



## **MEMORANDUM**

**TO:** Delta-Mendota Subbasin Coordination Committee Members and Alternates

**FROM:** John Brodie, Water Resources Programs Manager

**DATE:** April 21, 2023

**RE:** Approval of Task Order Amendment and Budget Increase for EKI Environment and Water to Respond to the Delta-Mendota Subbasin's GSPs Inadequate Determination

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### **BACKGROUND**

On March 2, 2023, the California Department of Water Resources (DWR) issued its final Determination on the six Delta-Mendota Subbasin GSPs as Inadequate. The Determination shifted the Subbasin to the jurisdiction of the California Water Resources Control Board (SWRCB). The SWRCB has authority granted by SGMA legislation to accept or reject DWR's findings and identify its own deficiencies in the GSPs. In an as yet unknown timeframe, the SWRCB will hold a public hearing to determine whether to place the Subbasin on probation while local efforts are underway to make amendments to the GSPs that will satisfy the identified deficiencies. If the Subbasin fails to achieve approved status for the revised GSPs, the SWRCB may place the Subbasin under an interim plan of its own after one year.

### **ISSUES FOR DECISION**

The Committee must decide whether to approve a task order amendment and budget increase for EKI Environment and Water, Inc. to begin the process of revising specific aspects of the GSP Common Chapter to achieve approved status for the Subbasin GSPs.

### **RECOMMENDATION**

Staff recommends that the Committee approves the amended task order and budget increase for EKI. The budget increase must also be approved by the SLDMWA Board. The Northern and Central Delta-Mendota Region Management Committees have already approved their representatives to the Coordination Committee to support approval.

## **ANALYSIS**

At its meeting on March 27, 2023, the Coordination Committee identified three measures of success for the Subbasin in responding to the Inadequate Determination:

- Maintaining local control.
- Avoiding SWRCB fees (to the extent feasible).
- Avoiding an imposed interim plan.

Also at that meeting, the Committee directed EKI to develop a scope and fee for amended Sustainable Management Criteria and water budget. The scope and budget were put together with the assumption that work on these items should be completed by the end of July, 2023. It is also assumed that the deliverables from this amended task order can be used in the 2025 Plan Update.

## **BUDGET**

The budget to complete the scope of work in the amended task order is \$200,000. The total cost under this task order will be split evenly between the six GSP groups.

6 April 2023

John Brodie  
Water Resources Program Manager  
San Luis & Delta-Mendota Water Authority  
842 6<sup>th</sup> Street, PO Box 2157  
Los Banos, CA 93635

Subject: Proposal to Initiate Response to the Inadequate Determination  
Delta-Mendota Subbasin  
(EKI C3-114)

Dear Mr. Brodie:

EKI Environment and Water, Inc. (EKI) is pleased to submit this proposal to support the Delta-Mendota Subbasin (Subbasin) to initiate response to the California Department of Water Resources (DWR's) "Inadequate" determination issued on 3 March 2023. This proposal is submitted in response to San Luis & Delta-Mendota Water Authority's (SLDMWA's or Client's) request on 27 March 2023.

## BACKGROUND

On 20 July 2022, the GSAs submitted a revised Subbasin Plan consisting of a Coordination Agreement and six GSPs (collectively, the Plan) in response to DWR's "incomplete" determination of the original Subbasin Plan submitted in January 2020. On 3 March 2023, DWR issued a final determination, finding the Subbasin's 2022 Revised Plan to be "inadequate" and transferring oversight of the Subbasin to the State Water Resources Control Board (State Board).

Key deficiencies identified by DWR included:

- **Deficiency #1:** "The Agencies did not provide sufficient information to demonstrate [that] water budget, change in storage, and sustainable yield, are or will use the same data or methodologies"
  - The coordination agreement and various technical memoranda that are part of the proposed management program remain unchanged, making it unclear how or whether certain revisions in some GSPs would be carried through on a basinwide scale.
- **Deficiency #2:** "The GSPs have not established common definitions of undesirable results in the Subbasin"
  - No new supporting information is provided within the Common Chapter or within the revised GSPs to justify the new groundwater management approach. (i.e., the coordinated Undesirable Results definitions)
  - No justification for setting a 50 percent threshold for groundwater levels or water quality is provided, details regarding modifying wells and pumps are absent from the resubmitted material, ... (i.e., part of revised significant and unreasonable definition)

- ... lack of specific, quantitative details, or a more defined and transparent decision-making process for establishing definitions of sustainability
- **Deficiency #3:** “The GSPs in the Subbasin have not set sustainable management criteria in accordance with the GSP regulations”
  - The Plan does not indicate when the historic low groundwater levels (which are part of the minimum threshold definitions) were observed.
  - No analysis was provided explaining or justifying why 50 percent was chosen as the threshold or what impacts would occur to the Subbasin’s pumping wells or the beneficial uses and users of groundwater if that threshold is approached or exceeded.
  - There is no discussion in the Plan related to continued overdraft or subsidence, migration of contamination plumes, degradation of water quality, or depletions of interconnected surface water if groundwater levels approach or exceed to new minimum thresholds, especially for those wells located near the San Joaquin River.
  - The revised Plan does not provide an explanation as to how the GSAs have determined that managing the Subbasin to near historical low groundwater elevations would avoid undesirable results for the other applicable sustainability indicators.
  - It is unclear if the minimum thresholds have been selected to avoid undesirable results.

It is understood that the State Board, in its review of the Subbasin’s Plan may identify additional deficiencies that will have to be addressed by the GSAs to avoid or remove probationary status. It is further understood that the Subbasin now has roughly one year to prepare a revised Plan that meets the requirements of the Sustainable Groundwater Management Act (SGMA) to avoid implementation of an Interim Plan developed by the State Board. While the exact timeline of State Board intervention is unknown of, it appears that in roughly the same time frame (i.e., by January 2025), the GSAs will be required to conduct their periodic evaluation of the Subbasin Plan and provide a written assessment to DWR that satisfies the requirements of CCR § 356.4. *Periodic Evaluation by Agency.*

The following Scope of Work addresses initial efforts to respond to the DWR deficiencies through July 2023, as it is understood that on-going coordination with DWR and the State Board and completion of the 2025 GSP Update will be subject to a Request for Proposals (RFP).

## **SCOPE OF WORK**

### **Task 1 – Revise the Sustainable Management Criteria**

EKI will support the GSAs to develop revised Sustainable Management Criteria (SMCs) for relevant Sustainability Indicators based on the requirements of California Code of Regulations (CCR) §354.22 - §354.30 (GSP SMC Regulations), the best available data, review of the approaches used in other basins, and review of the DWR deficiency letters.

As part of this task EKI will work with the GSAs to:

- Review and potentially revise the *Sustainability Goal* for the Subbasin;
- At a minimum, justify, and potentially revise the definitions of *Undesirable Results* (URs) for selected applicable SGMA Sustainability Indicators, and continue to demonstrate why seawater intrusion is not applicable;
- At a minimum, justify, and potentially revise the *Minimum Thresholds* (MTs) for each applicable Sustainability Indicator at each representative monitoring site;
- At a minimum, justify, and potentially revise the *Measurable Objectives* (MOs) and establish a *Margin of Operational Flexibility* for each applicable Sustainability Indicator at each representative monitoring site; and
- Develop *Interim Milestones* (IMs) at 5-year intervals through 2040 (beginning in 2025) for each applicable Sustainability Indicator based on the *Minimum Thresholds*, *Measurable Objectives*, and *Margin of Operational Flexibility* defined at each representative monitoring site.

EKI's approach to the above tasks will be to start with the SMC framework contained in the Revised Common Chapter, which was agreed upon and adopted by all GSAs, and to systematically and objectively identify (with consideration of the DWR inadequacy determination) the areas of deficiency with respect to conformance with the GSP SMC Regulations.

This systematic process will involve creating a summary table for each applicable Sustainability Indicator that presents in succinct terms (i.e., bullets) how the Common Chapter addresses each requirement (or not). For example, EKI will summarize how the existing Undesirable Results section in the Common Chapter describes: (a) the causes of groundwater conditions throughout the Subbasin that would lead to URs, (b) the potential effects of URs on beneficial uses/users, and (c) the criteria that define when URs occur (based on a quantitative description of MT exceedances that cause significant and unreasonable effects).

Similarly, for MTs, EKI will summarize the existing Common Chapter with respect to: (a) MT justification supported by information in the Basin Setting and other data or models as appropriate, (b) describing the relationships between MTs for each Sustainability Indicator, (c) how the MTs have been selected to avoid URs in adjacent basins, (d) how they may affect the interests of beneficial uses/users of groundwater or land use and property interests, (e) how (if at all) state, local, or federal standards relate to the sustainability Indicator, and (f) how each MT will be measured. EKI will conduct a similar Regulations-driven assessment for MOs and IMs.

With the above objective deficiency assessment complete, EKI will then examine SMC content from each of the six revised Subbasin GSPs that may be useful in addressing identified gaps and supporting the justification of SMCs. Where potentially supporting content from multiple GSPs is contradictory, EKI will identify these instances and bring them before the GSAs for consideration. Where consistent supporting content is not available, EKI will supplement this content with additional analyses, as appropriate (e.g., well impacts analysis, spatiotemporal analysis of historical data, groundwater modeling to assess conditions likely to occur once overdraft is ceased). EKI will also consider approaches to SMC development/establishment and justification from other GSPs in other basins that were approved by DWR and will assess whether such approaches may be appropriate for use in the Subbasin.

EKI will then synthesize the concepts and content identified through previous tasks into a recommended approach for updated SMCs for each applicable Sustainability Indicator, including URs, MTs, MOs, and IMs. To ensure compliance with the GSP SMC Regulations, EKI will first consider each Sustainability Indicator independently, and then will assess whether use of groundwater levels as a proxy for any other indicators is justifiable and appropriate. EKI will assess the relationships between indicators and will adjust MTs preliminarily established for a given indicator if they would result in URs for another indicator. EKI will use the exact language of the GSP SMC Regulations, as well as the SMC Best Management Practices document (DWR, 2017), as a guiding framework to developing compliant SMCs. For example, in accordance with the Regulations, the MOs and IMs will use the same metrics (i.e., units) as the MTs.

EKI will present key information to the GSAs during regular meetings (see Task 3) for direction and decisions. EKI will then prepare a draft SMC proposal for each Sustainability Indicator for GSA review. Comments provided by the GSAs will be incorporated.

#### *Deliverables*

- Draft Summary Table of Common Chapter SMC Approach and Identified Deficiencies
- Draft SMC proposal for each Sustainability Indicator
- PowerPoint presentation of proposed SMC approach

#### *Assumptions*

- SLDMWA will provide one consolidated set of review comments on each deliverable.
- Additional deficiencies identified by the State Board may impact the level of effort anticipated herein.
- To the extent possible, proposed approaches will be vetted with the State Board and DWR for feedback.
- Work efforts on the Interconnected Surface Water SMCs will be deferred to the 2025 GSP Update process pending forthcoming guidance from DWR.
- Work efforts on the Water Quality SMCs may have to be deferred to the 2025 GSP Update process pending receipt of data from the GSAs and potential budget /timing constraints.
- SMCs may be further revised as part of the 2025 GSP Update process based on groundwater modeling results and feedback provided by the GSAs, State Board and DWR.

### **Task 2 – Develop Subbasin Water Budget**

Under this Task, EKI will develop an initial set of Subbasin-wide current, historical, and projected water budgets (GSP water budgets) that comply with the requirements of CCR Title 23 § 354.18 and address the deficiencies outlined by the DWR. EKI will rely on the Central Valley Hydrologic Model Version 2 (CVHM2), which was recently developed by the US Geological Survey (USGS) and the US Bureau of Reclamation (USBR). In its utilization of the CVHM2 and development of the GSP water budgets, EKI will apply scientifically sound methodologies consistent with DWR guidelines and ensure the use of the best available data and information obtained from accepted and reliable resources.

As part of this Task, EKI will:

- Gather and review information and data used to develop previous Subbasin-wide and GSA-specific water budgets;
- Review underlying data for the available models, California Central Valley Groundwater-Surface Water Simulation Model Fine-Grid (C2VSIM-FG) and CVHM2, and assess their performances compared to previously developed GSP water budgets;
- Propose a water budget development framework that details the data and methodology used and how they will respond to the identified deficiencies;
- Revise current, historical, and projected water budgets' timelines, as needed; and,
- Develop initial GSP water budgets using the proposed methodology.

Based on the agreed-upon timeline of deliverables between EKI and the GSAs, EKI will develop the historical, current and future water budgets to secure feedback from the State Board. Since CVHM2 is not yet publicly released and peer-reviewed, it cannot be directly referenced. Therefore, EKI intends to use the CVHM2 draft version and its publicly released input data to conduct its water budget analysis, consistent with CVHM2 methodologies and results. This will facilitate the incorporation of the CVHM2 into the 2025 GSP Update if it is publicly released and can be directly cited. EKI does not expect significant departures from the CVHM2 simulated water budgets and will not substantially modify the input data to avoid inconsistencies in data and methodology. Any desired/required addition or modification of data will be incorporated as uncertainty sources to be potentially addressed in the 2025 GSP update.

In order to develop the projected water budget, EKI will coordinate with the GSAs to select a methodology and a historical period to be considered as the future baseline. EKI will use the future baseline to develop projected water budget and Climate Change Scenario water budgets using DWR's Central Tendency Climate Change Projections (i.e., 2030 and 2070 Central Tendency)<sup>1</sup>. Any additional water budgets or simulation of different operational or climate change scenarios or implementation of Projects and Management Actions (P/MAs) is outside of the current scope and is assumed to be completed as part of the 2025 GSP Update effort.

Upon development of the GSP water budgets, EKI will provide estimates of the changes in storage per each principal aquifer (Upper and Lower aquifers) using CVHM2 simulations. In coordination with Task 1, EKI will also provide estimates of sustainable yield for each principal aquifer.

EKI will present key information to the GSAs during regular meetings (see Task 3) for direction and decisions. These presentations will include, at the minimum, discussion of the proposed water budget development framework and presentation of GSP water budgets. Comments provided by the GSAs during these meetings will be incorporated. EKI expects one set of consolidated comments per deliverable and assumes timely submission of such comments to stay on schedule.

GSP water budgets, changes in storage, and sustainable yields developed under this Task will be on a Subbasin-wide scale. EKI will not develop fine-scale and/or GSA-specific water budgets, changes in

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<sup>1</sup> <https://data.cnra.ca.gov/dataset/climate-change-projections-wsip-2030-2070>

storage, or sustainable yields under this scope of work. EKI will not modify or recalibrate CVHM2 to address regional or GSA-wide data gaps and uncertainties.

#### *Deliverables*

- Draft Water Budget Estimates
- PowerPoint presentation of Water Budget approach
- Basin Model files

#### *Assumptions*

- EKI will rely on CVHM2 for preparation of the Subbasin water budget in its current form and will not be re-calibrating the model or significantly modifying any model inputs.
- SLDMWA will provide one consolidated set of review comments on each deliverable.
- To the extent possible, proposed approaches will be vetted with the State Board and DWR for feedback.
- Additional deficiencies identified by the State Board may impact the level of effort anticipated herein.
- Extension of the model to WY 2023 and inclusion of P/MAs and additional climate change or other scenarios will be done as part of the 2025 GSP Update.

### **Task 3 – Project Management and Coordination**

Task 3 involves facilitating near-term Subbasin coordination efforts during Task 1 and Task 2 preparation, assumed to be completed within four months (i.e., April through July 2023). Specifically, EKI will:

- Provide support including developing meeting agendas, presentations, and packets as applicable, and participate in the following meeting venues:
  - Up to eight bi-weekly Subbasin Coordination Committee meetings, assuming in-person attendance;
  - Up to eight bi-weekly one-hour planning meetings conducted virtually.
- Participate in inter-basin coordination efforts with GSAs in the adjacent Subbasins on an as-needed basis; assumes up to two 1-hour meetings conducted remotely.
- Participate in monthly meetings with DWR and the State Board; Assumes up to six 1-hour meetings, conducted remotely and up to two 1-hour meetings conducted in person.

#### *Deliverables*

- Meeting materials
- Monthly invoices and progress summary reports
- Project Schedule, regularly updated



*Assumptions*

- Bi-weekly coordination committee meetings, conducted in-person
- Remaining meetings will be conducted remotely

**PERSONNEL**

EKI's staff members who will lead this project include Anona Dutton, PG, CHg (Officer), Christopher Heppner, PhD, PG (Supervising 1), Amir Mani, PhD, PG (Senior 1), Nigel Chen, PhD, PE (Grade 1), Sarah Gerenday, PhD (Grade 2), and Sarah Hodson, PE (Grade 4); grades in parentheses are for purposes of billing in accordance with the attached Schedule of Charges (see **Attachment A**). Other EKI staff members will be assigned to assist with the performance of the tasks as required to meet project commitments.

**TERMS AND CONDITIONS**

All work performed by EKI under this scope will be performed pursuant to our existing Agreement with SLDMWA for Professional Services.

**COMPENSATION**

Inasmuch as the exact level of effort required to complete the above Scope of Work cannot be known precisely, EKI proposes to perform the work on a time and materials expense reimbursement basis in accordance with our current Schedule of Charges (**Attachment A**). The estimated budget for this scope of work is estimated to be \$200,000 (**Attachment B**).

**SCHEDULE**

EKI is prepared to start work on the above Scope of Work immediately upon authorization to proceed and will continue through July 2023. EKI will inform SLDMWA of any issues that arise that may affect the schedule for completion or impact the anticipated level of effort.

We are very excited about the opportunity to work with SLDMWA and the Subbasin GSAs on this project.

Please do not hesitate to contact me with any questions.

Very truly yours,

EKI ENVIRONMENT & WATER, INC.



Anona L. Dutton, PG, CHg  
Vice President / Principal-In-Charge

AUTHORIZATION  
SAN LUIS & DELTA-MENDOTA WATER AUTHORITY (CLIENT)

By \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

Attachments

Attachment A. Schedule of Charges, dated 1 January 2023

Attachment B. Detailed Budget Estimate

**ATTACHMENT A**

**EKI 2023 Schedule of Charges and Detailed Budget Table**

**SCHEDULE OF CHARGES FOR EKI ENVIRONMENT & WATER, INC.**

**1 January 2023**

| <u>Personnel Classification</u>      | <u>Hourly Rate</u> |
|--------------------------------------|--------------------|
| Officer and Chief Engineer-Scientist | 332                |
| Principal Engineer-Scientist         | 320                |
| Supervising I, Engineer-Scientist    | 309                |
| Supervising II, Engineer-Scientist   | 298                |
| Senior I, Engineer-Scientist         | 286                |
| Senior II, Engineer-Scientist        | 275                |
| Associate I, Engineer-Scientist      | 264                |
| Associate II, Engineer-Scientist     | 248                |
| Engineer-Scientist, Grade 1          | 231                |
| Engineer-Scientist, Grade 2          | 218                |
| Engineer-Scientist, Grade 3          | 200                |
| Engineer-Scientist, Grade 4          | 178                |
| Engineer-Scientist, Grade 5          | 157                |
| Engineer-Scientist, Grade 6          | 138                |
| Project Assistant                    | 130                |
| Technician                           | 125                |
| Senior GIS / Database Analyst        | 162                |
| CADD Operator / GIS Analyst          | 144                |
| Senior Administrative Assistant      | 159                |
| Administrative Assistant             | 124                |
| Secretary                            | 104                |

**Direct Expenses**

Reimbursement for direct expenses, as listed below, incurred in connection with the work will be at cost plus fifteen percent (15%) for items such as:

- a. Maps, photographs, reproductions, printing, equipment rental, and special supplies related to the work.
- b. Consultants, soils engineers, surveyors, drillers, laboratories, and contractors.
- c. Rented vehicles, local public transportation and taxis, travel, and subsistence.
- d. Special fees, insurance, permits, and licenses applicable to the work.
- e. Outside computer processing, computation, and proprietary programs purchased for the work.

