

# Merced GSP Joint Coordination & Stakeholder Advisory Committees Meeting

**August 18, 2025**

Meeting will begin at 10:00 am or a few minutes after – thank you for joining us!

**Merced Irrigation-Urban GSA  
Merced Subbasin GSA  
Turner Island Water District GSA-1**

Image courtesy: Veronica Adrover/UC Merced

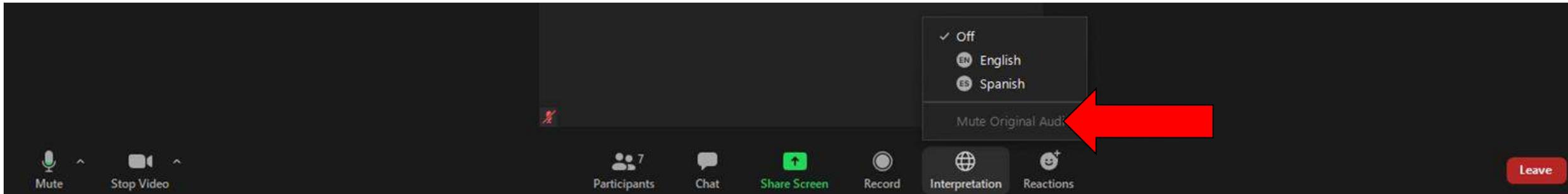


# Welcome, Instructions for Zoom

## Bienvenidos, Instrucciones para Zoom

We have two language audio channels available. English only speakers, please select English.

Si solamente habla español, debe seleccionar un canal de idioma



The meeting will have simultaneous interpreting, so you are welcome to comment in your native language.  
La junta será interpretada simultáneamente, así que le invitamos a que haga comentarios en su lenguaje nativo.

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# Agenda

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1. Call to Order and Welcome
2. Roll Call
3. Approval of Coordination Committee Meeting Minutes
4. Public Comment
5. Reports
6. GSP Plan Manager Update
7. Domestic Well Mitigation Program Development Update
8. Allocation Program Policies Coordination
9. Department of Water Resources Subsidence Best Management Practices
10. Update on Filling Monitoring Network Data Gaps
11. Next Steps and adjourn

Image courtesy: Veronica Adrover/UC Merced

# Coordination Committee Roll Call

**Bold indicates recent changes**

<b>Representative</b>	<b>GSA</b>
<b>Bryan Kelly</b>	Merced Irrigation-Urban GSA
Scott McBride	Merced Irrigation-Urban GSA
Justin Vinson	Merced Irrigation-Urban GSA
Frank Verduzco	Merced Irrigation-Urban GSA
Ken Elwin ( <i>alternate</i> )	Merced Irrigation-Urban GSA
Mike Gallo	Merced Subbasin GSA
Nic Marchini	Merced Subbasin GSA
<b>Bob Kelley</b>	Merced Subbasin GSA
Gino Pedretti ( <i>alternate</i> )	Merced Subbasin GSA
George Park ( <i>alternate</i> )	Merced Subbasin GSA
<b>Chase Hurley</b>	Turner Island Water District GSA #1
<b>Justin Darnell (<i>alternate</i>)</b>	Turner Island Water District GSA #1

## Stakeholder Advisory Committee Members

Committee Member	Interest/Affiliation	Alternate	Interest/Affiliation
Alvaro Arias	UC Merced	Phillip Woods	UC Merced
Arlan Thomas	MIDAC member	Ben Migliazzo	Live Oak Farms
Bill Eisenstein	River Partners		
		Blake Nervino	Stevinson/Merquin
Breanne Vandenberg	MCFB		
Caitie Diemel	ESJWQC		
Craig Arnold	Arnold Farms		
Daniel Melendrez	City of Merced		
Danielle Serrano	Serrano Farms - Le Grand		
David Belt	Foster Farms		
Eddie Rojas	E&J Gallo Winery		
Emma Reyes	Martin Reyes Farm/Land Leveling		
Jean Okuye	E Merced RCD		
Joe Sansoni	Sansoni Farms/MCFB		
Joe Scoto	Scoto Brothers/McSwain School Dist.		
Lisa Baker	Clayton Water District	Scott Menefee	Clayton Water District
Lisa Kayser-Grant	Sierra Club		
Maxwell Norton	Unincorporated area		
Nav Athwal	TriNut Farms		
Simon Vander Woude	Sandy Mush MWC		
Susan Walsh	City of Merced	Bill Spriggs	Resident City of Merced
Thomas Dinwoodie	Master Gardener/McSwain		
Trevor Hutton	Valley Land Alliance		
Wes Myers	Merced Grassland Coalition	Lou Myers	Benjamin Land LP
Zachary Hamman	Cal Am Water		



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# Approval of Coordination Committee Meeting Minutes

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Image courtesy: Veronica Adrover/UC Merced



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# Approval of Meeting Minutes

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- October 16, 2024
- March 5, 2025

Image courtesy: Veronica Adrover/UC Merced



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## Questions/Comments from Public:

For remote attendees, If you would like to make a comment, please type the comment in the chat or raise your hand to request to be taken off mute

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Image courtesy: Veronica Adrover/UC Merced



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# Reports

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Image courtesy: Veronica Adrover/UC Merced



# GSA Reports

- Updates from each GSA on activities within their own jurisdiction:
  - Merced Subbasin GSA
  - Merced Irrigation-Urban GSA
  - Turner Island Water District GSA #1

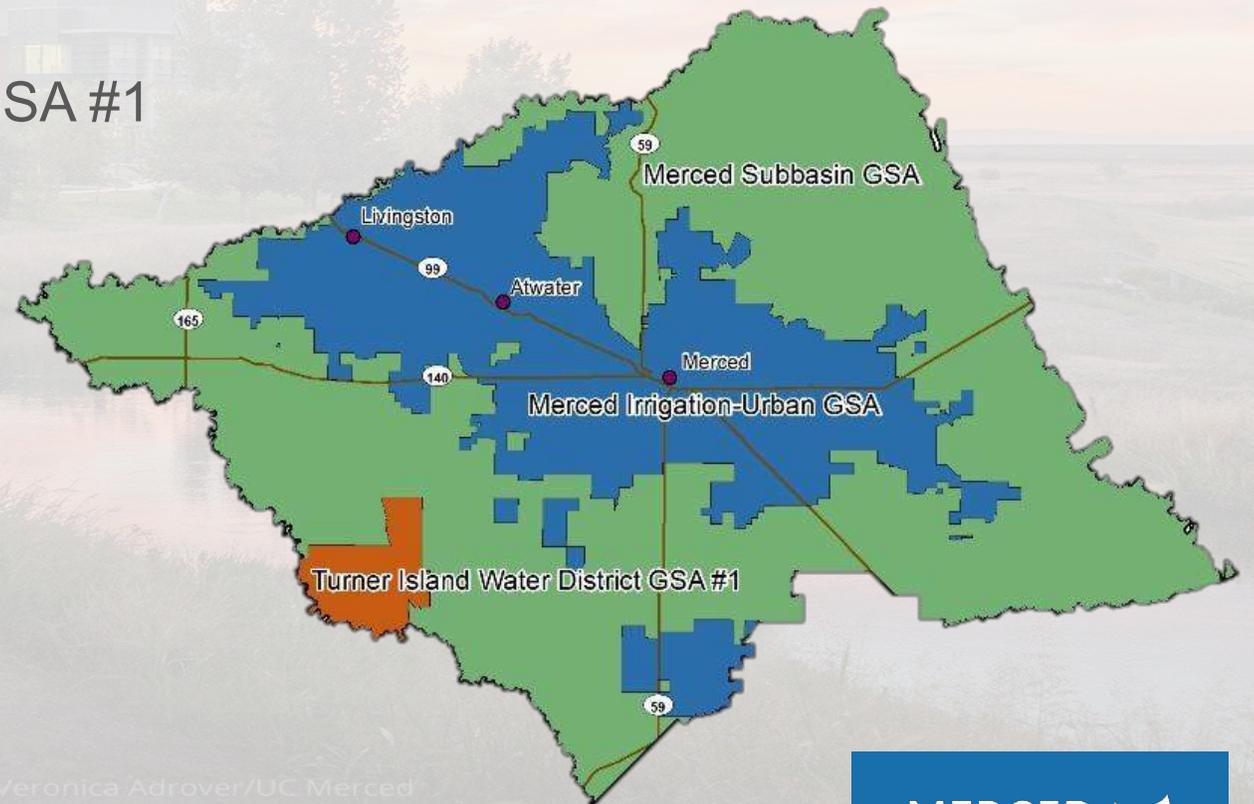


Image courtesy: Veronica Adrover/UC Merced

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# Other Reports

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- Current Basin Conditions

Image courtesy: Veronica Adrover/UC Merced

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# Merced Groundwater Subbasin Current Conditions Report August 18, 2025

Image courtesy: Veronica Adrover/UC Merced

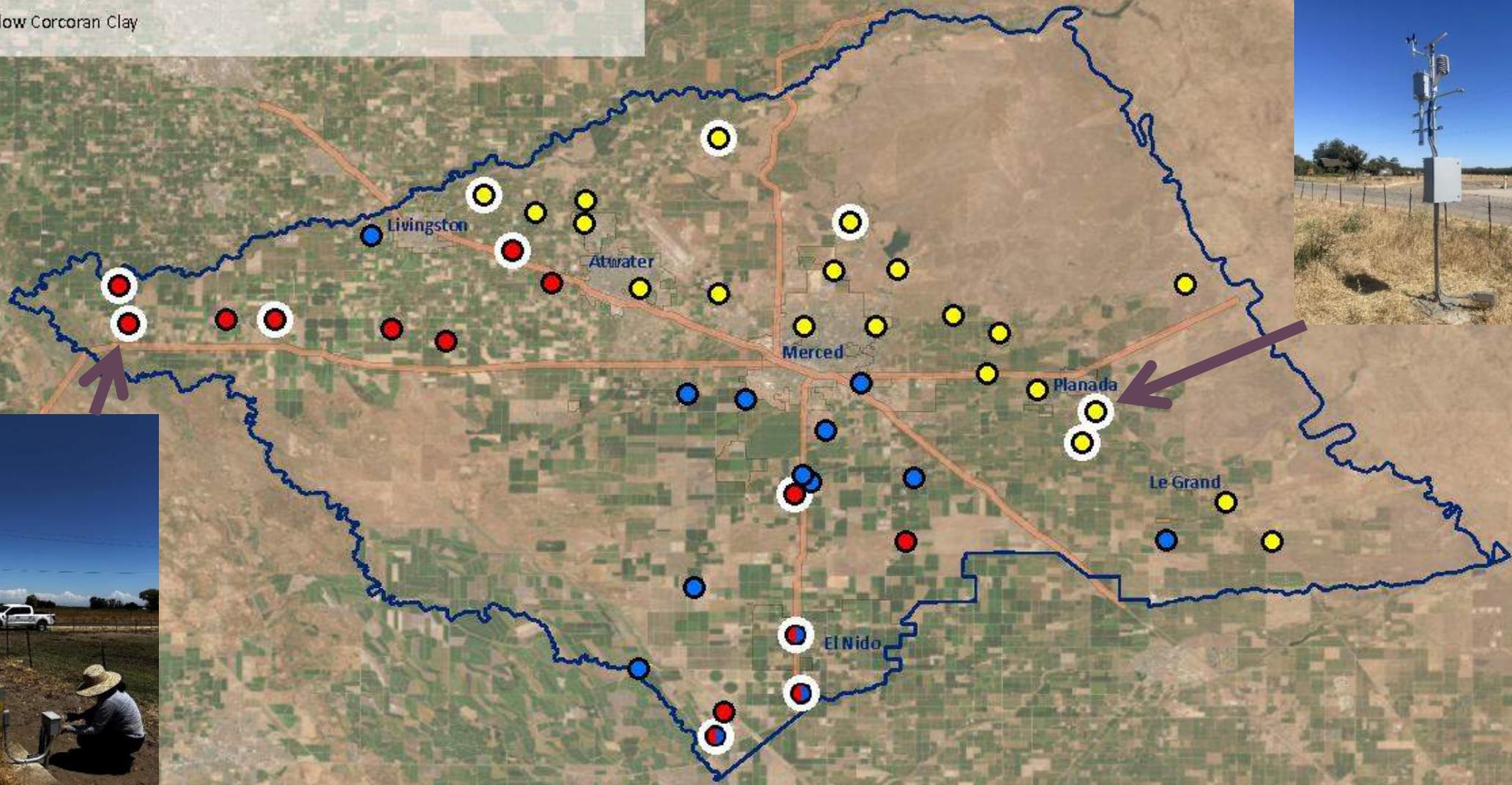
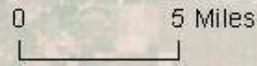
# Merced Groundwater Subbasin Monitoring Network

## Monitoring Wells

-  Above Corcoran Clay
-  Below Corcoran Clay
-  Outside Corcoran Clay
-  Above/Below Corcoran Clay

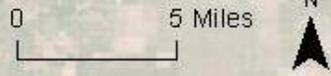
## Telemetry

-  Telemetry



# Merced Groundwater Subbasin Monitoring Network

Monitoring Wells



 Above/Below Corcoran Clay

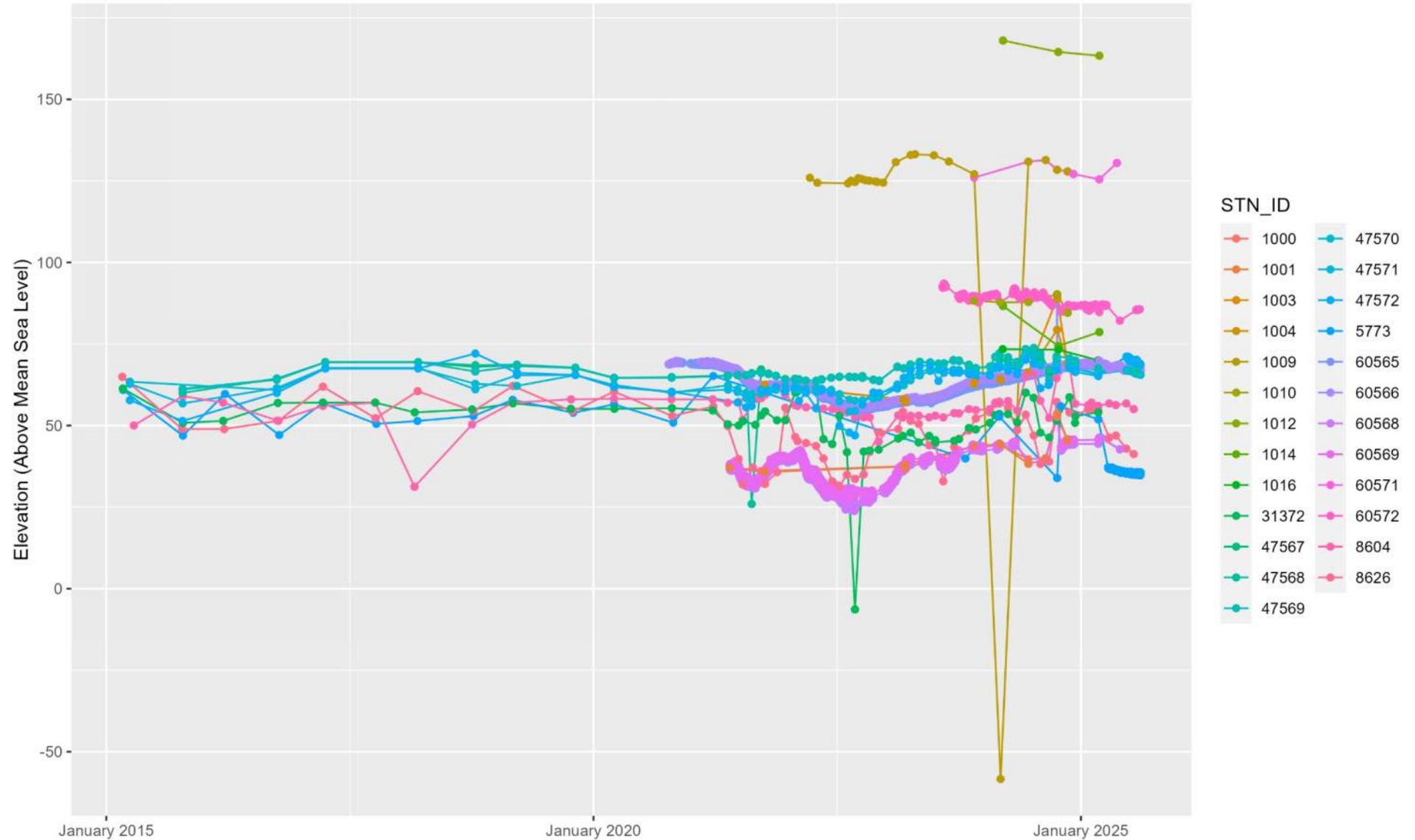
# Coming Soon!



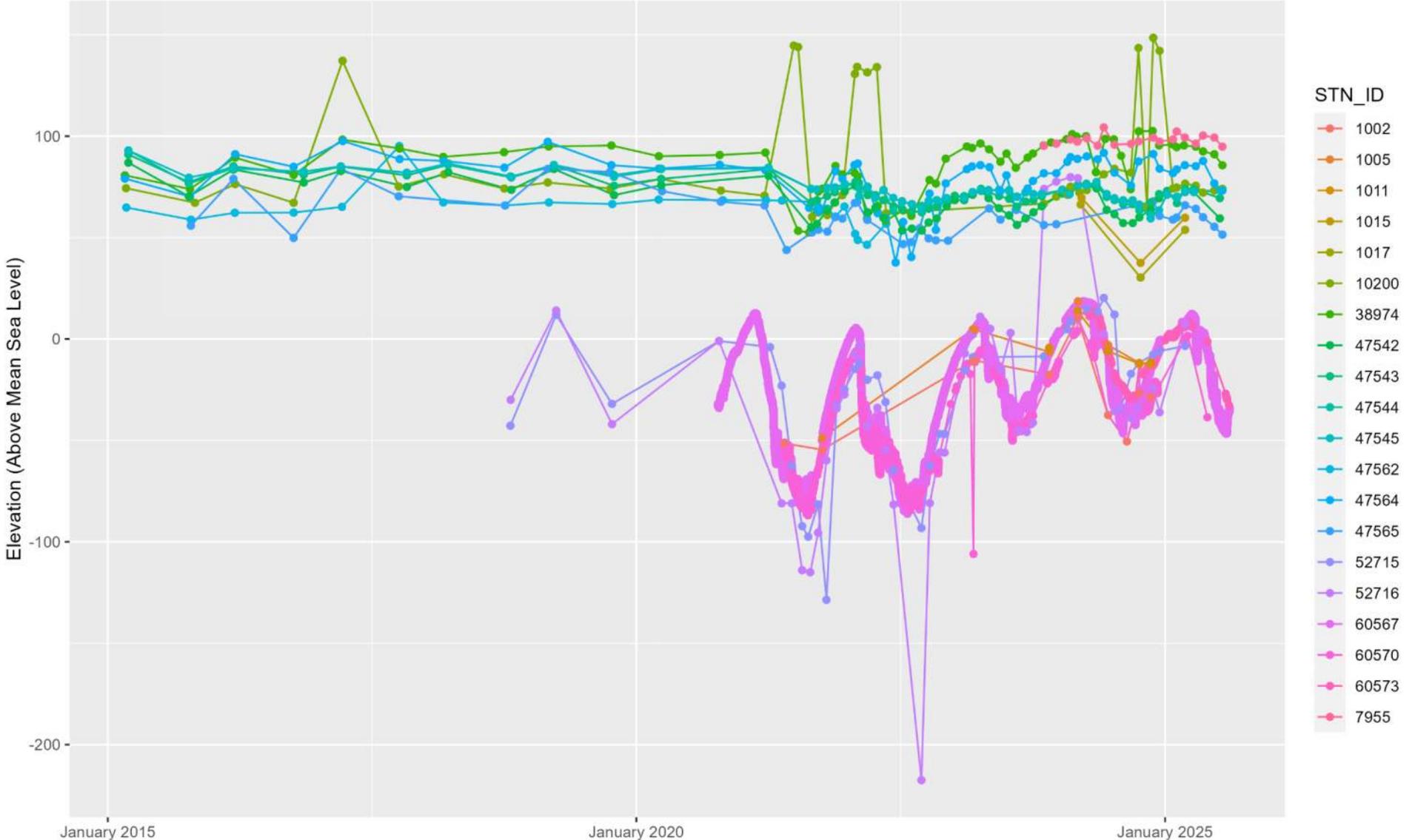
SUSTAINABLE GROUNDWATER  
MANAGEMENT (SGM)  
**GRANT PROGRAM**



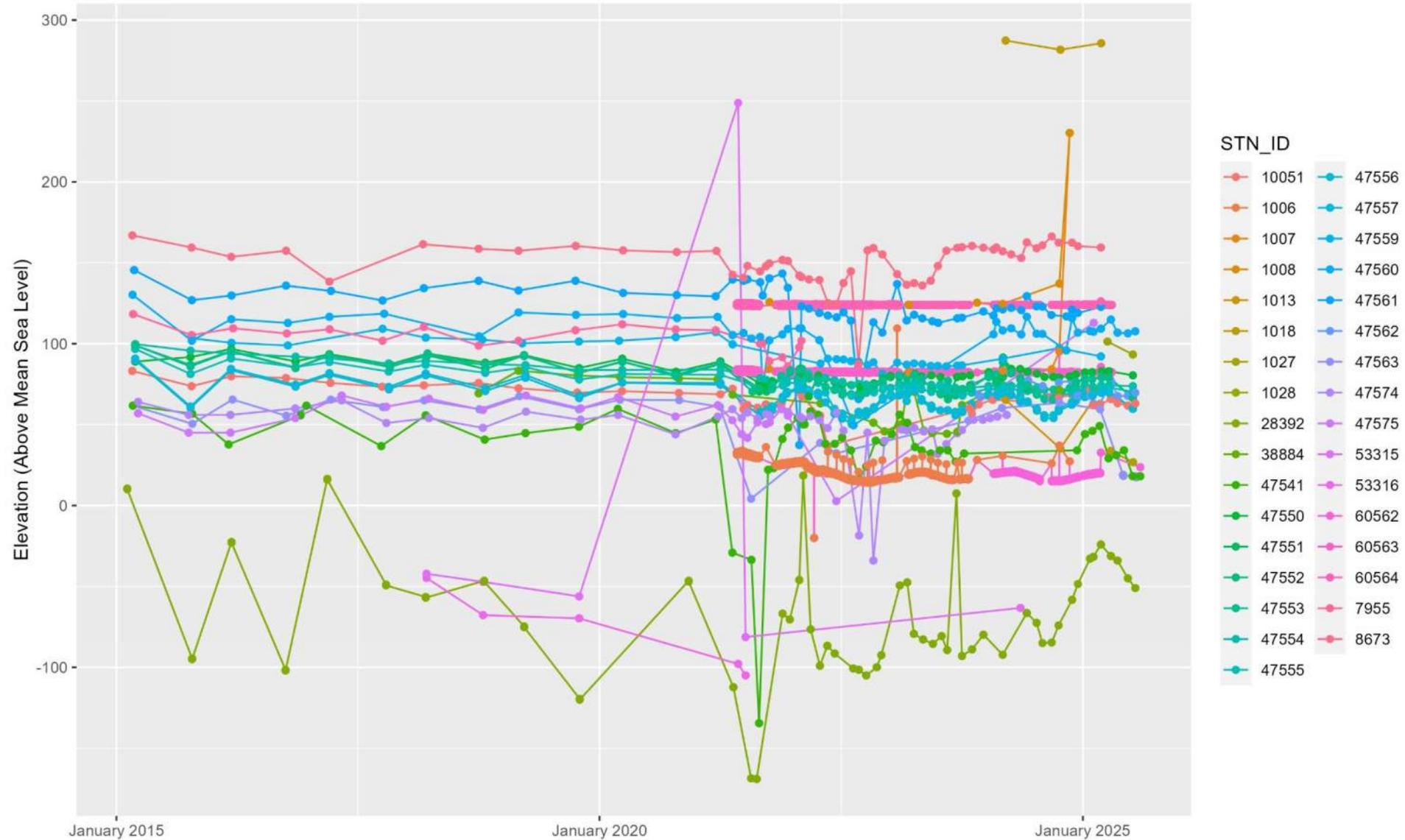
# Current Conditions – Above Corcoran Clay



# Current Conditions – Below Corcoran Clay



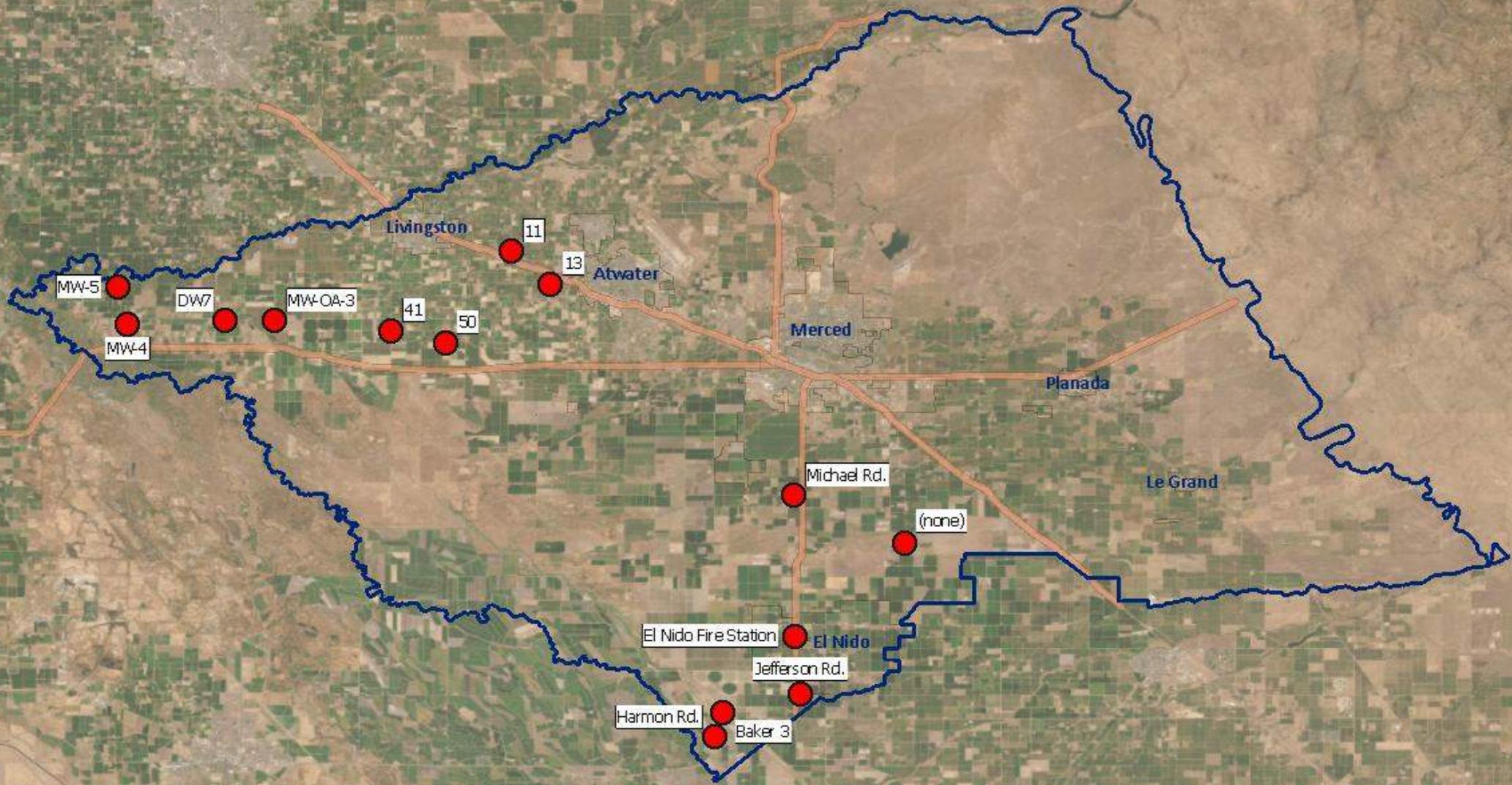
# Current Conditions – Outside Corcoran Clay



# Merced Groundwater Subbasin Monitoring Network

● Above Corcoran Clay

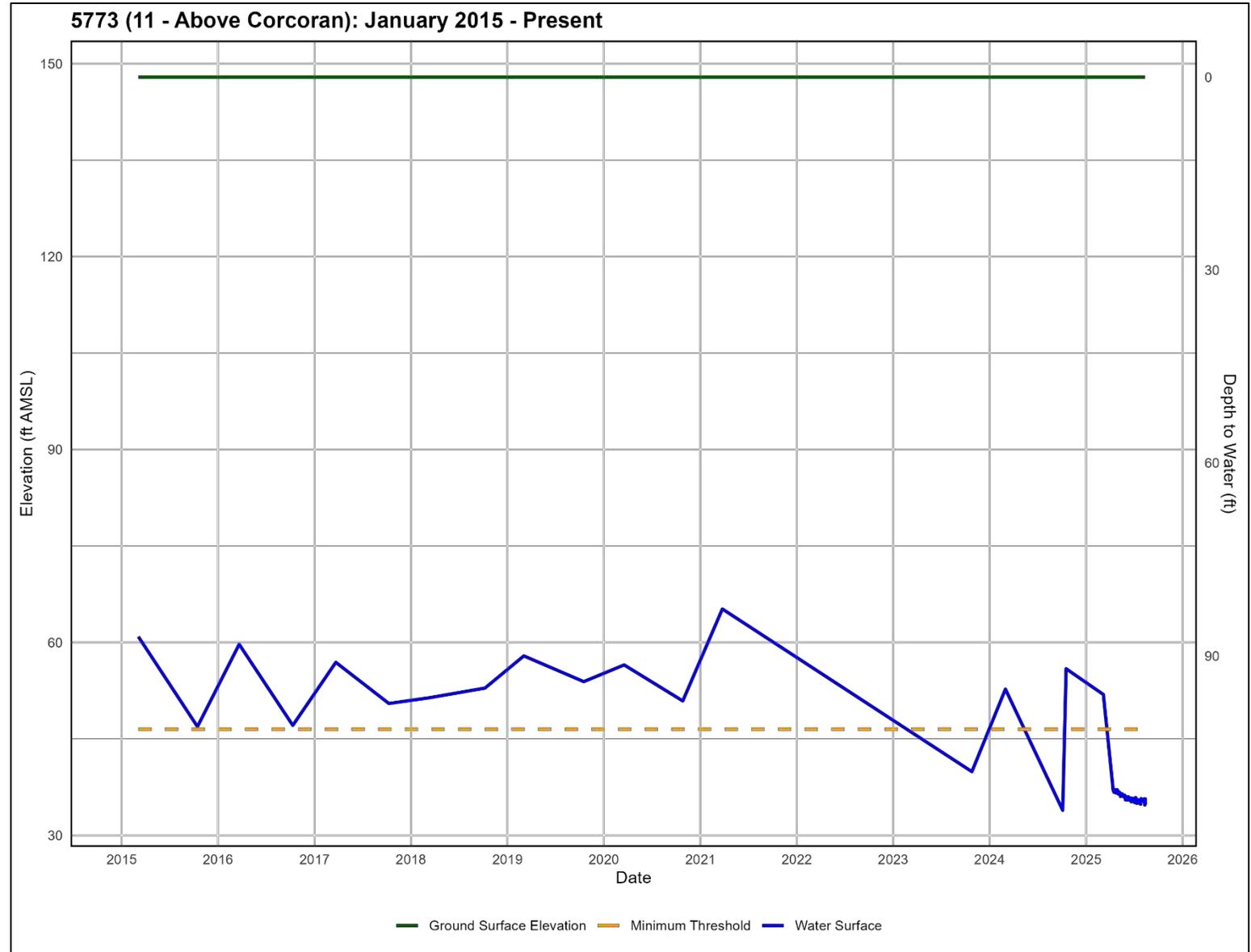
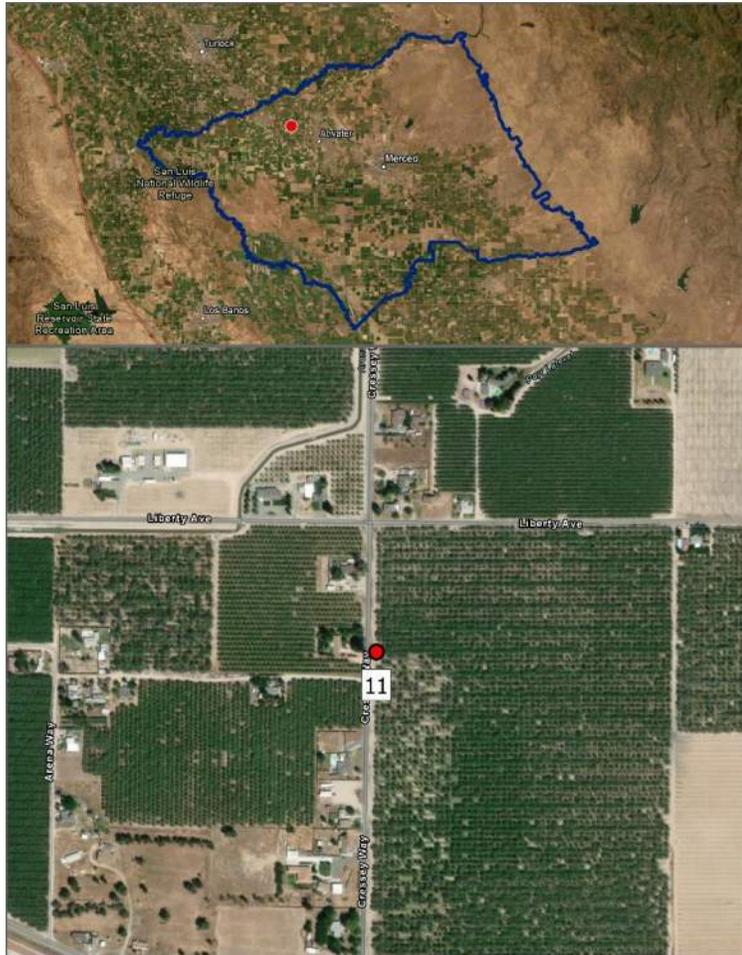
0 5 Miles



