Lisa Hunter

From: Barbara Vlamis <barbarav@aqualliance.net>
Sent: Thursday, April 18, 2024 9:37 PM
To: Lisa Hunter
Cc: Jim Brobeck; Michael Jackson
Subject: Revised Colusa Subbasin GSP Comments
Attachments: AquAllianceEtAlRevisedColusaGSP_041824.pdf; AquAlliance Glenn Colusa GeoTracker Sites 4.16.2024.pdf; Kincaid PMA Legal Implications Discussion Paper2020.pdf; AquAlliance 2_Colusa Revised GSP tracked changes 20240416 Exhibits (optimized).pdf

Importance: High

Hello Lisa, Attached are comments on the Revised Colusa Subbasin GSP with exhibits. Acknowledgment of receipt is appreciated.

Barbara

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AQUALLIANCE
DEFENDING NORTHERN CALIFORNIA WATERS

April 18, 2024

Lisa Hunter (County of Glenn)
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Re: Revised Colusa Subbasin Groundwater Sustainability Plan

Dear Ms. Hunter and the Colusa Subbasin GSAs:

AquAlliance, the California Sportfishing Protection Alliance, and the California Water Impact Network (hereinafter AquAlliance) submit the following comments and questions on the Revised Colusa Subbasin Groundwater Sustainability Plan ("Revised GSP" or "Plan") to the Colusa Groundwater Authority and the Glenn Groundwater Authority GSAs ("GSAs").

DWR's determination letter on the 2021 GSP found:

- *The GSAs should revise the GSP to provide a reasonable assessment of overdraft conditions using the best available information and describe a reasonable means to mitigate overdraft.*
- *The GSAs must provide a more detailed explanation and justification regarding the selection of the sustainable management criteria for groundwater levels, particularly minimum thresholds and measurable objectives, and quantitatively describe the effects of those criteria on the interests of beneficial uses and users of groundwater.*
- *The GSAs must provide a more detailed explanation and justification regarding the selection of the sustainable management criteria, monitoring method, and projects or management actions related to land subsidence.*[1]

Serious flaws remain in the Plan that require significant changes to the document, without which the public and policymakers are truly left in the dark and dangerous consequences will continue.

[1] DWR, 2023. *STATEMENT OF FINDINGS REGARDING THE DETERMINATION OF INCOMPLETE STATUS OF THE SACRAMENTO VALLEY – COLUSA SUBBASIN GROUNDWATER SUSTAINABILITY PLAN*. pp. 1-4.

A. Public Process

In light of the egregiously short time frame for comments on the revised GSP from the April 16th release late in the day to adoption by the GSAs on April 19th, AquAlliance will submits these written comments by April 19, 2024. Anything in our comments that seems confusing is due to the fact we are trying review almost 700 pages in *three days*. It wasn't helpful that there were complications with downloading the document from the Glenn County web site we were provided. Fortunately the Colusa County web site accommodated the download without barriers from third-party entities.

B. Subsidence

a) The Revised GSP indicates that the Focus RMS wells were selected in part because of the ongoing subsidence in the area (see attached Figure 5-4). Maps of the Colusa Subbasin area show categories of measured benchmark subsidence from 2008 to 2017 in the Revised GSP Figure 3-31 (p. 3-79, pdf p. 189), and the October 2018-2019 to October 2022-2023 InSAR measurements also show subsidence in Figure 3-32 (page 3-80, pdf 190).

The Revised GSP states that the subsidence MT would trigger an undesirable result when the cumulative and rate of subsidence minimum thresholds exceed the following (p. 5-56, pdf p. 328):

> • *The average cumulative subsidence exceeds two feet over a single PLSS section starting from January 2024, or*
>
> • *The average rate of subsidence in ten or more contiguous PLSS sections, in any configuration, exceeds 0.1 foot per year ft/yr in two consecutive years.*

The Revised GSP's proposed management of subsidence in the Artois and Arbuckle areas is shown in Figures 5-2 and 5-3 (pp. 5-24 and 5-25, pdf pp. 297 and 298). These graphs suggest that the rate of subsidence in these areas will keep exceeding the 0.1 feet/year MT until 2032. The cumulative subsidence since 2015 is estimated to be from 3.0 feet to 3.9 feet by 2042. These graphs also suggest that the setting of the IM elevations in the Focus RMS well areas below the MT elevations could cause the rate of subsidence to be up to -0.3 feet/year.