A Communication charge for e-mail access, web conferencing, cellphone calls, messaging and data access, file sharing, local and long distance telephone calls and conferences, facsimile transmittals, standard delivery U.S. postage, and incidental in-house copying will be charged at a rate of 4% of labor charges. Large volume copying of project documents, e.g., bound reports for distribution or project-specific reference files, will be charged as a project expense as described above.

Reimbursement for company-owned automobiles, except trucks and four-wheel drive vehicles, used in connection with the work will be at the rate of sixty cents (\$0.60) per mile. The rate for company-owned trucks and four-wheel drive vehicles will be seventy-five cents (\$0.75) per mile. There will be an additional

charge of thirty dollars (\$30.00) per day for vehicles used for field work. Reimbursement for use of personal vehicles will be at the federally allowed rate plus fifteen percent (15%).

CADD and other specialized software computer time will be charged at twenty dollars (\$20.00) per hour. In-house material and equipment charges will be in accordance with the current rate schedule or special quotation. Excise taxes, if any, will be added as a direct expense.

Rate for professional staff for legal proceedings or as expert witnesses will be at a rate of one and one-half times the Hourly Rates specified above.

The foregoing Schedule of Charges is incorporated into the Agreement for the Services of EKI Environment & Water, Inc. and may be updated annually.

**ATTACHMENT B**  
**Detailed Budget Estimate**

**Table 1. Detailed Estimated Budget**

| TASKS   | EKI Labor (hrs)       |                              |                    |                 |                     |              | Total EKI Labor, including 4% Comm. Charge <sup>(1)</sup> | Expenses                          | Total Requested Budget |
|---|-----------------------|------------------------------|--------------------|-----------------|---------------------|--------------|---|-----------------------------------|------------------------|
|   | Anona Dutton, PG, CHG | Christopher Heppner, PhD, PG | Amir Mani, PhD, PE | Nigel Chen, PhD | Sarah Gerenday, PhD | Sarah Hodson |   | Other Direct Costs <sup>(2)</sup> |                        |
|   | \$332                 | \$309                        | \$286              | \$231           | \$218               | \$178        | (\$)  | (\$)                              | (\$)                   |
| Task 1 – Revise the Sustainable Management Criteria | 24                    | 96                           | 0                  | 0               | 96                  | 128          | \$84,598  | \$0                               | <b>\$85,000</b>        |
| Task 2 – Develop Subbasin Water Budget              | 24                    | 0                            | 64                 | 96              | 0                   | 128          | \$74,081  | \$0                               | <b>\$74,000</b>        |
| Task 3 – Project Management and Coordination        | 90                    | 24                           | 0                  | 0               | 0                   | 0            | \$38,788  | \$2,000                           | <b>\$41,000</b>        |
| <b>Total</b>  | <b>138</b>            | <b>120</b>                   | <b>64</b>          | <b>96</b>       | <b>96</b>           | <b>256</b>   | <b>\$197,467</b>  | <b>\$2,000</b>                    | <b>\$200,000</b>       |

Notes:

- (1) A communications charge of 4% of labor costs covers e-mail access, web conferencing, cellphone calls, messaging and data access, file sharing, local and long-distance telephone calls and conferences, facsimile transmittals, standard delivery U.S. postage, and incidental in-house copying.
- (2) "Other Direct Costs" includes direct expenses, as listed below, incurred in connection with the work and will be reimbursed at cost plus ten percent (10%) for items such as:
- a. Maps, photographs, reproductions, printing, equipment rental, and special supplies related to the work.
  - b. Consultants, soils engineers, surveyors, drillers, laboratories, and contractors.
  - c. Rented vehicles, local public transportation and taxis, travel and subsistence.
  - d. Special fees, insurance, permits, and licenses applicable to the work.
  - e. Outside computer processing, computation, and proprietary programs purchased for the work.

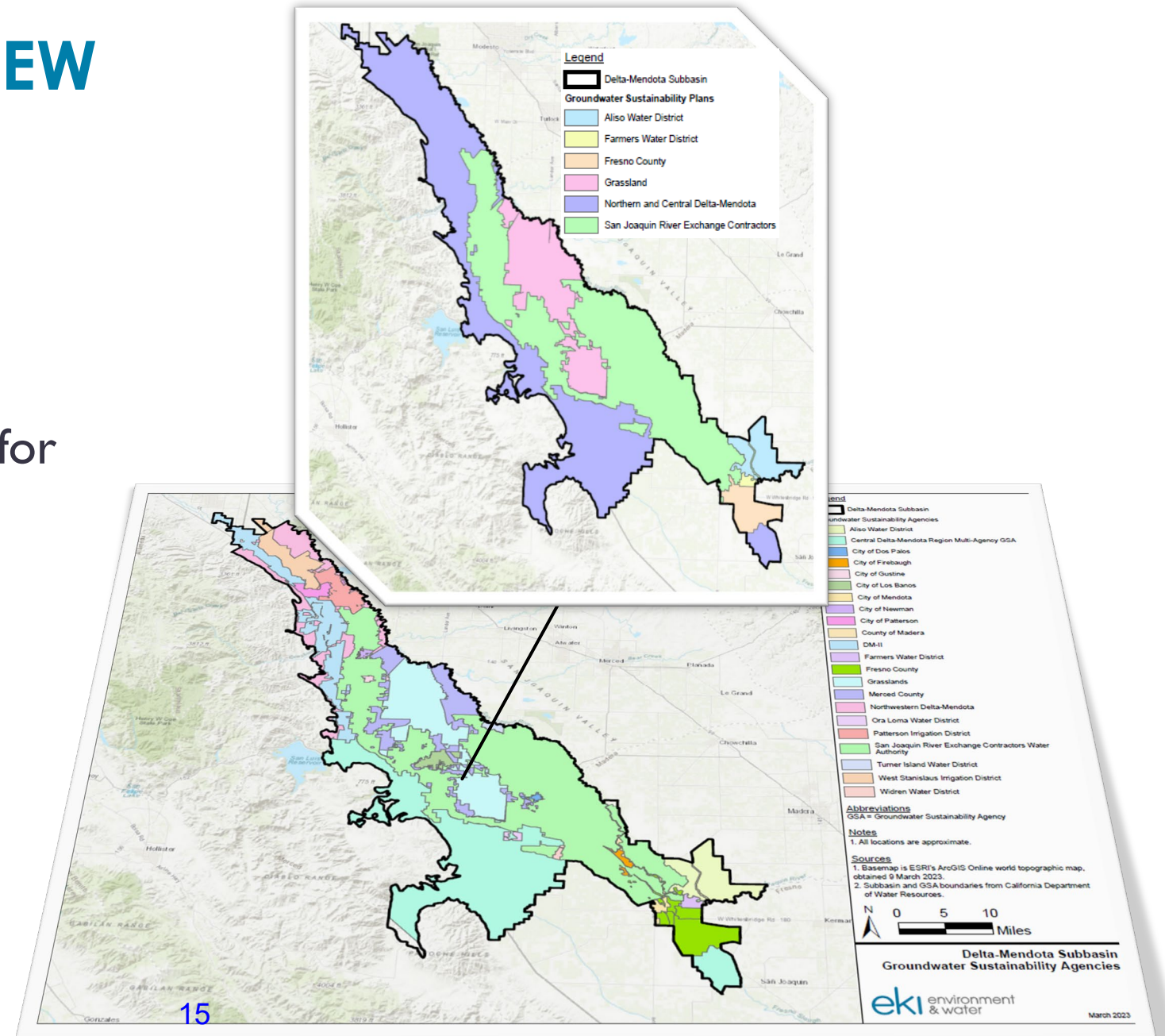
# DELTA-MENDOTA SUBBASIN RESPONSE TO INADEQUATE DETERMINATION

25 APRIL 2023

TECHNICAL MEETING #4

# PRESENTATION OVERVIEW

- Results to be Achieved Today:
  - Action on Water Level SMCs
  - Direction on SMC Approach for Water Quality
- Water Budget/Model Update
- Next steps



# MEETING OBJECTIVES

## Objective #1:

### Action on Water Level SMC Approach



## PROPOSED WATER LEVEL URs AND MTs/MOs

- **Undesirable Results:** UR occurs if MTs are exceeded at 25% or more of RMS for two consecutive years.
- **Minimum Thresholds:** Set at historic low groundwater level (prior to end of WY 2016 [i.e., up through Sept 2016])
- **Measurable Objectives:** Set at seasonal high water levels from WY 2015 (i.e., Spring 2015)
- **Interim Milestones:** Glide path between MTs and MOs based on future modeling and planned P/MA implementation

# MT/MO JUSTIFICATIONS

| Impacts to Beneficial Users   | Impacts to Adjacent Basins  | Impacts to Other Sustainability Indicators  |
|---|---|---|
| <ul style="list-style-type: none"> <li>• Less than 10% of wells will be impacted, which is lower than the anticipated natural replacement rate given current well ages</li> <li>• The average change in GDE health by area between 2009-2018, which represents a historical range of GDE health fluctuation and response to climatic and managed conditions, increased by 37%</li> <li>• Well mitigation program</li> </ul> | <p>Groundwater level MTs set at 2016 historical lows in the D-M basin are generally as high or higher than those set in adjacent basins</p> | <ul style="list-style-type: none"> <li>• Impacts no worse than recent historic lows, SGMA baseline</li> <li>• Sufficient GW storage to meet several years of drought</li> <li>• MTs limited to no lower than historic lows theoretically prevents additional subsidence* and groundwater quality degradation due to groundwater extraction</li> </ul> <p><i>* Delayed subsidence from historic lows may still occur for years</i></p> |

# UR DEFINITION & JUSTIFICATION

| UR Criteria  | UR Justification  |
|--|---|
| <p>MT exceedances at 25% of RMS for two consecutive years (four seasonal measurements)</p> | <p><b>Groundwater Pumpers</b></p> <ul style="list-style-type: none"><li>• Even if MTs were exceeded in ALL RMS, less than 10% of domestic wells would be impacted; fewer wells would be impacted at the UR criterion of 25% of RMS.</li><li>• A percentage much lower than 25% suggests a primarily local impact, whereas much larger percentage suggests a widespread impact inconsistent with the Sustainability Goal.</li><li>• Impacts are not significant and unreasonable because, based on current age of wells, approximately 19% of domestic wells (and 25% of all wells) are more than 40 years old and would likely have to be replaced anyway before 2040.</li><li>• Well mitigation program</li></ul> <p><b>Groundwater Dependent Ecosystems</b></p> <ul style="list-style-type: none"><li>• Based on NDVI trends between 2009 and 2018, the average change in GDE health by area increased by approximately 37%, which represents the historical range of GDE health fluctuation and response to climatic and managed conditions.</li><li>• A UR criterion of 25% of RMS falls within the range of GDE health by area fluctuations observed between 2009-2018 (37%)</li></ul> |

# MEETING OBJECTIVES

## Objective #2:

### Direction on Water Quality SMC Approach

## DWR DEFICIENCIES FOR THIS INDICATOR

### **Deficiency #2: “The GSPs have not established common definitions of undesirable results in the Subbasin”**

- **No new supporting information** is provided within the Common Chapter or within the revised GSPs to justify the new groundwater management approach. (i.e., the coordinated Undesirable Results definitions)
- ... **lack of specific, quantitative details**, or a more defined and transparent decision-making process for establishing definitions of sustainability

### **Deficiency #3: “The GSPs in the Subbasin have not set sustainable management criteria in accordance with the GSP regulations”**

- **No analysis** has been conducted to justify the use of 50 percent [of RMS with MT exceedances] as a threshold
- Minimum thresholds associated with **other constituents of concern**, such as boron, nitrate as nitrogen, and unquantified “poor quality groundwater” have been removed from the revised Plan and **no justification** for the removal of these constituents has been provided

# PROCESS REQUIRED TO JUSTIFY SMCs

## Undesirable Results (URs) (CCR §354.26)

- Identify beneficial uses/users that are impacted by URs
- Describe the causes and effects of URs
- Describe what constitutes "significant and unreasonable" effects
- Define quantitative criteria relating URs to MT exceedances

## Minimum Thresholds (MTs) (CCR § 354.28)

- Describe information and criteria used to establish and justify the MTs
- Describe relationship between MTs for each SI, and how URs are avoided
- Describe how MTs avoid impacts to adjacent basins
- Describe how MTs may affect beneficial uses/users, land uses and property interests
- Discuss related state, federal or local standards

## REQUIREMENTS FOR WATER QUALITY SMCs

- The **minimum threshold** for degraded water quality shall be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality ...that may lead to undesirable results [23 CCR § 354.28(c)(4)].
  - based on the number of supply wells, a volume of water or a location of an isocontour that exceeds concentrations of constituents ... of concern for the basin
  - consider local, state and federal water quality standards applicable to the basin
- The **measurable objective** shall be ... quantitative values using the same metrics and monitoring sites as are used to define the (MTs) [23 CCR § 354.30(b)].

# COMPARISON OF SMCs - APPROVED GSPs

- Kings
- Westside
- Merced
- Eastern San Joaquin





# WAS THE SGMA REGS PROCESS FOLLOWED TO DEVELOP THE WATER QUALITY SMCs?

| Basin                                      | ID Beneficial Users | Impacts to Beneficial Users | Consideration of Adjacent Basins | Relationship with Other SIs | State, Federal, and Local Standards |
|--|---------------------|-----------------------------|----------------------------------|-----------------------------|-------------------------------------|
| Delta-Mendota (Common Chapter SMC Section) | ✓                   | ✓                           | --                               | --                          | ✓                                   |
| Kings                                      | ✓                   | ✓                           | ✓                                | ✓                           | ✓                                   |
| Westside                                   | ✓                   | ✓                           | ✓                                | ✓                           | ✓                                   |
| Merced                                     | ✓                   | ✓                           | --                               | --                          | ✓                                   |
| Eastern San Joaquin                        | ✓                   | ✓                           | --                               | ✓                           | ✓                                   |

# ADJACENT BASIN CONSTITUENTS WITH SMCs

| Basin               | Constituent (Bold = Identified by SWRCB)  | Additional Constituents Identified by SWRCB  |
|---------------------|---|--|
| Tracy               | B, <b>NO<sub>3</sub>-N</b> , <b>TDS</b>   | Cr(6), Gross Alpha radioactivity, NO <sub>3</sub> + NO <sub>2</sub> , PFOA, PFOS   |
| Chowchilla          | Annual: As, DO, Electrical conductivity, <b>NO<sub>3</sub>-N</b> , ORP, pH, TDS, Temperature.<br>5-Year: Ca, Cl, CO <sub>3</sub> , HCO <sub>3</sub> , K, Mg, Na, SO <sub>4</sub>  | NO <sub>3</sub> + NO <sub>2</sub>  |
| Turlock             | <b>1,2,3-TCP</b> , <b>As</b> , <b>NO<sub>3</sub>-N</b> , PCE, <b>TDS</b> , <b>U</b><br>(Obtain data from GAMA)  | Gross Alpha radioactivity, NO <sub>3</sub> + NO <sub>2</sub> , NO <sub>2</sub> -N, PFOS  |
| Eastern San Joaquin | <b>TDS</b>  | 1,2,3-TCP, As, DBCP, Gross Alpha radioactivity, NO <sub>3</sub> -N, NO <sub>3</sub> + NO <sub>2</sub> , NO <sub>2</sub> -N, PCE, PFOA, PFOS, U |
| Westside            | <b>TDS</b>  | --   |
| Kings               | Varies by GSP. May include: <b>1,2,3-TCP</b> , Al, <b>As</b> , B, Cl, <b>Cr(6)</b> , Cr(total), <b>DBCP</b> , F, Fe, <b>Gross Alpha radioactivity</b> , Mn, MTBE, Na, <b>NO<sub>3</sub>-N</b> , Pb, <b>PCE</b> , <b>TCE</b> , <b>TDS</b> , <b>U</b> | NO <sub>3</sub> + NO <sub>2</sub> , NO <sub>2</sub> -N, PFOA, PFOS   |
| Modesto             | <b>1,2,3-TCP</b> , <b>As</b> , <b>DBCP</b> , <b>NO<sub>3</sub>-N</b> , PCE, <b>TDS</b> , <b>U</b><br>(Obtain data from GAMA)  | Gross Alpha radioactivity, NO <sub>3</sub> + NO <sub>2</sub> , NO <sub>2</sub> -N, PFOA, PFOS  |
| Merced              | <b>TDS</b>  | 1,2,3-TCP, As, Gross Alpha radioactivity, NO <sub>3</sub> -N, NO <sub>3</sub> + NO <sub>2</sub> , U  |
| Madera              | Varies by GSP. May include <b>As</b> , B, Cl, Electrical Conductivity, Fe, Mn, Na, <b>NO<sub>3</sub>-N</b> , N(total), TDS  | DBCP, Gross Alpha radioactivity, NO <sub>3</sub> + NO <sub>2</sub>   |

# SUMMARY OF WATER QUALITY MTs/MOs

| Basin                                     | MT   | MO   |
|---|--|--|
| <b>Delta-Mendota<br/>(Common Chapter)</b> | 1,000 mg/L TDS (upper SMCL)  | <1,000 mg/L TDS  |
| <b>Kings</b>                              | <p>COCs with historic MCL exceedance in GSP area. May include: 1,2,3-TCP, Al, As, B, Cl, Cr(6), Cr(total), DBCP, F, Fe, Gross Alpha radioactivity, Mn, MTBE, Na, NO<sub>3</sub>-N, Pb, PCE, TCE, TDS, U</p> <ul style="list-style-type: none"> <li>• CA primary MCLs (if recently below)</li> <li>• 20% higher than recent historic high (if recently above MCLs)</li> </ul> | <p>MO is to keep concentrations of COCs in below MCLs</p> <ul style="list-style-type: none"> <li>• For wells with concentrations currently above MCLs, MO is to maintain a stable or decreasing groundwater quality trend</li> </ul> |
| <b>Westside</b>                           | <p>(1) 1,000 mg/L TDS (upper SMCL)<br/>                     (2) Variable TDS, dependent on location in the Subbasin, historical trends, and maximum historical deviation</p>   | <p>(1) Municipal/Domestic: 500 mg/L TDS (rec. SMCL)<br/>                     Ag: 800 mg/L TDS<br/>                     (2) TDS constituents concentrations related to historical trends observed in the wells or nearby areas</p>    |
| <b>Merced</b>                             | 1,000 mg/L TDS (upper SMCL)  | 500 mg/L (recommended SMCL)  |
| <b>Eastern San Joaquin</b>                | 1,000 mg/L TDS (upper SMCL)  | 600 mg/L TDS (recommended SMCL + 100 mg/L buffer)  |

# WATER QUALITY MT/MO JUSTIFICATIONS

| Basin                                 | Impacts to Beneficial Users  | Impacts to Adjacent Basins  | Relationship with Other Sustainability Indicators   |
|---------------------------------------|--|---|---|
| <b>Delta-Mendota (Common Chapter)</b> | MTs as the SMCL maintains water quality suitable for municipal beneficial use.   | --  | Affected by GW levels; Interim Milestones state intention to develop GW level proxies for Water Quality.  |
| <b>Kings</b>                          | Existing beneficial use maintained at MT.  | No harm to adjacent basins.   | May be affected by GW levels and storage.   |
| <b>Westside</b>                       | <ul style="list-style-type: none"> <li>Increased cost to treat or obtain alternate source</li> <li>Reduced crop yields</li> <li>Reduction in land able to be used for irrigated agriculture</li> </ul> | No impacts, as there is no known migration of degraded quality water. | GW quality degradation may occur due to unsustainable pumping.  |
| <b>Merced</b>                         | Protective of both agricultural and drinking water beneficial use.   | --  | GW quality degradation due to GW level declines below MT not expected in the long-term; will continue to monitor relationship between water levels and water quality. |
| <b>Eastern San Joaquin</b>            | Protective of both agricultural and drinking water beneficial use.   | --  | Plan to evaluate correlations and trends between water quality conditions, groundwater levels, and groundwater level MTs.   |