# Station ID: 5773

## Well Name: 11

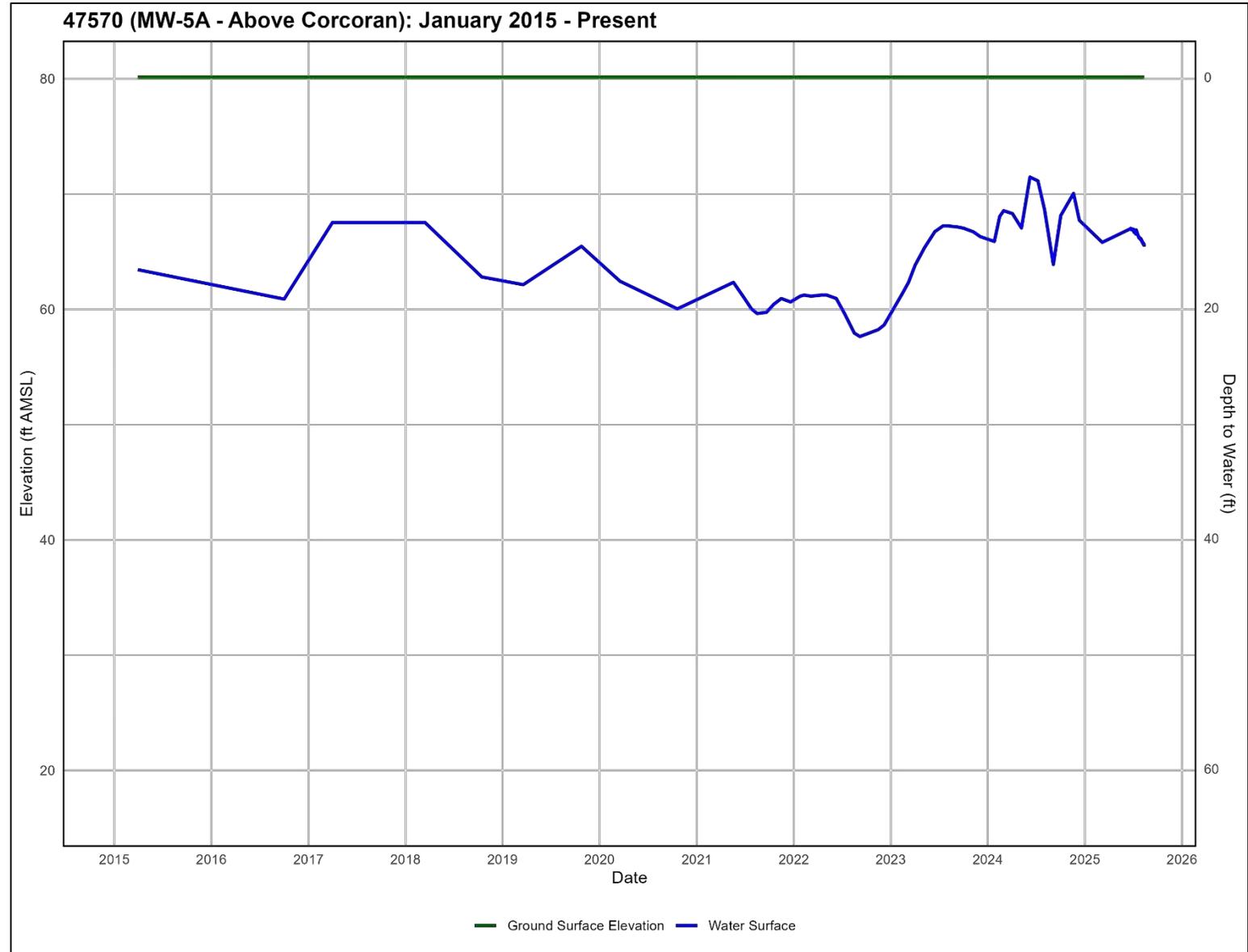
### Principal Aquifer: Above



Station ID: 47570

Well Name: MW-5A

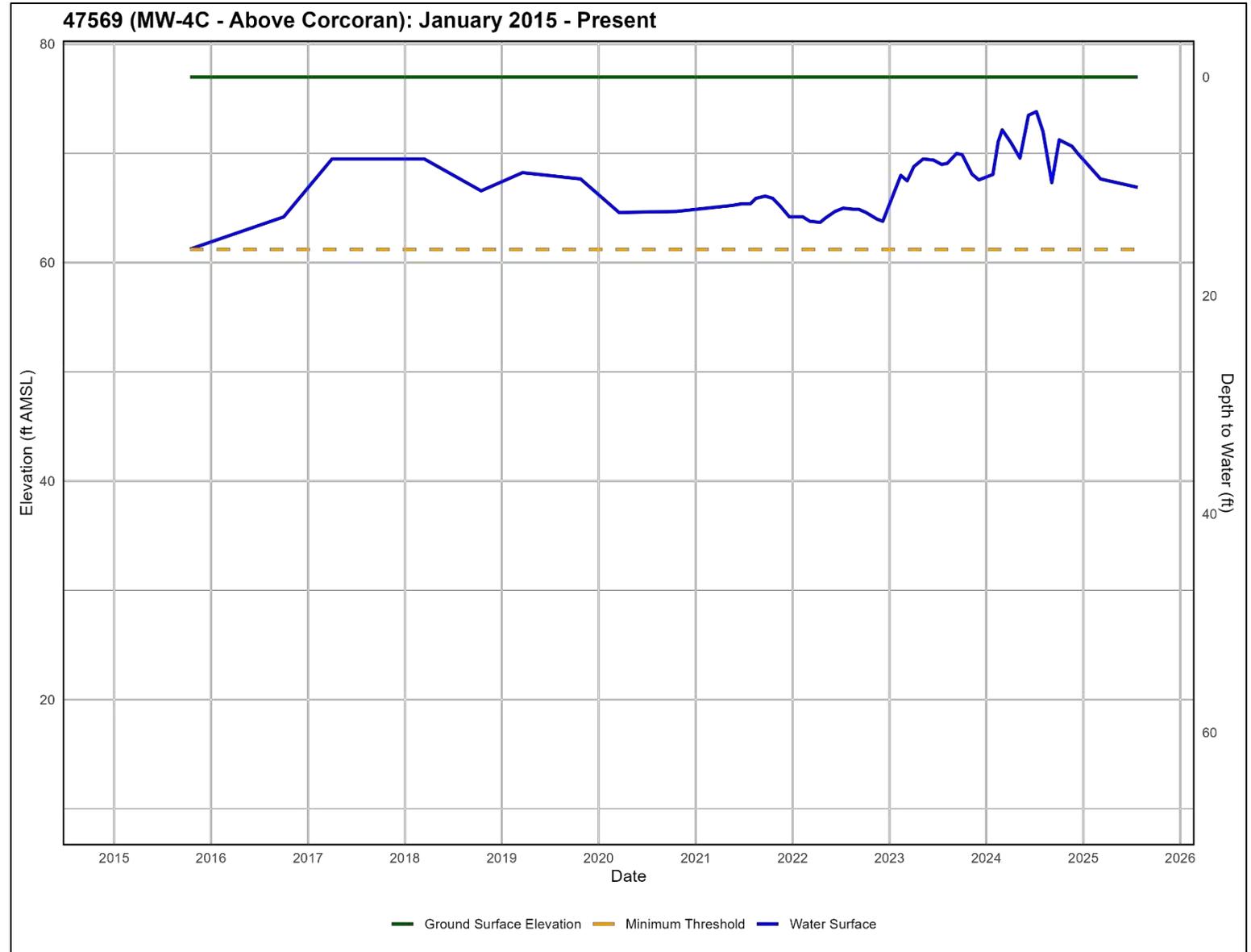
Principal Aquifer: Above



Station ID: 47569

Well Name: MW-4C

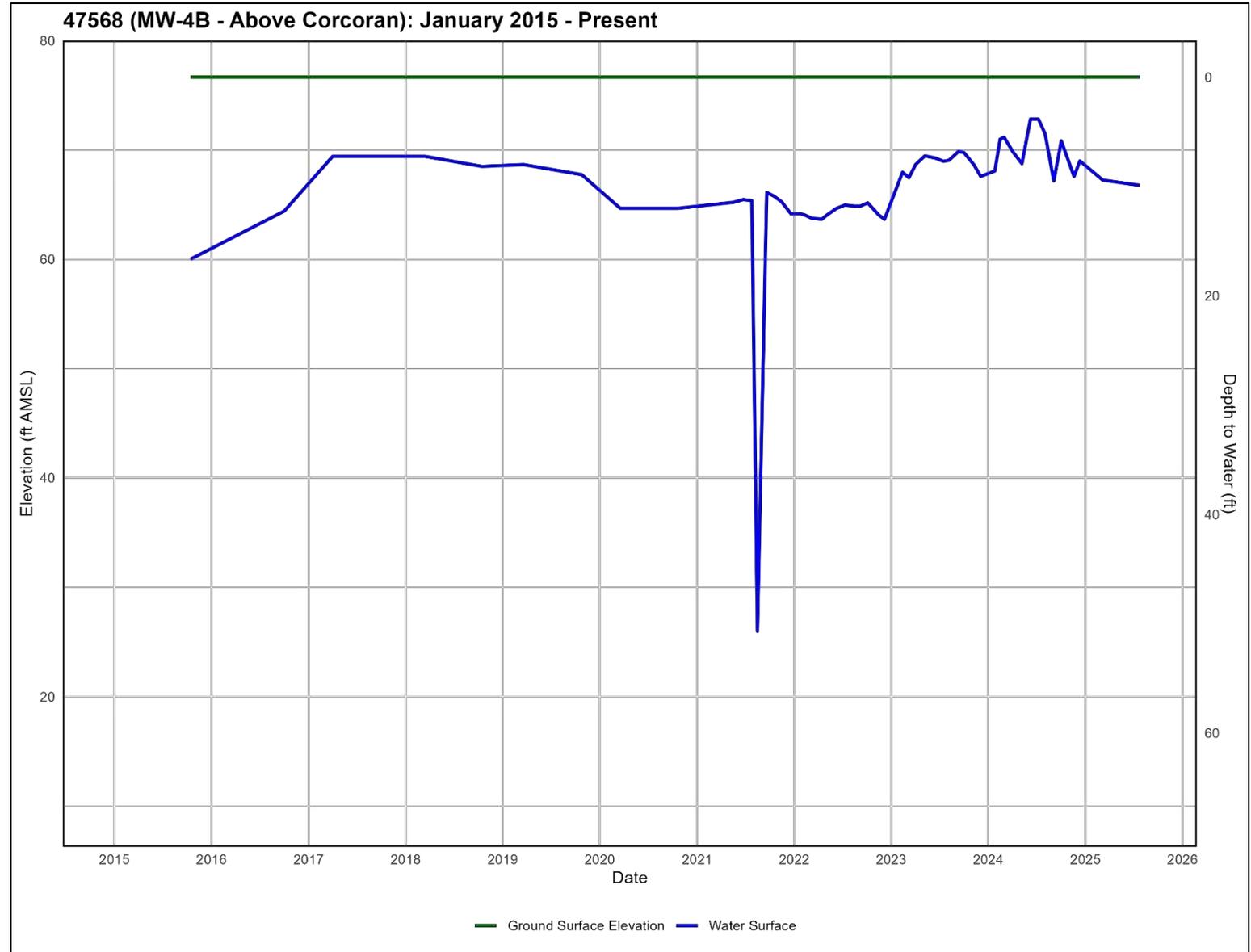
Principal Aquifer: Above



Station ID: 47568

Well Name: MW-4B

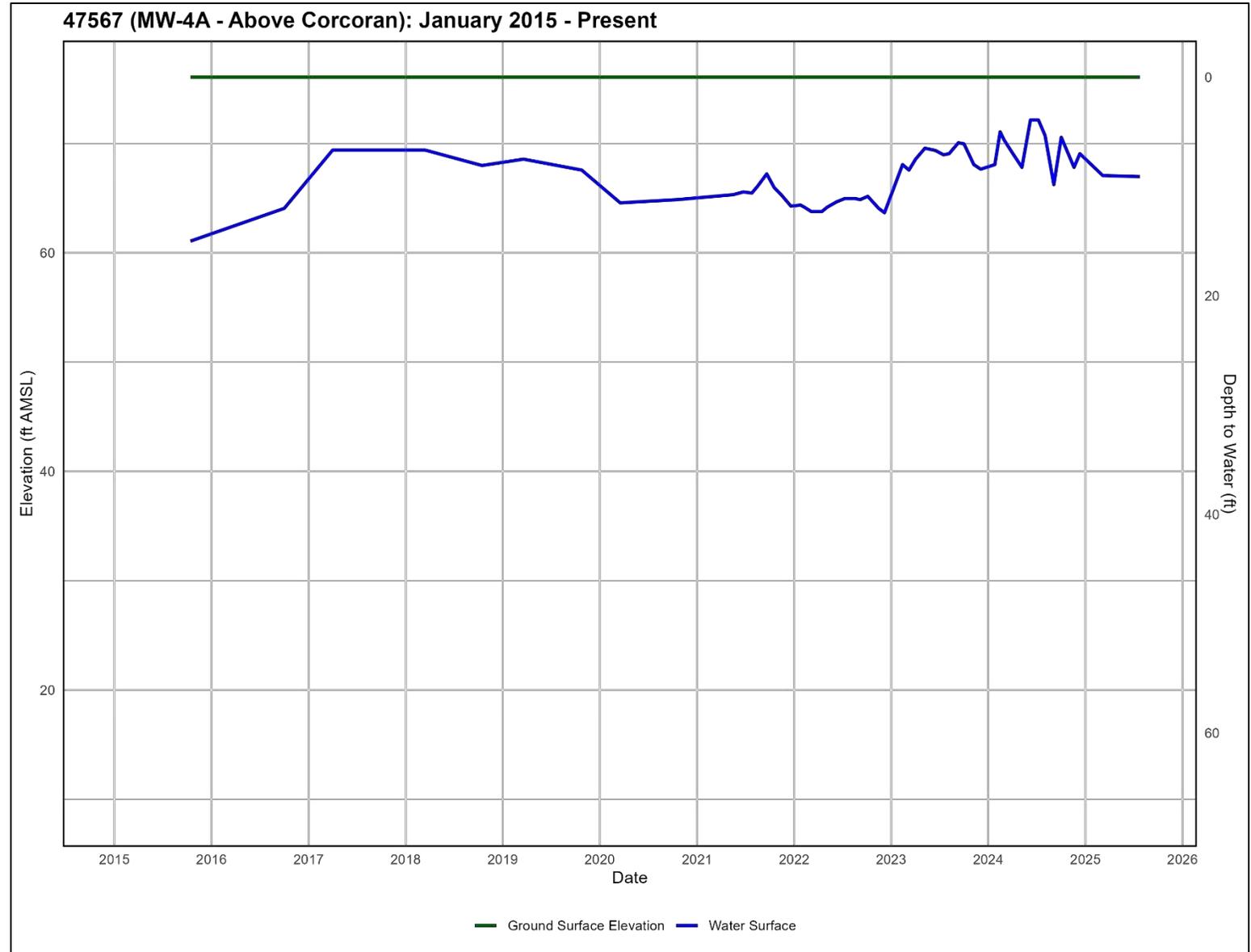
Principal Aquifer: Above



Station ID: 47567

Well Name: MW-4A

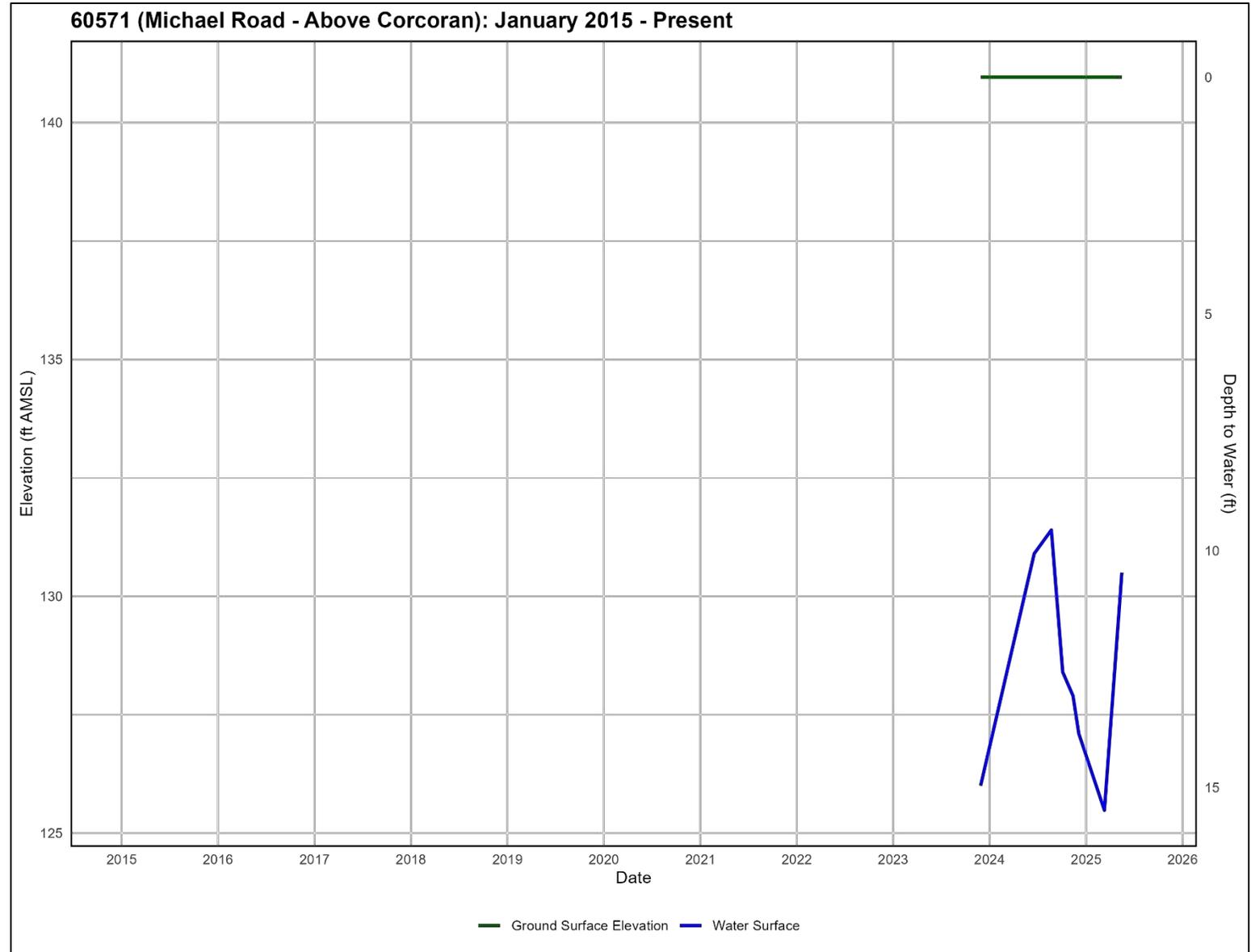
Principal Aquifer: Above



Station ID: 60571

Well Name: Michael Road

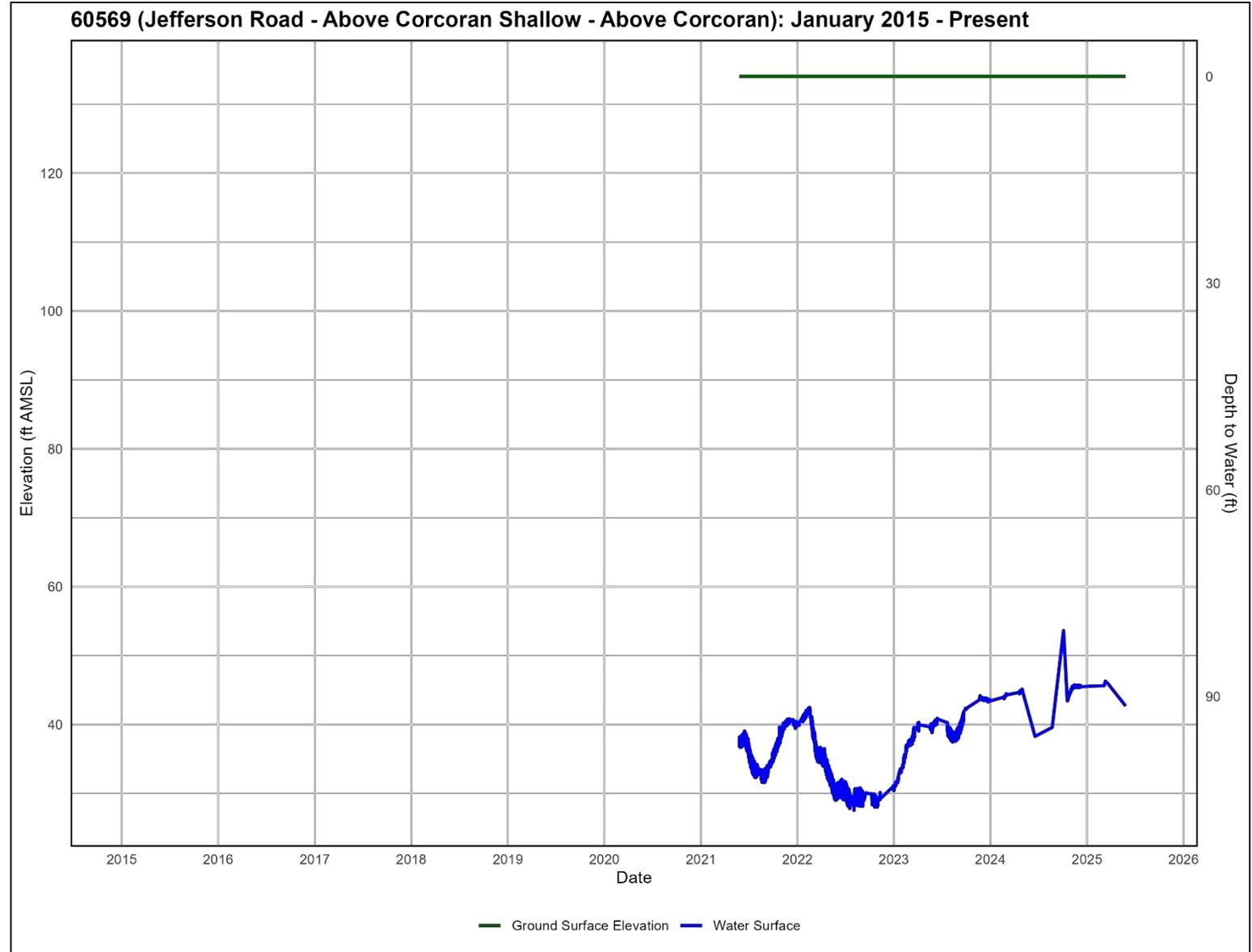
Principal Aquifer: Above



# Station ID: 60569

## Well Name: Jefferson Road – Above Corcoran Shallow

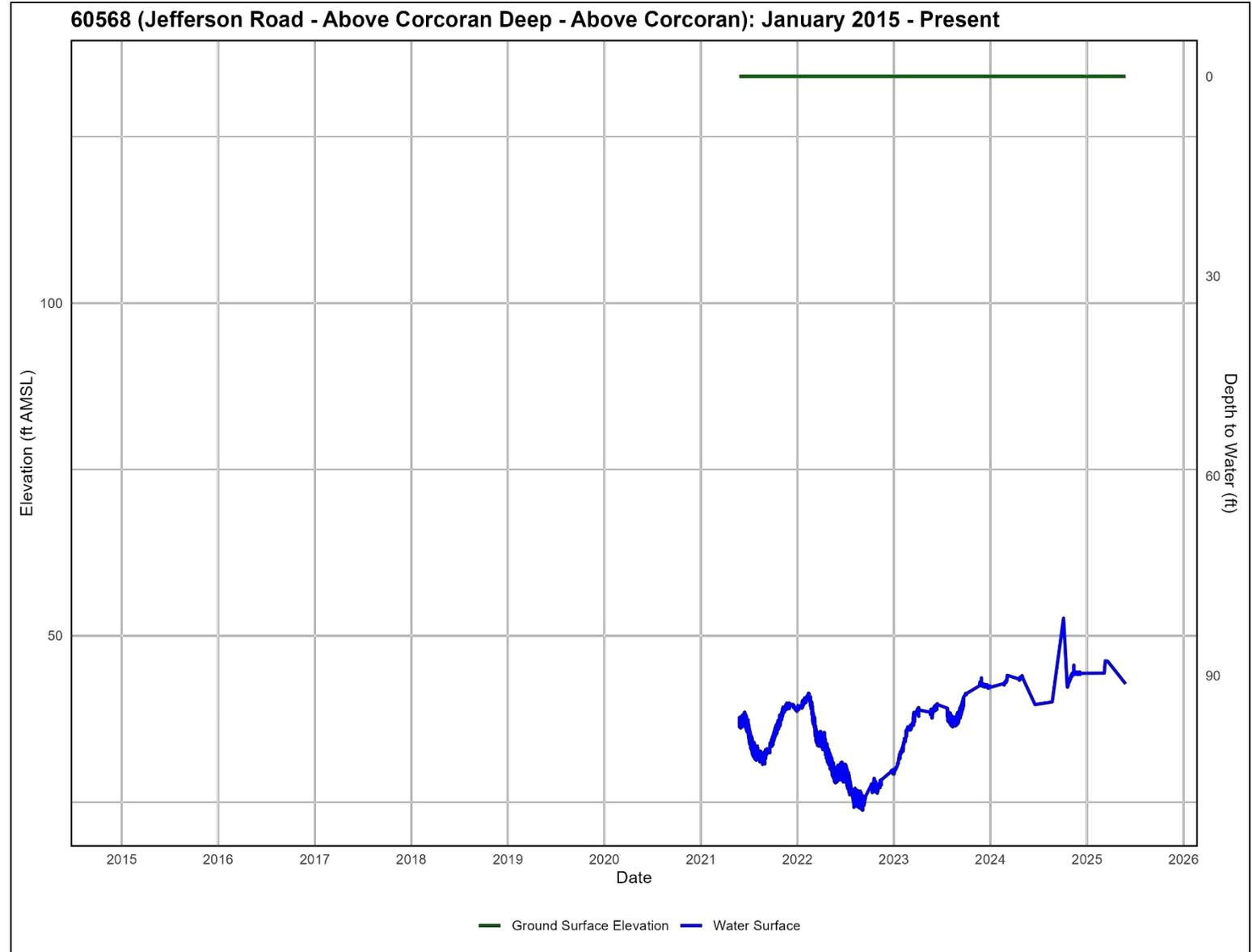
### Principal Aquifer: Above



# Station ID: 60568

## Well Name: Jefferson Road – Above Corcoran Deep

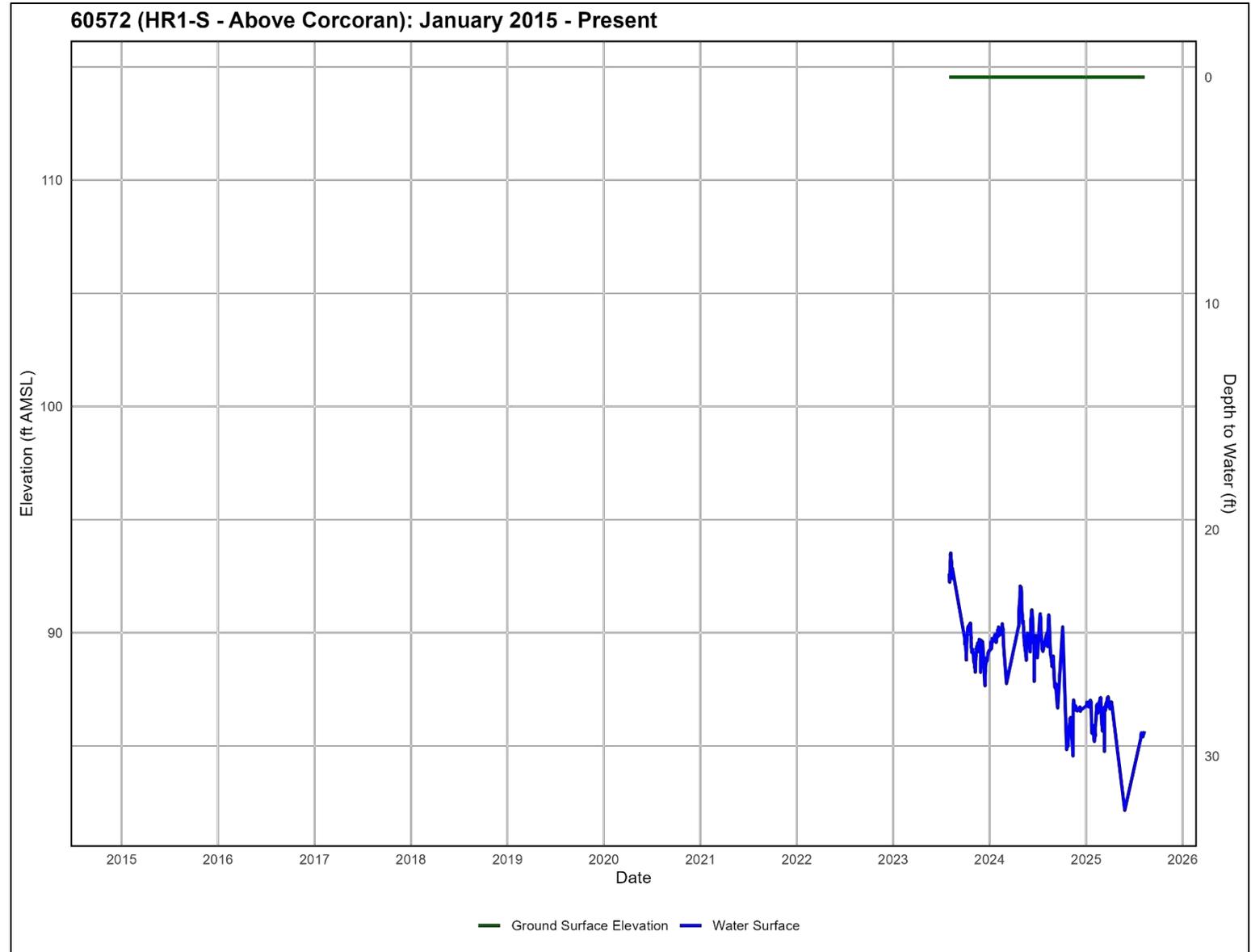
### Principal Aquifer: Above



Station ID: 60572

Well Name: HR1-S

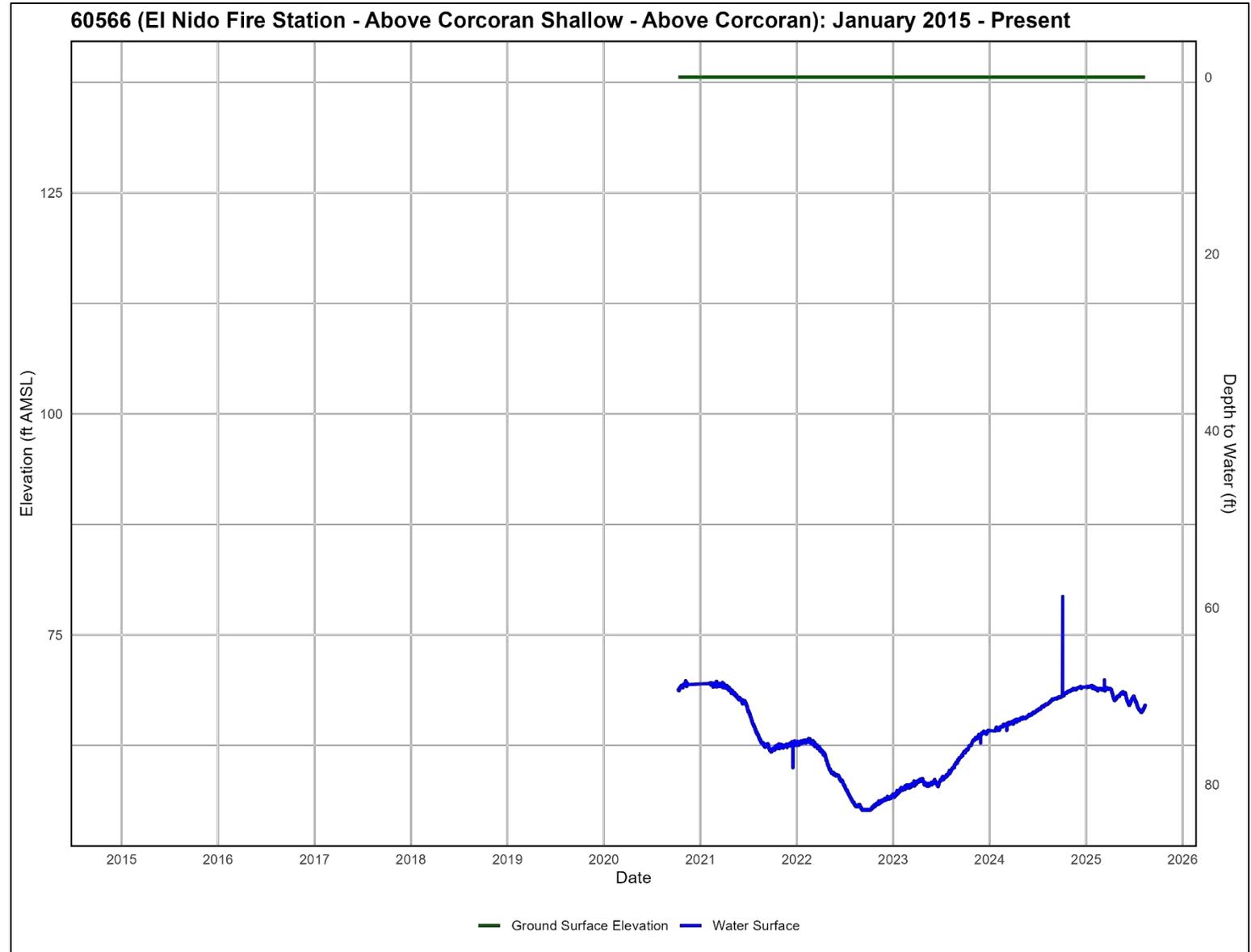
Principal Aquifer: Above



# Station ID: 60566

## Well Name: El Nido Fire Station – Above Corcoran Shallow

### Principal Aquifer: Above

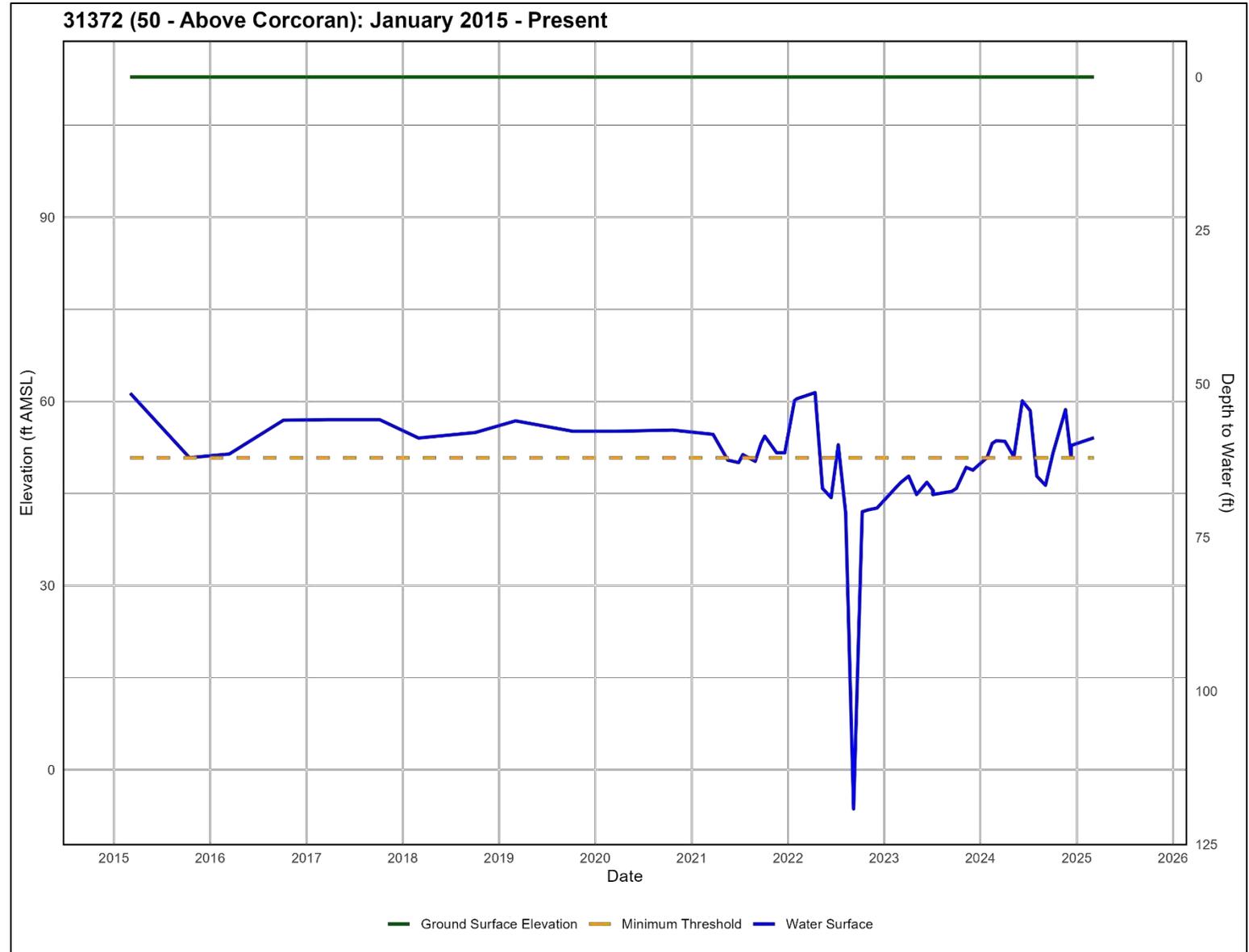
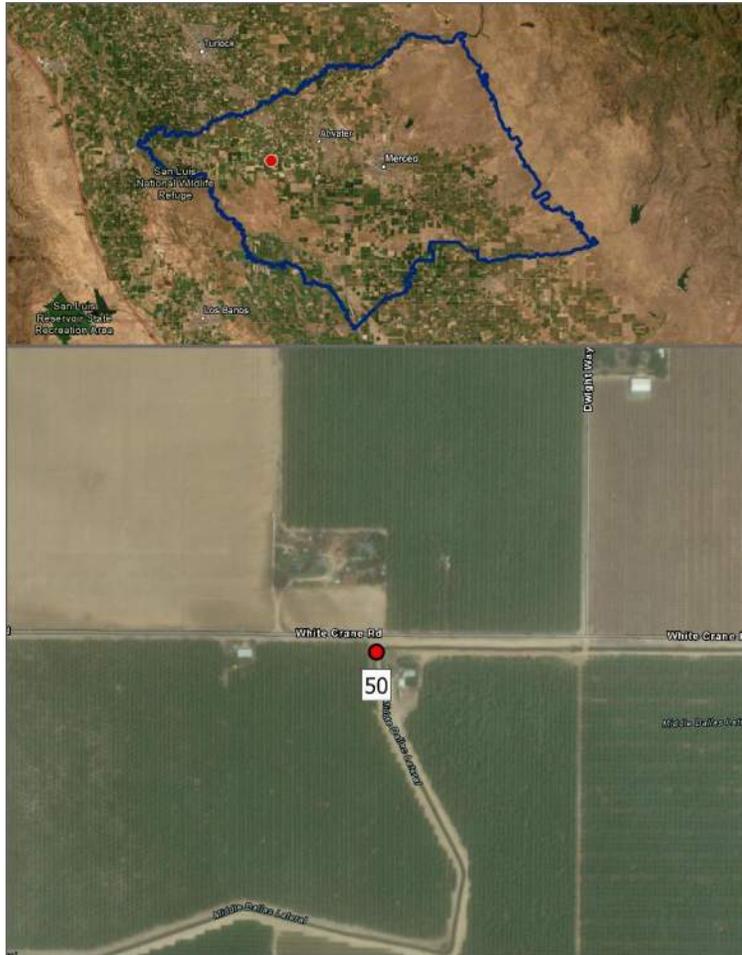




# Station ID: 31372

## Well Name: 50

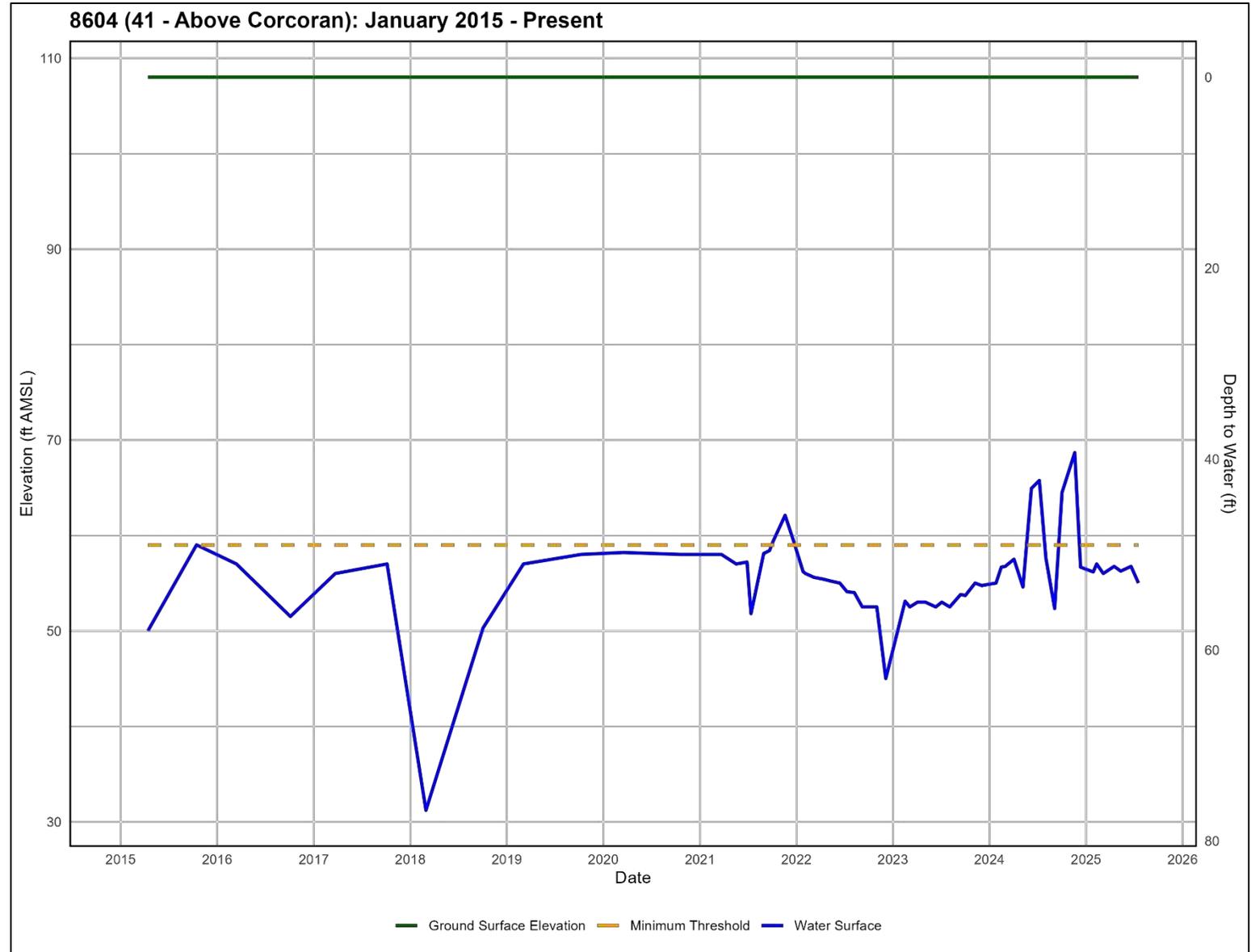
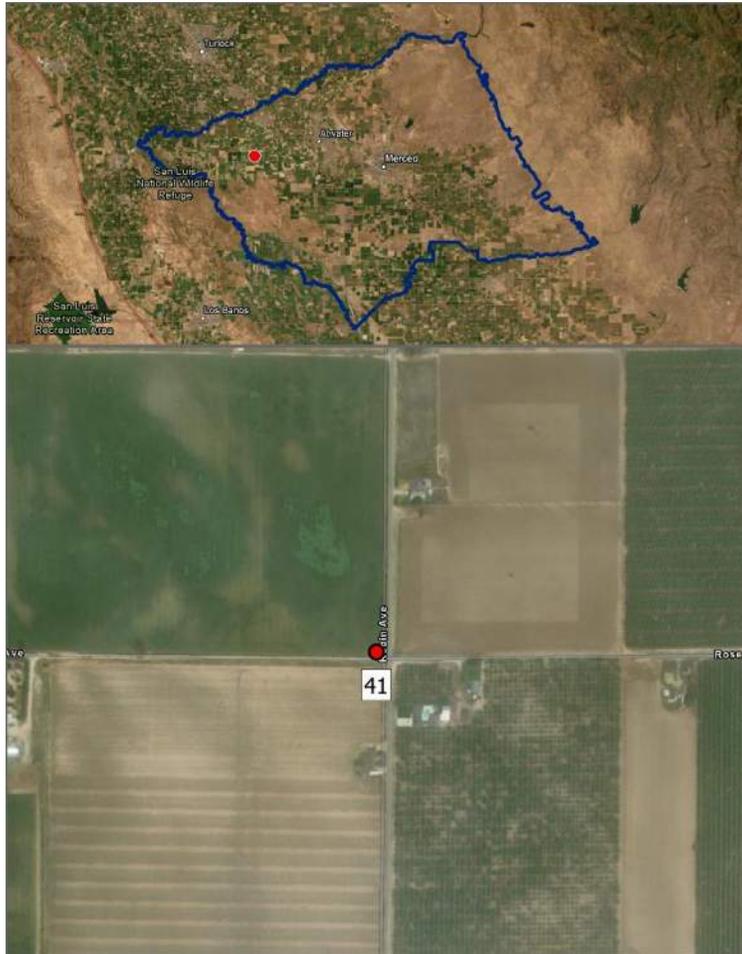
### Principal Aquifer: Above



Station ID: 8604

Well Name: 41

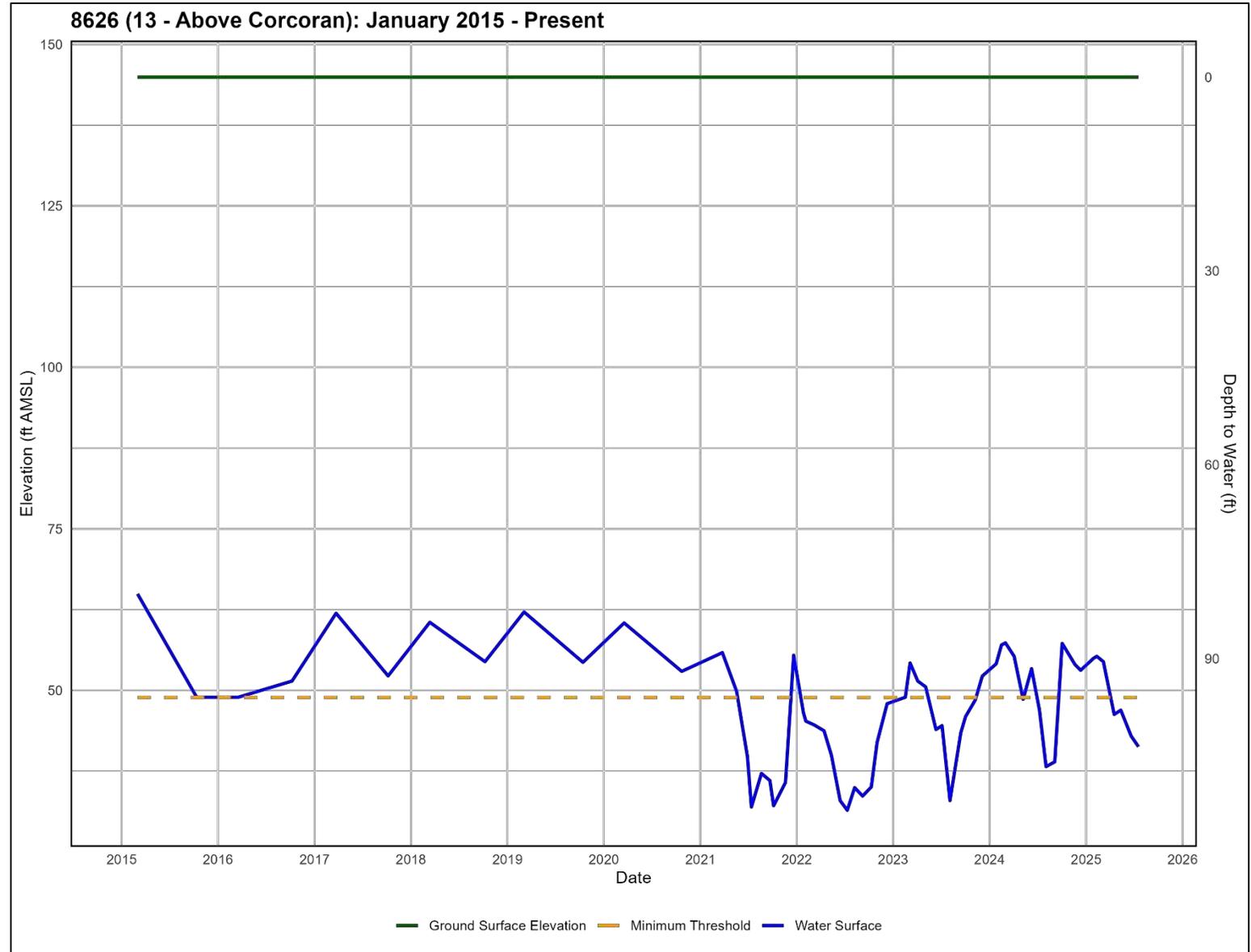
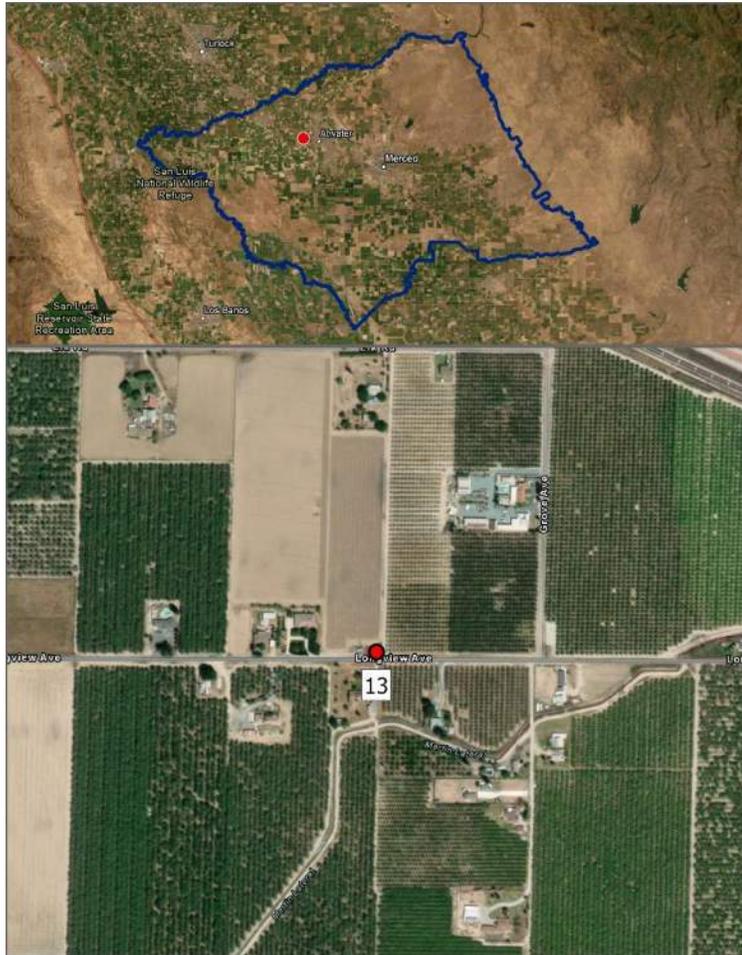
Principal Aquifer: Above



# Station ID: 8626

## Well Name: 13

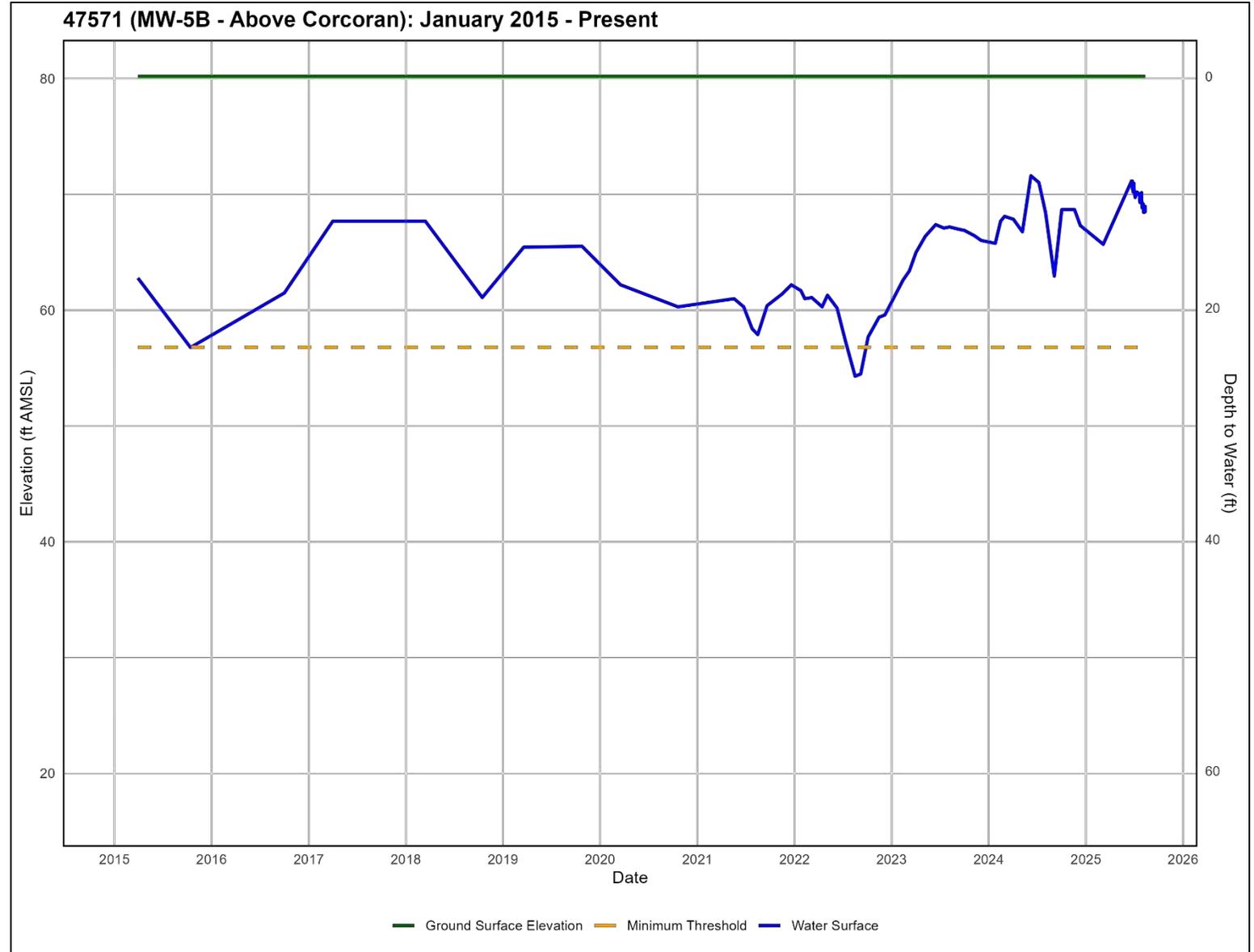
### Principal Aquifer: Above



Station ID: 47571

Well Name: MW-5B

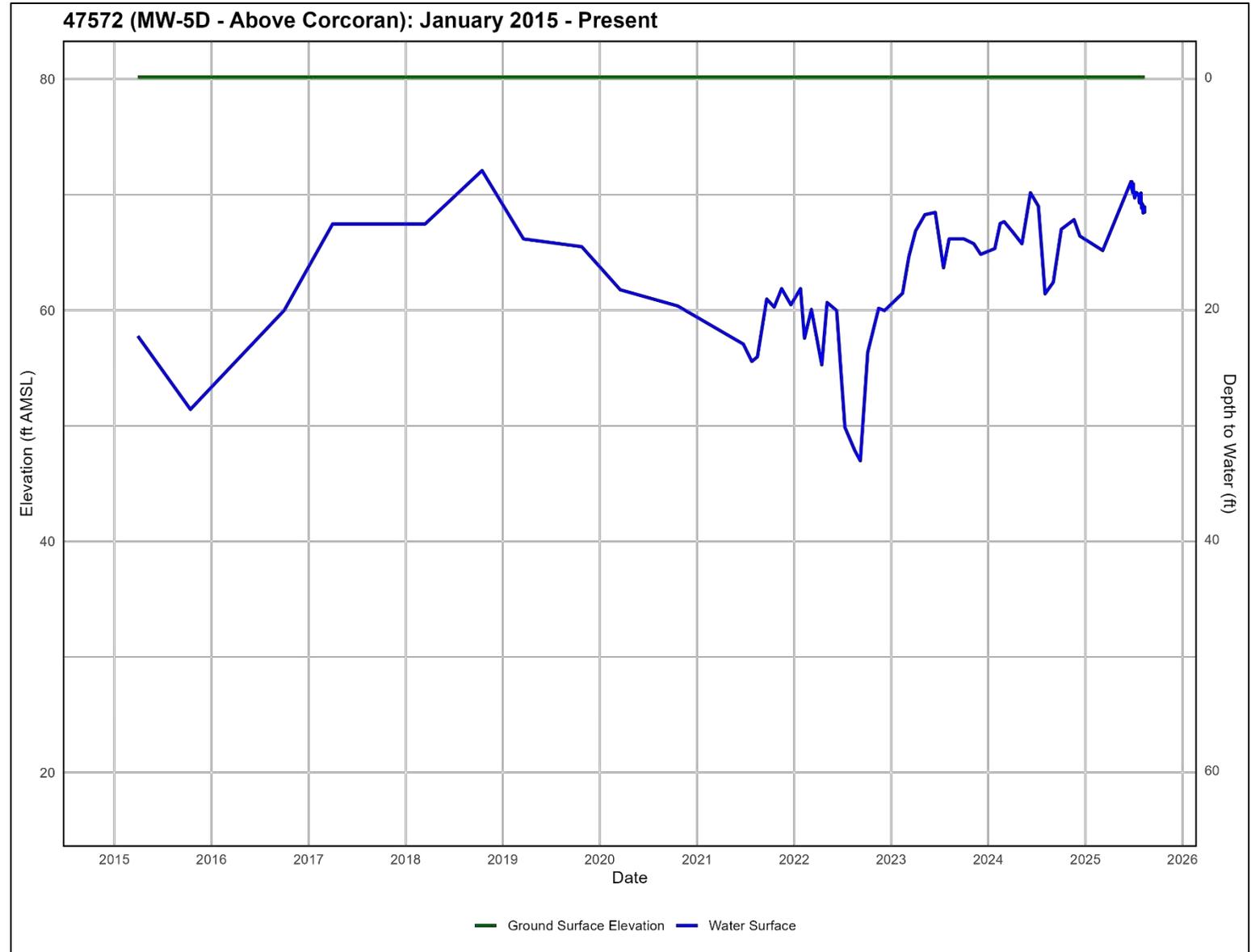
Principal Aquifer: Above



Station ID: 47572

Well Name: MW-5D

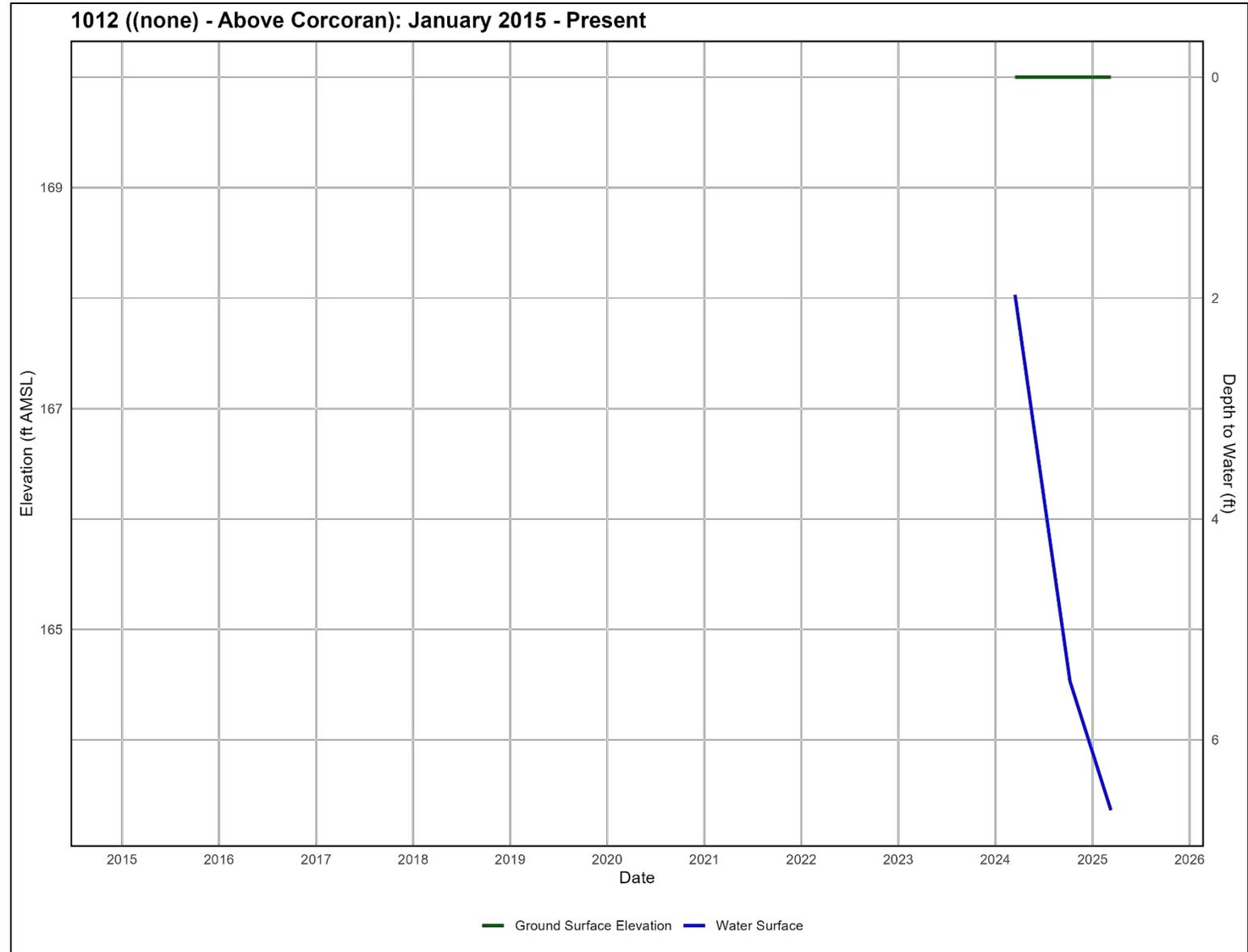
Principal Aquifer: Above



Station ID: 1012

Well Name: (none)

