



Annual Data Deliverable Memorandum Water Year 2021

Groundwater Level Monitoring Ventura County, California

prepared for
Upper Ventura River Groundwater Sustainability Agency

prepared by
Rincon Consultants, Inc.

January 20, 2022



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January 20, 2022
Project No: 20-10008

Bryan Bondy, PG, CHG
Executive Director
Upper Ventura River Groundwater Agency
202 West El Roblar Drive
Ojai, California 93023
Via email: bbondy@uvrgroundwater.org

**Subject: Annual Data Deliverable Memorandum for Water Year 2021
Upper Ventura River Groundwater Agency, Ventura County, California**

Dear Mr. Bondy:

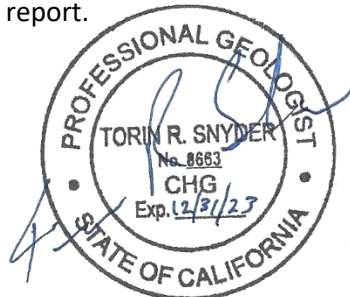
Rincon Consultants, Inc. (Rincon) has prepared the attached Annual Data Deliverable Memorandum for the 2021 Water Year (October 1, 2020, through September 30, 2021) for groundwater elevation monitoring activities performed at nine monitoring wells located within the Upper Ventura River Groundwater Basin in Ventura County California. The memorandum was prepared for Upper Ventura River Groundwater Agency (UVRGA) under the supervision of a licensed California Professional Geologist and in accordance with UVRGA's *Monitoring and Data Collection Protocols and Data Quality Control Review Procedures*.

We are pleased to support UVRGA on this important project and look forward to discussing any questions you may have regarding the data presented in this report.

Sincerely,
Rincon Consultants, Inc.

A handwritten signature in black ink, appearing to read "K. Brtalik", written over a light blue circular background.

Kiernan Brtalik, CPSWQ, QSD/P
Project Manager



Torin Snyder, PG, CHG
Principal Hydrogeologist

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1 Introduction

The Annual Data Deliverable Memorandum for the 2021 Water Year presents data collected between October 1, 2020, and September 30, 2021, from a network of nine groundwater monitoring wells located within the Upper Ventura River Valley Groundwater Basin (Basin) in Ventura County California (Figure 1). This memorandum was prepared for Upper Ventura River Groundwater Agency (UVRGA) under the supervision of a licensed California Professional Geologist. Rincon Consultants, Inc. (Rincon) conducted monitoring activities and data collection, as well as preparation of this memorandum in accordance with the UVRGA's *Monitoring and Data Collection Protocols and Data Quality Control Review Procedures*.

The groundwater monitoring program provides groundwater level and elevation data necessary for the preparation and implementation of UVRGA's Groundwater Sustainability Plan (GSP). In early 2017, UVRGA established a monitoring network comprised of six groundwater monitoring wells located throughout the Basin. This monitoring network was expanded in November 2019 by installing two additional pressure transducers in groundwater monitoring wells located at Foster Park (MW 1 and MW 4). Additionally, in 2019, Meiners Oaks Water District (MOWD) and Ventura River Water District (VRWD) agreed to provide groundwater level data from pressure transducers maintained by the districts in their production wells MOWD # 2 (State Well 05N23W33B04S) and VRWD No. 5 (State Well 04N23W15B01S), respectively. As of August 16, 2021, VRWD has made VRWD No. 5 accessible to UVRGA to collect depth-to-water measurements and download pressure transducer data from the District-owned transducer.

The following section presents a groundwater monitoring well location map (Figure 1) and well information table (Table 1), as well as figures presenting groundwater level as depth-to-water (Figure 2a and 2b) and groundwater elevation as feet above mean sea level (ft. amsl) (Figure 3a and 3b). Appendices include field data sheets, raw pressure transducer data, and the processed pressure transducer data.

