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June 23, 2024
Project No: 20-10008

Bryan Bondy, PG, CHG
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Via email: bbondy@uvrgroundwater.org

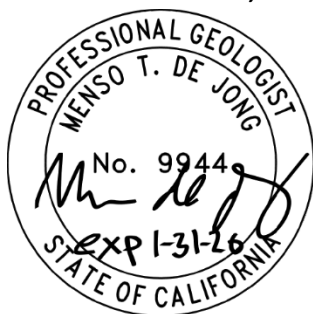
**Subject: Semi-Annual Data Deliverable Memorandum for the First Half of the 2023-2024 Water Year
Upper Ventura River Groundwater Agency, Ventura County, California**

Dear Mr. Bondy:

Rincon Consultants, Inc. (Rincon) has prepared the attached Semi-Annual Data Deliverable Memorandum for the first half of the 2023-2024 Water Year for groundwater elevation monitoring activities performed at thirteen monitoring wells located within the Upper Ventura River Groundwater Basin in Ventura County California. This memorandum includes data from October 1, 2023, through May 15, 2024. 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.



Menso de Jong, PhD, PG
Senior Watershed Scientist

A handwritten signature in black ink, appearing to read "Kiernan Brtalik".

Kiernan Brtalik, CPSWQ, QSD/P
Director, Watershed Sciences



Semi-Annual Data Deliverable Memorandum First Half of 2023-2024 Water Year

Groundwater Level Monitoring Ventura County, California

prepared for
Upper Ventura River Groundwater Sustainability Agency

prepared by
Rincon Consultants, Inc.

June 23, 2024

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1 Introduction

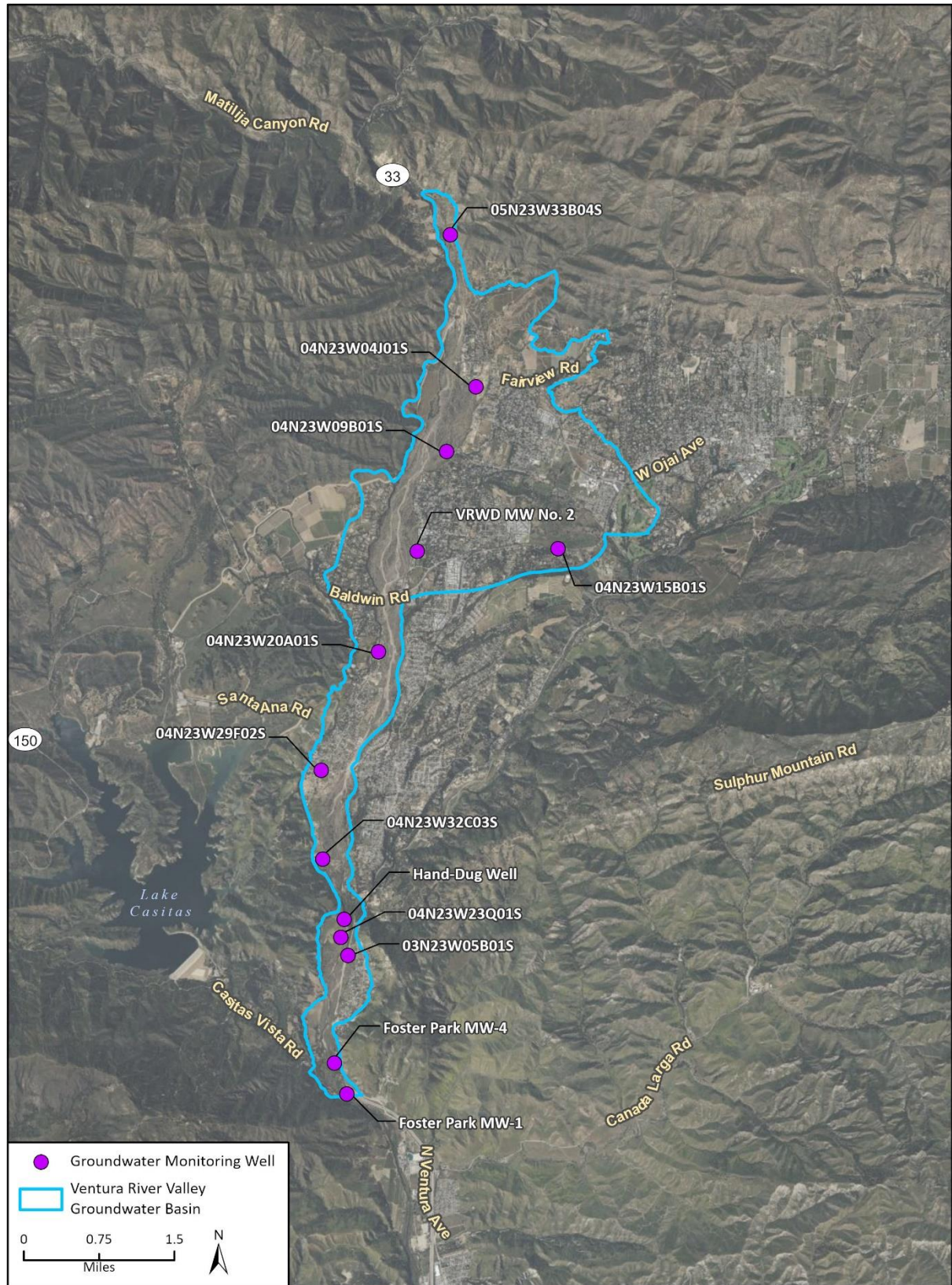
This Semi-Annual Data Deliverable Memorandum for the first half of the 2023-2024 Water Year presents data collected between October 1, 2023, and May 15, 2024 from a network of groundwater monitoring wells located within the Upper Ventura River Valley Groundwater Basin (Basin) in Ventura County California (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 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 and Rincon staff to collect depth-to-water measurements and to download pressure transducer data from the district-owned pressure transducer.

