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Annual Report - Water Year 2019
Scotts Valley Water District
Groundwater Management Plan

Prepared for:

Scotts Valley Water District

2 Civic Center Drive, Scotts Valley CA 95066

Prepared by:

Montgomery & Associates

1970 Broadway, Suite 225

Oakland, CA 94612

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1 EXECUTIVE SUMMARY

The Scotts Valley Water District (SVWD or District), located in Santa Cruz County, serves water to residents and businesses within an area of approximately 5.5 square miles that includes most of the City of Scotts Valley as well as some unincorporated areas north of the City. Groundwater from the Santa Margarita Groundwater Basin (SMGB) is the sole source of potable water supply for the District.

SVWD formally adopted its Groundwater Management Plan in 1994 under Assembly Bill 3030 (AB3030). Annual reports describing the groundwater conditions in the Scotts Valley area and the District's management programs have been prepared since 1994.

Slightly Above-Average Rainfall in Water Year 2019

Rainfall in Water Year (WY) 2019 at the District's weather station at El Pueblo Yard was 43.7 inches, which is 104% of average rainfall at that station. WY2019 is one of five of the past twelve years with above average precipitation. Since the drought that ended in WY2015, rainfall has been a cumulative 23 inches above-average, mainly due to an extremely wet year in WY2017. This cumulative above-average rainfall is only 42% of the cumulative 55-inch rainfall deficit that occurred over the drought.

District Groundwater Pumping Continues to be Substantially Less than Historical Pumping

Groundwater pumped by SVWD in WY2019 was 1,215 acre-feet, which is only four acre-feet more than WY2018 (Table ES-1). The District's groundwater pumping is now just under 900 acre-feet less than in WY2003 (approximately 42% of WY2003 pumping). SVWD sources all of its potable groundwater supply from the Lompico and Butano aquifers. In WY2019, approximately 58% of SVWD's groundwater pumping was from the Lompico aquifer and almost 42% was from the Butano aquifer.

SVWD maintains a number of ongoing activities to support the sustainable management of its groundwater resource including water use efficiency activities, recycled water program, and water audit and loss control program. In WY2019, recycled water deliveries were approximately 174 acre-feet. Since WY2002, approximately 2,490 acre-feet of recycled water has been delivered for non-potable use. Total recycled water deliveries since 2002 equate to banking a volume of groundwater that was pumped cumulatively by SVWD in WY2018 and WY2019.

Table ES-1. WY2010 to WY2019 Total SVWD Groundwater Pumping and Recycled Water Usage (in acre-feet)

Aquifer	Historical Maximum	WY2010	WY2011	WY2012	WY2013	WY2014	WY2015	WY2016	WY2017	WY2018	WY2019
Groundwater	2,100 (1997)	1,357	1,292	1,351	1,400	1,376	1,133	1,139	1,242	1,211	1,215
Recycled Water	200 (2013)	134	163	184	200	199	184	195	162	196	174
Total Water Supply	2,096 (2003)	1,491	1,455	1,535	1,600	1,575	1,317	1,334	1,404	1,407	1,389

Santa Margarita Aquifer and Monterey Formation Groundwater Levels Remain either Stable or Increasing

The two shallowest formations in the Scotts Valley area, the Santa Margarita aquifer and Monterey Formation, have stable and increasing groundwater level trends, respectively. The District does not pump groundwater from the Santa Margarita aquifer but continues to monitor its groundwater levels. In general, the Santa Margarita aquifer in the District's service area has stable groundwater levels with temporary increases in response to wet years. For example, WY2017 was a very wet year that caused a temporary increase in groundwater levels, that has since declined slightly. The Monterey Formation, is not a major aquifer in the Scotts Valley area, and is pumped minimally by the District (12 acre-feet over the past three years) and other pumpers. It has experienced an overall gradual increase in groundwater levels since WY2014. In WY2019, Monterey Formation groundwater levels in the southern portion of the District service area at SVWD Well #9 increased almost five feet.

Lompico Aquifer Groundwater Levels are Increasing

Even though the Lompico aquifer is the District's primary producing aquifer, over the past two years there has been an overall increasing trend in groundwater levels in the main pumping areas around SVWD Well #10, and Wells #11A and #11B where the 150-200 foot decline in groundwater levels historical occurred. Static groundwater levels in WY2019 rose between 9 and 18 feet at these production wells. At SVWD Well #10 in the southern portion of the District's service area there has been an approximately 25-foot increase in levels over the past two years. Increases at SVWD Wells #11A and #11B in the central portion of the District's service area, have also been observed over the past year. These increases likely resulted from reduced pumping but also the cumulatively above-average rainfall since the end of the drought in WY2015. Cumulatively greater than average rainfall has recharged the Lompico aquifer particularly in the area of SVWD Well #10A where the Lompico aquifer is directly beneath the Santa Margarita aquifer.

Butano Aquifer Groundwater Levels

Despite the increase in Butano aquifer pumping in WY2019 due to the Orchard Well coming online as a replacement for SVWD Well #7A, groundwater levels within the Butano aquifer pumping center (Orchard Well and Well #3B) have only shown a very slight decline of a foot or two. However, it is difficult to measure accurately from the hydrographs due to fluctuating data measured during pumping. In the northernmost portion of the District, at the Stonewood Well located approximately two miles north of the Butano aquifer pumping center, Butano aquifer groundwater levels have experienced increased around four feet over the past six years.

Groundwater Quality in District Wells Meets Drinking Water Standards

Groundwater quality in SVWD's production wells is good. Iron and manganese treatment ensures that the concentrations of these constituents in delivered water is below the secondary maximum contaminant level. Volatile organic compounds (VOC) are below detectable levels in all production wells, except SVWD Wells #9 and #11A which continue to have detections of VOCs below their respective maximum contaminant levels.

SVWD is being informed about remediation activities at regulated environmental compliance sites within the District boundaries. These sites have introduced primarily VOCs into the groundwater.

- The Watkins-Johnson Superfund site remediation is moving towards closure but still needs to complete the source control component of the remedial action to ensure protectiveness over the long-term. The site is currently designated as open-remediation for residential use due to existing soil gas plumes of benzene, TCE, PCE, arsenic and cadmium in soils. A draft Focused Feasibility Study proposing potential remediation alternatives including soil excavation was submitted to the USEPA in January 2019.

- The Scotts Valley Dry Cleaners site continued operation of the soil vapor extraction and air sparging systems in their current configuration. These are remediation systems for the unsaturated soils above the groundwater table so no groundwater is extracted, only soil vapor. Their consultant is also recommending researching environmental data and past use history of the former nearby airport to assess potential source(s) for the elevated PCE and TCE concentrations detected in their distal sampling location. Groundwater remediation systems at this site have been shut down since 2015.

2 INTRODUCTION

2.1 Annual Report Format

An annual report is a key part of implementing the GWMP. The annual report evaluates and documents progress on meeting the GWMP goals and BMOs, and identifies any concerns that should be monitored or addressed. This annual report is a management-level summary of groundwater conditions and groundwater management activities conducted by the District during Water Year (WY) 2019. The annual report is presented to the SVWD Board of Directors, distributed among local agencies and stakeholders, and made available to the public at the SVWD office and website.

The District has been producing annual reports since 1994. The format of the annual report has evolved over time to meet the needs of the District. Starting in 2013, the format of the annual reports began following a two-year cycle with a more comprehensive report provided in even years. Based on past experience, there are only incremental year-to-year changes in the basin; therefore, the two-year cycle provides a more cost- effective approach to accomplish the objectives of the annual report.

The odd year annual reports (2013, 2015 and 2017) are concise summaries focused on District operations whereas the even year annual reports (2014, 2016 and 2018) provide a more regional assessment that includes an evaluation of data from neighboring water districts and private suppliers, an assessment of water quality issues, an assessment of Basin conditions and the results from of the updated basin wide groundwater model.

In order to evaluate groundwater conditions within the context of California's climate cycle, data in the annual report are typically reported over a water year defined as the period from October 1 through September 30 of the following year. This period captures the cause and effect relationship on groundwater conditions of the typical rainy winter season followed by low rainfall and higher pumping during the summer.

2.2 District Overview

The Scotts Valley Water District (SVWD or District) was formed under the County Water District Law, specifically California Water Code Section (CWC§) 30321, and received certification from the California Secretary of State in 1961. SVWD covers an area of about 5.5 square miles (Figure 1) in northern Santa Cruz County, and is located approximately five miles inland from the Monterey Bay. SVWD provides water to a majority of the residents and businesses in and around the City of Scotts Valley. Groundwater is the sole source of potable water supply for SVWD, so careful management is necessary to sustain the resource.

SVWD has been actively managing groundwater since the early 1980's; with the goal of increasing water supply reliability and protecting local water supply sources. In 1983, SVWD instituted a Water Resources Management Plan to monitor and manage water resources in the Scotts Valley area. In 1994, SVWD formally adopted a Groundwater Management Plan ([GWMP], Todd Engineers, 1994) in accordance with Assembly Bill 3030 (AB 3030), also known as the Groundwater Management Act (CWC §10750 *et seq.*).

2.3 Groundwater Management Goals and Objectives

The overall purpose of the GWMP is to provide a planning tool that helps guide the District in managing the quantity and quality of its groundwater supply, and to comply with the requirements of AB3030. The main goal of the GWMP is to better manage the sole source aquifers serving the community's drinking water. The goal of the SVWD GWMP is stated as:

> *"By implementation of a groundwater management plan for Scotts Valley, SVWD hopes to preserve and enhance the groundwater resource in terms of quality and quantity, and to minimize the cost of management by coordination of efforts among agencies."*

Development of Basin Management Objectives (BMOs) are required for the GWMP under CWC §10753.7(a)(1) as a systematic process to support groundwater basin management. The BMOs for SVWD are currently summarized as:

- Encouraging public participation through an annual report of groundwater management activities and its presentation at one or more public meetings.
- Coordinating with other local agencies.
- Continued monitoring and evaluation of groundwater conditions.
- Implementing groundwater augmentation projects.
- Investigating groundwater quality and preventing groundwater contamination.

These BMOs continue to guide the SVWD groundwater management program and serve as the major objectives of groundwater management for the District.