Figure 1 Groundwater Monitoring Well Locations

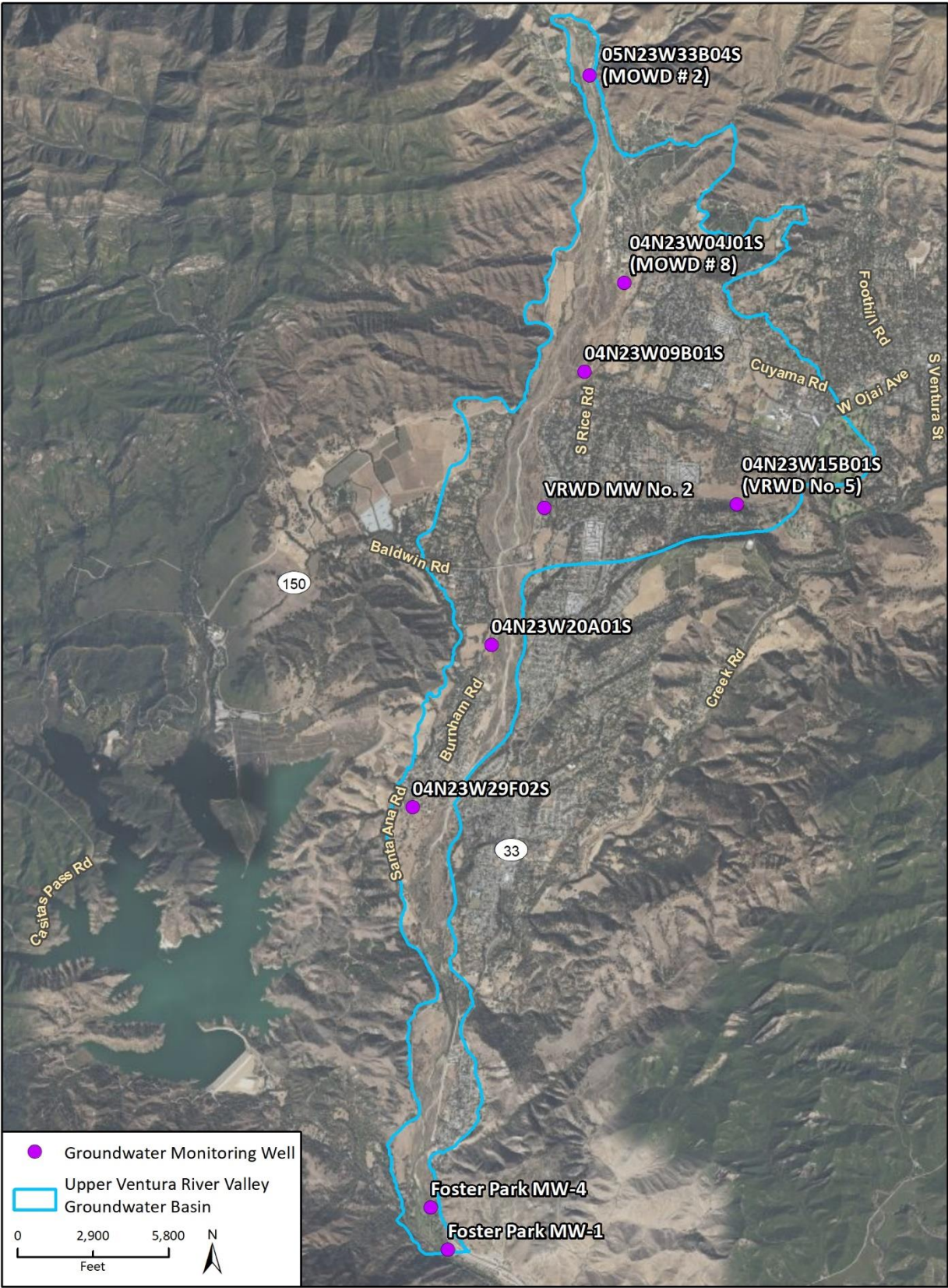


Table 1 Groundwater Monitoring Well Information

State Well Number	Other Name	Owner	Use	Data Source	Reference Point Elevation (ft. amsl)	Coordinates (NAD 83)
05N23W33B04S	MOWD # 2	MOWD	Municipal	MOWD Manual Measurements	816.54	34.4771809, -119.291636
04N23W04J01S	MOWD # 8	MOWD	Municipal	UVRGA Pressure Transducer	713.04	34.4552614, -119.2868565
04N23W09B01S	N/A	Private	Agricultural	Well Owner Pressure Transducer beginning April 2021	662.30	34.445844, -119.291794
N/A	VRWD MW No. 2	VRWD	Monitoring	UVRGA Pressure Transducer	565.11	34.431363, -119.296737
04N23W15B01S	VRWD No. 5	VRWD	Municipal (Inactive)	VRWD Pressure Transducer	686.27	34.4320185, -119.2721482
04N23W20A01S*	N/A	Private	Agricultural	UVRGA Pressure Transducer	488.89	34.4168, -119.303224
04N23W29F02S	N/A	Private	Domestic/ Agricultural	UVRGA Pressure Transducer	396.58	34.399551, -119.312975
N/A	Foster Park MW-1	City of Ventura	Municipal	UVRGA Pressure Transducer	226.01	34.3527778, -119.3077778
N/A	Foster Park MW-4	City of Ventura	Municipal	UVRGA Pressure Transducer	240.84	34.3572222, -119.310

MOWD – Meiners Oaks Water District

UVRGA – Upper Ventura River Groundwater Agency

VRWD – Ventura River Water District

N/A – Not Available

ft. amsl – Feet Above Mean Sea Level

NAD 88 – North American Datum of 1983

* – Transducer removed, and monitoring suspended during the 2021 water year monitoring period (see Section 2.1 Quality Assurance and Control Observations)