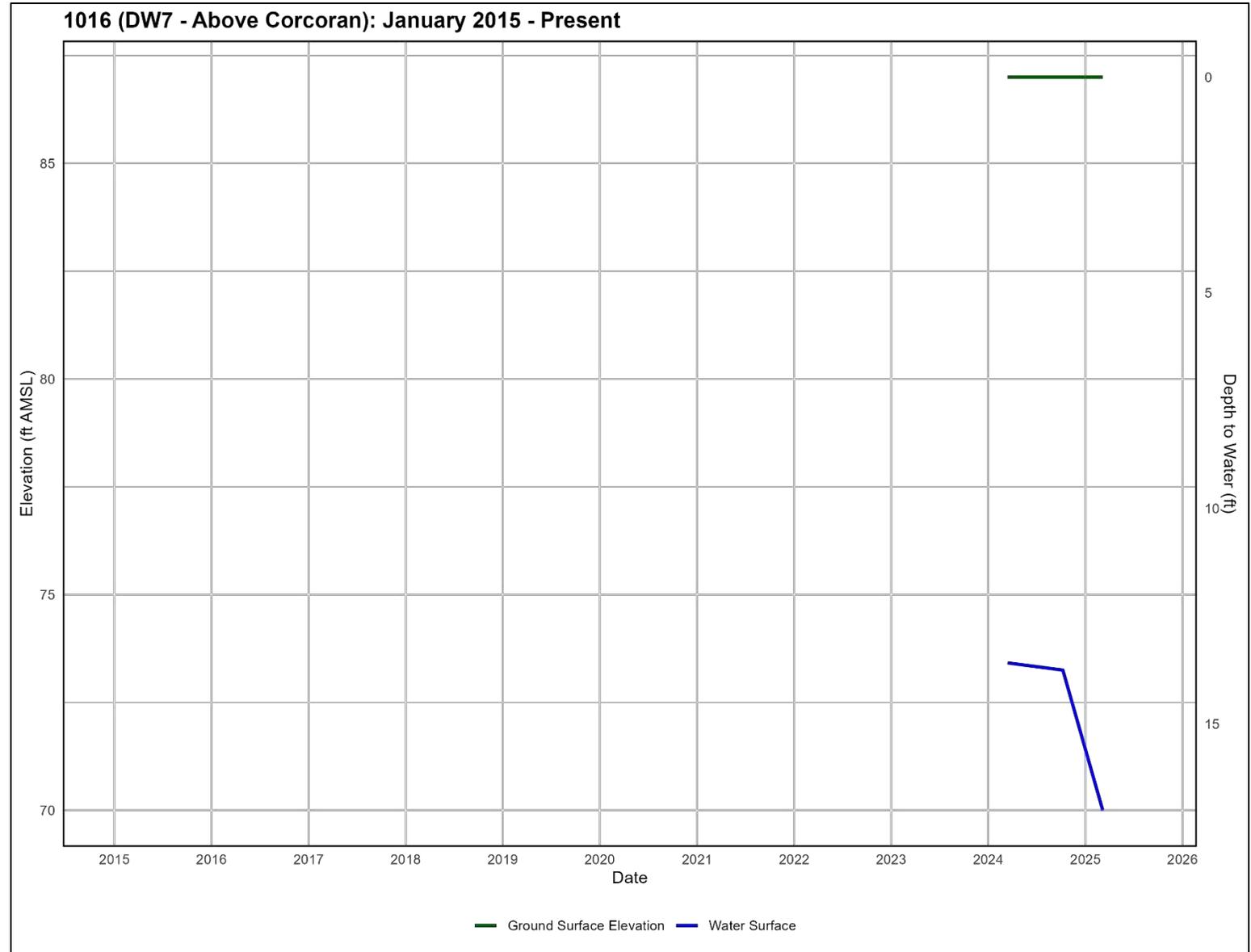
Principal Aquifer: Above



Station ID: 1016

Well Name: DW7

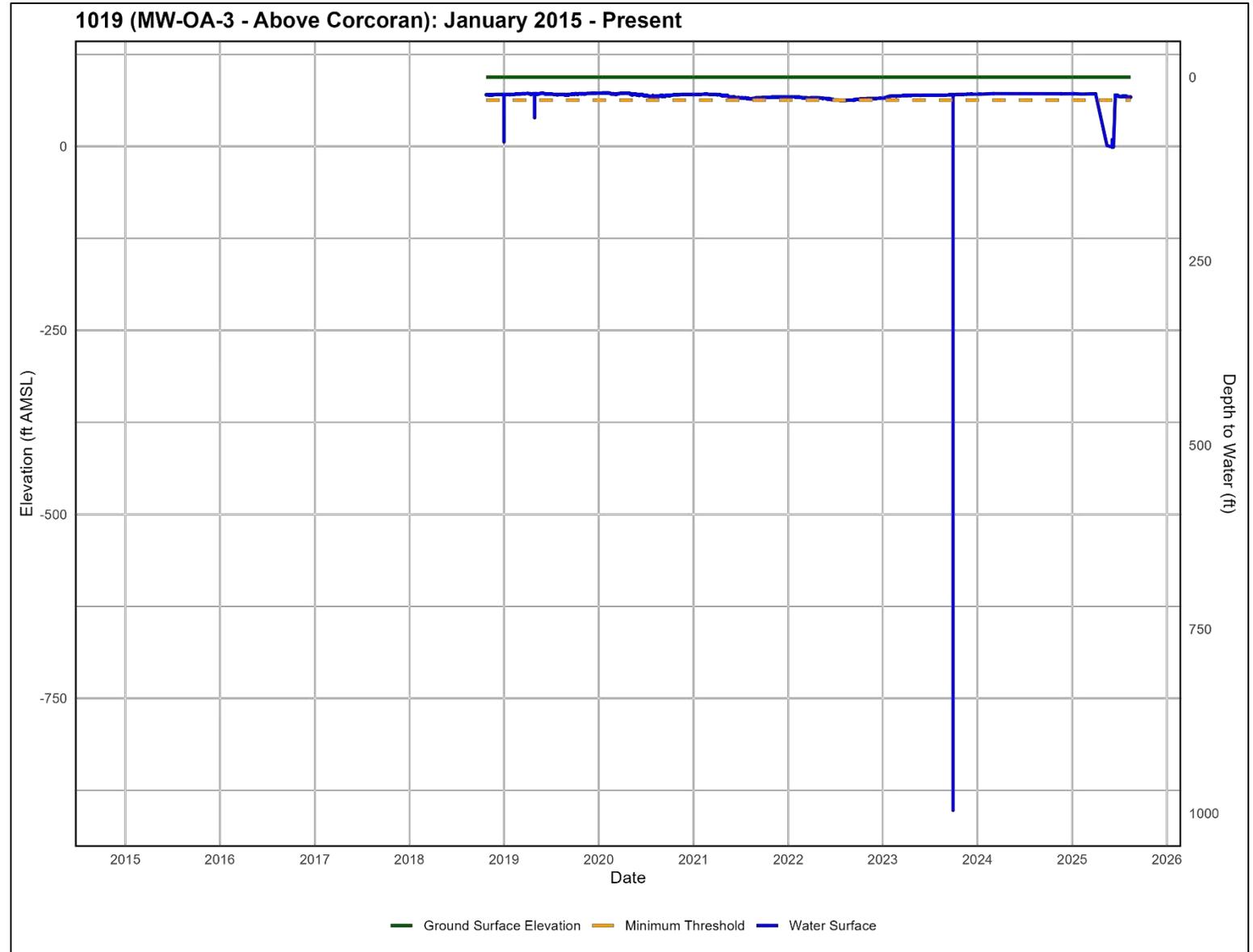
Principal Aquifer: Above



Station ID: 1019

Well Name: MW-OA-3

Principal Aquifer: Above



# Merced Groundwater Subbasin Monitoring Network

● Below Corcoran Clay

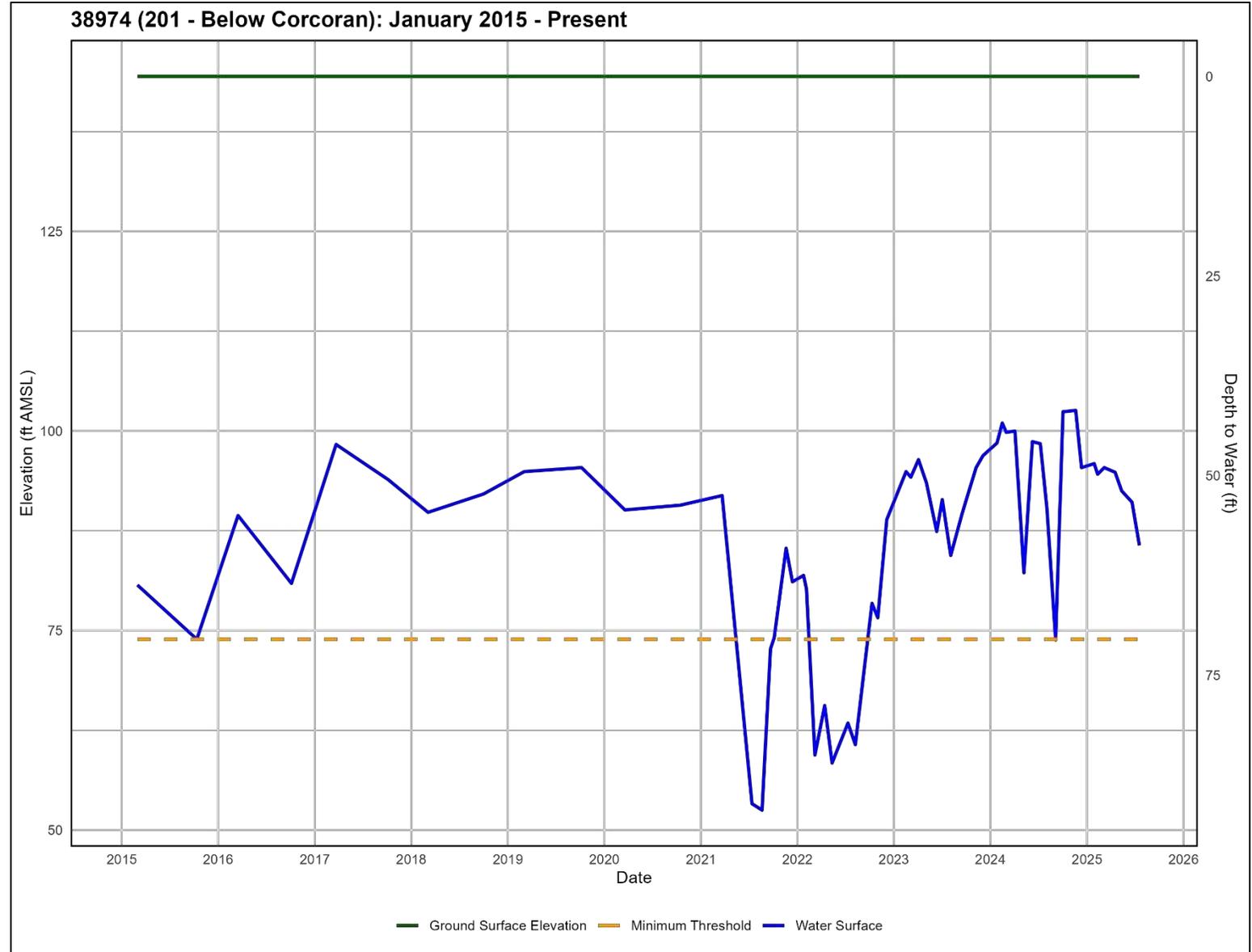
0 5 Miles



Station ID: 38974

Well Name: 201

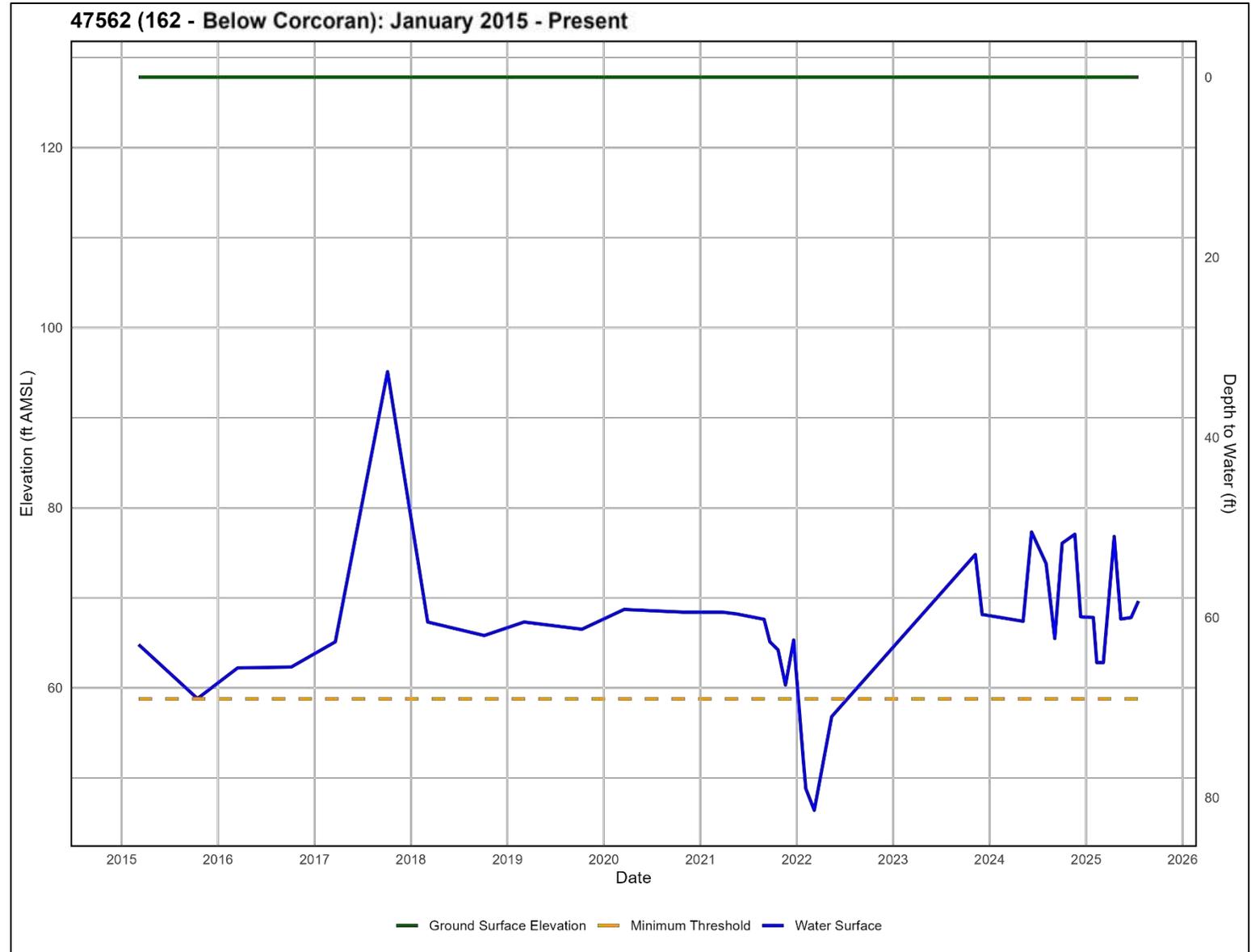
Principal Aquifer: Below



Station ID: 47562

Well Name: 162

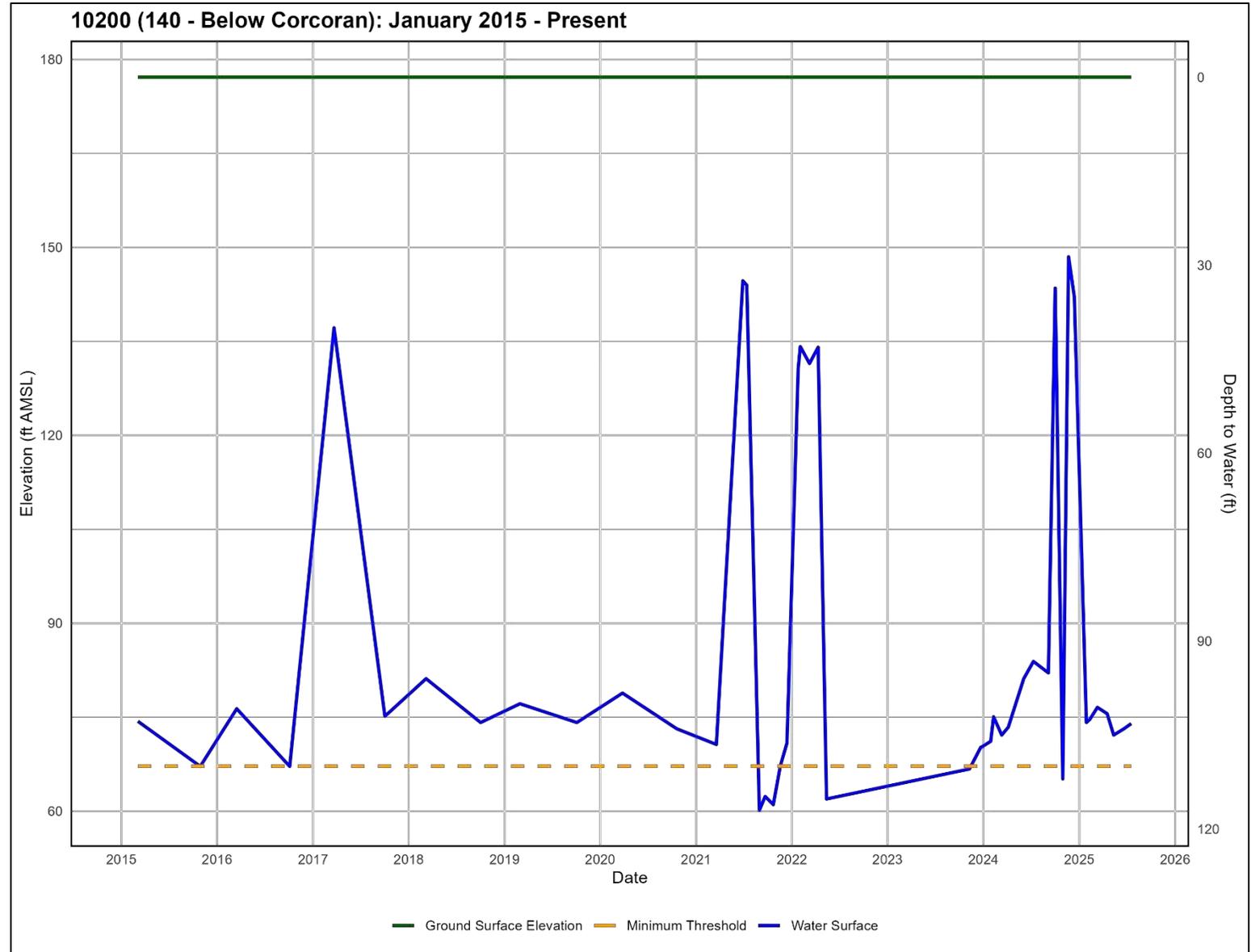
Principal Aquifer: Below



Station ID: 10200

Well Name: 140

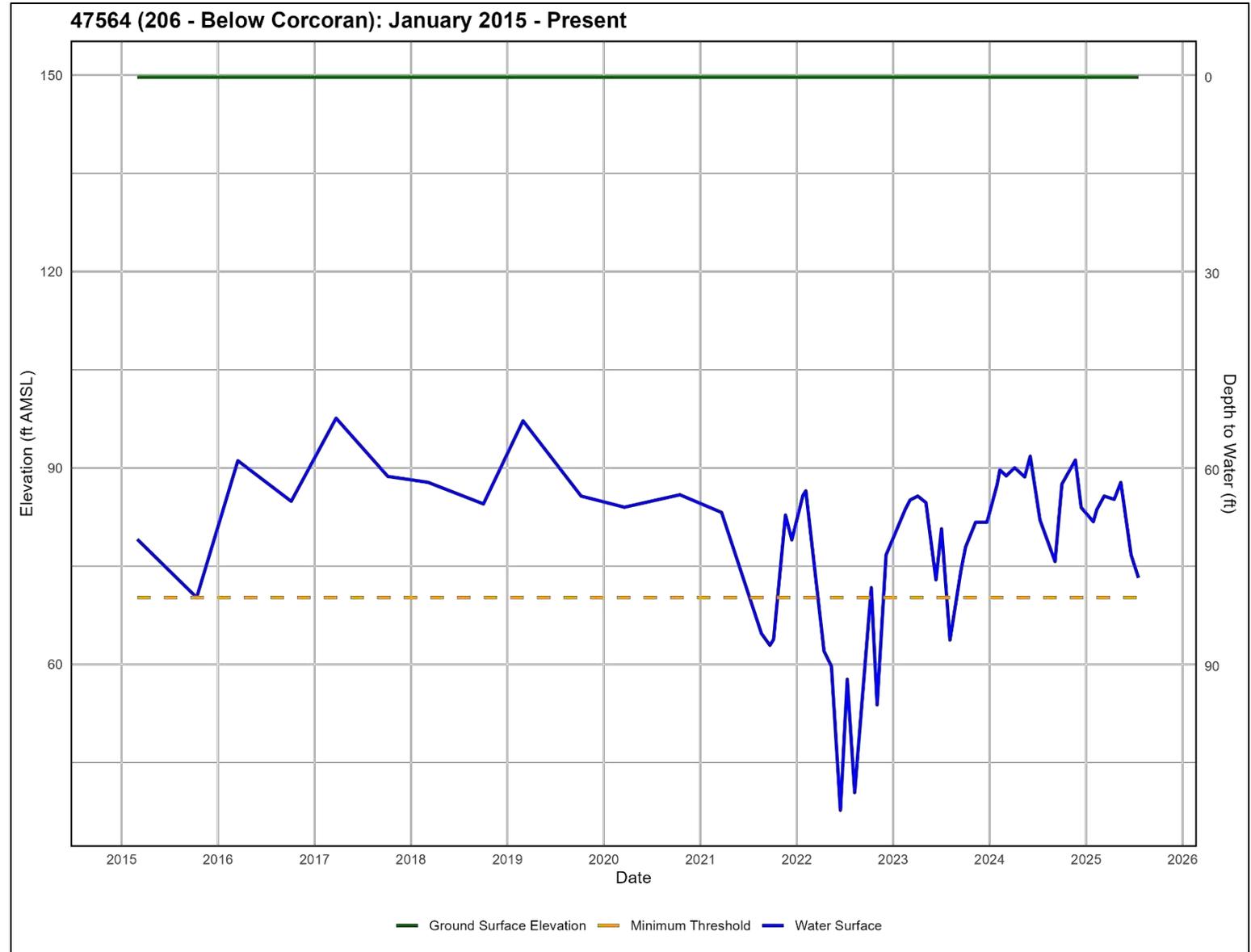
Principal Aquifer: Below



Station ID: 47564

Well Name: 206

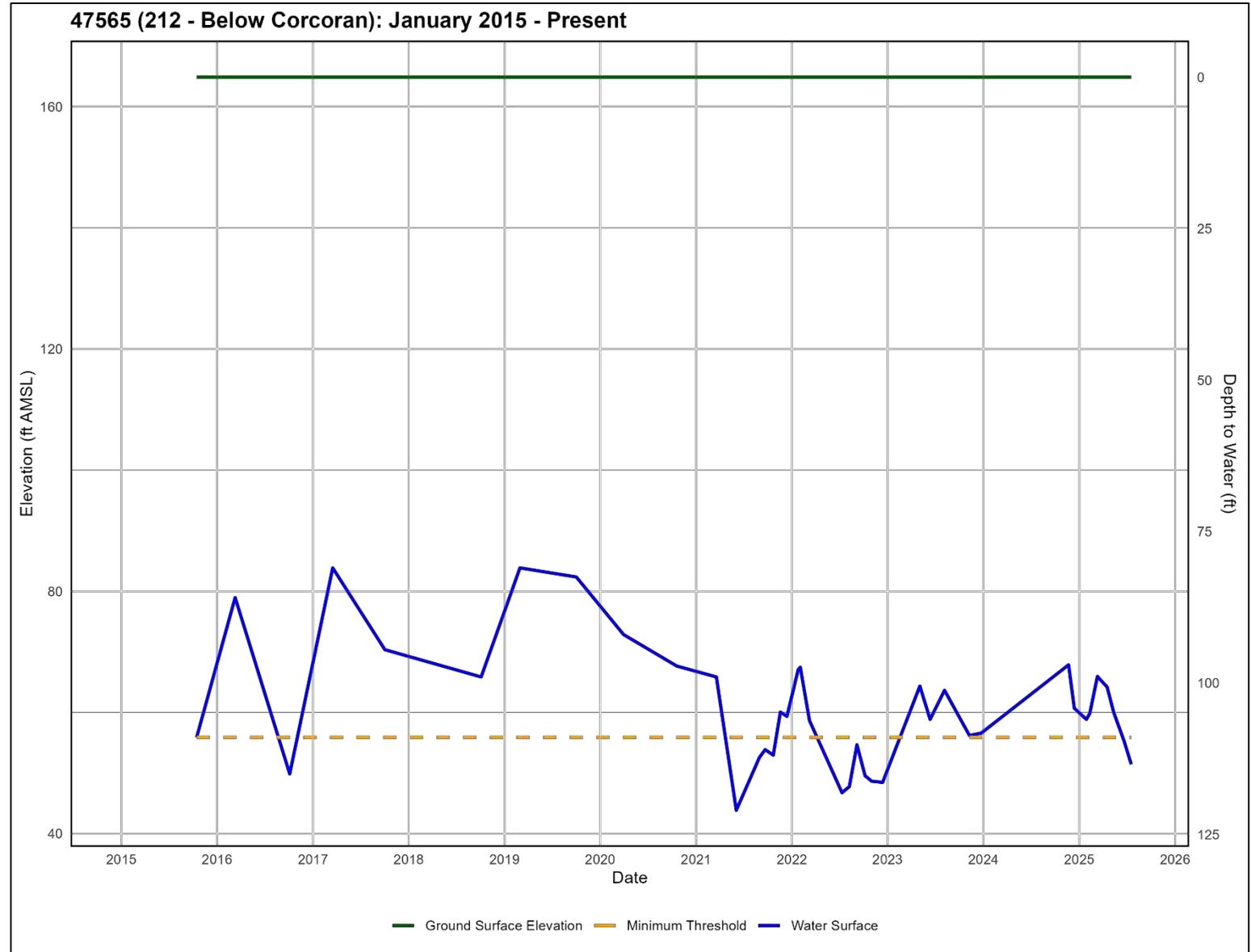
Principal Aquifer: Below



# Station ID: 47565

## Well Name: 212

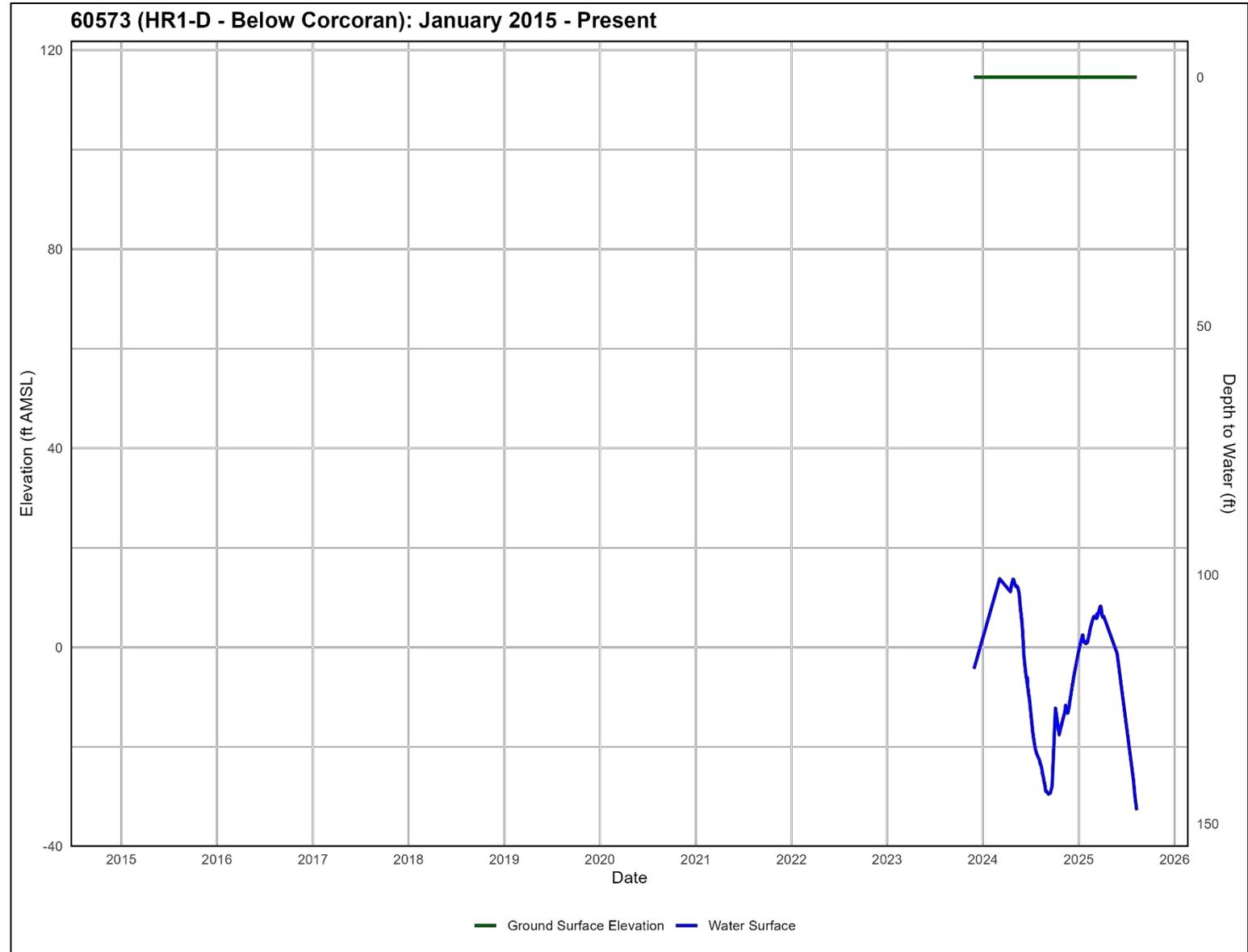
### Principal Aquifer: Below



Station ID: 60573

Well Name: HR1-D

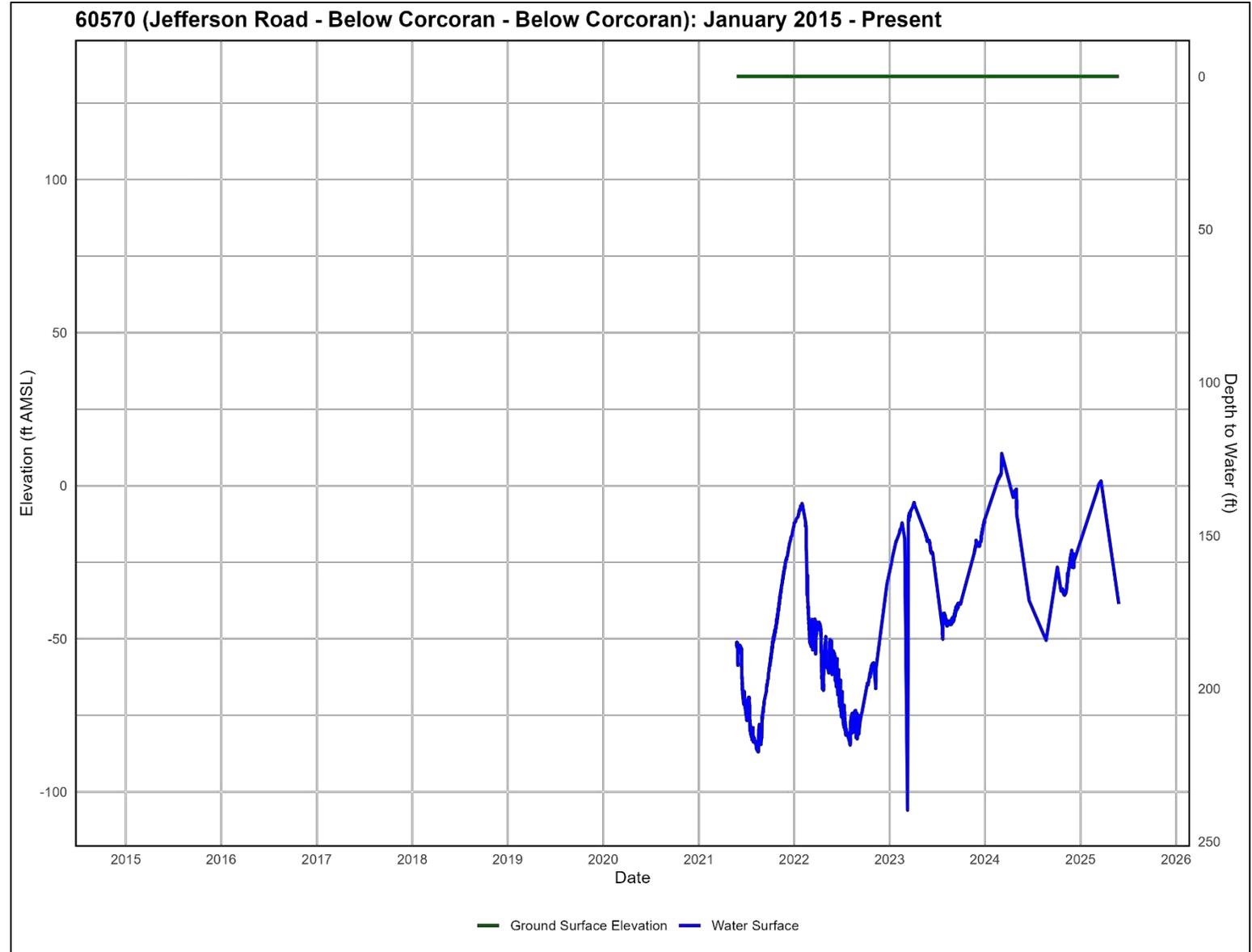
Principal Aquifer: Below



# Station ID: 60570

## Well Name: Jefferson Road – Below Corcoran

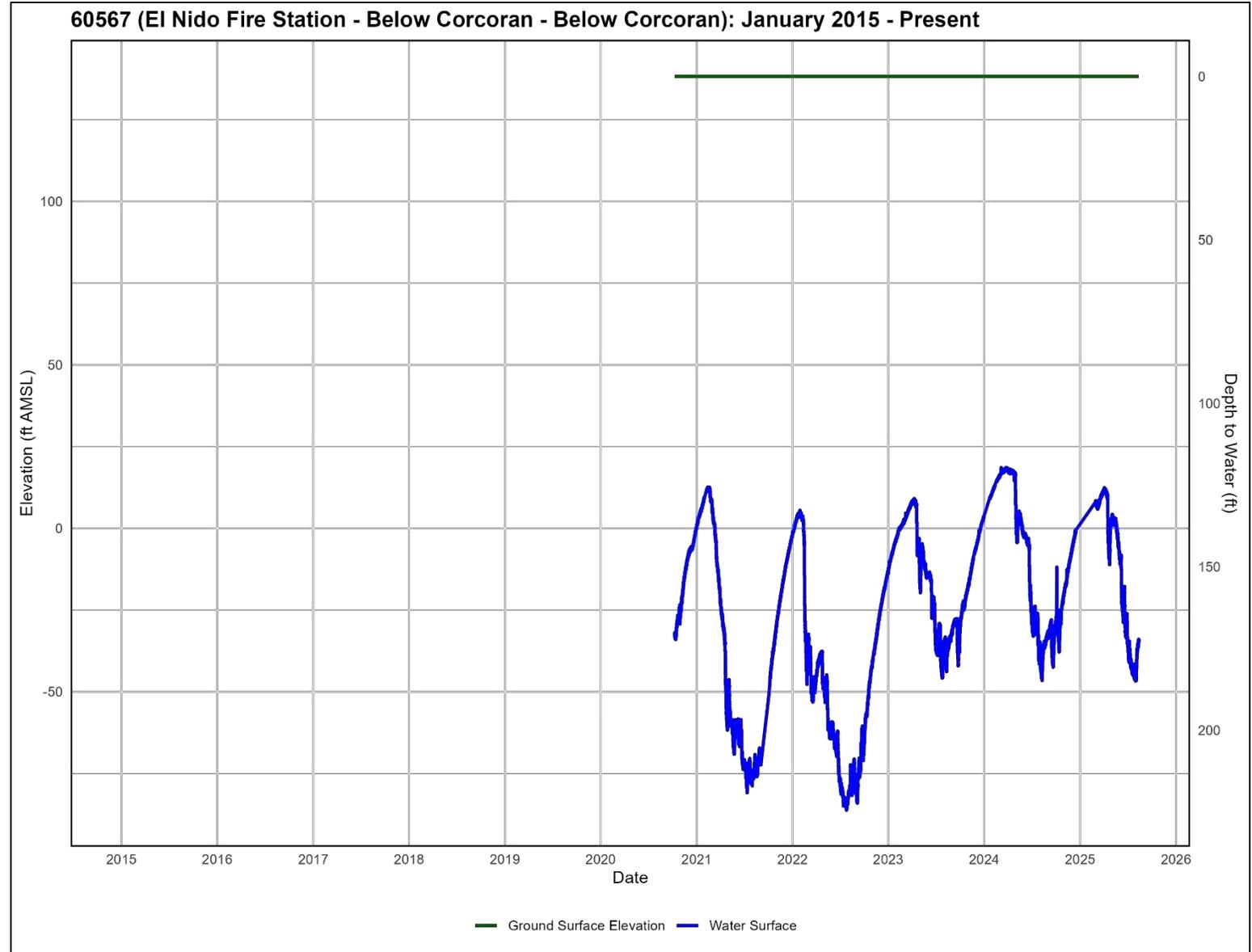
### Principal Aquifer: Below



# Station ID: 60567

## Well Name: El Nido Fire Station – Below Corcoran

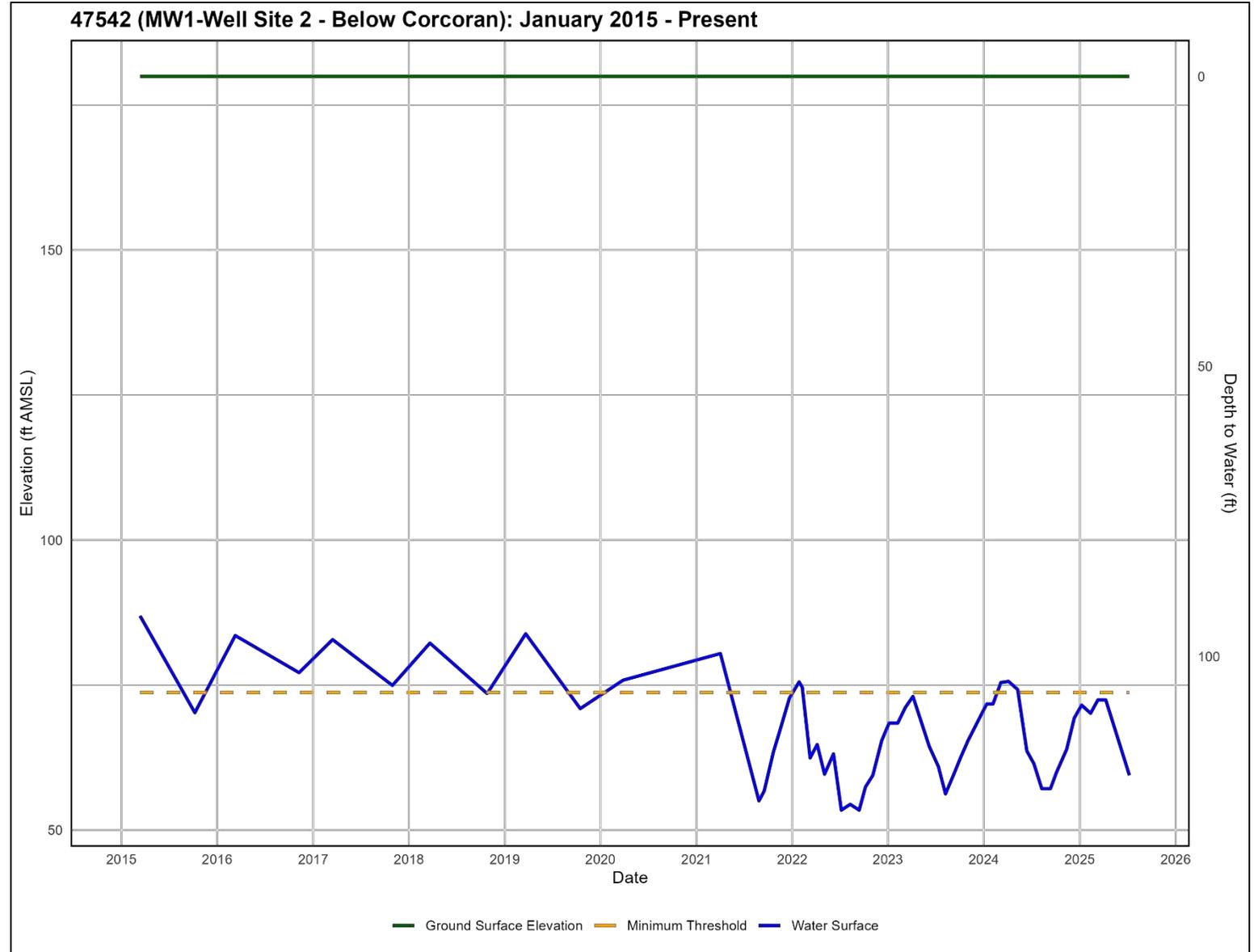
### Principal Aquifer: Below



# Station ID: 47542

## Well Name: MW1 – Well Site 2

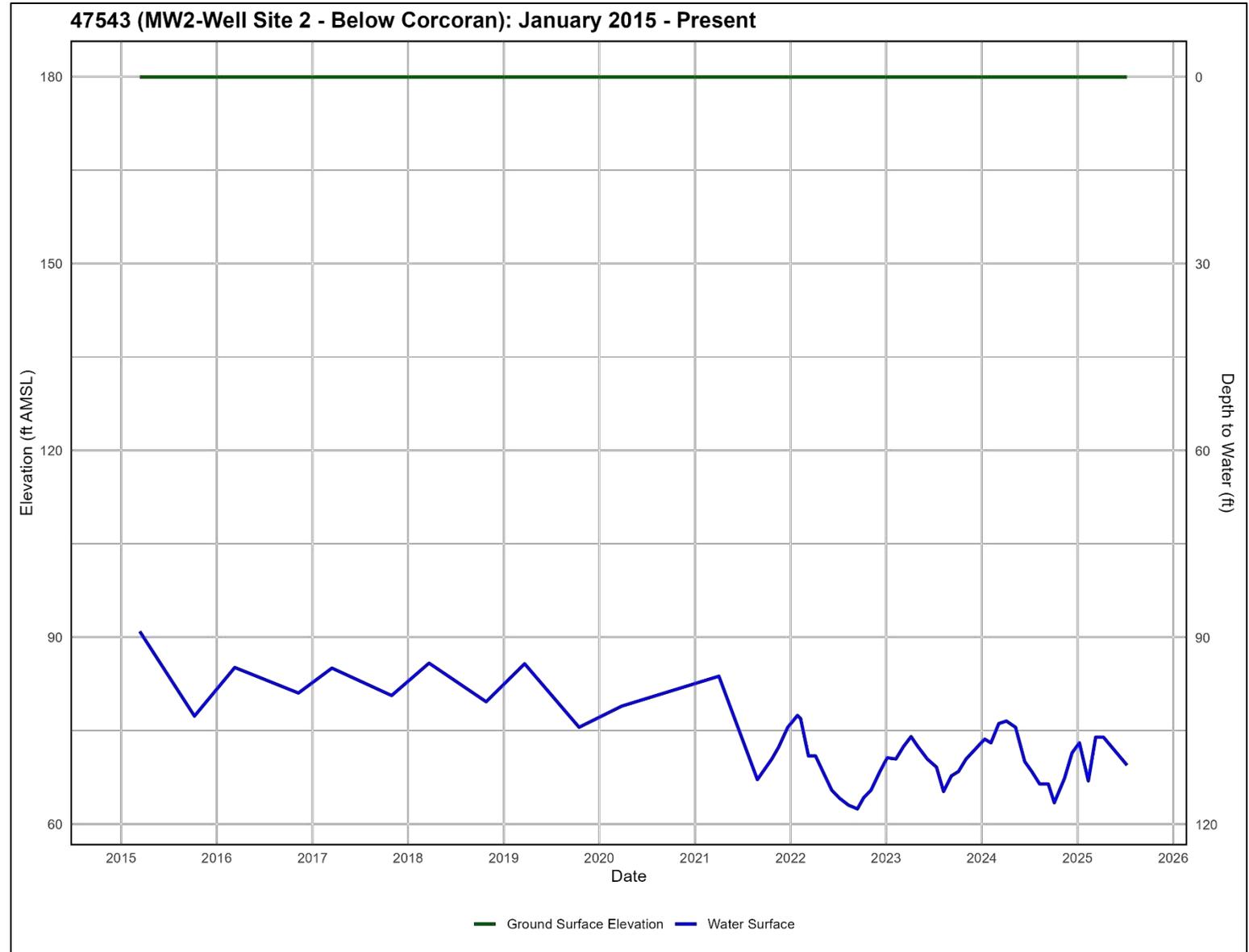