During the first half of the 2023-2024 Water Year on November 21, 2023, monitoring resumed in State Well 03N23W05B01S. Two additional pressure transducers were installed on December 20, 2023 in two wells, State Well 04N23W32Q01S and a hand dug well that predates the assignment of state well numbers). On May 15, 2024, a pressure transducer was installed in State Well 04N23W32C03 and monitoring resumed at State Well 04N23W20A01.

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 Figure 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



Imagery provided by Microsoft Bing, Esri, and their licensors © 2024.
Additional data provided by California Natural Resources Agency, 2020

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Table 1 Groundwater Monitoring Well Information

| State Well Number | Other Name | Owner | Well Type | Data Source | Reference Point Elevation (ft. amsl) | Coordinates (NAD 83) |
|---------------------------|------------------|-----------------|---------------------------|-----------------------------------------------------|--------------------------------------|--------------------------|
| 05N23W33B04S | MOWD # 2 | MOWD | Municipal | MOWD Pressure Transducer | 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 ¹ | 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 |
| 04N23W32C03S | N/A | Private | Agricultural | UVRGA Pressure Transducer | 342.36 | 34.386672, -119.312473 |
| N/A | Hand Dug Well | Private | Domestic | UVRGA Pressure Transducer | 306.21 | 34.378005, -119.308624 |
| 04N23W32Q01S | N/A | Private | Domestic | UVRGA Pressure Transducer | 306.90 | 34.375415, -119.309151 |
| 03N23W05B01S ² | N/A | Private | Domestic/ Agricultural | UVRGA Pressure Transducer | 293.20 | 34.3728, -119.3079 |
| 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 83 – North American Datum of 1983

¹ 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. The transducer was reinstalled on May 15, 2024 after modifying the wellhead and installing a sounding tube in the well.

² Access to monitor State Well 03N23W05B01S was revoked by the property owner in 2019. Access was reestablished with the new property owner in October 2023 and monitoring resumed on November 21, 2023.

2 Monitoring Data Summary

As part of the first half of the 2023-2024 Water Year monitoring period, Rincon conducted field monitoring activities on November 20 and 21, 2023, December 21, 2023, and May 15, 2024. During these events, manual depth-to-water measurements were collected, pressure transducer data were downloaded, and/or new pressure transducers were installed in new wells and to replace old equipment as needed.

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. The processed data (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.