2 Monitoring Data Summary

As part of the 2021 water year monitoring period, field monitoring activities were conducted on October 30, 2020, November 5, 2020, June 11, 2021, and October 11 through 12, 2021 by Rincon. During these events, manual depth-to-water measurements were collected, and pressure transducer data were downloaded. On November 5, 2020, the pressure transducer at State Well 0423W20A01S was removed for servicing and when reinstallation was attempted on February 18, 2021, Rincon observed that the well was reconfigured by a new property owner and was not reinstalled due to well reconfiguration. UVRGA is currently developing a new access agreement for this monitoring well. In addition, during the June 11, 2021, field visit, Rincon observed that the UVRGA's pressure transducer installed in State Well 04N23W09B01S had been replaced by the well owner's transducer. The well owner has agreed to provide data from its transducer to UVRGA going forward.

Field data sheets are provided as Appendix A and raw pressure transducer data is provided as Appendix B. Processed data, including a compilation of raw pressure transducer level data are provided as Appendix C. Appendix C includes a metadata and Quality Assurance and Quality Control (QA/QC) worksheet to summarize the processed data file deliverable, raw data processing activities, and QA/QC considerations. In addition, in 2020, Rincon compiled historical data recorded at the nine groundwater monitoring wells to provide a centralized dataset for data deliverables and to streamline record keeping.

Pressure transducer data recorded by Solinst Levelloggers were exported to Microsoft Excel to process groundwater level and elevation. Groundwater level was calculated by subtracting raw pressure transducer level data from the effective logger depth for each pressure transducer.¹ Groundwater elevation was calculated by subtracting the groundwater level from the reference point elevation at the top of well casing, which was provided by UVRGA. Groundwater level data provides insight into how groundwater changes in relation to the land surface, whereas elevation data can provide insight into the direction of groundwater flow and gradient. Groundwater levels are presented in Figure 2a and Figure 2b, and groundwater elevations are presented in Figure 3a and 3b. For presentation purposes, these figures present monitoring wells located north and south of Baldwin Road.

¹ This effective logger depth is developed using raw pressure transducer level data (including both water pressure and atmospheric pressure) and manual depth to water measurements.

2.1 Quality Assurance and Control Observations

The following provides a summary of specific QA/QC observations for the 2021 Water Year that were identified during the preparation of this data deliverable.

Barometric Compensation

As summarized in the 2020 Annual Data Deliverable (Rincon Consultants, 2021), Rincon understands that the effect of barometric fluctuations on groundwater levels may not be of significance in evaluation of long-term trends in these groundwater monitoring wells. For example, the barometric pressure recorded at State Well 04N23W29F02S and Foster Park MW-4 between September 2018 and October 2021 ranges from 14.3 pounds per square inch (psi) to 14.8 psi, with an average of approximately 14.6 psi. Considering these minor fluctuations around approximately one standard atmosphere, coupled water level fluctuations on the order of five or more feet, data were not compensated for barometric pressure. This was noted in the 2018 report (Kear Groundwater, 2018) and the processed data file included in the 2020 report (Kear Groundwater, 2020) does not present data compensation. For purposes of consistency, Rincon followed previous data processing procedures and did not compensate for barometric fluctuations.

Data Availability for State Well 05N23W33B04S (MOWD #2)

Continuous pressure transducer data from January 1, 2020, through September 30, 2021, for State Well 05N23W33B04S (MOWD #2) were provided by MOWD. Monthly manual depth-to-water measurement data were provided by MOWD and have been used in-lieu of missing continuous pressure transducer data. As such, the data presented in the figures below reflect a combination of provided manual measurements and continuous pressure transducer data. Monthly manual measurement dates were not specified by MOWD; therefore, these data are presented by using the first day of each month.

Transducer removed at State Well 04N23W09B01S

During the June 2021 monitoring event, a representative depth-to-water was not retrieved from the 04N23W09B01S groundwater monitoring well due to active pumping. In addition, the pressure transducer was observed to be missing from the casing and was understood to have been removed by the well owner. Rincon observed the transducer had been replaced with a Keller pressure transducer that is connected to a data cable and external antenna-equipped control box. Rincon did not disturb the newly installed equipment. The well owner has since granted access to UVRGA to retrieve groundwater level data via a web portal, with data beginning April 23, 2021. The UVRGA pressure transducer was retrieved from the well owner on January 10, 2021. Therefore, previously missing data from between October 30, 2020, and April 23, 2021, was downloaded and included as part of this memo.

Transducer removed at State Well 04N23W20A01S

During the October 2020 monitoring event, the pressure transducer was removed for servicing due to connectivity issues. The manufacturer (Solinst Canada Ltd.) extracted the previously recorded data from the pressure transducer and provided it to Rincon as well as a new replacement pressure transducer. During the site visit on February 18, 2021, to deploy the new replacement pressure transducer, Rincon observed that the groundwater well was reconfigured for pumping and water

storage and the property had been sold to a new owner. Pressure transducer reinstallation is pending negotiations with the new owner. Thus, data beyond November 5, 2020, is unavailable.