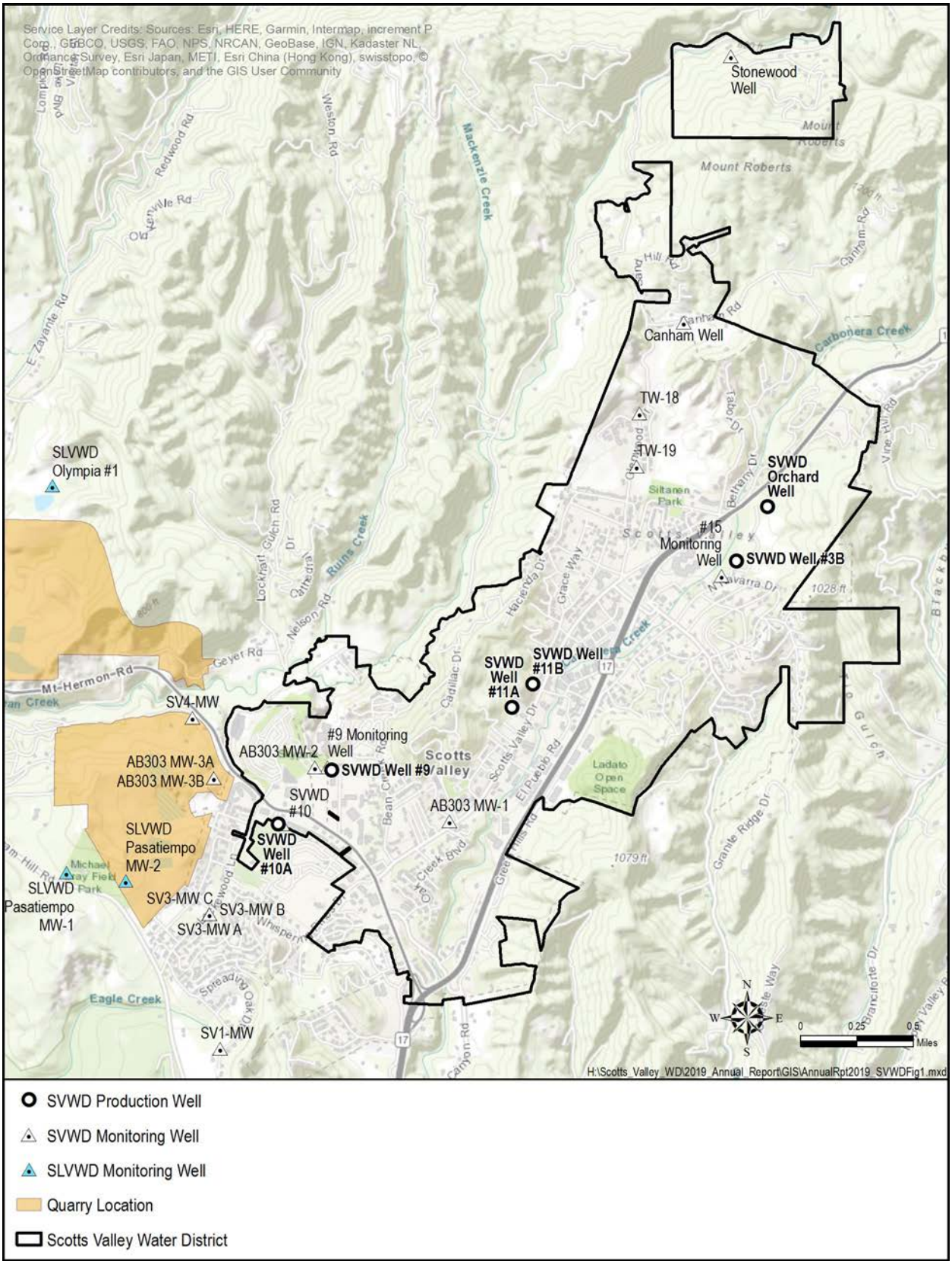


Figure 1. Scotts Valley Water District with Key Well Locations

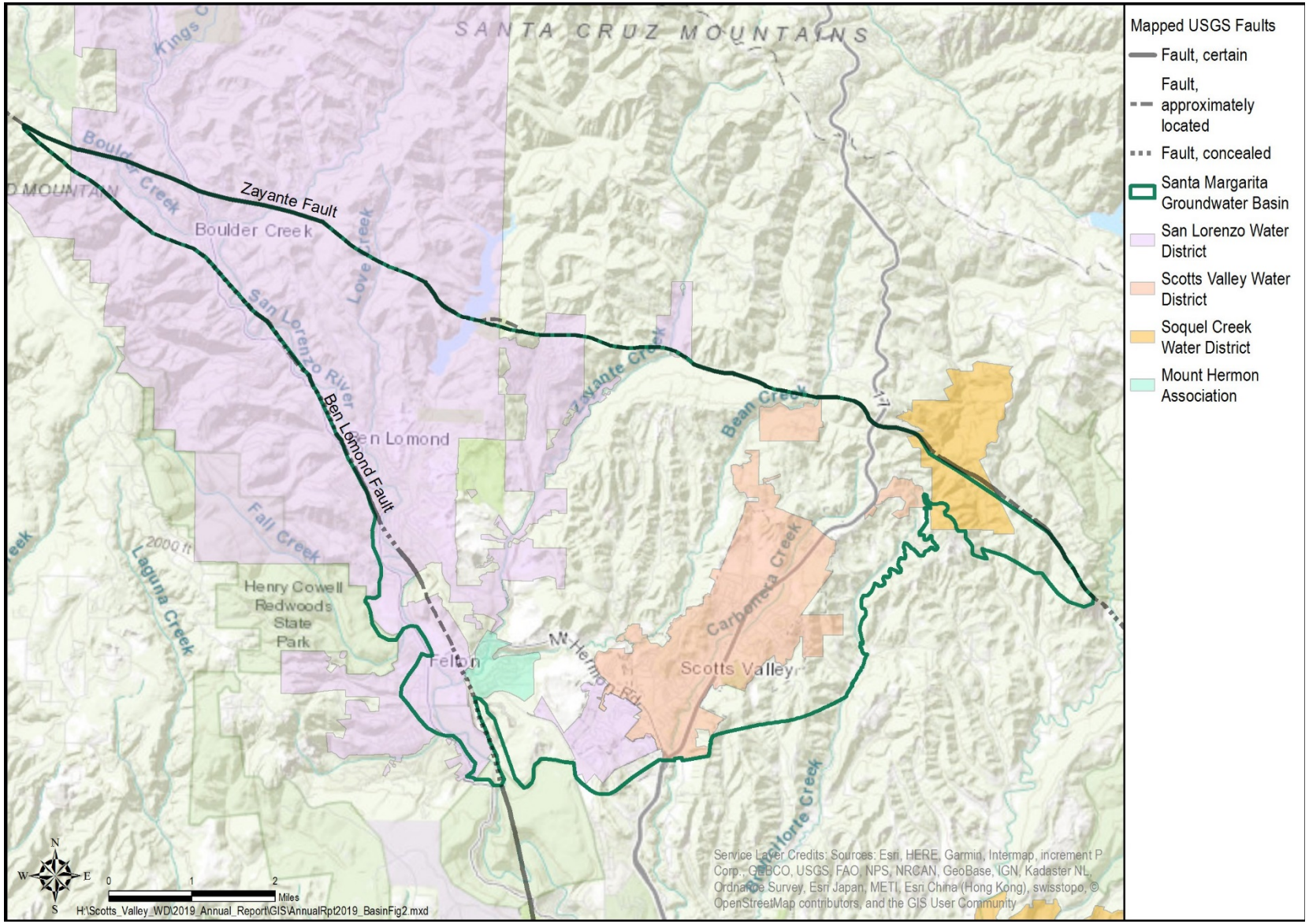


Figure 2. Santa Margarita Groundwater Basin and Water Districts

2.4 Water Year 2019 Groundwater Management Activities

SVWD continues to support the sustainable management of groundwater resources in the SMGB to maintain a safe and reliable water supply for District customers. Groundwater management programs conducted by the District to meet BMOs include the following:

- Water Use Efficiency Program: The District continues to conduct numerous activities to encourage water use efficiency among customers, coordinating public outreach activities, issuing monetary rebates to customers, and implementing best water use efficiency management practices. The District's focus has been on water loss control, leak detection and notification for customers, and water meter change-outs. A more detailed description of SVWD's water use efficiency activities can be found on the water use efficiency section of the District's website at: http://www.svwd.org/water-use-efficiency.
- Recycled Water Program: Recycled water is used in lieu of groundwater for certain non-potable uses, mainly landscape irrigation. This augments the groundwater supply and helps meet overall supply resiliency goals. Recycled water usage represents an equivalent reduction in groundwater pumping. The District encourages the use of recycled water in-lieu of potable when practical and feasible. SVWD's recycled water program has resulted in the majority of bulk water customers accessing recycled water for non-potable uses, and all new developments that are constructed near the recycled water transmission mains are required to use recycled water for irrigation. The Recycled Water Fill Station that was established in 2015 in response to the drought where City residents were eligible to receive up to 250 gallons of free recycled water per day for permitted uses was discontinued in WY2019 due to reduced demand and interest. The program operated for a few months in WY2015 and then for an additional three full seasons (WY2016 through WY2018). During that time total of 320,684 gallons (almost 1 acre-foot) of recycled was provided to the community.
- Low Impact Development (LID) Projects: LID projects include implementing stormwater best management practices to retain and infiltrate stormwater that would otherwise be diverted to the storm drain system. Infiltrated stormwater recharges shallow groundwater. SVWD has been involved in three LID projects to date:
    1. As part of a Prop 84 grant match, the District worked with a local developer to install a stormwater recharge facility at the Woodside HOA along Scotts Valley Drive.
    2. An earlier grant-funded project installed a below-ground infiltration basin at the Scotts Valley Library.

3. SVWD teamed up with the County of Santa Cruz as a sub-grantee for the Proposition 84 grant on retrofitting the existing parking lot at the Scotts Valley Transit Center to include a LID system.

- Regional Intertie Project: The Emergency Intertie between SVWD and San Lorenzo Valley Water District (SLVWD) was completed in 2016 as a solution for enhancing supply reliability. The intertie was not activated in WY2019. In the future, the intertie could be converted to a permanent intertie to support conjunctive use in the basin.
- Santa Margarita Groundwater Agency (SMGWA): Development of the Santa Margarita Basin Groundwater Sustainability Plan (GSP) per the Sustainable Groundwater Management Act (SGMA) started in March 2019. The District, as a member agency of the SMGWA, is represented on the SMGWA board by two appointed Board members and one alternate Board member. District staff provides administrative support to the SMGWA and the District's General Manager, Piret Harmon, is the SMGWA's Authorized Representative as defined by SMGWA By-laws.
- Santa Margarita Basin Groundwater Model: The Santa Margarita Groundwater Basin model that was originally developed in 2006 by ETIC for the District and updated a number of times since is being updated and improved by the SMGWA's GSP consultant for use in GSP development.
- Santa Margarita Groundwater Basin ASR Project: In 2017, the groundwater model was used to evaluate a proposed City of Santa Cruz aquifer storage and recovery (ASR) project. The modeling is being used to identify benefits or detriments to the basin resulting from the proposed ASR project. This project is ongoing, and additional modeling took place in WY2019.
- Purified Recycled Water Recharge Project: In February 2017, the District completed the Facilities Planning Report for Santa Margarita Groundwater Basin Recycled Water Groundwater Replenishment Program (Kennedy Jenks 2017). In WY2019, the District started making plans for an environmental impact report (EIR) preparation for a groundwater replenishment project using advanced treated purified wastewater. This work has been put on hold temporarily while the District is addressing the issues around the source of wastewater and brine discharge for the project.
- SVWD Data Collection: The District continues to monitor groundwater per the Groundwater Management Monitoring Plan to assess groundwater conditions in its service area. The primary monitored components are groundwater levels, groundwater pumping, precipitation, and groundwater quality.
- CASGEM Program: The District continues to provide groundwater elevation data to Santa Cruz County Environmental Health Services for submission to DWR as part of the

California Statewide Groundwater Elevation Monitoring (CASGEM) program. The CASGEM program will be replaced by the monitoring network that is to be developed for the GSP, as thus groundwater levels will be included in GSP annual reports from January 2022 onwards in place of CASGEM.

- Stakeholder Outreach: The District facilitates public participation in groundwater management through meetings of the SVWD Board of Directors and making its annual reports available through its website. SVWD was an active participant in the Santa Margarita Groundwater Basin Advisory Committee (SMGBAC), which was dissolved with the formation of the SMGWA. SVWD is also a member agency of the Regional Water Management Foundation and a signatory to the Santa Cruz Integrated Regional Water Management Plan (IRWMP).
- Regional Water Supply MOA: In 2017 The District entered into a Memorandum of Agreement with SLVWD, City of Santa Cruz and County of Santa Cruz to explore and evaluate potential projects for the conjunctive use of surface and groundwater resources in the Santa Margarita basin and San Lorenzo River watershed.

3 GROUNDWATER SUPPLY ASSESSMENT

3.1 Background

The groundwater supply assessment in this section provides a summary of the WY2019 precipitation, groundwater pumping, and recycled water use data to give an overview of the factors affecting the volume of groundwater in the SMGB. The assessment for the 2019 Annual Groundwater Report summarizes data from only District operations. The 2020 Annual Groundwater Report will provide a regional groundwater supply assessment including an assessment of the change in the volume of groundwater in aquifer storage over the past two years

3.2 Precipitation Summary

Precipitation is the primary source of groundwater recharge through both direct percolation of rainfall through the soil and infiltration of runoff through streambeds. Therefore, evaluating annual precipitation is a key component of understanding water supply trends and groundwater conditions. Average annual precipitation at the District's El Pueblo Yard weather station in Scotts Valley is 42 inches based on measurements collected since 1947 (Figure 3). Since 1947, the highest annual rainfall in Scotts Valley was 86.2 inches in WY1983, and the lowest annual rainfall was 19.9 inches in WY1976. For WY2019, precipitation was 43.7 inches, or about 104% of average (Figure 3). Due to the mountainous nature of the Basin, precipitation varies across the District's service area can vary up to 8 inches, with increasing precipitation iin a westerly directly. For example, in Felton, average annual precipitation is approximately 4-5 inches greater than in central Scotts Valley.

WY2019 is one of five of the past twelve years with above average precipitation. The cumulative rainfall deficit over the twelve-year period from October 2006 through September 2019 is 48 inches below average. Since the end of drought (September 2015), rainfall is a cumulative 23 inches above average. This above average rainfall is only 42% of the cumulative 55-inch rainfall deficit that occurred during the drought.

