

TECHNICAL MEMORANDUM

Date:	06/29/2026
To:	Rob Swartz, Santa Margarita Groundwater Agency (SMGWA)
From:	Kiernan Kelty and Chris Hammersmark, CBEC Eco Engineering LLP (CBEC)
Subject:	SMGWA Streamflow Monitoring, Dry Season 2025

1 INTRODUCTION

As part of the Santa Margarita Groundwater Agency's (SMGWA) Groundwater Sustainability Plan (GSP), surface water monitoring during the dry season (May – October) has been an ongoing effort since 2017 (SMGWA 2021). CBEC has been conducting surface water monitoring since 2023 (cbec 2023; cbec 2025). The monitoring effort is intended to better characterize the surface-groundwater interaction within the Santa Margarita Groundwater Basin during the dry season. Historically, surface flow, stage, water temperature, and specific conductance time series were collected at SMGWA's gage network, although the collection of continuous specific conductance data was not undertaken at all sites during the 2025 dry season, as gages have malfunctioned and SMGWA has aimed to reduce monitoring costs. Field measurements of specific conductance were still collected during site visits for the 2025 dry season.

2 METHODS

2.1 Gaging Sites

Six active gage sites are currently monitored within SMGWA's dry season monitoring network (Figure 1). Five gage sites (San Lorenzo River Upstream of Love Creek, Newell Creek Upstream of the San Lorenzo River, Zayante Creek at Woodwardia Weir, Bean Creek at Mt. Hermon Camp, and Carbonera Creek at Carbonero Way) were actively managed and maintained by CBEC during the 2025 dry season. The Carbonera Creek at Carbonero Way gage site was identified and established with SMGWA representatives in the 2024 dry season (cbec 2025), to supplement the basin's GSP streamflow monitoring network. The Bean Creek Downstream of Mackenzie Creek gage site (Figure 1) is operated year-round and maintained/reported on by Balance Hydrologics, Inc., with dry season field measurements of surface flow, stage, water temperature, and specific conductance collected by CBEC field staff. Prior to initiating the 2025 monitoring, CBEC visited the six active gage sites and updated SMGWA staff regarding each site's maintenance needs.

2.2 Supplemental Flow Measurements

In collaboration with SMGWA, CBEC identified supplemental flow measurement sites during the 2024 dry season (cbec 2025) on Zayante and Carbonera Creeks (Figure 1) and continued to monitor these sites for the 2025 dry season to assess surface-to-groundwater interaction and identify potential impacts from groundwater pumping and/or natural aquifer recharge on these creeks. The Zayante Creek Downstream of Lompico Creek site was chosen to provide a measurement location upstream of the San Lorenzo Valley Water District (SLVWD) production wells, Olympia #2 and Olympia #3, a nearby shallow monitoring well (MW), and Quail Hollow MW-A (Figure 1). The Zayante Creek at Quail Hollow Road site was chosen to align with the axis of the Scotts Valley Syncline (Figure 2) and existing groundwater wells. The supplemental sampling site on Carbonera Creek at Bethany Drive was selected upstream of three Scotts Valley Water District (SVWD) production wells (Orchard Well, #11B, #11A), and in an area where the Santa Margarita and Lompico Sandstone geologic units are known to be in direct contact with each other in the subsurface (Figures 1-3). The contact facilitates increased exchange between the two aquifers, unlike other areas of the basin where the Monterey Formation restricts this movement (SMGWA 2021). Supplemental measurements were collected monthly along with the gage download and maintenance schedule for the dry season outlined in the following sections.

2.3 Measurements and Analysis

Gages were deployed on April 30, 2025, and visited monthly for inspection, download, and maintenance. During monthly visits, calibration measurements of surface flow, stage, water temperature, and specific conductance were collected. Supplemental flow, water temperature, and specific conductance measurements were also taken at the Zayante and Carbonera Creek gage sites. Gages were retrieved on November 5, 2025, concluding the 2025 monitoring period. Measurements of stage and flow were utilized to develop site-specific rating curves for the gage sites managed by CBEC utilizing historical (2023 & 2024 dry seasons) and current dry season field measurements (Tables 1-6).

Several notable rain events occurred during the 2025 dry season: May 12, 2025 (0.26 in), October 2, 2025 (0.43 in), October 13, 2025 (1.70 in), and October 26, 2025 (0.31 in) (San Lorenzo Valley Water District Rain Gage, SLVWD, 17387, Boulder Creek, CA) that generated stage time series values outside of observed flow measurements (Tables 1-6) at the respective gage sites. The rating curves were used to convert the stage records into estimated flow time series for each site with several exceptions, namely the noted rain events (May 12, October 2, 13, and 26, 2025) that required significant rating curve extrapolation to estimate flow values because event based high flow measurements were not collected. Site-specific time frames, excluding flow estimations, are detailed in the notes sections of Figures 4 through 8. Supplemental flow measurements at Zayante and Carbonera Creeks were also compared to show potential surface-to-groundwater interactions between different reaches of the respective creeks.

3 RESULTS

Calibration measurements for the monitoring network are provided in Tables 1–9. The time series of surface flow, water temperature, and specific conductance for the five gage sites managed by CBEC are shown in Figures 4-13. Supplemental flow measurement comparisons for Zayante and Carbonera Creeks (Figures 14 - 15) were collected to identify any potential surface-to-groundwater interaction between sample sites during the 2024 (cbec 2025) and 2025 dry seasons. The 2025 dry season results do not

indicate potential impacts (i.e., reductions in surface flow) at Zayante Creek from the Lompico to Woodwardia measurement sites, differing from 2024 dry season observations (cbec 2025). For Carbonera Creek, potential impacts were observed from July 1 – September 2, 2025 and November 3, 2025, similar to 2024 dry season results. A detailed summary of the 2025 dry season results is provided below.

3.1 Monitoring Summary

The surface flows for the 2025 dry season (Figures 4-8) were lower than previous observations from the 2023 and 2024 dry seasons (cbec 2023; cbec 2025) but higher than the 2020-2022 dry seasons (Neill et al. 2021; Neill et al. 2022; Balance Hydrologics 2023). A comparison of daily average flows for the 2023-2025 dry seasons at the San Lorenzo River Upstream of Love Creek, Newell Creek Upstream of the San Lorenzo River, Zayante Creek at Woodwardia Weir, and Bean Creek at Mt. Hermon Camp gage sites is provided in Appendix A. Carbonera Creek at Carbonero Way flow data were estimated only for the 2025 dry season and were therefore excluded from the comparison.

Generally, each gage site displayed a typical downtrend in surface flow magnitude with the exception of the identified rain events: May 12, 2025 (0.26 in), October 2, 2025 (0.43 in), October 13, 2025 (1.70 in), and October 26, 2025 (0.31 in). Newell Creek Upstream of the San Lorenzo River (Figure 5), was also influenced by managed releases from Loch Lomond Reservoir. For the Newell Creek site, surface flow values are estimated from May 2, 2025, 17:00 to May 29, 2025 9:00, due to stage values being above the maximum observed stage (2.92 ft), requiring an extrapolation of the developed rating curve for the site (Figure 5). The Bean Creek at Mt. Hermon Camp gage flow time series also increased after June 22, 2025, remaining elevated compared to earlier in the dry season (Figure 7). For Carbonera Creek, the observed fluctuations in flow outside of the identified rain events (Figure 8) are likely associated with the flushing of the SVWD Orchard Well, which discharges into Carbonera Creek between the Bethany Drive and Carbonero Way monitoring sites (SMGWA 2021).

Supplemental flow measurement comparisons at the Zayante Creek sites (Figure 14), did not indicate surface water losses to the subsurface between the Lompico to Woodwardia gage sites. Potential impacts were previously observed in the 2024 dry season (cbec 2025). The Carbonera Creek sites (Figure 15) however, indicated potential impacts from July 1 – September 2, 2025 and November 3, 2025 measurements. For those dates, flow measurements were lower at Carbonera Creek at Carbonero Way than at Carbonera Creek at Bethany Drive, suggesting surface-to-groundwater exchange (i.e., a losing reach) is occurring between the two sites, which is consistent with 2024 dry season observations (cbec 2025).

Water temperatures generally began near 14°C for all gage sites before increasing to peak temperatures in July for the San Lorenzo Upstream of Love Creek, Newell Creek Upstream of the San Lorenzo River, and Bean Creek at Mt. Hermon Camp sites. For the Zayante Creek at Woodwardia Weir and Carbonera Creek at Carbonero Way gage sites peak temperatures occurred in September (Figures 4-8). The seven-day forward rolling average threshold of 20 °C for steelhead rearing in the San Lorenzo River system (Alley 2015), was not exceeded at any of the gage sites during the 2025 dry season. During the 2024 dry season the threshold was exceeded for a total of 16 days at the San Lorenzo Upstream of Love Creek gage site. The threshold was not exceeded during the 2023 dry season at any of the gage sites. In the 2021 dry

season, the threshold was exceeded for 39 days (Neill et al. 2022). Additional analysis would be required to estimate total days of exceedance for the 2022 dry season (Balance Hydrologics 2023).

Specific conductance was not measured continuously at any gage site during the 2025 dry season due to previous gage malfunction and a decision by SMGWA to forgo conductivity gage replacements to reduce monitoring costs. Specific conductance measurements were taken during site visits at all gage sites for the 2025 dry season and related to the temperature times series at the respective gage sites (Figures 9 – 13). Generally, specific conductance measurements were relatively consistent throughout the dry season with the lowest values occurring at the start of the season for the San Lorenzo River Upstream of Love Creek and Newell Creek Upstream of the San Lorenzo River sites. Alternatively, the highest value occurred at the start of the season for the Zayante Creek at Woodwardia Weir and Bean Creek at Mt. Hermon Camp sites. For Carbonera Creek at Carbonero Way, the peak specific conductance occurred on July 29, 2025, and decreased through the remainder of the dry season.

4 REFERENCES

Alley, D., 2015, Fishery implications of water-temperature data collected in the San Lorenzo River system in 2014: Consulting report to the San Lorenzo Valley Water District, June 2015, 74p.

Balance Hydrologics, Inc. 2023. Santa Margarita Basin Streamflow Monitoring, Dry Season 2022 (Graphs Only). Prepared for SMGWA.

cbec, inc. 2023. Technical Memorandum – SMGWA Streamflow Monitoring, Dry Season 2023. Prepared for SMGWA. Santa Cruz, CA.

cbec, inc. 2025. Technical Memorandum – SMGWA Streamflow Monitoring, Dry Season 2024. Prepared for SMGWA. Santa Cruz, CA.

Neill, C., Hecht, B., Goodwin, E., and Parke, J. 2021, Water Year, 2020, Santa Margarita Basin Streamflow Monitoring and Accretion Assessment, Dry Season of 2020, consulting report 220237, 19p. Plus figures, tables, and forms.

Neill, C., Parke, J., Hecht, B., Goodwin, E., 2022, Water Year, 2021, Santa Margarita Basin Streamflow Monitoring and Accretion Assessment, Dry Season of 2021, consulting report 221237, 18p. Plus figures, tables, and forms.

Santa Margarita Groundwater Agency [SMGWA], 2021. Groundwater Sustainability Plan. Santa Cruz, CA.

5 Tables

Table 1. Station Log, San Lorenzo River Upstream of Love Creek, County of Santa Cruz, California, Dry Season 2025

Data is preliminary, subject to revision.

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 16:00	1.66	29.35	14.80	318.03	394.67	Visible inflow downstream of the gage site from Love Creek. Water is clear.
5/29/2025 13:45	1.42	20.66	17.00	347.5	410.10	Visible inflow downstream of the gage site from Love Creek. Water is clear.
7/1/2025 13:45	1.25	12.32	19.20	369.63	415.47	Visible inflow downstream of the gage site from Love Creek. Water is clear.
7/29/2025 14:30	1.18	8.32	20.00	374.43	413.90	Visible inflow downstream of the gage site from Love Creek. Water is clear.
9/2/2025 15:30	1.05	5.67	20.10	361.57	399.07	Visible inflow downstream of the gage site from Love Creek. Water is clear.
9/25/2025 14:00	1.06	5.97	19.50	355.80	397.83	Visible inflow downstream of the gage site from Love Creek. Water is clear.
11/3/2025 13:15	1.11	7.41	12.20	324.20	428.97	Visible inflow downstream of the gage site from Love Creek. Water is clear.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at 25°C.