Well Access and Reference Point Elevation Update at State Well 04N23W15B01S (VRWD No. 5)

Previously, the VRWD would provide depth-to-water data and pressure transducer data from Well 04N23W15B01S. As of August 16, 2021, VRWD has made MW No. 5 accessible to UVRGA to collect depth-to-water measurements and download pressure transducer data. In addition, VRWD indicated that the reference point elevation has been updated from 686.73 to 686.27 ft. amsl. The figures and processed data included in this memo present groundwater elevation data using these updated values and has been applied to the groundwater elevation calculations for historical data in Appendix C.

Reference Point Elevation Update at VRWD MW No. 2, State Well 04N23W04J01S (MOWD #8), and State Well 04N23W29F02S

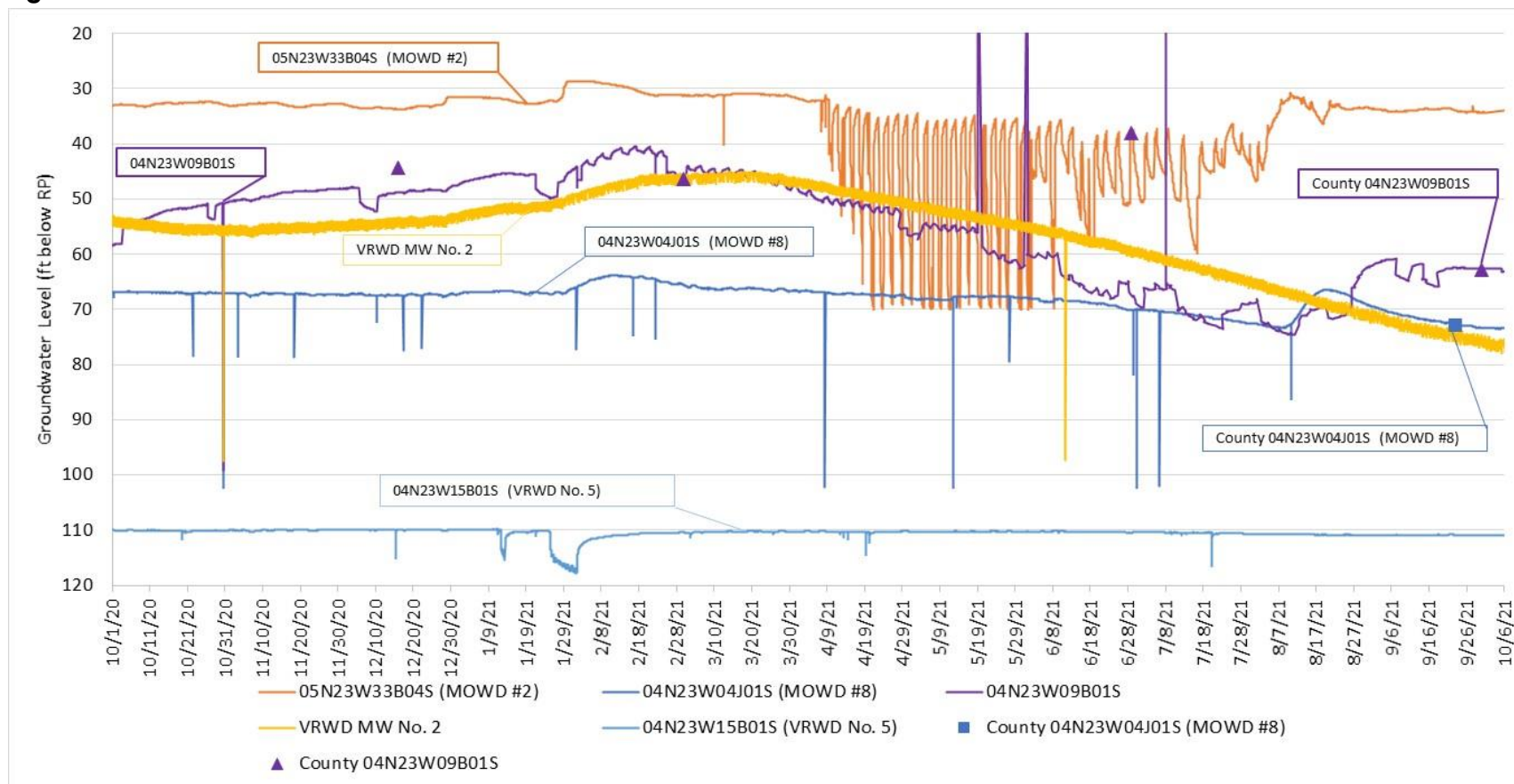
As presented in the 2020 water year annual memorandum, VRWD provided updated reference point elevation for VRWD MW No. 2 as of October 15, 2020. Therefore, the figures and processed data in this data deliverable present groundwater elevation data using this value. In addition, this reference point elevation has been applied to groundwater elevation calculations for historical data records in Appendix C.