The Revised GSP also notes that:

> *While the sensitivity of local infrastructure to inelastic land subsidence is not well understood at this time, the Subbasin has extensive infrastructure consisting of pipelines and open canals (lined and unlined) and drains owned by various surface water suppliers that are used to convey water for urban and agricultural uses. A GSP Study is proposed in Chapter 7 that would evaluate the sensitivity of local infrastructure to potential subsidence in the Subbasin. Should additional information be developed on the vulnerability of this infrastructure to subsidence, these minimum thresholds may be refined. The GSAs will continue monitoring to improve the understanding of the causes of inelastic land subsidence in the Subbasin during GSP implementation. Refinement of minimum thresholds and an improved understanding of subsidence in the Subbasin will be reported in the annual reports and periodic evaluations.* (p. 5-56, pdf p. 328)

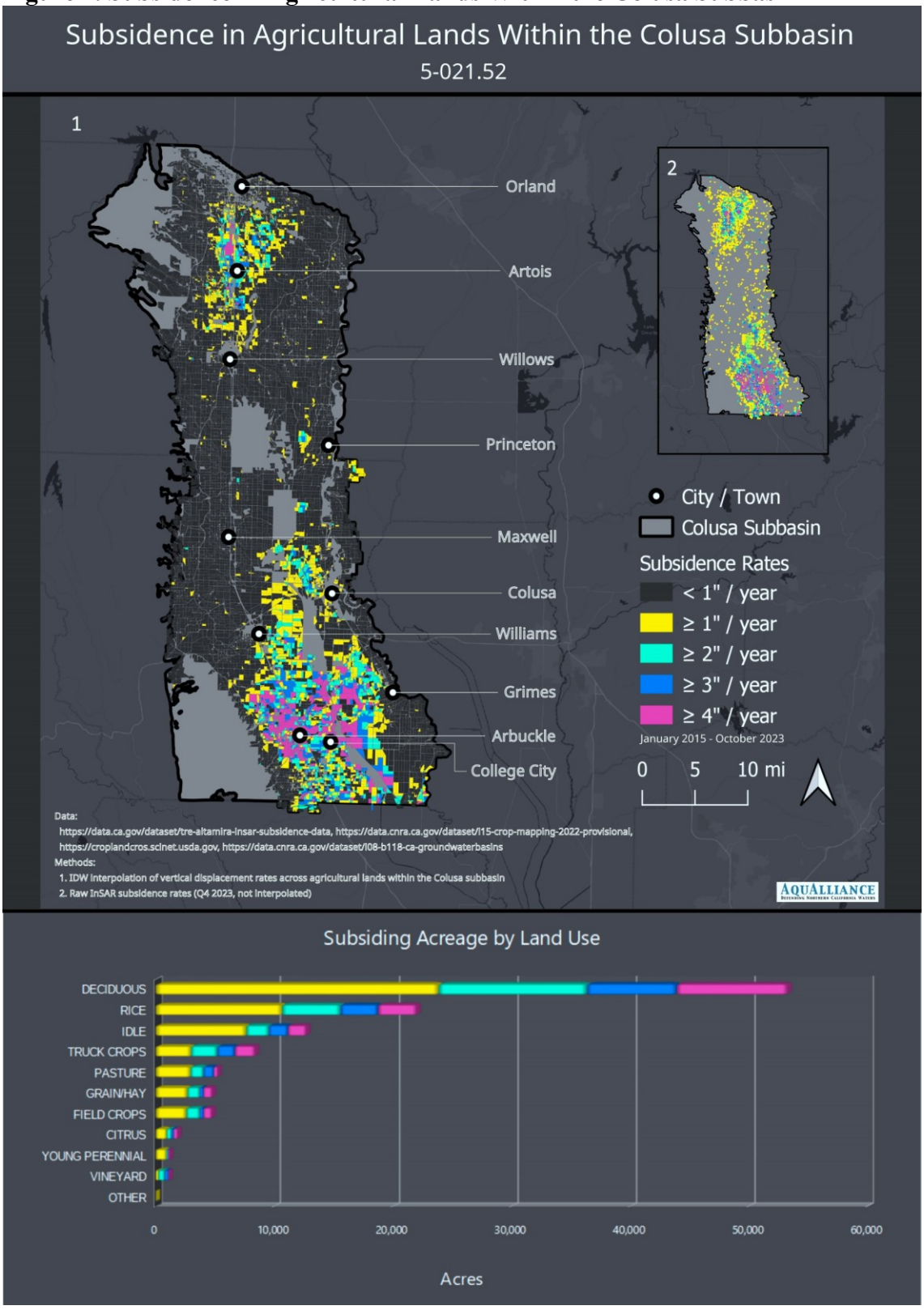
The Revised GSP infrastructure study for subsidence impacts is described in Chapter 7, 7.1.2.15 - Evaluate Infrastructure Sensitivity to Subsidence (p. 7-16 and 7-17, pdf pp. 493 and 494).

