Executive Summary

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1. Introduction

The Sierra Valley groundwater basin (the Basin) is managed cooperatively by the Sierra Valley Groundwater Management District (SVGMD) and Plumas County, which act as the Groundwater Sustainability Agencies (GSAs) for the Basin. Following the submittal of the Sierra Valley Groundwater Sustainability Plan (GSP) on January 31, 2022, the GSAs are required to submit an annual report for the preceding Water Year (October 1 through September 30) to DWR by April 1 (23 C.C.R 356.2). These annual reports provide a summary of hydrologic conditions and water use in the Basin (Figure 1) using observed data from monitoring networks and/or estimated using best available methods. This annual report provides a brief summary of Basin water use and changes in groundwater storage during the period from October 1, 2020 to September 30, 2021, and provides context for Basin conditions relative to the sustainable management criteria developed for the Basin. This report has been prepared in accordance with the requirements for annual reports as identified in the Sustainable Groundwater Management Act (SGMA). More detailed analysis and discussion of long-term hydrologic trends will be included in the periodic evaluation of the GSP the GSAs are required to perform at least every five years (23 C.C.R 356.2).

For additional clarification or more detailed information on the basin plan area or conditions, please refer to the Sierra Valley GSP. As acknowledged by the Department of Water Resources, it is important to note that there are still some data gaps and missing information as the GSAs continues to gather information for better analysis and decisions.

2. Groundwater Elevations

Groundwater elevation contour maps for the upper and lower aquifers in the spring of 2021 are shown in Figure 2 and Figure 3, respectively, and for the upper and lower aquifers in the fall of 2021 in Figure 4 and Figure 5. These maps depict the seasonal high (spring) and low (fall) water level elevations for the two principal aquifers in the Basin. Spring and fall water level elevations are defined as observations within a four week period centered on April 1st or October 1st. If a well has multiple observations within this period, then the value collected nearest to April 1st or October 1st is used.

Observed spring groundwater elevations in the upper aquifer (Figure 2) ranged from 4818.88 to 5175.41 ft above mean sea level (amsl), with an average elevation of 4931.36 ft amsl. Spring groundwater elevations for the lower aquifer (Figure 3) ranged from 4798.09 to 5088.93 ft amsl, with an average elevation of 4902.02 ft amsl. Groundwater elevations in the fall for the upper aquifer ranged from 4841.98 to 5169.91 ft amsl, with an average elevation of 4943.89 ft amsl. Observations from the lower aquifer showed groundwater elevations ranged from 4734.59 to 5085.93 ft amsl, with an average elevation of 4865.57 ft amsl.

Flow patterns in the Basin are complex and heavily influenced by the spatial distribution of recharge, faults that act as groundwater flow barriers, and groundwater pumping. On the west side of the Basin flow is generally from south to north, towards the surface water outlet of the Basin located to the northwest (start of the of the Middle Fork Feather River; MFFR). Flow on the east side of the basin is generally from the margins of the basin towards the pumping center located in the vicinity of wells W5 and DMW 7. Observed groundwater elevation changes from October 2020 to October 2021 in the upper aquifer ranged from -19.3 to -0.4 with an average change of -6.41 ft. For the lower aquifer groundwater elevation changes ranged from -14 to -2.3 with an average of -7.07 ft.

Hydrographs for representative monitoring points (RMPs) in the Basin are presented in Appendix A. Water levels in the context of sustainable management criteria (SMCs) vary considerably across the basin. Some wells show recent water level elevations above the established measurable objective, while others have water elevations that have dropped below the minimum threshold. [Author's Note: Some type of map would likely be useful for displaying recent conditions for RMPs due to the highly variable conditions observed in the RMP graphs. More time is needed to develop this.]

3. Groundwater Extractions

The Sierra Valley Groundwater Management District (SVGMD) meters all active large-capacity wells (defined as wells that produce 100+ gallons per minute or wells with a casing diameter of 6 inches or greater) in the Basin. A meter technician employed by SVGMD confirms metered extraction volumes reported by growers. Domestic groundwater pumping was not estimated due to the relatively small population in the valley not served by municipal extractions that are metered. Furthermore, the majority of domestic wells are located along the margins of the valley and based on available well log information, typically screened in fractured beckrock.