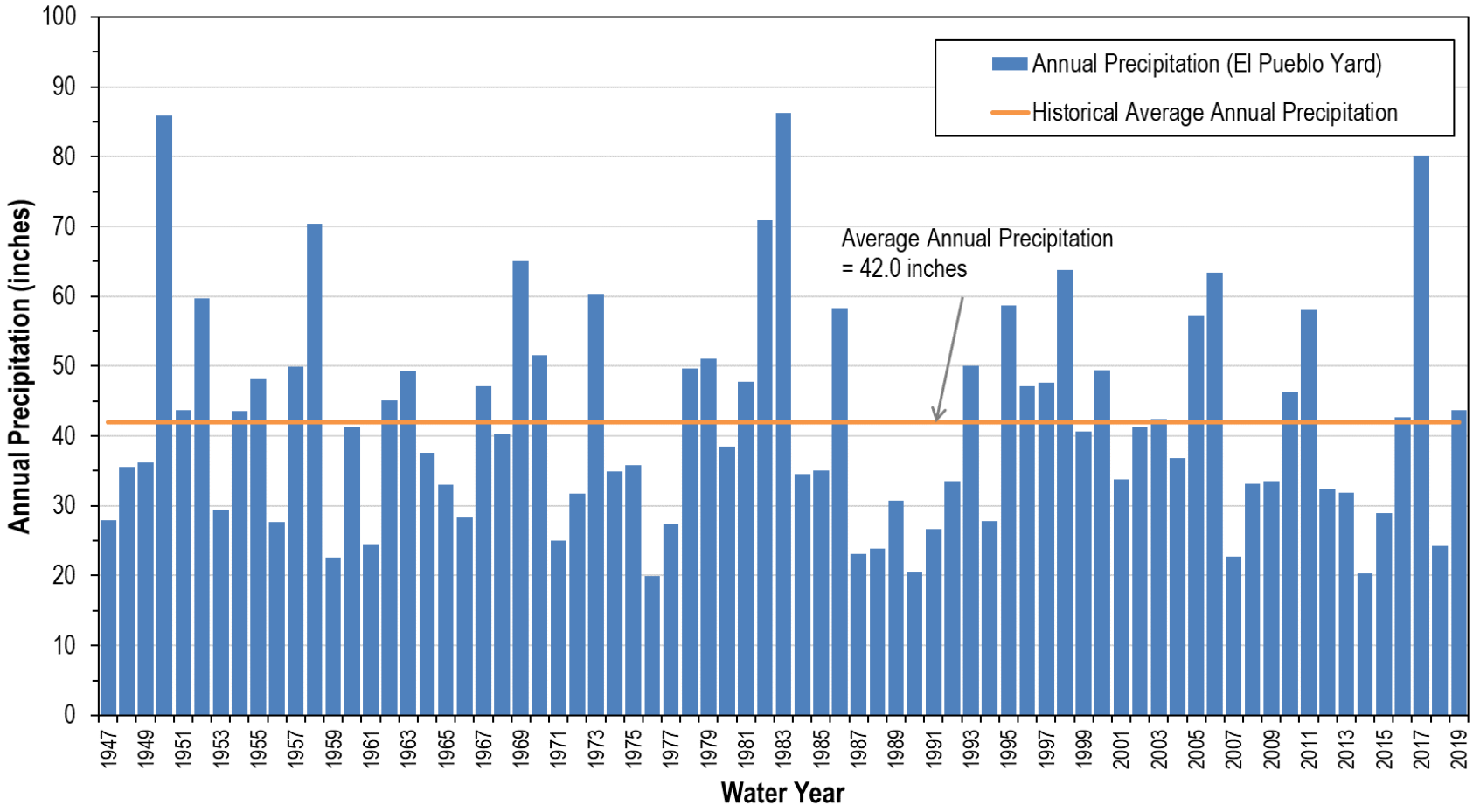


Figure 3. Annual Precipitation for Scotts Valley Water District's El Pueblo Yard by Water Year

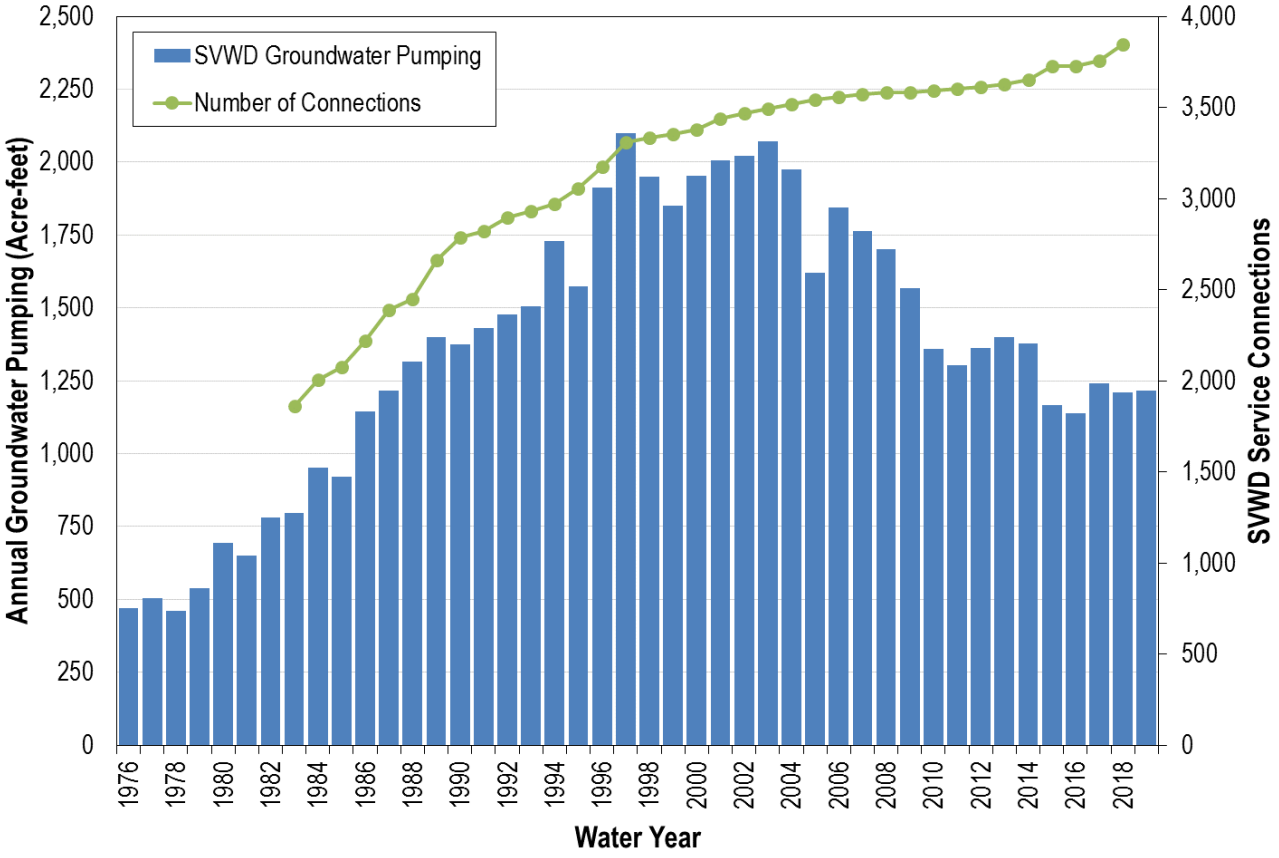


Figure 4. Annual SVWD Groundwater Pumping Volumes and Service Connections

3.3 SVWD Groundwater Pumping

SVWD currently operates five production wells: #3B, Orchard, #10A, #11A, and #11B. The locations of these wells are shown in Figure 1. Groundwater production by well varies seasonally and annually to meet changing local water demand and allow for well maintenance activities. Annual pumping in WY2019 was 1,215 acre-feet, which is similar to the previous two years' pumping (Table 1). In WY2019, SVWD wells Orchard, #10A, and #11B were the highest-producing wells, and provided 97% of SVWD's potable supply (Table 1).

Many SVWD wells have limited capacity for various reasons, including:

- SVWD Well #9 is perforated entirely in the poorer-quality and lower-yielding Monterey aquifer (Kennedy/Jenks, 2016).
- SVWD Well #11A's capacity is likely reduced because of limited saturated aquifer thickness, local variations in aquifer properties, and suboptimal well design (Feeney, 2015).

All wells are currently operated substantially below their historical maximum annual extraction volumes.

Table 1. WY2010 to WY2019 SVWD Groundwater Pumping by Well (in acre-feet)

SVWD Well	Historical Maximum	WY2010	WY2011	WY2012	WY2013	WY2014	WY2015	WY2016	WY2017	WY2018	WY2019
#3B	409	150	226	143	208	273	160	257	167	337	7
#7A	991	427	312	501	368	335	236	281	354	destroyed	
Orchard	-	-	-	-	-	-	-	-	-	200	843
#9	426	3	3	4	35	23	0	2	6	4	2
#10A	544	357	362	378	391	429	374	331	333	371	234
#11A	152	20	1	13	59	19	39	22	34	39	28
#11B	683	400	397	323	339	298	324	246	348	260	101
Total	2,077 (2003)	1,357	1,292	1,351	1,400	1,376	1,133	1,139	1,242	1,211	1,215

In WY2019, over 99 percent of SVWD groundwater pumping was derived from the Lompico and Butano aquifers (Table 2). Groundwater pumped from the Lompico and Butano aquifers accounts for 58 and 42 percent of total WY2019 SVWD pumping, respectively. Current pumping from each aquifer is substantially less than historical maximum pumping.

Groundwater pumping by SVWD in WY2019 was 1,215 acre-feet (Table 1), which is only four acre-feet more than WY2018. Note that this annual report reports actual groundwater pumped from the Basin, while SVWD frequently reports groundwater production and demand for other occasions. Production is the volume of groundwater pumped minus any process water that is not put into the distribution system. Demand is production plus/minus change in storage volumes. Production volumes are therefore less than the groundwater pumping volumes reported in this annual report. In comparison to groundwater pumped, in WY2019, production volumes that account for process water were 1,110 acre-feet, which is less than WY2018's production of 1,146 acre-feet.

Although WY2018 and WY2019 had slightly more pumping than WY2015 and WY2016, groundwater pumped is less than what was pumped prior to the drought. WY2019 pumping continues an overall decreasing groundwater pumping trend over the past 15 years.

The aquifers SVWD relies on are currently being pumped well below their historical maximum annual pumping volumes (Table 2). Annual groundwater pumping from the Lompico aquifer has declined noticeably since WY2014. WY2019 pumping from the Lompico aquifer is 47% of the pumping high of 1,483 acre-feet in WY2003. Similarly, WY2019 pumping in the Butano aquifer is 69% of the pumping high of 735 acre-feet in WY1997. The amount of Butano aquifer pumping increased in WY2019 due to the Orchard Well being the primary producing well for SVWD over the year (Table 1).

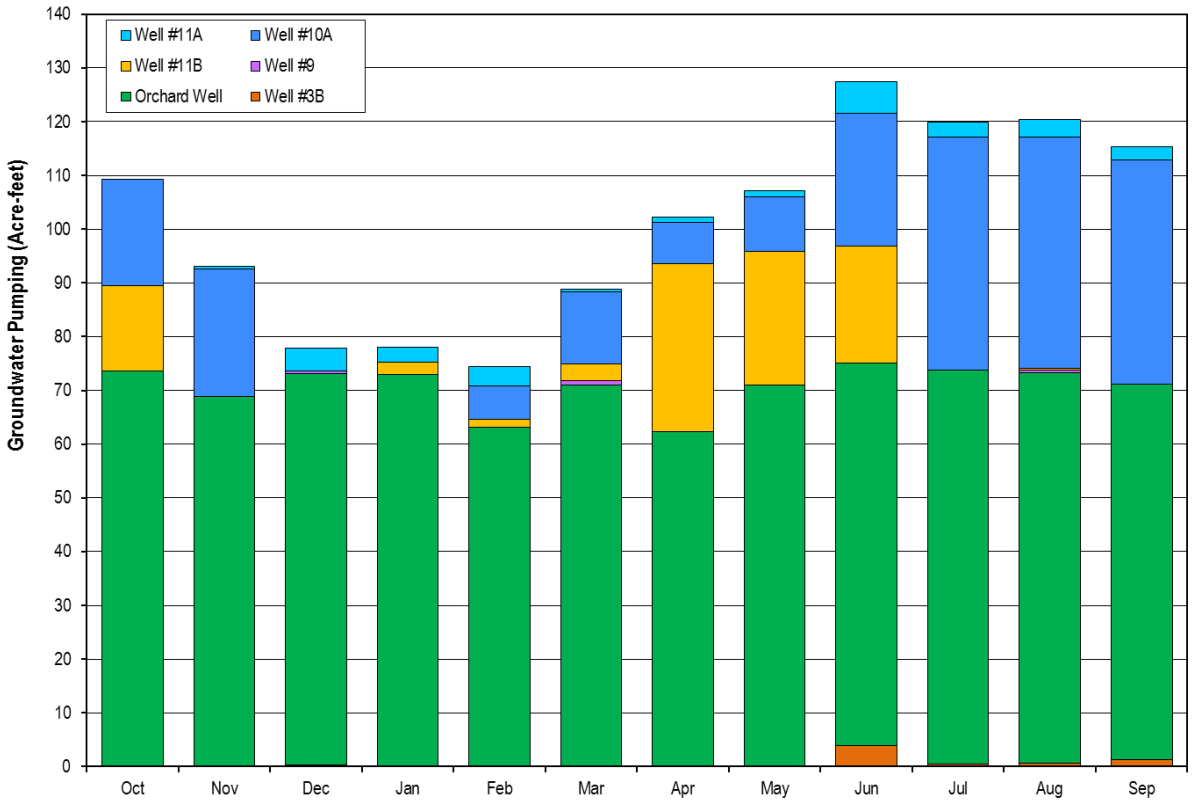
Table 2. WY2010 to WY2019 SVWD Groundwater Pumping by Aquifer and Recycled Water Usage (in acre-feet)

Aquifer	Historical Maximum	WY2010	WY2011	WY2012	WY2013	WY2014	WY2015	WY2016	WY2017	WY2018	WY2019
Monterey	426 (1984)	3	3	4	35	23	0	2	6	4	2
Lompico	1,483 (2003)	1,009	969	964	1,020	989	896	814	923	884	703
Butano	735 (1997)	346	320	383	345	365	237	323	312	322	510
Groundwater	*2,100 (1997)*	*1,357*	*1,292*	*1,351*	*1,400*	*1,376*	*1,133*	*1,139*	*1,242*	*1,211*	*1,215*
Recycled Water	*200 (2013)*	*134*	*163*	*184*	*200*	*199*	*184*	*195*	*162*	*196*	*174*
Total Water Supply	2,096 (2003)	1,491	1,455	1,535	1,600	1,575	1,317	1,334	1,404	1,407	1,389

SVWD Wells #10, #10A, #11A and #11B produce exclusively from the Lompico aquifer, whereas SVWD Wells #3B, #7A, and the Orchard Well which is #7A's replacement, are screened across both the Lompico and Butano aquifers. Based on results of the groundwater model (Kennedy/Jenks, 2015), 60% of the groundwater pumped from SVWD Wells #3B, #7A, and the Orchard well is from the Butano aquifer and 40% is from the Lompico aquifer. This pumping distribution has been applied for past pumping (Table 2), so the values may differ from past annual reports.