> *The study would be a cooperative effort with infrastructure owners and operators of critical infrastructure and land uses, as well as other stakeholders in the Subbasin. The GSAs could, but do not necessarily need to, lead the assessment.*
>
> *In addition to the sensitivity evaluation, the GSAs and involved entities will form a Critical Infrastructure Working Group to report on suspected impacts to critical infrastructure and land uses suspected to be due to land subsidence caused by groundwater withdrawal, report on progress of PMAs and GSP Study implementation, and provide information vital for refining subsidence sustainable management criteria. The Critical Infrastructure Working Group will meet at least annually at the conclusion of the water year to assess critical infrastructure in the Subbasin. The Critical Infrastructure Working Group will meet more frequently if subsidence conditions warrant additional meetings, as described in Section 5.4.5. The Critical Infrastructure Working Group be open to entities owning or operating critical infrastructure in the Subbasin.*[sic]
>
> *It is expected that data collection and analysis in this study would be grant-funded, though local funding sources could also be used.*

While it is crucial that critical infrastructure in the Subbasin be protected from the impacts of subsidence, those structures aren't the only ones that need protection from pumping induced subsidence and settlement. Local landowners' homes, barns, and wells can also be impacted by subsidence. The Revised GSP should provide procedures for local landowners to register their properties that have been damaged due to subsidence or settlement and the Revised GSP should provide a mechanism for mitigating those impacts, like the Domestic Well Mitigation Program, only done more comprehensively. In addition, the Revised GSP should provide a mechanism for the public to have transparent and readily available electronic file access to the engineering analyses and data that are collected on subsidence, so that they can independently evaluate whether the stress observed in their buildings or wells may be due to subsidence.

b) Figure 1 clearly illustrates the subsidence in the Colusa Subbasin. How does it compare with the GSP material? As one can see in the magenta areas, the land is collapsing at 4 inches per year, or a foot every three years. Knowing the land uses overlying the subsidence paints an interesting picture. What will the GSAs consider doing to stop the actors causing it?

Figure 1. Subsidence in Agricultural Lands Within the Colusa Subbasin



C. Water Quality

The Revised GSP's groundwater quality monitoring network focuses on salinity. Monitoring of other water quality parameters that might affect the beneficial uses of groundwater is left to other regulatory agencies, such as local Environmental Health Agencies, the California Department of Toxic Substance Control, the State Water Resources Control Board (SWRCB), and the Central Valley Regional Water Quality Control Board, whose policies include the Basin Plan Amendment for the Salt and Nitrate Control Program and the Irrigated Lands Regulatory Program (p. 5-15, pdf p. 288).