*Data is preliminary, subject to revision***Table 2. Station Log, Newell Creek Upstream of the San Lorenzo River, County of Santa Cruz, California, Dry Season 2025**

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 15:15	2.92	2.74	13.70	279.50	356.60	Water is clear, waterfowl and aquatic activity at the gage site.
5/29/2025 12:45	2.89	1.62	15.50	276.10	337.50	Water is clear, waterfowl and aquatic activity at the gage site.
6/18/2025 10:00	2.87	1.41	14.40	270.60	339.53	Water is clear, waterfowl and aquatic activity at the gage site.
7/1/2025 12:30	2.87	1.38	17.30	283.53	340.00	Water is clear, waterfowl and aquatic activity at the gage site.
7/29/2025 12:45	2.85	1.36	16.90	289.93	343.00	Water is clear, waterfowl and aquatic activity at the gage site.
9/2/2025 14:30	2.92	1.36	17.10	294.53	346.27	Water is clear, waterfowl and aquatic activity at the gage site. Flow measurements is an outlier. Excluded from rating curve development.
9/25/2025 13:00	2.84	1.34	17.10	295.07	348.10	Water is clear, waterfowl and aquatic activity at the gage site.
11/3/2025 12:15	2.86	1.47	12.60	269.50	352.70	Water is clear, waterfowl and aquatic activity at the gage site.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm³) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm³) of a solution at 25°C.

**Table 3. Station Log, Zayante Creek at Woodwardia Weir,
County of Santa Cruz, California, Dry Season 2025**

Data is preliminary, subject to revision

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 12:00	0.77	6.83	13.20	368.00 (g) 376.60 (m) 373.30 (a)	474.00 (g) 489.00 (m) 481.50 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.
5/29/2025 10:00	0.70	4.30	14.05	379.70 (g) 388.67 (m) 384.18 (a)	479.00 (g) 492.00 (m) 485.50 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.
7/1/2025 9:45	0.63	2.94	16.00	370.67 (g) 381.13 (m) 375.90 (a)	448.17 (g) 461.33 (m) 454.75 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.
7/29/2025 9:30	0.61	2.41	16.50	349.50 (g) 370.83 (m) 360.17 (a)	417.77 (g) 443.30 (m) 430.53 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.
9/2/2025 10:15	0.58	1.62	17.15	350.57 (g) 351.10 (m) 350.83 (a)	412.03 (g) 413.53 (m) 412.78 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.
9/25/2025 9:45	0.61	1.91	17.90	350.57 (g) 351.10 (m) 350.83 (a)	417.00 (g) 418.37 (m) 417.68 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.
11/3/2025 9:00	0.60	2.51	11.50	321.53 (g) 322.80 (m) 322.17 (a)	433.27 (g) 435.00 (m) 434.13 (a)	Water is clear, there is inflow from a culvert US of the gage site influencing measured conductance.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at 25°C. **(g).** measured at gage site. **(m).** measured in main channel. **(a).** average of all measured data.

*Data is preliminary, subject to revision***Table 4. Station Log, Bean Creek at Mount Hermon Camp, County of Santa Cruz, California, Dry Season 2025**

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 7:30	2.10	4.85	13.70	359.50	646.00	Water is clear, no debris present.
5/29/2025 15:30	2.01	3.23	17.60	392.47	457.00	Water is clear, no debris present.
7/1/2025 15:15	2.07	2.16	19.10	403.10	454.60	Water is clear, no debris present. Flow measurements is an outlier. Excluded from rating curve development.
7/29/2025 15:30	1.98	2.66	19.03	404.17	456.00	Water is clear, no debris present.
9/2/2025 16:45	2.01	2.80	17.20	388.80	457.00	Water is clear, no debris present.
9/25/2025 15:45	2.01	2.62	18.30	401.57	460.67	Water is clear, no debris present.
11/3/2025 14:45	2.02	3.04	13.10	362.43	469.00	Water is clear, no debris present.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm³) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm³) of a solution at 25°C.

**Table 5. Station Log, Bean Creek Downstream of Mackenzie Creek,
County of Santa Cruz, California, Dry Season 2025**

Data is preliminary, subject to revision

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 10:30	2.24	0.96	13.20	422.43	560.00	Water is clear, no debris present.
5/29/2025 9:00	2.18	0.33	12.90	442.97	577.00	Water is clear, no debris present.
7/1/2025 8:45	2.12	0.16	14.80	464.00	575.00	Water is clear, no debris present.
7/29/2025 9:00	0.40	0.00	14.10	300.00	378.83	Standing water, no flow.
9/2/2025 9:45	-	0.00	-	-	-	Stream is dry. No measurements taken.
9/25/2025 9:15	-	0.00	-	-	-	Stream is dry. No measurements taken.
11/3/2025 8:30	0.66	0.00	11.00	358.53	490.00	Standing water, no flow.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at 25°C.

**Table 6. Station Log, Carbonera Creek at Carbonero Way,
County of Santa Cruz, California, Dry Season 2025**

Data is preliminary, subject to revision

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/18/2025	1.10	0.75	-	-	-	Flow measurement taken at preseason gage site inspection prior gage deployment. No other field measurements were collected.
4/30/2025 12:00	0.98	0.43	13.20	437.00	564.00	Water is clear, leaf litter present.
5/29/2025 7:00	0.85	0.21	14.00	556.00	703.00	Water is clear, leaf litter present.
6/18/2025 9:00	0.89	0.17	14.60	535.00	666.00	Water is clear, leaf litter present.
7/1/2025 7:00	0.88	0.09	15.10	564.00	695.00	Water is clear, leaf litter present.
7/29/2025 7:15	0.80	0.03	16.30	666.67	800.00	Water is clear, leaf litter present.
9/2/2025 7:30	-	-	-	-	-	Stream is dry. No flow measurements taken.
9/25/2025 7:30	1.17	0.93	18.20	647.67	745.00	Water is clear, leaf litter present.
11/3/2025 6:30	0.79	0.07	12.20	536.00	710.33	Water is clear, leaf litter present.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at 25°C.

**Table 7. Supplemental Flow Site Log, Carbonera Creek at Bethany Drive,
County of Santa Cruz, California, Dry Season 2025**

Data is preliminary, subject to revision

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 9:30	-	0.38	11.30	367.07	494.00	No staff plate installed at the site. Water is clear, no debris present.
5/29/2025 8:00	-	0.22	11.80	374.25	500.00	No staff plate installed at the site. Water is clear, no debris present.
6/18/2025 0:00	-	-	-	-	-	Site not visited.
7/1/2025 7:45	-	0.21	13.50	414.23	531.00	No staff plate installed at the site. Water is clear, no debris present.
7/29/2025 8:15	-	0.14	14.50	433.97	543.00	No staff plate installed at the site. Water is clear, no debris present.
9/2/2025 8:45	-	0.13	16.10	465.00	560.67	No staff plate installed at the site. Water is clear, no debris present.
9/25/2025 8:30	-	0.18	17.00	482.33	570.00	No staff plate installed at the site. Water is clear, no debris present.
11/3/2025 7:30	-	1.88	12.00	429.57	572.00	No staff plate installed at the site. Water is clear, no debris present.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm³) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm³) of a solution at 25°C.

Table 8. Supplemental Flow Site Log, Zayante Creek at Quail Hollow Road, County of Santa Cruz, California, Dry Season 2025

Data is preliminary, subject to revision

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 13:00	-	5.24	13.60	451.40	577.00	No staff plate installed at the site. Water is clear, no debris present.
5/29/2025 11:30	-	3.82	14.30	487.00	612.00	No staff plate installed at the site. Water is clear, no debris present.
7/1/2025 10:45	-	2.42	16.00	506.00	610.00	No staff plate installed at the site. Water is clear, no debris present.
7/29/2025 10:45	-	1.91	16.70	521.67	619.67	No staff plate installed at the site. Water is clear, no debris present.
9/2/2025 12:15	-	0.85	18.20	563.00	646.33	No staff plate installed at the site. Water is clear, no debris present.
9/25/2025 11:00	-	1.05	17.90	538.33	623.33	No staff plate installed at the site. Water is clear, no debris present.
11/3/2025 10:15	-	1.26	11.60	450.17	604.67	No staff plate installed at the site. Water is clear, no debris present.

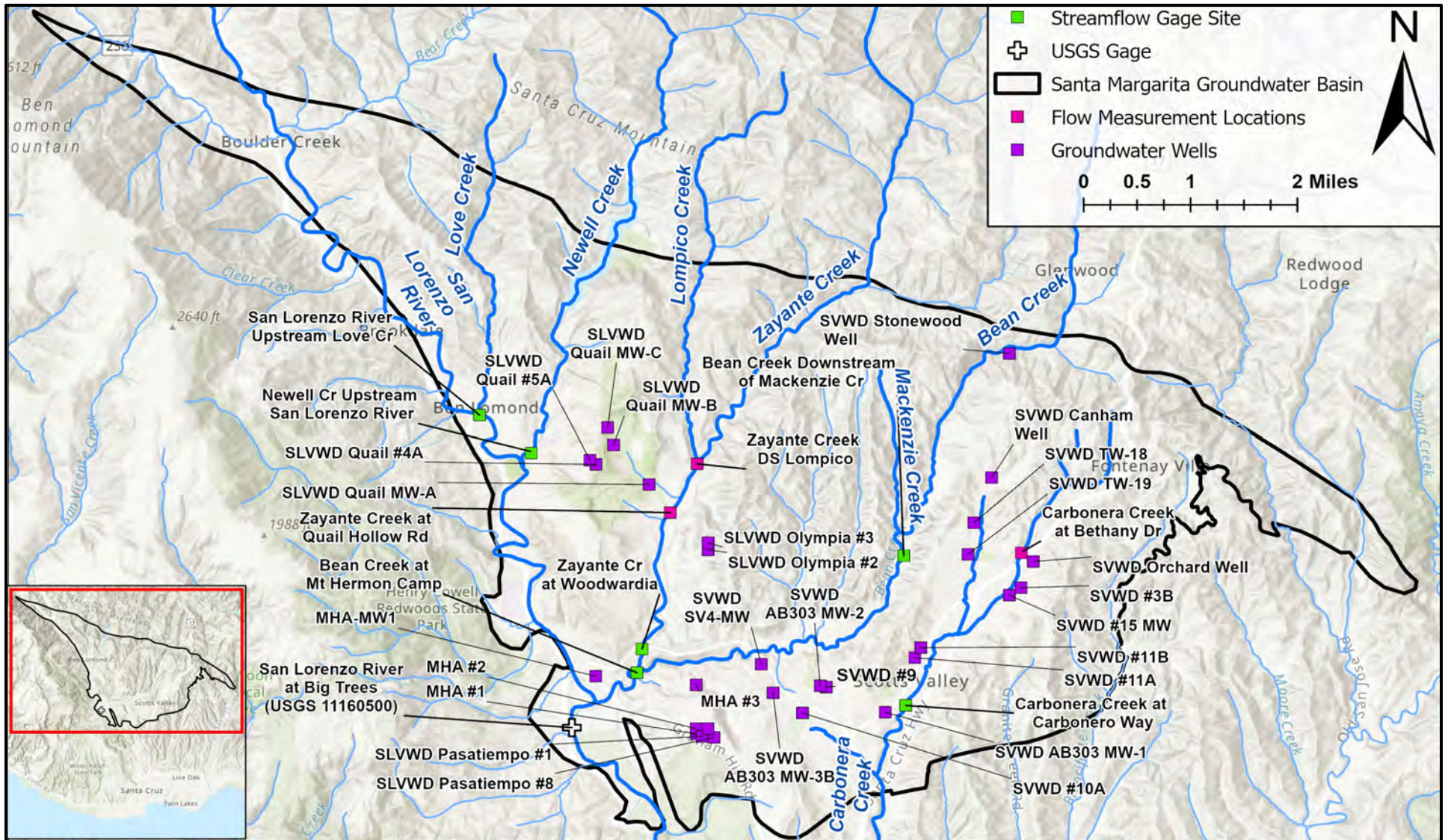
Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at 25°C.

Table 9. Supplemental Flow Site Log, Zayante Creek Downstream of Lompico Creek, County of Santa Cruz, California, Dry Season 2025

Data is preliminary, subject to revision

Date/Time	Observed Stage	Measured Flow	Water Temperature	Electric Conductance	Specific Conductance at 25°C	Field Notes
	(ft)	(cfs)	(°C)	(μS)	(μS)	(-)
4/30/2025 13:45	-	4.45	13.40	471.00	604.00	No staff plate installed at the site. Water is clear, no debris present.
5/29/2025 12:15	-	2.70	13.70	494.67	630.00	Handheld temperature and conductivity sensor was malfunctioning. Water is clear, no debris present.
7/1/2025 11:30	-	1.39	17.70	572.00	665.00	No staff plate installed at the site. Water is clear, no debris present.
7/29/2025 11:45	-	1.08	16.20	562.00	675.00	No staff plate installed at the site. Water is clear, no debris present.
9/2/2025 13:30	-	0.69	17.40	603.67	706.33	No staff plate installed at the site. Water is clear, no debris present.
9/25/2025 11:45	-	0.78	17.80	602.67	699.00	No staff plate installed at the site. Water is clear, no debris present.
11/3/2025 11:00	-	0.87	11.30	499.67	676.00	No staff plate installed at the site. Water is clear, no debris present.

Observed Stage: Water level noted on staff plate. **Electric Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at field temperature. **Specific Conductance:** electrical conductance of 1 cubic centimeter (cm^3) of a solution at 25°C.