The revised geologic interpretation has SVWD Well #9 screened completely within the Monterey Formation rather than the Santa Margarita aquifer (Kennedy Jenks, 2016a). This change is reflected on Table 1. The maximum estimated groundwater pumped from the Monterey Formation was 426 AF in WY1984 when groundwater levels were about 200 feet higher. Due to low groundwater levels and low yield, SVWD Well #9 is not a consistently active production well. Only 0.2% of the SVWD's total groundwater pumped was pumped from the Monterey Formation.

Groundwater pumping is highest in the dry season months of May through October and lowest in the wetter months of December through March due primarily to seasonal changes in outdoor use (Figure 5). The timing of increased outdoor water use typically shifts with the amount of springtime precipitation. If March through May rainfall is above average, outdoor water usage tends to be below-average, whereas below-average spring rain tends to increase outdoor water



use. To assess changes in SVWD water use trends, a comparison of the District's recent monthly groundwater pumped is compared to average groundwater pumped from earlier periods when water use was higher. The results are shown on Figure 5.

Figure 5. SVWD Groundwater Pumping by Month for WY2019

Figure 6 shows four historical average monthly groundwater extraction rates. The first period represents the period of highest historical water use from WY1997 through WY2004, when the average annual groundwater pumped was about 1,980 acre-feet. The second period presents the period of declining groundwater extraction from WY2005 to WY2011, when the average annual groundwater pumped was about 1,630 acre-feet. The third period covers the recent drought from WY2012 through WY2015 when the average annual groundwater pumped was about 1,330 acre-feet. The fourth period includes the four years since the drought (including WY2019) where the average annual groundwater pumped has been about 1,200 acre-feet. Monthly pumping volumes for the four periods are included on Figure 6 as separate vertical bars.

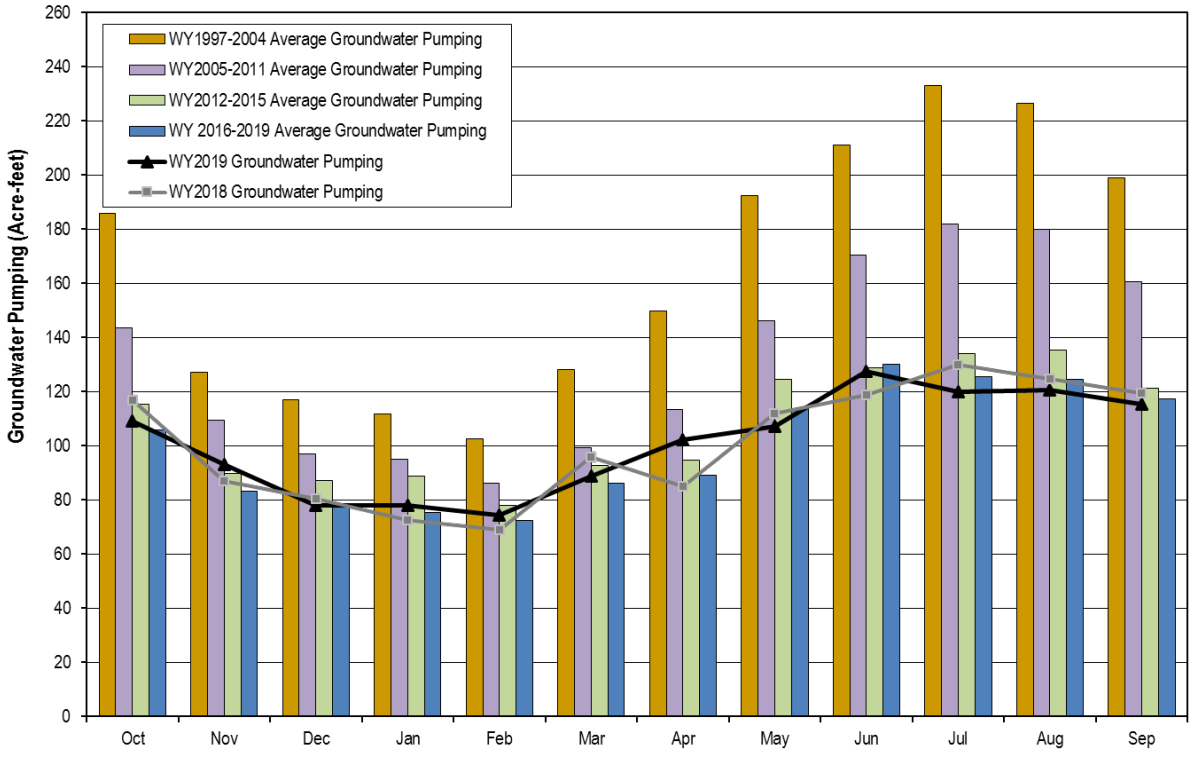


Figure 6. SVWD Monthly Groundwater Pumping Comparison

Comparing historical averages to average monthly groundwater pumping for WY2016 through WY2019, monthly groundwater pumped is well below pre-drought historical averages, and even below monthly pumping during the recent drought (except for the month of June). Monthly pumping differences are most pronounced during the summer months of May through October. The difference between the maximum and minimum monthly pumping in WY2019 is 53 acre-feet, while in 1997 it was 133 acre-feet. This indicates that water use efficiency measures focused on reducing outdoor water usage, primarily landscape irrigation, have been very effective.

SVWD maintains a number of ongoing programs to support the sustainable management of its groundwater resource including the use of recycled water, water use efficiency and water loss reduction programs as discussed in Section 2.4. These programs have contributed to reduced water demands that results in less groundwater pumping. Other factors that can influence water demand include variations in the weather, economic conditions, and the number and type of customers.

3.1 Recycled Water Use

Recycled water deliveries show a general increasing trend through Water Year 2013 but thereafter have not increased at the same rate but have hovered between 162 and 199 acre-feet per year. Deliveries in WY2019 decreased to approximately 174 acre-feet from 196 acre-feet in WY2018 (Table 3 and Figure 7). The Recycled Water Program has issued a total of 56 permits for recycled water use, excluding renewals (Figure 7).

Table 3. WY2010 to WY2019 SVWD Groundwater Pumping by Aquifer and Recycled Water Usage (in acre-feet)

Aquifer	Historical Maximum	WY2010	WY2011	WY2012	WY2013	WY2014	WY2015	WY2016	WY2017	WY2018	WY2019
Groundwater	2,100 (1997)	1,357	1,292	1,351	1,400	1,376	1,133	1,139	1,242	1,211	1,215
Recycled Water	200 (2013)	134	163	184	200	199	184	195	162	196	174
Total Water Supply	2,096 (2003)	1,491	1,455	1,535	1,600	1,575	1,317	1,334	1,404	1,407	1,389

There is a strong correlation between rainfall and recycled water deliveries, with wet years such as Water Years 2017 and 2019 having reduced recycled water demand (Table 3 and Figure 7). Other reasons for decreased demand could be due to recycled water customers replacing their landscapes or improving their irrigation practices as a consequence of the drought and associated efforts to use water more efficiently.

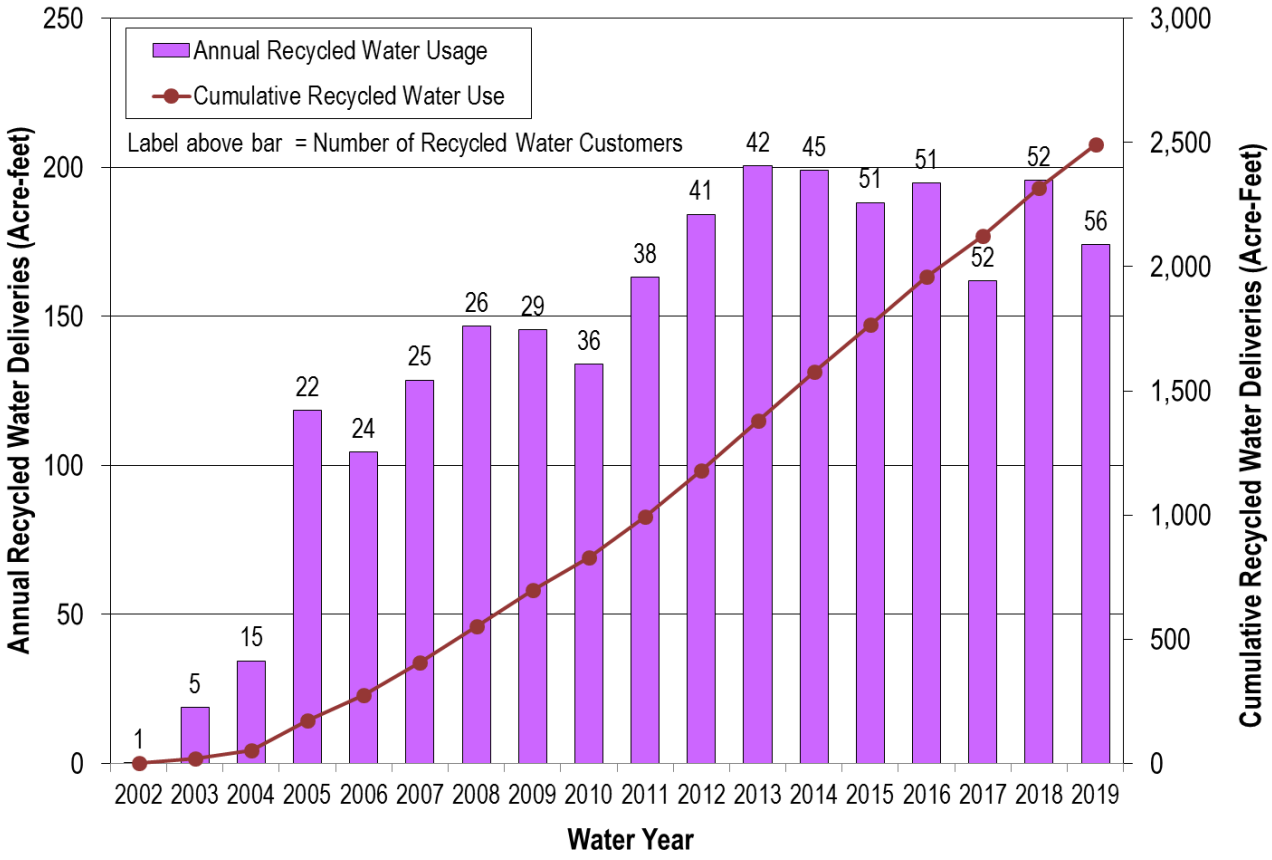


Figure 7. Annual and Cumulative Recycled Water Usage

The Recycled Water Program has issued 56 permits in total, with one new permit issued in WY2019 (Figure 7). From WY2002 through WY2019, approximately 2,492 acre-feet of recycled water has been delivered to customers (Figure 7). The cumulative use of the Recycled Water is equivalent to 205% of the District's groundwater pumping in WY2019. Since recycled water is used in lieu of pumped groundwater, we assume that an equivalent volume of groundwater has remained in the SMGB and is available to support future water supply needs.

The Regional Water Quality Control Board permit for recycled water use includes a Monitoring and Reporting Program (MRP), which requires effluent monitoring and system performance monitoring. The MRP Order No. 01-067 details recycled water monitoring requirements, standard observations, distribution system inspections, and reporting requirements.

The presence of nitrate in recycled water has been noted in effluent samples, which is typical of treated wastewater. USEPA has established a primary drinking water MCL of 10 milligrams per liter (mg/L) for nitrate reported as nitrogen (nitrate as N). Nitrate in the City's recycled water during WY2019 ranged from 1.1 to 2.8 mg/L, with an average of 1.84 mg/L (City of Scotts Valley, 2020). Nitrogen removal efficiency at the plant ranged from 58% to 76%.

4 SVWD GROUNDWATER QUALITY

SVWD monitors water quality at its groundwater production wells for the constituents required by the Safe Drinking Water Act and under Title 22 of the California Code of Regulations. Groundwater is sampled from the SVWD production wells for inorganic minerals, trace metals, total dissolved solids (TDS), pH, volatile organic compounds (VOCs), and methyl-tert-butyl ether (MTBE). Results of water quality analysis are reported to the California Department of Drinking Water (CDDW).