Additionally, based on reference point elevation data provided by Ventura County in 2020, State Well 04N23W04J01S (MOWD #8) was updated from 713.00 to 713.04 ft and State Well 04N23W29F02S was updated from 396.00 to 396.58 ft. The figures and processed data in this deliverable present the groundwater elevation using these updated values and these values have been applied to the groundwater elevation calculations for historical data in Appendix C.

County of Ventura Manual Measurements

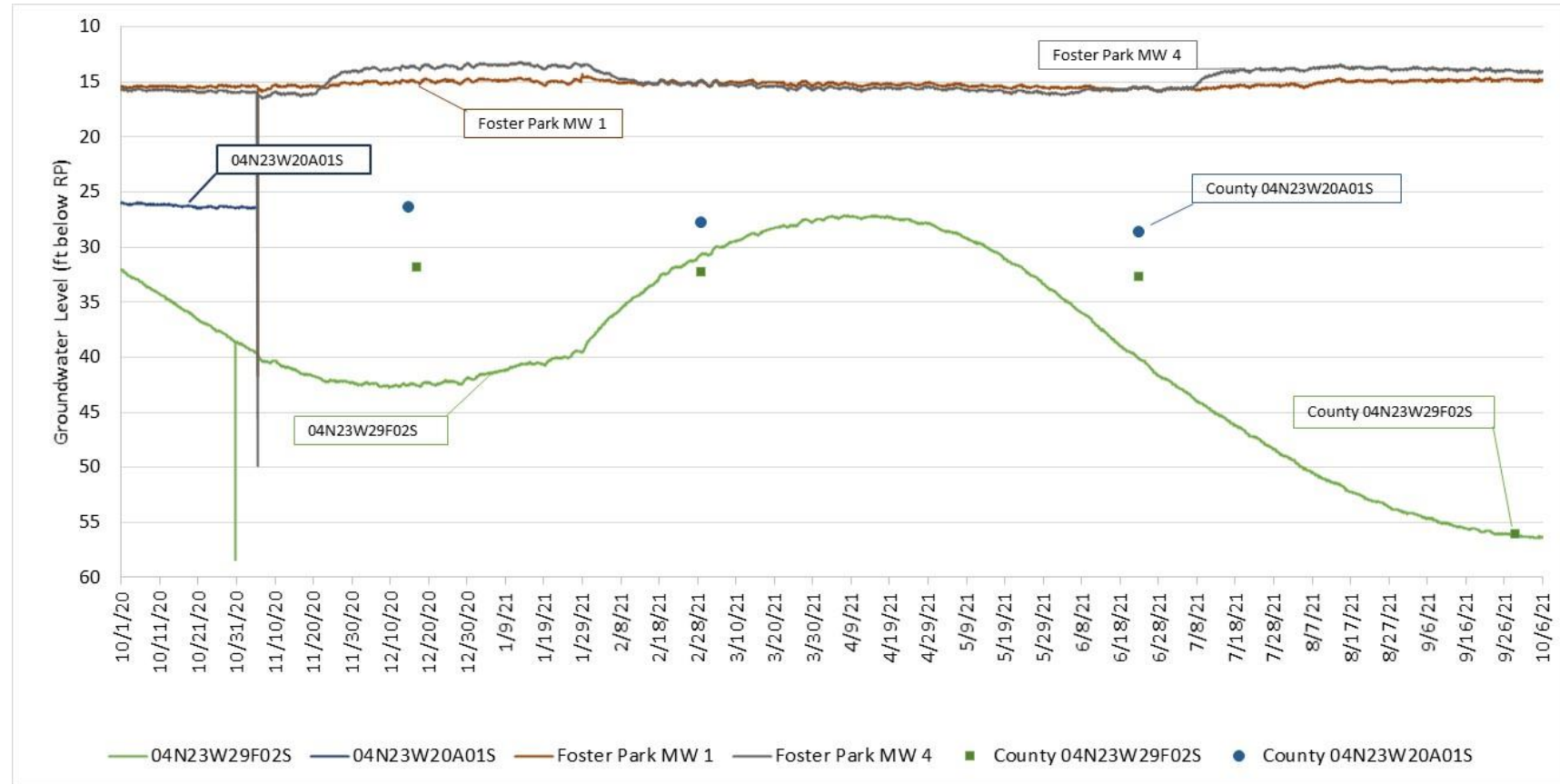
Manual depth to water measurement data collected by the County of Ventura (County) is included in a separate tab in the Processed Pressure Transducer Data file (Appendix C). These data are presented in the figures below to allow comparison between the County's manual measurements and continuous pressure transducer measurements. This comparison provides additional layer of QA/QC insight to reveal both similarities and discrepancies in the dataset.