### Principal Aquifer: Below



# Station ID: 47543

## Well Name: MW2 – Well Site 2

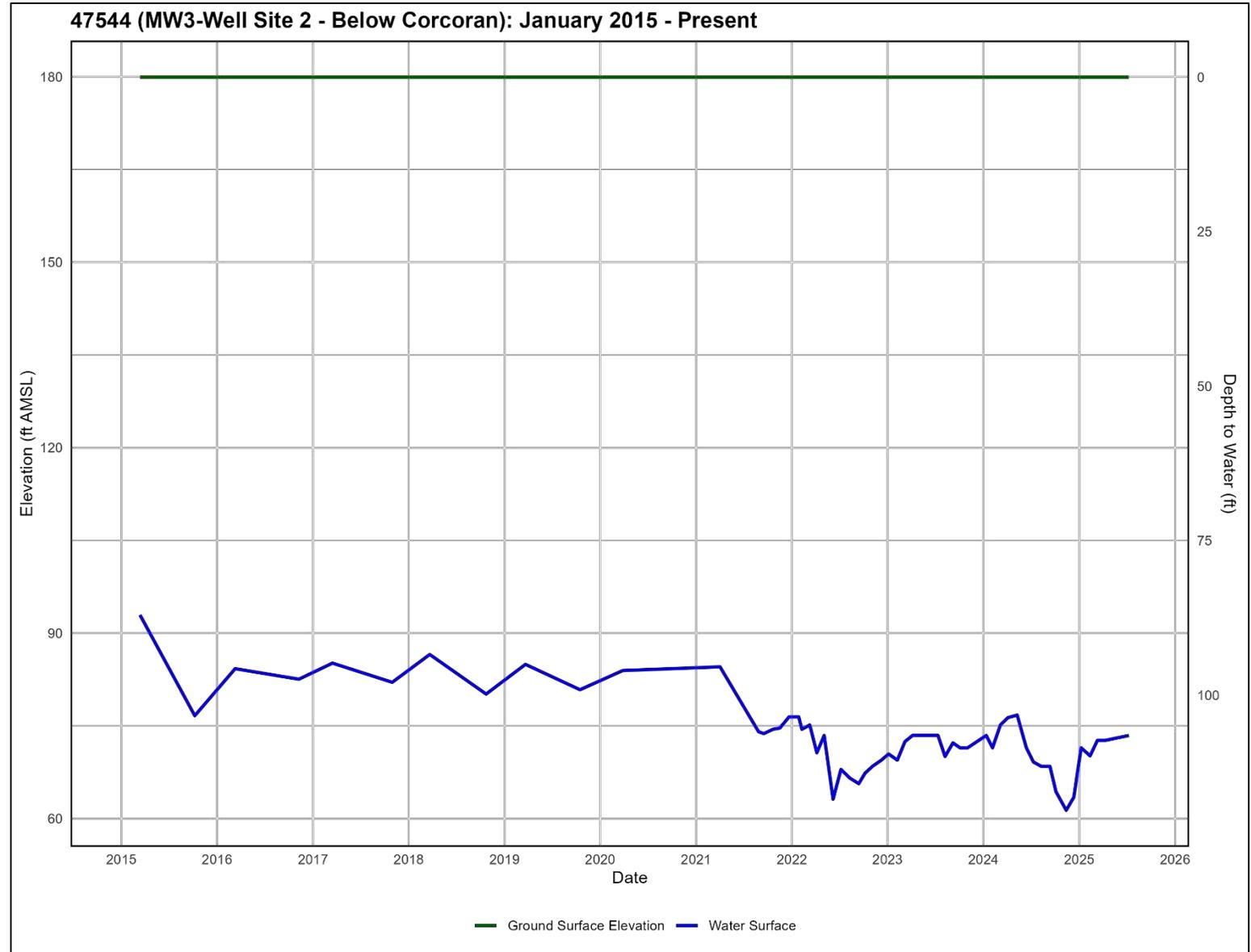
### Principal Aquifer: Below



# Station ID: 47544

## Well Name: MW3 – Well Site 2

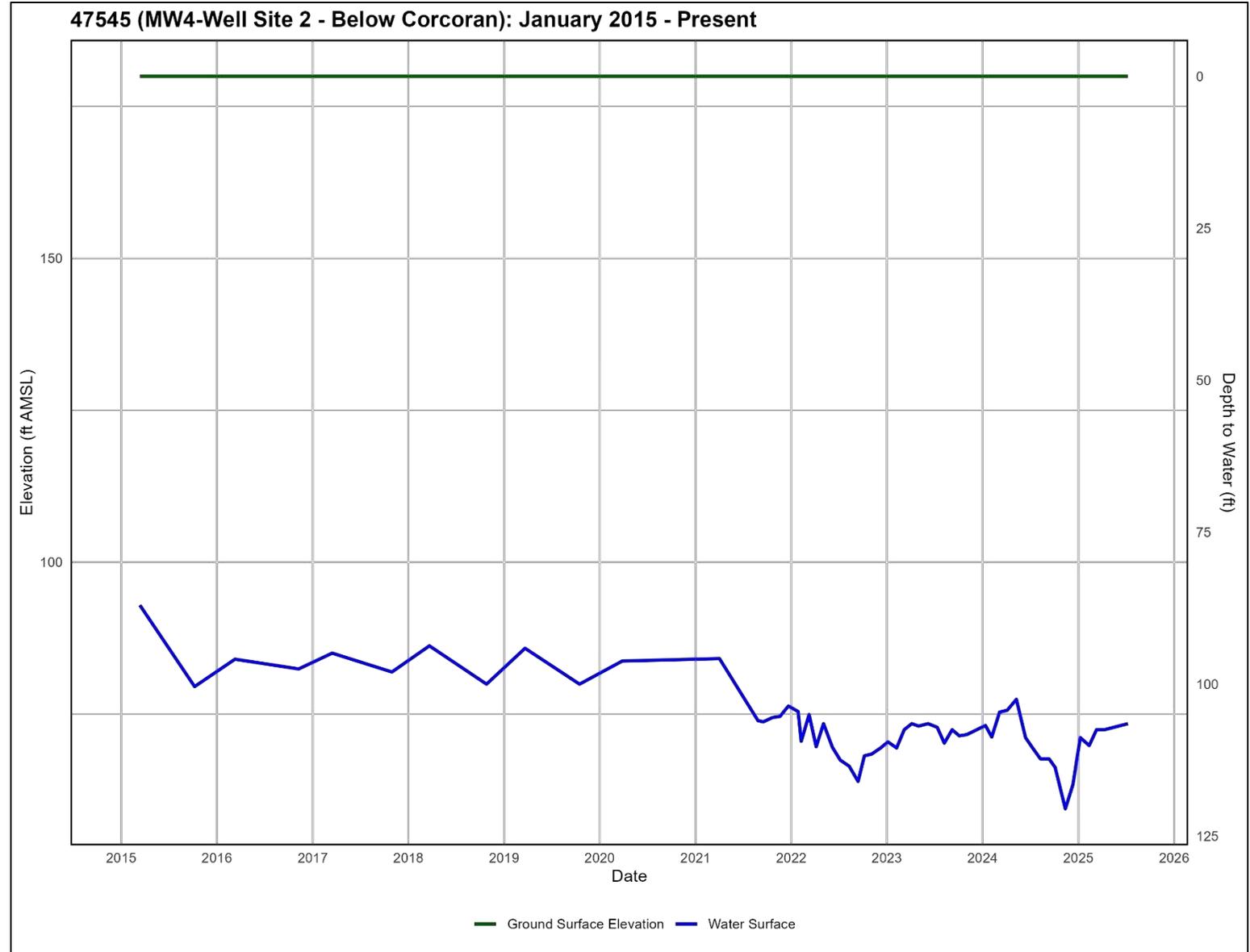
### Principal Aquifer: Below



# Station ID: 47545

## Well Name: MW4 – Well Site 2

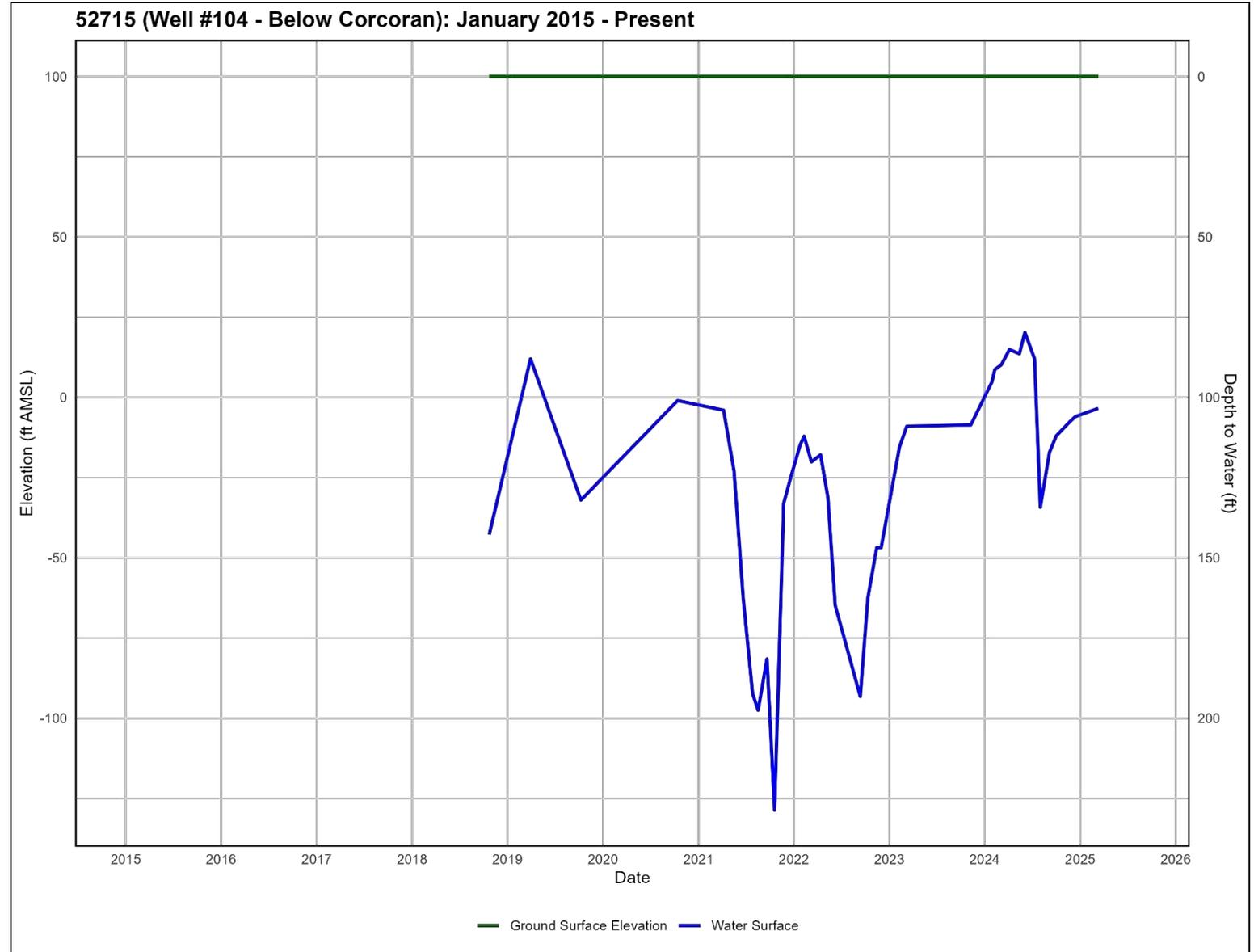
### Principal Aquifer: Below



Station ID: 52715

Well Name: Well #104

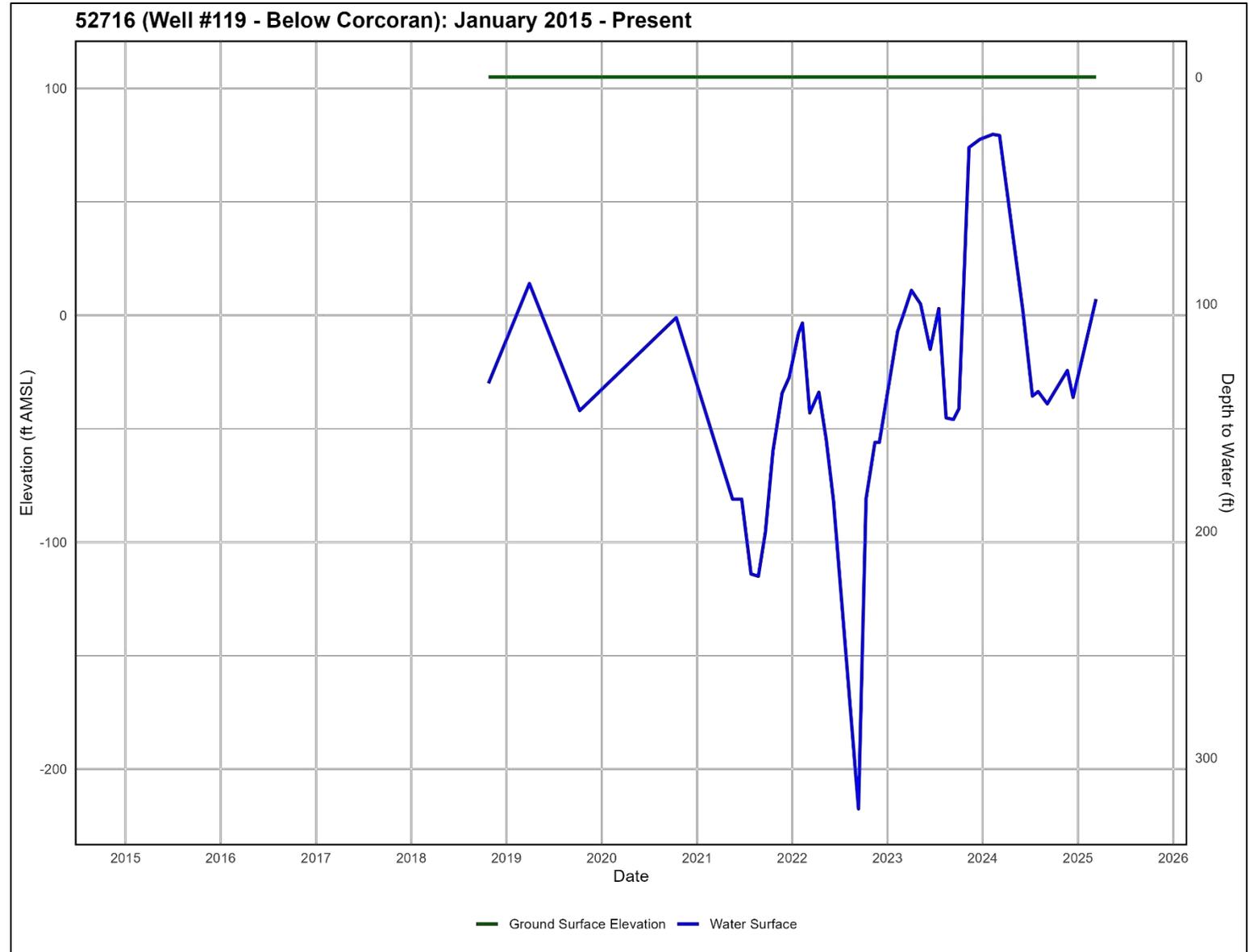
Principal Aquifer: Below



Station ID: 52716

Well Name: Well #119

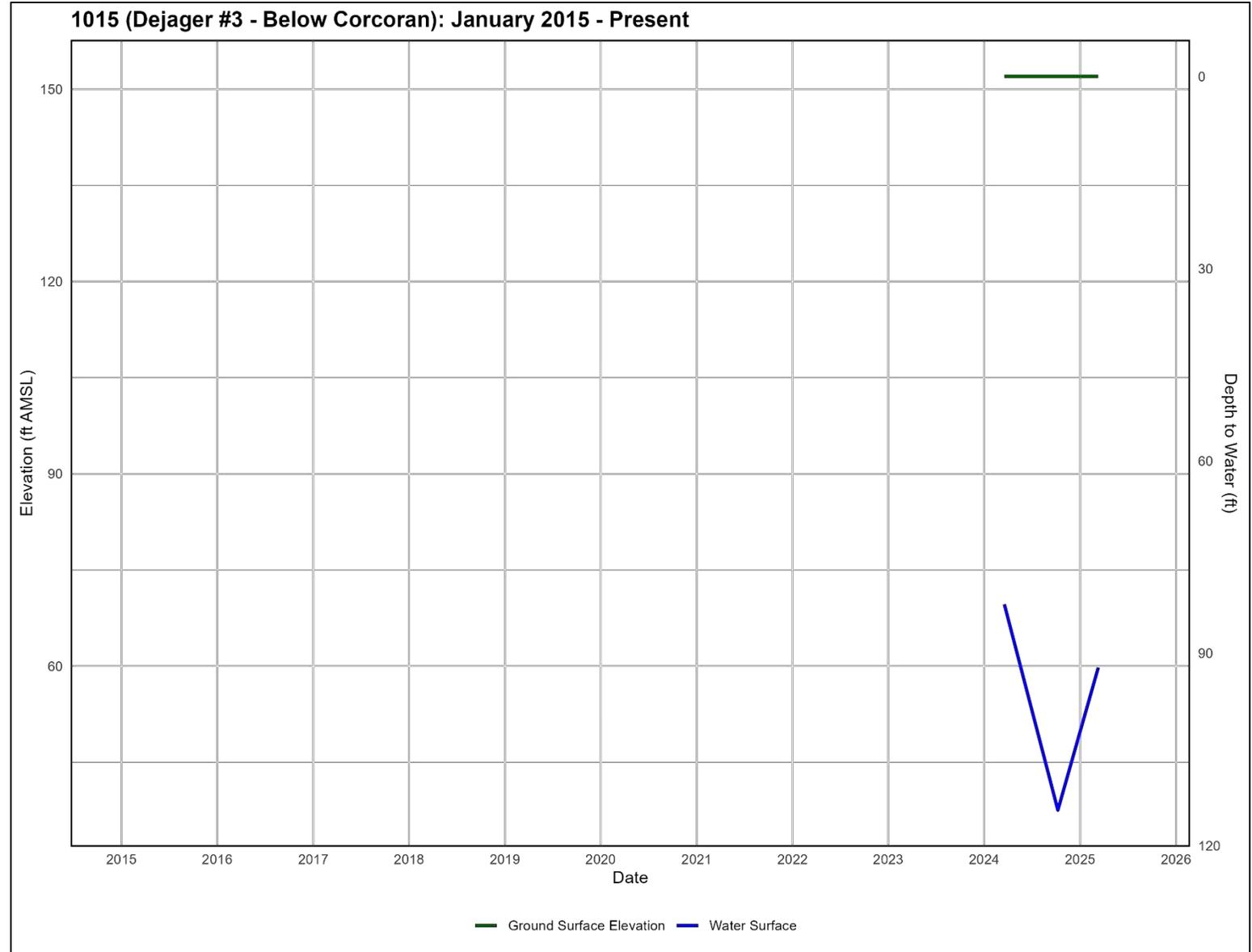
Principal Aquifer: Below



# Station ID: 1015

## Well Name: Dejager #3

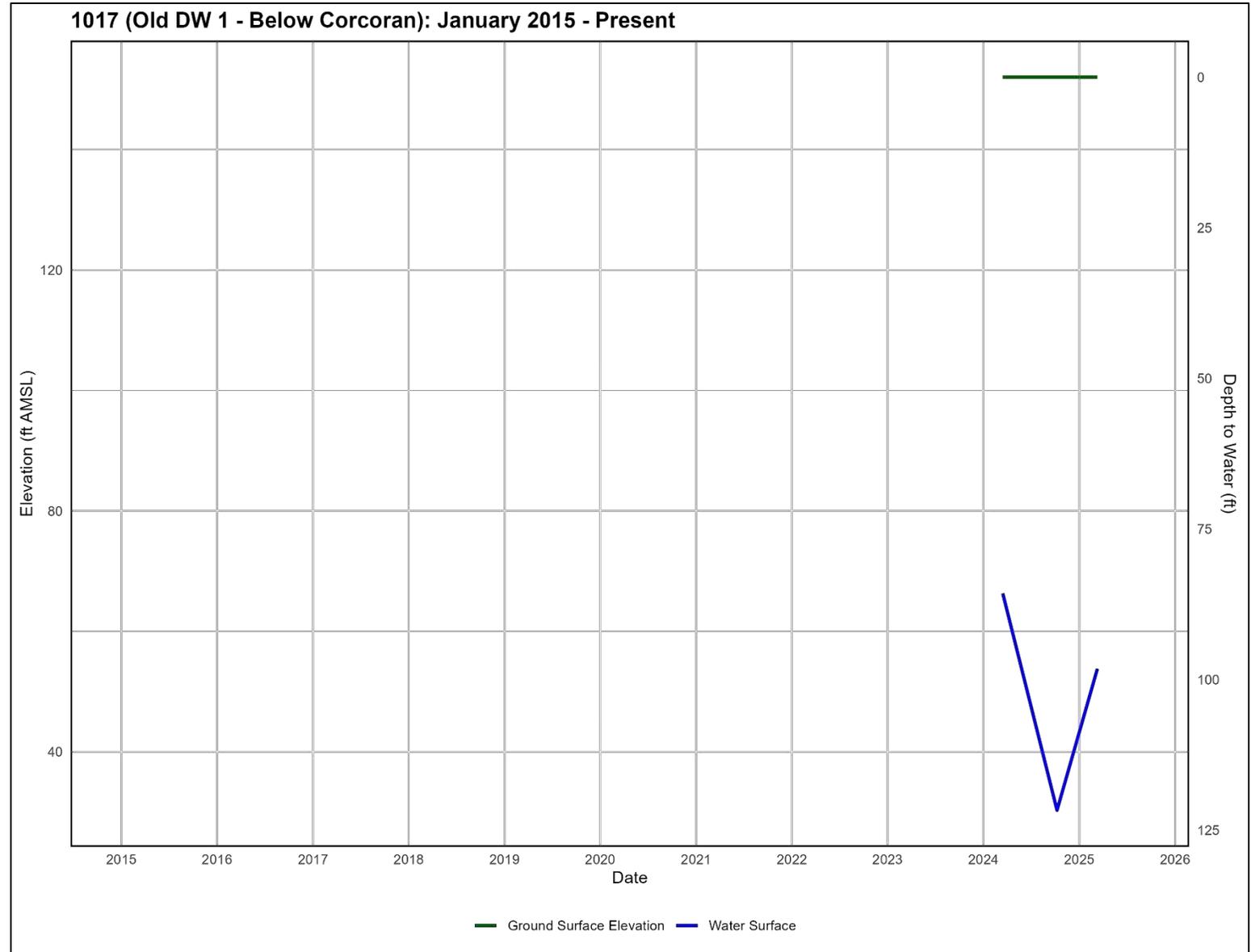
### Principal Aquifer: Below



# Station ID: 1017

## Well Name: Old DW 1

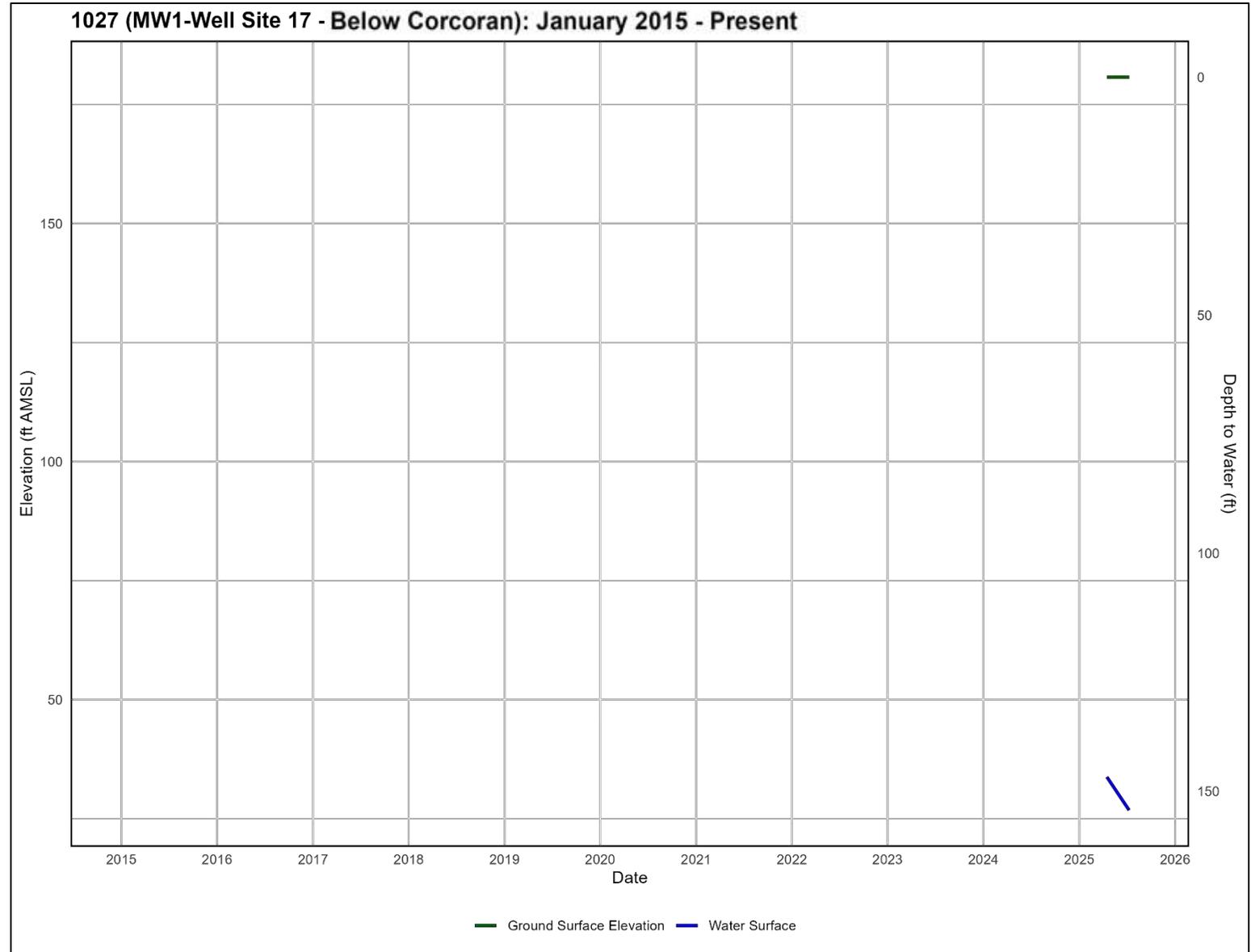
### Principal Aquifer: Below



Station ID: 1027

Well Name: DW #2

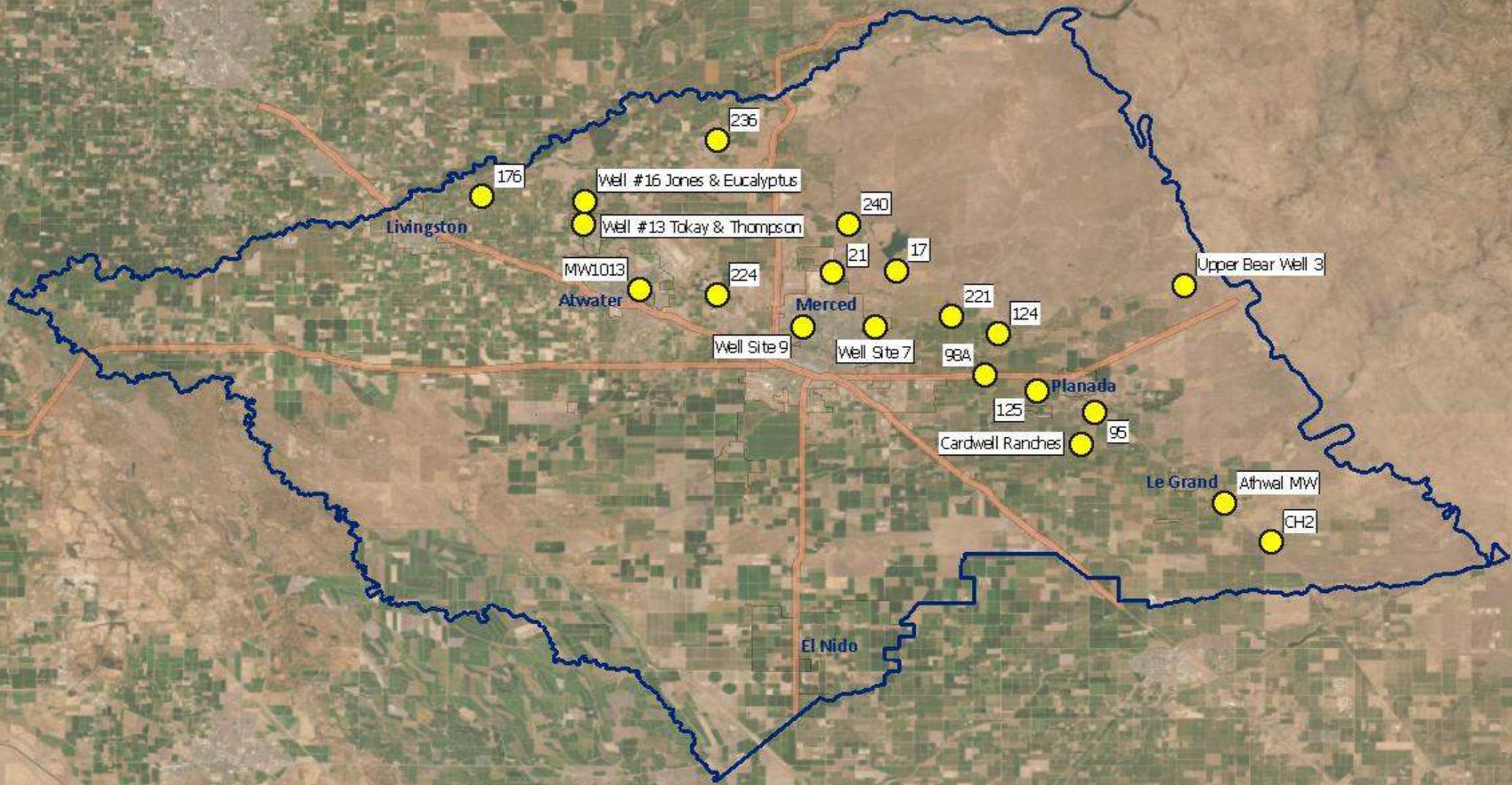
Principal Aquifer: Below



# Merced Groundwater Subbasin Monitoring Network

● Outside Corcoran Clay

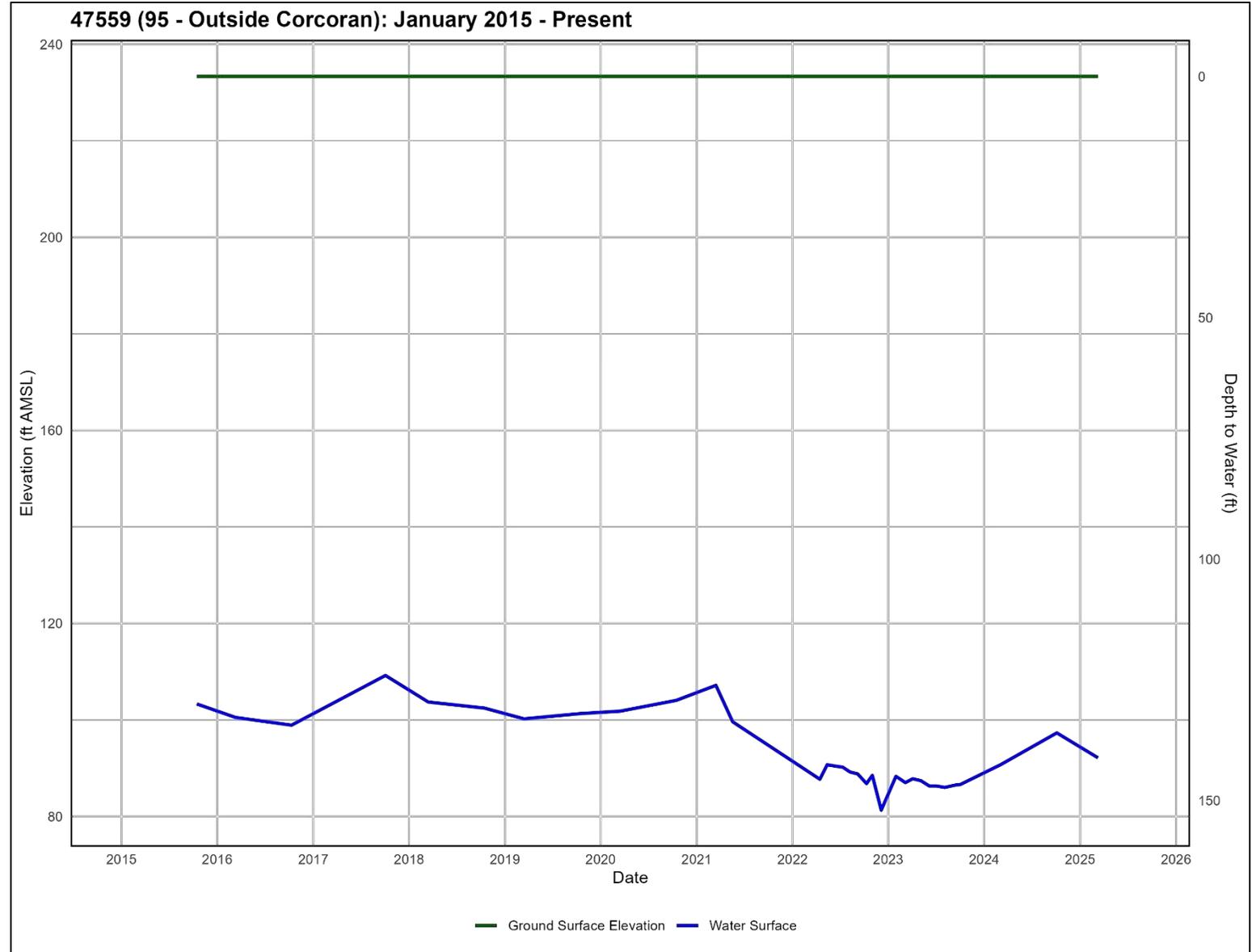
0 5 Miles



Station ID: 47559

Well Name: 95

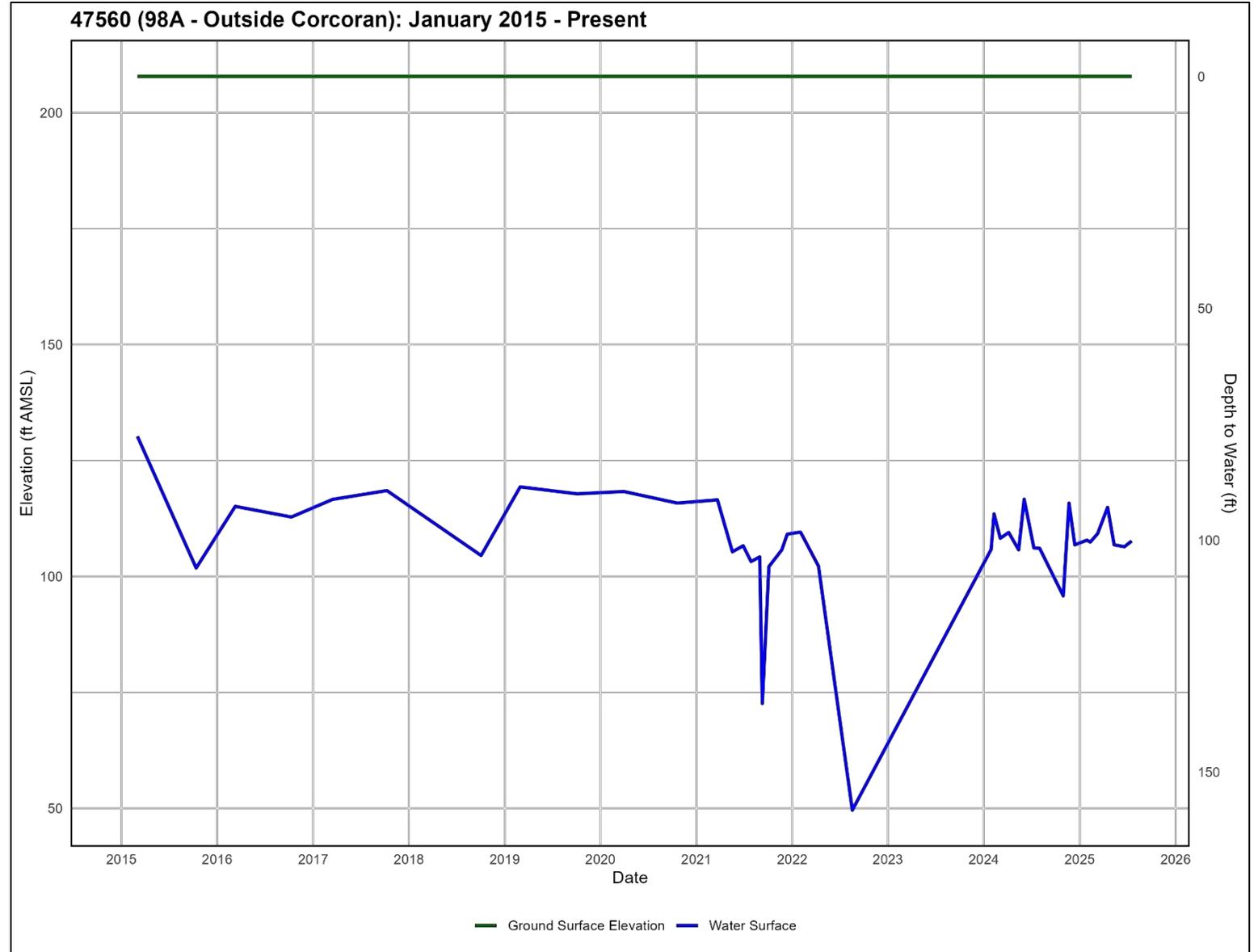
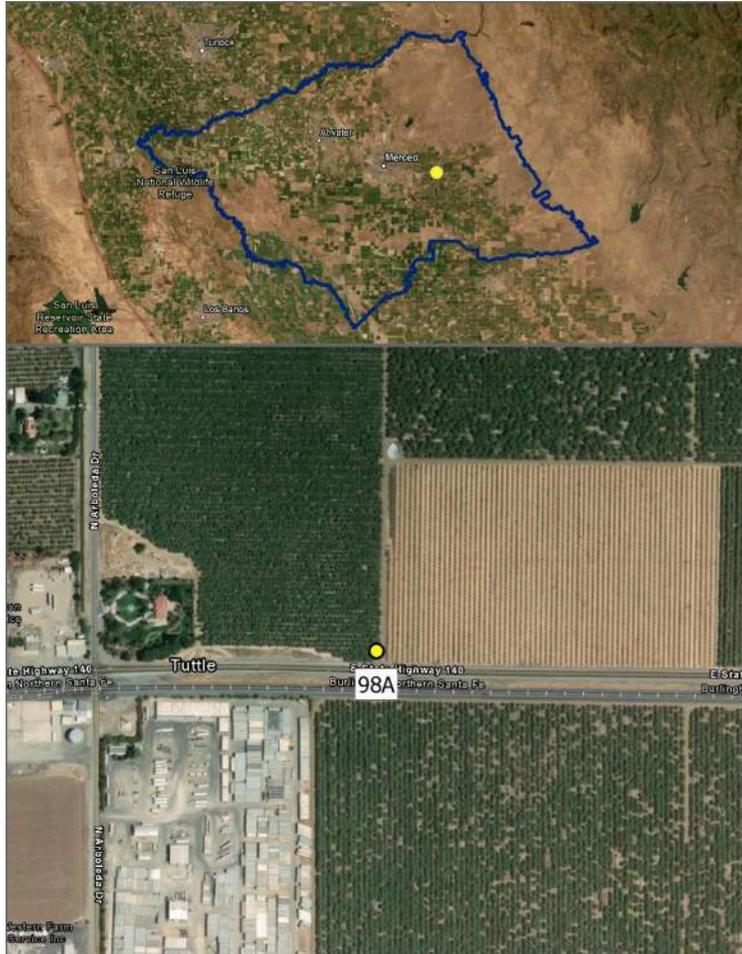
Principal Aquifer: Outside



Station ID: 47560

Well Name: 98A

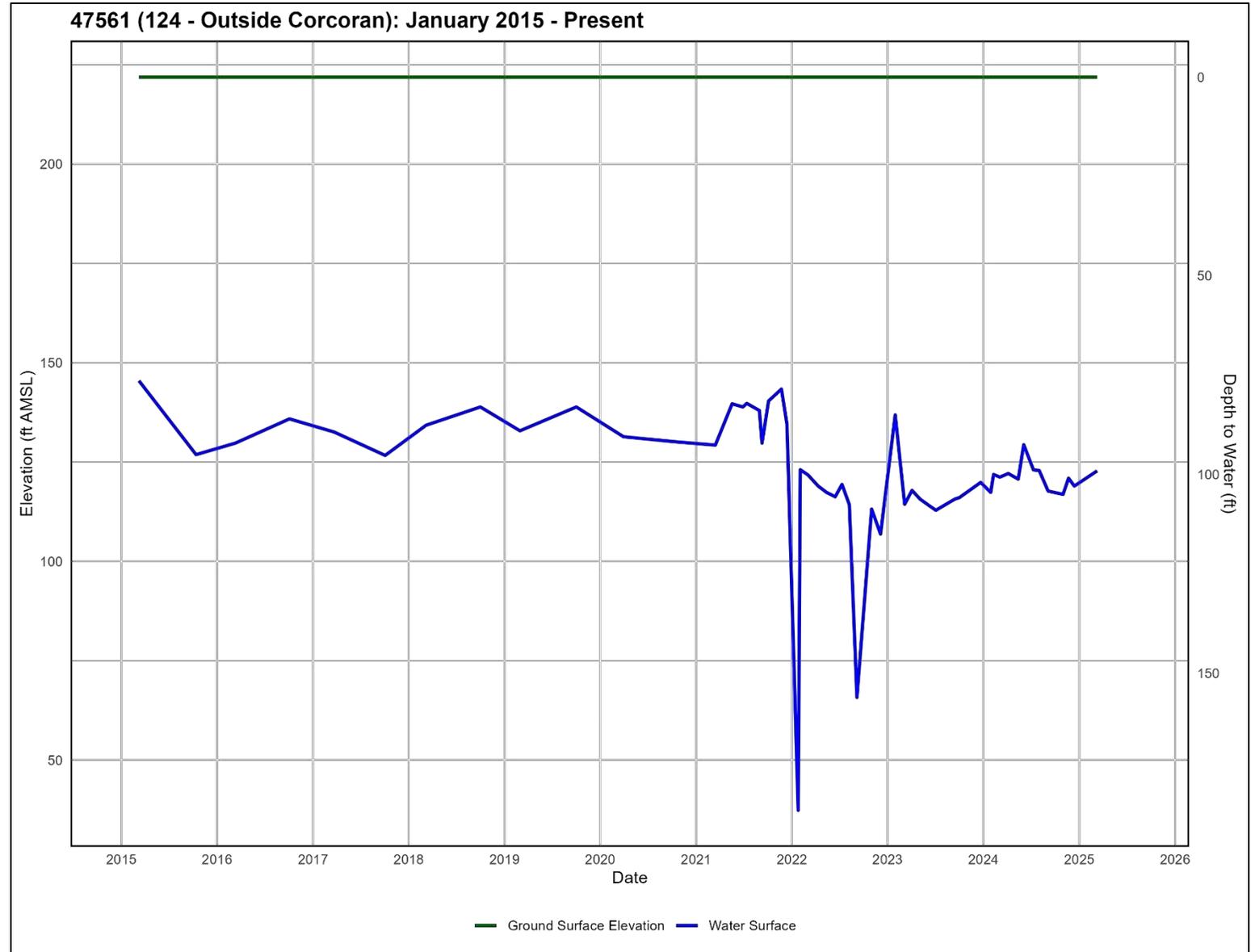
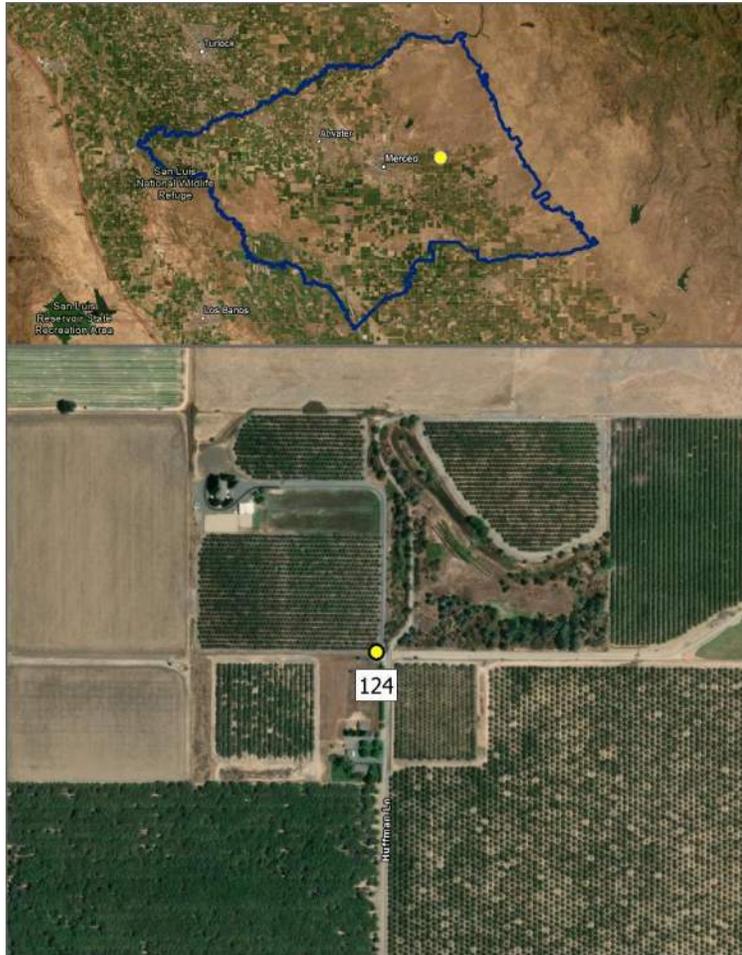
Principal Aquifer: Outside