Estimated groundwater extractions for WY 2021 grouped by water use sector and measurement method are shown in Table 1. Groundwater pumping within each public land survey (PLSS) section (1 mi^2) shows the spatial distribution of agricultural (Figure 6), municipal & industrial (Figure 7) and total (Figure 8) groundwater extractions within the Basin. Groundwater pumping totaled

approximately 14,212 AF. Agricultural beneficial uses accounted for about 94% of total groundwater extractions for WY 2021.

Table 1. Groundwater Extractions

Sector	Method	GW Extraction Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Totalizer	14,212	± 5	13,501 - 14,922
Municipal and Industrial	Totalizer	850	± 5	808 - 893
Total		**15,062**		**14,309 - 15,815**

4. Surface Water Supply

Surface water used in the Basin grouped by source and measurement method is summarized in Table 2. Surface water is sourced from streams that enter the valley along the margin, releases from Frenchman Reservoir and Lake Davis, or imported water from the Little Truckee River. Observed flow rates for releases from Lake Davis and Frenchman Reservoir, and imports from the Little Truckee River are available from the Sierra Valley Watermaster. For the purposes of calculating surface water usage within the Basin, observed flow rates from Lake Davis were excluded as Big Grizzly Creek enters Sierra Valley very near the Basin outlet and there are few irrigated fields in the vicinity. All imported water from the Little Truckee River diversion was assumed to be used beneficially for agricultural purposes, as well as all contract and water right releases from Frenchman Reservoir. Flow data for streams entering Sierra Valley is sporadic and diversion volumes are not well reported. Therefore, surface water diverted from the local streams is not included in the applied surface water volume calculations and the reported volume is likely biased low. Improvement of diversion observations from local streams would help fill this data gap.

Imports from the Little Truckee River diversion totaled approximately 7,396 AF for WY 2021, while contract and water right releases from Frenchman reservoir were about 6,590 AF. Total surface water used in the Basin during WY 2021 was estimated to be 13,986 AF.

Table 2. Surface Water Use

Surface Water Source	Method	Annual Volume Used (AF)	Accuracy (%)	Range (AF)
Local Supplies (AF)	Weir	7396	± 5 %	7,026 - 7,766
Local Imported Supplies (AF)	Weir	6590	± 5 %	6,261 - 6,920
Total		**13,986**		**13,287 - 14,686**

5. Total Water Use

Total water use in the Basin grouped by water use sector and measurement method is shown in Table 3. Total water volumes used in the Basin during WY 2021 was estimated to be 14,835 AF.

Table 3. Total Water Use

Sector	Method	Total Annual Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Totalizer	14,212	± 5 %	13,501 - 14,923
	Weir	13,986	± 5 %	13,287 - 14,685
Agriculture Subtotal		28,198	-	26,788 - 29,608
Municipal and Industrial	Totalizer	850	± 5 %	808 - 893
Total		**29,048**		**27,596 - 30,500**

6. Change in Groundwater Storage

Observed changes in water levels from Fall 2020 to Fall 2021 for the upper and lower aquifers are shown in Figure 9 and Figure 10, respectively. Volumetric change in groundwater storage for the Basin was estimated using the Sierra Valley Integrated Hydrologic Model (SVHSM). Total total change in basin storage for WY 2021 is -7,600 AF. Figure 11 shows annual groundwater pumping and change in storage, along with cumulative storage since WY 2000. Current storage condition relative to WY 1990 is -29,600 AF. Negative change in storage is expected due to critically dry conditions for WY 2021.

7. Progress Towards GSP Implementation

[TEXT NEEDED]

8. References

Sierra Valley Groundwater Management District (SVGMD). 2022a. Sierra Valley Subbasin Groundwater Sustainability Plan. https://sgma.water.ca.gov/portal/gsp/preview/125

Sierra Valley Groundwater Management District (SVGMD). 2022b. DMS Technical Memorandum. Appendix 2-1 of Sierra Valley Subbasin Groundwater Sustainability Plan. https://www.sierravalleygmd.org/files/51e7b778f/Appendix+2-1+DMS+Tech+Memo.pdf

Sierra Valley Groundwater Management District (SVGMD). 2022c. Sierra Valley Hydrogeologic System Model and Water Budget Report. Appendix 2-7 of Sierra Valley Subbasin Groundwater Sustainability Plan.

Appendix A

Representative Monitoring Point Hydrographs