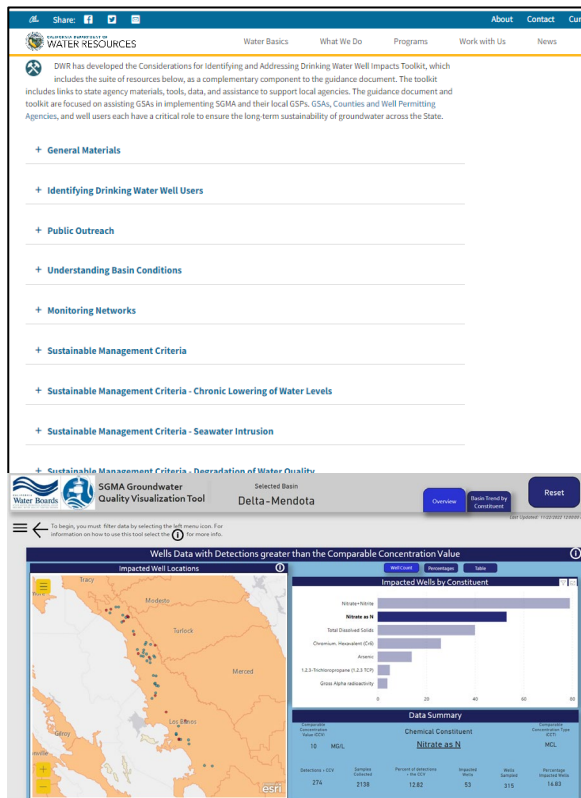
# SUMMARY OF WATER QUALITY URs

| Basin                                 | UR Criteria  | UR Justification  |
|---------------------------------------|--|---|
| <b>Delta-Mendota (Common Chapter)</b> | MT exceedance at > 50% of RMS within a given aquifer and GSP area where current TDS ≤ 1,000 mg/L   | <ul style="list-style-type: none"> <li>UR defines degradation of water quality that substantially affects beneficial use; May be revised as informed by CV-SALTS and ongoing Prioritization and Optimization Study.</li> <li>Sites with current TDS &gt; 1,000 mg/L are subject to existing regulatory water quality compliance and remediation programs.</li> </ul>  |
| <b>Kings</b>                          | MT exceedance at 15% of RMS for 2 consecutive years  | Allows for natural fluctuations and data uncertainty.   |
| <b>Westside</b>                       | <ol style="list-style-type: none"> <li>MT exceedance at a well in 2 consecutive measurements</li> <li>25% of wells above the MT for the same constituent, based on 3-year average</li> </ol> | <ol style="list-style-type: none"> <li>Consistent with groundwater quality QA/QC approaches used in the State Board’s recommendation for determining potential trend.</li> <li>No justification.</li> </ol>   |
| <b>Merced</b>                         | MT exceedance at 25% of RMS (6 of 22 sites) for two consecutive years  | <ul style="list-style-type: none"> <li>No justification for 25% threshold.</li> <li>SGMA does not require GSPs to consider: (1) Naturally occurring constituents, (2) COCs caused by activities not managed by SGMA, and (3) COCs covered by another regulatory authority.</li> <li>Wells with TDS currently &gt; 1,000 mg/L are not considered undesirable as water use has already shifted to accommodate elevated concentrations.</li> </ul> |
| <b>Eastern San Joaquin</b>            | MT exceedance at 25% of RMS (3 of 10 sites) for 2 consecutive years as a result of groundwater management activities   | No justification for 25% threshold.   |

# GUIDANCE DOCUMENTS / RESOURCES

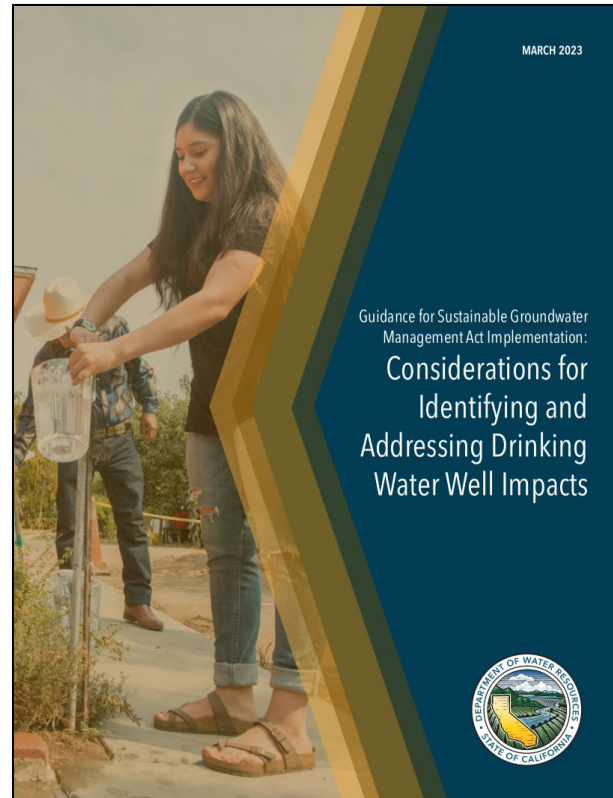
## DWR Toolkit:

Considerations for Identifying and Addressing Drinking Water Well Impacts



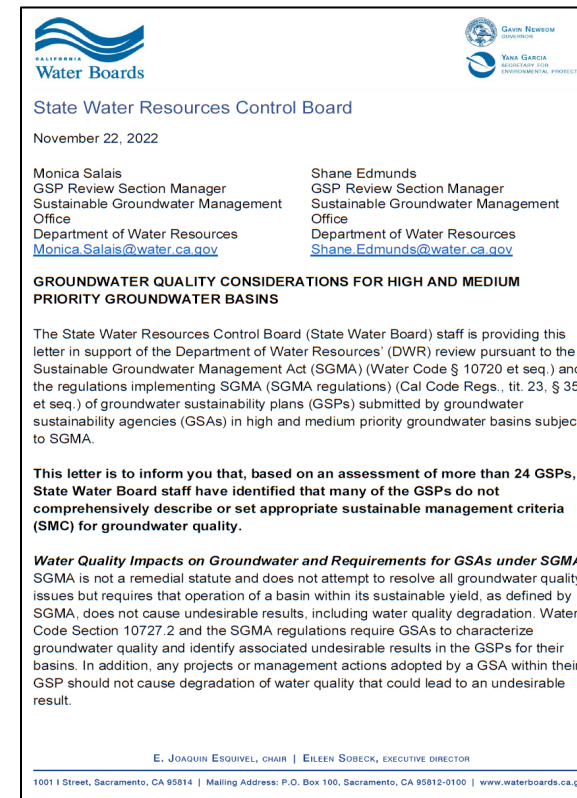
## DWR Guidance for SGMA Implementation:

Considerations for Identifying and Addressing Drinking Water Well Impacts

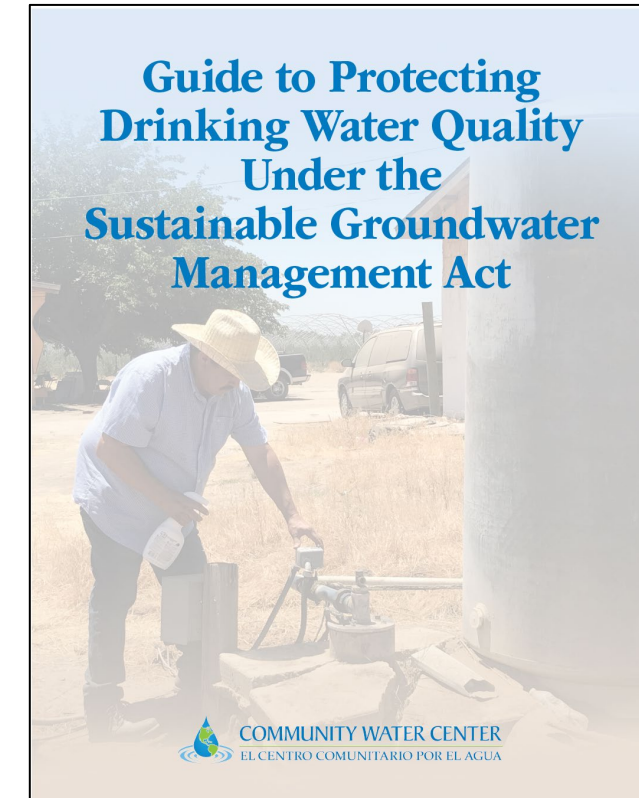


## SWRCB Letter (Nov 2022):

Groundwater Quality Considerations for High and Medium Priority Groundwater Basins





**Community Water Center:**  
Guide to Protecting Drinking Water Quality Under SGMA



# PRELIMINARY CONSTITUENTS OF CONCERN

Potential COCs identified for Delta-Mendota Subbasin by SWRCB in letter dated 22 November 2022

- 1,2,3-TCP
- Arsenic
- Hexavalent Chromium [Cr(VI)]
- Gross Alpha radioactivity
- Nitrate (NO<sub>3</sub>)
- Total Dissolved Solids (TDS)



State Water Resources Control Board

November 22, 2022

|  |  |
|--|--|
| Monica Salais<br>GSP Review Section Manager<br>Sustainable Groundwater Management<br>Office<br>Department of Water Resources<br><a href="mailto:Monica.Salais@water.ca.gov">Monica.Salais@water.ca.gov</a> | Shane Edmunds<br>GSP Review Section Manager<br>Sustainable Groundwater Management<br>Office<br>Department of Water Resources<br><a href="mailto:Shane.Edmunds@water.ca.gov">Shane.Edmunds@water.ca.gov</a> |
|--|--|

**GROUNDWATER QUALITY CONSIDERATIONS FOR HIGH AND MEDIUM PRIORITY GROUNDWATER BASINS**

The State Water Resources Control Board (State Water Board) staff is providing this letter in support of the Department of Water Resources' (DWR) review pursuant to the Sustainable Groundwater Management Act (SGMA) (Water Code § 10720 et seq.) and the regulations implementing SGMA (SGMA regulations) (Cal Code Regs., tit. 23, § 350 et seq.) of groundwater sustainability plans (GSPs) submitted by groundwater sustainability agencies (GSAs) in high and medium priority groundwater basins subject to SGMA.

**This letter is to inform you that, based on an assessment of more than 24 GSPs, State Water Board staff have identified that many of the GSPs do not comprehensively describe or set appropriate sustainable management criteria (SMC) for groundwater quality.**

***Water Quality Impacts on Groundwater and Requirements for GSAs under SGMA***  
SGMA is not a remedial statute and does not attempt to resolve all groundwater quality issues but requires that operation of a basin within its sustainable yield, as defined by SGMA, does not cause undesirable results, including water quality degradation. Water Code Section 10727.2 and the SGMA regulations require GSAs to characterize groundwater quality and identify associated undesirable results in the GSPs for their basins. In addition, any projects or management actions adopted by a GSA within their GSP should not cause degradation of water quality that could lead to an undesirable result.

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

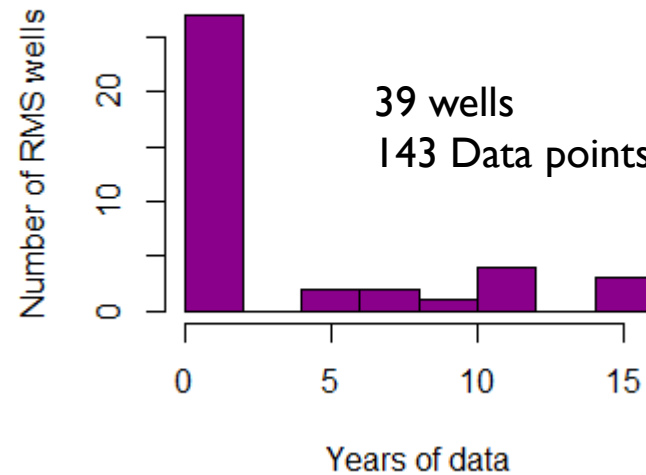
1001 I Street, Sacramento, CA 95814 | Mailing Address: P.O. Box 100, Sacramento, CA 95812-0100 | [www.waterboards.ca.gov](http://www.waterboards.ca.gov)

# DATA SOURCES USED TO ASSESS POTENTIAL COCs

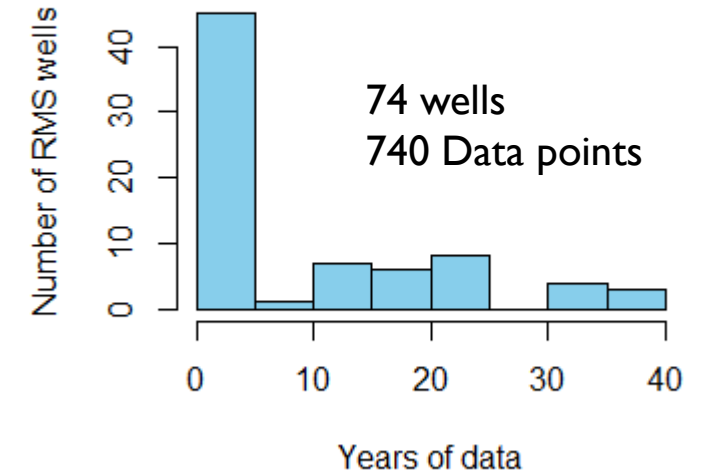
## ■ Delta-Mendota DMS

- 2 constituents (NO<sub>3</sub> and TDS)
- 883 data points
- 77 wells
- 40 years

NO<sub>3</sub> data from DMS



TDS data from DMS



## ■ GAMA

- All constituents
- ~36,300 data points
- ~ 2,600 wells
- ~ 90 years

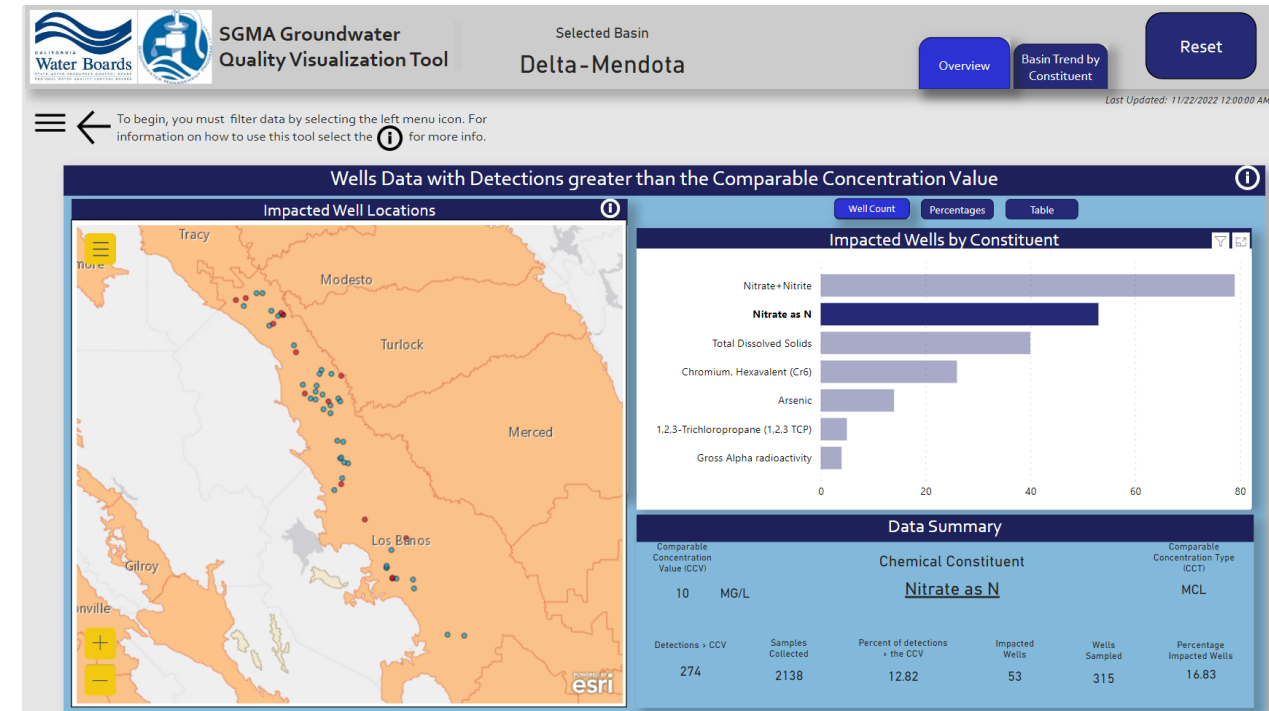
## ■ SWRCB GW Quality Visualization Tool

- All constituents
- ~19,650 data points
- 1,961 wells
- 82 years

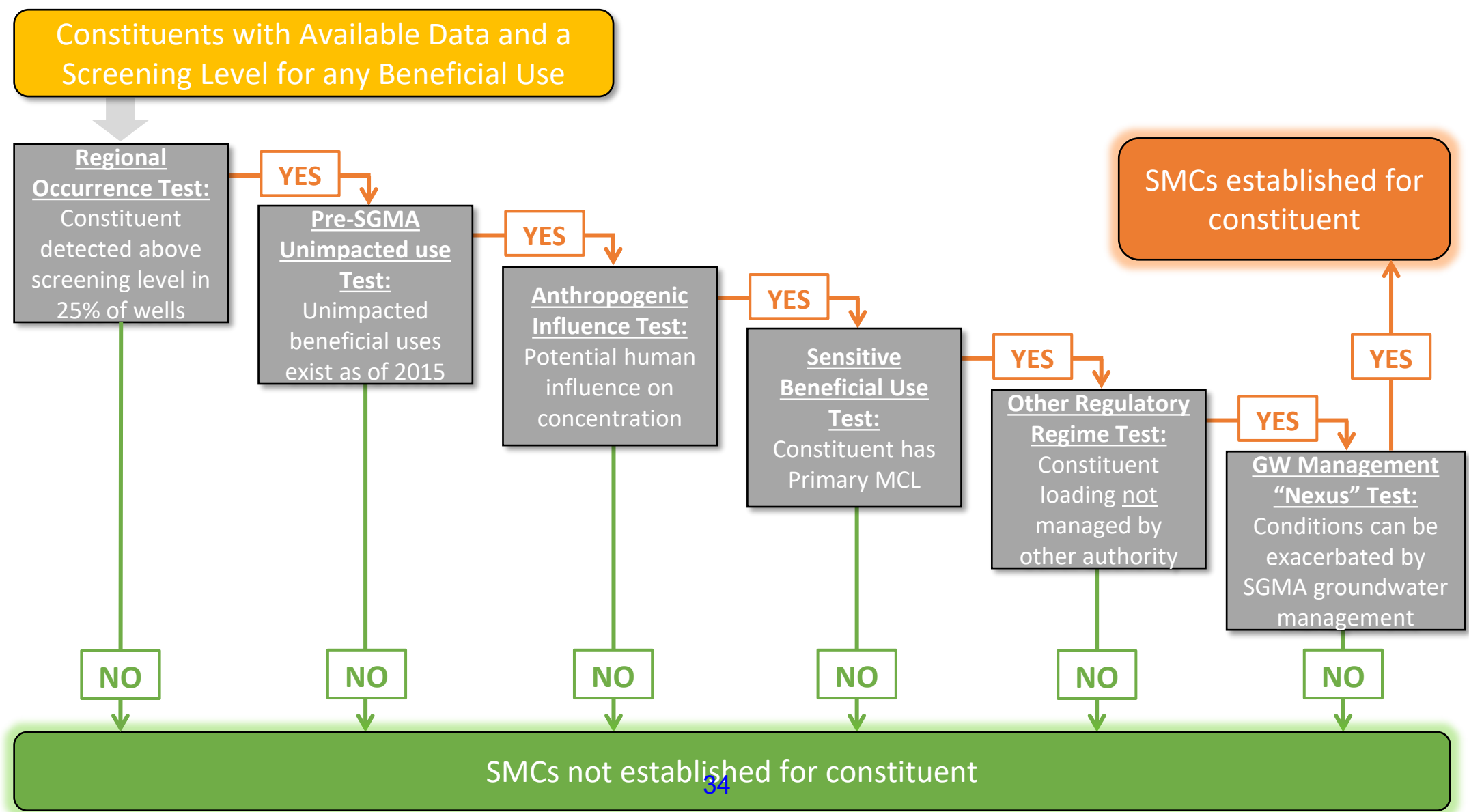


# POTENTIAL PATHWAYS FORWARD

- Option 1: Develop SMCs for all constituents identified by the SWRCB in their 2022 Letter
- Option 2: Justify development of SMCs for a small number of constituents