Figure 2a Groundwater Level Below Reference Points – Wells North of Baldwin Road

**Notes:**

To present depth to water relative to the monitoring well's reference point (RP) at ground surface, the y-axis is presented in reverse order. County of Ventura manual depth to water measurements are presented on this chart for quality assurance purposes.

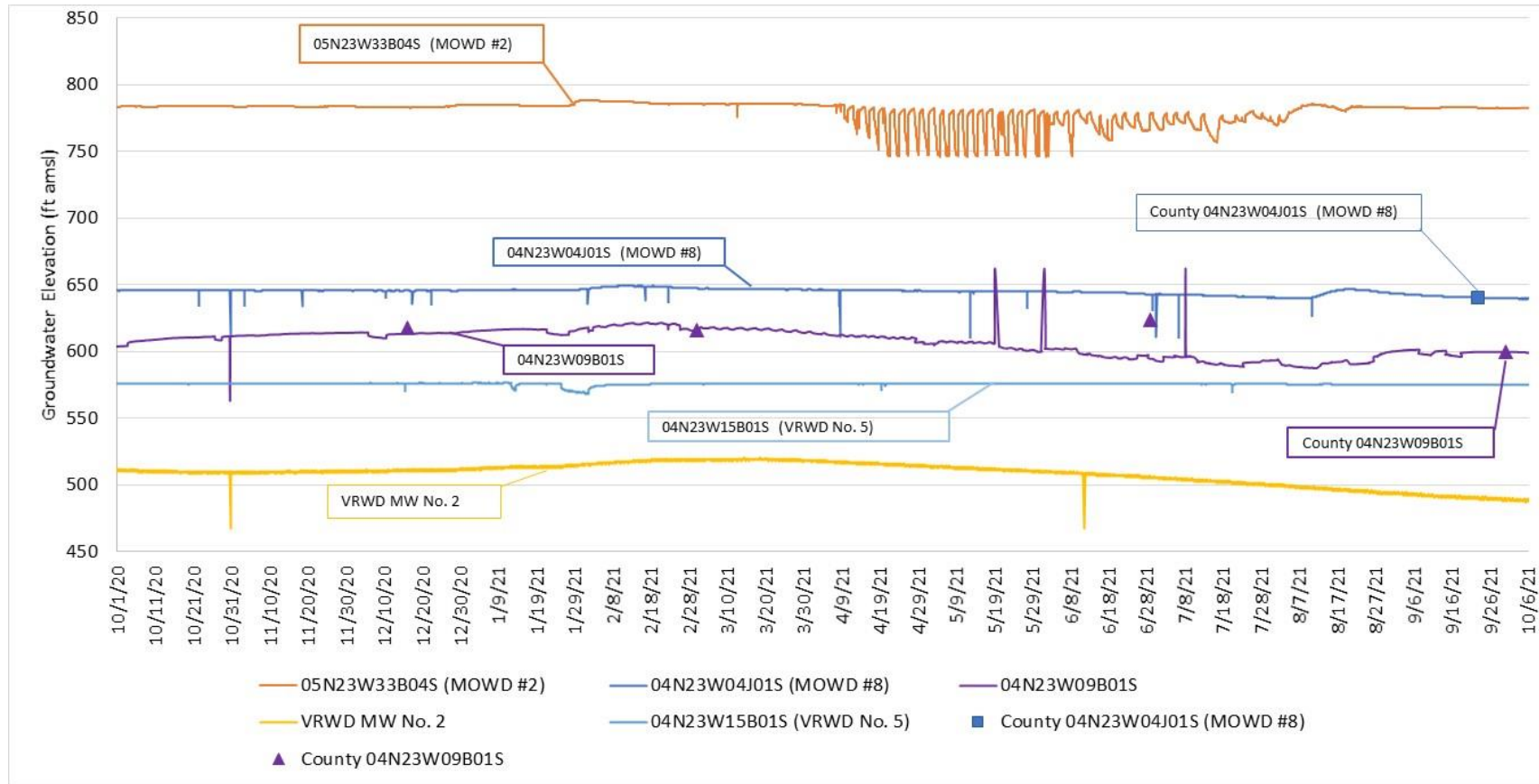
Figure 2b Groundwater Level Below Reference Points – Wells South of Baldwin Road



Notes:

