
1989	6,243	20	6,263	0	3,000	3,000	500	522	1,022	0	9,743	542	10,285
1990	8,225	20	8,245	0	2,000	2,000	500	539	1,039	0	10,725	559	11,284
1991	7,039	20	7,059	0	2,240	2,240	500	480	980	0	9,779	500	10,279
1992	8,938	20	8,958	987	1,256	2,243	500	446	946	987	10,694	466	12,147
1993	8,020	20	8,040	443	1,798	2,241	500	439	939	443	10,318	459	11,220
1994	10,606	20	10,626	311	1,959	2,270	500	474	974	311	13,065	494	13,870
1995	11,174	20	11,194	6	2,200	2,206	500	453	953	6	13,874	473	14,353
1996	12,020	266	12,286	780	1,237	2,017	500	547	1,047	780	13,757	813	15,350
1997	12,826	445	13,271	1,067	1,000	2,067	500	548	1,048	1,067	14,326	993	16,386
1998	10,250	426	10,676	12	2,000	2,012	500	423	923	12	12,750	849	13,611
1999	13,824	479	14,303	20	1,842	1,862	500	509	1,009	20	16,166	988	17,174
2000	11,857	374	12,231	3	1,644	1,647	1,220	513	1,733	3	14,721	887	15,611
2001	12,661	300	12,961	0	1,604	1,604	1,224	573	1,797	0	15,489	873	16,362
2002	13,514	211	13,725	0	1,602	1,602	1,063	589	1,652	0	16,179	800	16,979
2003	10,999	122	11,121	0	2,273	2,273	931	504	1,435	0	14,203	626	14,829
2004	10,991	268	11,259	0	2,725	2,725	1,071	535	1,606	0	14,787	803	15,590
2005	8,648	6	8,654	0	2,499	2,499	1,133	499	1,632	0	12,280	505	12,785
2006	11,477	934	12,411	0	3,026	3,026	1,369	506	1,875	0	15,872	1,440	17,312
2007	9,968	971	10,939	0	2,085	2,085	1,088	656	1,744	0	13,141	1,627	14,768
2008	9,191	330	9,521	0	3,506	3,506	1,100	623	1,723	0	13,797	953	14,750
2009	11,061	379	11,440	0	3,432	3,432	1,097	595	1,692	0	15,590	974	16,564
2010	10,772	366	11,138	0	3,446	3,446	957	558	1,515	0	15,175	924	16,099
2011	10,323	344	10,667	0	3,226	3,226	1,013	533	1,546	0	14,562	877	15,439
2012	11,296	0	11,296	0	2,722	2,722	1,090	586	1,676	0	15,108	586	15,694
2013	12,091	0	12,091	0	2,309	2,309	1,061	690	1,751	0	15,461	690	16,151
2014	9,262	0	9,262	0	2,082	2,082	869	672	1,541	0	12,213	672	12,885
2015	8,868	0	8,868	0	1,768	1,768	723	720	1,443	0	11,359	720	12,079
2016	11,276	0	11,276	0	1,616	1,616	713	754	1,467	0	13,605	754	14,359
2017	10,348	0	10,348	0	1,630	1,630	576	884	1,460	0	12,554	884	13,438
2018	10,231	0	10,231	0	1,611	1,611	595	634	1,229	0	12,437	634	13,071
2019	9,790	0	9,790	0	1,560	1,560	617	543	1,160	0	11,967	543	12,510

1. Formerly called Los Angeles County Honor Farm; groundwater sold to LACWD 36 in 2004 and 2005 is reported in Table 2-1.
2. Reflects State Water Project through 2006; includes imported water from State Water Project and Buena Vista WSD Agreement beginning in 2007.
3. Sand Canyon Country Club irrigation and estimated private pumping.
4. Valencia Country Club and Vista Valencia Golf Course irrigation.

Appendix A
Table 3
Total Water Supply Utilization for Municipal, Agricultural and Other Uses
Santa Clarita Valley Water Report
(Acre-Feet)

Year	SCV Water		Local Production		Other	Total
	Imported Water ¹	Treated Groundwater ²	Alluvium	Saugus Formation	Recycled Water	
1980	1,126	-	31,463	4,589	-	37,178
1981	5,817	-	30,790	4,970	-	41,577
1982	9,659	-	21,868	4,090	-	35,617
1983	9,185	-	20,286	3,852	-	33,323
1984	10,996	-	27,318	4,449	-	42,763
1985	11,823	-	25,347	4,715	-	41,885
1986	13,759	-	24,205	5,485	-	43,449
1987	16,285	-	22,642	5,561	-	44,488
1988	19,033	-	21,648	6,928	-	47,609
1989	21,618	-	23,721	7,759	-	53,098
1990	21,613	-	23,876	8,861	-	54,350
1991	7,968	-	27,187	14,917	-	50,072
1992	14,898	-	27,591	10,924	-	53,413
1993	13,836	-	30,126	10,610	-	54,572
1994	14,700	-	33,133	12,025	-	59,858
1995	17,002	-	34,464	8,560	-	60,026
1996	18,873	-	38,438	8,186	-	65,497
1997	23,215	-	39,599	7,745	-	70,559
1998	20,266	-	36,648	5,555	-	62,469
1999	27,302	-	43,406	3,716	-	74,424
2000	32,582	-	39,937	4,080	-	76,599
2001	35,369	-	37,589	4,140	-	77,098
2002	41,763	-	38,276	5,160	-	85,199
2003	44,416	-	33,599	4,207	50	82,273
2004	47,205	-	33,757	6,503	420	87,885
2005	37,997	-	38,648	6,453	418	83,516
2006	40,048	-	43,061	7,312	419	90,840
2007	45,151	-	38,773	7,685	470	92,079
2008	41,705	-	41,716	6,918	311	90,650
2009	38,546	-	39,986	7,678	328	86,538
2010	30,578	-	41,159	8,092	336	80,165
2011	30,808	2,784	40,748	5,531	373	80,244
2012	35,558	2,956	40,701	5,763	428	85,406
2013	43,281	3,108	36,892	5,930	400	89,611
2014	33,092	2,503	36,896	8,098	474	81,063
2015	24,148	2,961	30,692	8,319	450	66,570
2016	31,130	3,407	28,849	8,432	507	72,325
2017	46,651	2,993	21,978	4,870	501	76,993
2018	41,999	2,918	26,467	6,555	352	78,291
2019	42,072	3,186	21,016	5,855	458	72,587

1. Reflects State Water Project through 2006; includes imported water from State Water Project and Buena Vista WSD Agreement beginning in 2007.

2. In January 2011, SCV Water began operation of the Saugus Formation groundwater containment project. After treatment for perchlorate removal, that water was blended with treated imported water and delivered through the SCV Water distribution system.