4.1 Groundwater Quality and Treatment

Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency (USEPA) and CDDW have set primary maximum contaminant levels (MCL) associated with public health risks as drinking water standards for various chemicals and constituents. These include industrial chemicals including VOCs and MTBE, and naturally occurring constituents such as arsenic. Secondary MCLs (SMCL) exist for constituents that are not defined as public health risks but require treatment for taste, odor, and other aesthetic issues. Table 4 provides a summary of the constituents of concern for untreated groundwater in SVWD production wells. In WY2019, natural-occurring constituents that require treatment (arsenic, iron, manganese, sulfate and TDS) remained within their respective historical ranges. SVWD Well #11A had several arsenic concentrations detected below the MCL. SVWD Well #11B had two detections of arsenic below the MCL and one concentration at the MCL of 10 µg/L. Arsenic is removed to drinking water standards as part of iron and manganese treatment.

Historically, the VOCs tetrachloroethene (PCE), trichloroethylene (TCE) and cis-1,2-dichloroethylene (cis-1,2-DCE) along with MTBE have been detected in low concentrations in SVWD Well #9. Since Well #9 has not pumped much over the past several years, a sample has not been collected from the well for some time. However, in WY2019, a sample was collected and it showed that there are still detections of cis-1,2-DCE, TCE, and MTBE that are below their respective MCLs. Low detection of chlorobenzene, cis-1,2-DCE, and TCE were also found in SVWD Well #11A below their respective MCLs.

SVWD treats groundwater extracted from wells to reduce concentrations of certain constituents that are above or approaching MCLs or SMCLs. In addition, the District treats groundwater for hydrogen sulfide for aesthetic reasons, even though this is not a regulated compound. SVWD treats groundwater at four water treatment plants (WTPs) prior to distribution. Table 5 summarizes the treatment processes at four District groundwater treatment plants. By applying the appropriate treatment technology, the District is able to deliver potable water that meets regulatory standards and is safe to drink.

Table 4. WY2019 Summary of Key Water Quality Constituents in Raw Groundwater

SVWD Well	VOCs	MTBE	Arsenic	Chromium- 6	Iron & Manganese	Sulfate	TDS
#3B	ND	ND	ND	ND	Above SMCL	Below SMCL	Above SMCL
Orchard Well	ND	ND	ND	ND	Below SMCL	Below SMCL	Below SMCL
#9	Below MCL	Below MCL	ND	ND	Below SMCL	Above SMCL	Above SMCL
#10A	ND	ND	ND	ND	Above SMCL	Below SMCL	Below SMCL
#11A	Below MCL	ND	Below MCL	ND	Above SMCL	Below SMCL	Above SMCL
#11B	ND	ND	At MCL	ND	Above SMCL	Below SMCL	Below SMCL

Notes: ND – not detected in any samples collected in WY2017; NS – Not Sampled
Above MCL or SMCL – At least one sample in WY2017 exceeded respective primary MCL or secondary MCL
Below MCL or SMCL – Constituent detected in levels below respective primary MCL or secondary MCL

Table 5. Summary of Water Treatment Processes Applied by SVWD

Water Treatment Plant	SVWD Wells	Aquifer	Chemicals of Concern	Treatment Type
Orchard Run	#3B Orchard Well	Butano & Lompico	Iron, manganese, and hydrogen sulfide	Air stripper, chlorination, dual media filtration, and sequestering agent
SVWD Well #9	#9	Monterey	Sulfate, VOCs, and hydrogen sulfide	Chlorination and granular activated carbon (GAC) filtration
SVWD Well #10	#10 #10A	Lompico	Iron, manganese, VOCs, and hydrogen sulfide	Air stripper, chlorination, dual media filtration, sequestering agent, and standby GAC filtration
El Pueblo	#11A #11B	Lompico	Iron, manganese, and arsenic	pH adjustment, chlorination, dual media filtration, and sequestering agent

4.2 Environmental Compliance Sites

To protect its potable water supplies and more effectively manage the groundwater basin, SVWD stays informed about local environmental compliance sites within the District's groundwater management area where groundwater quality has been impacted by pollution or chemical spills. Currently active environmental remediation sites within the District include the following sites:

- Watkins-Johnson Superfund site at 440 Kings Village Road,
- Scotts Valley Dry Cleaners Site located at 272 Mount Hermon Road, and
- King's Cleaners site at 222 Mount Hermon Road.

The Watkins-Johnson Superfund site remediation is moving towards closure but still needs to complete the source control component of the remedial action to ensure protectiveness over the long-term. The site is currently designated as open-remediation for residential use due to existing soil gas plumes of benzene, TCE, PCE, arsenic and cadmium in soils. A draft Focused Feasibility Study proposing potential remediation alternatives including soil excavation was submitted to USEPA in January 2019.

In WY2019, The Scotts Valley Dry Cleaners site continued operation of the soil vapor extraction and air sparging systems in their current configuration. These are remediation systems for the unsaturated soils above the groundwater table so no groundwater is extracted, only soil vapor. Their consultant is also recommending researching environmental data and past use history of the former nearby airport to assess potential source(s) for the elevated PCE and TCE concentrations detected in their distal sampling location. Groundwater remediation systems at this site have been shut down since 2015. There is a request to transfer some of Watkins Johnson monitoring wells to Scotts Valley Dry Cleaners (Pratt Company) to assume access and responsibility, although no agreement has been finalized yet. There has also been an ongoing request by the District to take over two Watkins Johnson monitoring wells located on City owned land. Due to the City's desire to sign off on these wells, it is looking unlikely these wells can be acquired by the District.

No remedial actions had occurred at the Kings Cleaners site over the past several years. The County of Santa Cruz Environmental Health Division (EHD) took over the oversight responsibilities for this site from the RWQCB in April 2017. EHD issued the responsible party, Ow Properties, with a Notice of Intent to Open Remedial Action Case under the Voluntary Cleanup Program. This Notice of Intent is based on documents on the GeoTracker website that show that PCE and related chemicals may be present in subsurface soils vapor, and possibly subsurface soil, at concentrations above applicable health-based screening levels. CSCEHD has also requested that a work plan for further investigation to characterize the chemical

concentrations in soil, soil gas, and indoor air be developed with conclusions and recommendations regarding the conditions, potential risks to human health and the environment, and the remedial actions needed.

More detailed information for these sites is available from the State Water Resources Control Board (SWRCB) GeoTracker website at https://geotracker.waterboards.ca.gov/ and the Department of Toxic Substances Control (DTSC) Envirostor web site at www.envirostor.dtsc.ca.gov/public.

5 ASSESSMENT OF GROUNDWATER CONDITIONS

5.1 Groundwater Level Monitoring

As part of the GWMP, the District collects groundwater level data from its production wells and monitoring wells including:

- Monthly measurements from all active and inactive SVWD production wells (Figure 1 and Table 6),
- Monthly and semi-annual measurements from 14 operational monitoring wells (Figure 1 and Table 6), and
- Measurements recorded every 15 minutes with electronic data transducers from 14 operational monitoring wells.

Table 6. SVWD Wells Used for the Groundwater Management Monitoring Program

Well Name	Status	Top of Casing Elevation (feet msl)	Primary Producing Formation for Production Wells / Screened Interval for Monitoring Wells	Screen Interval Depth (feet bgs)
SVWD Production Wells – Measurements taken monthly for both static and dynamic levels				
SVWD Well #3B	Active	672.47	Butano	700-730, 880-1050, 1180-1370, 1400-1670
SVWD Orchard Well	Active	723	Butano	705-784, 805-1063, 1084-1455
SVWD Well #9 (to be destroyed in FY2020)	Inactive	528.14	Monterey	155-195, 315-355
SVWD Well #10 (to be destroyed in FY2020)	Inactive	510.85	Lompico	190-220, 240-270, 325-355
SVWD Well #10A	Active	512.00	Lompico	280-380, 400-450
SVWD Well #11A	Active	602.60	Lompico	399-419, 459-469,495-515
SVWD Well #11B	Active	587.95	Lompico	348-388, 423-468, 500-515
SVWD Monitoring Wells - Key Indicator Wells – Measurements taken monthly				
#15 Monitoring Well[2]	Active	660	Lompico, Butano	700-1100
#9 Monitoring Well[2]	Active	528	Monterey	N/A
SVWD Monitoring Wells - Measurements taken semi-annually				
SVWD AB303 MW-1[1,2]	Active	561.07	Santa Margarita	114-124
SVWD AB303 MW-2[2]	Active	524.22	Lompico	705-715, 810-850
SVWD AB303 MW-3A[1,2]	Active	522.69	Lompico	630-680
SVWD AB303 MW-3B[1,2]	Active	522.11	Santa Margarita	120-125
Canham Well[2]	Active	782.78	Butano	1,281-1,381
Stonewood Well[2]	Active	898.54	Butano	799-859
SV1-MW (filled with sand)	Inactive	704.3	Santa Margarita	60-80
SV3-MW A[2]	Active	584.65	Santa Margarita	60-80
SV3-MW B[2]	Active	584.65	Santa Margarita	100-110
SV3-MW C[2]	Active	584.65	Lompico	150-160
SV4-MW[2]	Active	447.79	Santa Margarita	50-60
TW-18[1,2]	Active	715.03	Santa Margarita	285-345
TW-19[1,2]	Active	659.49	Lompico	960-1060

Notes: [1]Groundwater level measurement data submitted to DWR CASGEM Program
[2]Equipped with electronic data transducer
feet msl = elevation in feet relative to mean sea level
feet bgs = depth in feet below ground surface

5.1.1 Water Year 2019 Groundwater Levels in Production Wells

Historical groundwater levels collected and reported for production wells include both pumping (dynamic) and non-pumping (static) conditions. Monitoring dynamic and static groundwater levels provides a means for evaluating well performance. If well efficiency declines over time, this may be indicated by increasing differences between static and dynamic groundwater levels, thereby demonstrating the well is in need of maintenance. Static and dynamic hydrographs for active SVWD production wells are shown in Figure 8 through Figure 12.

Furthermore, when groundwater levels decline below the top of the well screen, there is a potential to reduce well efficiency from air entrapment, mineral precipitation, biofouling, or corrosion resulting in lower pumping rates and higher operating costs. Analysis of dynamic and static groundwater levels in active production wells show the following for WY2019:

- SVWD Well #3B: both the dynamic and static groundwater levels are above the top of the upper well screen. The difference between dynamic and static groundwater levels has remained fairly consistent.
- SVWD Orchard Well: because this well has been pumping almost continuously since it was put into operation in May 2018, there is only one static level recorded. However, because the Orchard Well is new and constructed with stainless steel casing and screen, no maintenance should be required for several years.
- SVWD Well #10A, #11A, and #11B: both the dynamic groundwater levels and static groundwater levels for SVWD Well #10A and #11A are currently above the top of the upper well screen. SVWD Well #10A had a slight drop in dynamic pumping levels around 2013 but those lower levels have recovered since and are now above the top of its upper well screen during pumping. Since 2004, SVWD Well #11B has pumping levels below the bottom of its upper well screen. The difference between dynamic and static groundwater levels in all three wells has remained fairly consistent. Static and pumping groundwater levels in SVWD Well #10A increased over the two years (Figure 10, while static and pumping groundwater levels in SVWD Well #11A and #11B have increased over the past year (Figure 11 and Figure 12, respectively).