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. In cases where surveyed elevations were not available, this was estimated from a LiDAR dataset and adjusted using measured reference point stick up. 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.

2.1 Quality Assurance and Control Observations

The following provides a summary of specific QA/QC observations for the first half of the 2023-2024 Water Year that were identified during the preparation of this data deliverable. A list of QA/QC comments is provided in the “MetaData and QAQC” tab of Appendix C.

Barometric Compensation

As summarized in previous reports and most recently in the 2023 Annual Data Deliverable (Rincon Consultants, 2023), 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. Barometric pressure is measured continuously using Solinst Barologgers at two locations in the basin and these data are available for data compensation if determined necessary by UVRGA.

The barometric pressure recorded at the sites between October 1, 2023 and May 15, 2024 had a range of 0.42 pounds per square inch (psi) (14.32 – 14.74 psi), a range equivalent to approximately 0.97 feet of water. Groundwater level fluctuations during this period were on the order of five feet or more. Groundwater pressure transducer data were not barometrically compensated, which was noted in the 2018 report (Kear Groundwater, 2018) and the processed data file included in the 2020

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.

report (Kear Groundwater, 2020). For purposes of consistency, Rincon followed previous data processing procedures and is not compensating for barometric fluctuations.

Data Calibration at State Well 03N23W05B01S

Pressure transducer data at State Well 03N23W05B01S after the December 2023 download through the remainder of the reporting period were calibrated to the manual water level taken by Rincon on December 20, 2023, to account for a change of transducer depth upon redeployment.

Data Logger Reinstallation Issue at Foster Park MW-4

During the November 20, 2023 download, the Solinst Barologger at Foster Park MW-4 was mistakenly deployed in the well on the Solinst Levellogger line, and the Levellogger was deployed outside the well on the Barologger line. Subsequently, water level data for Foster Park MW-4 after the December 2023 download was calculated using the Barologger data, and air pressure data was calculated using the Levellogger data. As Solinst Barologgers are not rated for water level readings, and Solinst Levelloggers are not rated for air pressure readings, Foster Park MW-4 barometric and water level data for this time period may have diminished data quality. However, this is not apparent in the data comparisons between groundwater level variations when compared to Foster Park MW-1.