Station ID: 47561

Well Name: 124

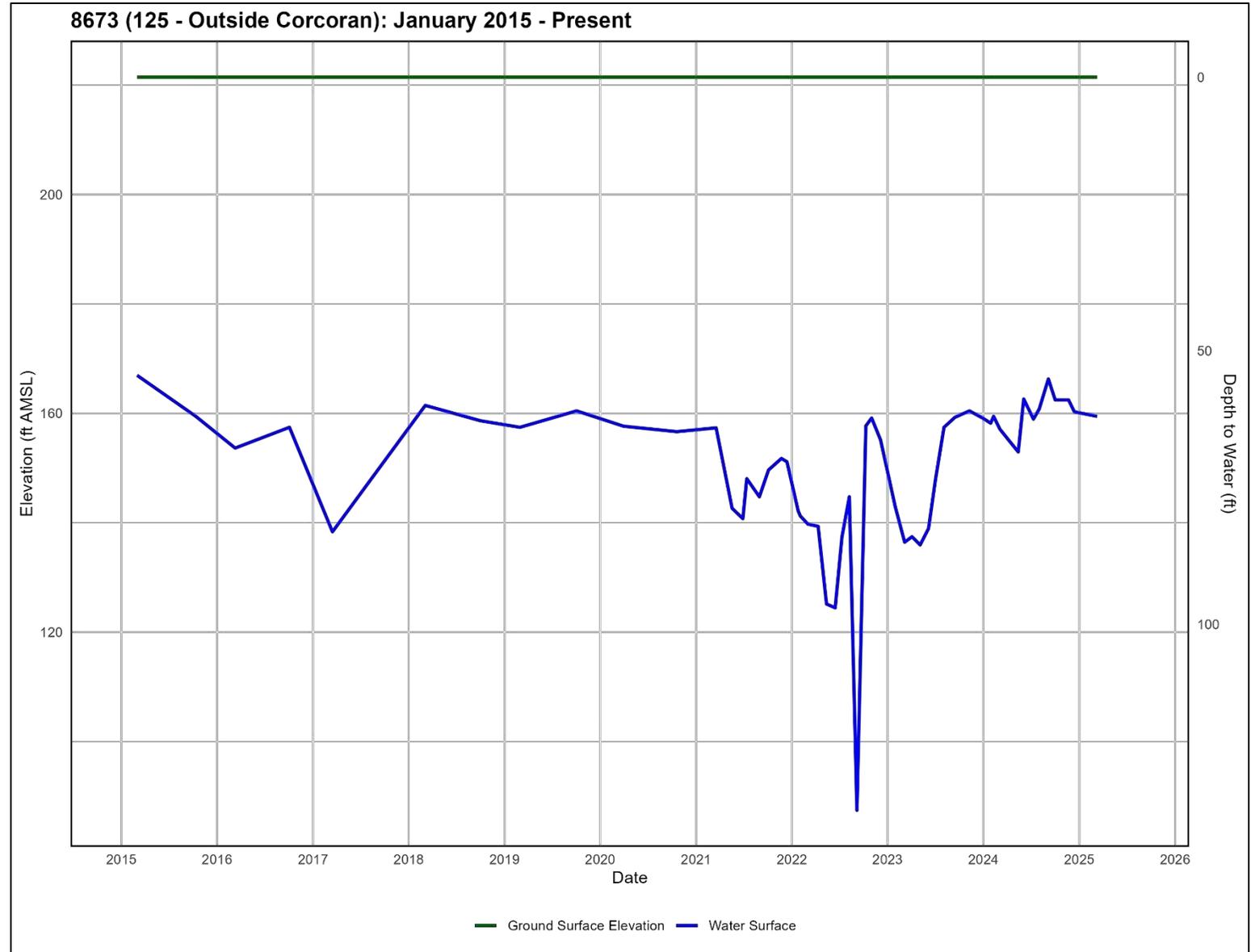
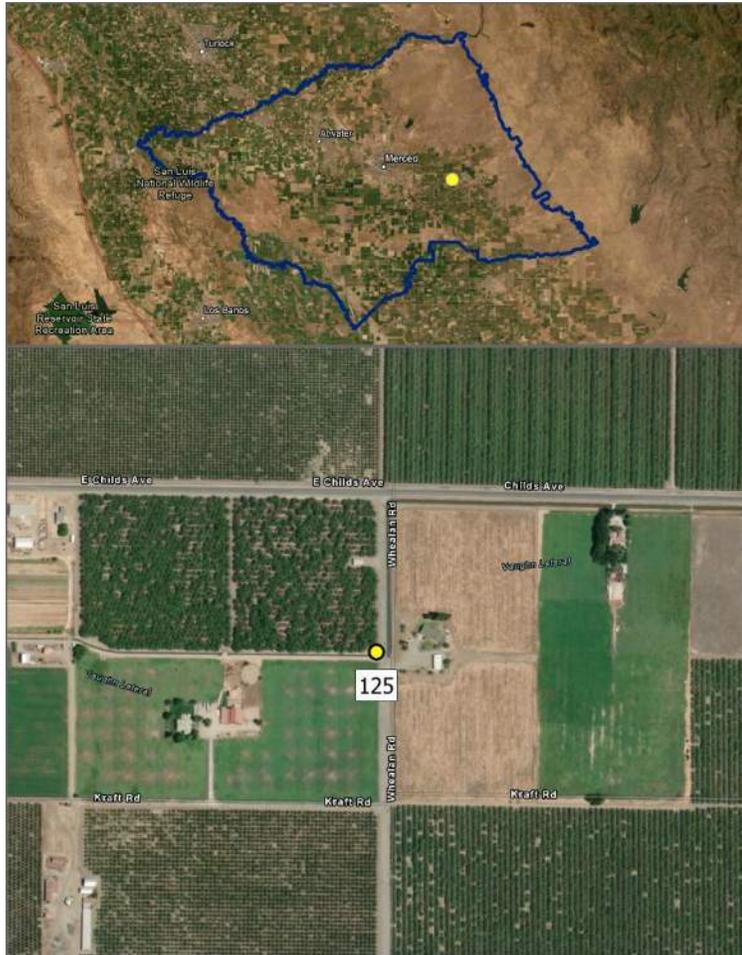
Principal Aquifer: Outside



Station ID: 8673

Well Name: 125

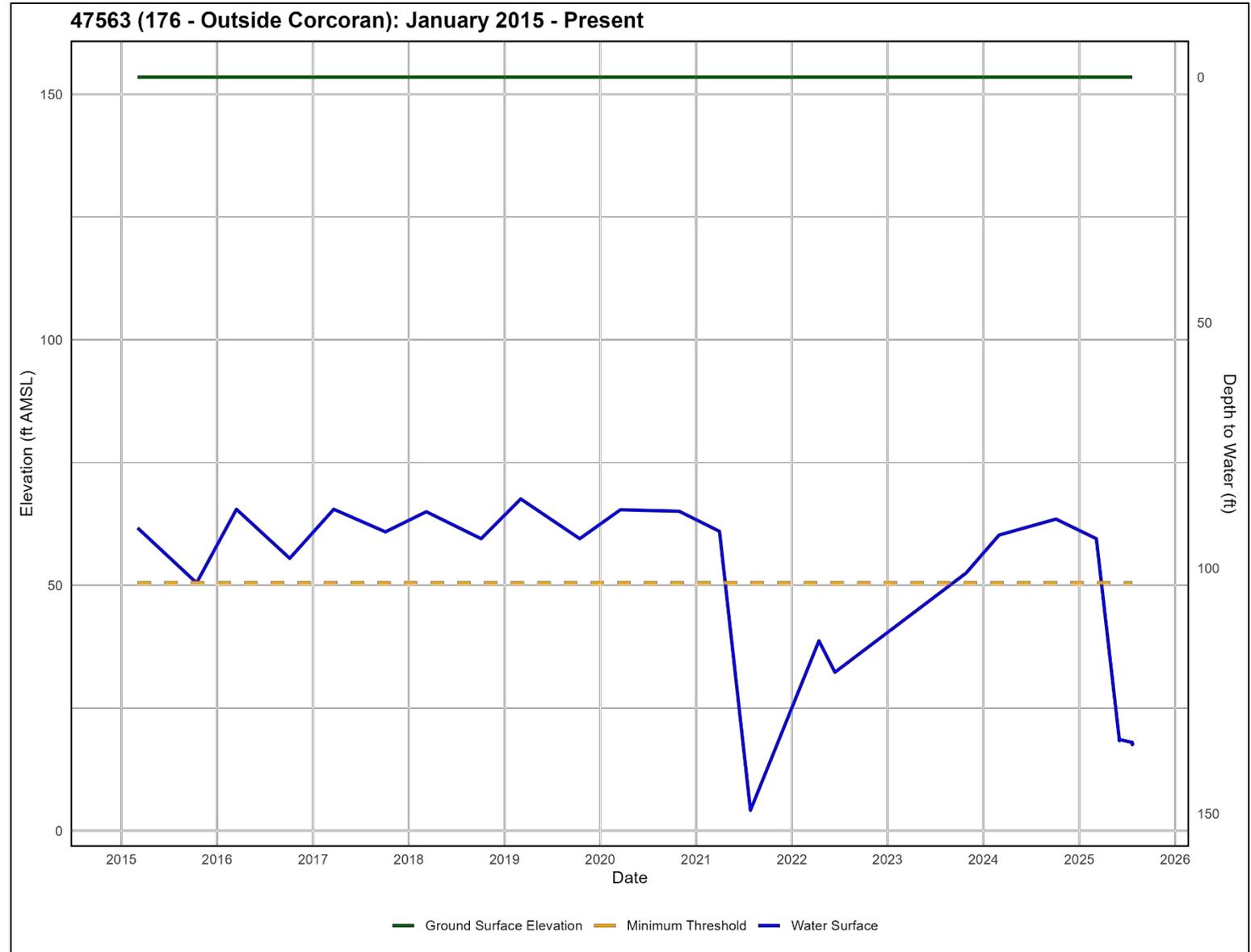
Principal Aquifer: Outside



# Station ID: 47563

## Well Name: 176

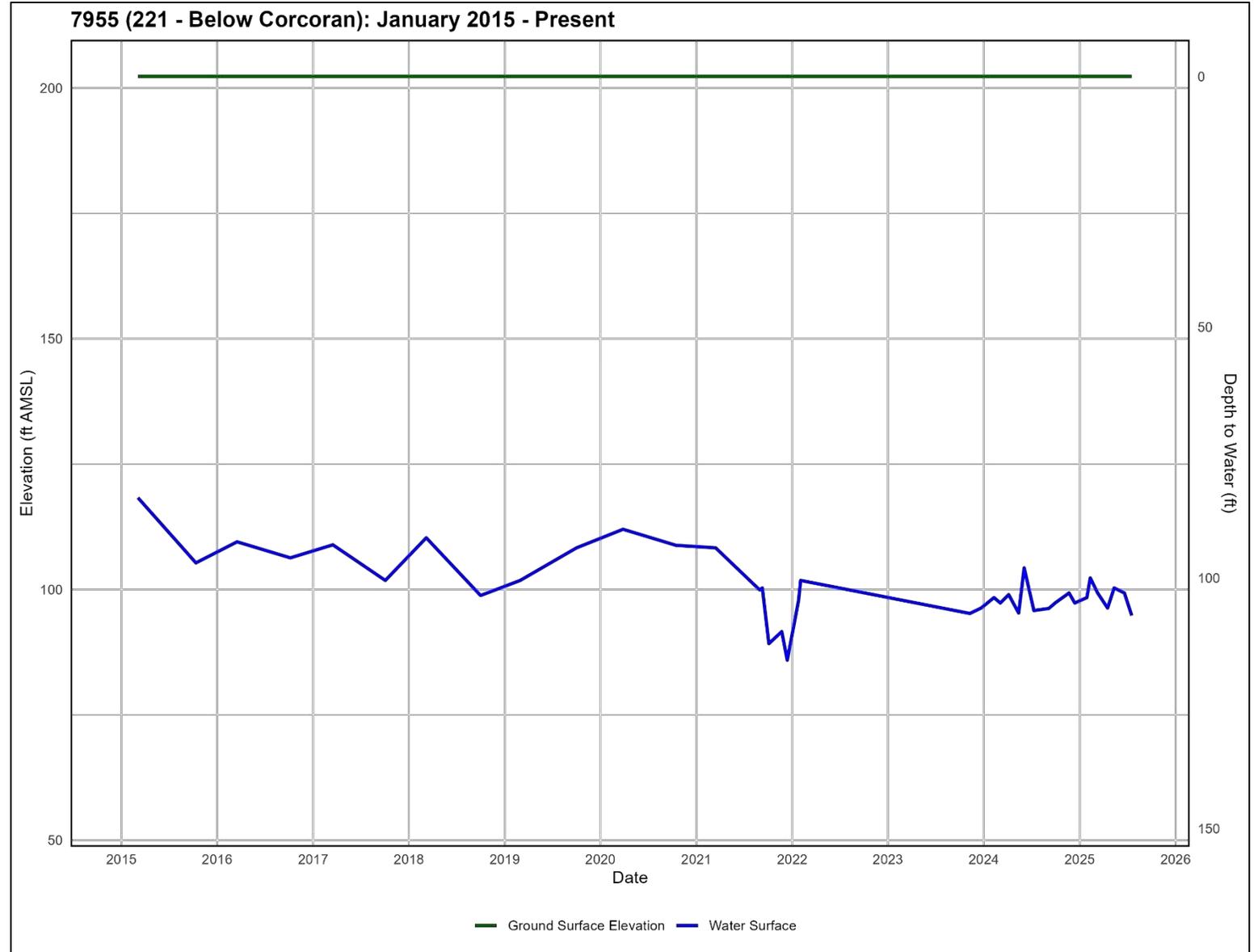
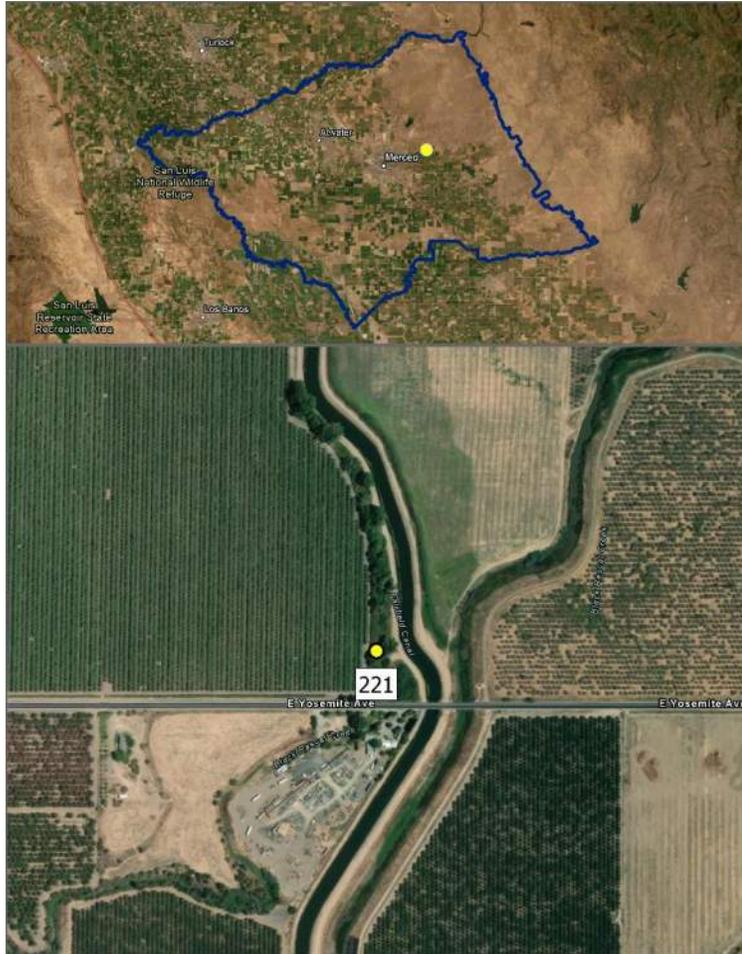
### Principal Aquifer: Outside



Station ID: 7955

Well Name: 221

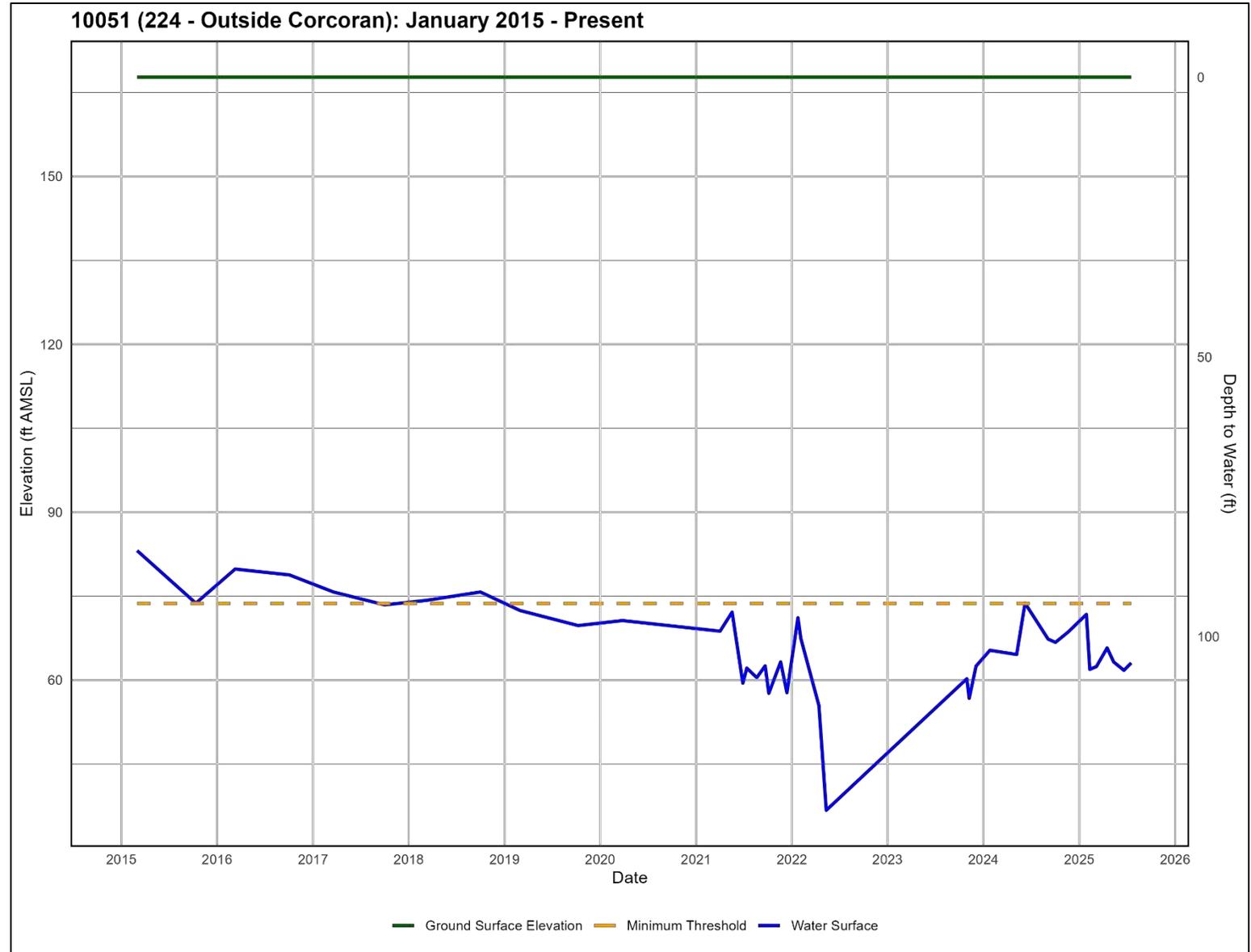
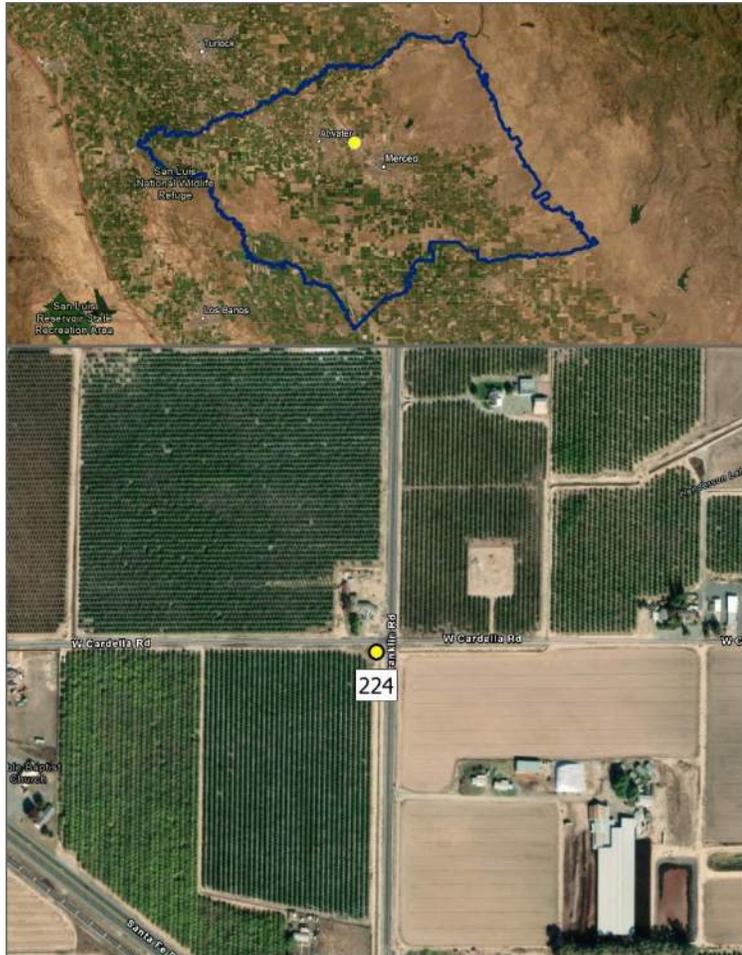
Principal Aquifer: Outside



Station ID: 10051

Well Name: 224

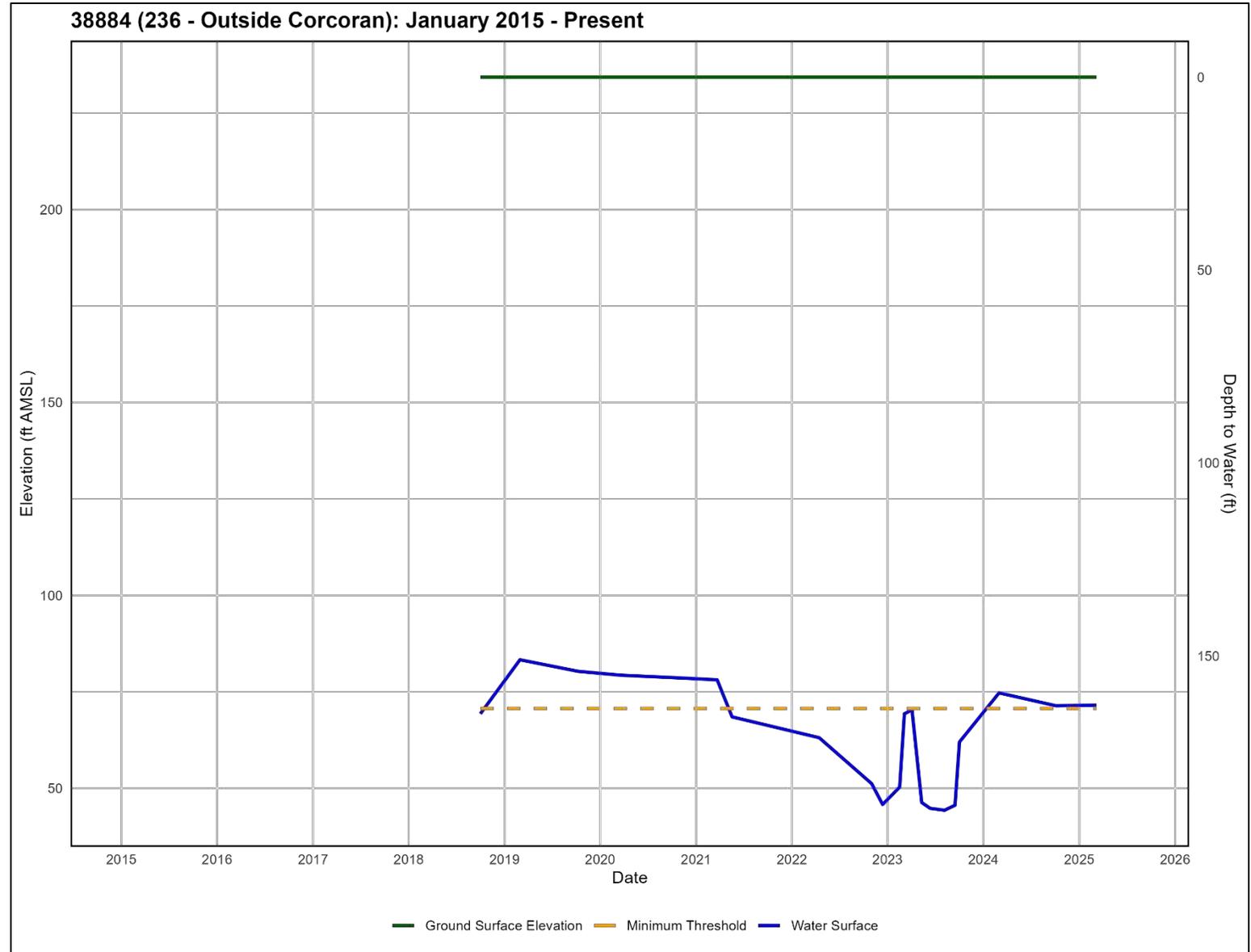
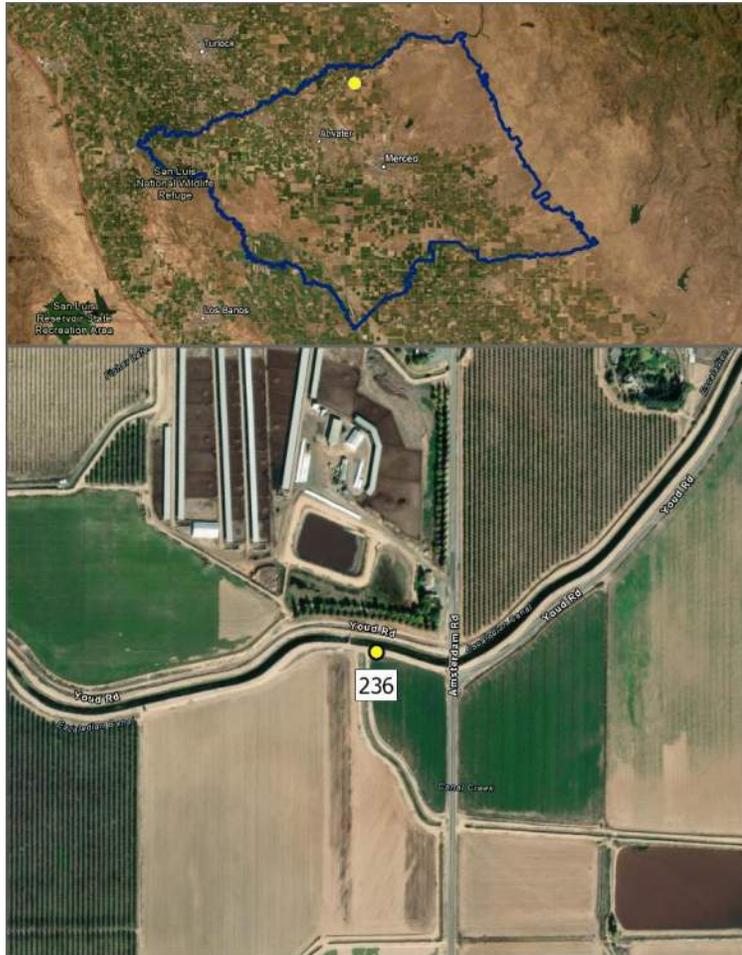
Principal Aquifer: Outside



Station ID: 38884

Well Name: 236

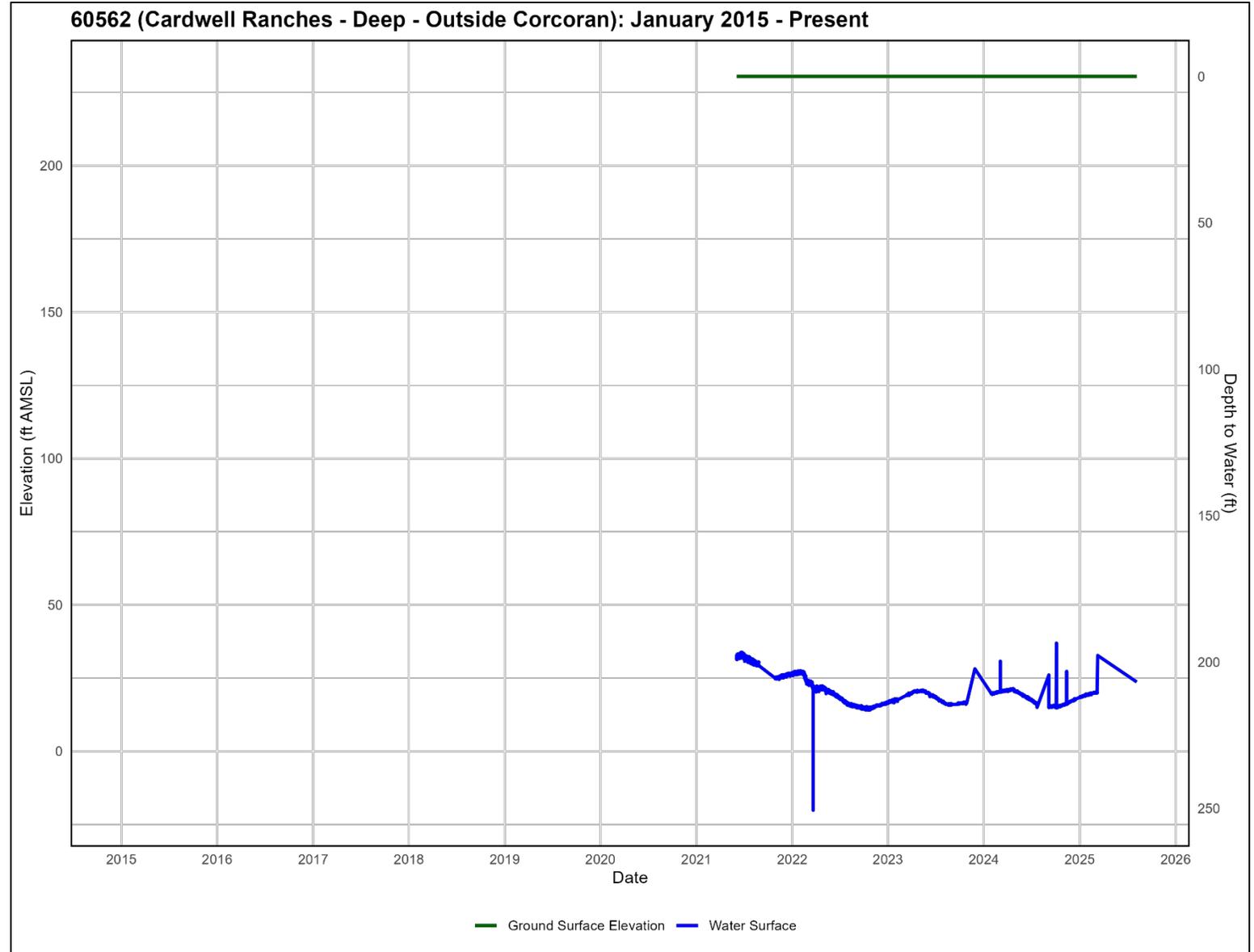
Principal Aquifer: Outside



# Station ID: 60562

## Well Name: Cardwell Ranches – Deep

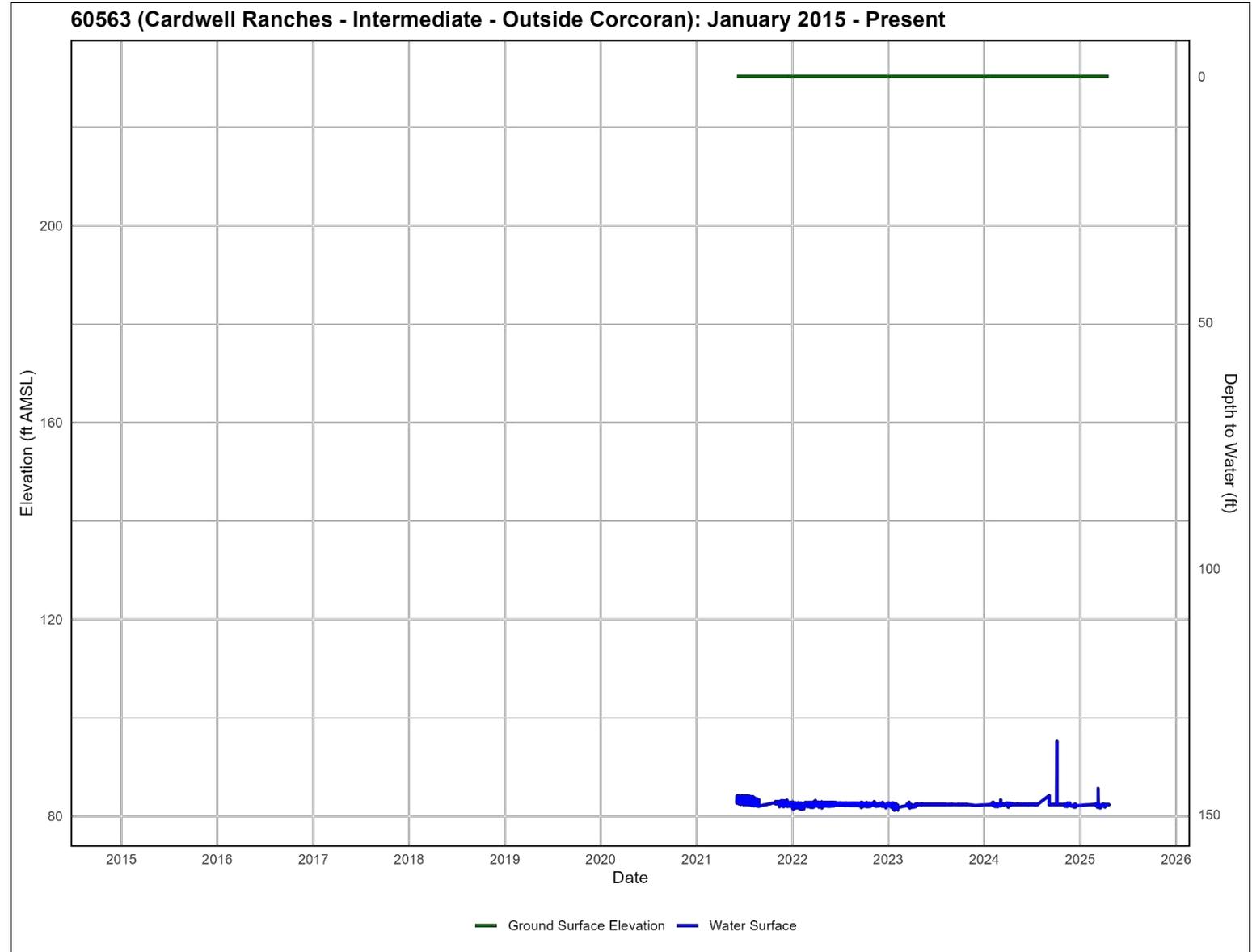
### Principal Aquifer: Outside



# Station ID: 60563

## Well Name: Cardwell Ranches – Intermediate

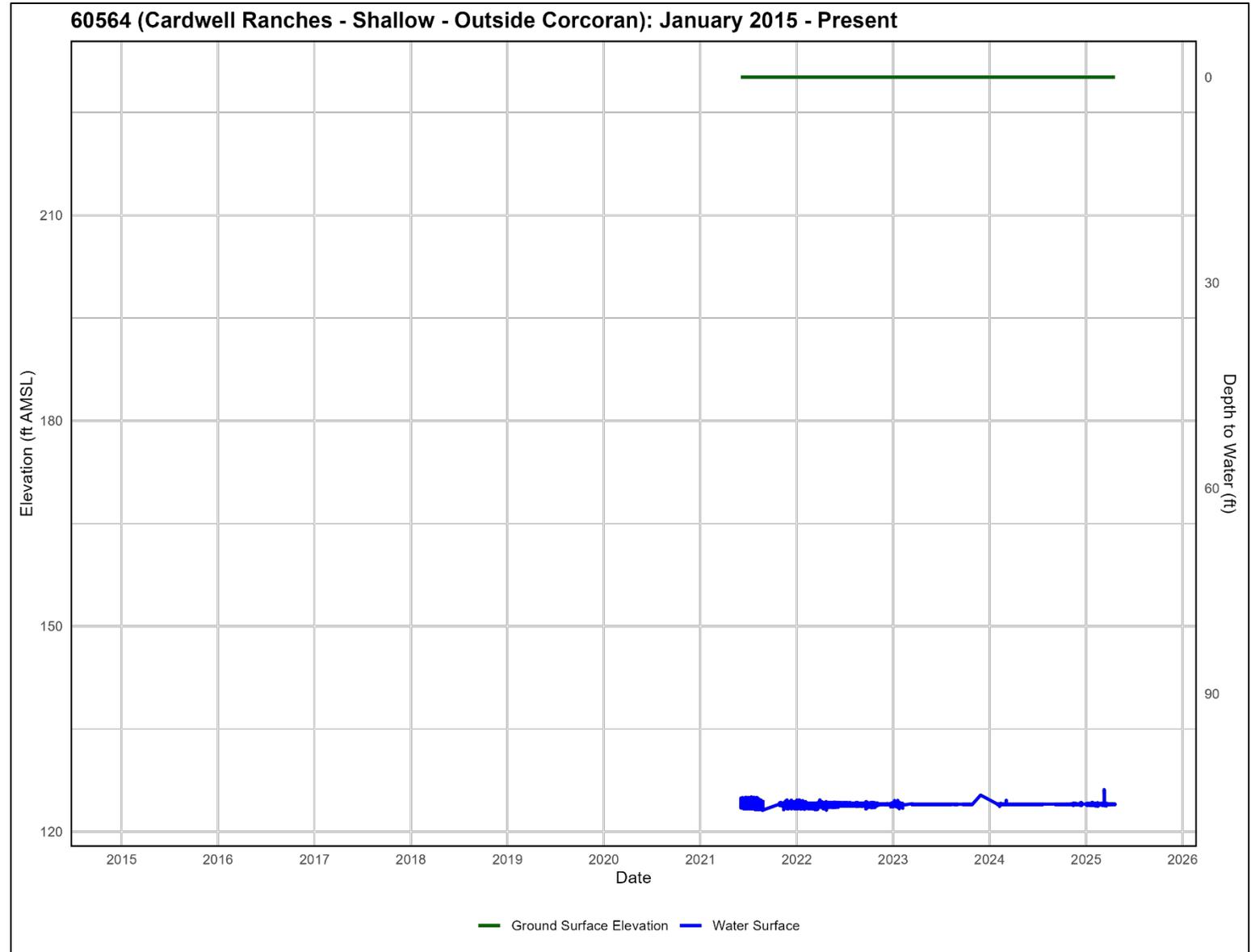
### Principal Aquifer: Outside



# Station ID: 60564

## Well Name: Cardwell Ranches - Shallow

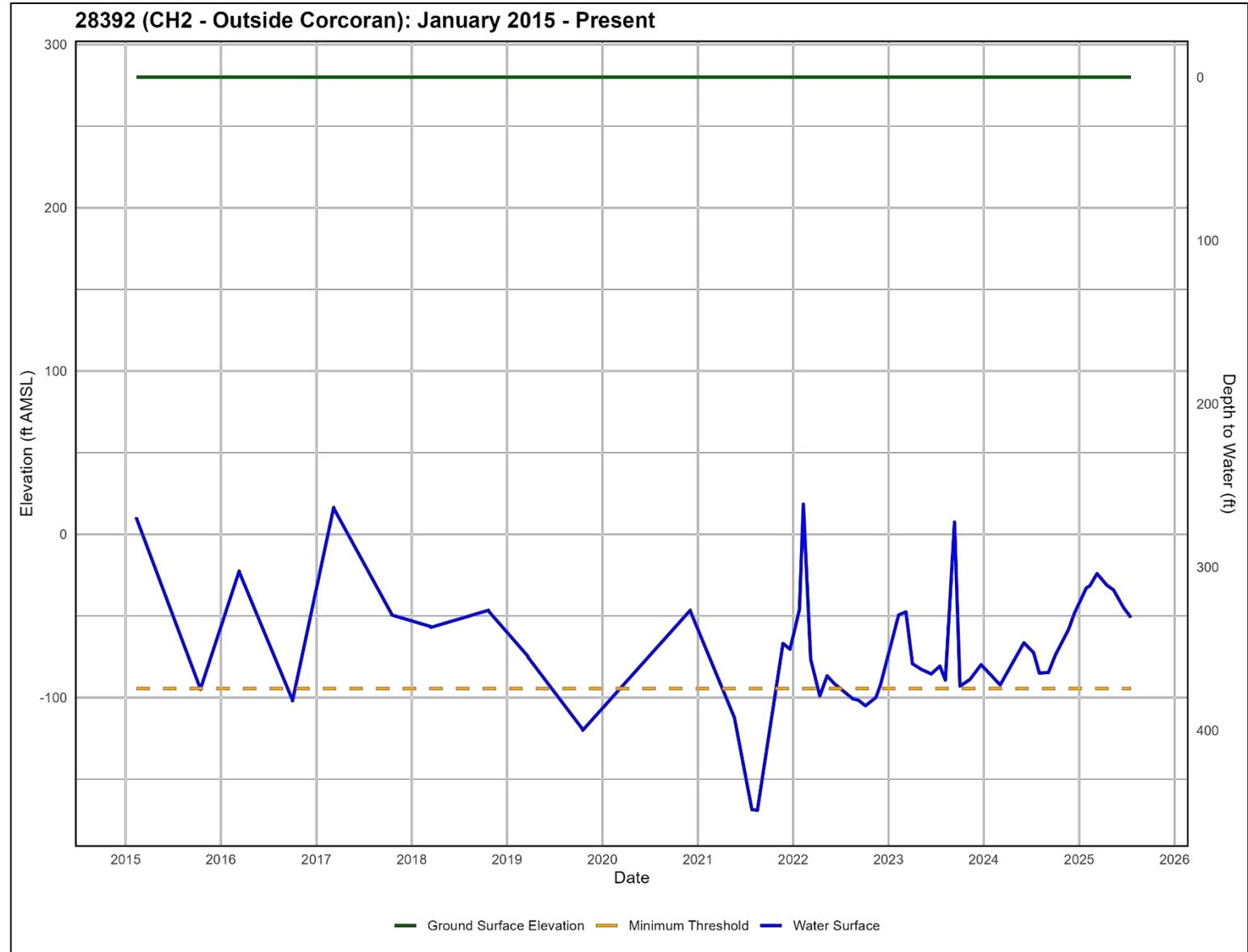
### Principal Aquifer: Outside



Station ID: 28392

Well Name: CH2

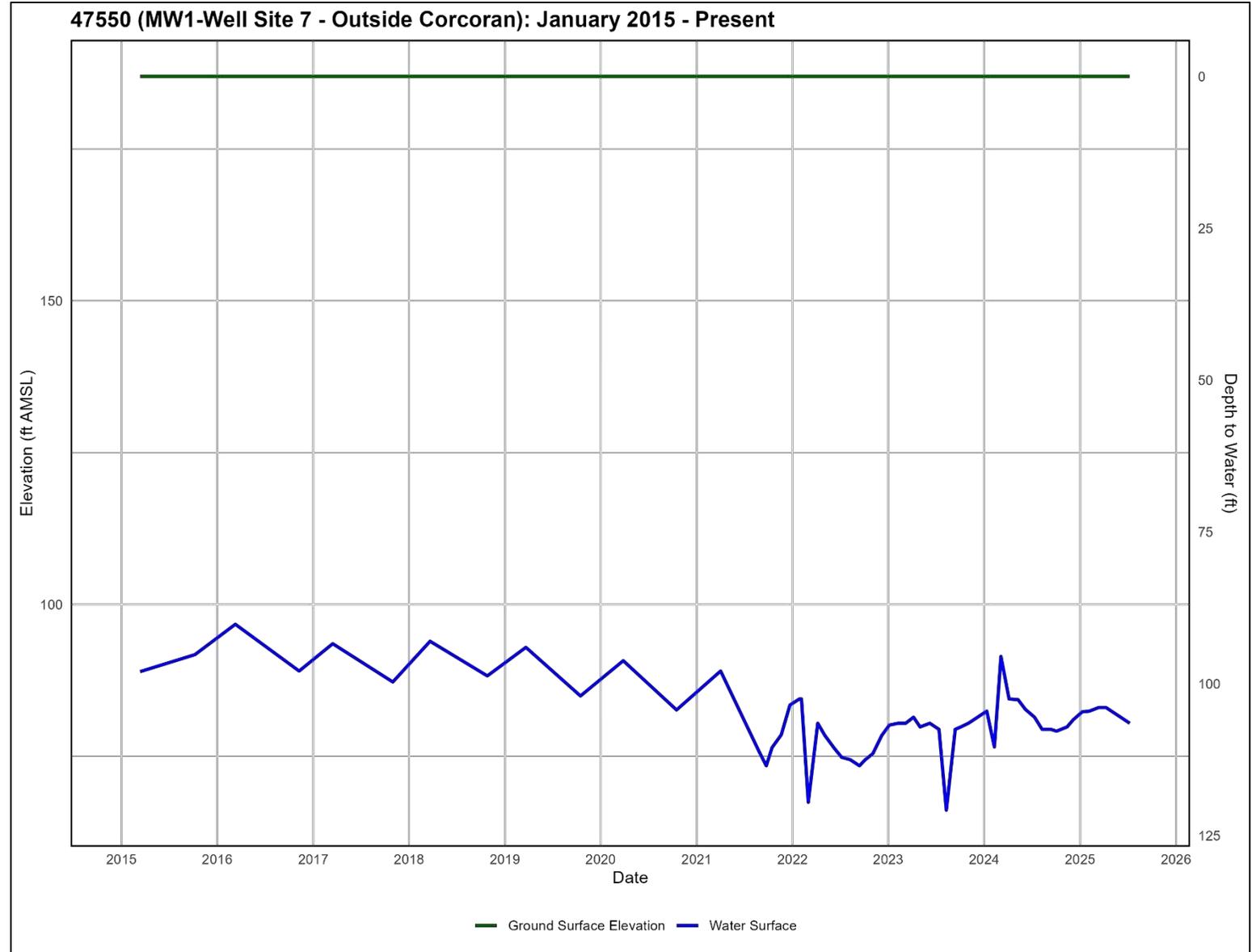
Principal Aquifer: Outside



# Station ID: 47550

## Well Name: MW1 – Well Site 7

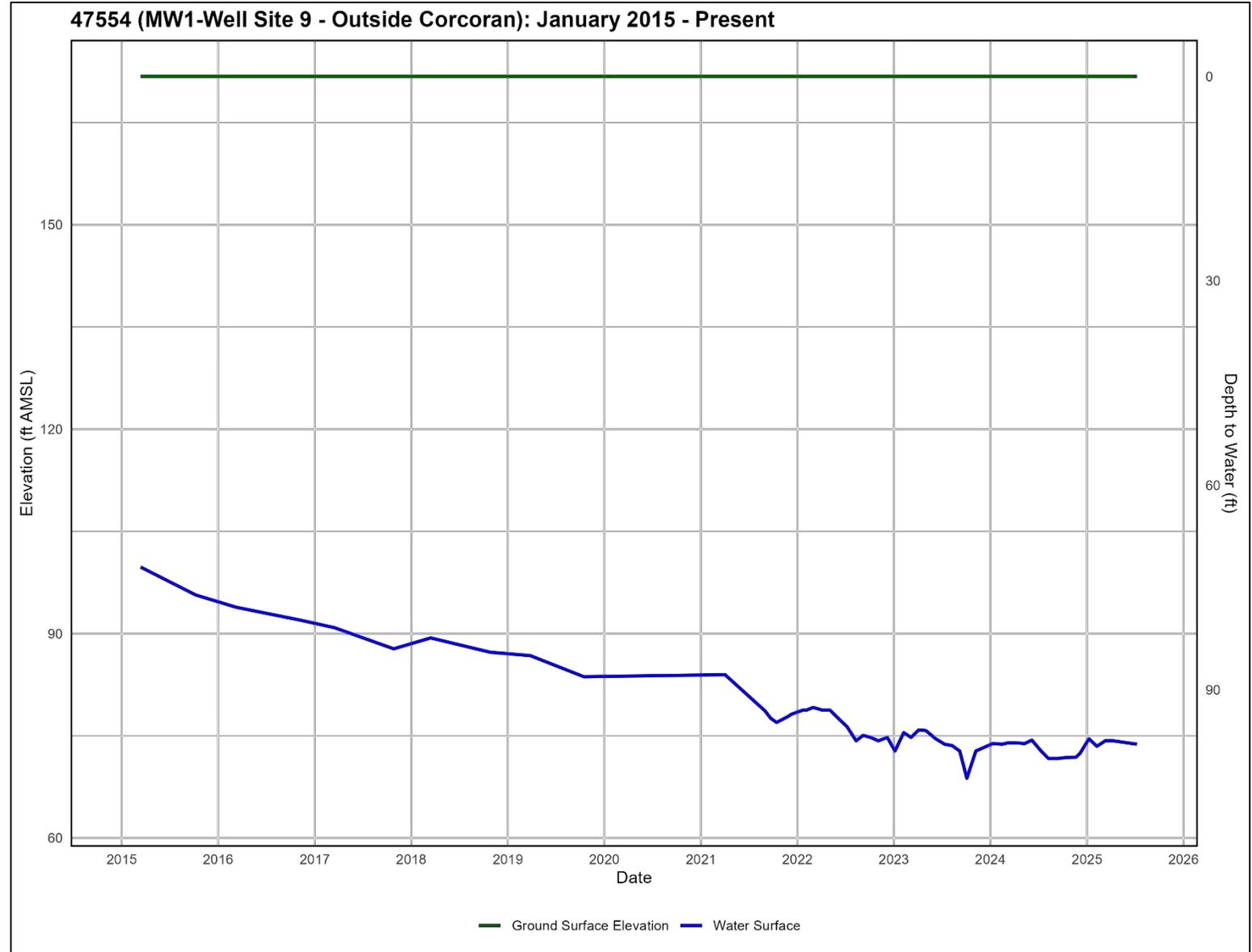
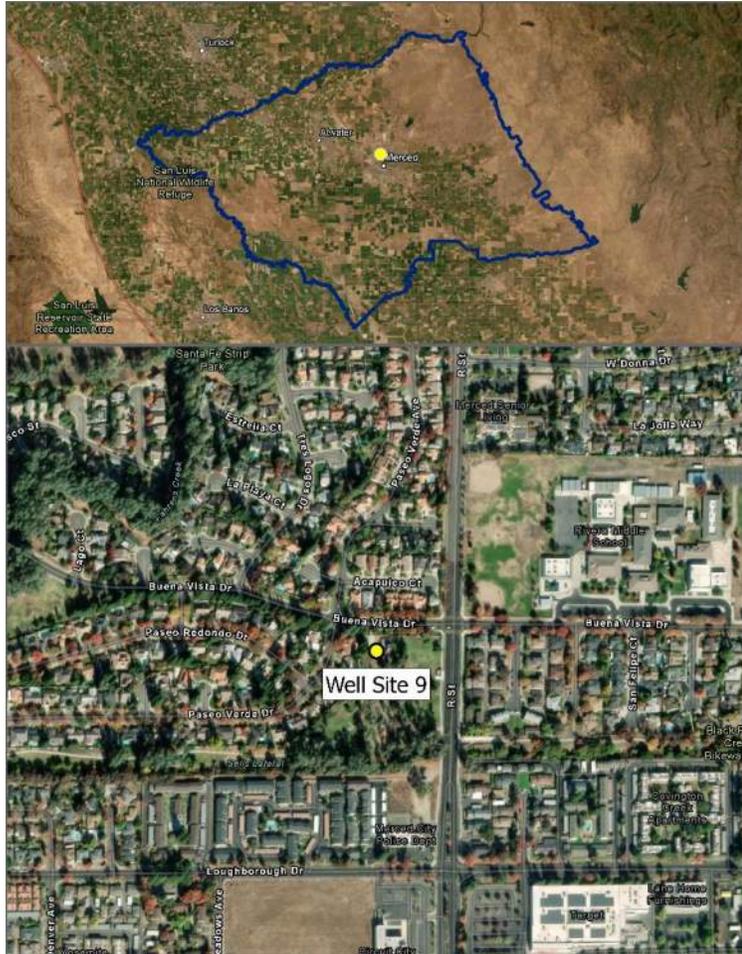
### Principal Aquifer: Outside