# POTENTIAL SCREENING/WINNOWING OF COCs



## POTENTIAL TESTS TO SCREEN OUT COCs

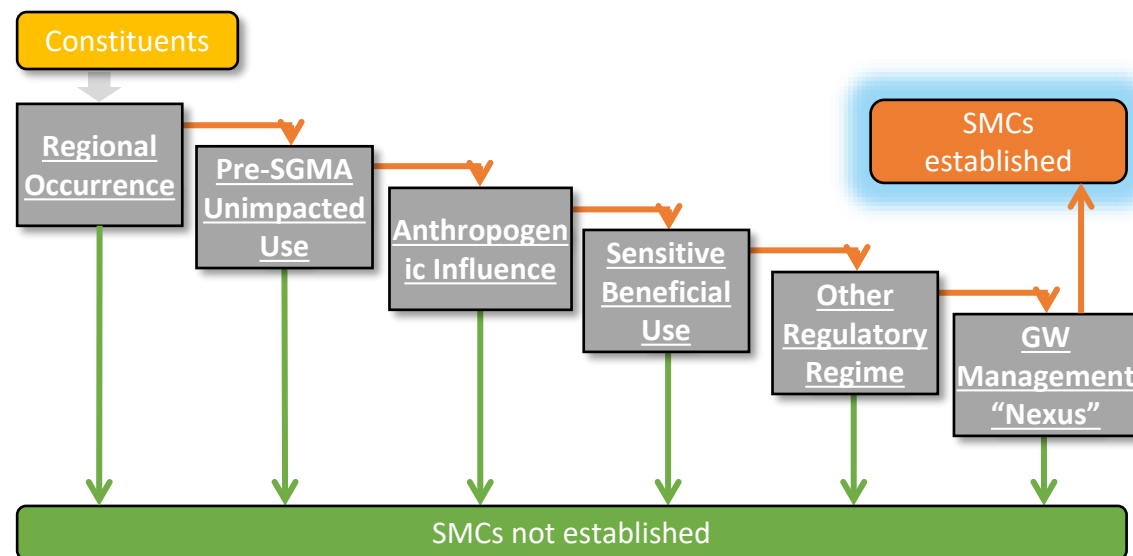
- **Regional occurrence** – Exceeds MCL in >25% of GAMA wells in last 10 years of data?
- **Pre-SGMA unimpacted use** – Do unimpacted beneficial uses exist before 2015?
- **Anthropogenic Influence** – Is it primarily naturally occurring?
- **Sensitive beneficial use** – Does it have a primary MCL?
- **Other regulatory regime** – is constituent managed under different program such that SGMA is redundant?
- **GW Management Nexus** – Is there a correlation between groundwater levels and concentrations?

## SUMMARY SWRCB COCS RELATIVE TO SCREENING TESTS

| Potential COC (SWRCB) | Regional Occurrence (% exceedance)                            | Pre-SGMA Unimpacted Use | Anthropogenic Influence (source) | Sensitive Beneficial Use | Other Regulatory Regime                               | GW Mgmt. "Nexus" |
|-----------------------|---|-------------------------|----------------------------------|--------------------------|---|------------------|
| Arsenic               | Muni: 18%<br>Domestic: insufficient data                      | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Cr(VI)                | Muni: 47%<br>Other supply: 43%<br>Domestic: insufficient data | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Gross Alpha           | Muni: 4%<br>Domestic: no data                                 | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Nitrate               | Muni: 12%<br>Other supply: 13%<br>Dom: 22%                    | Yes                     | Anthropogenic                    | Primary MCL              | IRLP, CV-SALTS<br>Muni: CA Title 22<br>Domestic: IRLP | Recharge         |
| TDS                   | Muni: 29%<br>Other supply: 43%<br>Domestic: 53%               | Yes                     | Both                             | Secondary MCL            | IRLP, CV-SALTS<br>Muni: CA Title 22<br>Domestic: none | Yes              |
| 1,2,3-TCP             | Muni: 15%<br>Domestic: insufficient data                      | Yes                     | Anthropogenic                    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   | Recharge         |

# PRIORITY COCs REMAINING AFTER SCREENING

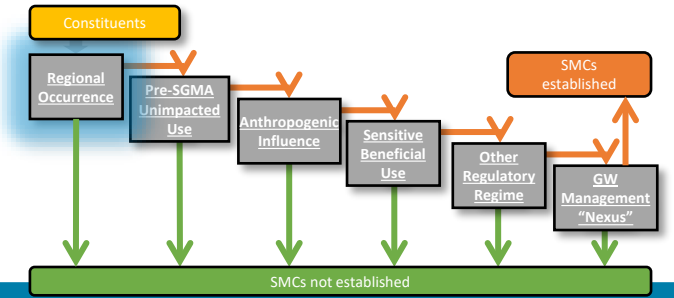
- TDS
- I,2,3-TCP



| Potential COC (SWRCB) | Regional Occurrence (% exceedance)                            | Pre-SGMA Unimpacted Use | Anthropogenic Influence (source) | Sensitive Beneficial Use | Other Regulatory Regime                               | GW Mgmt. "Nexus" |
|-----------------------|---|-------------------------|----------------------------------|--------------------------|---|------------------|
| Arsenic               | Muni: 18%<br>Domestic: insufficient data                      | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Cr(VI)                | Muni: 47%<br>Other supply: 43%<br>Domestic: insufficient data | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Gross Alpha           | Muni: 4%<br>Domestic: no data                                 | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Nitrate               | Muni: 12%<br>Other supply: 13%<br>Dom: 22%                    | Yes                     | Anthropogenic                    | Primary MCL              | IRLP, CV-SALTS<br>Muni: CA Title 22<br>Domestic: IRLP | Recharge         |
| TDS                   | Muni: 29%<br>Other supply: 43%<br>Domestic: 53%               | Yes                     | Both                             | Secondary MCL            | IRLP, CV-SALTS<br>Muni: CA Title 22<br>Domestic: none | Yes              |
| I,2,3-TCP             | Muni: 15%<br>Domestic: insufficient data                      | Yes                     | Anthropogenic                    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   | Recharge         |

# REGIONAL OCCURRENCE TEST

MCL exceeded in >25% of GAMA wells in last decade?



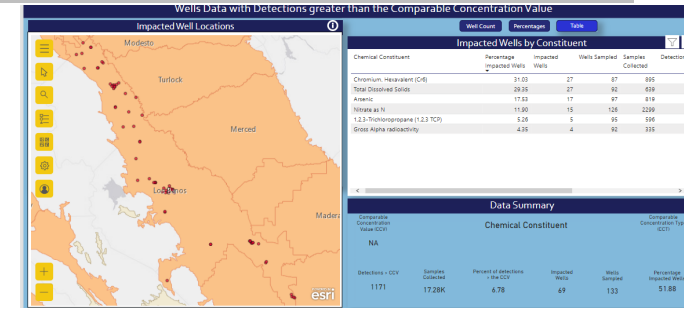
| Well Category            | Analyte     |         |         |         |                   |           |     |
|--------------------------|-------------|---------|---------|---------|-------------------|-----------|-----|
|                          | Gross Alpha | Arsenic | Cr (VI) | Nitrate | Nitrate + Nitrite | 1,2,3-TCP | TDS |
| Municipal                | 4%          | 18%     | 47%     | 12%     | 14%               | 15%       | 29% |
| Water Supply, Other      | no data     | 13%     | 43%     | 13%     | no data           | 100%      | 43% |
| Domestic                 | no data     | 0%      | 0%      | 22%     | 23%               | 100%      | 53% |
| Irrigation / Industrial  | no data     | 0%      | 33%     | 0%      | 0%                | 100%      | 36% |
| Monitoring               | no data     | no data | no data | 67%     | 67%               | no data   | 50% |
| Monitoring (Remediation) | no data     | 31%     | 92%     | 79%     | 92%               | 53%       | 83% |
| Total                    | 4%          | 19%     | 54%     | 32%     | 29%               | 48%       | 34% |

Notes

1. Reporting limit (0.12 ug/L) for some TCP measurements are higher than the MCL. These NDs may or may not have MCL exceedance.
2. Data from WY 2013 to current are used for this analysis.
3. "Total" considers all well categories.

# REGIONAL OCCURRENCE TEST

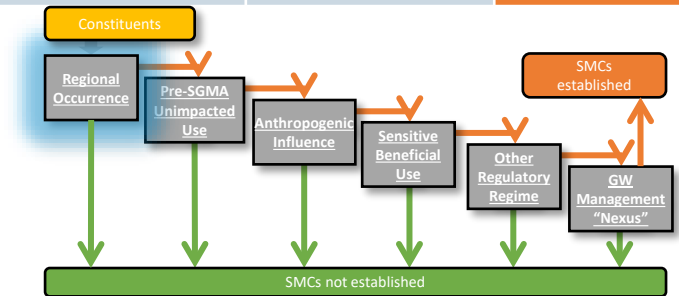
Screening level exceeded in >25% of SWRCB reported wells  
2013 – 2023?



| Well Category           | Analyte     |         |         |         |                   |           |     |
|-------------------------|-------------|---------|---------|---------|-------------------|-----------|-----|
|                         | Gross Alpha | Arsenic | Cr (VI) | Nitrate | Nitrate + Nitrite | 1,2,3-TCP | TDS |
| Municipal               | 4%          | 18%     | 31%     | 12%     | no data           | 5%        | 29% |
| Water Supply, Other     | no data     | no data | no data | no data | no data           | no data   | 43% |
| Domestic                | no data     | no data | no data | 22%     | 23%               | no data   | 50% |
| Irrigation / Industrial | no data     | no data | no data | no data | no data           | no data   | 36% |
| Monitoring              | no data     | no data | no data | no data | 67%               | no data   | 50% |
| Total                   | 4%          | 16%     | 5%      | 17%     | 22%               | 5%        | 34% |

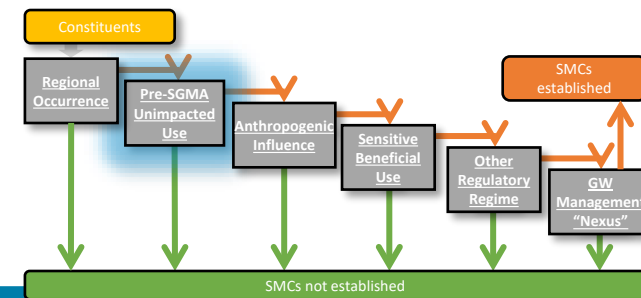
Notes

1. Screening levels set at MCLs except Cr(VI) which uses a HBSL of 20 µg/L.
2. “Total” considers all well categories.



# PRE-SGMA IMPACTS TEST

MCL exceeded in >25% of GAMA wells PRE-SGMA?



| Well Category            | Analyte     |         |         |         |                   |           |     |
|--------------------------|-------------|---------|---------|---------|-------------------|-----------|-----|
|                          | Gross Alpha | Arsenic | Cr (VI) | Nitrate | Nitrate + Nitrite | 1,2,3-TCP | TDS |
| Municipal                | 12%         | 16%     | 45%     | 8%      | 6%                | 82%       | 36% |
| Water Supply, Other      | 100%        | 12%     | 22%     | 13%     | no data           | 100%      | 45% |
| Domestic                 | no data     | 0%      | 0%      | 13%     | 13%               | 100%      | 75% |
| Irrigation / Industrial  | no data     | 14%     | 67%     | 14%     | 14%               | 100%      | 43% |
| Monitoring               | no data     | 19%     | 13%     | 44%     | 44%               | 100%      | 38% |
| Monitoring (Remediation) | no data     | 29%     | 54%     | 49%     | 87%               | 46%       | 74% |
| Total                    | 14%         | 25%     | 58%     | 29%     | 47%               | 84%       | 62% |

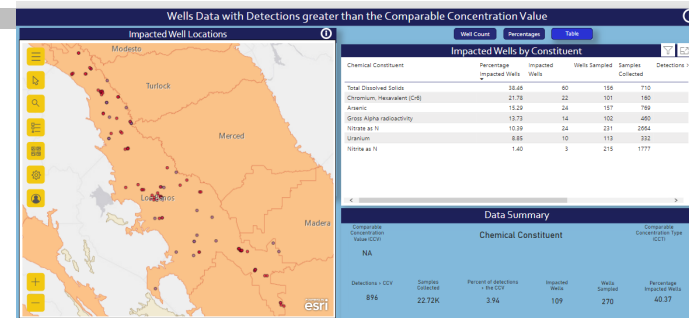
Notes

1. Reporting limit (0.12 ug/L) for some TCP measurements are higher than the MCL. These NDs may or may not have MCL exceedance.
2. Data from 2005-2014 are used for this analysis
3. "Total" considers all well categories



# PRE-SGMA IMPACTS TEST

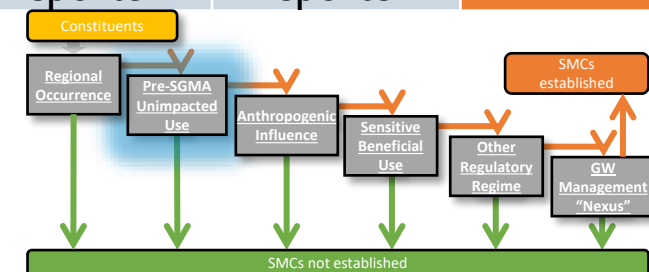
## Screening level exceeded in >25% of SWCRB-reported wells PRE-SGMA?



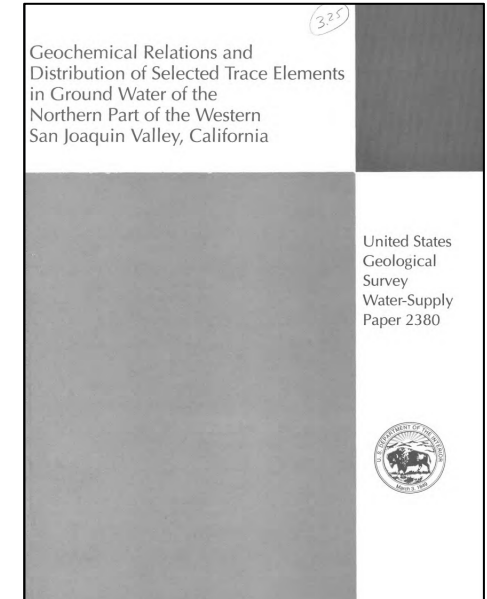
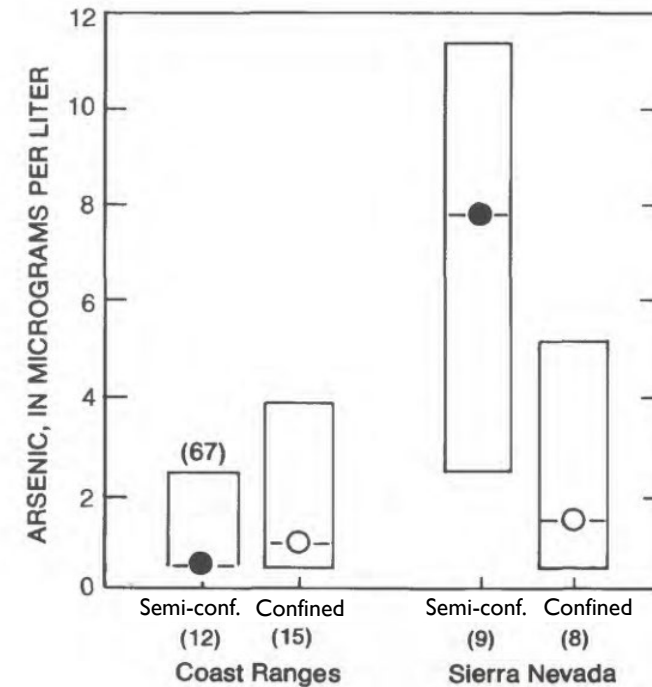
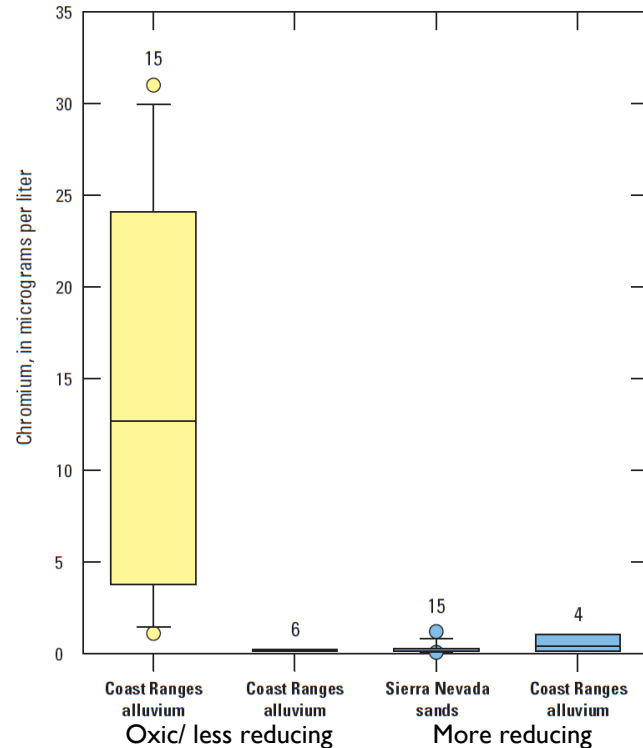
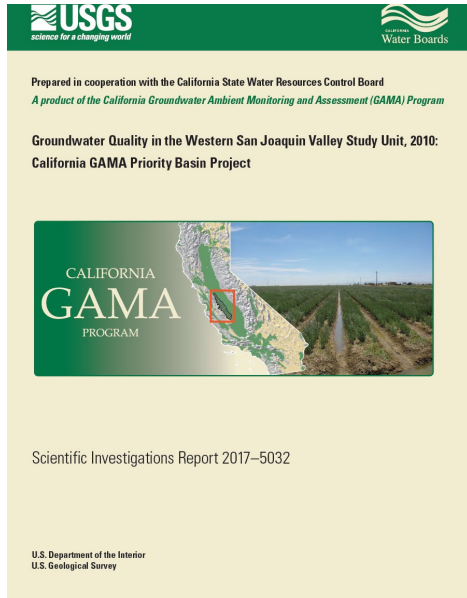
| Well Category           | Analyte     |             |             |             |                      |                      |             |
|-------------------------|-------------|-------------|-------------|-------------|----------------------|----------------------|-------------|
|                         | Gross Alpha | Arsenic     | Cr (VI)     | Nitrate     | Nitrate + Nitrite    | 1,2,3-TCP            | TDS         |
| Municipal               | 12%         | 16%         | 27%         | 8%          | none reported        | none reported        | 36%         |
| Water Supply, Other     | no data     | 12%         | 22%         | 13%         | none reported        | none reported        | 45%         |
| Domestic                | 0 / no data | 0 / no data | 0 / no data | 0 / no data | none reported        | none reported        | 0 / no data |
| Irrigation / Industrial | no data     | no data     | no data     | no data     | none reported        | none reported        | no data     |
| Monitoring              | no data     | no data     | no data     | no data     | none reported        | none reported        | no data     |
| <b>Total</b>            | <b>14%</b>  | <b>16%</b>  | <b>22%</b>  | <b>1%</b>   | <b>none reported</b> | <b>none reported</b> | <b>38%</b>  |

### Notes

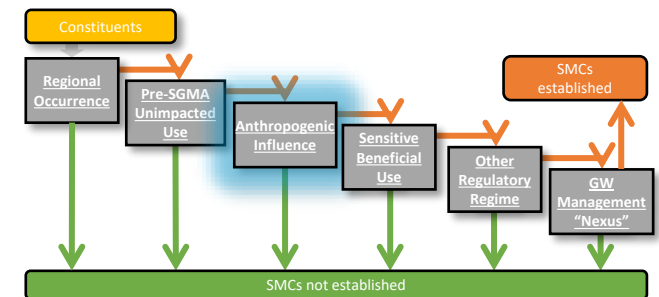
1. Screening levels set at MCLs except Cr(VI) which uses a HBSL of 20 µg/L.
2. Data from 2005-2014 are used for this analysis.
3. 35 domestic wells sampled with no detected exceedances. Constituents tested for are not specified.
4. Tool does not distinguish between constituents with no measurements or no exceedances.