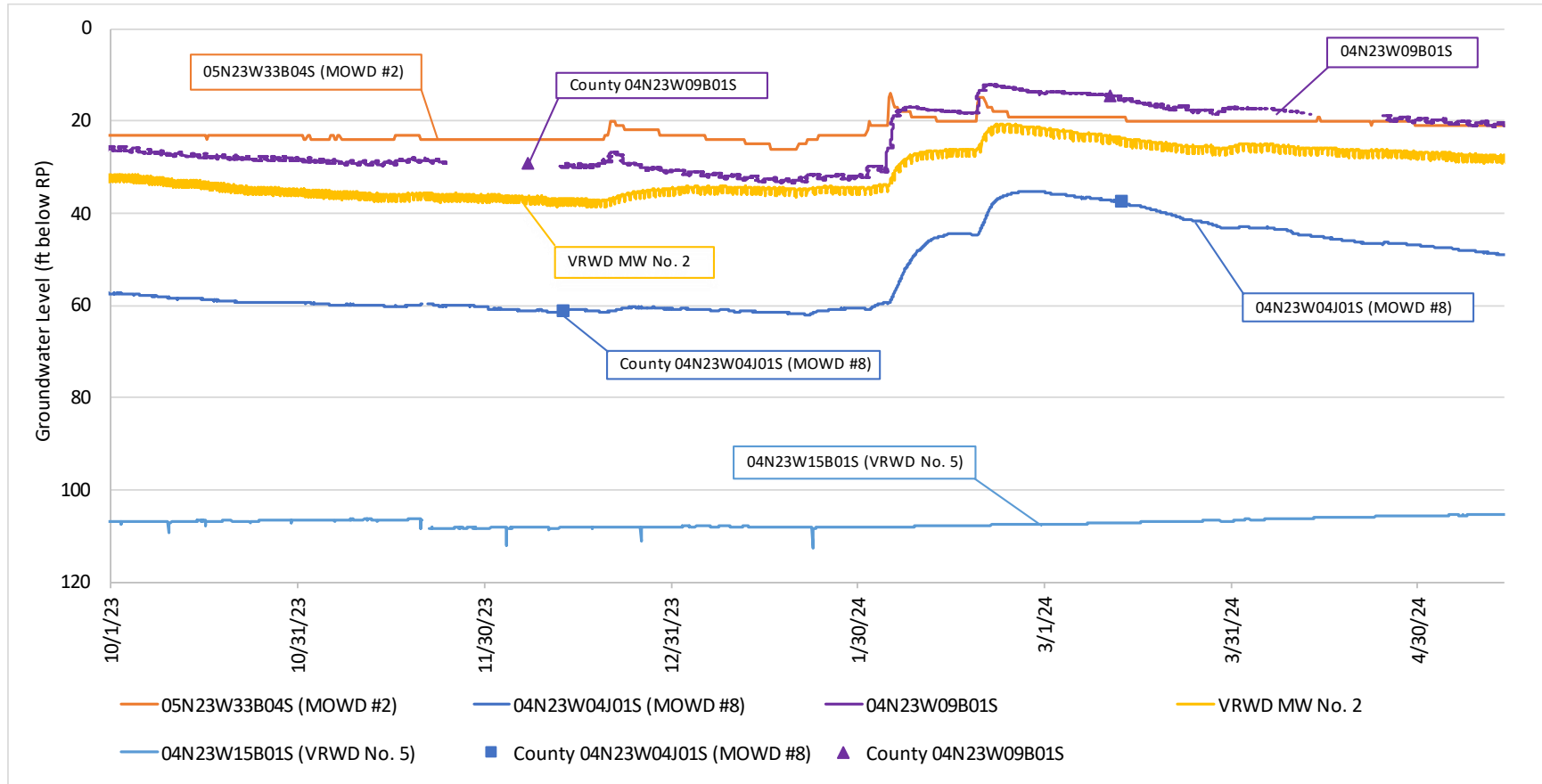
Reference Point Elevation Estimation for Hand Dug Well, State Well 04N23W32C03, and State Well 04N23W32Q01S

Reference point elevations for the Hand Dug Well, State Well 04N23W32C03, and State Well 04N23W32Q01S were estimated using LiDAR elevation data and measured stick up. Well surveys are recommended at these wells to increase data accuracy. Reference point elevations will be updated to surveyed elevations once available from UVRGA.

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 an additional layer of QA/QC insight to reveal both similarities and discrepancies in the dataset.