Notes: A new gage site was added at Carbonera Creek at Carbonero Way on 6/13/2024 during the 2024 dry season (cbec 2025). Supplemental flow sampling locations were continued for the 2025 dry season for: Carbonera Creek at Bethany Dr, Zayante Creek at Quail Hollow Rd, and Zayante Creek DS Lompico Creek.

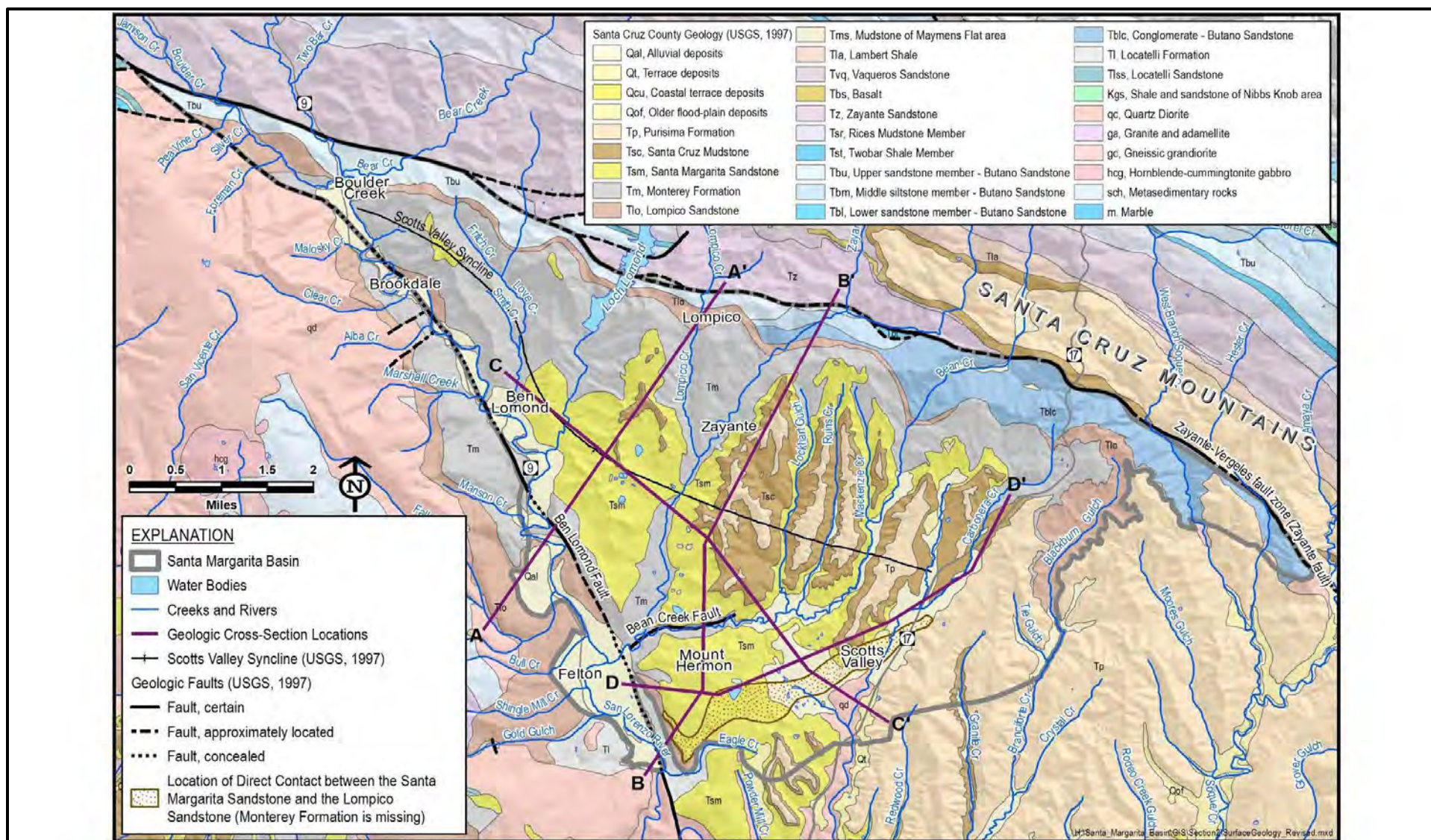


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Santa Margarita Groundwater Agency Streamflow Monitoring Sites

Project No. 23-1013

Created By: KMK

Figure 1



Notes: Figure adapted from SMGWA, 2021, Figure 2-18.

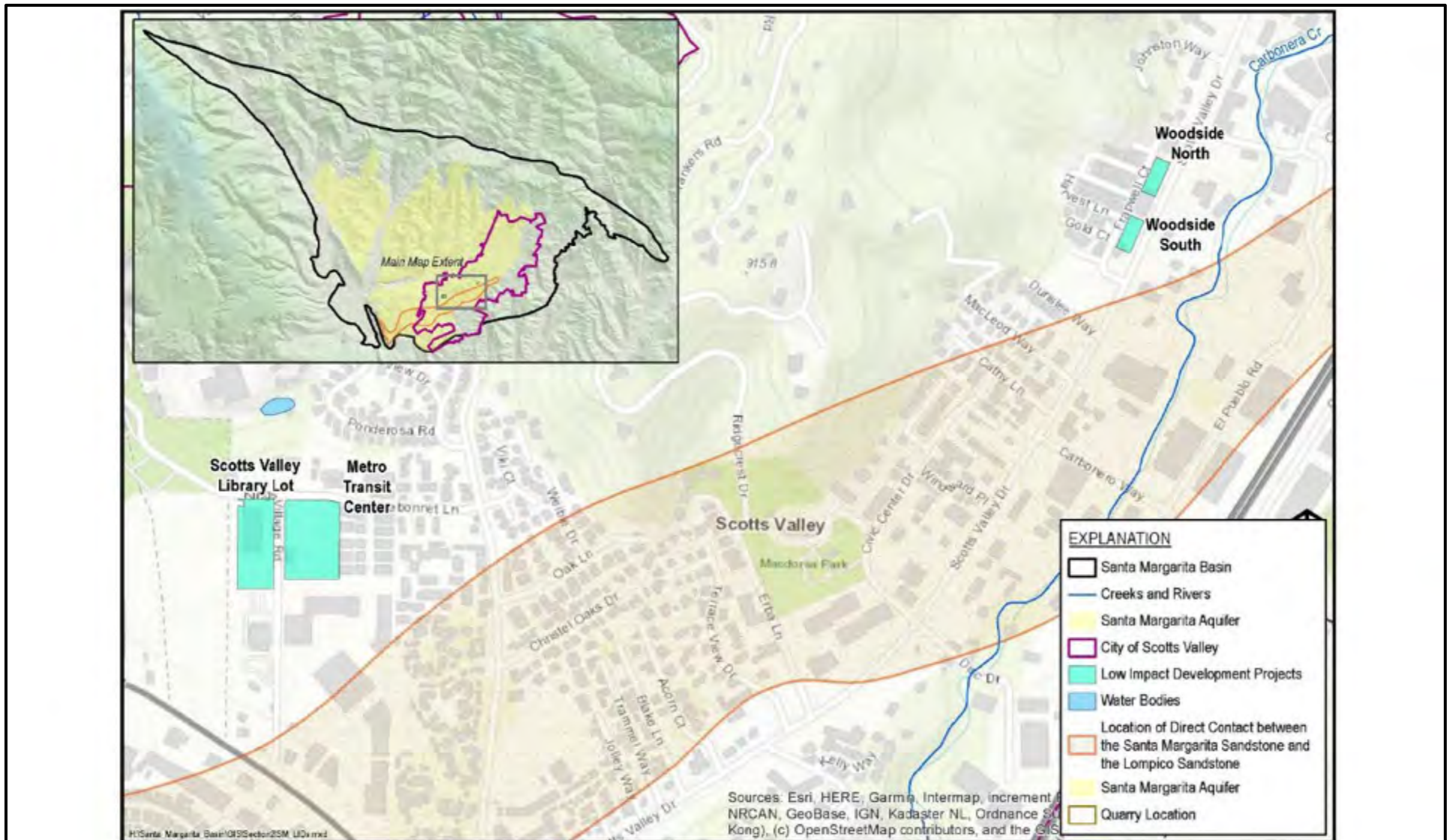


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Santa Margarita Basin Surface Geology

Project No. 23-1013

Created By: KMK

Figure 2



Notes: Figure adapted from SMGWA, 2021, Figure 2-7.

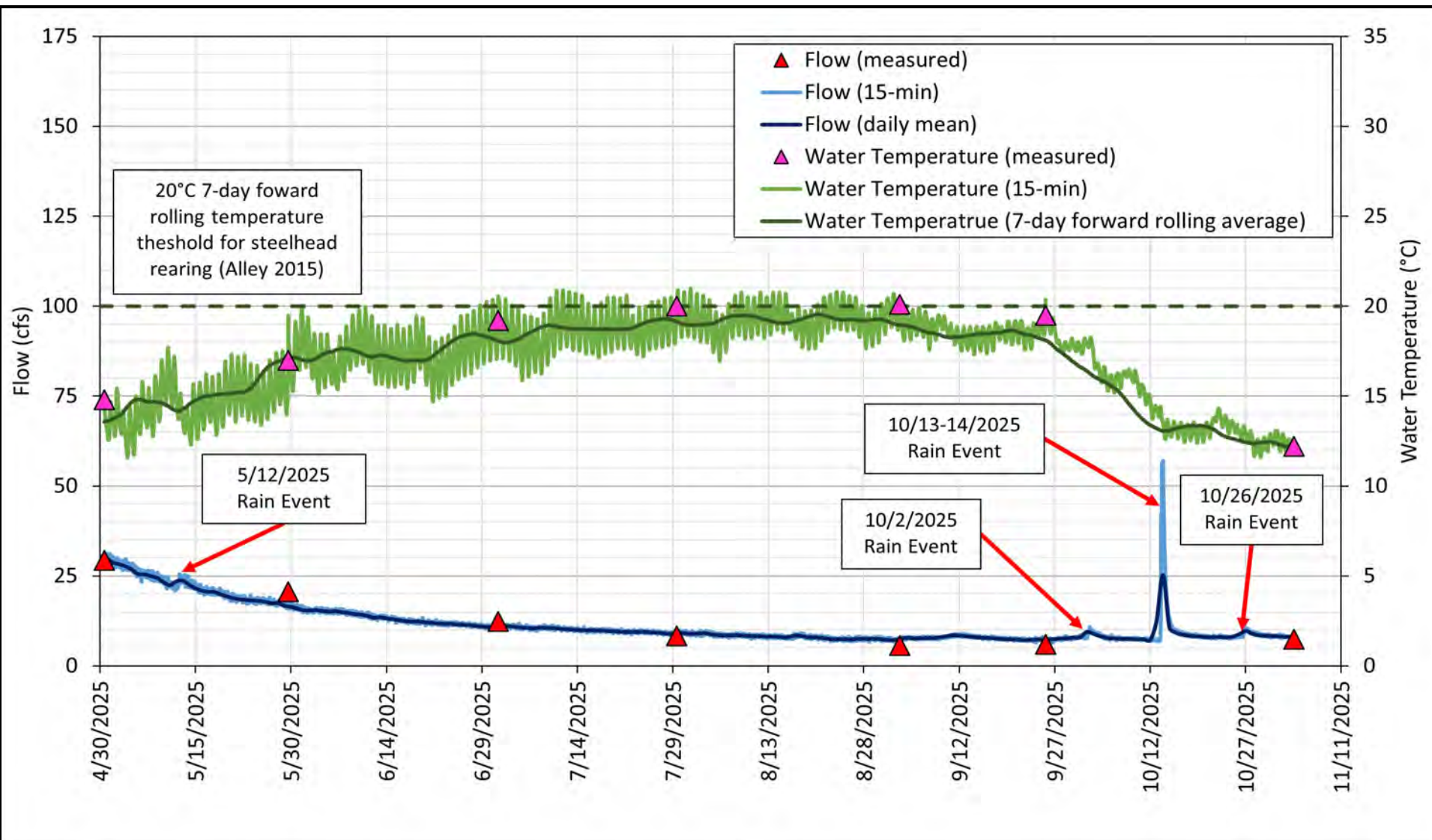


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Carbonera Creek: Santa Margarita Sandstone and Lompico Sandstone Connection

Project No. 23-1013

Created By: KMK

Figure 3



Notes: Flows were not estimated for: 10/13/2025 20:00 – 10/14/2025 0:30 due to the need for significant rating curve extrapolation. Rain events occurred: May 12, 2025 (0.26 in), October 2, 2025 (0.43 in), October 13, 2025 (1.70 in), and October 26, 2025 (0.31 in) (San Lorenzo Valley Water District Rain Gage, SLVWD, 17387, Boulder Creek, CA).