# ANTHROPOGENIC INFLUENCE TEST: NATURAL OCCURRENCE



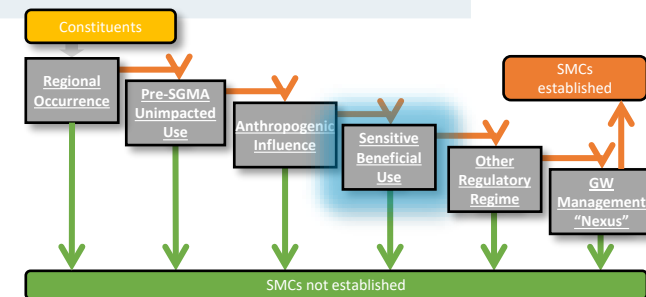
- Chromium and Arsenic primarily related to sediment source and redox conditions.
- Gross alpha radioactivity primarily caused by decay of uranium in sediments.



# SENSITIVE BENEFICIAL USE TEST

| Constituent               | Screening Level                              | Screening Level Type |
|---------------------------|--|----------------------|
| 1,2,3-TCP                 | 0.005 µg/L                                   | Primary MCL          |
| Arsenic                   | 10 µg/L                                      | Primary MCL          |
| Hexavalent Chromium       | 10 µg/L                                      | Draft Primary MCL    |
| Gross Alpha Radioactivity | 15 pCi/L                                     | Primary MCL          |
| Nitrate (as N)            | 10 mg/L                                      | Primary MCL          |
| Total Dissolved Solids    | 500 mg/L “recommended”<br>1,000 mg/L “upper” | Secondary MCL        |

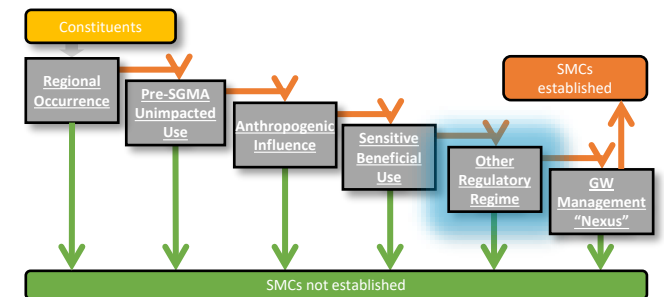
Presence of MCL = Potable use deemed sensitive by OEHHA and SWRCB



# OTHER REGULATORY REGIME TEST

- Drinking Water Quality:
  - Public Water Systems – water quality served to customers is regulated by the SWRCB Division of Drinking Water and required to meet all drinking water standards
  - **Domestic Wells – water quality is unregulated**
- Groundwater Quality related to Agricultural Land Use Management
  - Irrigated Lands Regulatory Program (IRLP)
    - **Also includes regulation of NO<sub>3</sub> in domestic wells**
  - Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS)

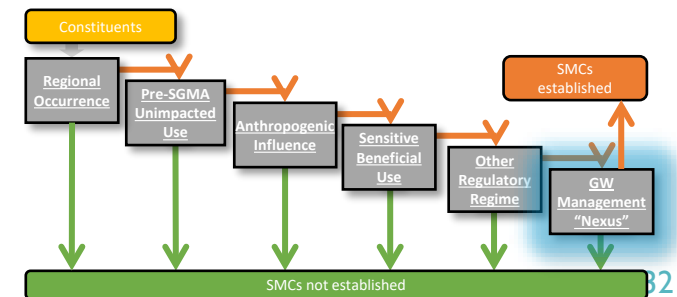
**NO<sub>3</sub>-N is only COC regulated for all sensitive uses.**



# GW MANAGEMENT NEXUS TEST: WATER LEVEL AND WATER QUALITY CORRELATION AT THE BASIN SCALE

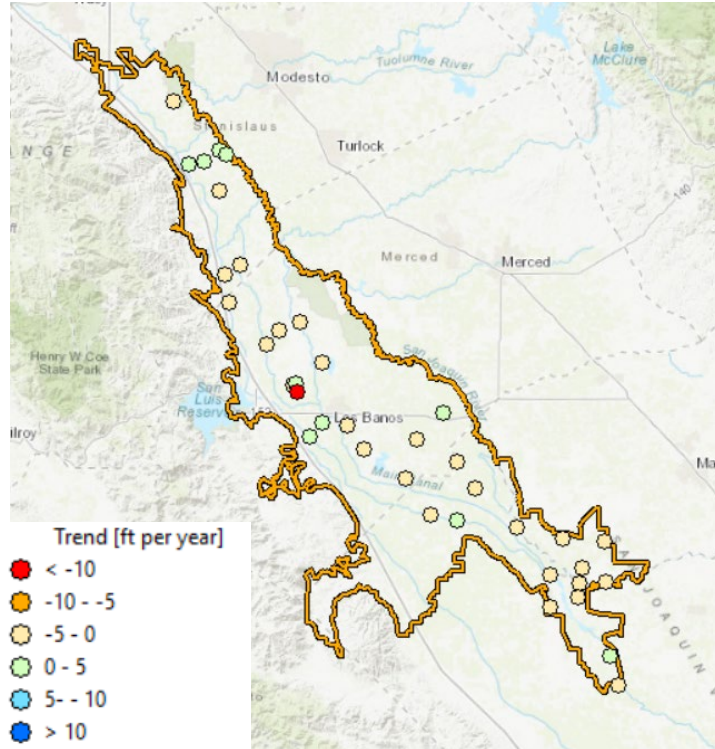
|                    | Increasing Trends | Decreasing Trends |
|--------------------|-------------------|-------------------|
| Water Level (RMWs) | 17 (27%)          | 45 (73%)          |
| TDS                | 101 (61%)         | 65 (39%)          |
| NO3                | 152 (56%)         | 118 (44%)         |

Trends analysis shows, for basin as a whole, predominantly a worsening in both water level and water quality conditions

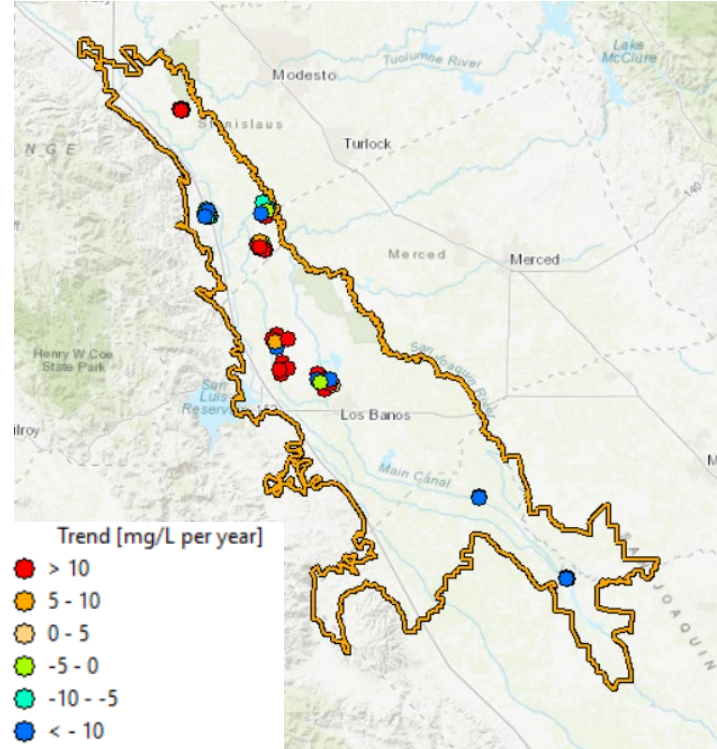


# GW MANAGEMENT NEXUS TEST: WL VS. WQ (UPPER AQUIFER)

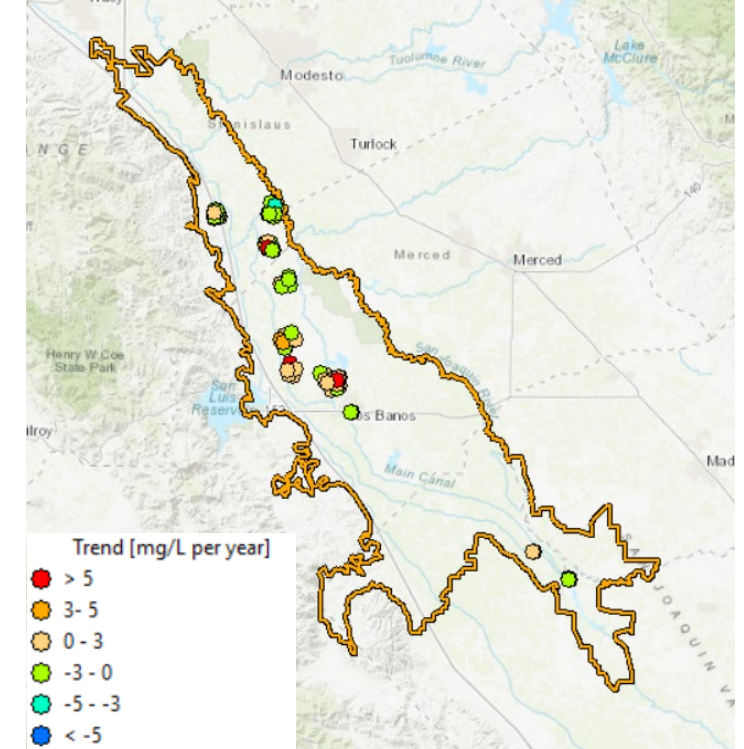
**Water Level**



**TDS**

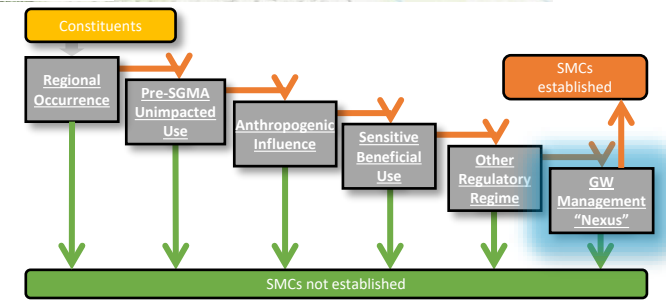


**NO<sub>3</sub>**



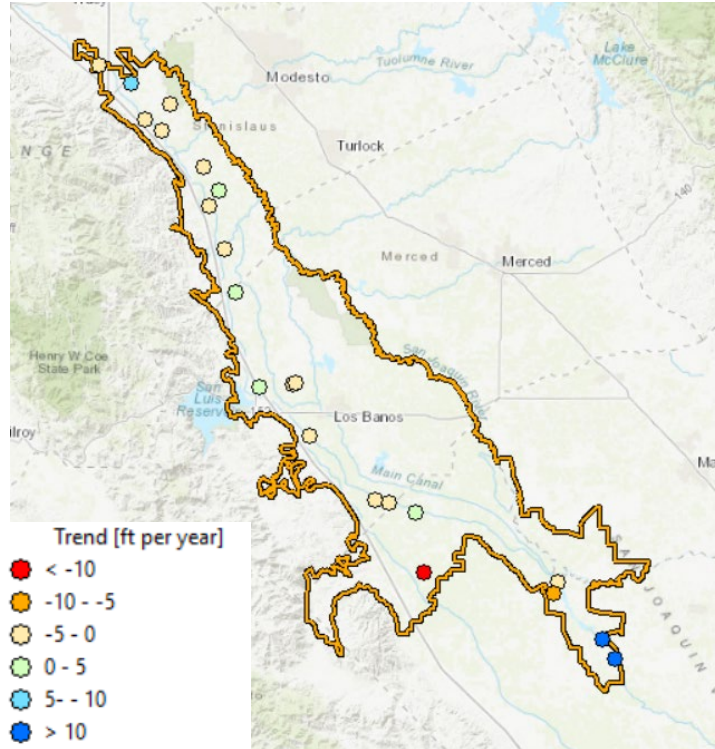
**Sources/Notes:**

1. Water level data from RMS network.
2. Water quality data from GAMA database.
3. For water quality data, 'Monitoring' wells are assumed as upper aquifer wells.