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

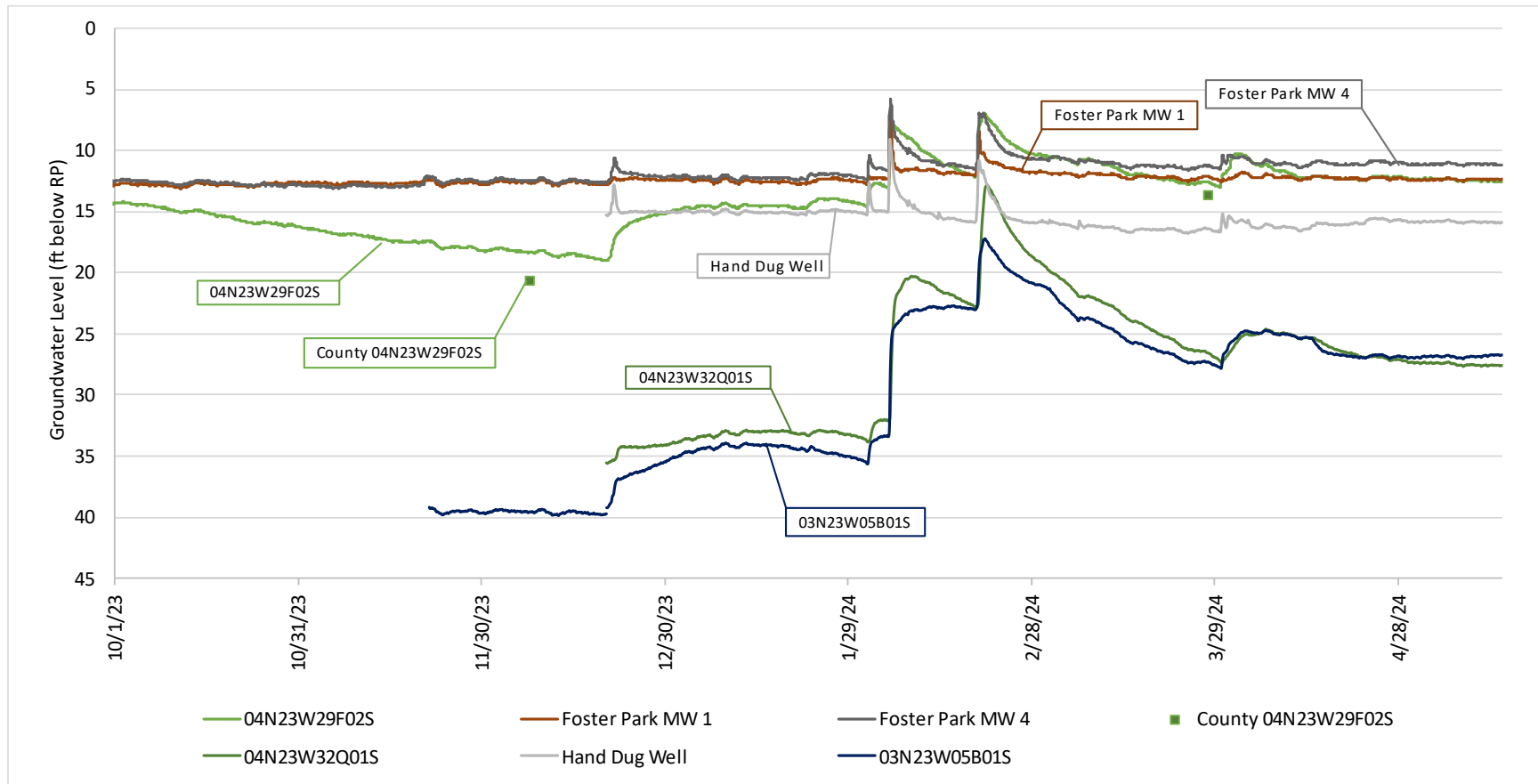


Notes:

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 Depth Below Reference Points – Wells South of Baldwin Road