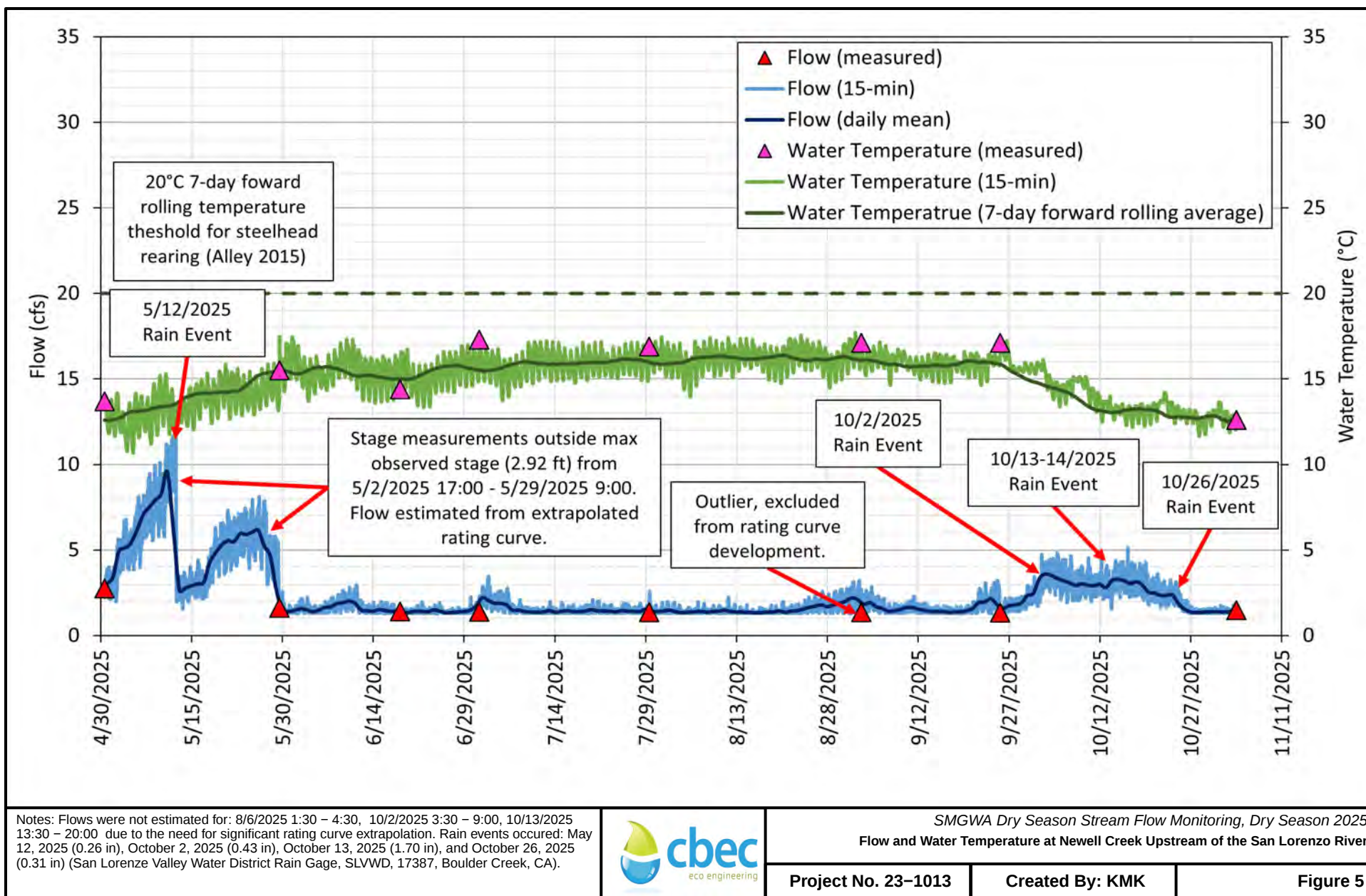


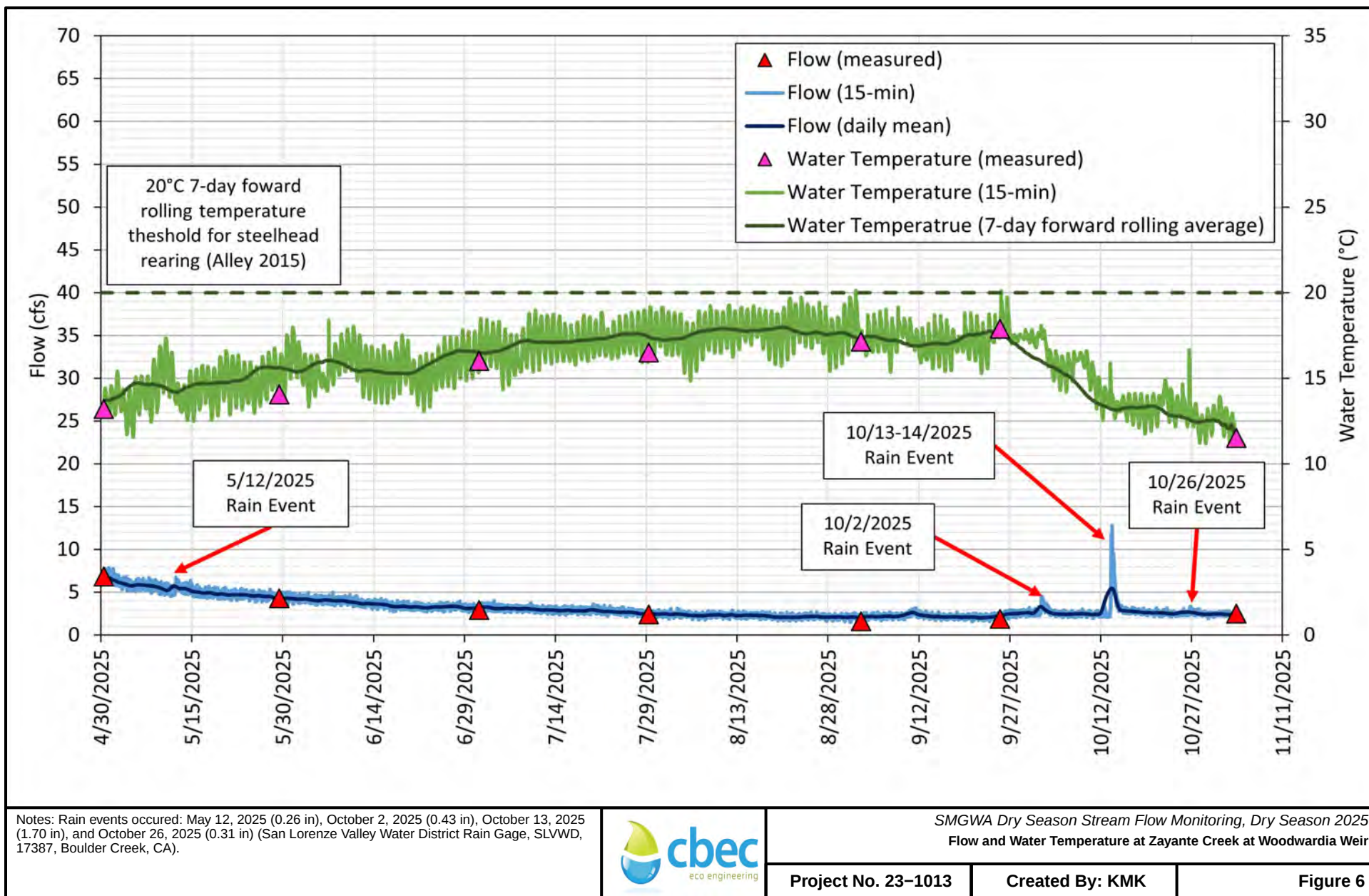
SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Flow and Water Temperature at San Lorenzo River Upstream of Love Creek