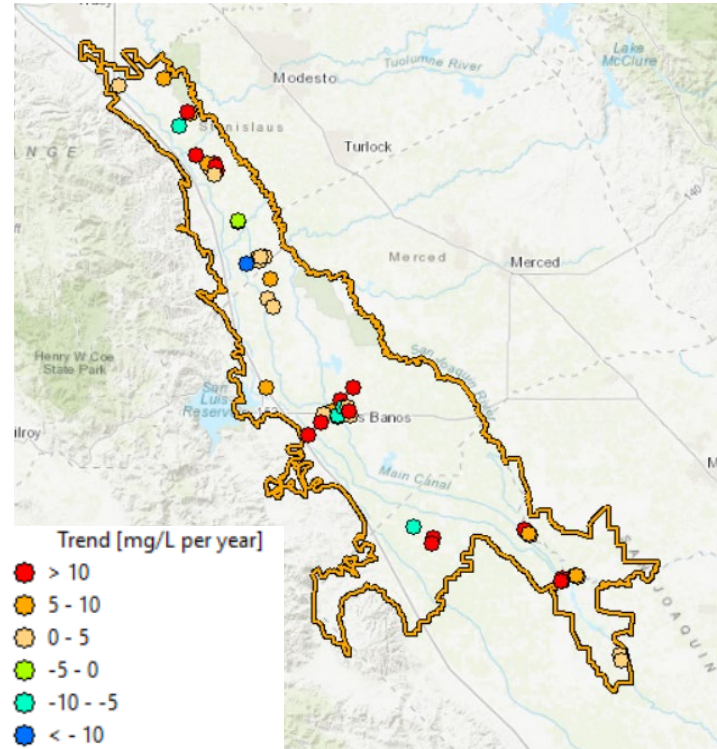


# GW MANAGEMENT NEXUS TEST : WL VS. WQ (LOWER AQUIFER)

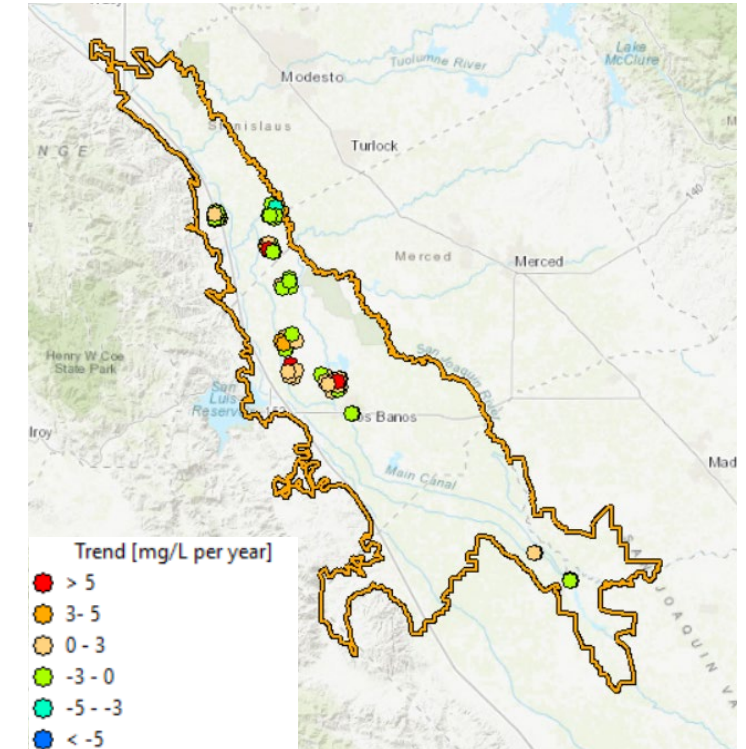
**Water Level**



**TDS**

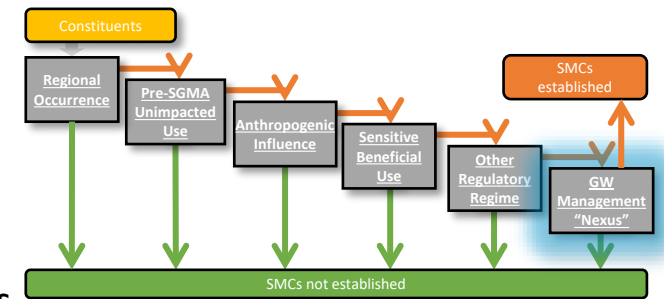


**NO<sub>3</sub>**



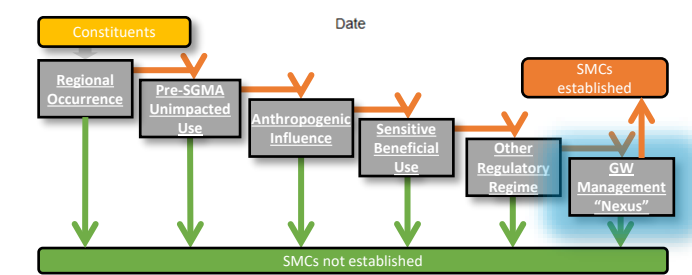
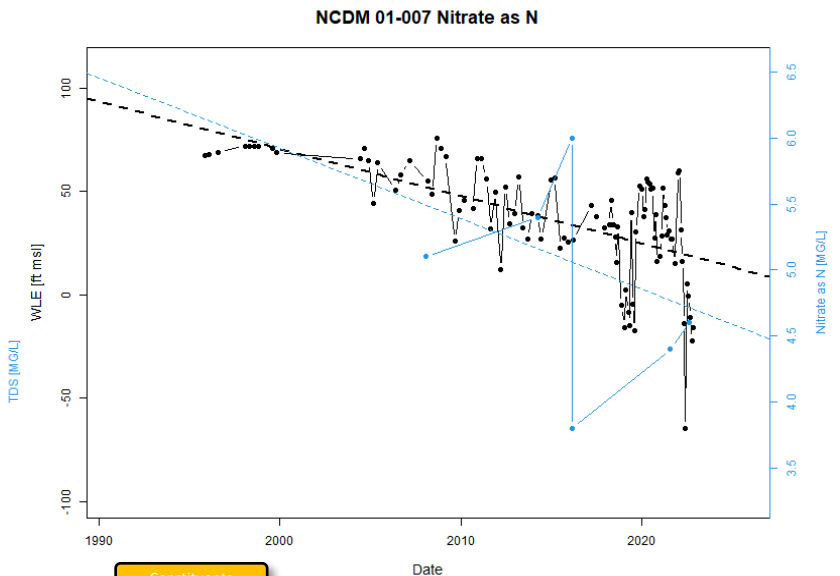
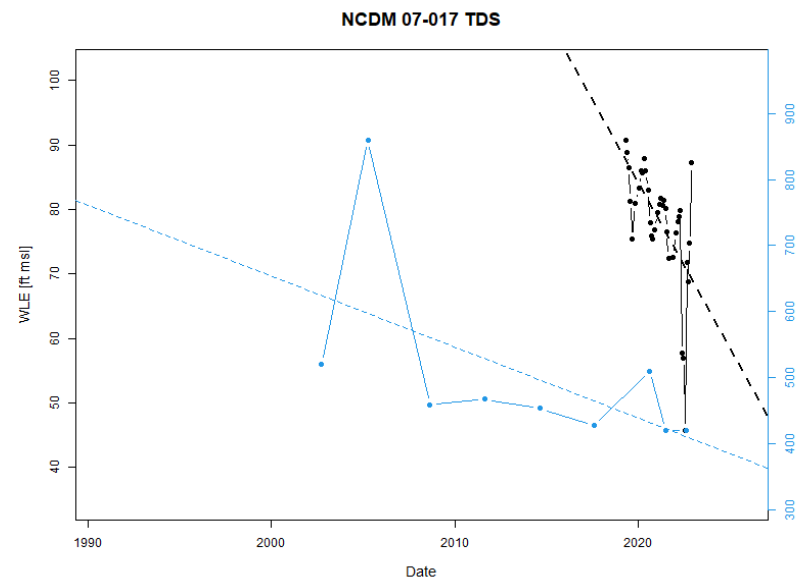
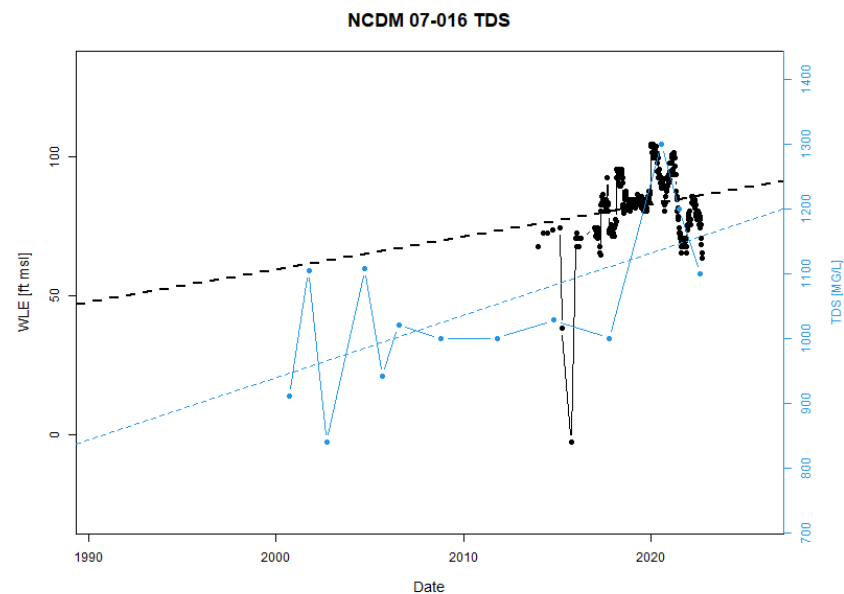
**Sources/Notes:**

1. Water level data from RMS network.
2. Water quality data from GAMA database.
3. For water quality data, "Municipal" and "Water Supply, Others" wells are assumed as lower aquifer wells.



# GROUNDWATER MANAGEMENT NEXUS TEST: WATER LEVEL AND WATER QUALITY CORRELATION (DMS) AT THE WELL SCALE

- Correlation between Water Level (WL) and Water Quality (WQ) requires additional monitoring
  - 1,115 WQ measurements (1982-2022) at WQ RMS wells, including 740 TDS, 143 Nitrate, and 121 Boron measurements
  - 50 unique wells (520 total data counts) are also WL RMS wells
  - Wells with both WQ and WL data are mostly in NCDM, with one additional well from Farmers WD
  - WQ trends may not be statistically significant given limited data points

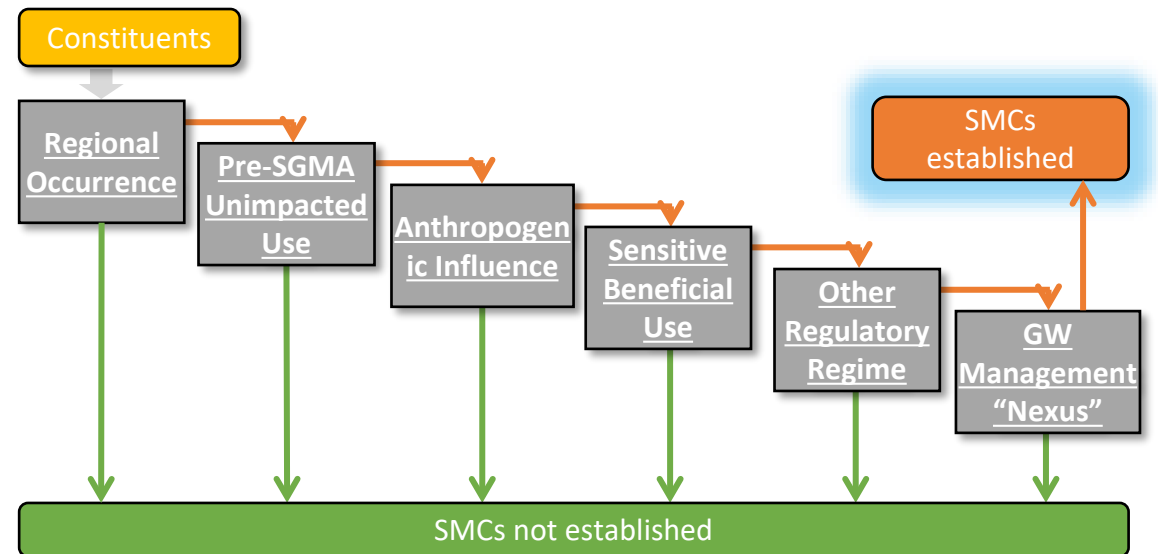


Difficult to use Water Levels as a proxy for Water Quality



# PRIORITY COCs REMAINING AFTER SCREENING

- TDS
- I,2,3-TCP



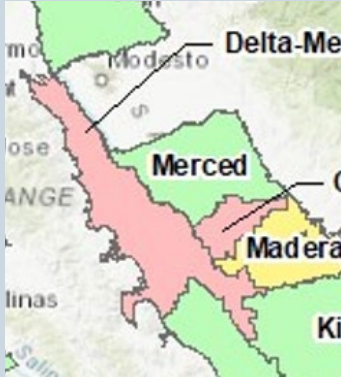
| Potential COC (SWRCB) | Regional Occurrence (% exceedance)                            | Pre-SGMA Unimpacted Use | Anthropogenic Influence (source) | Sensitive Beneficial Use | Other Regulatory Regime                               | GW Mgmt. "Nexus" |
|-----------------------|---|-------------------------|----------------------------------|--------------------------|---|------------------|
| Arsenic               | Muni: 18%<br>Domestic: insufficient data                      | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Cr(VI)                | Muni: 47%<br>Other supply: 43%<br>Domestic: insufficient data | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Gross Alpha           | Muni: 4%<br>Domestic: no data                                 | Yes                     | Primarily Naturally Occurring    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   |                  |
| Nitrate               | Muni: 12%<br>Other supply: 13%<br>Dom: 22%                    | Yes                     | Anthropogenic                    | Primary MCL              | IRLP, CV-SALTS<br>Muni: CA Title 22<br>Domestic: IRLP | Recharge         |
| TDS                   | Muni: 29%<br>Other supply: 43%<br>Domestic: 53%               | Yes                     | Both                             | Secondary MCL            | IRLP, CV-SALTS<br>Muni: CA Title 22<br>Domestic: none | Yes              |
| I,2,3-TCP             | Muni: 15%<br>Domestic: insufficient data                      | Yes                     | Anthropogenic                    | Primary MCL              | Muni: CA Title 22<br>Domestic: none                   | Recharge         |

# PROPOSED WATER QUALITY URs AND MTs/MOs

- **Undesirable Results:** UR occurs if MTs are exceeded at **25%** or more of RMS for two consecutive years.
- **Minimum Thresholds:**
  - For RMS/COC where pre-2015\* conc. is less than MCL: **MT = MCL**
  - For RMS/COC where pre-2015\* conc. is greater than MCL: **MT = 20% above pre-2015 conc.**
- **Measurable Objectives:**
  - For RMS/COC where pre-2015\* conc. is less than MCL: **MO = MCL**
  - For RMS/COC where pre-2015\* conc. is greater than MCL: **MO = maintain or improve COC concentrations**
- **Interim Milestones:** Glide path between current concentration and MO

\* For RMS/COC that do not have pre-SGMA data, set interim MTs/MOs at MCL, and conduct monitoring to establish baseline based on at least 2 years of monitoring data and use to set permanent MTs/MOs.

# WATER QUALITY SMC DEVELOPMENT PROCESS

| ID Beneficial Users   | Impacts to Beneficial Users   | Consideration of Adjacent Basins   | Relationships with Other Sustainability Indicators            | State, Federal, and Local Standards  |
|---|---|--|---|--|
| <ul style="list-style-type: none"> <li>• Drinking water GW users</li> <li>• Agricultural GW users</li> <li>• Environmental users</li> </ul> | <ul style="list-style-type: none"> <li>• Increased cost to treat; potentially economically prohibitive to continue to use for drinking water</li> </ul> | <ul style="list-style-type: none"> <li>• Compare MOs/MTs to those in adjacent basins to assess potential impacts to GW quality</li> </ul>  <p>The map shows the geographical relationship between the Delta-Merced, Merced, and Madera basins. The Delta-Merced basin is highlighted in green, the Merced basin in pink, and the Madera basin in yellow. Other nearby basins like Kings River and Salinas are partially visible.</p> | <ul style="list-style-type: none"> <li>• GW Levels</li> </ul> | <ul style="list-style-type: none"> <li>• MCLs</li> <li>• Basin Plan</li> </ul> |

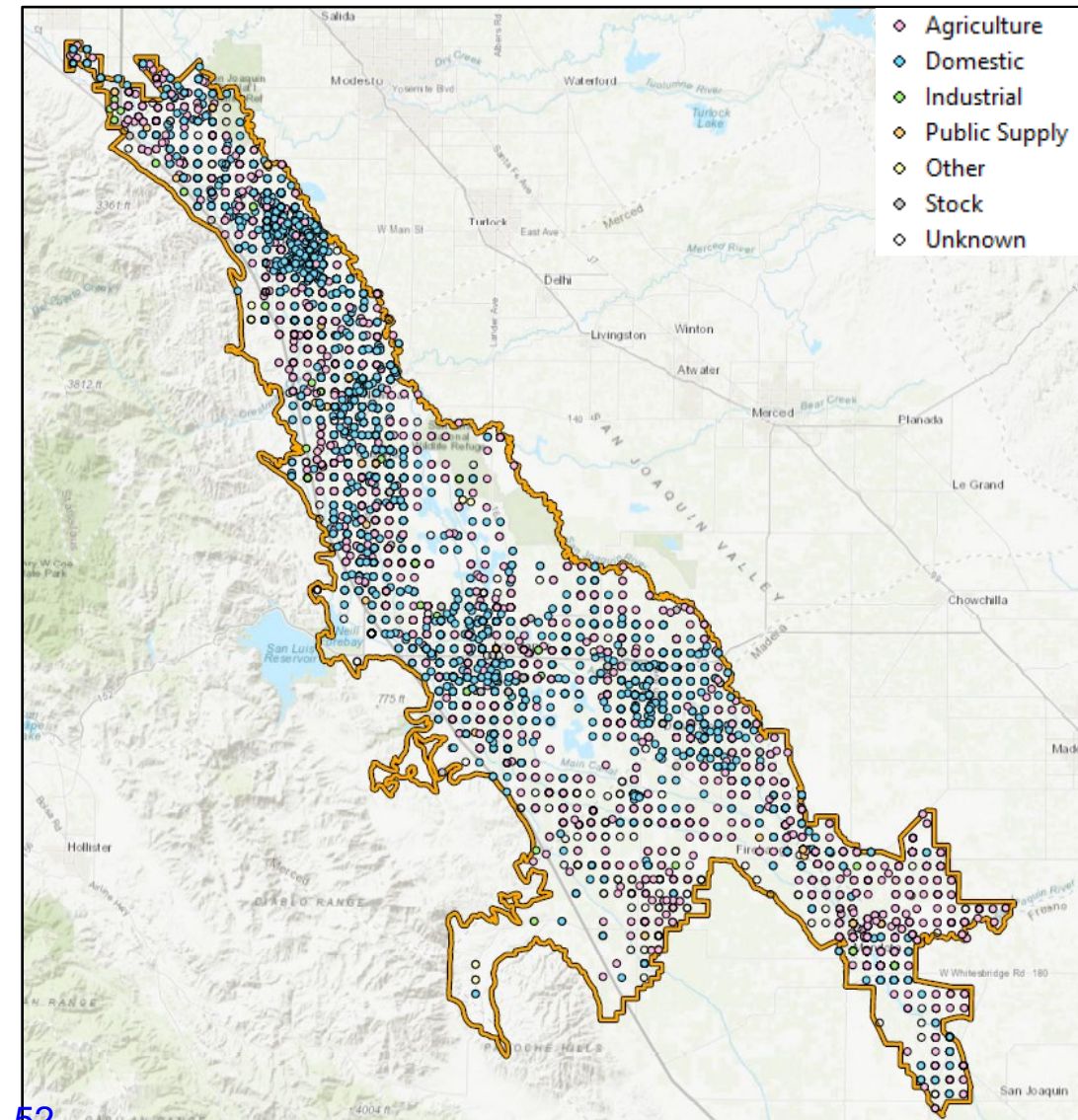
# BENEFICIAL USERS: GROUNDWATER PUMPERS

## Well Count by Type\*:

- Agricultural: 1,729
- Domestic: 2,470
- Public Supply: 87
- Industrial: 71
- Other: 1,172

**Total: 5,529 wells**

\* Excludes cathodic, test, injection, remediation, and monitoring wells



# IDENTIFICATION OF NEGATIVE EFFECTS OF SUSTAINABILITY INDICATORS ON BENEFICIAL USERS

| Sustainability Indicator                | Beneficial Uses/Users             |   |                            |                           |
|---|-----------------------------------|---|----------------------------|---------------------------|
|   | Agricultural/<br>Industrial Users | Domestic /<br>Small<br>Community<br>Users | Municipal<br>Users         | Environmental<br>Users    |
| <b>Degradation of<br/>Water Quality</b> | Reduced crop<br>yields            | Impaired drinking<br>water                | Impaired drinking<br>water | Toxicity, algal<br>blooms |

# DEFINE UNDESIRABLE RESULTS CRITERIA

| Sustainability Indicator        | Beneficial Uses/Users   |   |                    |                        |
|---------------------------------|---|---|--------------------|------------------------|
|                                 | Agricultural/<br>Industrial Users   | Domestic /<br>Small<br>Community<br>Users | Municipal<br>Users | Environmental<br>Users |
| Degradation of<br>Water Quality | <p><u>Questions:</u></p> <ul style="list-style-type: none"><li>• How much <b>water quality degradation</b> is significant &amp; unreasonable?</li><li>• In other words, what percentage of wells being contaminated is significant &amp; unreasonable, and why?</li></ul> <p><u>Translate</u> answer to MT exceedances at RMS locations:<br/>MT exceedances at X% of RMS locations over XX period</p> |   |                    |                        |

↑ ↑  
Need justification for choices

## ASSESSMENT OF RELATED SUSTAINABILITY INDICATORS

- **Degraded Water Quality** may be *affected by* other sustainability indicators but generally *does not affect* them\*

**\*with the possible exception that significant degradation of water quality could reduce groundwater demand and improve groundwater levels**

# MT/MO JUSTIFICATIONS

| <b>Impacts to Beneficial Users</b>   | <b>Impacts to Adjacent Basins</b>   | <b>Impacts to Other Sustainability Indicators</b>                                |
|--|---|--|
| <ul style="list-style-type: none"><li>• MCLs designed to be protective of beneficial uses.</li></ul> | <ul style="list-style-type: none"><li>• SMCs similar to other basins.</li><li>• No known plumes migrating out of basin.</li></ul> | <ul style="list-style-type: none"><li>• Not affected by water quality.</li></ul> |



# REVISED UR DEFINITION & JUSTIFICATION

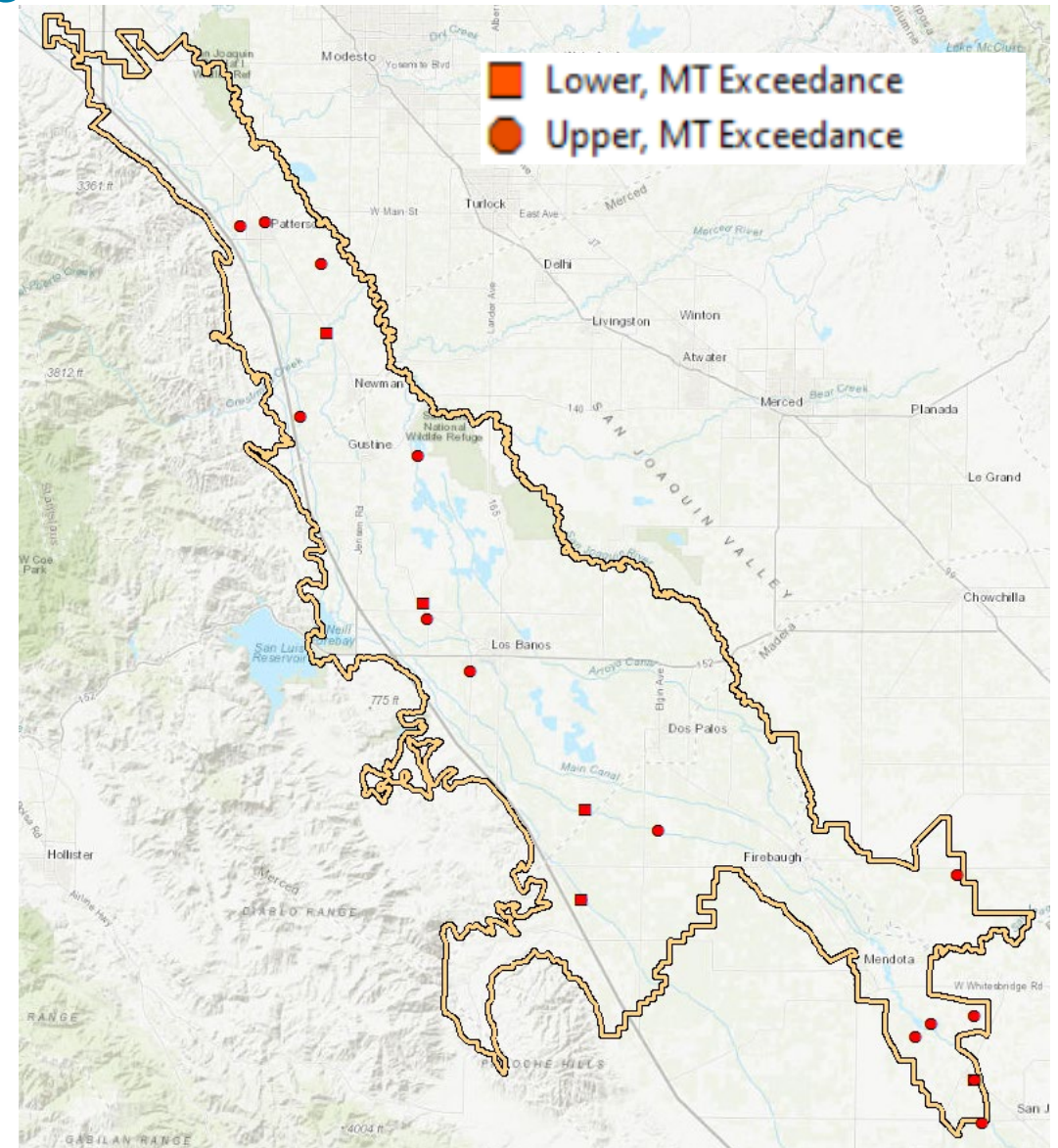
| UR Criteria  | UR Justification  |
|--|---|
| <p>MT exceedances at 25% of RMS for two consecutive years (four seasonal measurements)</p> | <ul style="list-style-type: none"><li>• A percentage much lower than 25% suggests a primarily local impact, whereas much larger percentage suggests a widespread impact inconsistent with the Sustainability Goal.</li><li>• 2 years accounts for potential seasonal variations</li></ul> |

## RESPONSE TO MT EXCEEDANCES

- Increase monitoring to assess root cause(s)
- Coordination with other regulatory agencies with jurisdiction
- Projects and Management Actions

# POTENTIAL RISK TO BASIN / GSAs

- Can the GSAs maintain COC concentrations below the proposed SMCs?
- In the past two years there would have been MT exceedances for TDS
  - In WY 2021: **12 MT exceedances** out of 48 RMS wells with data (25%)
  - In WY 2022: **20 MT exceedances** out of 57 RMS wells with data (35%)
  - **2 RMS wells** with consecutive exceedances out of 14 with data (14%)



Wells Exceeding proposed TDS MTs – WY 2022

# MEETING OBJECTIVES

## Objective #3: Water Budget / Model Update

## USGS/USBR MODEL STATUS UPDATE

- CVHM2 has been released to SLDMWA and will be transferred to EKI shortly
- Subbasin will not be able to “rely” on CVHM2 to support decision making or for direct citation until it has been released publicly; Journal article submission currently in process.