# Station ID: 47554

## Well Name: MW1 – Well Site 9

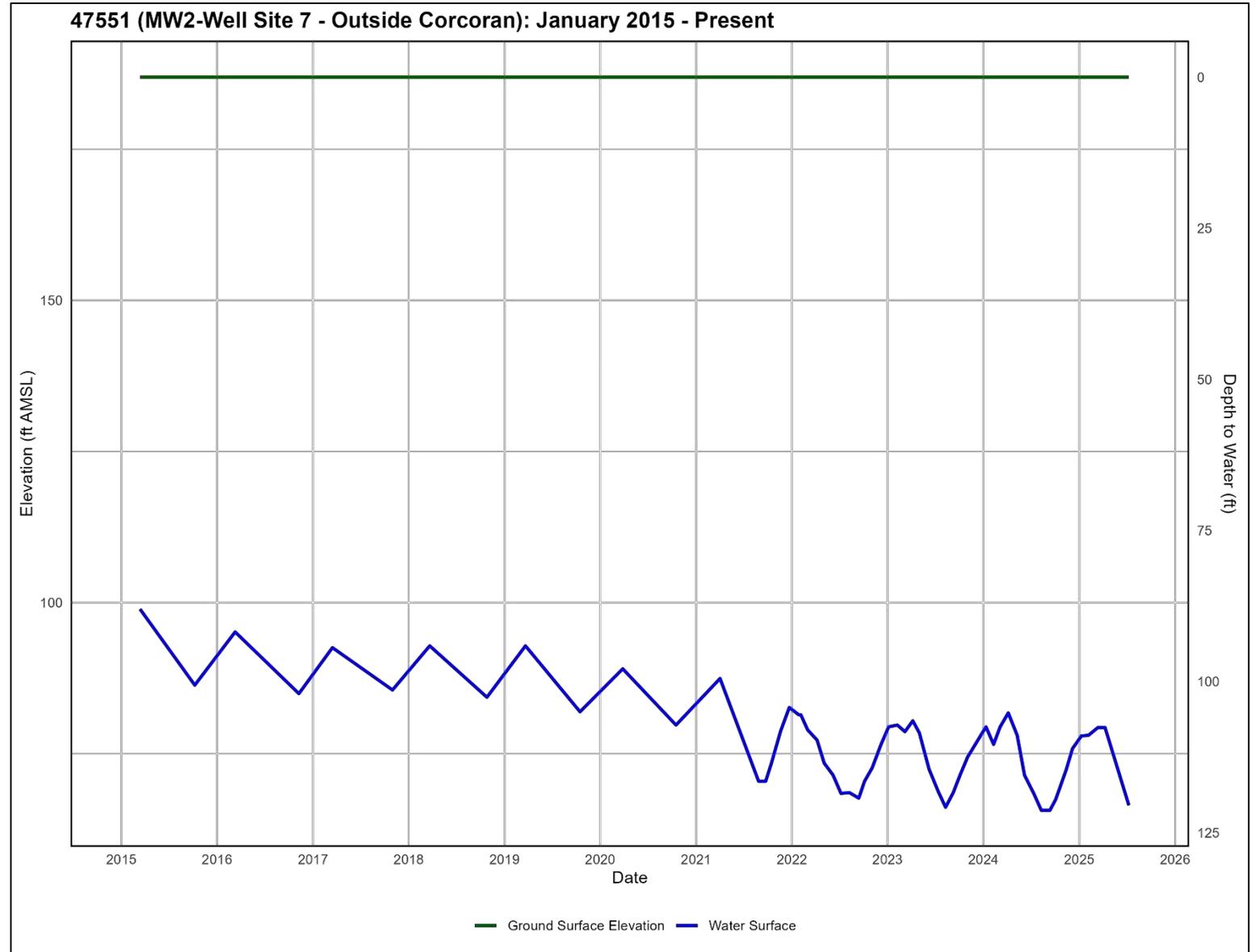
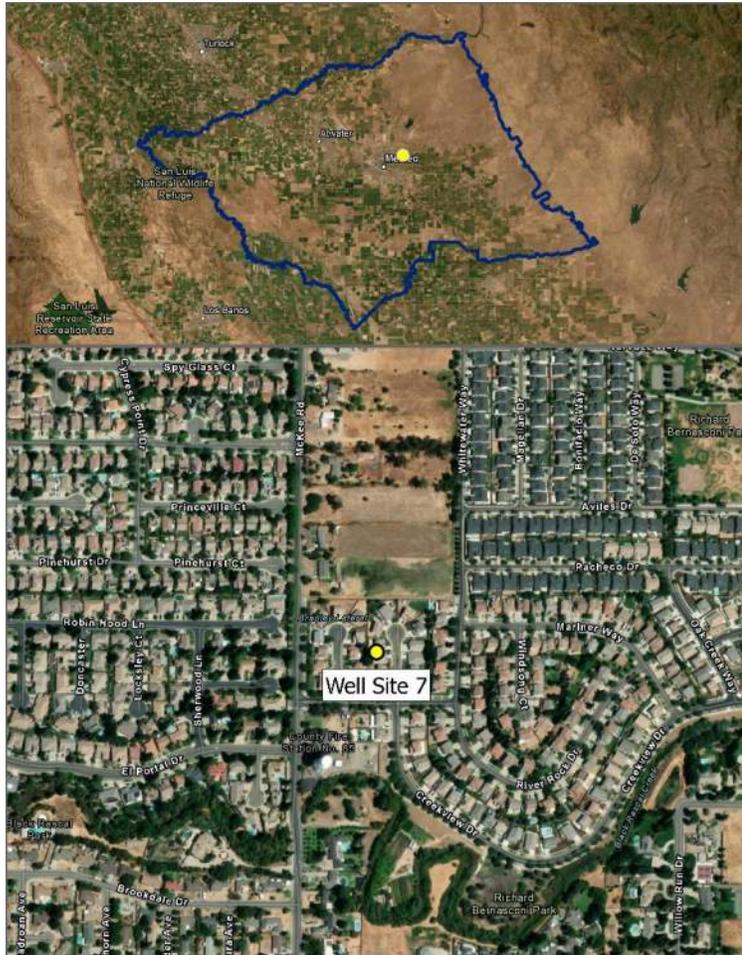
### Principal Aquifer: Outside



# Station ID: 47551

## Well Name: MW2 – Well Site 7

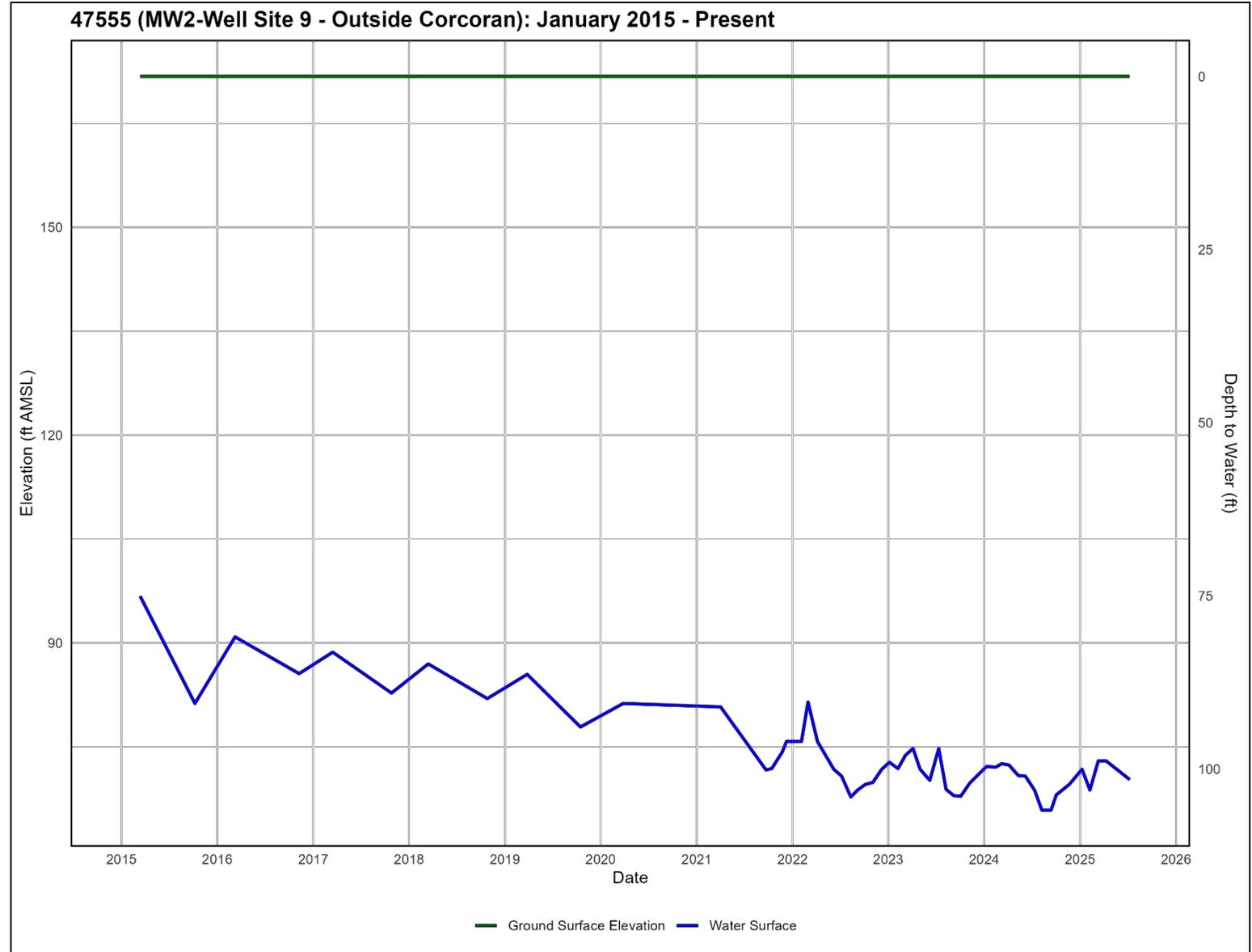
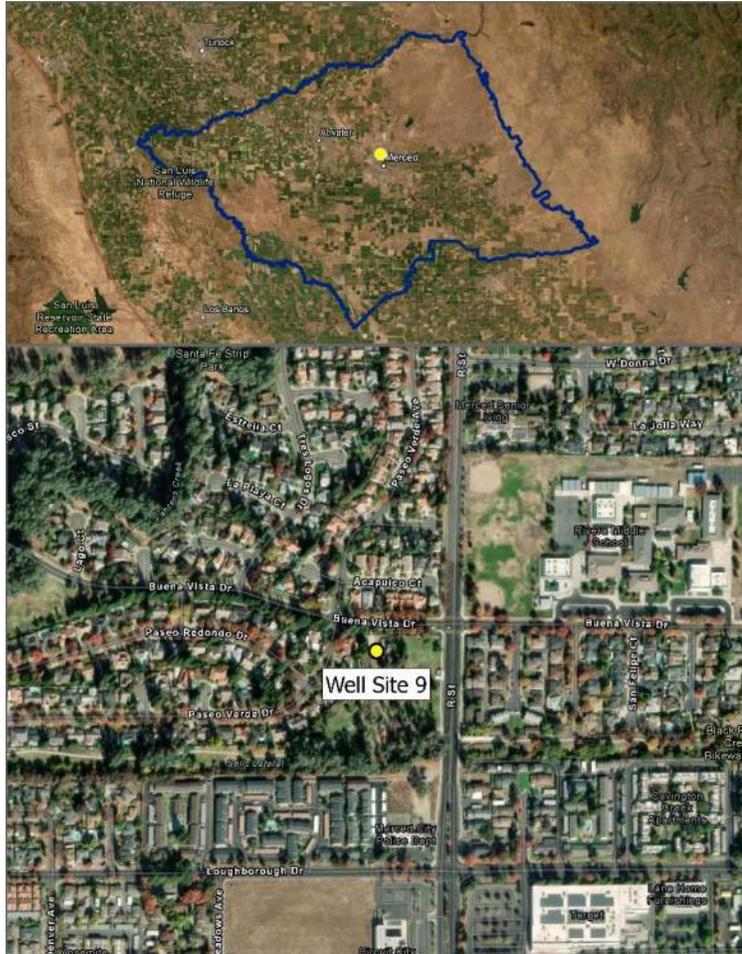
### Principal Aquifer: Outside



# Station ID: 47555

## Well Name: MW2 – Well Site 9

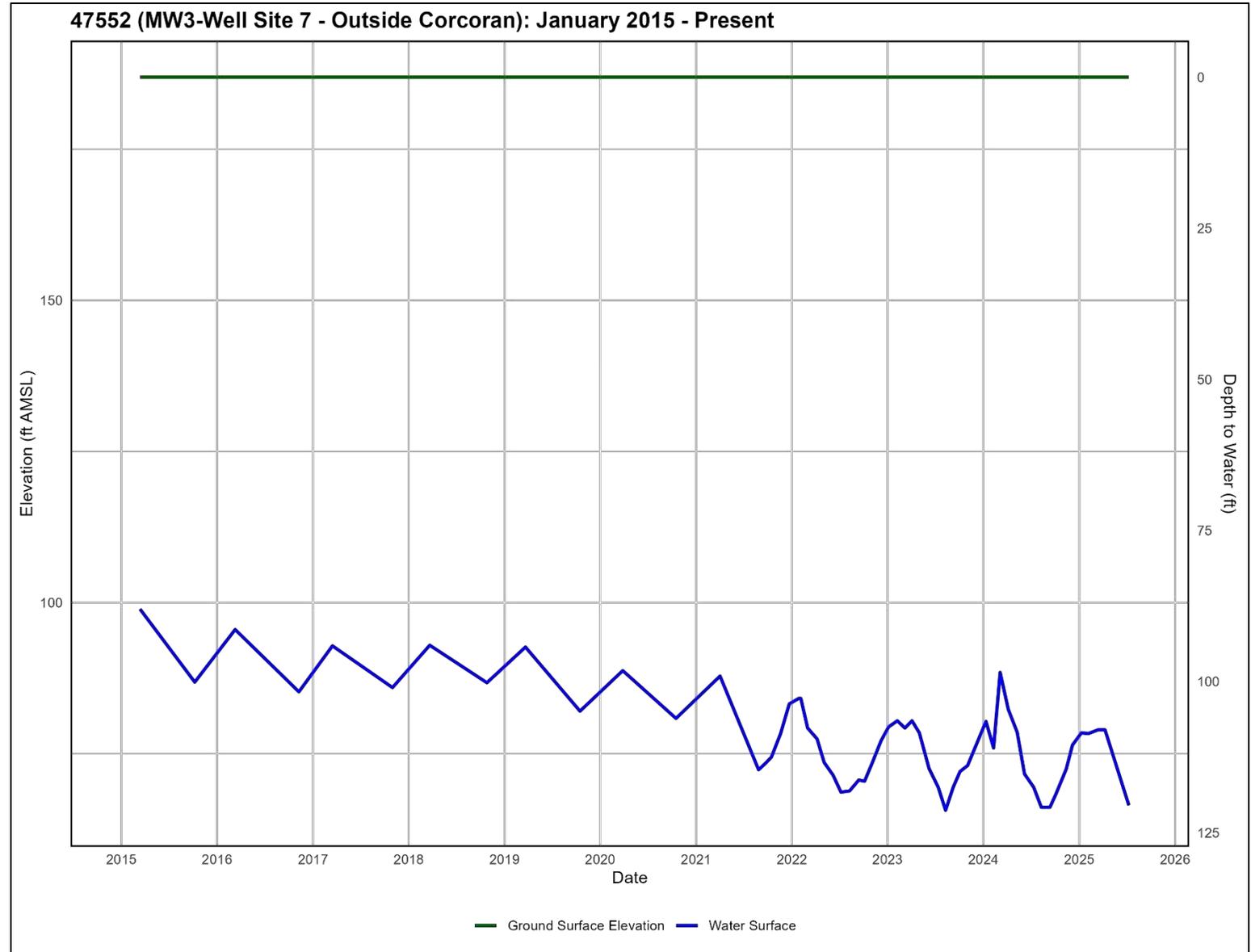
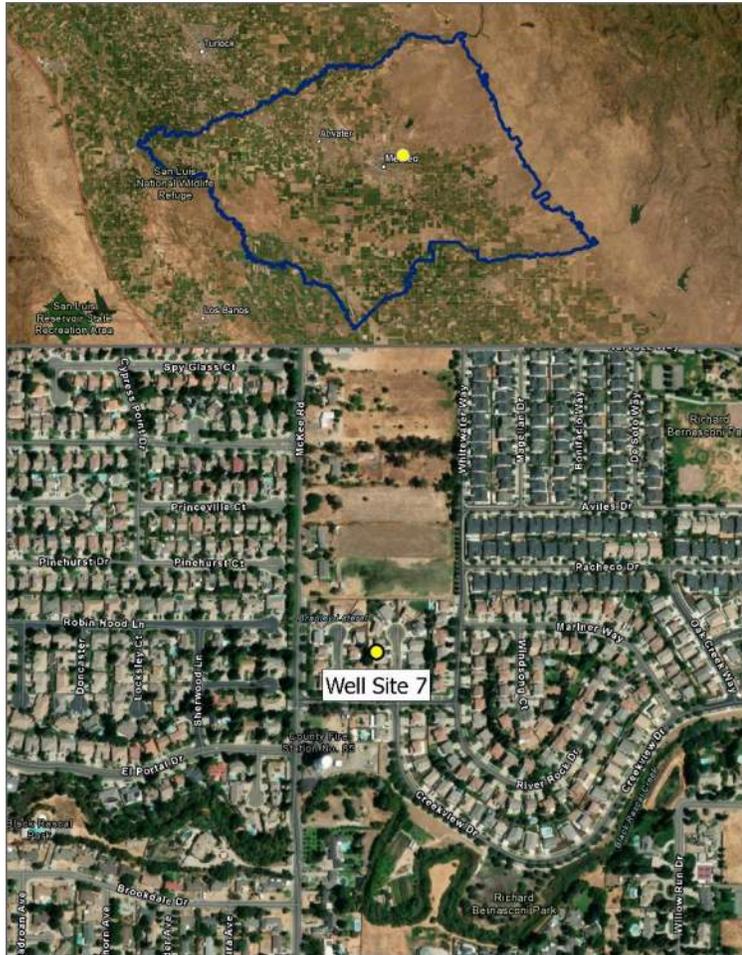
### Principal Aquifer: Outside



# Station ID: 47552

## Well Name: MW3 – Well Site 7

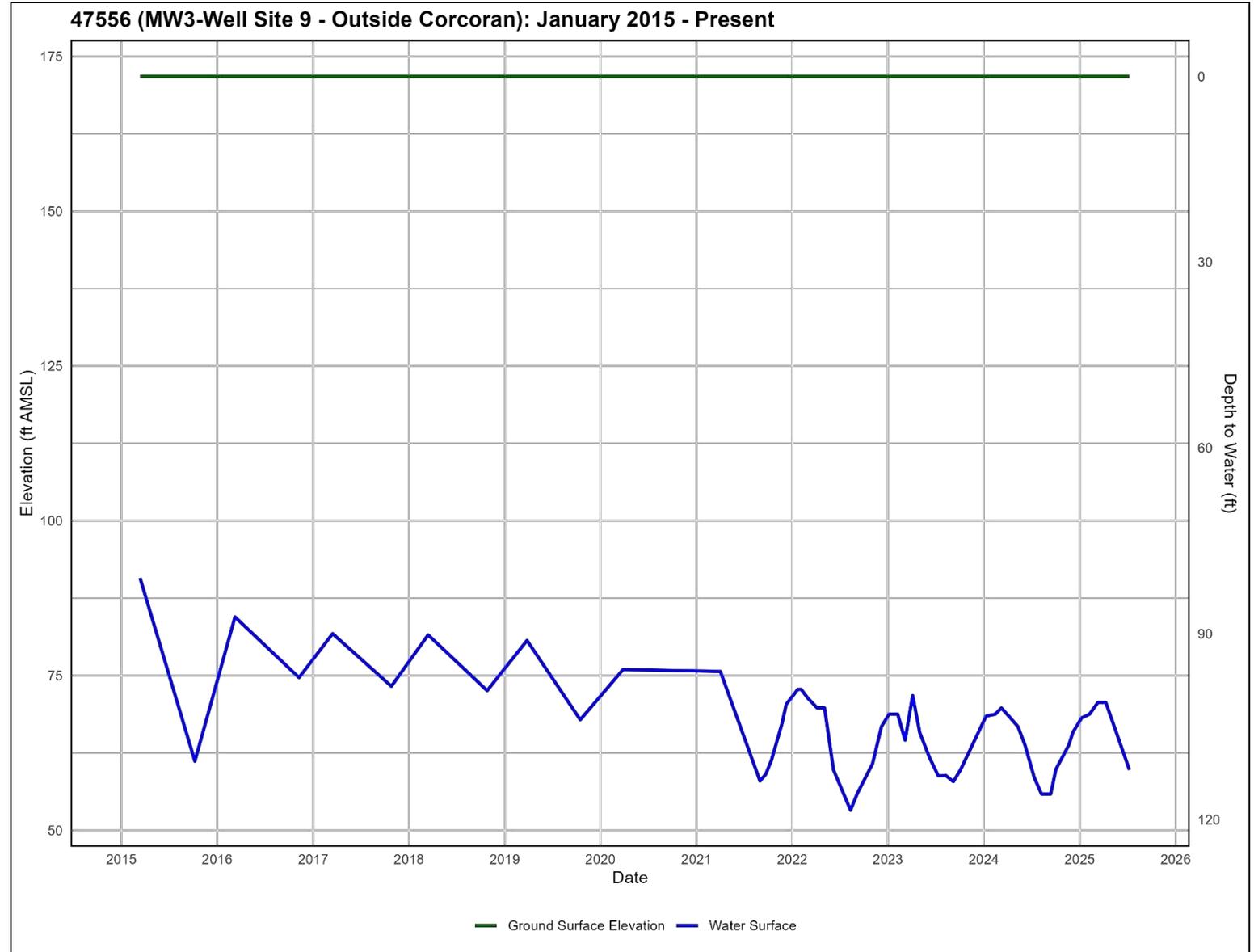
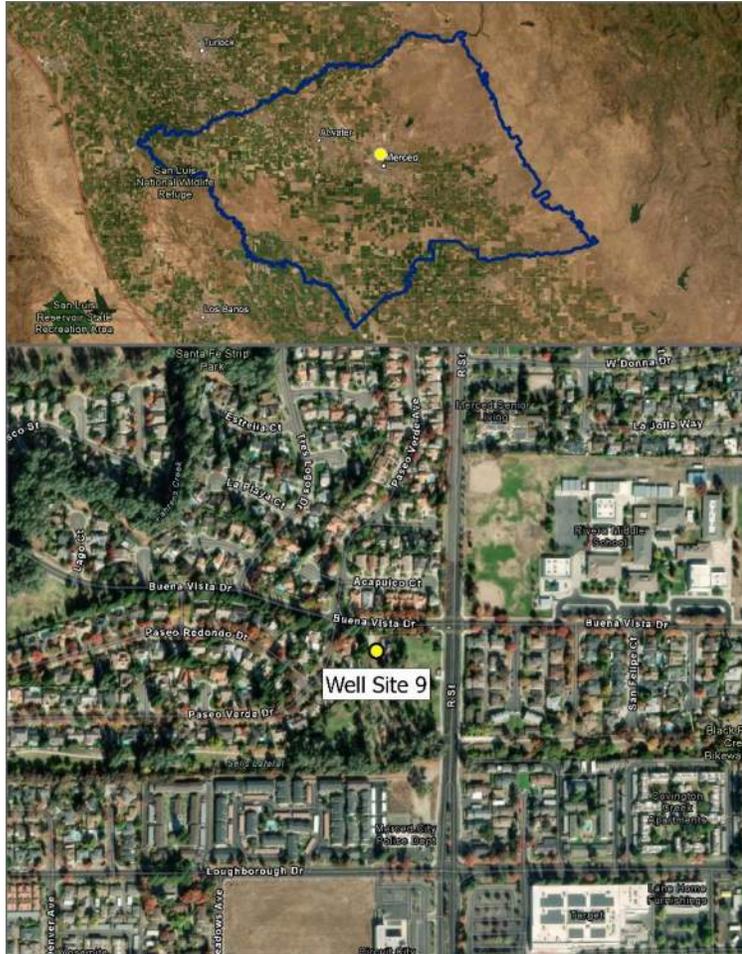
### Principal Aquifer: Outside



# Station ID: 47556

## Well Name: MW3 – Well Site 9

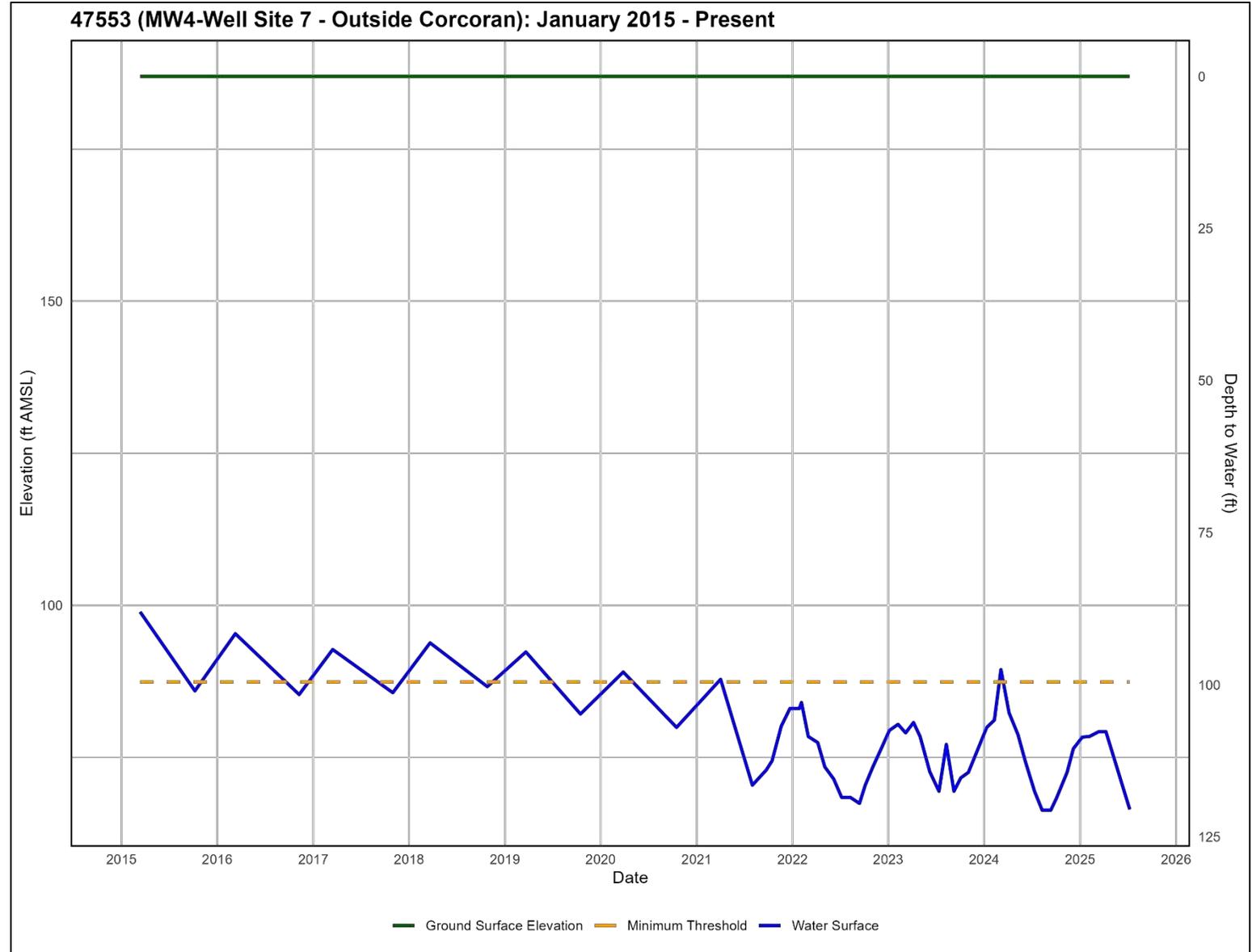
### Principal Aquifer: Outside



# Station ID: 47553

## Well Name: MW4 – Well Site 7

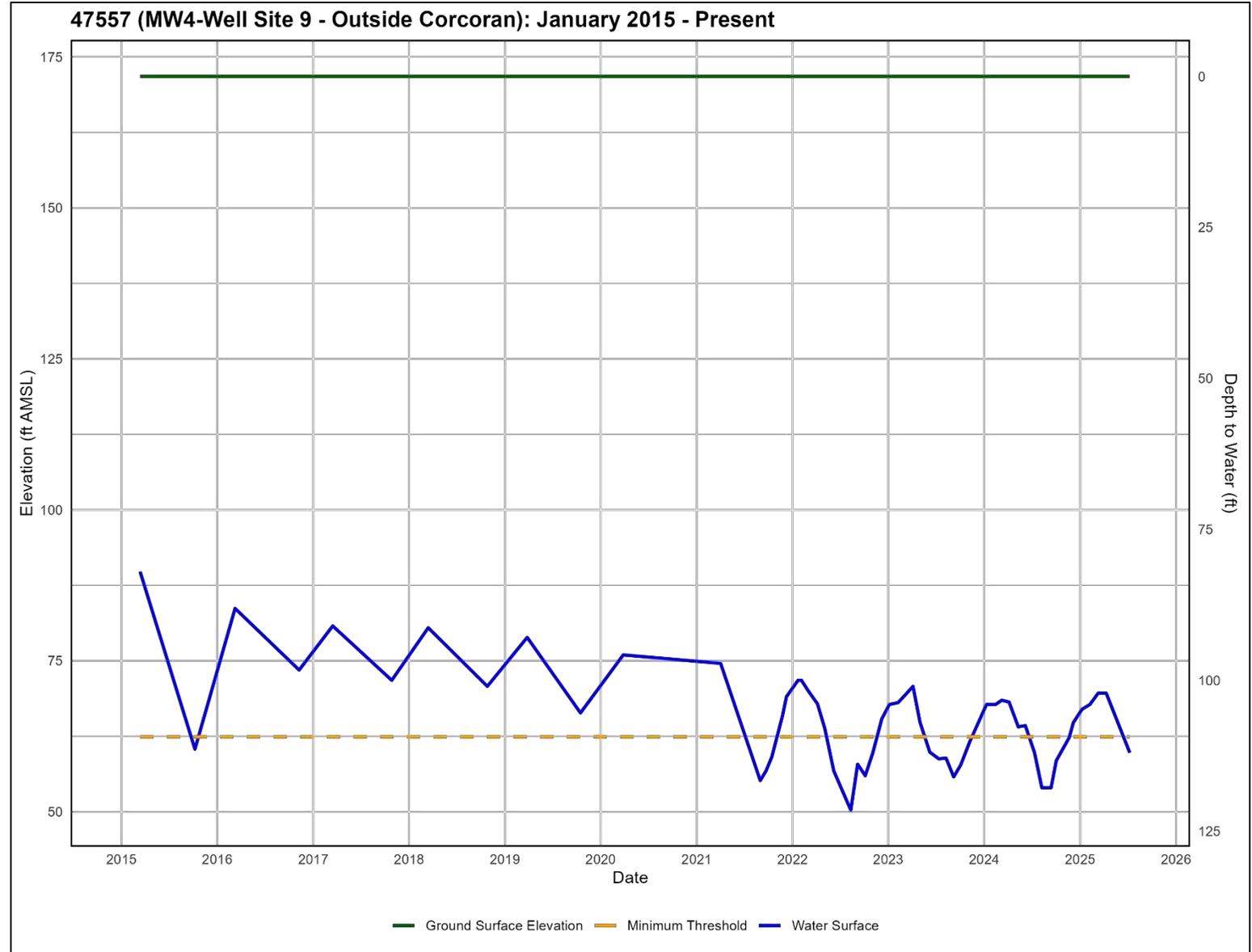
### Principal Aquifer: Outside



# Station ID: 47557

## Well Name: MW4 – Well Site 9

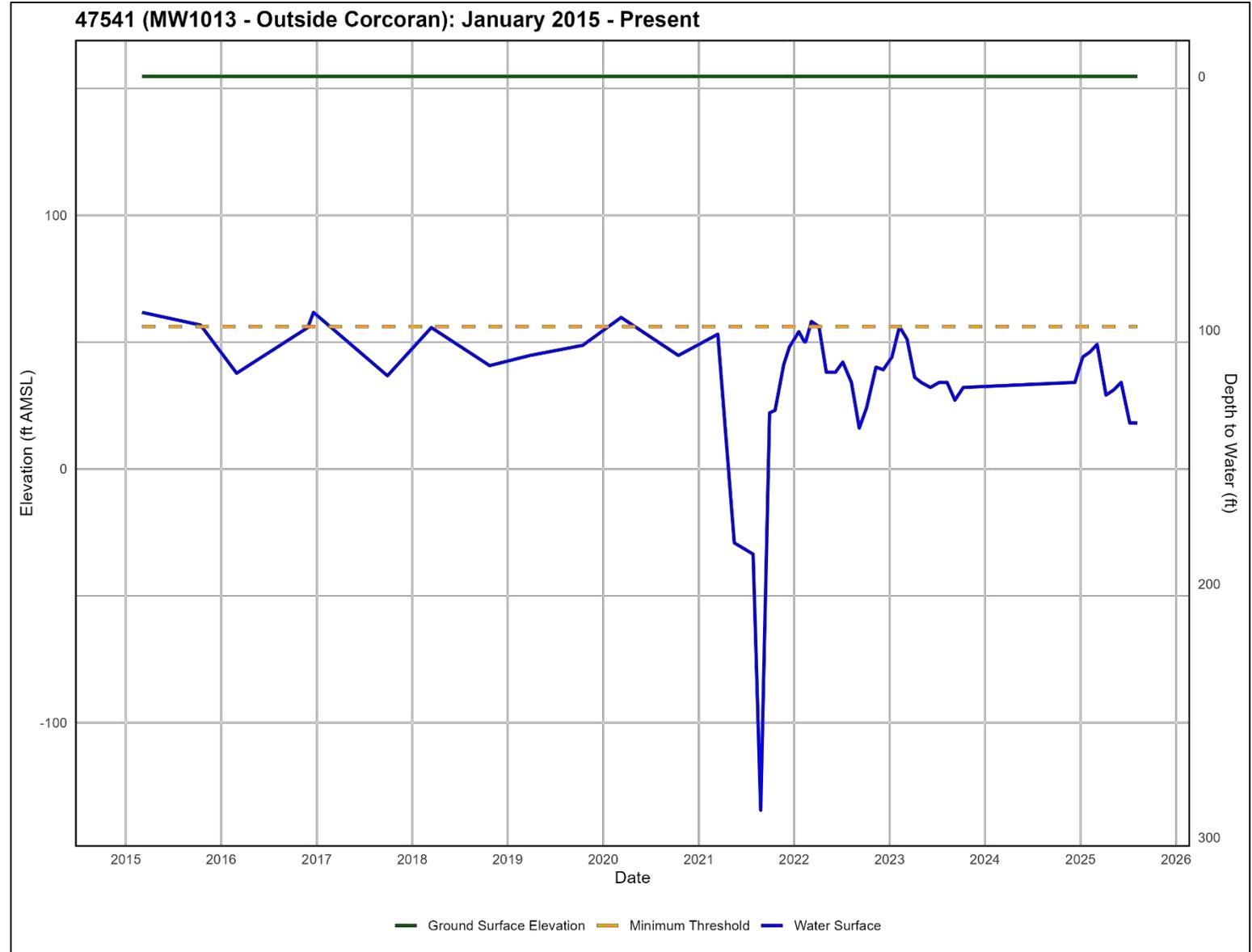
### Principal Aquifer: Outside



Station ID: 47541

Well Name: MW1013

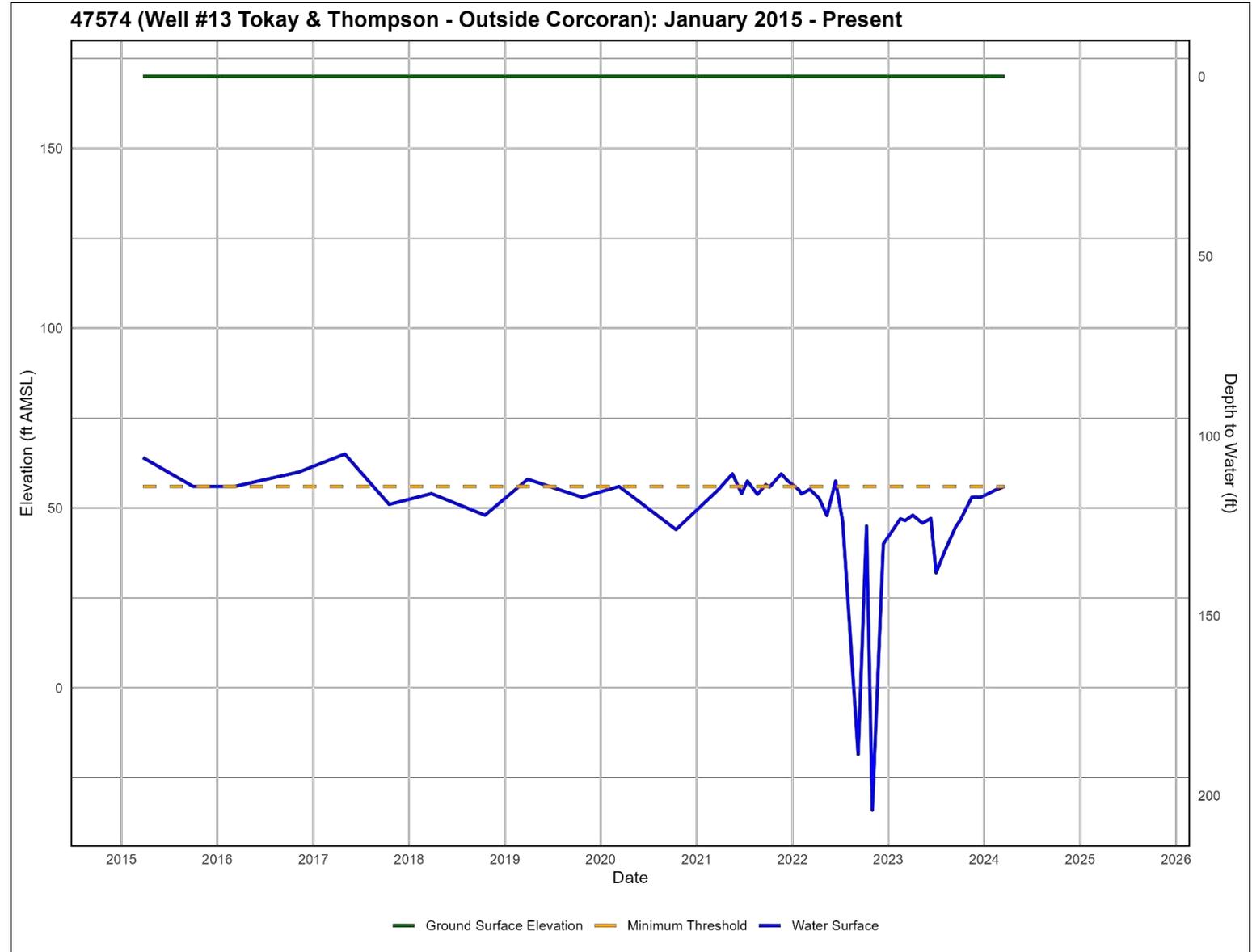
Principal Aquifer: Outside



# Station ID: 47574

## Well Name: Well #13 Tokay & Thompson

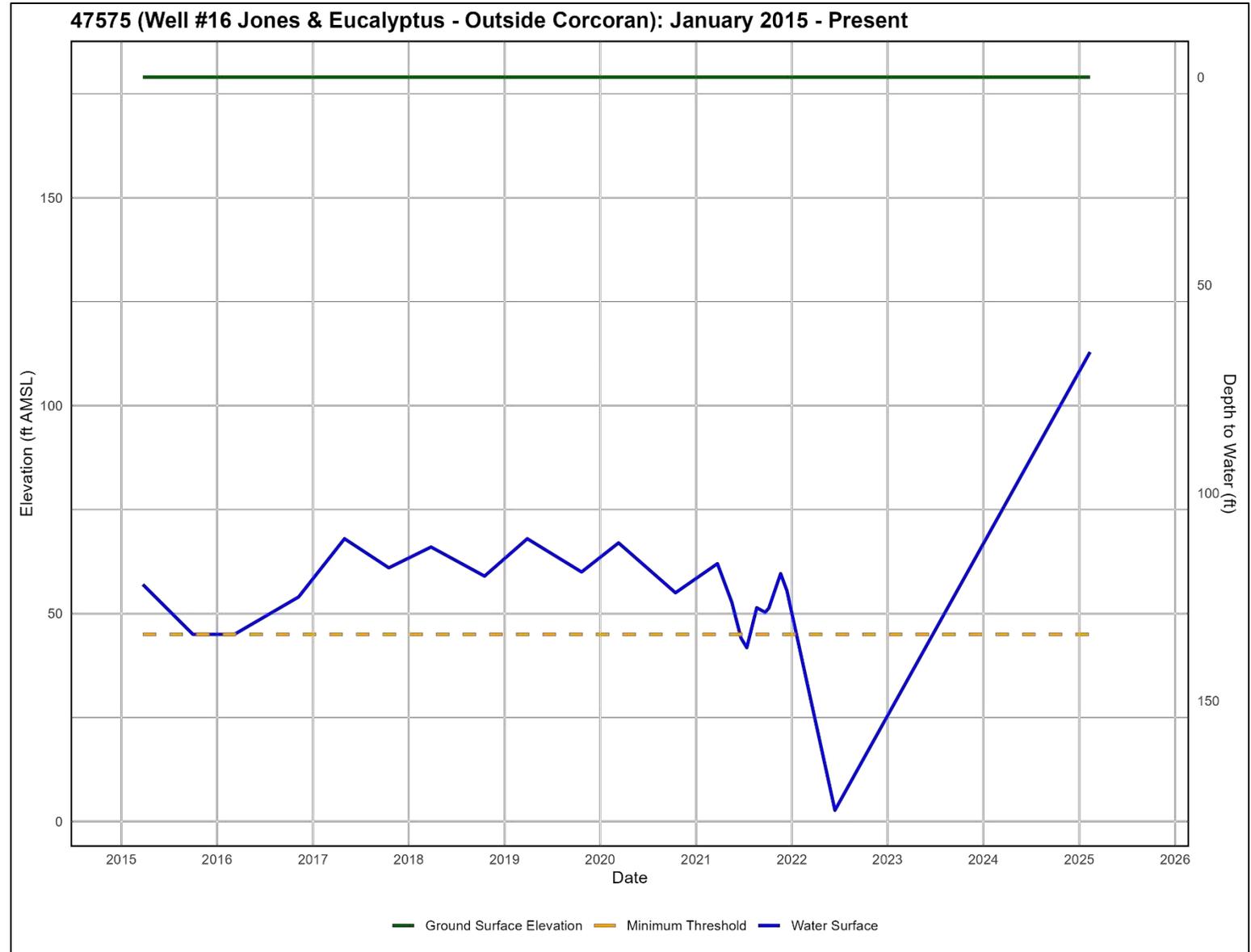
### Principal Aquifer: Outside



# Station ID: 47575

## Well Name: Well #16 Jones & Eucalyptus

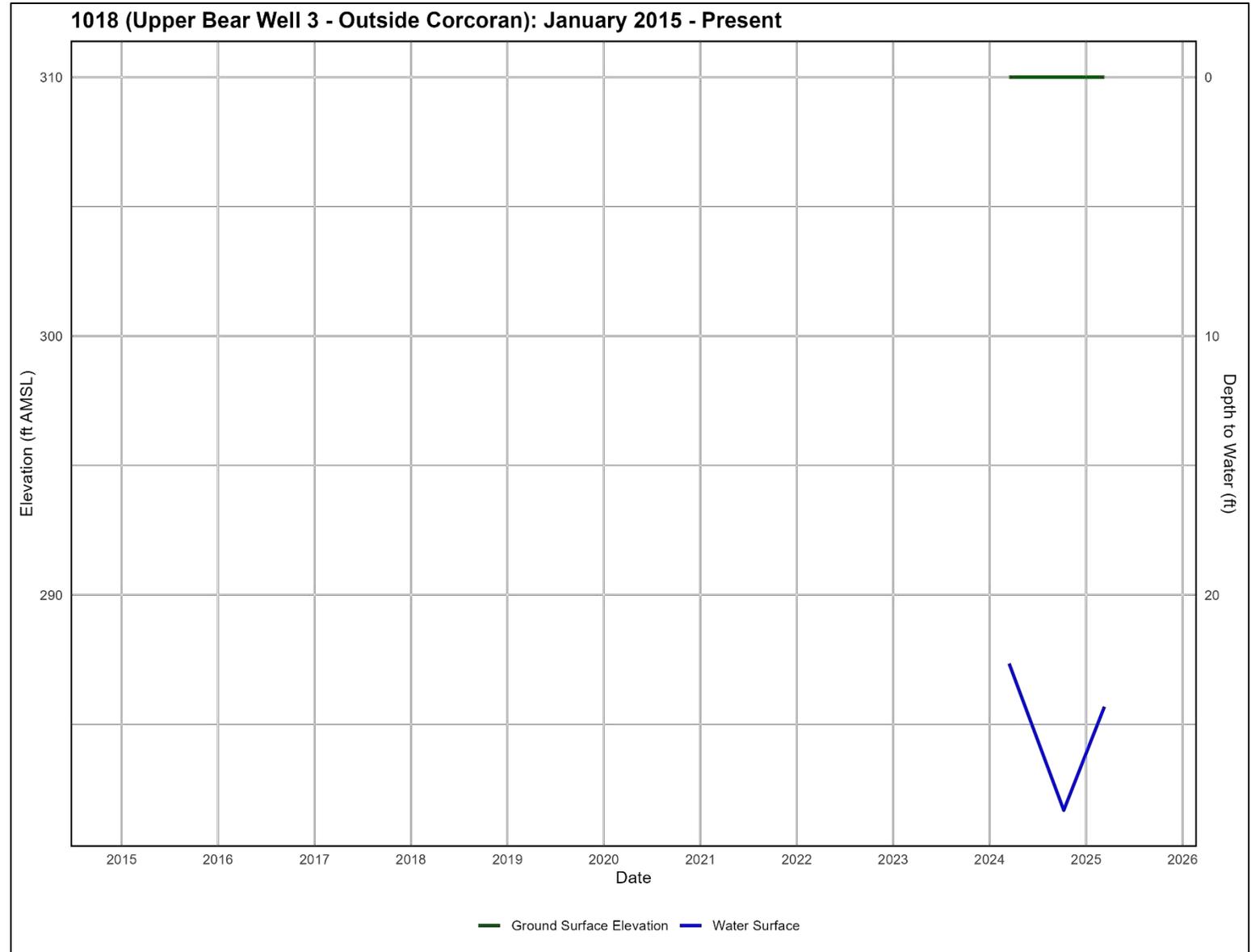
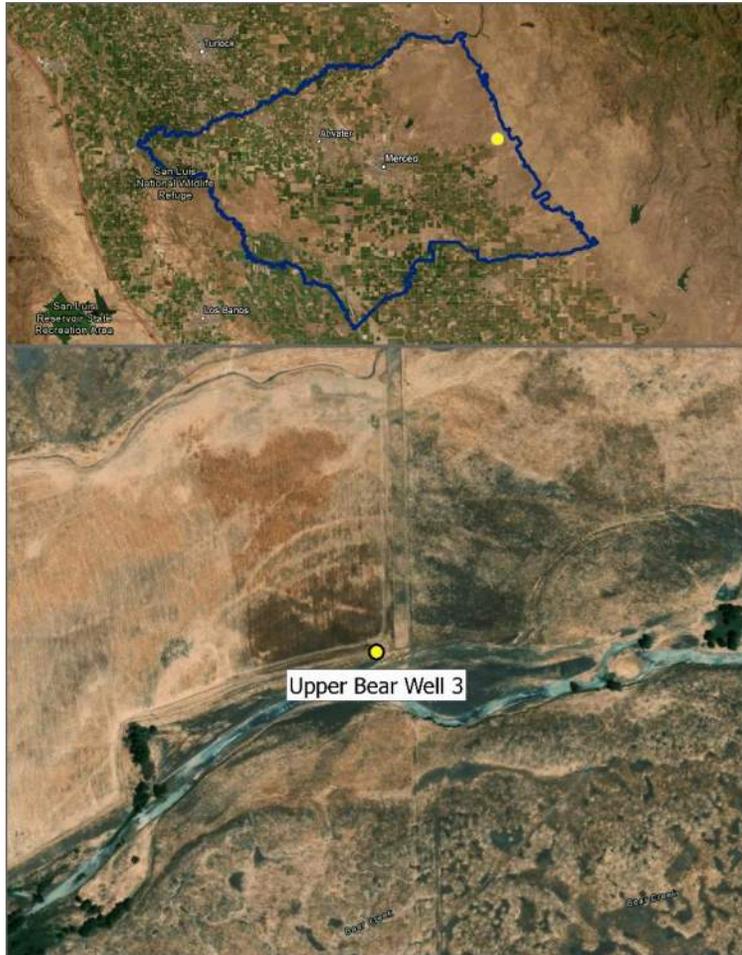
### Principal Aquifer: Outside