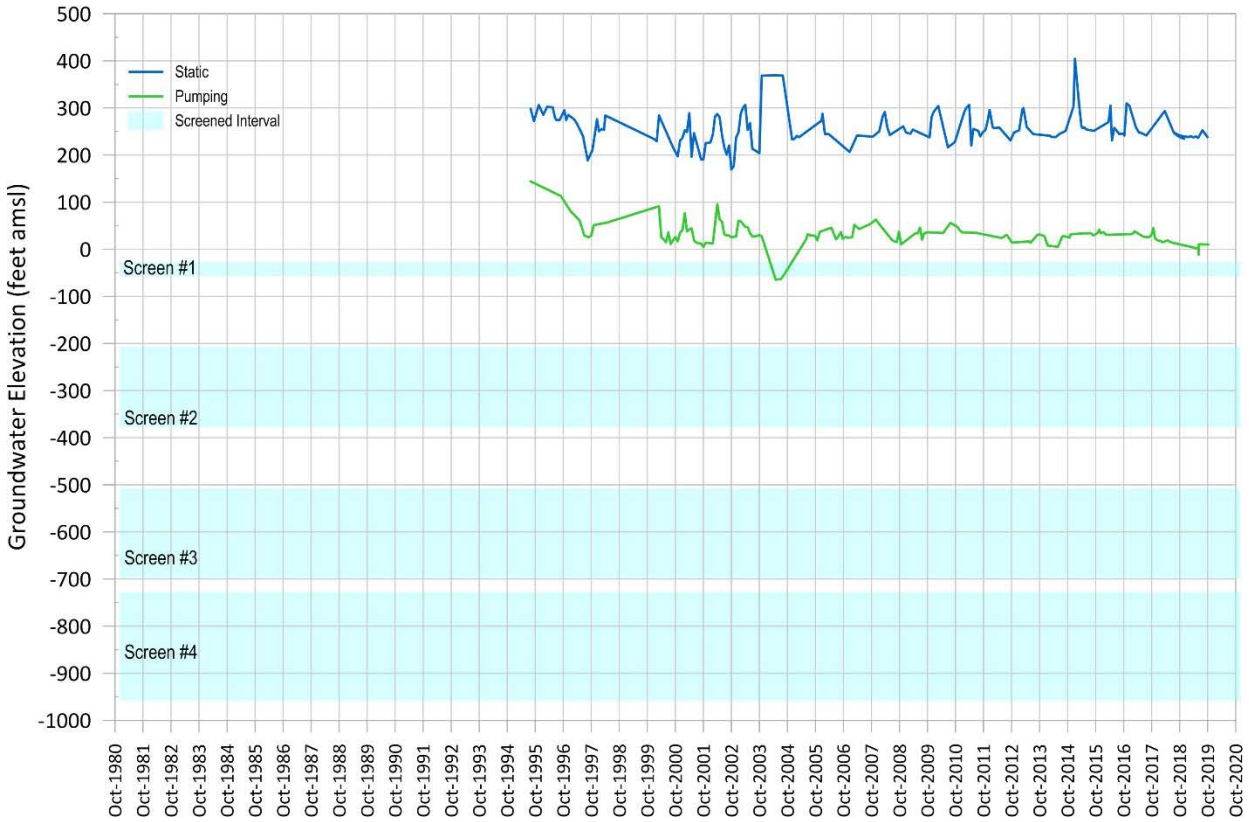


Figure 8. SVWD Well #3B Comparison of Groundwater Level and Screens

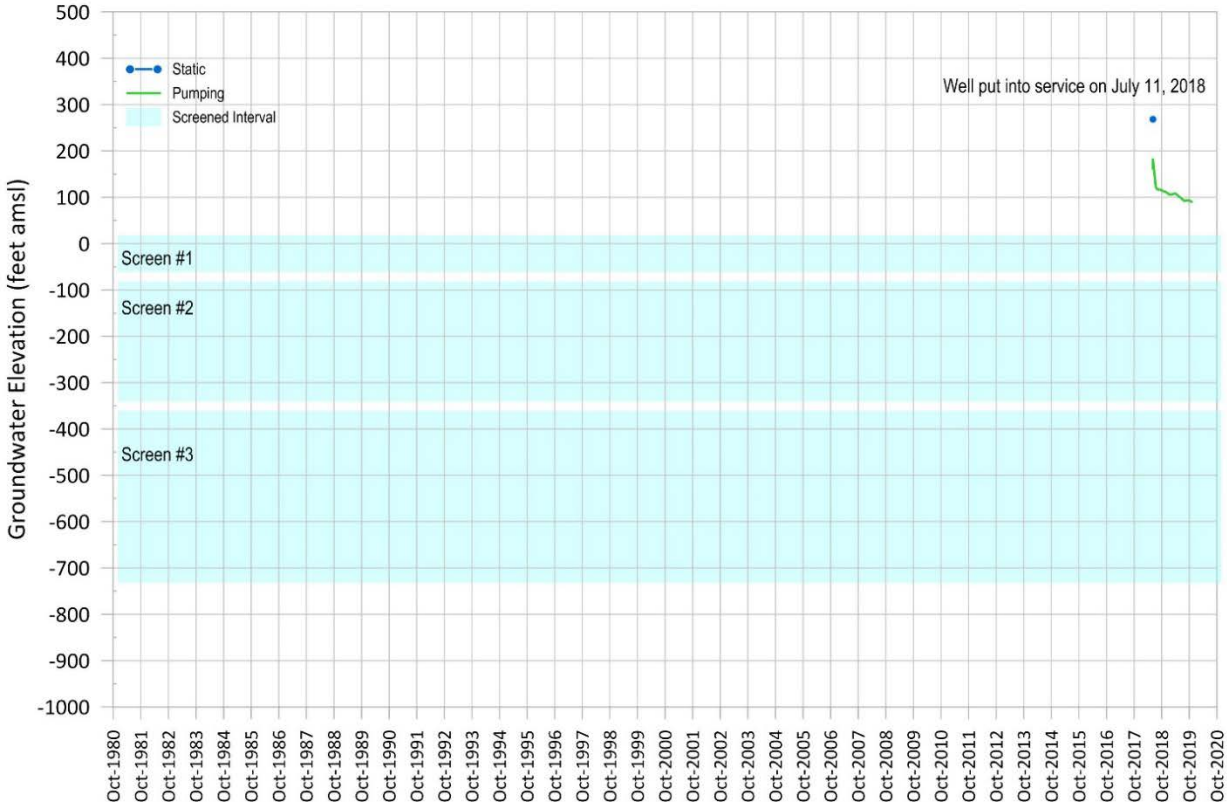


Figure 9. SVWD Orchard Well Comparison of Groundwater Level and Screens

Figure 10. SVWD Well 10A Comparison of Groundwater Level and Screens

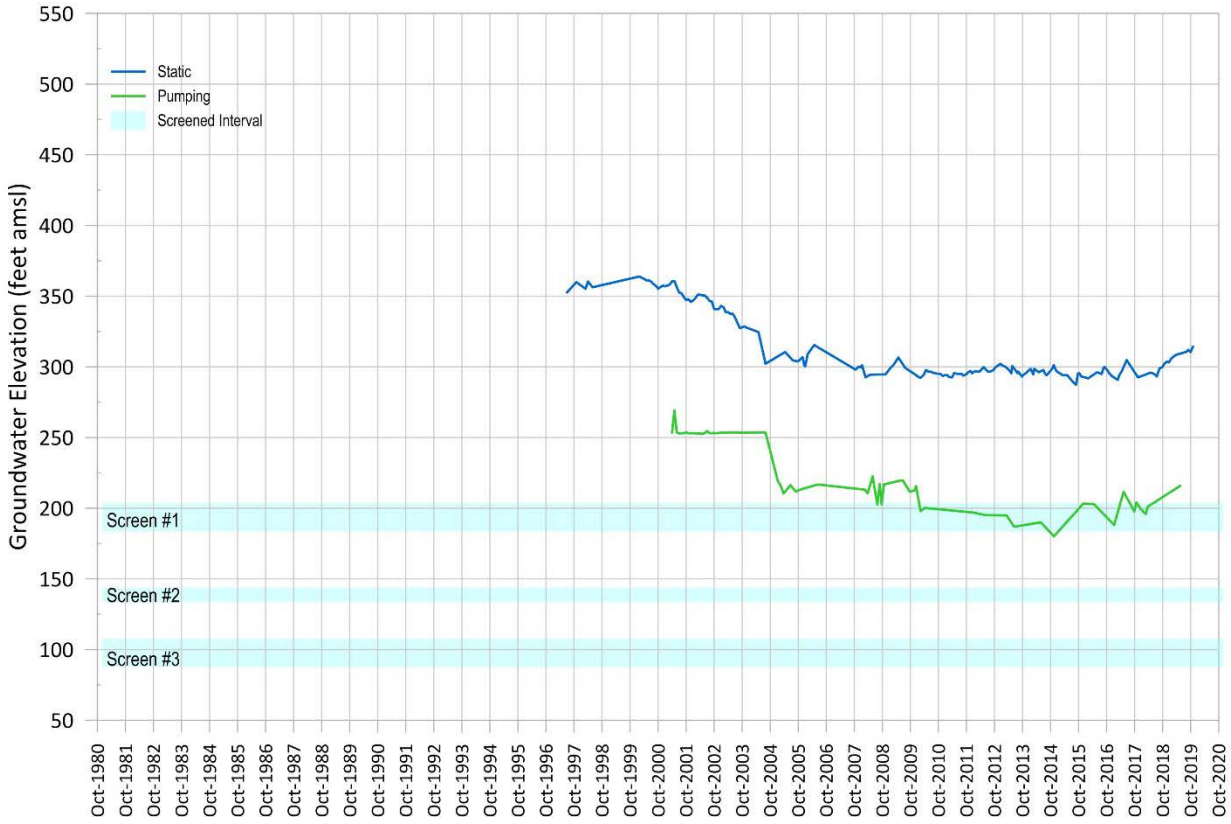


Figure 11. SVWD Well #11A Comparison of Groundwater Level and Screens

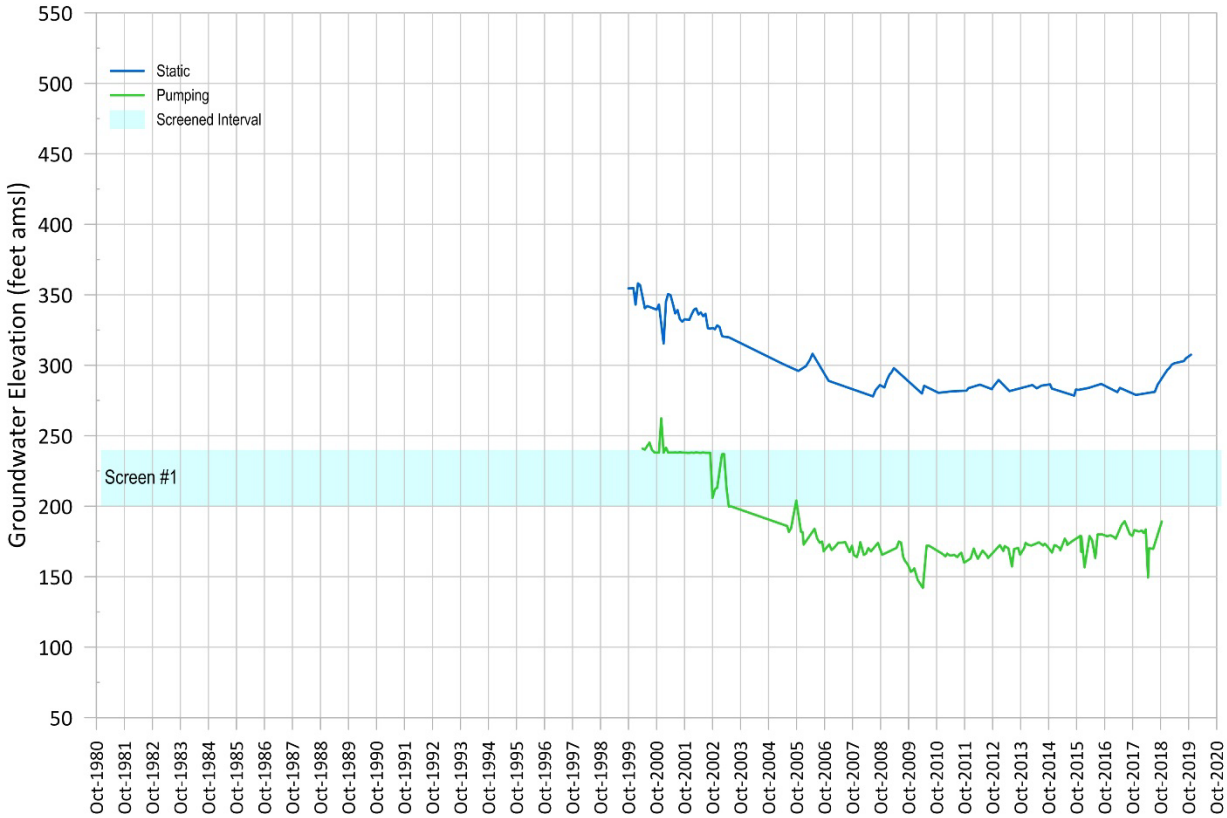


Figure 12. SVWD Well #11B Comparison of Groundwater Level and Screens

5.1.2 Water Year 2019 Groundwater Levels in Monitoring Wells

In WY2019, groundwater level data collected from 14 monitoring wells shown in Table 6 were evaluated to determine year-to-year changes. Groundwater level data are compiled into the District's groundwater management database. The following subsections summarize the observed groundwater level changes for each aquifer during WY2019.

5.1.2.1 Santa Margarita Aquifer

Transducer and measured data from monitoring well TW-18, and SLVWD Pasatiempo MW-2 (Figure 13) show relatively stable groundwater levels over time. Most recently, in monitoring well TW-18 there has been a very slight one foot increase over the past two years. Since SLVWD's Pasatiempo MW-2 groundwater level increase in 2017 when there was record rainfall in Scotts Valley, groundwater levels have been falling but are still 12 feet from elevations experienced during the most recent drought (Water Years 2012 through 2015).