## NEXT STEPS

- Refine the Water Quality SMCs based on feedback today
- Initiate other SMC development efforts
- Begin running the CVHM2 Model

# QUESTIONS



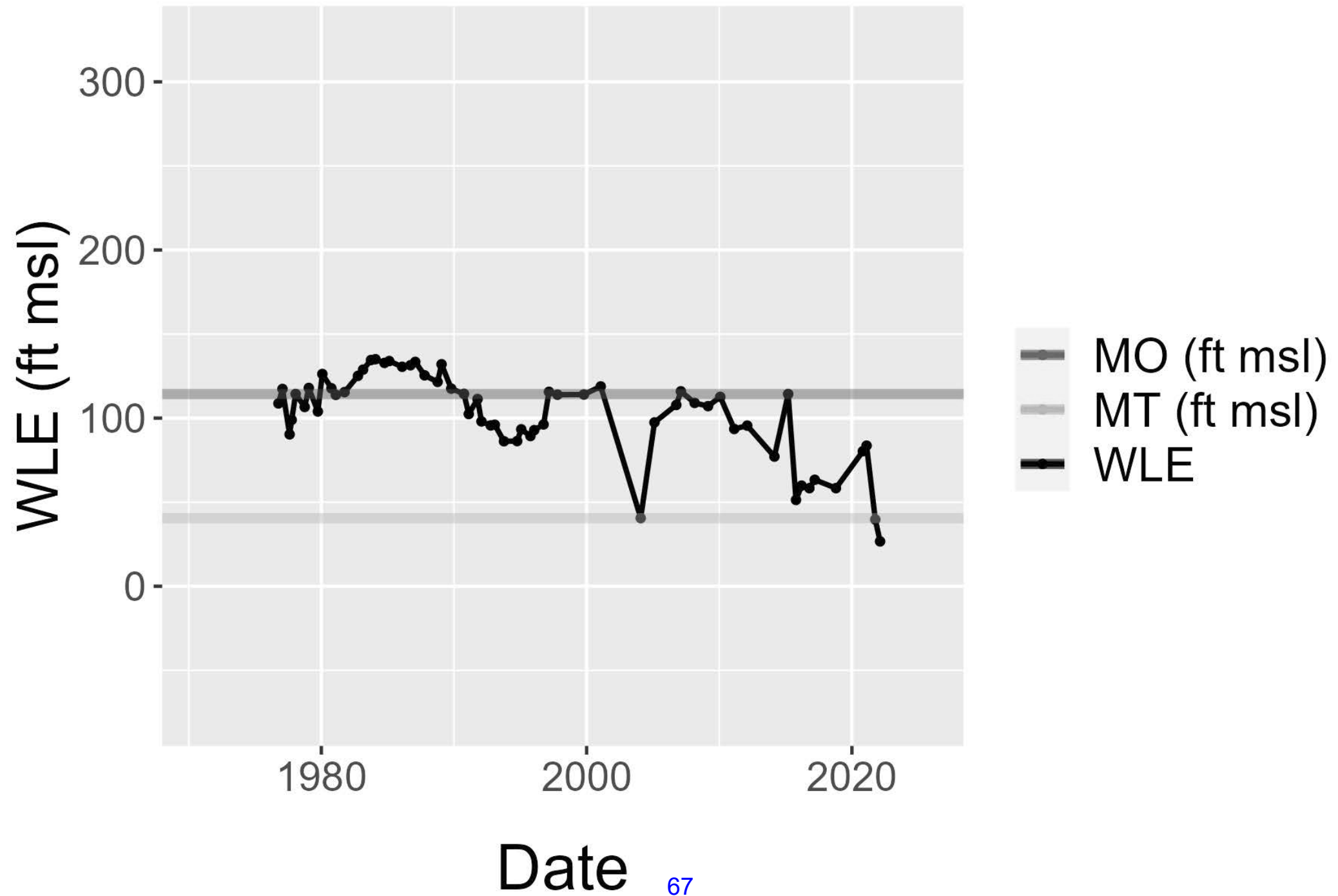
|                           | A                                     | B                      | C                | D                    | E               | F                | G                      |
|---------------------------|---------------------------------------|------------------------|------------------|----------------------|-----------------|------------------|------------------------|
| Component Invoice Summary |                                       |                        |                  |                      |                 |                  |                        |
|                           | Component                             | Grant Request          | Local Cost Share | Amount Invoiced      | Amount Received | Retention Amount | Balance                |
| 3                         | C1: Los Banos Creek Recharge & Recove | \$ 2,000,000.00        | \$ -             |                      |                 |                  | \$ 2,000,000.00        |
| 4                         | C2: Floodwater Capture                | \$ 1,000,000.00        | \$ -             |                      |                 |                  | \$ 1,000,000.00        |
| 5                         | C3: Chowchilla Bypass Recharge        | \$ 1,000,000.00        | \$ -             |                      |                 |                  | \$ 1,000,000.00        |
| 6                         | C4: Lat 4 N Reservoir Recap. & Recirc | \$ 228,030.00          | \$ -             |                      |                 |                  | \$ 228,030.00          |
| 7                         | C5: North Valley RRWP                 | \$ 272,270.00          | \$ -             |                      |                 |                  | \$ 272,270.00          |
| 8                         | C6: Farmers Water Bank                | \$ 791,300.00          |                  | \$ 25,556.65         |                 |                  | \$ 765,743.35          |
| 9                         | C7: LB Creek Res. Reg. & Storage      | \$ 600,000.00          |                  |                      |                 |                  | \$ 600,000.00          |
| 10                        | C8: Data Gaps & Monitoring            | \$ 929,400.00          | \$ -             | \$ 1,303.75          |                 |                  | \$ 928,096.25          |
| 11                        | C9: GSP Revisions & Updates           | \$ 561,500.00          |                  | \$ 272,507.21        |                 |                  | \$ 288,992.79          |
| 12                        | C10: Outreach & Engagement            | \$ 172,500.00          |                  | \$ 111,880.78        |                 |                  | \$ 60,619.22           |
| 13                        | C11: Studies & Investigations         | \$ 45,000.00           |                  |                      |                 |                  | \$ 45,000.00           |
| 14                        |                                       |                        |                  |                      |                 |                  |                        |
| 15                        | <b>Total</b>                          | <b>\$ 7,600,000.00</b> | <b>\$ -</b>      | <b>\$ 411,248.39</b> | <b>\$ -</b>     | <b>\$ -</b>      | <b>\$ 7,188,751.61</b> |



|    | A                             | B                       | C                      | D                      | E                     | F                     | G                      |
|----|-------------------------------|-------------------------|------------------------|------------------------|-----------------------|-----------------------|------------------------|
| 1  | <b>Individual GSP Summary</b> |                         |                        |                        |                       |                       |                        |
| 2  | <b>GSP Group</b>              | <b>Component Number</b> | <b>Budget Category</b> | <b>Grant Amount</b>    | <b>Invoice Amount</b> | <b>Invoice Number</b> | <b>Balance</b>         |
| 3  | Aliso WD                      | C 3                     | C: Implementation      | \$ 1,000,000.00        |                       |                       | \$ 1,000,000.00        |
| 4  | Aliso WD                      | C 8                     | C: Implementation      | \$ 134,400.00          |                       |                       | \$ 134,400.00          |
| 5  | Aliso WD                      | C 9                     | B: Env., Eng., Design  | \$ 50,000.00           | \$ 29,917.95          | 1                     | \$ 20,082.05           |
| 6  | Aliso WD                      | C 11                    | B: Env., Eng., Design  | \$ 45,000.00           |                       |                       | \$ 45,000.00           |
| 7  | <b>Subtotal</b>               |                         |                        | <b>\$ 1,229,400.00</b> | <b>\$ 29,917.95</b>   |                       | <b>\$ 1,199,482.05</b> |
| 8  | Farmers WD                    | C 6                     | B: Env., Eng., Design  | \$ 125,000.00          | \$ 25,556.65          | 1                     | \$ 99,443.35           |
| 9  | Farmers WD                    | C 6                     | C: Implementation      | \$ 616,000.00          | \$ -                  |                       | \$ 616,000.00          |
| 10 | Farmers WD                    | C 6                     | D: Monitoring          | \$ 50,000.00           | \$ -                  |                       | \$ 50,000.00           |
| 11 | Farmers WD                    | C 8                     | C: Implementation      | \$ 50,000.00           | \$ -                  |                       | \$ 50,000.00           |
| 12 | Farmers WD                    | C 8                     | D: Monitoring          | \$ 25,000.00           | \$ -                  |                       | \$ 25,000.00           |
| 13 | Farmers WD                    | C 9                     | B: Env., Eng., Design  | \$ 125,000.00          | \$ 55,688.00          | 1                     | \$ 69,312.00           |
| 14 | Farmers WD                    | C 9                     | E: Outreach            | \$ 50,000.00           | \$ -                  |                       | \$ 50,000.00           |
| 15 | Farmers WD                    | C 10                    | E: Outreach            | \$ 40,000.00           | \$ 13,542.50          | 1                     | \$ 26,457.50           |
| 16 | <b>Subtotal</b>               |                         |                        | <b>\$ 1,081,000.00</b> | <b>\$ 94,787.15</b>   |                       | <b>\$ 986,212.85</b>   |
| 17 | Fresno County                 | C 8                     | B: Env., Eng., Design  | \$ 10,000.00           | \$ 1,303.75           |                       | \$ 8,696.25            |
| 18 | Fresno County                 | C 8                     | C: Implementation      | \$ 70,000.00           | \$ -                  |                       | \$ 70,000.00           |
| 19 | Fresno County                 | C 9                     | B: Env., Eng., Design  | \$ 124,000.00          | \$ 52,778.47          | 1                     | \$ 71,221.53           |
| 20 | Fresno County                 | C 9                     | E: Outreach            | \$ 50,000.00           | \$ -                  |                       | \$ 50,000.00           |
| 21 | Fresno County                 | C 10                    | E: Outreach            | \$ 25,000.00           | \$ 10,979.86          | 1                     | \$ 14,020.14           |
| 22 | <b>Subtotal</b>               |                         |                        | <b>\$ 279,000.00</b>   | <b>\$ 65,062.08</b>   |                       | <b>\$ 213,937.92</b>   |
| 23 | Grasslands WD                 | C 2                     | B: Env., Eng., Design  | \$ 200,000.00          |                       |                       | \$ 200,000.00          |
| 24 | Grasslands WD                 | C 2                     | C: Implementation      | \$ 800,000.00          |                       |                       | \$ 800,000.00          |
| 25 | Grasslands WD                 | C 9                     | B: Env., Eng., Design  | \$ 112,500.00          | \$ 87,935.82          | 1                     | \$ 24,564.18           |
| 26 | Grasslands WD                 | C 10                    | E: Outreach            | \$ 25,000.00           | \$ -                  |                       | \$ 25,000.00           |
| 27 | <b>Subtotal</b>               |                         |                        | <b>\$ 1,137,500.00</b> | <b>\$ 87,935.82</b>   |                       | <b>\$ 1,049,564.18</b> |
| 28 | Northern & Central            | C 1                     | C: Implementation      | \$ 1,000,000.00        |                       |                       | \$ 1,000,000.00        |
| 29 | Northern & Central            | C 4                     | B: Env., Eng., Design  | \$ 228,030.00          |                       |                       | \$ 228,030.00          |
| 30 | Northern & Central            | C 5                     | C: Implementation      | \$ 272,000.00          |                       |                       | \$ 272,000.00          |
| 31 | Northern & Central            | C 7                     | C: Implementation      | \$ 300,000.00          |                       |                       | \$ 300,000.00          |
| 32 | <b>Subtotal</b>               |                         |                        | <b>\$ 1,800,030.00</b> | <b>\$ -</b>           |                       | <b>\$ 1,800,030.00</b> |
| 33 | SJREC                         | C 1                     | C: Implementation      | \$ 1,000,000.00        |                       |                       | \$ 1,000,000.00        |
| 34 | SJREC                         | C 7                     | C: Implementation      | \$ 300,000.00          |                       |                       | \$ 300,000.00          |
| 35 | SJREC                         | C 9                     | B: Env., Eng., Design  | \$ 50,000.00           | \$ 26,300.34          | 1                     | \$ 23,699.66           |
| 36 | SJREC                         | C 10                    | E: Outreach            | \$ 82,500.00           | \$ 7,839.00           | 1                     | \$ 74,661.00           |
| 37 | <b>Subtotal</b>               |                         |                        | <b>\$ 1,432,500.00</b> | <b>\$ 34,139.34</b>   |                       | <b>\$ 1,398,360.66</b> |
| 38 | Subbasin                      | C 8                     | B: Env., Eng., Design  | \$ 98,400.00           |                       |                       | \$ 98,400.00           |
| 39 | Subbasin                      | C 8                     | C: Implementation      | \$ 229,200.00          |                       |                       | \$ 229,200.00          |
| 40 | Subbasin                      | C 8                     | D: Monitoring          | \$ 216,800.00          |                       |                       | \$ 216,800.00          |
| 41 | Subbasin                      | C 8                     | E: Outreach            | \$ 95,600.00           |                       |                       | \$ 95,600.00           |
| 42 | Subbasin                      | C 9                     | B: Env., Eng., Design  |                        |                       |                       |                        |
| 43 | Subbasin                      | C 9                     | E: Outreach            |                        | \$ 19,886.63          |                       |                        |
| 44 | Subbasin                      | C 10                    | E: Outreach            |                        | \$ 79,519.42          |                       |                        |
| 45 | <b>Subtotal</b>               |                         |                        | <b>\$ 640,000.00</b>   | <b>\$ 99,406.05</b>   |                       | <b>\$ 540,593.95</b>   |
| 46 | <b>Total</b>                  |                         |                        | <b>\$ 7,599,430.00</b> | <b>\$ 411,248.39</b>  |                       | <b>\$ 7,188,181.61</b> |

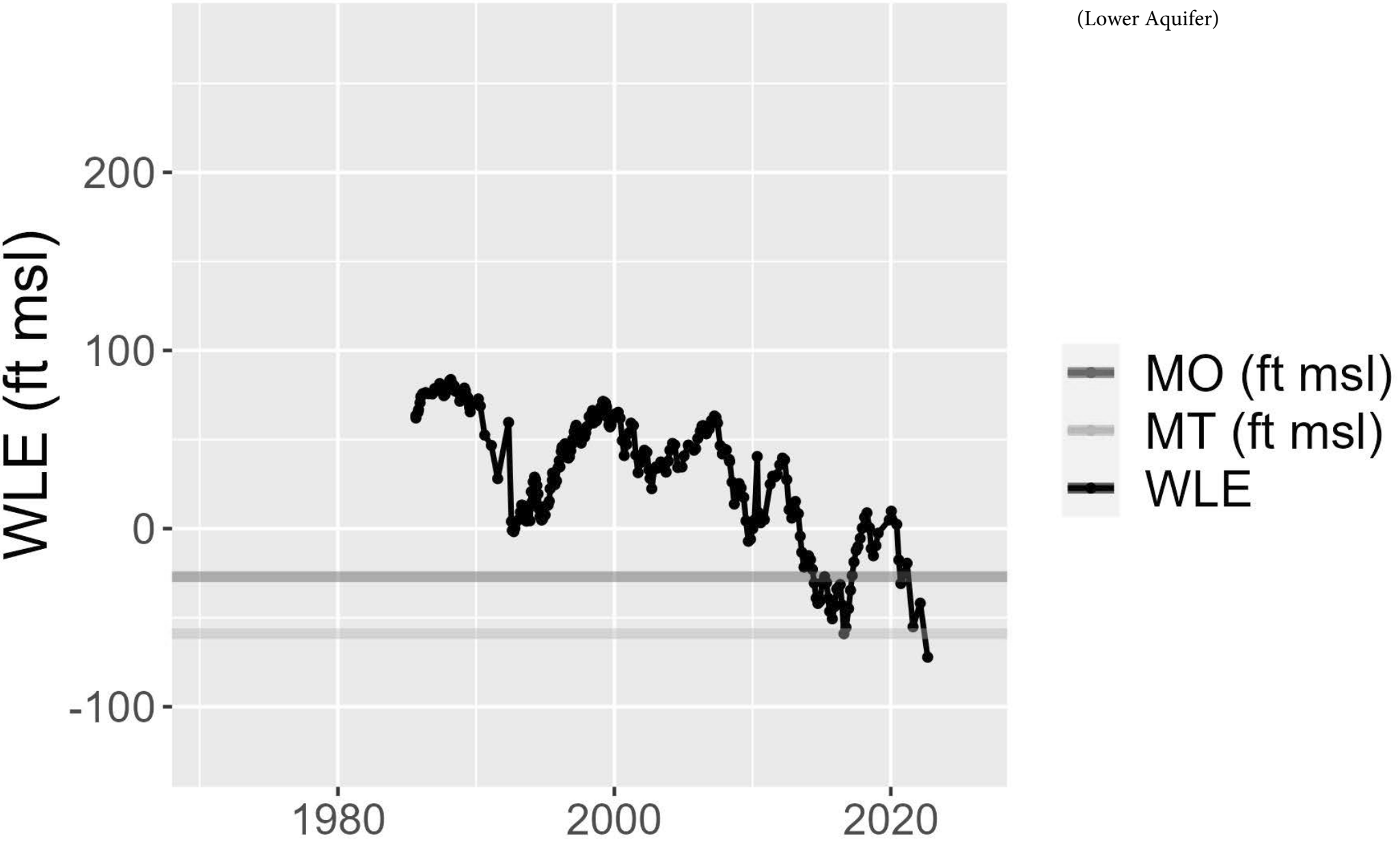
|  | A               | B                     | C         | D               | E                   | F                    |
|--|-----------------|-----------------------|-----------|-----------------|---------------------|----------------------|
| <b>Shared Subbasin Wide Component Expenses</b> |                 |                       |           |                 |                     |                      |
|  | Component       | Entity                | Invoice # | Budget Category | Amount              | Individual GSP Share |
| 1  |                 |                       |           |                 |                     |                      |
| 2  |                 |                       |           |                 |                     |                      |
| 3  | 9               | SLDMWA                | 1         | 1 E*            | \$ 19,886.53        | \$ 3,314.42          |
| 4  | 10              | Baker Manock & Jensen | 1         | 1 E             | \$ 17,691.50        | \$ 2,948.58          |
| 5  | 10              | EKI                   | 1         | 1 E             | \$ 13,803.92        | \$ 2,300.65          |
| 6  | 10              | Woodard & Curran      | 1         | 1 E             | \$ 48,024.00        | \$ 8,004.00          |
| 7  | <b>Subtotal</b> |                       |           |                 | <b>\$ 99,405.95</b> | <b>\$ 16,567.66</b>  |
| 8  |                 |                       |           |                 | \$ -                | -                    |
| 9  |                 |                       |           |                 | \$ -                | -                    |
| 10   |                 |                       |           |                 | \$ -                | -                    |