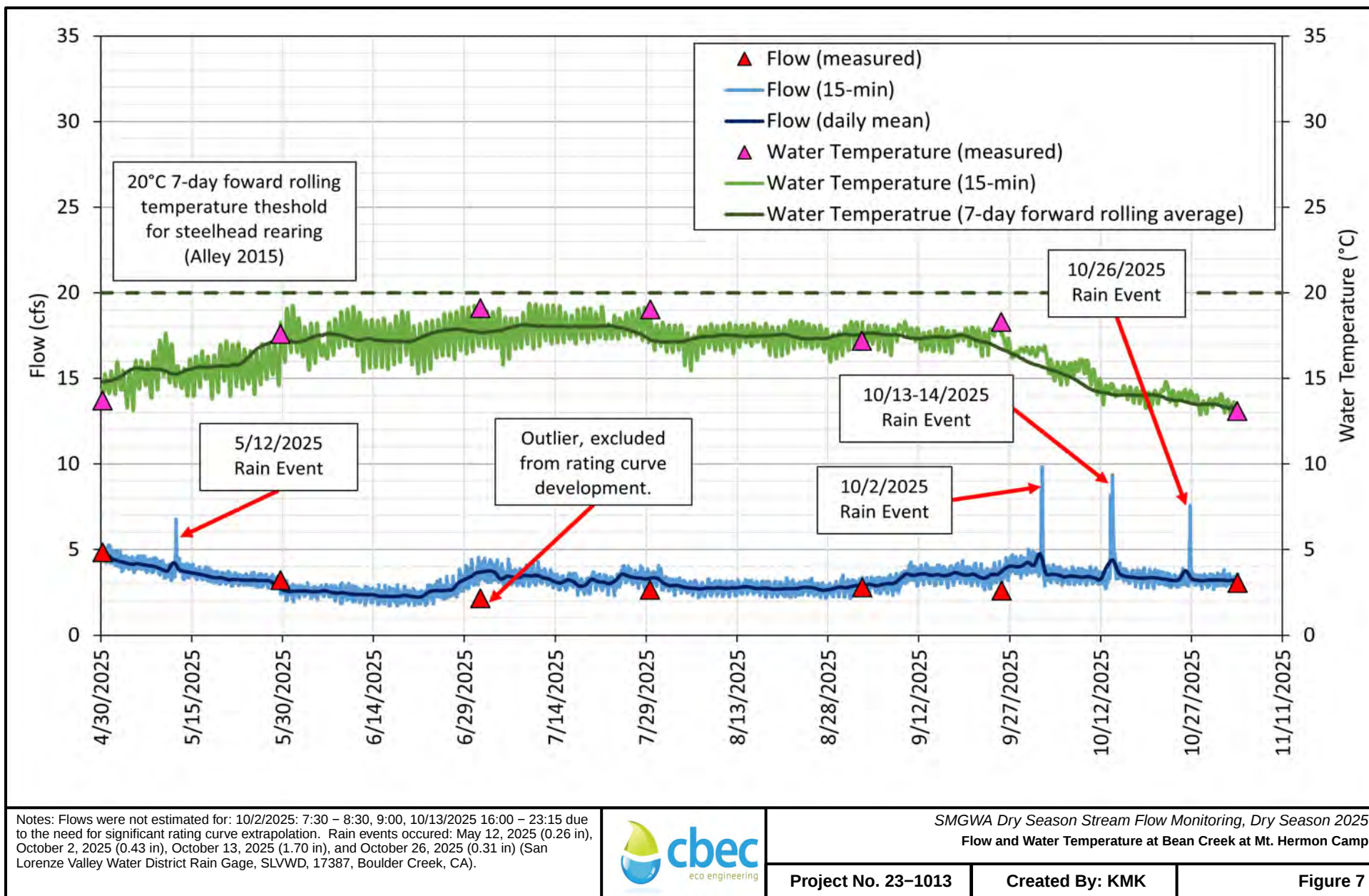
Project No. 23-1013

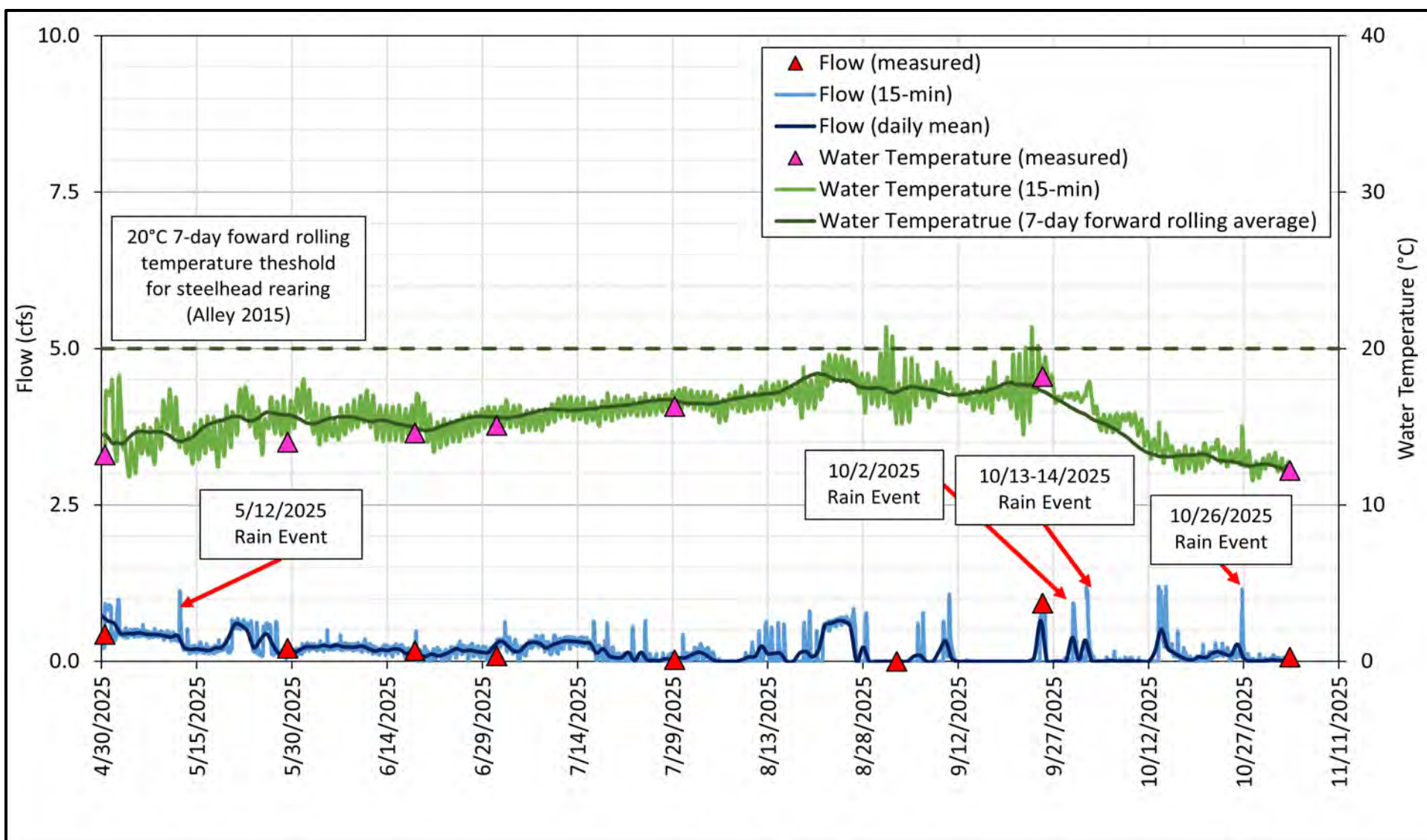
Created By: KMK

Figure 4









Notes: Flows were not estimated for: 5/12/2025 7:30 – 9:45, 10/2/2025: 3:45 – 5:00, 5:15 – 9:00, 10/13/2025 14:00 – 22:00, 10/14/2025 15:45 – 18:00, 10/26/2025 16:30 – 18:15 due to the need for significant rating curve extrapolation. Rain events occurred: May 12, 2025 (0.26 in), October 2, 2025 (0.43 in), October 13, 2025 (1.70 in), and October 26, 2025 (0.31 in) (San Lorenzo Valley Water District Rain Gage, SLVWD, 17387, Boulder Creek, CA).

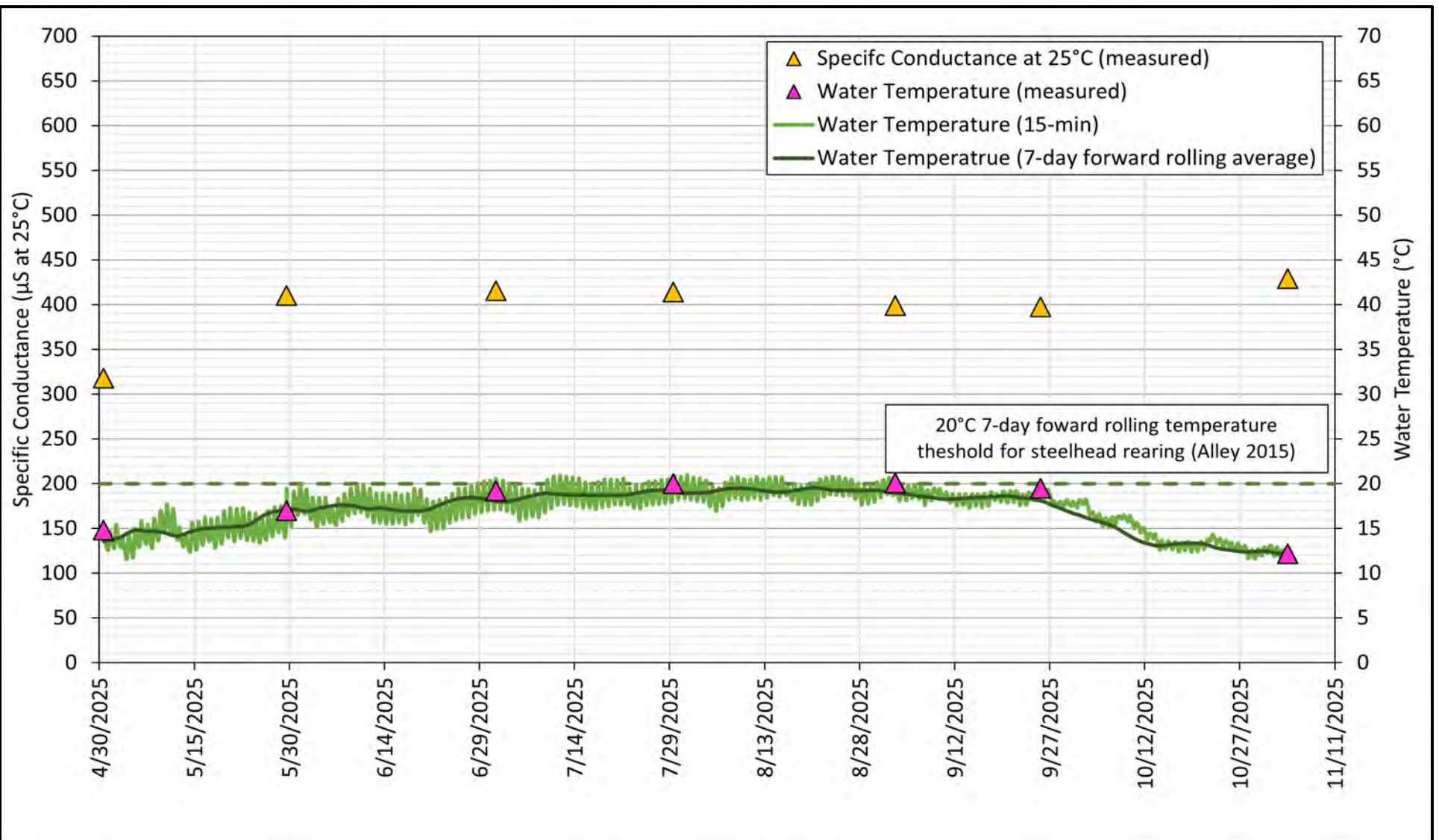


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Flow and Water Temperature at Carbonera Creek at Carbonero Way

Project No. 23–1013

Created By: KMK

Figure 8



Notes: Deployed gage was only capable of recording pressure and water temperature. No specific conductance time series was recorded at the site. Specific conductance field measurements were taken during site visits.

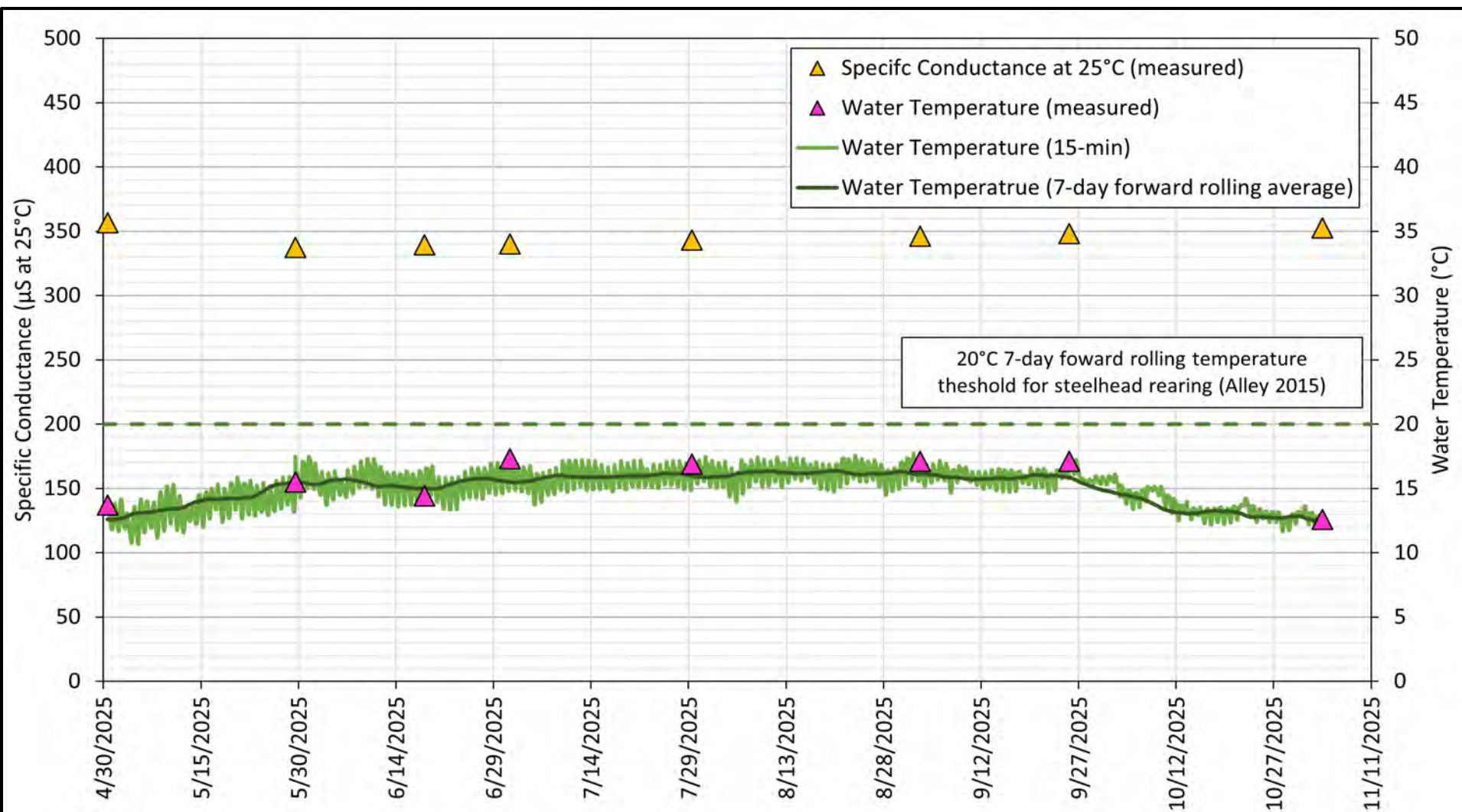


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Specific Conductance and Water Temperature at San Lorenzo River Upstream of Love Creek

Project No. 23-1013

Created By: KMK

Figure 9



Notes: Deployed gage was only capable of recording pressure and water temperature. No specific conductance time series was recorded at the site. Specific conductance field measurements were taken during site visits.