# Station ID: 1018

## Well Name: Upper Bear Well 3

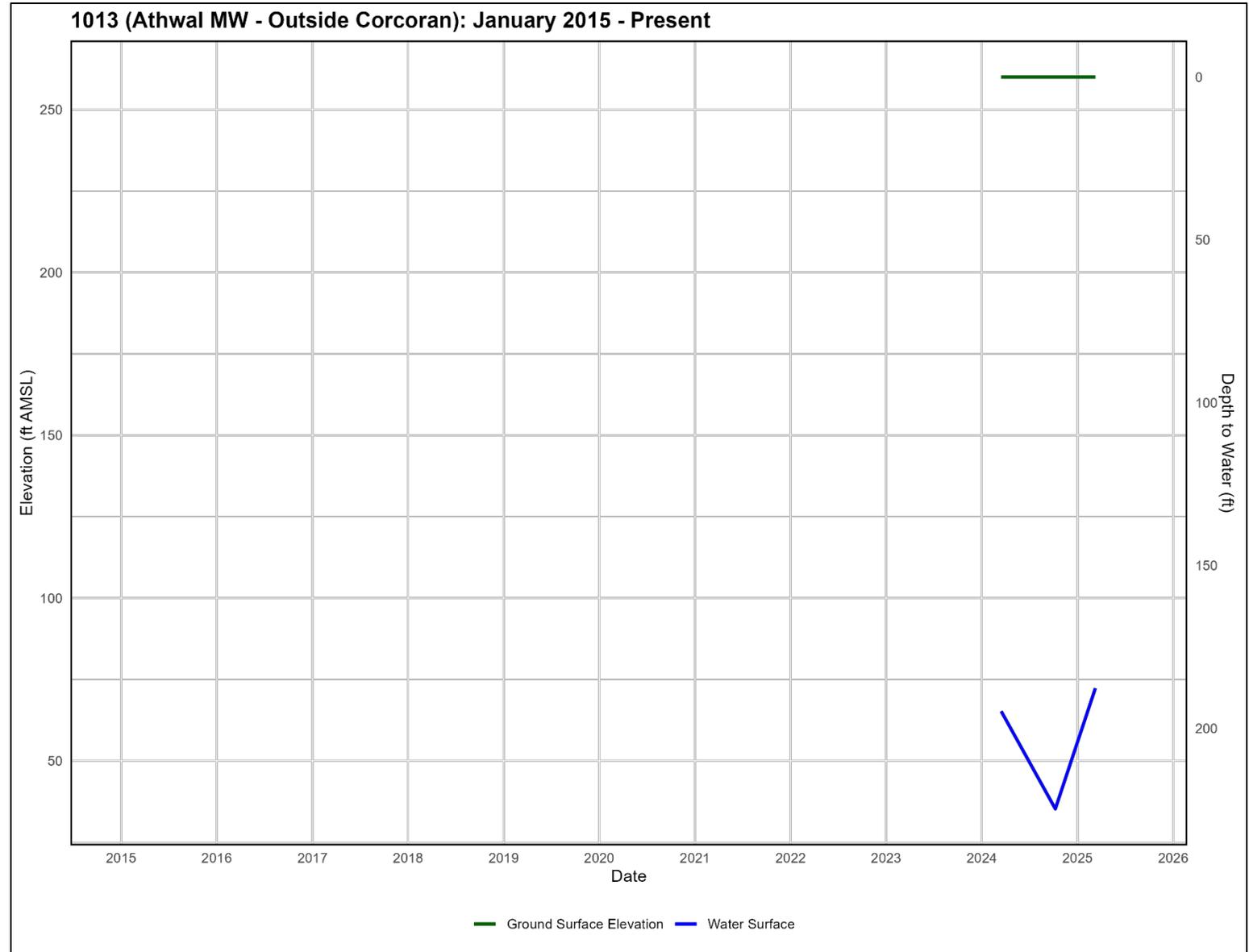
### Principal Aquifer: Outside



# Station ID: 1013

## Well Name: Athwal MW

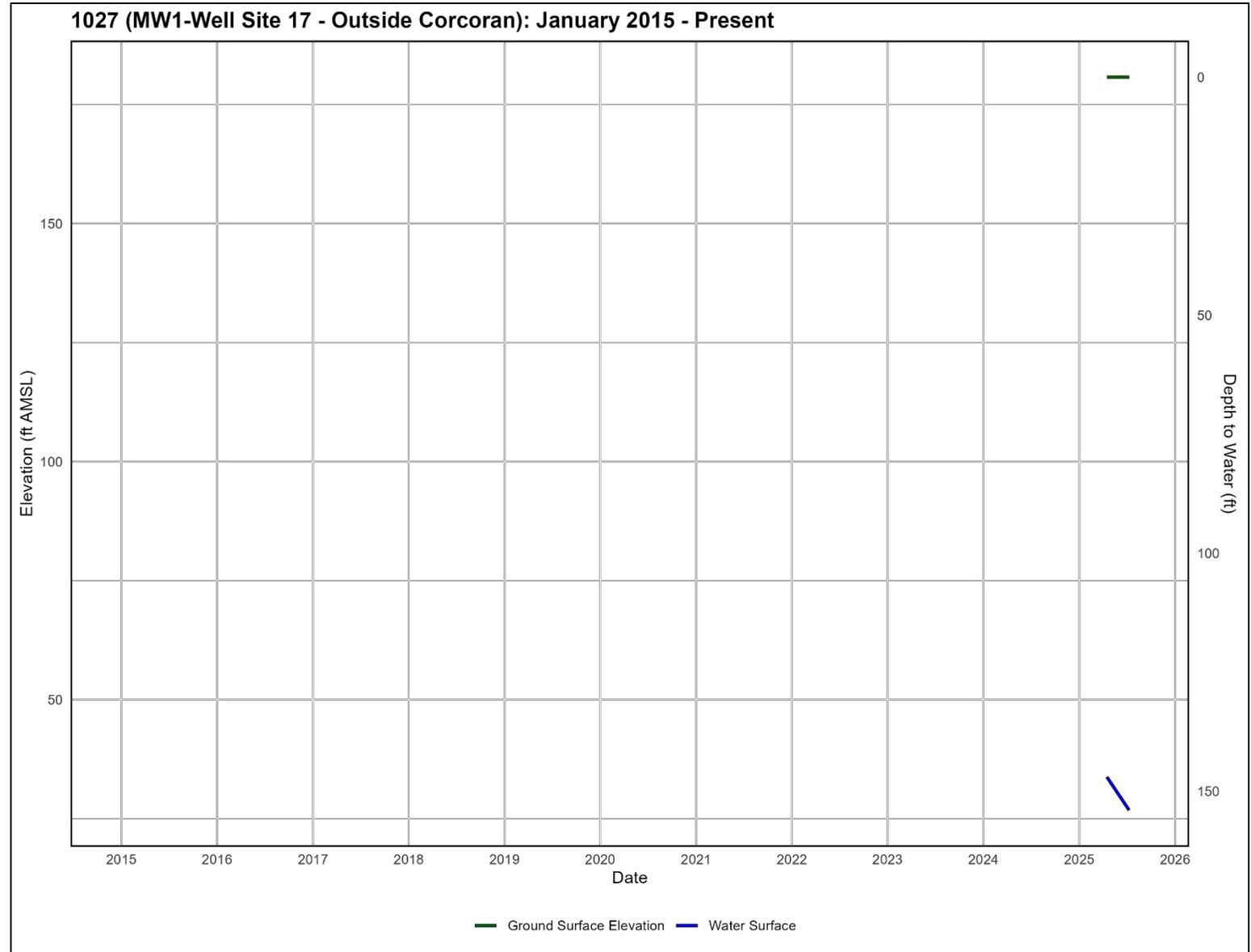
### Principal Aquifer: Outside



# Station ID: 1027

## Well Name: MW1 – Well Site 17

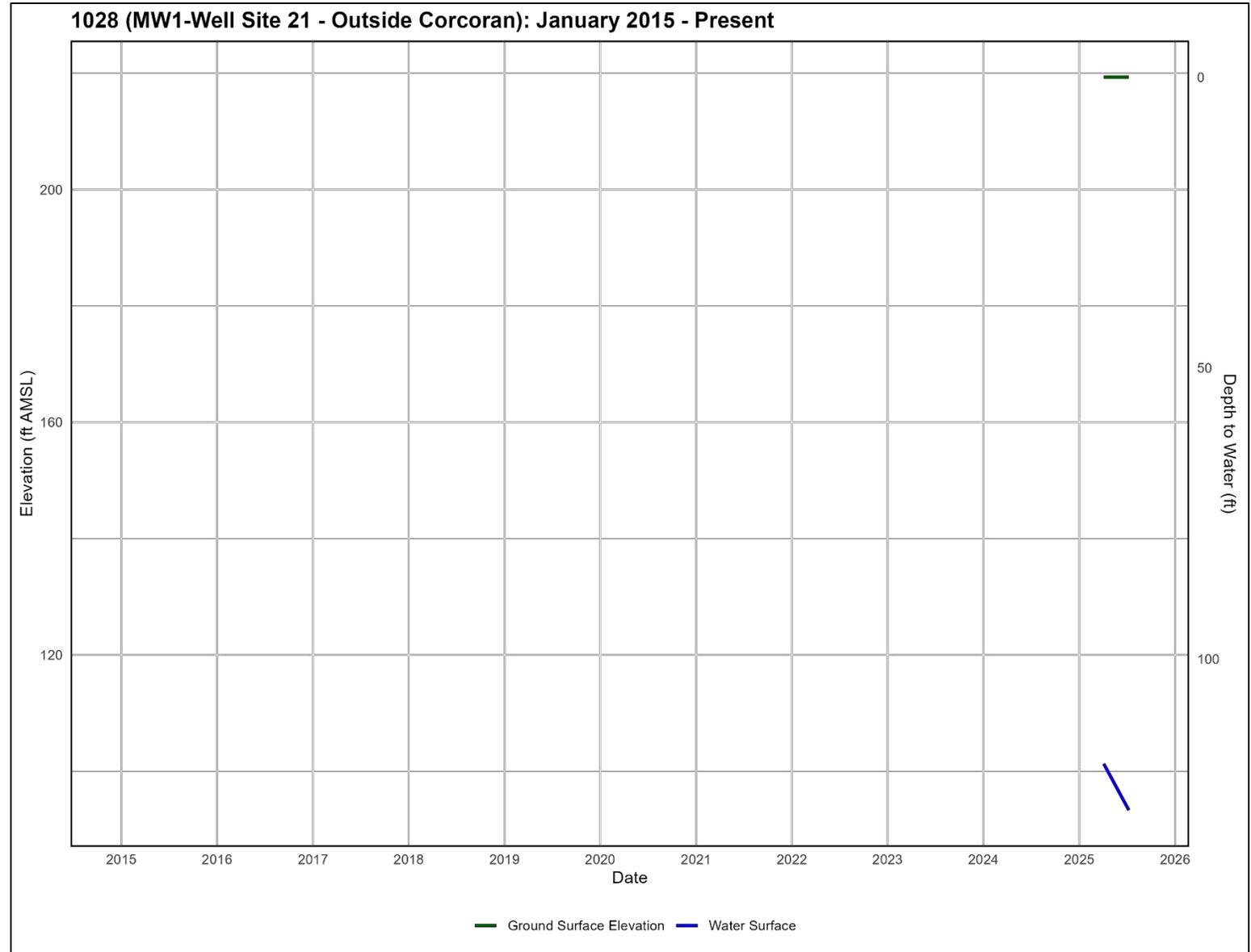
### Principal Aquifer: Outside



# Station ID: 1028

## Well Name: MW1 – Well Site 21

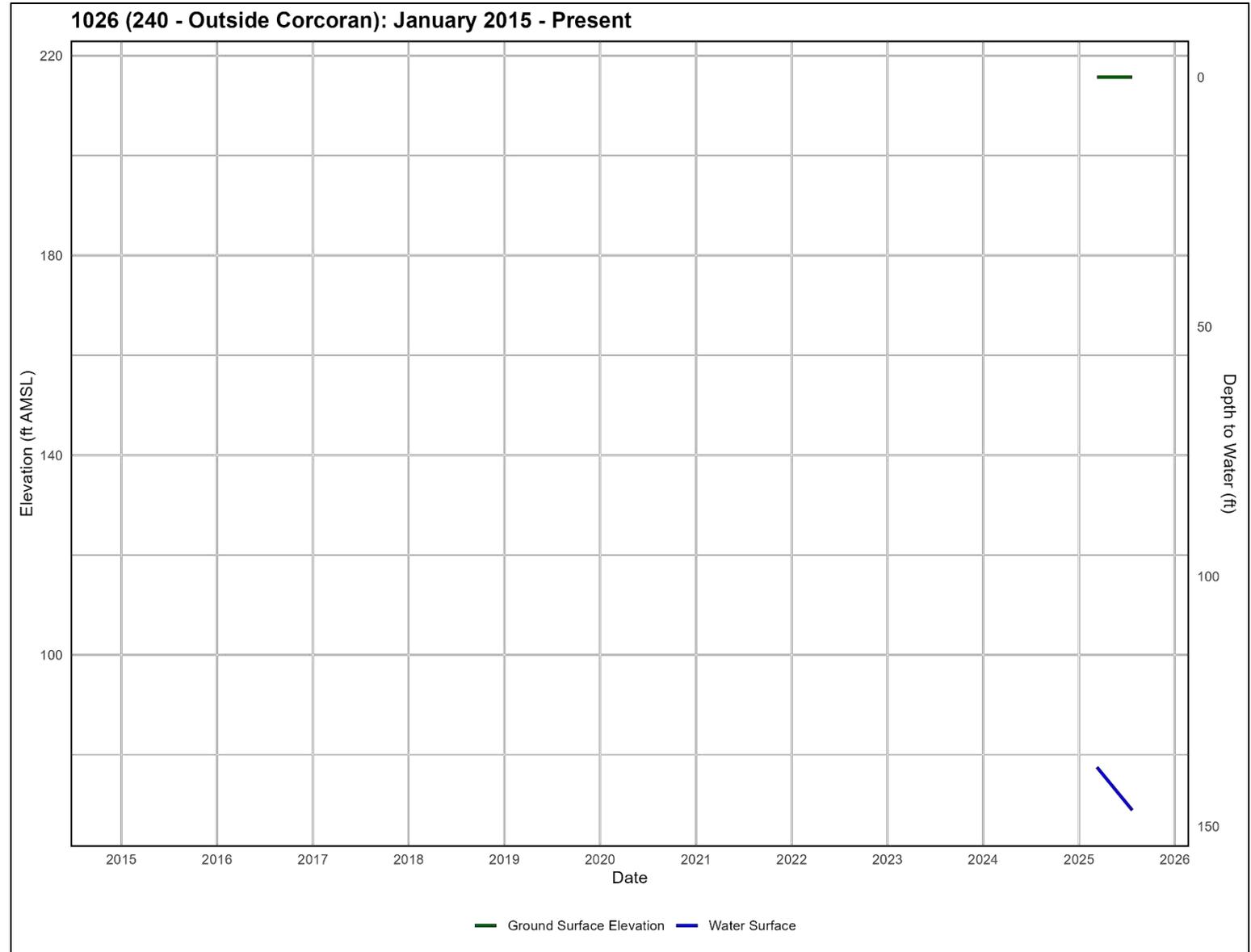
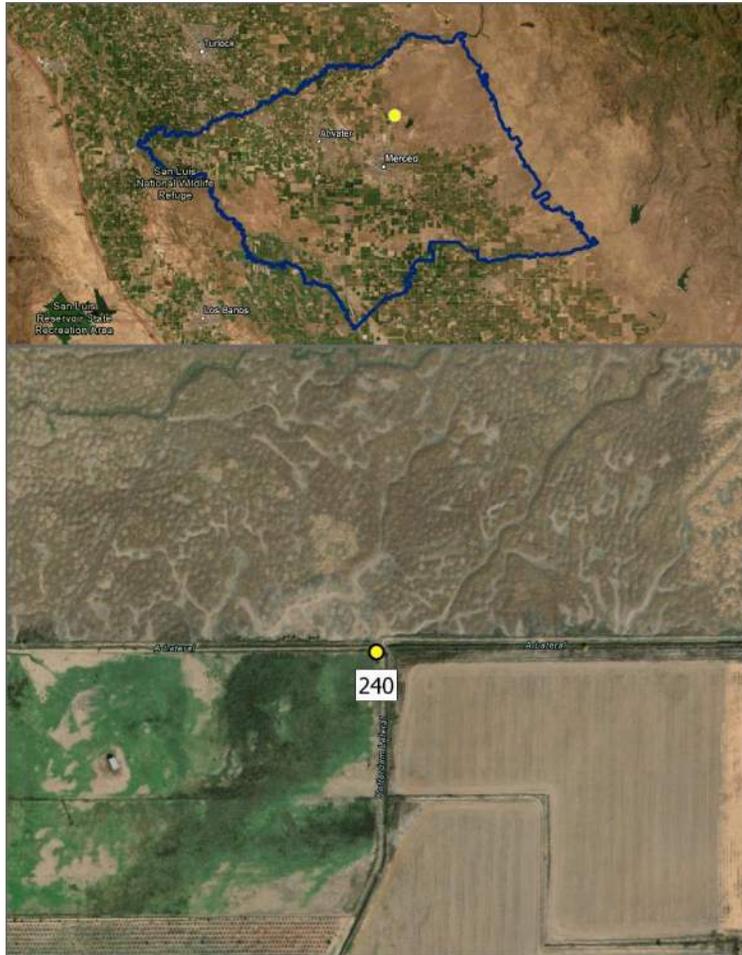
### Principal Aquifer: Outside



# Station ID: 1026

## Well Name: 240

### Principal Aquifer: Outside





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# GSP Plan Manager Update

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Image courtesy: Veronica Adrover/UC Merced





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# Domestic Well Mitigation Program Development Update

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Image courtesy: Veronica Adrover/UC Merced

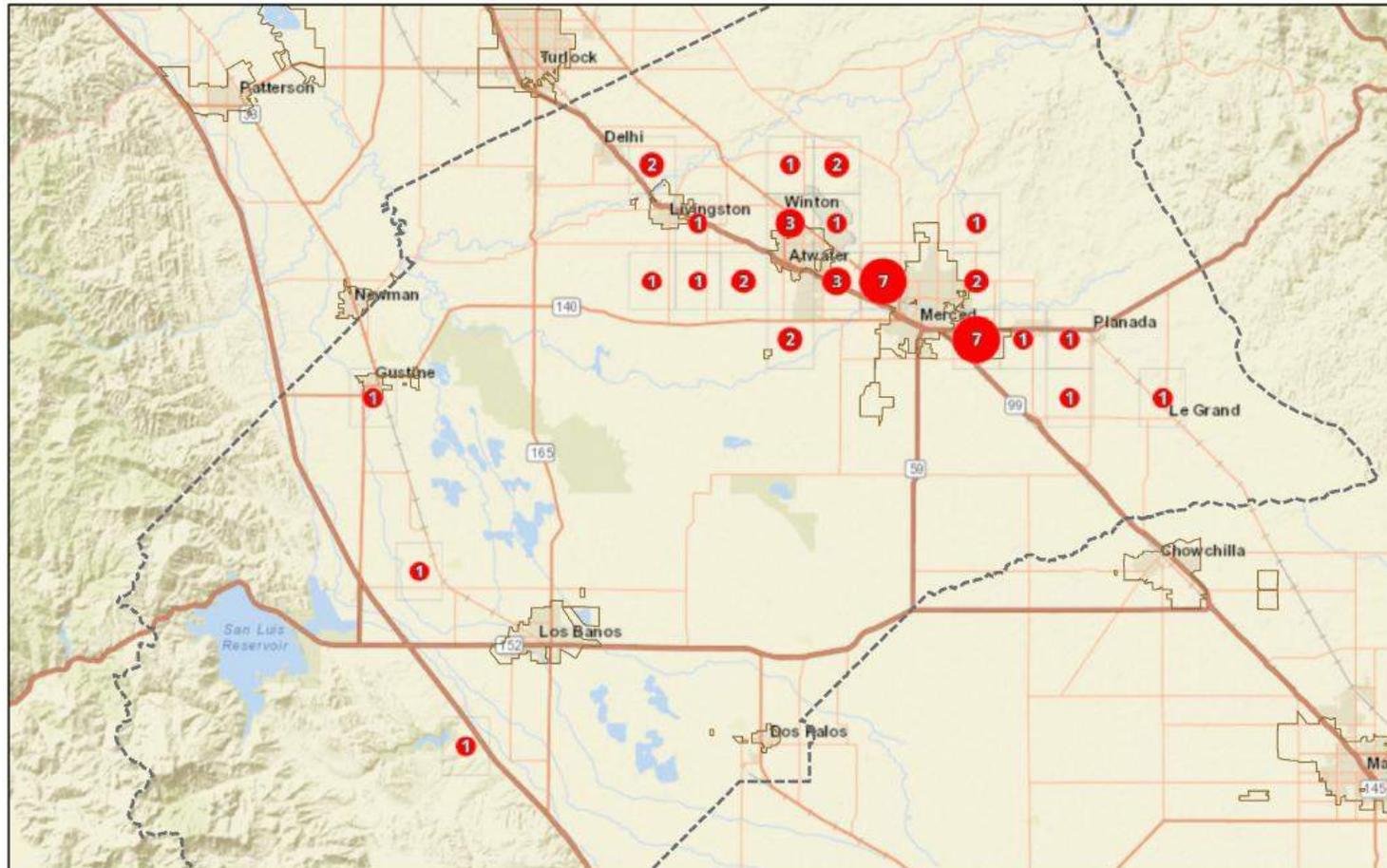
# DWR Expectations for GSAs Expecting Further Overdraft During Implementation through 2040

- Well mitigation program should be in place prior to impacts from ongoing overdraft, building on details in GSP
  - Eligibility criteria
  - Assessment criteria and protocols
  - Appeals process
  - Program management
- Monitor mitigation implementation to assess additional funding needs
- DWR guidance “Considerations for Identifying and Addressing Drinking Water Well Impacts”: Structure program such that “...it does not arbitrarily or inequitably exclude certain drinking water well users”
- Must balance the need to maintain water supplies with the costs of the program.

Image courtesy: Veronica Adrover/UC Merced

# Existing County Water Services

Merced County Interim Services 7/25/25

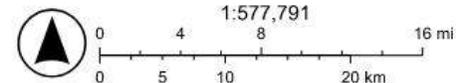


8/14/2025

Merced County Boundary

World\_Street\_Map

Incorporated Area



Esri, HERE, Garmin, NGA, USGS, NPS

# Potential Impacts on Domestic & Public Water Supply (PWS) Wells in Merced

- Used County's well permitting database (~1996 and newer) = 3,300 domestic and PWS wells in Subbasin with depth reported
- Assigned each well to one of the 29 representative monitoring wells

Groundwater Conditions	# wells shallower than groundwater	Notes
Fall 2015 (Minimum Threshold)	27	Expect that these have been deepened or abandoned and replaced given that groundwater levels have declined to this level in the past.
2025 & 2030 Interim Milestones	27 + <b>20 additional</b> = 47	

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# Domestic Well Inventory Summary

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- Merced County Well Permit Database
  - Electronic records from early 1990s through present
- California DWR Online System for Well Completion Reports (OSWCR)
  - Electronic records from 1950s through present
- Domestic Well Inventory Project funded by DWR Disadvantaged Community Involvement Grant and MIUGSA
  - Door-to-door survey(s)
  - Machine-learning exercise
  - Manual review of all well completion reports in OSWCR

Image courtesy: Veronica Adrover/UC Merced

# Chowchilla Subbasin Domestic Well Mitigation Policy

- Purpose:
  - for wells that went dry, are imminently going to go dry
  - mitigate for domestic wells that have documented degraded water quality.
  - Mitigate domestic wells and shallow wells that supply drinking water from impacts that occur from groundwater management activities outlined in the Revised GSP.
- Maximum Mitigation Award: \$30,000. (excess of \$30,000 on a case-by-case basis ).
- Temporary Mitigation Measures: Temporary mitigation services until permanent mitigation is in place starting the following business day of a Program application submission.
- The Program is operating in coordination with partners from the Chowchilla Nitrate Management Zone (CV-Salts) and Self-Help Enterprises

Image courtesy: Veronica Adrover/UC Merced

# Chowchilla Subbasin Domestic Well Mitigation Policy (Cont)

- A **one-time \$100.00 application fee** (the one-time fee will be reimbursed if awarded mitigation under the program)
- Applicant must complete initial well assessment, and provide documents of any work that has been performed on the well
- Taking applications for wells that have gone dry after Jan. 1, 2020
- **Fully funded (9) wells to date**
- Approximately another **20 applications on deck** for further review
- GSA's within the Subbasin funding their pro-rata share of program expenses

Image courtesy: Veronica Adrover/UC Merced

# Delta-Mendota Subbasin Domestic Well Mitigation Policy

- Purpose:
  - Mitigate for **domestic water users whose wells have gone dry or are in imminent threat of going dry due to groundwater levels dropping as a result of groundwater management in the Subbasin.**
  - Subject to specific conditions, **also addresses mitigation for water quality for domestic well users.**
- During the last 10 years, fewer than 40 wells across the nearly 1,200 square miles of the Subbasin have been reported dry or applied for replacement. Not all of those were drinking water wells.
- **Applies** to landowners using groundwater for domestic health and safety supply purposes **as of November 19, 2024, the date the revised Subbasin GSP was adopted by all GSAs.**
- Short-term emergency water supplies
  - Delivery of **bottled water** within 24 hours
  - After a site investigation, the delivery and **installation of water tanks** on a case-by-case basis at the GSA's discretion;
  - All reasonable efforts made to provide tanked water within seventy-two (72) hours.

Image courtesy: Veronica Adrover/UC Merced

# Delta-Mendota Subbasin Domestic Well Mitigation Policy (Cont)

- The GSA's preliminary review of a well mitigation application will consist of all of the following items:
  - Well construction information,
  - Well and pump maintenance records,
  - Historic water level data for nearby representative monitoring network wells,
  - Nearby known production well information,
  - Nearby land use and any recent land use changes, and/or
  - An analysis of nearby conjunctive use activity (if known).
- Such Mitigation Measures may include, but are not limited to, the following:
  - Lowering the well pump or otherwise modifying pump equipment,
  - Deepening the well if the existing well has an open bottom,
  - Installing a new well,
  - Assisting landowner with facilitating a connection to an existing municipal or community water system or other water supply, if feasible, or
  - Other appropriate mitigation as may be agreed to by both parties.
- Delta-Mendota Subbasin Coordination Committee agree to equally fund a common account to a total of \$300,000.

Image courtesy: Veronica Adrover/UC Merced

# DRAFT Program Development and Refinement

## Merced Groundwater Subbasin Groundwater Sustainability Agencies

### Merced Irrigation-Urban GSA

City of Atwater  
City of Livingston  
City of Merced  
Le Grand CSD  
Planada CSD  
Winton Water and Sanitary District  
Merced Irrigation District

### Merced Subbasin GSA

Amsterdam Water District  
Le Grand-Athlone Water District  
Lone Tree Mutual Water Company  
Mariposa County  
Merced County  
Merquin County Water District  
Plainsburg Irrigation District  
Sandy Mush Mutual Water Company  
Stevinson Water District

### Turner Island Water District GSA-1

Turner Island Water District

### Coordination Committee

Representatives from Boards of GSAs

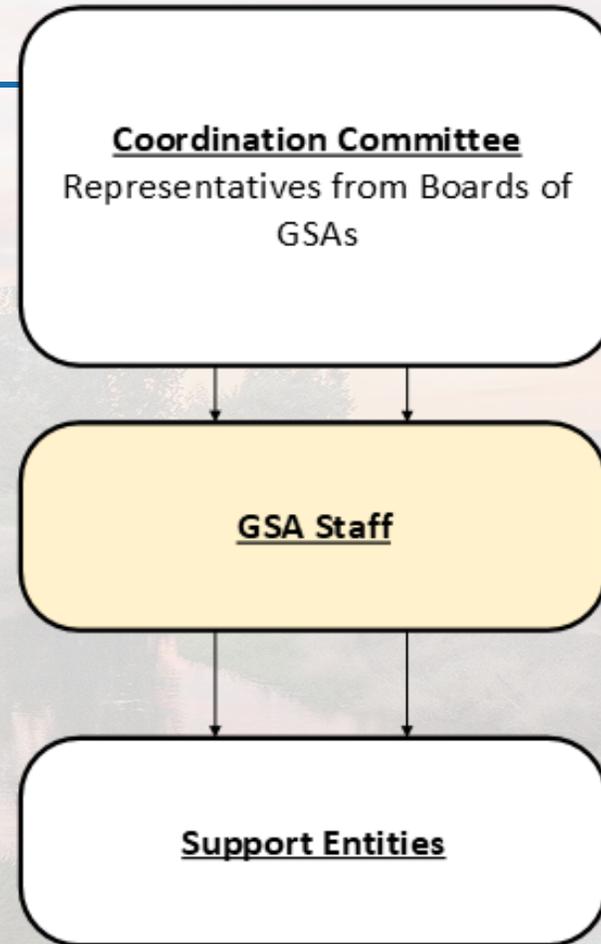
### GSA Staff

### Stakeholder Advisory Committee

Growers  
City Residents  
Disadvantaged Communities  
County Residents / Domestic Well Owners  
Environmental  
Schools  
Private Water System Providers  
NGOs

Image courtesy: Veronica Adrover

# DRAFT Program Implementation Structure

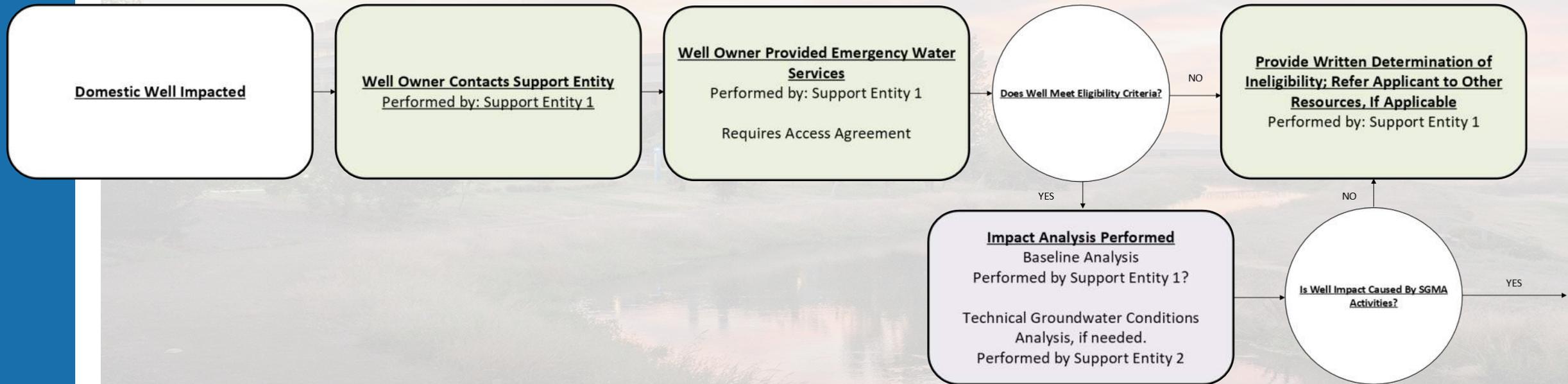


1.  
General Program Support (i.e. Initial  
Contact)

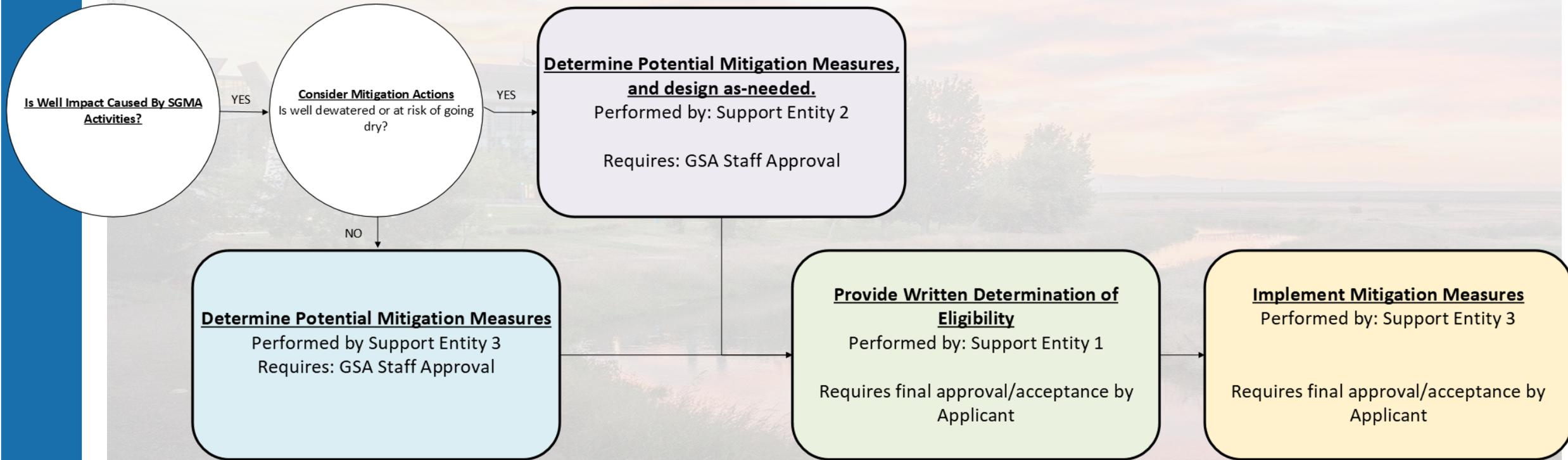
2.  
Technical Consultant

3.  
Pump Contractor(s)  
Well Driller(s)

# DRAFT Program Process, cont'd.



# DRAFT Program Process, cont'd.



# Merced Domestic Well Mitigation Program Framework

## Eligibility

Wells that have experienced adverse impacts due to declining groundwater levels

## Well Eligibility Criteria

- The well is within the Merced Subbasin
- The well existed prior to 9/1/2025
- There is evidence connecting GSA management actions to well's ability to provide potable water
- The well does not supply water for non-domestic use
- The well does not extract more than 2 AFY
- The adverse impact on well performance is not attributed to the well's original construction
- The well has not been previously mitigated by this program

## Mitigation Measures

### Emergency Water Supply

- Bottled drinking water
- Tanked supply

### Long Term Solution

- Connection to a Public Water Supply System
- Modifications to Existing Well
- Well Deepening
- Well Replacement

Image courtesy: Veronica Adrover/UC Merced

# Discussion Questions

- Should the program mitigate multiuse wells that serve non-domestic purposes?
- Should the program mitigate domestic wells are not de-minimis?
- Should there be a financial cap on any well mitigation measures?
- Should the program reimburse applicants who have already replaced a domestic well that went dry prior to September 2025?
- Should the program offer the option to reimburse an eligible applicant who wants to manage the replacement of their own well?

Image courtesy: Veronica Adrover/UC Merced



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# Allocation Program Policies Coordination

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Image courtesy: Veronica Adrover/UC Merced



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# Department of Water Resources DRAFT Subsidence Best Management Practices

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Image courtesy: Veronica Adrover/UC Merced

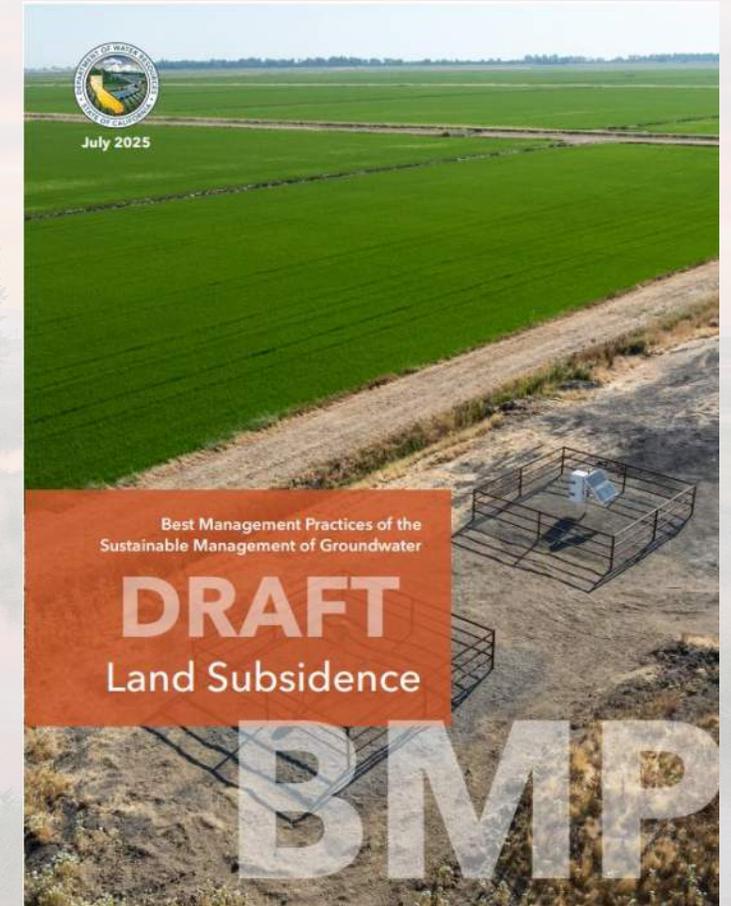
# DWR's Draft Subsidence BMP

- Released July 24
- 68 pages
- Public comments due Sept. 22 at [sgmps@water.ca.gov](mailto:sgmps@water.ca.gov)
- In-person meetings scheduled for
  - Willows: Sept. 11, 1pm, Memorial Hall
  - Clovis: Sept. 9, 3pm, Veteran's Hall
  - Delano: Sept. 10, 1pm, Hyatt Place Delano



scan for details and registration

Image courtesy: Veronica Adrover/UC Merced



# What is a Best Management Practice document?

- Regulation definition: “Best management practice” refers to a practice, or combination of practices, that are designed to achieve sustainable groundwater management and have been determined to be technologically and economically effective, practicable, and based on best available science
- DWR’s web site notes:
  - ...not substitutes for GSP Regulations or the statutory provisions of SGMA...
  - In brief, BMPs provide:
    - Clarification
    - Guidance
    - Examples to help GSAs develop the essential elements of a GSP

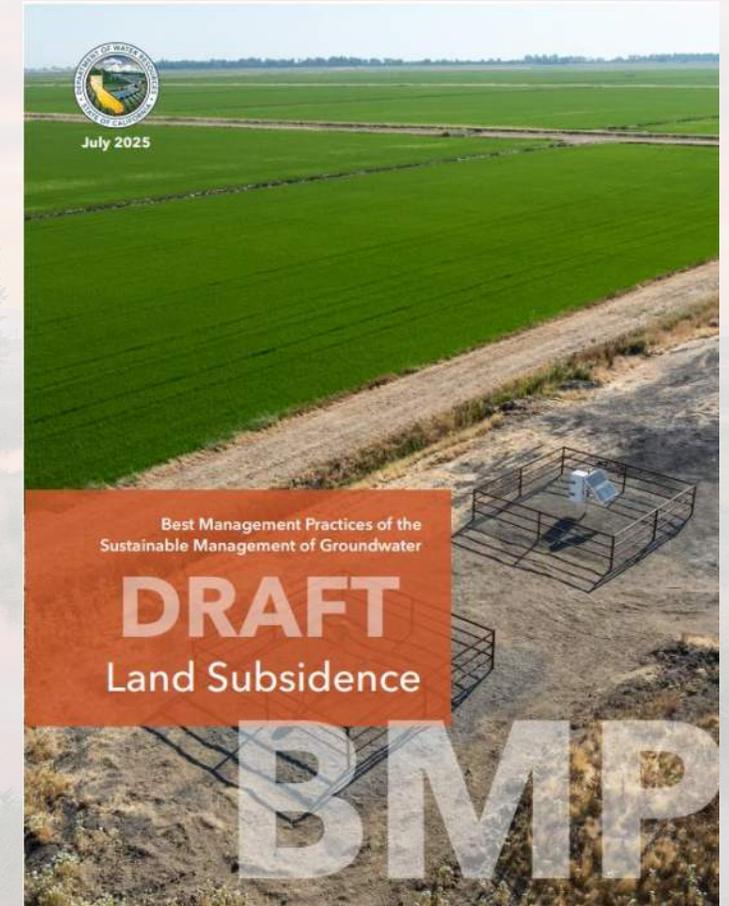


Image courtesy: Veronica Adrover/UC Merced

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# Subsidence Management in the Merced Subbasin

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- GSAs use available subsidence data, notably data from the San Joaquin River Restoration Program
- Sustainable Management Criteria based on selected SJRRP sites
- GSAs have installed new monitoring wells for groundwater level data
- Subsidence management is focused on groundwater level minimum thresholds based on 2015 groundwater levels and associated supply augmentation / demand reduction efforts

Image courtesy: Veronica Adrover/UC Merced

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# Considerations and Challenges

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- The GSAs are working to minimize subsidence
- Addressing subsidence involves projects and management actions that take time
- Data limitations and financial limitations restrict the level of analyses that can be performed
- Ideally the draft BMP supports local efforts to manage subsidence, together with neighboring subbasins

Image courtesy: Veronica Adrover/UC Merced

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# Goals for Today

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- Build awareness of the draft BMP
- Prepare to address whatever is in the final BMP
- Consider submitting comments on the draft BMP

Image courtesy: Veronica Adrover/UC Merced

# Highlights

***The effects [of subsidence] are costing Californians hundreds of millions of dollars annually in damage repairs, reducing water supply reliability, and jeopardizing public safety. It is imperative that existing subsidence is minimized as quickly as possible, and the emergence of new subsiding areas avoided.***

- Change from “avoid or minimize” subsidence to raising levels “as high and as quickly as possible”
- Change from subsidence rate to cumulative subsidence
- Estimate Critical Head – groundwater level below which subsidence begins
- Monitor groundwater levels monthly – or more frequently
- Responsibility for Mitigation

Image courtesy: Veronica Adrover/UC Merced

# Raise Groundwater Levels As High and as Quickly as Possible

- BMP indicates the best management practice of raising groundwater level elevations as high and as quickly as possible is the most effective way to avoid or minimize subsidence.
- Absent other considerations, this approach is valid.
- “As high and as quickly as possible” likely correlates to immediate pumping bans, which would be catastrophic to the local economy.
- BMPs must consider if economically effective and practicable.
- More balanced approaches are necessary.