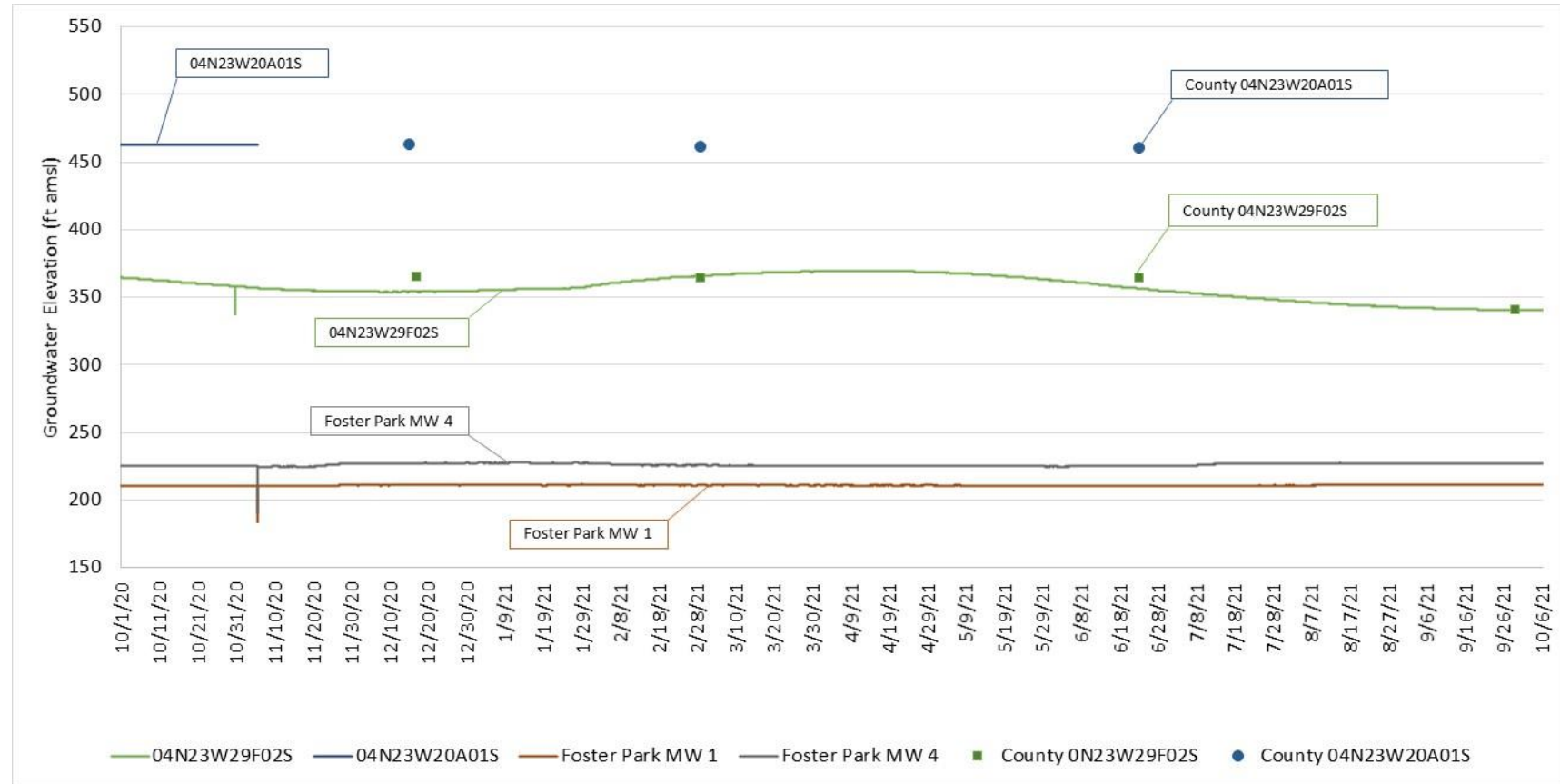
To present depth-to-water relative to the monitoring well's reference point (RP) at ground surface, the y-axis is presented in reverse order.
State Well 04N23W20A01S is no longer equipped for water level monitoring due to an ownership change.
County of Ventura manual depth to water measurements are presented on this chart for quality assurance purposes.

Figure 3a Groundwater Elevation – Wells North of Baldwin Road

**Notes:**

County of Ventura manual elevation measurements are presented on this chart for quality assurance purposes.

Figure 3b Groundwater Elevation – Wells South of Baldwin Road



Notes:

State Well 04N23W20A01S is no longer equipped for water level monitoring due to an ownership change.
County of Ventura manual elevation measurements are presented on this chart for quality assurance purposes.

3 References

Kear Groundwater, 2018, *Report of Groundwater Level and Temperature data, spring 2017 to summer 2018 Upper Ventura River Groundwater Basin Ventura County, California*. September 30, 2018.

Kear Groundwater, 2020, *Report of Groundwater Level and Temperature Data, Spring 2017 to September 2019, Upper Ventura River Groundwater Basin, Ventura County, California*. January 31, 2020.

Rincon Consultants, 2021. *Annual Data Deliverable Memorandum Water Year 2021*. January 31, 2021.