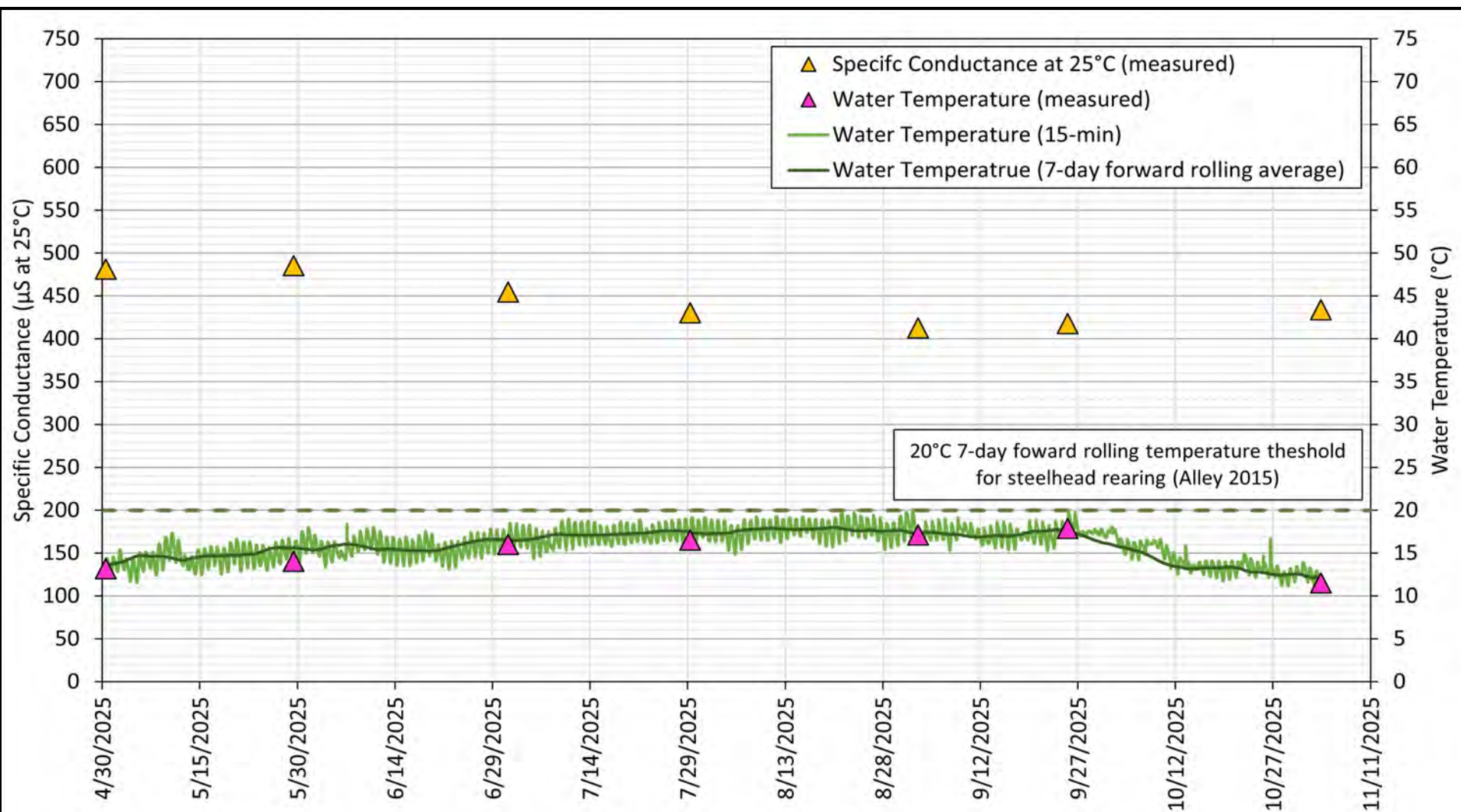


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Specific Conductance and Water Temperature at Newell Creek Upstream of the San Lorenzo River

Project No. 23-1013

Created By: KMK

Figure 10



Notes: Deployed gage was only capable of recording pressure and water temperature. No specific conductance time series was recorded at the site. Specific conductance field measurements were taken during site visits.

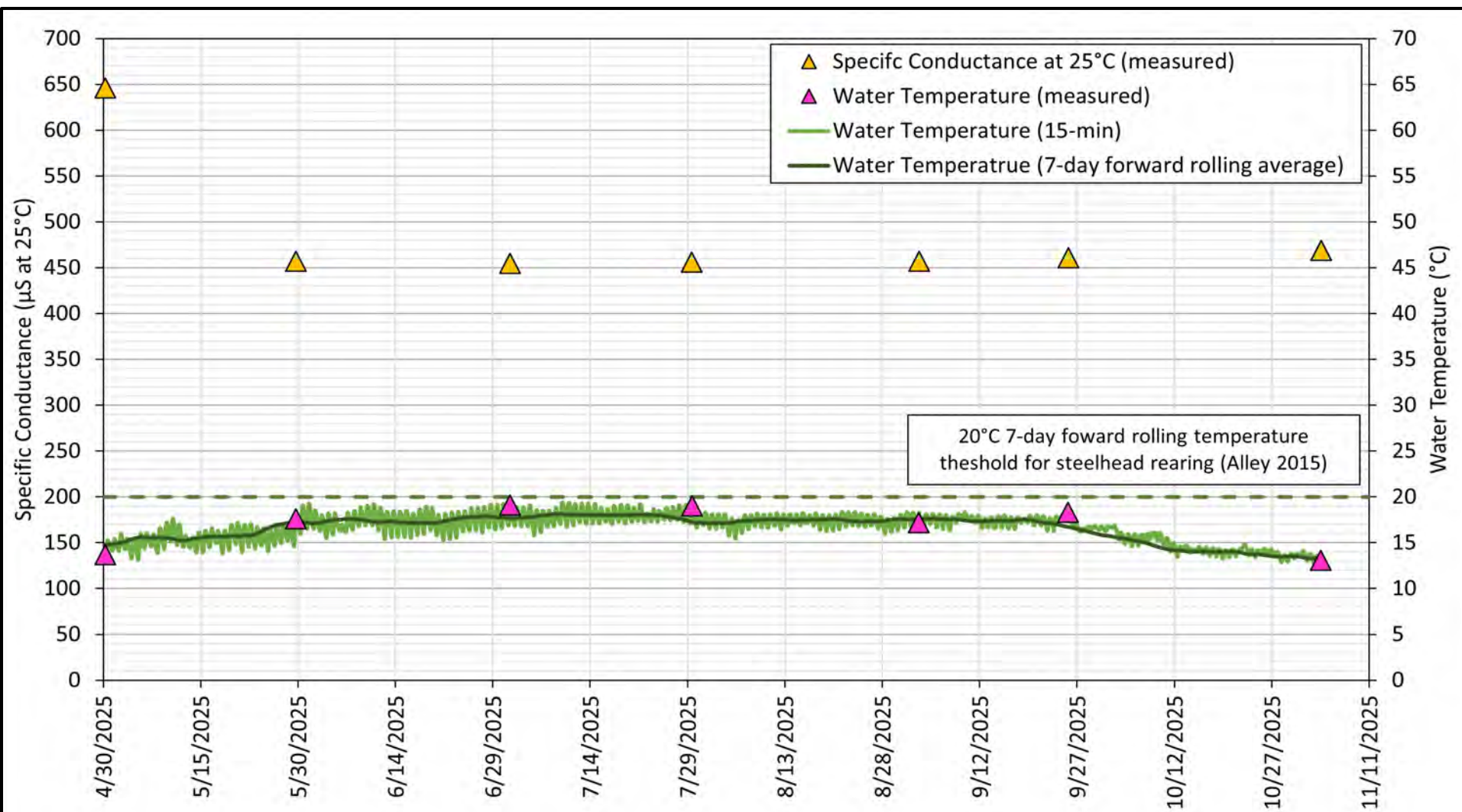


SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Specific Conductance and Water Temperature at Zayante Creek at Woodwardia Weir

Project No. 23-1013

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Figure 11



Notes: Deployed gage was only capable of recording pressure and water temperature. No specific conductance time series was recorded at the site. Specific conductance field measurements were taken during site visits.

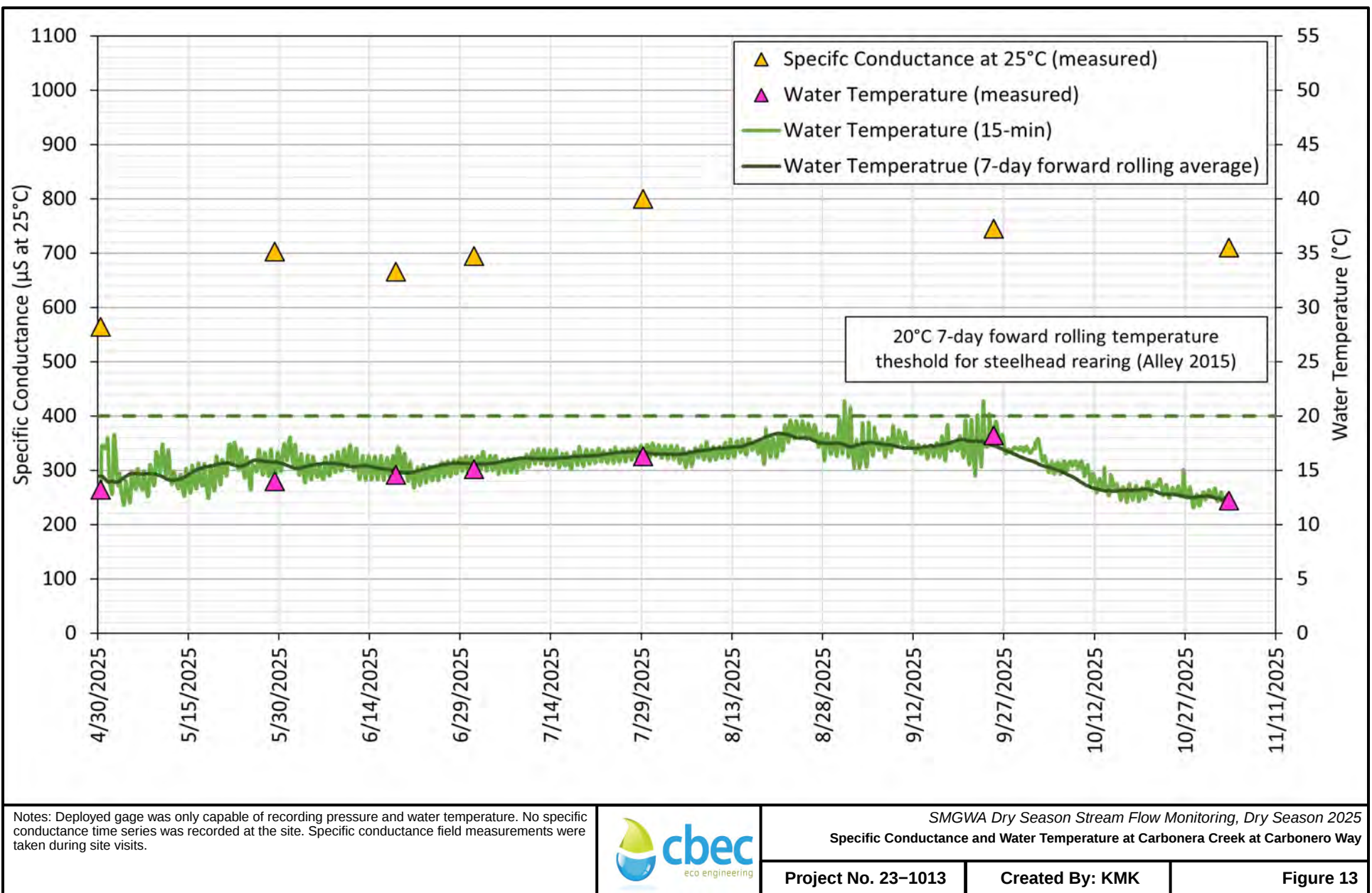


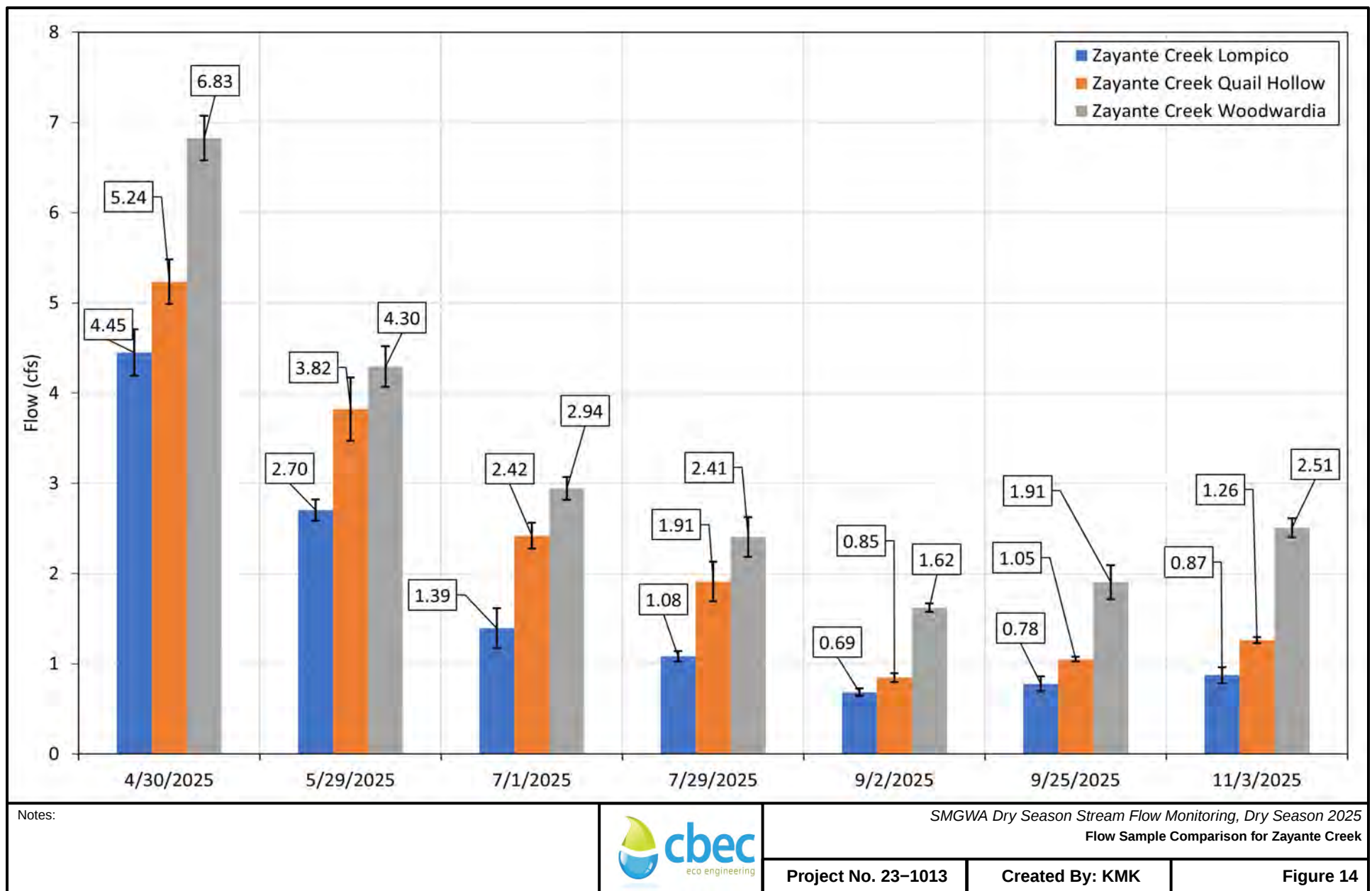
SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Specific Conductance and Water Temperature at Bean Creek at Mt. Hermon Camp