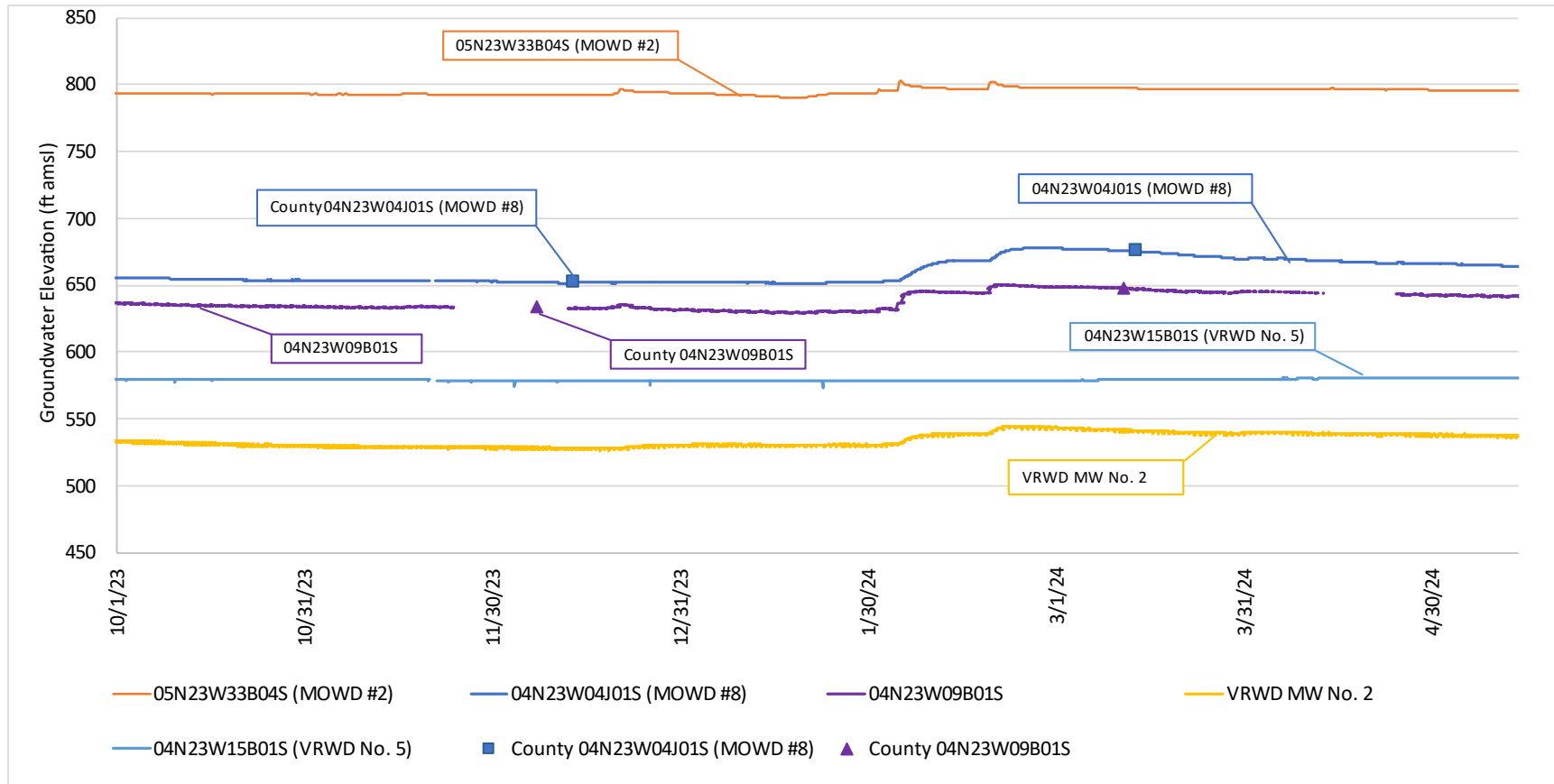


Notes:

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.

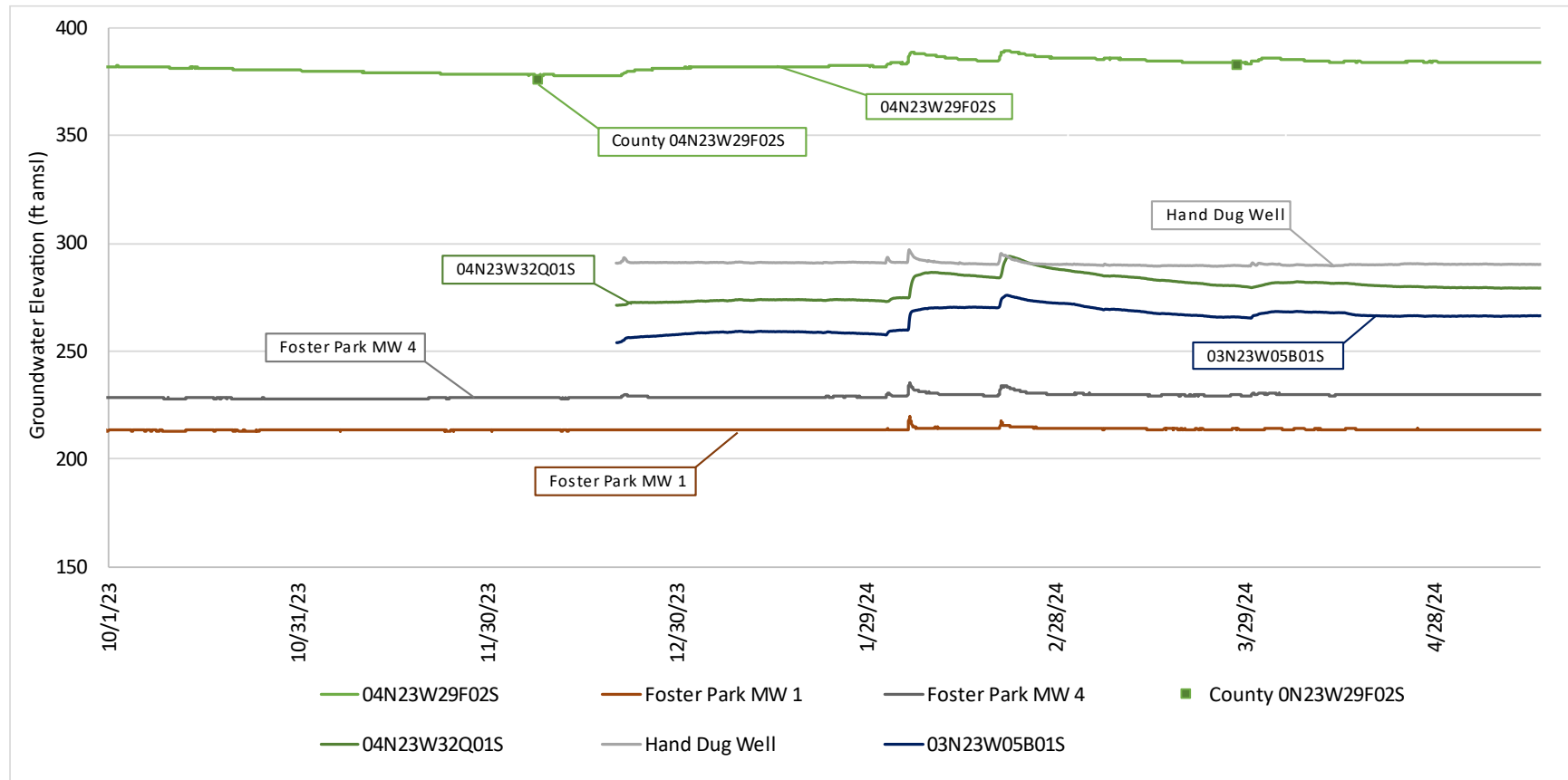
County of Ventura manual elevation measurements are presented on this chart for quality assurance purposes.