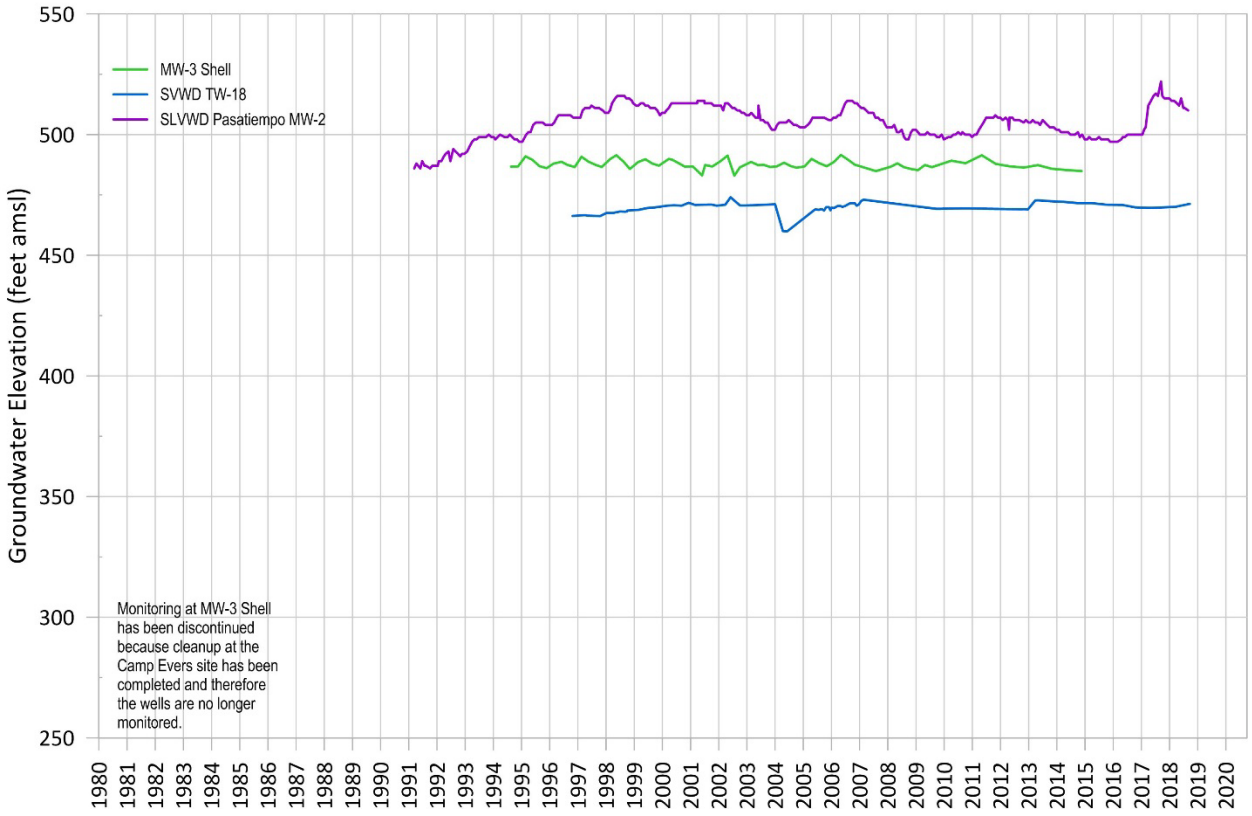


Figure 13. Santa Margarita Aquifer Hydrographs for Monitoring Wells

5.1.2.2 Monterey Formation

Groundwater is not produced from the Monterey Aquifer by SVWD, nor are there any active wells that monitor groundwater levels other than SVWD #9. Figure 14 shows groundwater levels in this well have been increasing since 2014. Almost 50 feet of recovery have taken place since 1998.

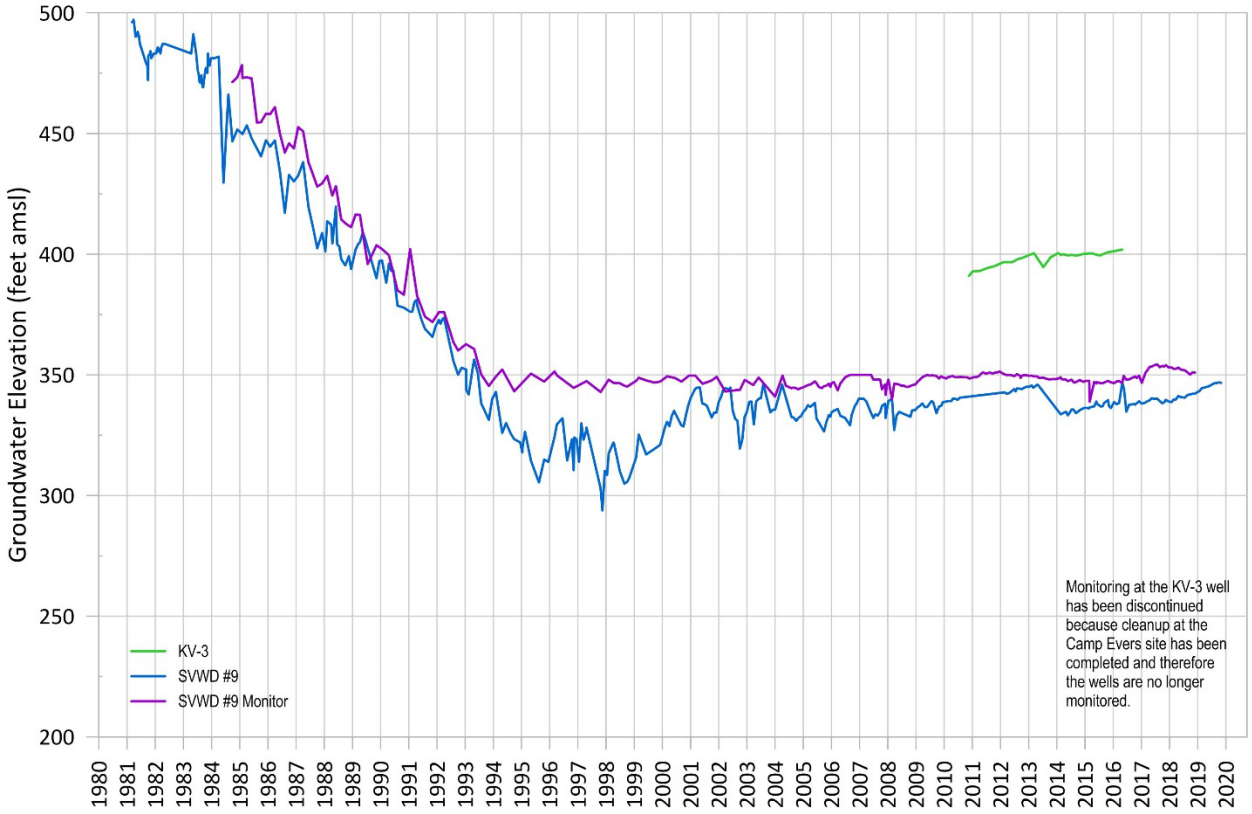


Figure 14. Montery Formation Hydrographs for Monitoring Wells

5.1.2.3 Lompico Aquifer

Transducer and measured data from monitoring well TW-19, in the northern portion of the District, show groundwater levels have historically been variable. There has been approximately 20 feet of groundwater level rise in this well over the past five years, with about 10 feet occurring in WY2019 (Figure 15). It should be noted that there have been past difficulties with measuring groundwater elevations at this well and thus the data plotted on the hydrographs may be compromised. It is recommended that the well's integrity be evaluated in the field along with its transducer settings, and groundwater levels be measured by more than one method to confirm the true groundwater level.

Other Lompico monitoring wells, such as SVWD Well #10, have similar increasing trends in the central portion of the District. Production well, SVWD #11A, has static groundwater levels that

have increased 24 feet over the past four years, with 12 feet occurring in WY2019 feet (Figure 11).

The SVWD #10 (previously a production well and now a monitoring well) hydrograph, representing the Lompico aquifer in the southern portion of the District, shows an increase in groundwater levels of about two feet in WY2019 (Figure 15).

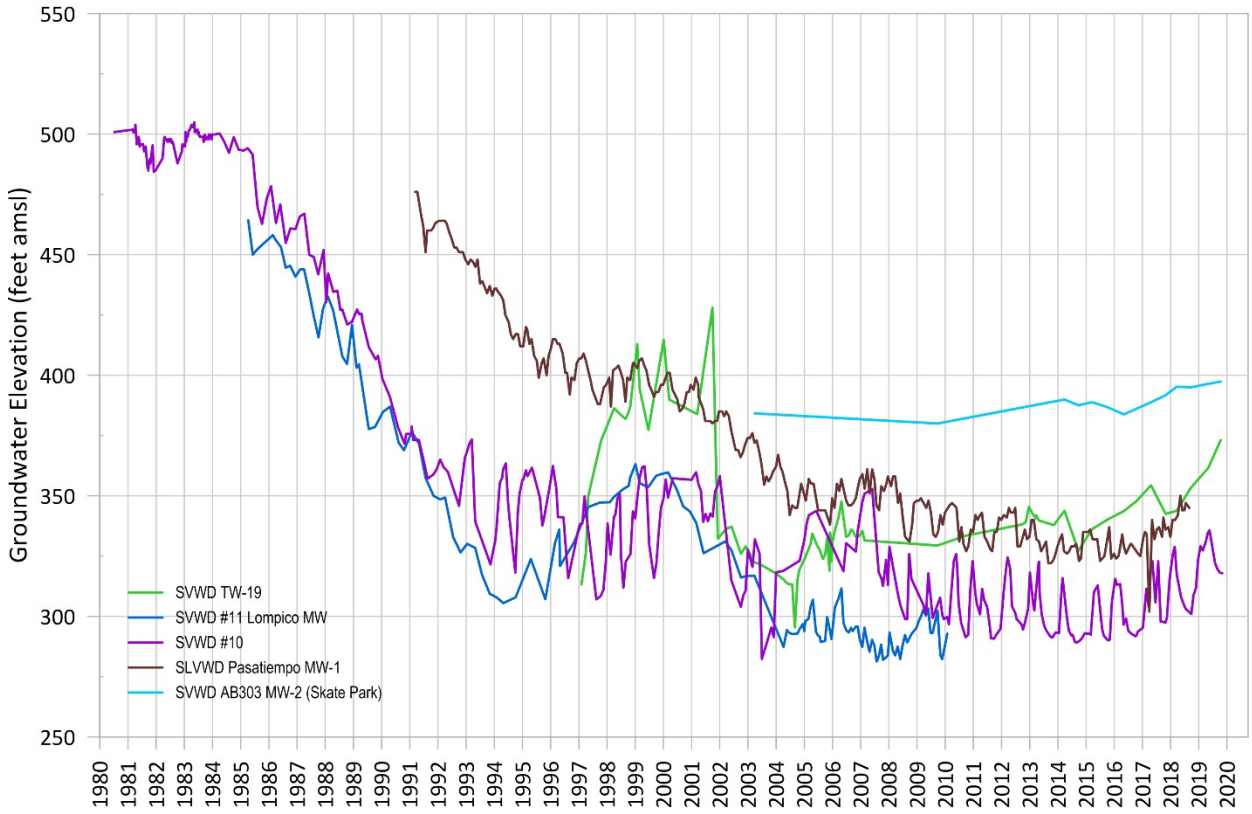


Figure 15. Lompico Aquifer Hydrographs for Monitoring Wells

5.1.2.4 Butano Aquifer

The only monitoring wells screened exclusively in the Butano aquifer are the Stonewood and Canham monitoring wells (Figure 1). The Canham well is located approximately 0.9 miles northeast of the District's Butano production wells (Wells #3B and Orchard Well) groundwater level decreased by about one foot in WY2019 (Figure 16). Over the past five years it has declined two feet. The Stonewood well is located two miles away from the Butano production wells and is located within the area where the Butano aquifer outcrops at the surface. Figure 16 shows that groundwater levels in the Stonewood well have increased gradually by four feet over the past six years.

The only other wells screened in the Butano aquifer are SVWD #3B, #7B, and the Orchard Well. These wells, however, are also screened in the Lompico aquifer and therefore the groundwater levels measured in them are composite levels that do not represent the Butano aquifer (Figure 17). Since these are actively pumped wells, it is difficult to determine trends from their hydrographs because of the large fluctuations caused by pumping (Figure 17). It is recommended that a dedicated monitoring well be constructed near the Butano production wells to monitor groundwater levels in this important aquifer that supplies 37% of the District's water supply.