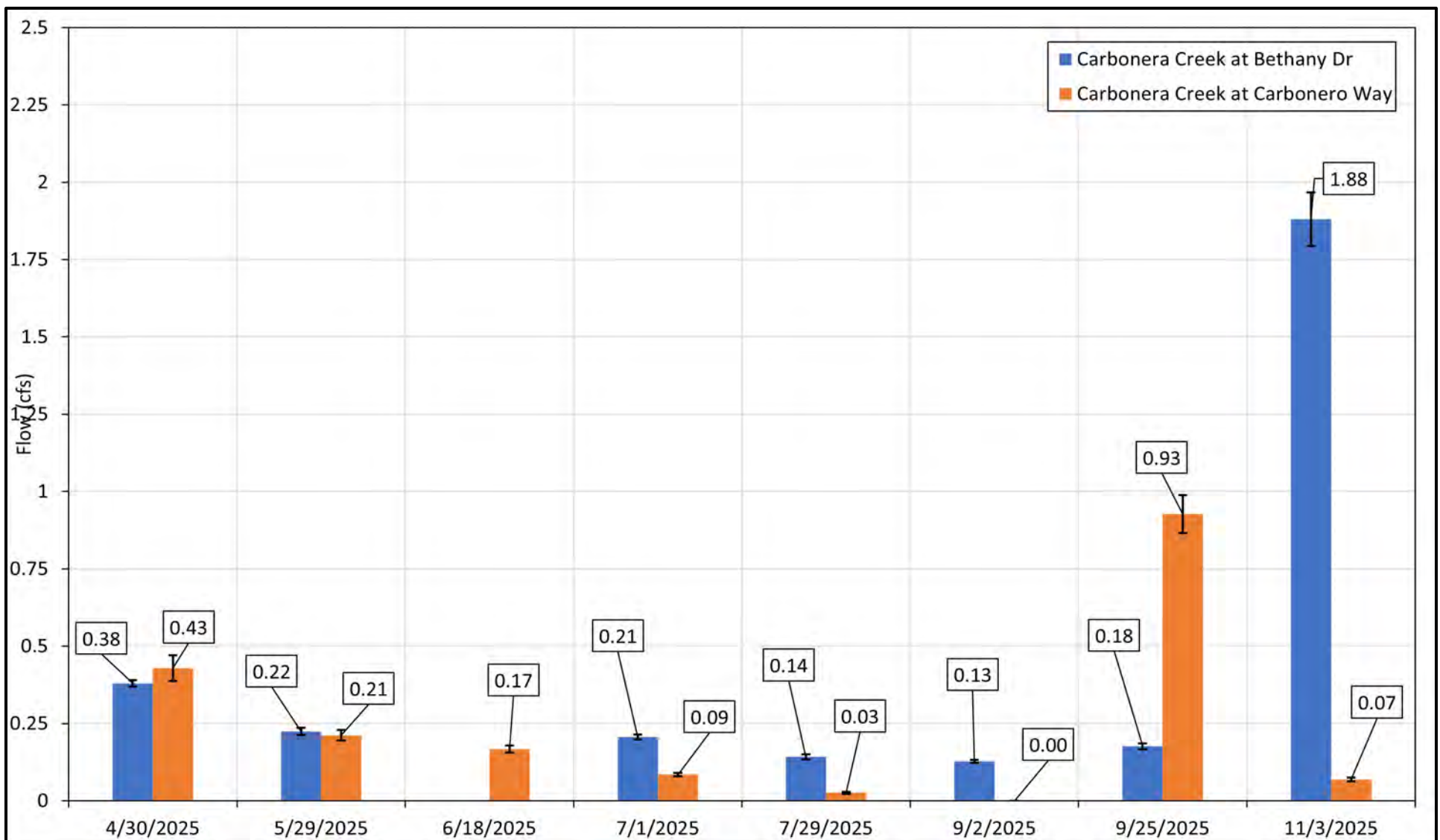
Project No. 23-1013

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Figure 12







Notes:



SMGWA Dry Season Stream Flow Monitoring, Dry Season 2025
Flow Sample Comparison for Carbonera Creek

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Figure 15

APPENDIX A

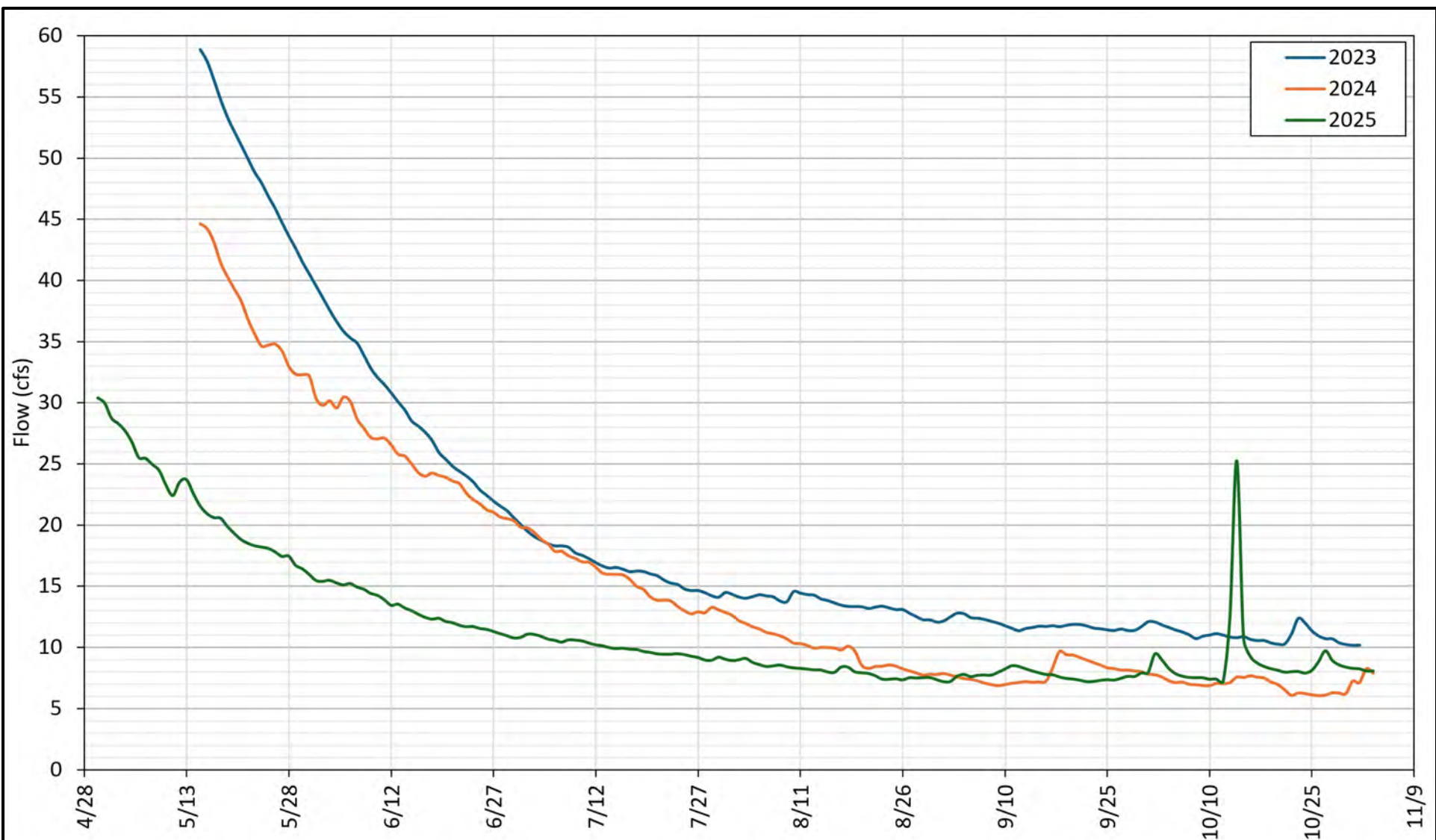
Figures A-1 through A-4 present daily average flows for the 2023 through 2025 dry seasons at the San Lorenzo River Upstream of Love Creek, Newell Creek Upstream of the San Lorenzo River, Zayante Creek at Woodwardia Weir, and Bean Creek at Mt. Hermon Camp gage sites. Monitoring began on May 15 during the 2023 and 2024 dry seasons and on April 30 during the 2025 dry season. Initial dry-season flows were generally highest in 2023, followed by 2024 and 2025. Newell Creek Upstream of the San Lorenzo River was an exception to the observed trend due to managed releases from Loch Lomond Reservoir. Rating curve extrapolation was also required at Newell Creek during May and June of each monitoring year.

At the San Lorenzo River Upstream of Love Creek site (Figure A-1), initial daily average flows ranged from 58.87 cfs during the 2023 dry season to 30.39 cfs during the 2025 dry season. Flows generally declined to baseflow conditions by August in each monitoring period, with similar baseflow magnitudes observed during the 2024 and 2025 dry seasons. Flow during the 2023 dry season was elevated relative to the 2024 and 2025 seasons throughout the monitoring period, although the overall rate of seasonal flow recession was generally similar across all three years.

At the Newell Creek Upstream of the San Lorenzo River gage (Figure A-2), daily average flows varied across the 2023–2025 dry seasons, reflecting the influence of managed releases from Loch Lomond Reservoir. For all three years, flow rates in the first portion of the monitoring period were often elevated and varied between years, although the exact magnitude of flow during the higher release periods are less certain as they were estimated by rating curve extrapolation. Flows generally ranged from 1 to 5 cfs, with the highest daily average flow observed during the 2023 dry season. The 2024 and 2025 dry seasons were generally similar in magnitude (i.e. 1–3 cfs); however, late dry-season precipitation in September and October 2025, along with potential changes in reservoir releases, resulted in elevated flows relative to the 2024 dry season.

At the Zayante Creek at Woodwardia Weir gage (Figure A-3), observed dry-season flow patterns were generally consistent with those observed at the San Lorenzo River gage. Initial daily average flows ranged from 13.44 cfs during the 2023 dry season to 6.99 cfs during the 2025 dry season. Flows generally decreased through each dry season, with a minor change in the recession rate observed around July 29 during the 2023 monitoring period. Baseflow conditions were similar during the 2024 and 2025 dry seasons, while higher baseflows were observed during the 2023 dry season.

At the Bean Creek at Mt. Hermon Camp gage (Figure A-4), initial daily average flows were similar during the 2023 and 2024 dry seasons and were higher than those observed during the 2025 dry season. Initial flows ranged from 8.19 cfs during the 2023 dry season to 4.71 cfs during the 2025 dry season. Flow recession trends were similar during the 2023 and 2024 dry seasons, while the 2025 dry season recession was more gradual. Baseflows increased after June 22 during the 2025 dry season and remained elevated throughout the remainder of the monitoring period. Baseflow variability was also observed during the 2024 dry season, which had the lowest baseflow magnitudes of the three monitoring years. The highest baseflows were observed during the 2023 dry season. Overall, observed baseflow variability likely reflects changes in surface-water and groundwater exchange at the gage site, as well as the influence of late dry-season precipitation events.



Notes: 2023: Monitoring period began 5/15/2023. 2024: Monitoring period began 5/15/2024. 2025: Monitoring period began 4/30/2025.