Figure 3a Groundwater Elevation – Wells North of Baldwin Road



Note:
 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:

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.
- _____. 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, Inc. 2023. *Annual Data Deliverable Memorandum Water Year 2023*. June 13, 2023.
- UVRGA Monitoring and Data Collection Protocols, Updated and Adopted November 13, 2018.

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> | |
| MOWD #8 | 5/15/2024 | 15:02 | 713.04 | 5.65 | 49.16 | 663.88 | |
| 04N23W09B01S | 5/15/2024 | - | 662.3 | - | - | - | Well data provided by owner |
| VRWD MW No. 2 | 5/15/2024 | 11:36 | 565.11 | 0.51 | 27.60 | 537.51 | |
| 04N23W29F02S | 5/15/2024 | 15:49 | 396.58 | 2.18 | 12.47 | 384.11 | Barologger data downloaded |
| Foster Park MW-4 | 5/15/2024 | 12:45 | 240.84 | 2.2 | 11.39 | 229.45 | Barologger data downloaded |
| Foster Park MW-1 | 5/15/2024 | 13:21 | 226.01 | 0.9 | 12.11 | 213.9 | |
| VRWD #5 | 5/15/2024 | 15:31 | 686.27 | 0.25 | 104.96 | 581.31 | Access provided by VRWD. Measured DTW from ST. |
| 04N23W32Q01S | 5/15/2024 | 13:42 | 306.90 | 0.45 | 27.58 | 279.320 | |
| Hand Dug Well | 5/15/2024 | 14:03 | 306.21 | 0.5 | 15.91 | 290.30 | |
| 03N23W05B01S | 5/17/2024 | 15:32 | 293.20 | - | 26.78 | 266.42 | |
| 04N23W20A01S | 5/15/2024 | 14:25 | 488.89 | 0.97 | 8.90 | 479.99 | Transducer installed on 5/15/2024 |
| 04N23W32C03S | 5/15/2024 | 11:45 | 342.36 | 2.05 | 11.27 | 341.09 | Transducer installed on 5/15/2024 |

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Appendix B

Raw Pressure Transducer Data (Provided Electronically)

Appendix C

Processed Pressure Transducer Data (Provided Electronically)