# Aliso Water District 09-001 (Upper Aquifer)



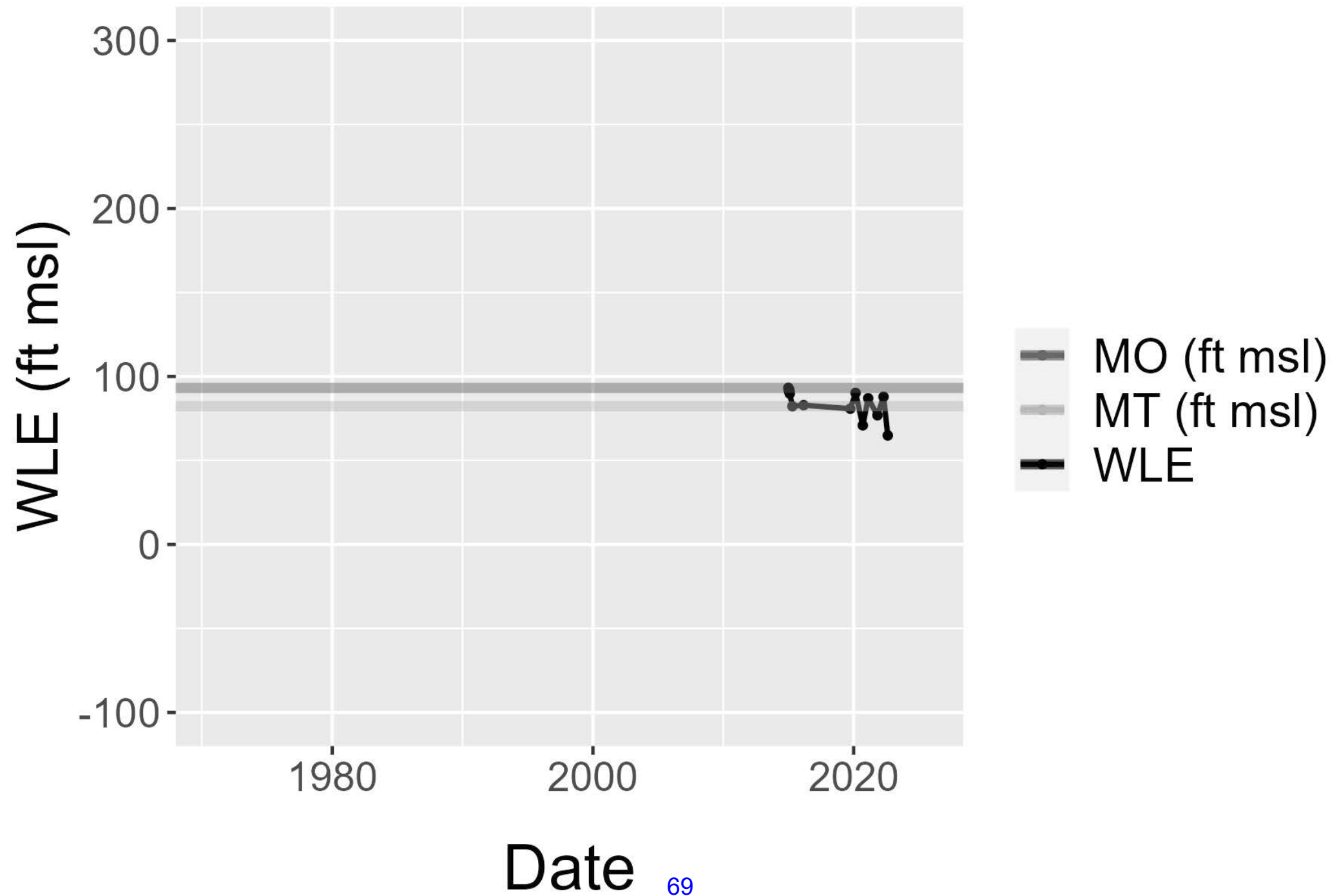
# Farmers Water District 13-004

(Lower Aquifer)



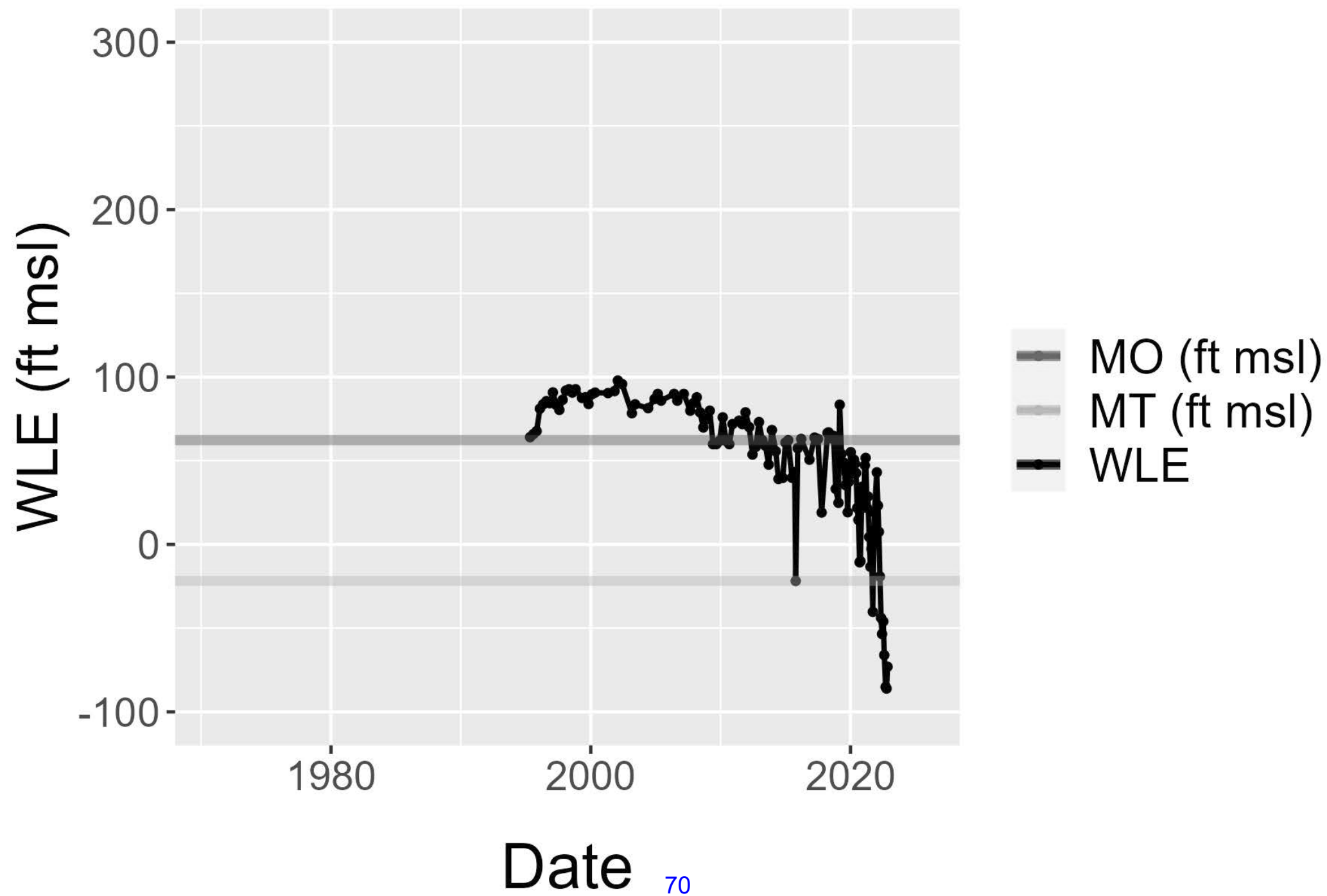
# Grassland 11-008

(Upper Aquifer)



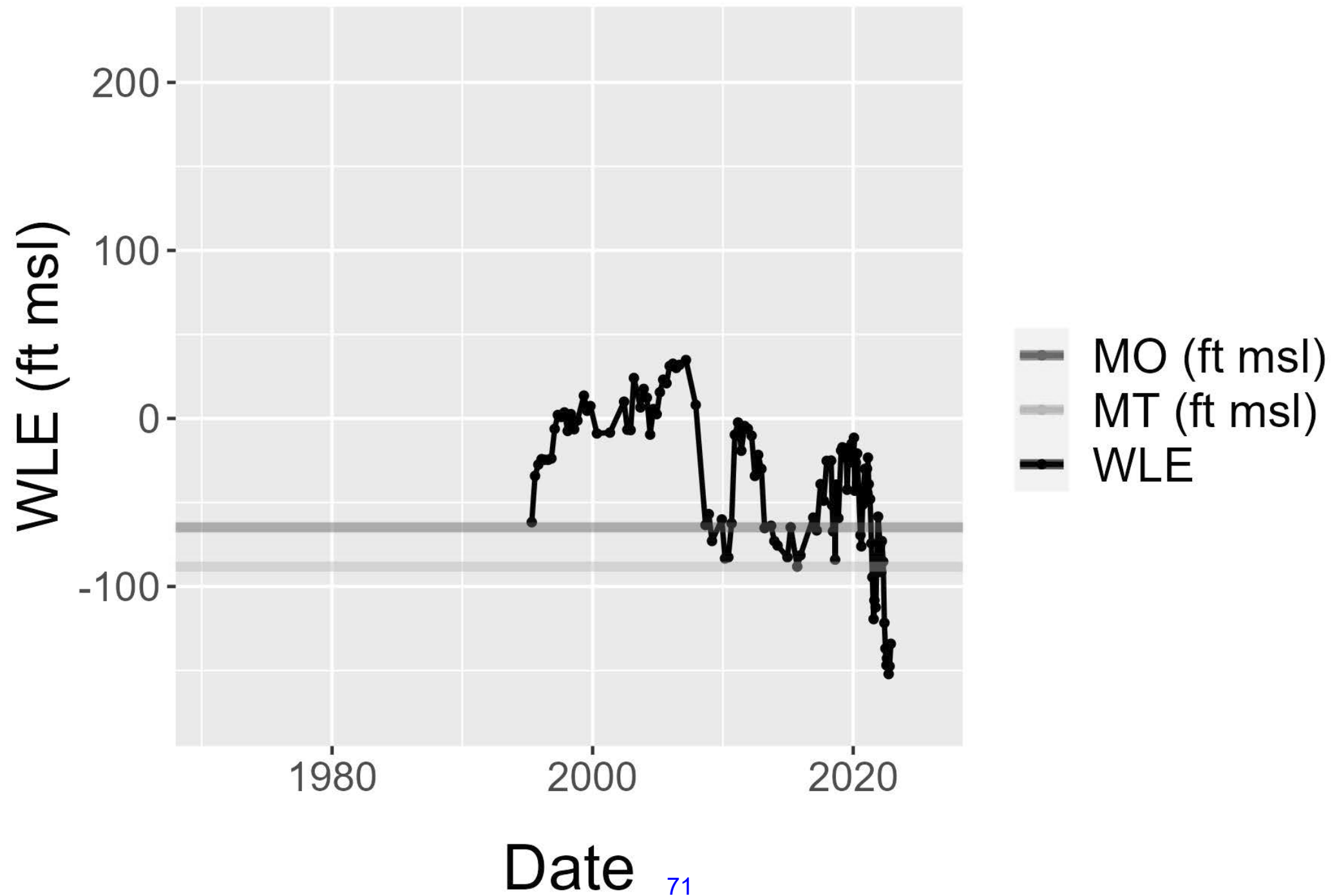
# NCDM 01-003

(Lower Aquifer)



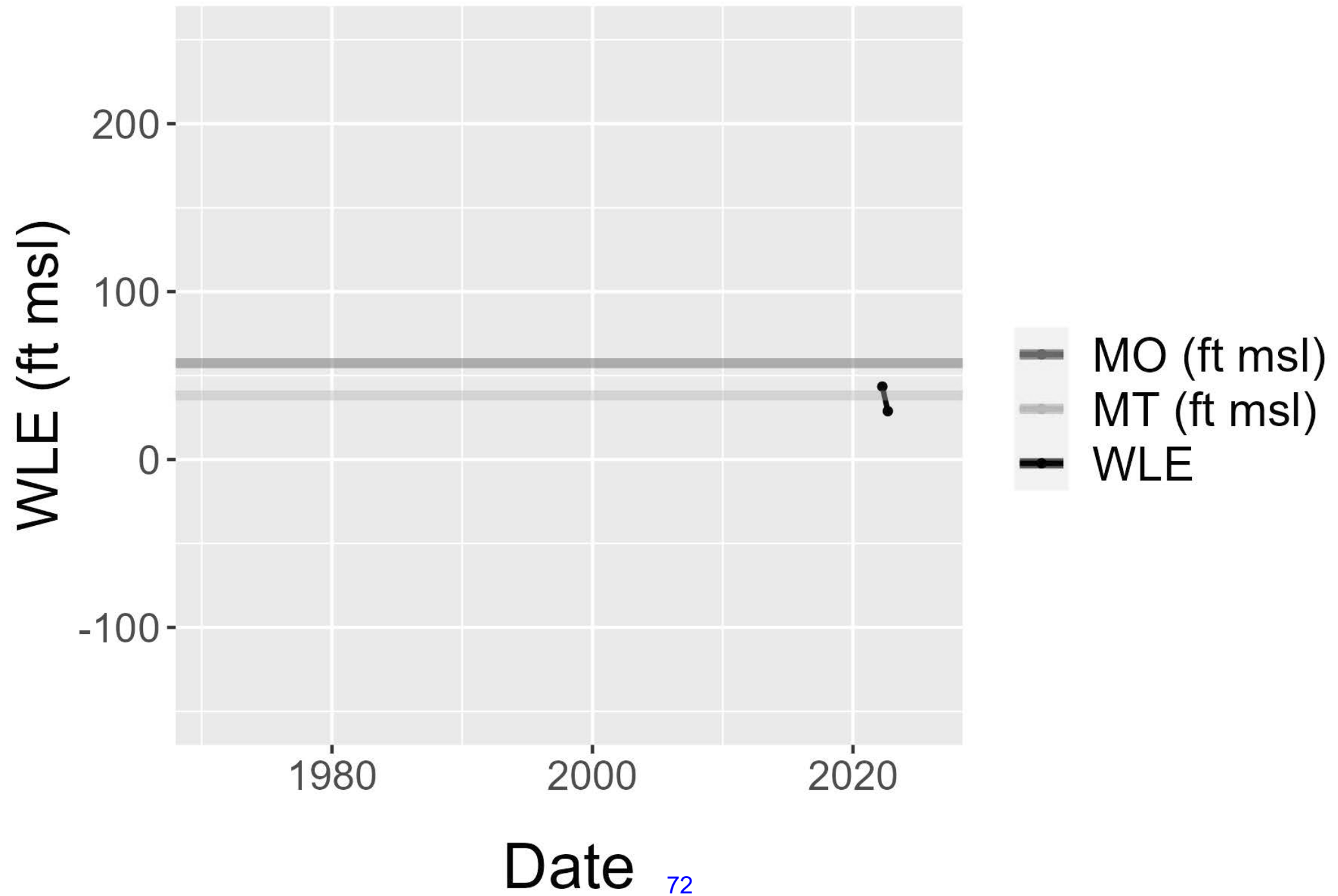
# NCDM 07-028

(Lower Aquifer)



# SJREC 14-020

(Lower Aquifer)





| Table CC-16: Delta-Mendota Subbasin SMC for Chronic Lowering of Groundwater Levels |   |
|--|---|
|  | and unreasonable is quantitatively defined as exceeding the MT at more than 50% of representative monitoring sites by aquifer in a GSP area.  |
| Sustainability Goal  | Maintain groundwater levels that are comparable to existing conditions (historic low conditions as of Water Year 2016) in order to continue meeting the demand of beneficial uses and users of groundwater and prevent a trend of decreasing groundwater levels. The Delta-Mendota Subbasin will continue successful and ongoing coordination with neighboring Subbasins to address chronic lowering of groundwater levels caused by pumping outside of the Subbasin.   |
| Minimum Threshold  | <p>The groundwater elevation indicating a chronic lowering of groundwater levels that may lead to undesirable results is an elevation that is lower than the historical seasonal low. The historic seasonal low is a fixed elevation at each site, based on available groundwater level data prior to the end of Water Year 2016. To account for future year-to-year variations in hydrology, compliance with the fixed historic seasonal low threshold will be compared with a 4-year rolling average of annual groundwater level measurements.</p> <p>Shorter-term (“acute”) groundwater elevation thresholds will also be established at each representative monitoring site by 2025 using a coordinated methodology. Acute thresholds will be established at levels that are intended to avoid short-term undesirable results, particularly for domestic water wells, groundwater dependent ecosystems, and interconnected surface waters where present in the Upper Aquifer, and for subsidence in the Lower Aquifer. Each year, both the historic seasonal low and the acute groundwater elevation thresholds will apply, whichever is more protective. Groundwater levels are measured as water surface elevation (WSE). Each GSP area includes multiple representative monitoring sites (RMS) to which the minimum threshold applies. See <b>Table CC-17</b> for numeric MTs.</p> <p>For any RMS without data prior to Water Year 2016, MTs and acute thresholds will be established using the aforementioned methodologies and the data resulting from the first five years of monitoring following Water Year 2016 or following construction of the well.</p> |
| Measurable Objective   | <p>Maintain seasonal high groundwater levels at an elevation that is at or above the Water Year 2015 seasonal high at more than 50% of representative monitoring sites in a GSP area. The Water Year 2015 seasonal high is a fixed elevation at each site, based on available groundwater level data. If data are unavailable for Water Year 2015 at a representative monitoring site, either a Water Year 2014 or Water Year 2016 Seasonal High will be used. To account for future year-to-year variations in hydrology, compliance with the fixed seasonal high threshold will be compared with a 4-year rolling average of annual groundwater level measurements. Groundwater levels are measured as water surface elevation (WSE). Each GSP area includes multiple representative monitoring sites (RMS) to which the measurable objective applies. See <b>Table CC-17</b> for numeric MOs.</p> <p>For any RMS without data prior to Water Year 2016, Measurable Objectives will be established using the aforementioned methodology and</p>   |