UVRGA Monitoring and Data Collection Protocols, Updated and Adopted November 13, 2018.

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Appendix A: Field Data Sheets

Appendix A – Groundwater Level Field Form



GROUNDWATER LEVEL MEASUREMENT FIELD DATA SHEET

A	B	C	D	E	F	G	H
Well ID	DATE	TIME	RPE (ft amsl)	RPH (ft agl)	DTW (ft)	GWE (ft amsl)	Notes
<i>Researched</i>	<i>Record</i>	<i>Record</i>	<i>Researched</i>	<i>Measured</i>	<i>Measured</i>	<i>D-F</i>	
04N23W09B01S	10/30/2020	11:50	662.3	-	50.67	611.63	
MOWD #8	10/30/2020	13:53	713	6.0	67.34	645.66	
VRWD MW No. 2	10/30/2020	14:58	565.11	0.51	58.65	506.46	
04N23W20A01S	10/30/2020	15:25	488.89	-	26.74	462.15	Solinst equipment failure
04N23W29F02S	10/30/2020	16:04	396	2.18	38.52	357.48	
Foster Park MW-1	11/5/2020	10:48	226.01	0.9	16.57	209.44	Well locked, received access on 11/5/2020
Foster Park MW-4	11/5/2020	11:08	240.84	2.2	14.3	226.54	Well locked, received access on 11/5/2020

Appendix A – Groundwater Level Field Form



GROUNDWATER LEVEL MEASUREMENT FIELD DATA SHEET

A	B	C	D	E	F	G	H
Well ID	DATE	TIME	RPE (ft amsl)	RPH (ft agl)	DTW (ft)	GWE (ft amsl)	Notes
<i>Researched</i>	<i>Record</i>	<i>Record</i>	<i>Researched</i>	<i>Measured</i>	<i>Measured</i>	<i>D-F</i>	
MOWD #8	6/11/2021	09:11	713	6.0	68.55	644.45	Transducer pulled at 0905. Programmed to begin at 5PM. Transducer sits at 102.3 feet below top of well casing.
04N23W09B01S	6/11/2021	09:50	662.3	-	-	-	Actively pumping, could not receive an accurate depth to water. Solinst Transducer removed by unknown entity and new SCADA Keller installed. Will talk to MOWD to receive well data.
VRWD MW No. 2	6/11/2021	10:45	565.11	0.51	58.16	506.95	Distance to top of well pad 58.67 feet. Transducer pulled at 1040. Transducer sits at 99.55 feet below top of well casing.
04N23W20A01S	6/11/2021	-	-	-	-	-	Well removed by new owner.
04N23W29F02S	6/11/2021	11:30	396	2.18	36.88	359.12	Transducer pulled at 1129. Transducer sits at 63.3 feet below the top of well casing. Barologger data downloaded.
Foster Park MW-4	6/11/2021	12:07	240.84	2.2	16.15	224.69	Transducer pulled at 1205. Transducer sits at 50.5 feet below the top of well casing. Barologger data downloaded.
Foster Park MW-1	6/11/2021	12:25	226.01	0.9	14.21	211.8	Transducer pulled at 1220. Transducer sits at 50.5 feet above the top of well casing.

Appendix A – Groundwater Level Field Form



GROUNDWATER LEVEL MEASUREMENT FIELD DATA SHEET

A	B	C	D	E	F	G	H
Well ID	DATE	TIME	RPE (ft amsl)	RPH (ft agl)	DTW (ft)	GWE (ft amsl)	Notes
<i>Researched</i>	<i>Record</i>	<i>Record</i>	<i>Researched</i>	<i>Measured</i>	<i>Measured</i>	<i>D-F</i>	
MOWD #8	10/11/2021	10:10	713.04	5.65	68.71	644.33	Transducer pulled at 1230. Troubleshoot bad connection. Reinstalled transducer on 10/12/2021 at 10:00.
04N23W09B01S	10/11/2021	13:00	662.3	-	-	-	Actively pumping, could not receive an accurate depth to water. Solinst Transducer removed and new SCADA Keller installed.
VRWD MW No. 2	10/12/2021	11:11	565.11	0.51	80.62	484.49	
04N23W20A01S	10/11/2021	-	-	-	-	-	Well removed by new owner.
04N23W29F02S	10/12/2021	11:50	396.58	2.18	56.15	340.43	Barologger data downloaded.
Foster Park MW-4	10/11/2021	11:35	240.84	2.2	15.23	225.61	Barologger data downloaded.
Foster Park MW-1	10/11/2021	16:00	226.01	0.9	14.77	211.23	
VRWD #5	10/11/21	14:48	686.27	0.25	112.14	574.13	Access provided by VRWD.

Appendix B: Raw Pressure Transducer Data

(Provided Electronically)

Appendix C: Processed Pressure Transducer Data

(Provided Electronically)