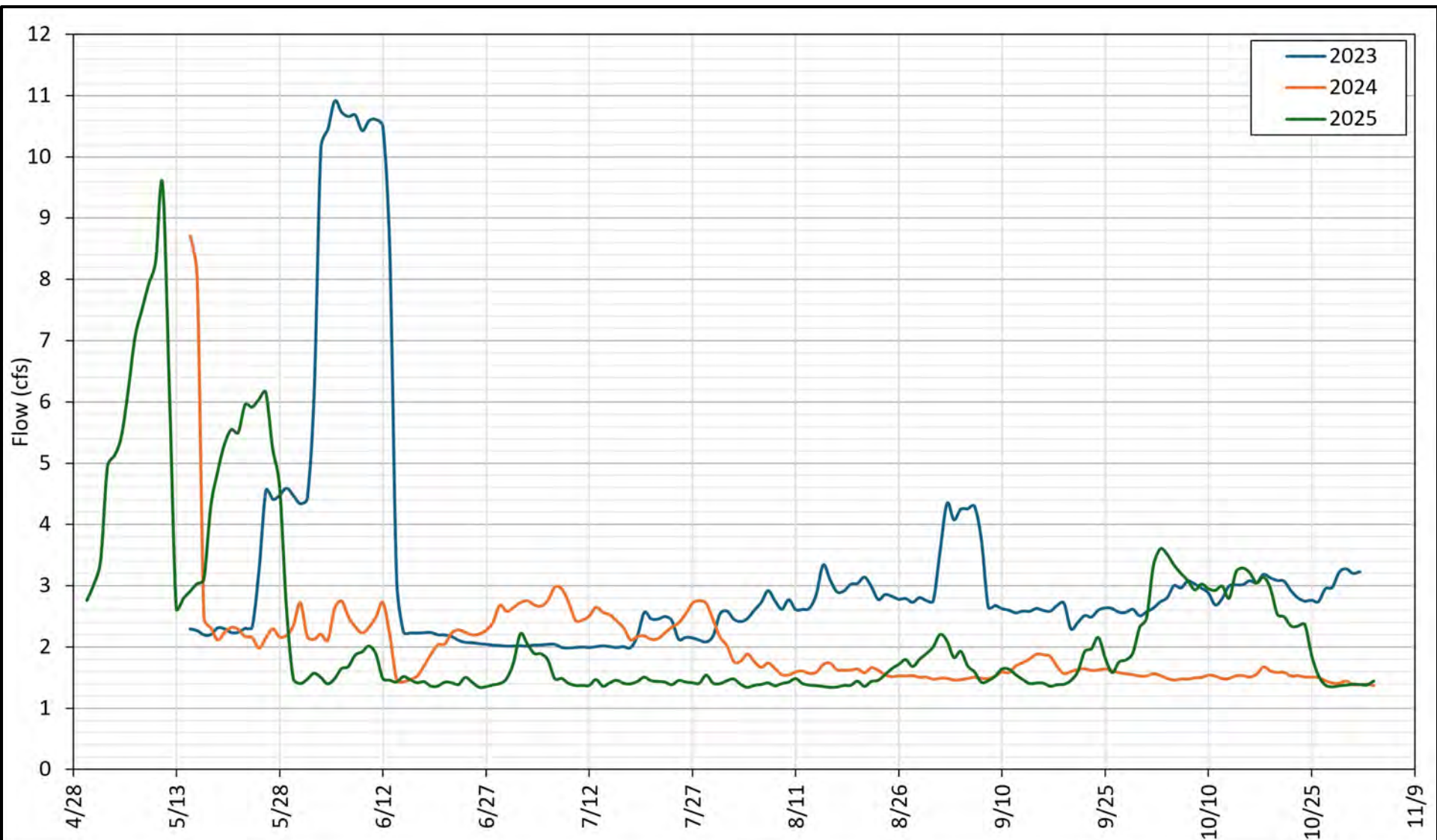


SMGWA Dry Season Stream Flow Monitoring, Dry Seasons 2023 – 2025 Flow Comparison
Daily Averaged Flow Comparison at San Lorenzo River Upstream of Love Creek

Project No. 23-1013

Created By: KMK

Figure A-1



Notes: 2023: Monitoring period began 5/15/2023. Stage measurements from 5/25/2023 – 6/16/2023 were outside max observed stage. Flow was estimated from a extrapolated rating curve. 2024: Monitoring period began 5/15/2024. Stage measurements from 5/15/2024 – 5/16/2024 were outside of max observed stage. Flow was estimated from a extrapolated rating curve. 2025: Monitoring period began 4/30/2025. Stage measurements from 5/2/2025 – 5/29/2025 were outside of max observed stage. Flow was estimated from a extrapolated rating curve.

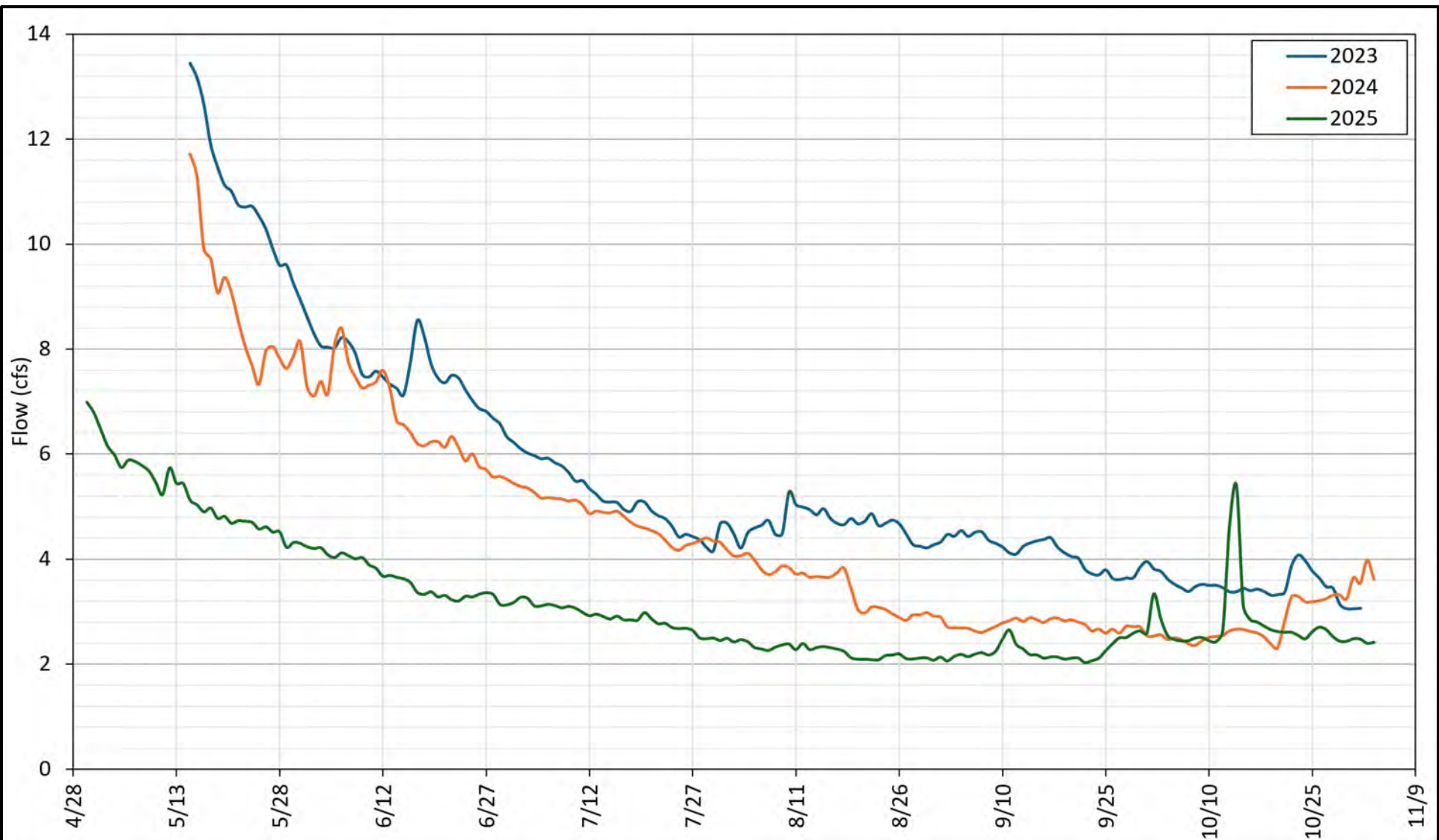


SMGWA Dry Season Stream Flow Monitoring, Dry Seasons 2023 – 2025 Flow Comparison
Daily Averaged Flow Comparison at Newell Creek Upstream of the San Lorenzo River

Project No. 23-1013

Created By: KMK

Figure A-2



Notes: 2023: Monitoring period began 5/15/2023. 2024: Monitoring period began 5/15/2024. 2025: Monitoring period began 4/30/2025.

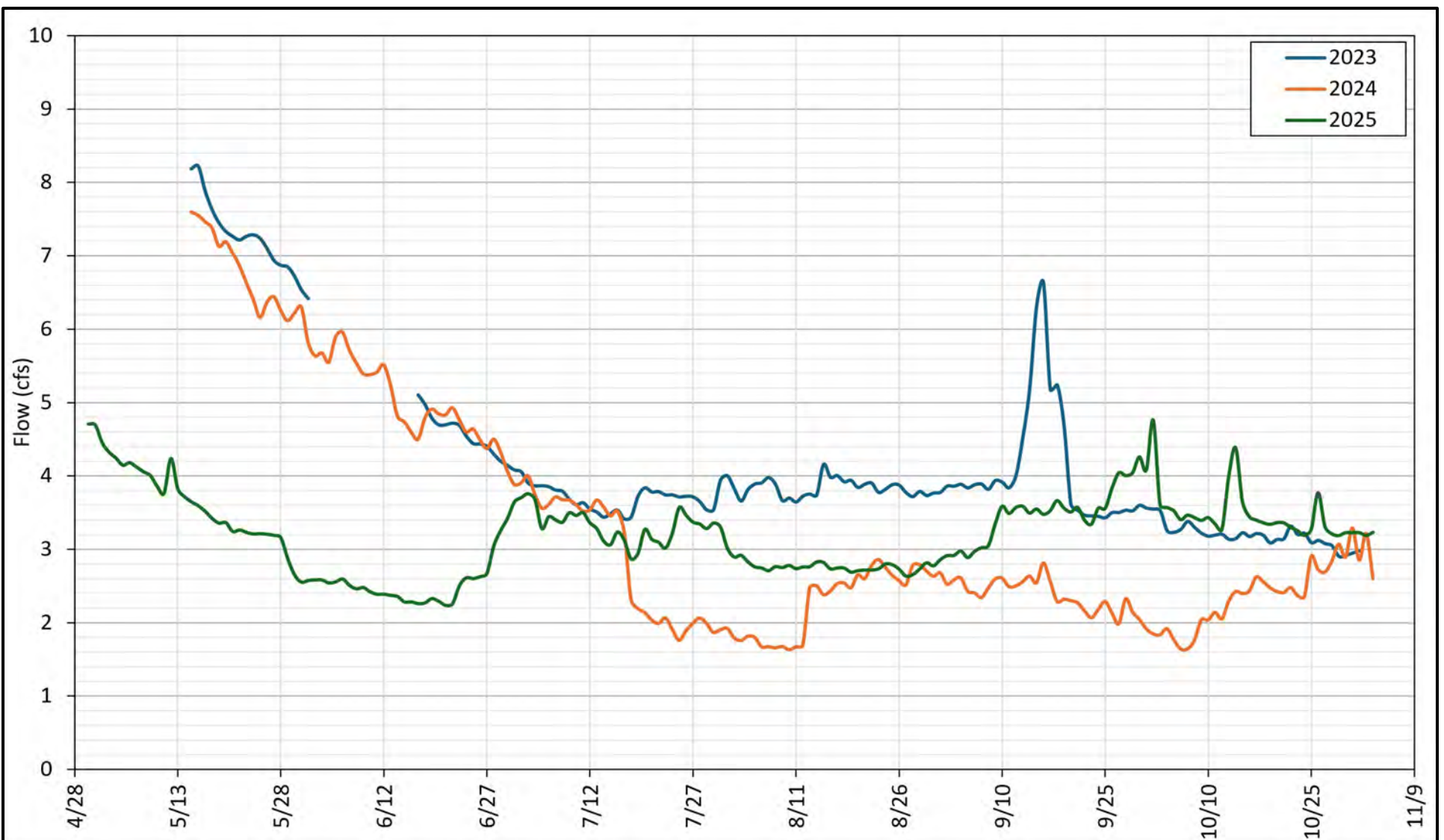


SMGWA Dry Season Stream Flow Monitoring, Dry Seasons 2023 – 2025 Flow Comparison
Daily Averaged Flow Comparison at Zayante Creek at Woodwardia Weir

Project No. 23-1013

Created By: KMK

Figure A-3



Notes: 2023: Monitoring period began 5/15/2023. A gage failure occurred during the 2023 dry season resulting in a data gap from 6/2/2023 – 6/16/2023. 2024: Monitoring period began 5/15/2024. 2025: Monitoring period began 4/30/2025.



SMGWA Dry Season Stream Flow Monitoring, Dry Seasons 2023 – 2025 Flow Comparison
Daily Averaged Flow Comparison at Bean Creek at Mt. Hermon Camp

Project No. 23-1013

Created By: KMK

Figure A-4