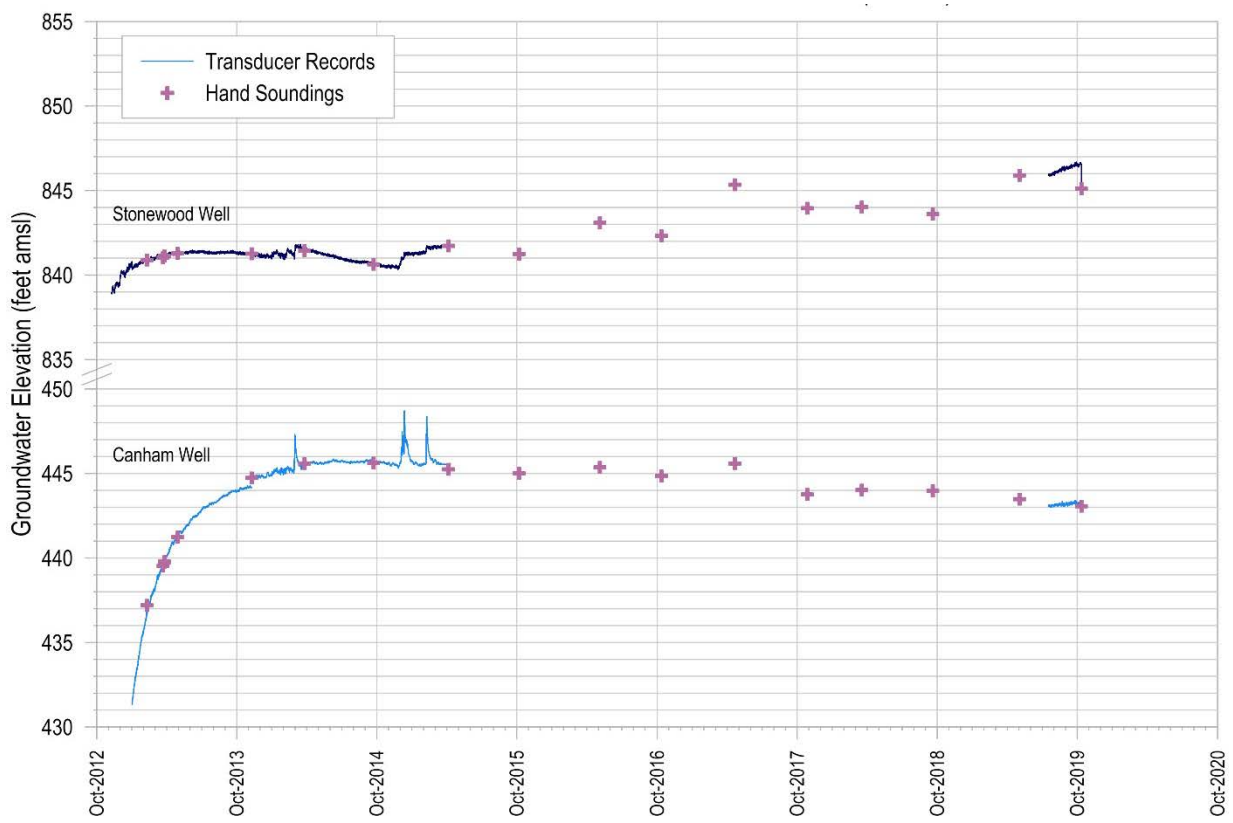


Figure 16. Butano Aquifer Hydrographs for Monitoring Wells

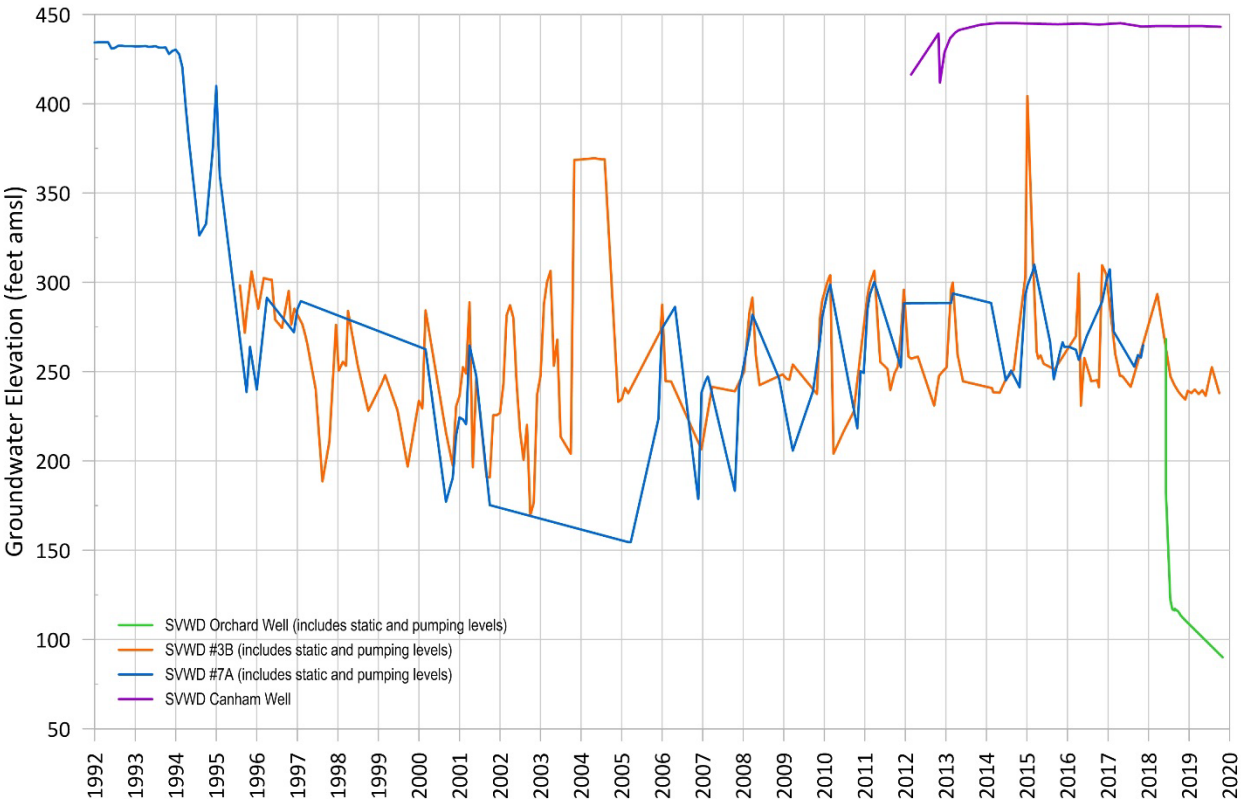


Figure 17. Lompico/Butano Aquifer Hydrographs for Production Wells

5.2 Aquifer Conditions

5.2.1 Santa Margarita Aquifer

The Santa Margarita aquifer is the shallowest aquifer in the SMGB, and is usually the first aquifer to be impacted by changing hydrologic conditions. The District currently does not pump groundwater from the Santa Margarita aquifer. In general, the Santa Margarita aquifer in the District's service area has stable groundwater levels with temporary increases in response to wet years. In WY2019, groundwater levels in the Santa Margarita aquifer decreased slightly, potentially because rainfall was not much above average.

Groundwater conditions are also affected by the geologic complexity within the SMGB. Along the southeastern margin of the SMGB underneath Scotts Valley, the Santa Margarita aquifer is in direct contact with the underlying Lompico aquifer. In these areas, the Santa Margarita aquifer remains unsaturated, as it has since the 1980s when groundwater levels in the Lompico aquifer declined. Elsewhere, the Santa Margarita aquifer overlies the Monterey Formation that hydraulically separates it from the deeper Lompico aquifer. Historic groundwater levels in these areas have remained relatively stable over time, demonstrating that groundwater levels in the Santa Margarita aquifer respond independently from changes in the Lompico aquifer in locations where the Monterey Formation is present.

5.2.2 Monterey Formation

The Monterey Formation is primarily composed of mudstone, shale, and siltstone. This composition makes the Monterey Formation a regional aquitard that separates the Santa Margarita and Lompico aquifers. However, the gradational geologic transition from the underlying Lompico sandstone means that the lower Monterey Formation contains several sandstone interbeds that can locally produce groundwater.

As noted in Section 2.3, the revised geologic interpretation for SVWD Well #9 is that it is screened completely within the Monterey Formation (Kennedy/Jenks, 2016). SVWD Well #9 experienced over 200 feet of groundwater level decline during the 1980's and early 1990's that diminished its water supply potential significantly (Figure 14). Groundwater levels in SVWD Well #9 have risen slowly since WY2006, with a temporary decline occurring around WY2013, likely in response to the increased pumping in the Monterey Formation during this time (Table 1). Since WY2014, there has been a gradual increase in groundwater levels in Well #9, but groundwater levels are still about 150 feet below elevations prior to 1980 (Figure 14). In WY2019, groundwater levels in the southern portion of the District service area at SVWD Well #9 increased almost 5 feet.

5.2.3 Lompico Aquifer

The Lompico aquifer is the primary producing aquifer in the SMGB and provides a large percentage of the municipal water supply in the Scotts Valley area. In WY2019, approximately 58% of the District's groundwater pumping was from the Lompico aquifer (Table 2). Long-term pumping from this aquifer has contributed to groundwater level declines underling the central portion of the District. Combined pumping at SVWD Wells #11A and #11B in WY2019 was 170 acre-feet less than in WY2018, and the least pumping at these wells since WY2013. Away from the pumping center, groundwater levels have increased by up to 12 feet.

The Lompico aquifer in the southern portion of the District's service area at SVWD Well #10 (Figure 1) had a nine foot increase in groundwater levels during WY2019. Groundwater levels in this inactive production well are influenced by pumping in the nearby SVWD Well #10A. The amount of pumping from SVWD Well #10A in WY2019 was approximately 100 acre-feet less than pumped annually over the previous ten years (Table 1). The nine-foot groundwater level increase may have resulted primarily from reduced pumping but also the slightly above-average precipitation during WY2019. This is consistent with the geologic interpretation of the Lompico aquifer being in direct contact with the overlying Santa Margarita aquifer in the southern portion of the SMGB. This direct contact between the two aquifers allows recharge to more rapidly increase groundwater levels in the southern portion of the Lompico aquifer.

5.2.4 Butano Aquifer

The Butano aquifer is a significant water-producing aquifer in the SMGB for SVWD, accounting for approximately 42% of groundwater pumped by SVWD in WY2019. During the first few years of pumping from this aquifer (WY1993 to WY1995), groundwater levels in SVWD Well #7A (now replaced by the Orchard Well) declined nearly 200 feet relative to pre-pumping levels. However, since SVWD Well #7A was completed in both the Lompico and Butano aquifers, it is unclear whether this drop in groundwater levels reflects conditions in the Butano aquifer or the similar observed decreases in the Lompico aquifer. From 1996 to 2006, static groundwater levels at SVWD Well #3B and #7A fluctuated seasonally within an elevation range of 200 to 300 feet above mean sea level (amsl). With decreased pumping since 2006, groundwater levels have increased slightly, and the seasonal range in groundwater elevations is typically between 250 and 300 feet amsl (Figure 17).

With increased pumping from the Orchard Well in WY2019 there has been a slight decline in groundwater levels over the year, although it is difficult to measure accurately from the hydrographs due to the fluctuating data measured during pumping. With increasing distance from the pumping center caused by SVWD's Well #3B and Orchard Well pumping, groundwater levels are less affected by pumping. The Canham Well located approximately 0.9 miles north of the pumping center has had a two foot decline in groundwater levels over the past five years. In the

northernmost portion of the District, the Stonewood Well located approximately two miles from the pumping center, experienced increased groundwater levels in the Butano aquifer of around four feet over the past six years.

6 RECOMMENDATIONS

Based on an evaluation of the quality of groundwater level data collected by the District and M&A over the past few years, this year's annual report contains some recommendations for improving groundwater level data collected and relied upon for assessing the health of the portion of the Basin pumped by the District.

1. Review and verification of the District's pressure transducer data collection program. This is an important recommendation because the District is currently expanding its program to all monitoring and production wells. Together with District staff, M&A will visit each deployed data logger to verify its deployment details, condition and configuration. If appropriate, the transducers will be reconfigured and reprogramed to establish a new baseline, data collection frequency and program settings. M&A will assist District staff with data download and processing procedures to ensure the data collected is barometrically compensated and quality checked.

2. Inconsistent groundwater levels measured in monitoring well TW-19 requires that the well be evaluated in the field along with its transducer settings and configuration, and groundwater levels be measured by more than one method to confirm its true groundwater level. Most of this work can be completed at part of recommendation #1.

3. A monitoring well completed only in the Butano aquifer should be constructed near the Butano production wells to monitor groundwater levels in that aquifer.

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8 ACRONYMS

AMI.....Automated Metering Infrastructure
amsl.....above mean sea level
ASR.....aquifer storage and recovery
bgs.....below ground surface
BMO .....Basin Management Objectives
BMP .....best management practice
CASGEM .....California Statewide Groundwater Elevation Monitoring
CDDW .....California Division of Drinking Water
DCE.....dichloroethylene
DWR .....California Department of Water Resources
GAC .....granular activated carbon
GPD.....gallons per day
gpm .....gallons per minute
GAC .....granualted activiated carbon
GSA.....Groundwater Sustainability Agency
GSP .....Groundwater Sustainability Plan
GWMP .....Groundwater Management Plan
GWRA .....Groundwater Reporting Area
IRWMP .....Integrated Regional Watershed Management Plan
JPA.....Joint Powers Agreement
LID.....low impact development
LTCP.....Low-Threat Closure Policy
MCL.....maximum contaminant level
mg/L.....milligrams per liter
MHA .....Mount Hermon Association
MRP .....Monitoring and Reporting Program
MTBE .....methyl-tert-butyl ether
NPDES.....National Pollutant Discharge Elimination System
NPL.....National Priorities List
O&M.....operations and maintenance
PCE .....tetrachloroethene
RACR.....Groundwater Remedial Action Completion Report
RWQCB .....Central Coast Regional Water Quality Control Board
SCMGB.....Santa Cruz Mid-County Groundwater Basin
SGMA.....Sustainable Groundwater Management Act
SLVWD .....San Lorenzo Valley Water District
SMCL.....secondary maximum contaminant level
SMGB .....Santa Margarita Groundwater Basin

SMGBAC .....Santa Margarita Groundwater Basin Advisory Committee
SMGWA .....Santa Margarita Groundwater Agency
SVWD.....Scotts Valley Water District
SWRCB.....State Water Resources Control Board
TCE .....trichloroethylene
TDS .....total dissolved solids
µg/L.....micrograms per liter
USEPA.....United Stated Enivornmental Protection Agency
UWMP .....Urban Water Management Plan
VOC .....volatile organic compounds
WTP .....water treatment plant
WY .....Water Year