Image courtesy: Veronica Adrover/UC Merced

# Subsidence Rate to Cumulative Subsidence

- Draft BMP states: “GSAs are required to set criteria based on a rate and/or cumulative amount of land subsidence that may represent significant and unreasonable conditions”
  - Refers to 23 CCR § 355.4(c), which does not exist
  - 354.28(c)(5) states: “The minimum threshold for land subsidence shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.”
- Draft BMP pushes GSAs to use cumulative amounts of subsidence, which makes management of residual subsidence or ramp-up of projects challenging

Image courtesy: Veronica Adrover/UC Merced

# Estimation of Critical Head

- Estimation of Critical Head – groundwater level below which subsidence occurs
- BMP provides 3 methods
  - Trend-based analysis
  - Empirical analysis
  - Modeling analysis

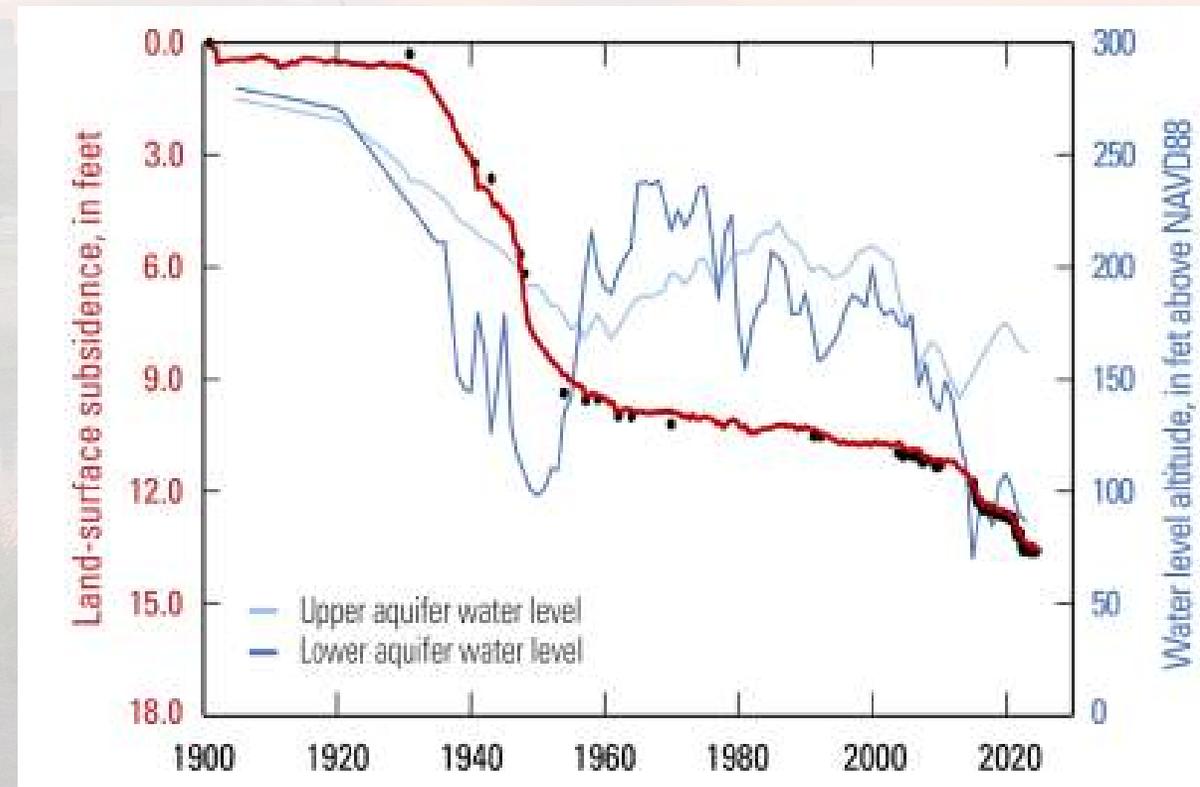
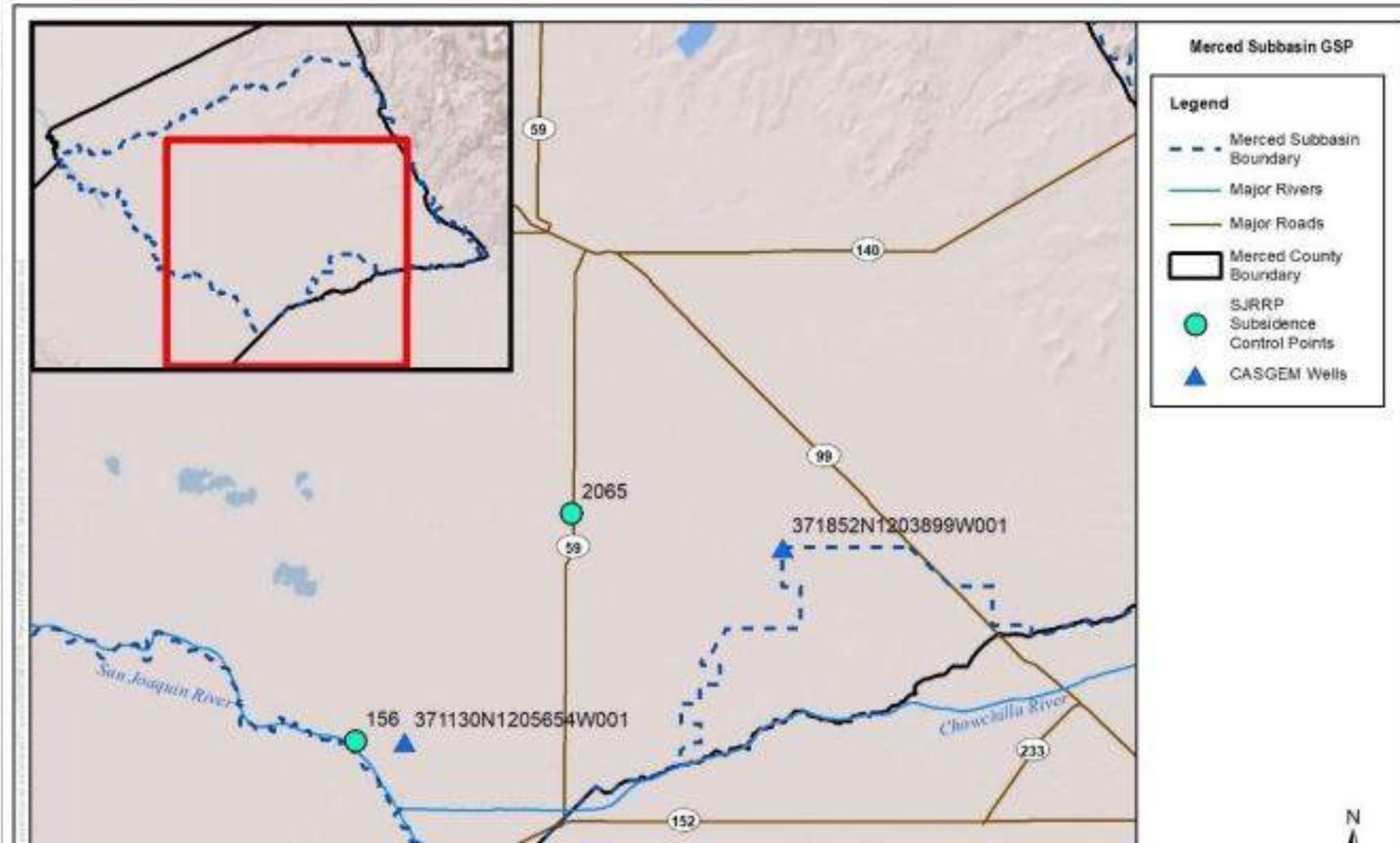
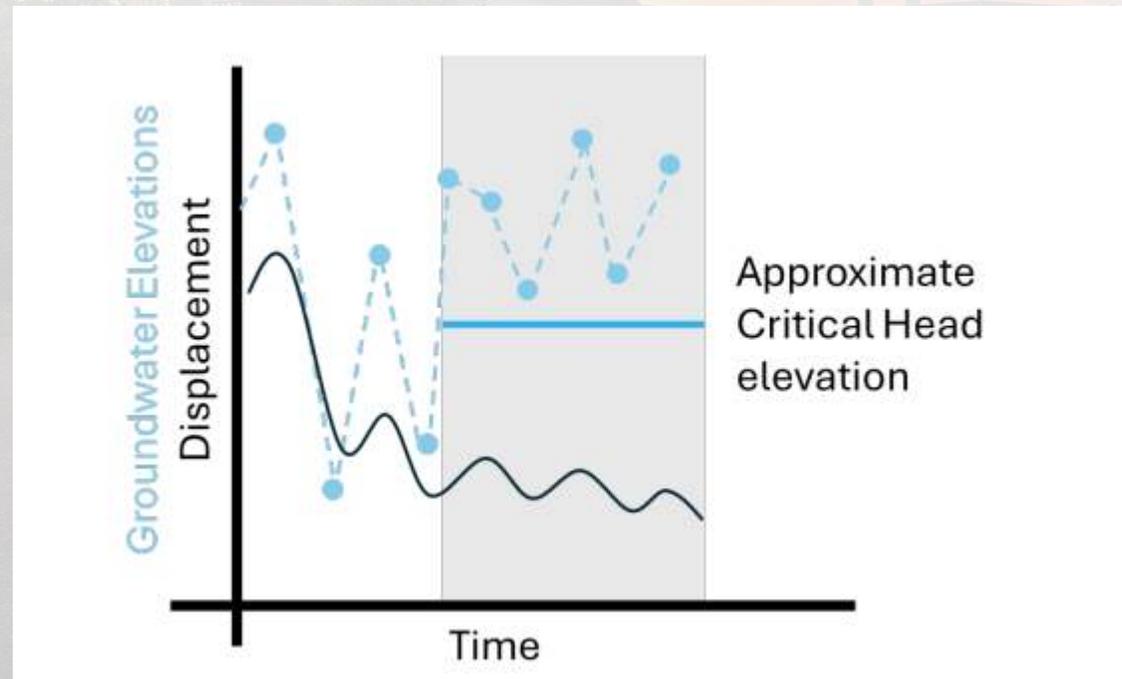


Image courtesy: Veronica Adrover/UC Merced

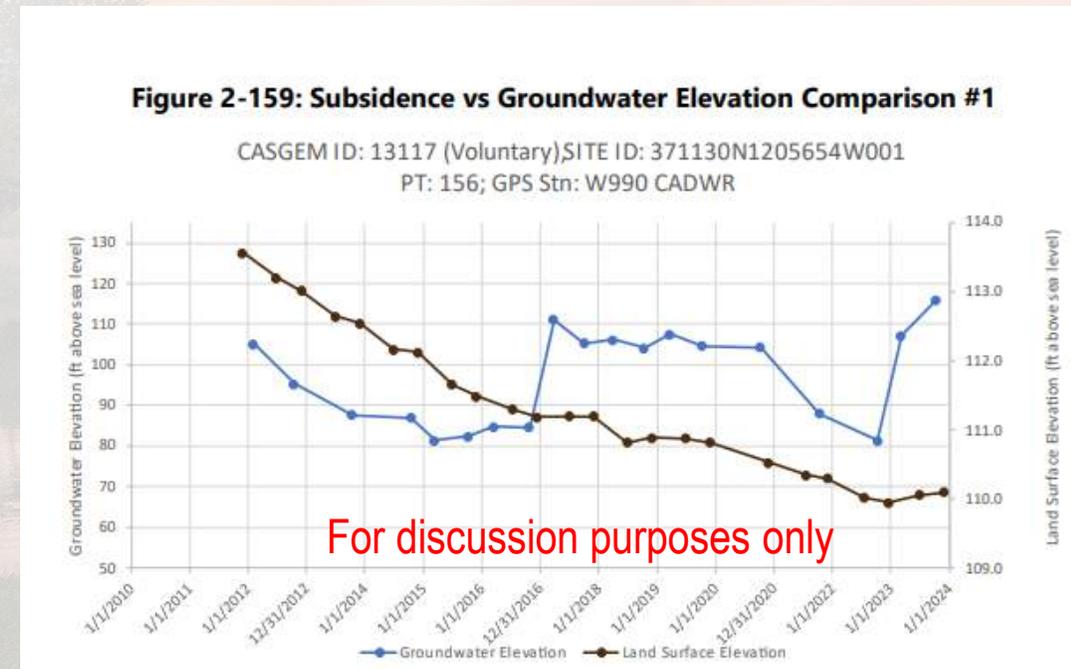
# Real-world challenges – location and frequency of data



# Trend Analysis challenges – data frequency



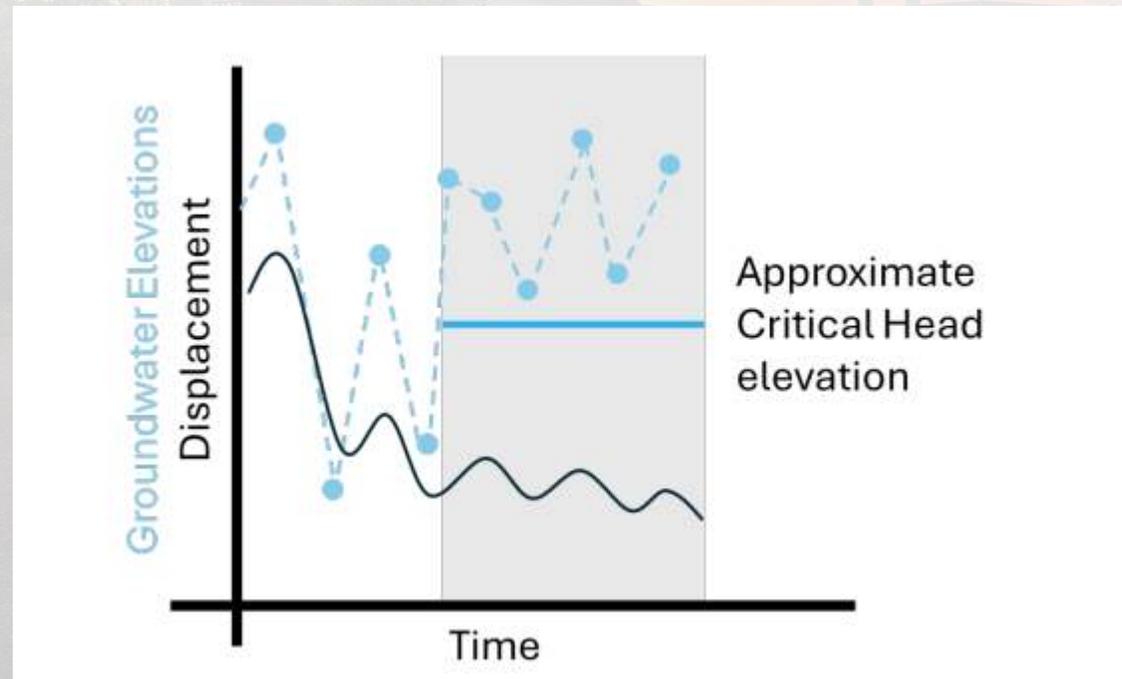
DWR example



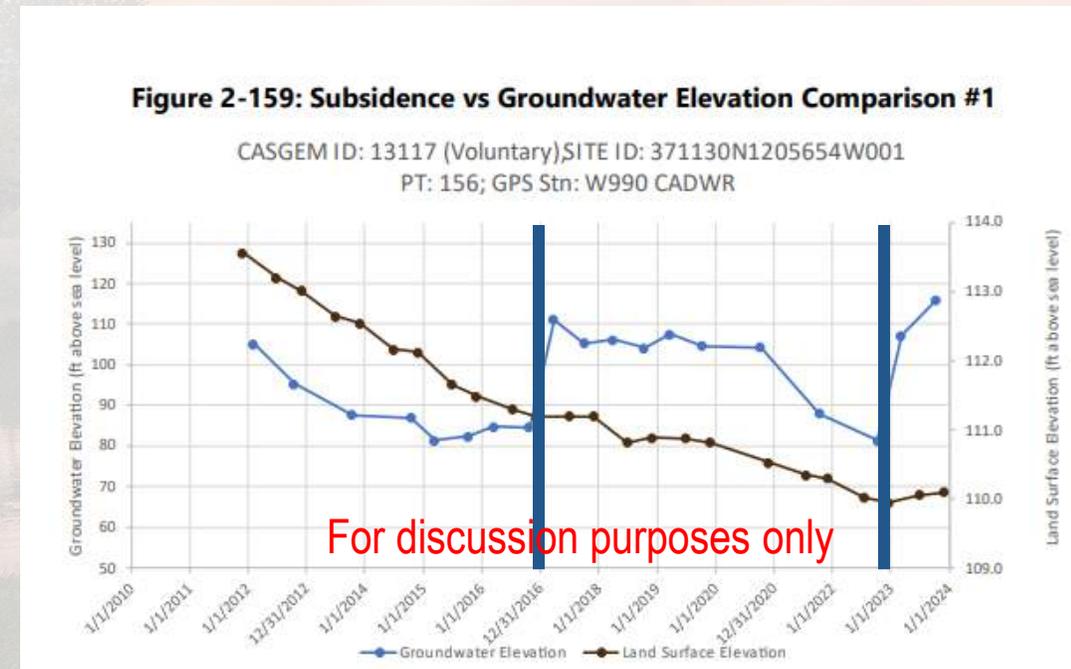
Merced data

Image courtesy: Veronica Adrover/UC Merced

# Trend Analysis challenges – data frequency



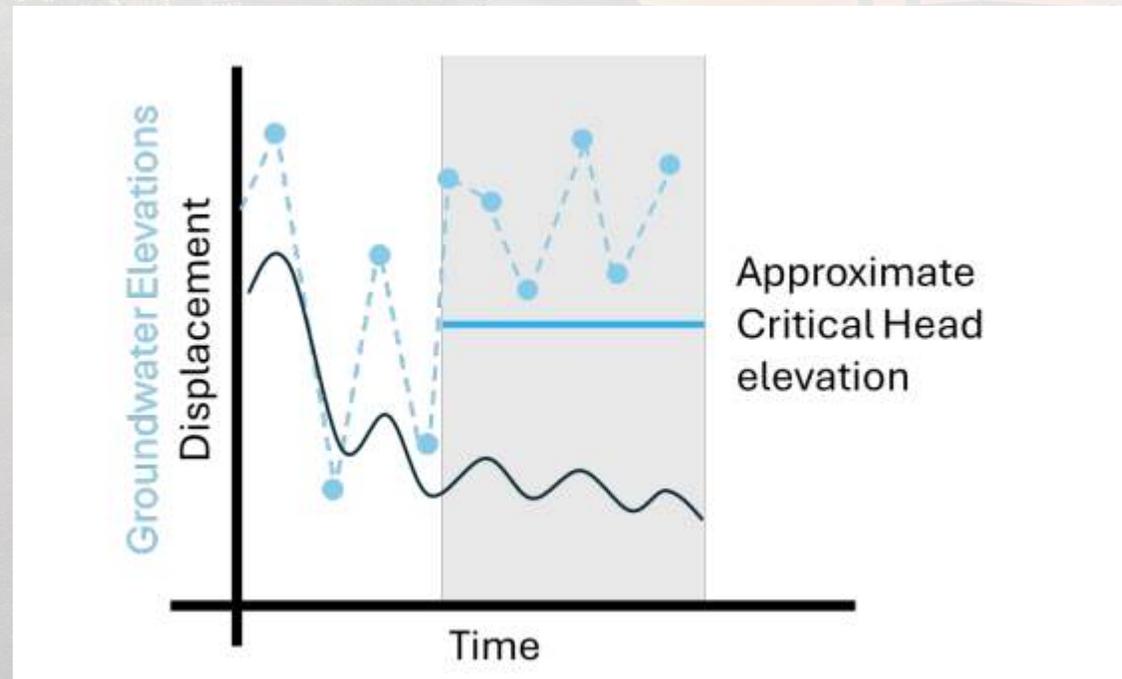
DWR example



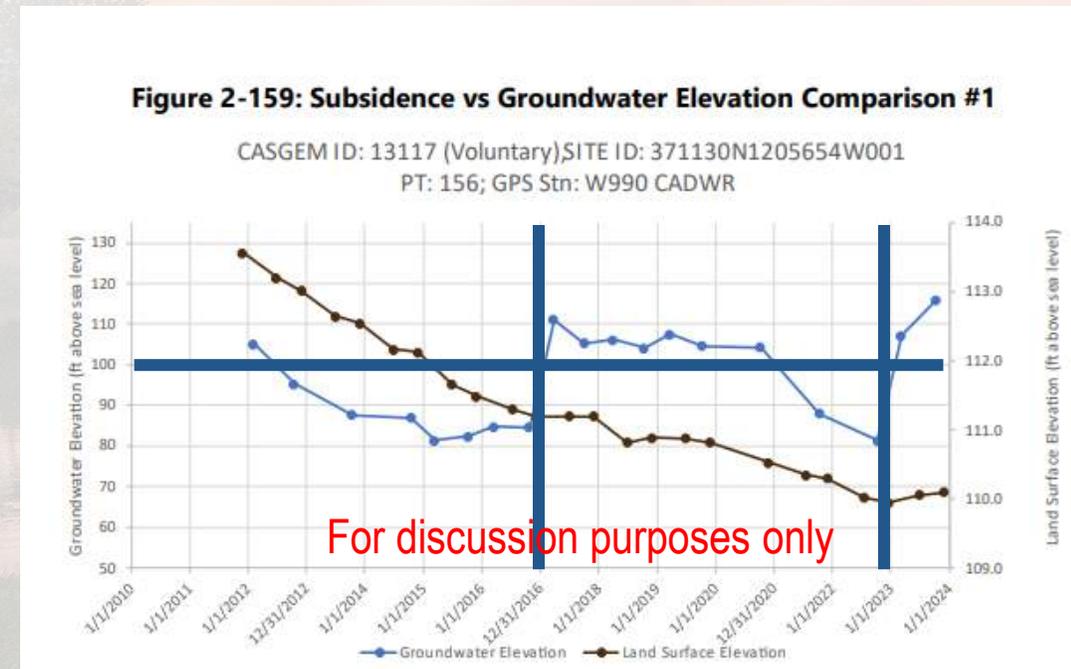
Merced data

Image courtesy: Veronica Adrover/UC Merced

# Trend Analysis challenges – data frequency



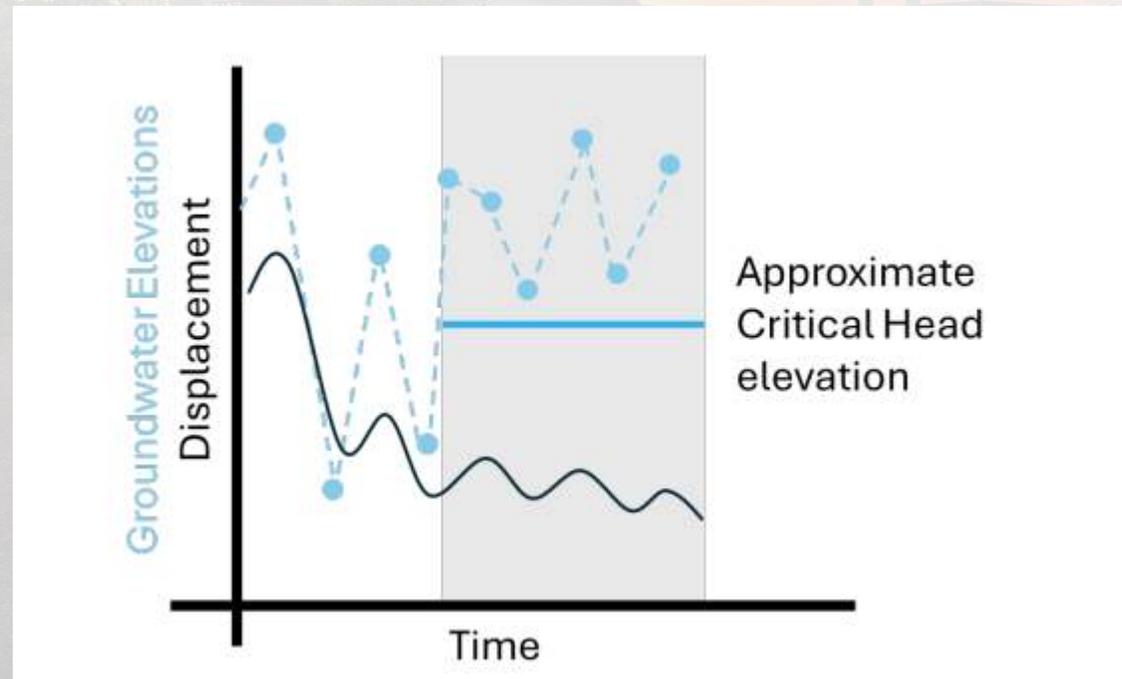
DWR example



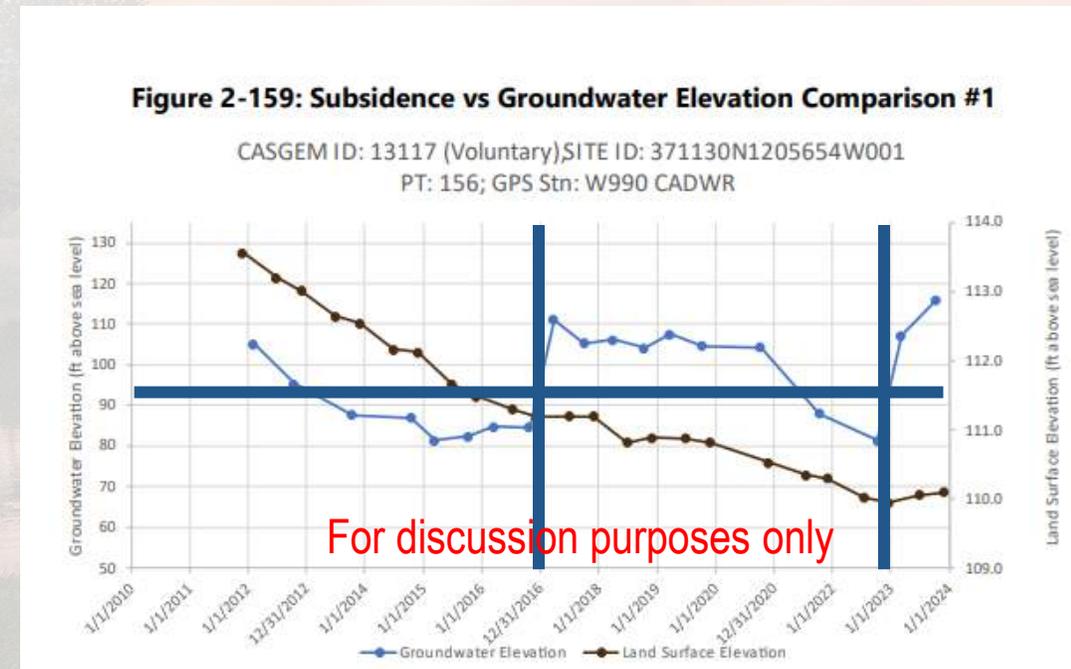
Merced data

Image courtesy: Veronica Adrover/UC Merced

# Trend Analysis challenges – data frequency



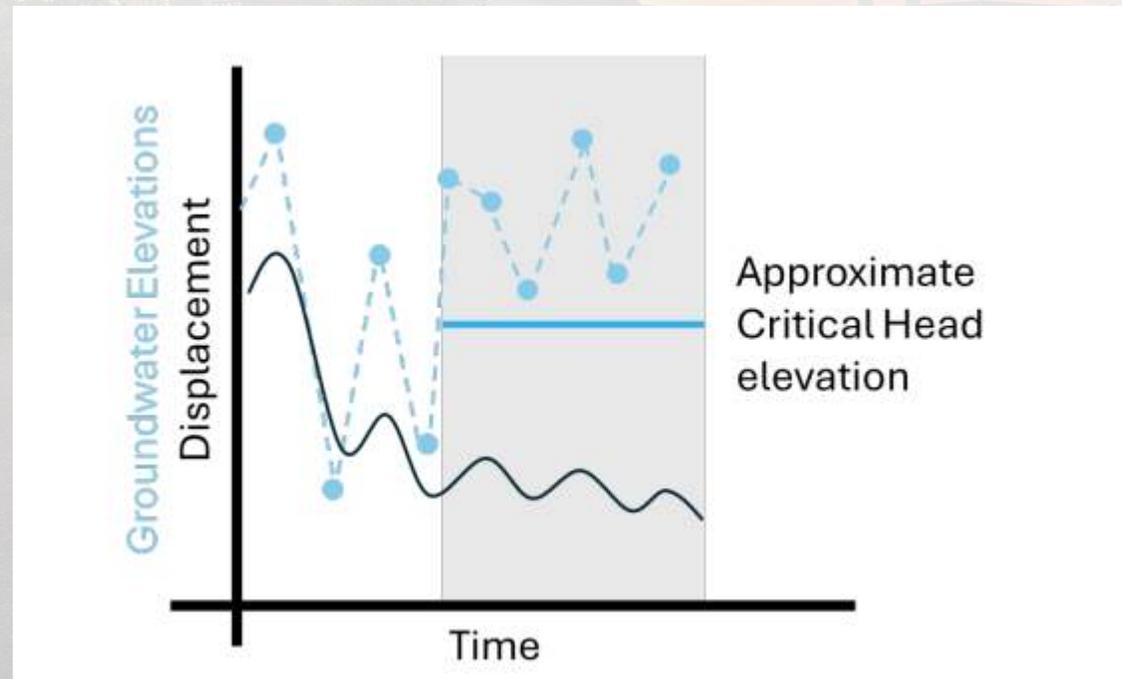
DWR example



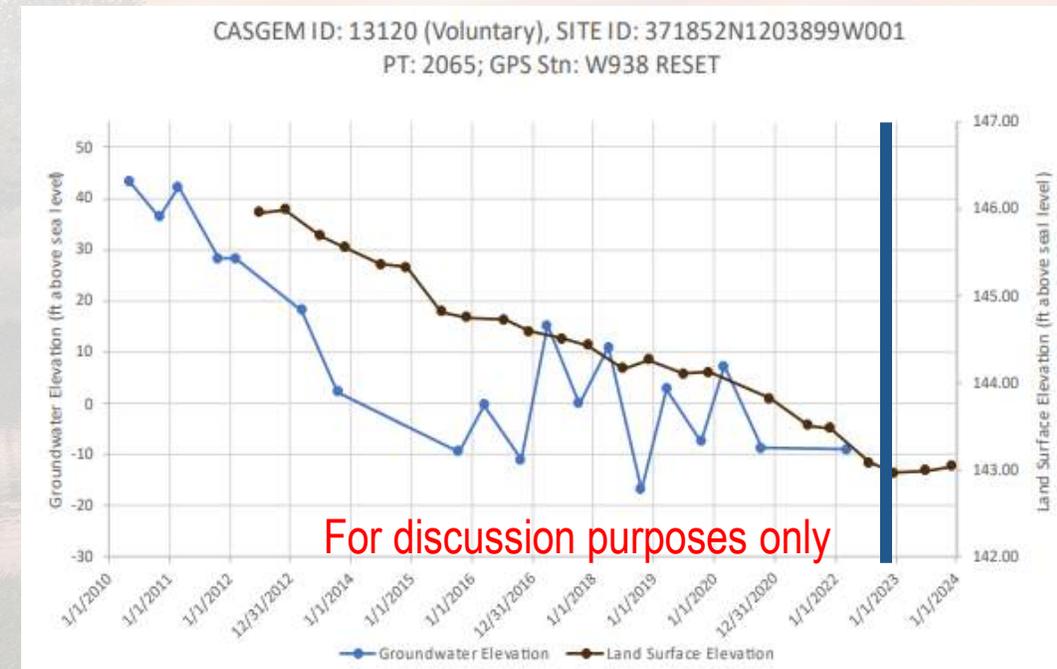
Merced data

Image courtesy: Veronica Adrover/UC Merced

# Trend Analysis challenges – data frequency



DWR example



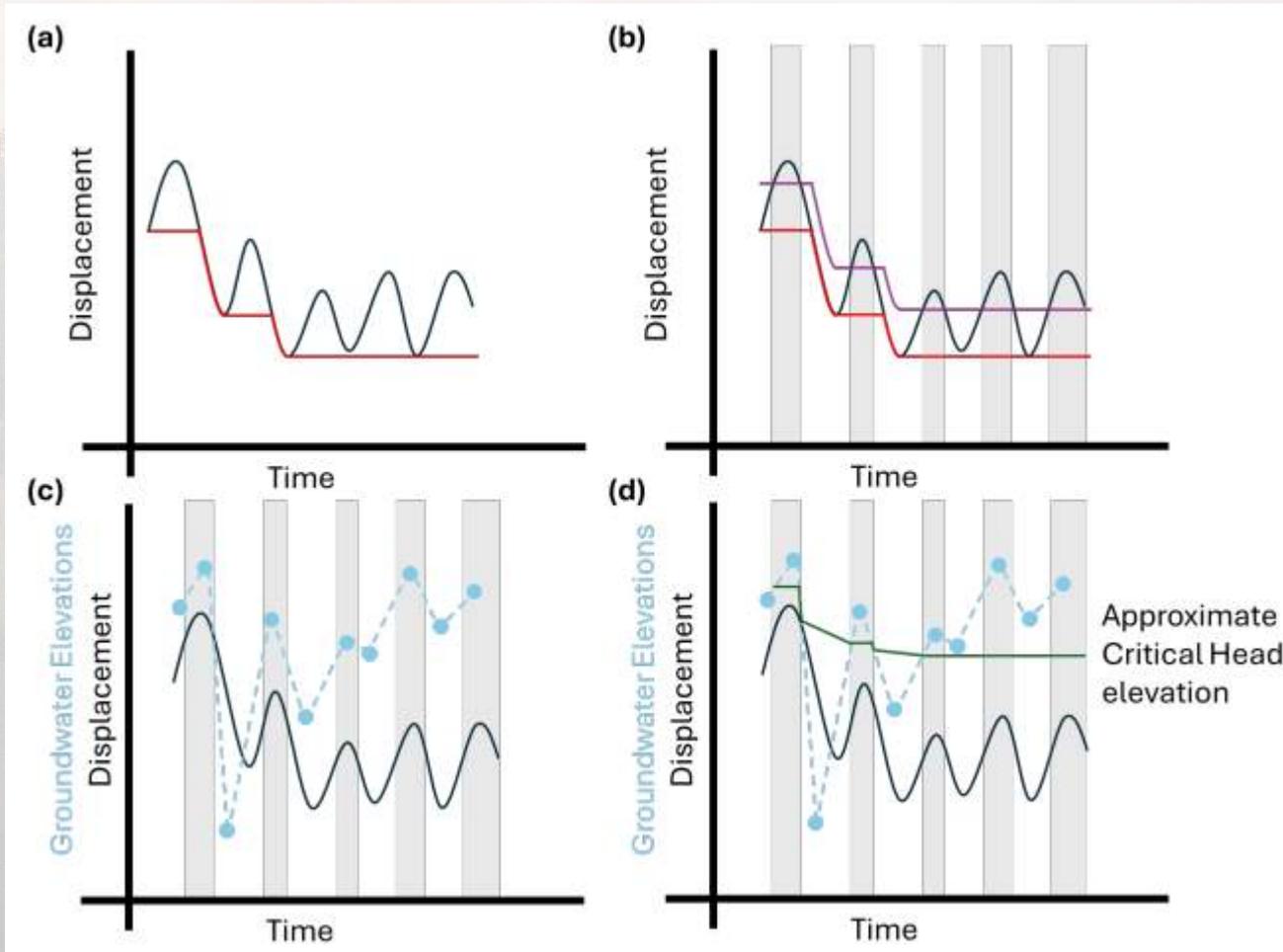
Merced data

Image courtesy: Veronica Adrover/UC Merced

# Empirical Analysis

ID "maximum subsidence"  
(red line)

ID groundwater levels  
(blue)



ID land surface rebound (gray shade)

ID critical head  
(green line)

Image courtesy: Veronica Adrover/UC Merced

DWR example

# Empirical Analysis challenges – data frequency

- Data frequency unable to support the empirical analysis
- Spatial differences continue to be an issue

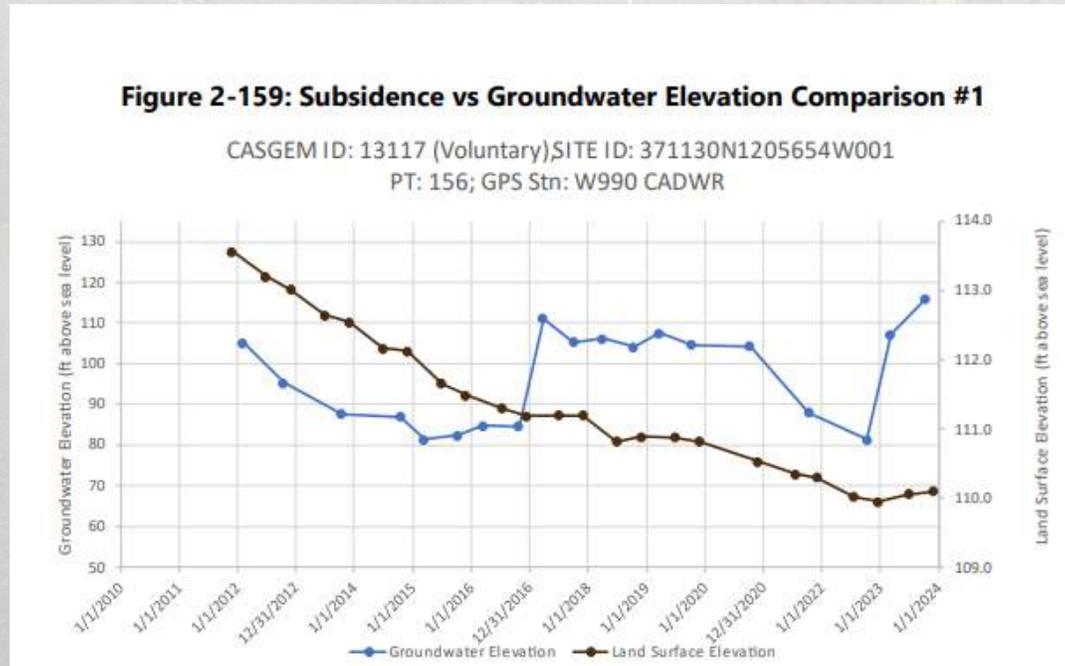


Image courtesy: Veronica Adrover/UC Merced

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# Modeling analysis challenges – data

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- BMP: “GSAs should select modeling methods in consideration of data availability and hydrogeologic complexities in their basin, as well as considering regional management complexity.” “A primary consideration for model development is the availability of long-term, high-frequency observation data.”
- Data limitations noted under previous options would impact a modeling analysis of subsidence.

Image courtesy: Veronica Adrover/UC Merced

# Monitoring – Groundwater Levels and More

- Subsidence monitoring indicates need for
  - Spirit-leveling
  - Extensometers
  - GPS
  - InSAR
- Groundwater level monitoring indicates the need for “monthly or better” monitoring.
- Subsidence data is indicated for quarterly review
- Metering of pumping is a listed best management practice in areas with land subsidence.
- Implementation of BMP-compliant monitoring will require funding

Image courtesy: Veronica Adrover/UC Merced

# Responsibility for Mitigation

- BMP states: “The GSA should ... set the minimum threshold as the amount of additional subsidence that does not cause further substantial interference with land uses that the GSA cannot pay to mitigate.”
- Potential for dramatic cost burden on GSA

Image courtesy: Veronica Adrover/UC Merced

# Responsibility for Mitigation

- SGMA does not explicitly require mitigation if not considered significant and unreasonable

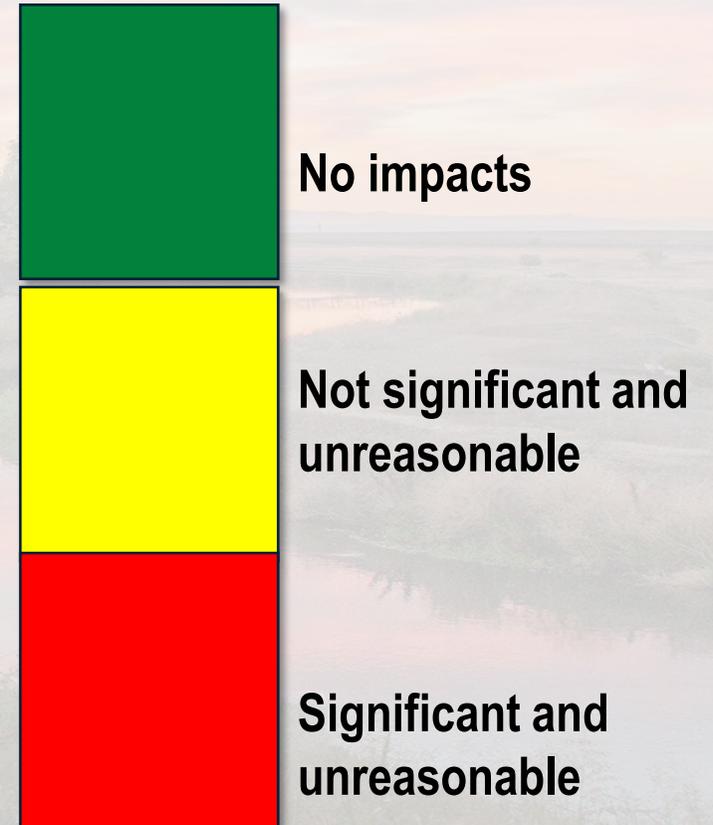


Image courtesy: Veronica Adrover/UC Merced

# Responsibility for Mitigation

- SGMA does not explicitly require mitigation if not considered significant and unreasonable
- Mitigation can be used to extend “not significant and unreasonable”
- Consult your legal counsel for legal opinions

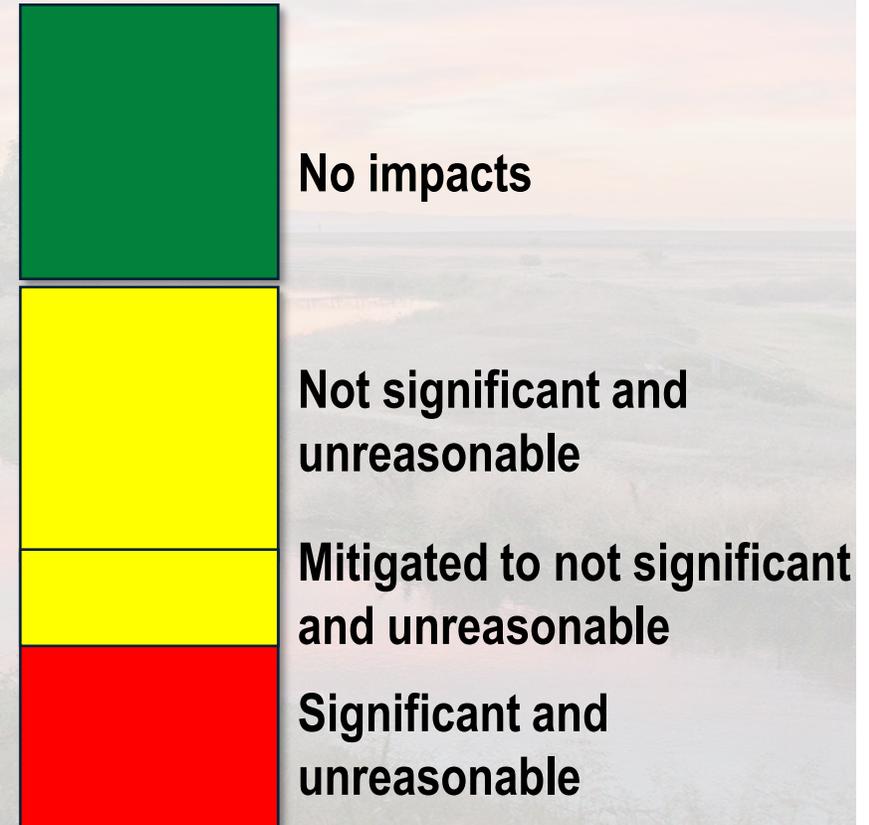


Image courtesy: Veronica Adrover/UC Merced

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# Overview of potential comments on the draft BMP

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- The BMP provides a comprehensive approach to combat subsidence. All parties wish to address subsidence issues.
- Approaches in the BMP often may miss the “economically effective” and “practicable” components of the regulations.
- Many items that should be clarification and guidance read more like rules and standards.
- Approaches should reflect the type of data limitations that GSAs are likely to encounter.

Image courtesy: Veronica Adrover/UC Merced

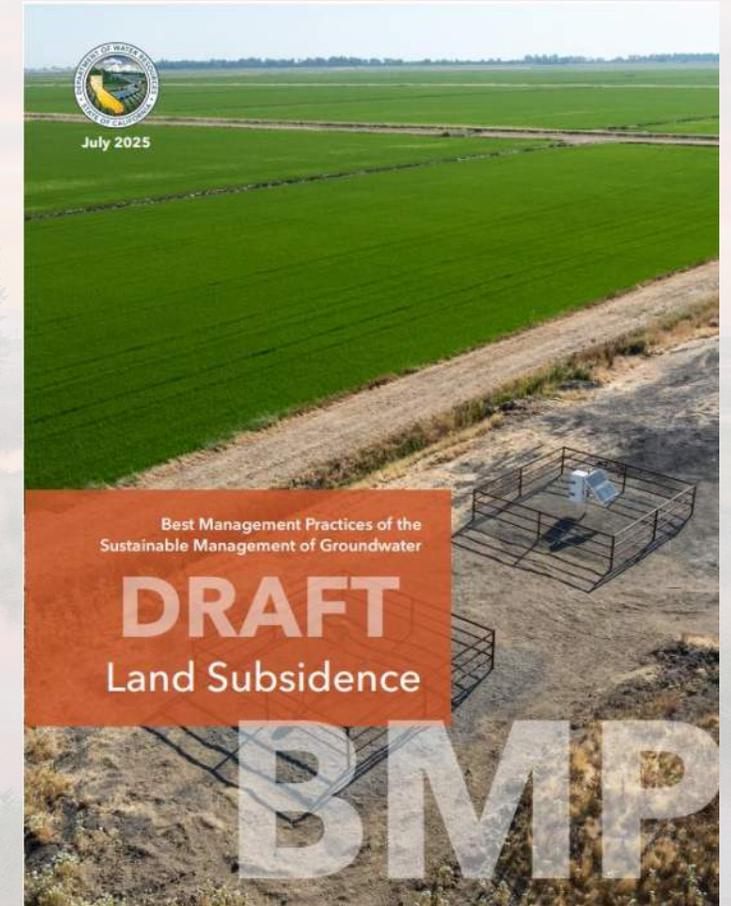
# Next Steps

- Public comments due Sept. 22 at [sgmps@water.ca.gov](mailto:sgmps@water.ca.gov)
- In-person meetings scheduled for
  - Willows: Sept. 11, 1pm, Memorial Hall
  - Clovis: Sept. 9, 3pm, Veteran's Hall
  - Delano: Sept. 10, 1pm, Hyatt Place Delano



scan for details and registration

Image courtesy: Veronica Adrover/UC Merced





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# Update on Filling Monitoring Network Data Gaps

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Image courtesy: Veronica Adrover/UC Merced



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# Next Steps

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Image courtesy: Veronica Adrover/UC Merced



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# What's coming up next?

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- Next meeting potentially in November
- Discuss anticipated DWR Depletion of Interconnected Surface Waters Guidance

Image courtesy: Veronica Adrover/UC Merced

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# Merced GSP Joint Coordination & Stakeholder Advisory Committees Meeting

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**August 18, 2025**

**Merced Irrigation-Urban GSA  
Merced Subbasin GSA  
Turner Island Water District GSA-1**

Image courtesy: Veronica Adrover/UC Merced