The Revised GSP states that the

> *[g]roundwater quality in the Subbasin is generally good, with local exceedances of water quality objectives for some constituents. The sole groundwater quality concern not addressed by the existing groundwater quality regulatory programs is mobilization of saline water from deeper parts of the aquifer along faults, other geologic structures, or other naturally-occurring zones with high salinity as a result of GSP projects and management actions and other groundwater development. Sustainable management criteria for salinity have been established to supplement existing regulatory programs.* (p. 5-17, pdf p. 289)

The potential causes of degraded water quality may be:

> • *Mobilization of saline water from deeper parts of the aquifer along faults, other geologic structures, or other naturally-occurring zones with high salinity as a result of GSP projects and management actions and other groundwater development*
>
> • *Mobilization of poor quality water, including contaminant plumes, monitored under existing regulatory programs as the result of GSP projects and management actions and other groundwater development*
>
> • *Mobilization of naturally-occurring constituents in soils, the unsaturated zone, or the aquifer matrix as the results of projects involving direct groundwater recharge*
>
> • *Direct groundwater recharge using water with constituent concentrations exceeding applicable water quality objectives or historical concentrations for the same constituents in groundwater.* (p. 5-17 pdf p. 289)

The groundwater quality monitoring network consists of "[2]5 monitoring sites RMS to monitor for groundwater quality degradation due to increasing salinity concentrations, either via migration of deep brackish to saline waters into the freshwater aquifer system or recharge from agricultural runoff." (p. 4-37, pdf 269) The Revised GSP groundwater quality monitoring program relies "[o]n existing monitoring and reporting carried out by the regulated community within the Subbasin when and where possible to address water quality concerns. The CGA and GGA will conduct supplemental water quality monitoring using existing wells or new monitoring wells constructed for that purpose when and where necessary to fill data gaps and to develop and implement projects and management actions." (p. 5-17 pdf p. 289)

"The undesirable result for degraded water quality is considered to occur during GSP implementation when 25 percent of representative monitoring sites (i.e., 6 of 25 wells) exceed their minimum thresholds for two consecutive years. The six sites must be the same subset of sites, not any combination of six sites. The subset of sites is not predetermined; rather, it is delineated only as sites collectively exceed their minimum threshold values." (p. 5-18, pdf p. 290)

The Revised GSP provides two water quality maps, Figure 3-17, *Base of Fresh Water* based on total dissolved solids (TDS) concentration of 2,000 mg/L (pdf 148), and Figure 3-30 with three maps of the historical TDS concentrations in three depth intervals, less than 200 feet, 200 to 700 feet, and greater than 700 feet deep.

The Revised GSP doesn't provide information as required by CCR § 354.28 with "[k]nown groundwater quality issues that may affect the supply and beneficial uses of groundwater, including a description and map of the location of known groundwater contamination sites and plumes." The information on known groundwater contamination sites is readily available from the SWRCB's Geotracker[2] website. In addition to known contaminated sites, the Geotracker site allows for the display of the known oil and gas well using WellSTAR. A set of screen capture maps taken from Geotracker on April 16, 2024, are attached along with Revised GSP Figure 4-3, which shows the groundwater quality monitoring network.

The attached six screen captures of the Geotracker website show that there are a number of known contaminated sites and oil and gas wells throughout the Subbasin. The Revised GSP doesn't provide an analysis of whether the monitoring network shown in Figure 4-3 is adequate to collect sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater for known contaminants for each applicable principal aquifer to determine groundwater quality trends for water quality indicators to address known water quality issues (CCR § 354.34(a), (c)(4)).

Although the management of the business operations and any contaminant site cleanups are overseen by other regulatory agencies, the GSA should demonstrate in the Revised GSP that they have sufficient knowledge of the groundwater quality issues and problems in the Subbasin so that they can ensure that any water quality data gaps are filled and the Project and Management Actions do not result in the degradation of water quality or impact the beneficial uses of groundwater. The fact that the Revised GSP lacks the basic descriptions and maps of known contaminated sites as required by SGMA suggests that the groundwater quality monitoring network isn't adequate to comply with minimal requirements of SGMA.

D. Additional Areas of Concern

Focus/Unfocused Areas

[2] https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento

a) Attached are two maps from the Revised GSP that show the general outline of the Focus RMS wells area overlain on the historical June 2015 to June 2023 cumulative vertical subsidence, Figure 5-4 (page 5-37, pdf 309), and both the Focus and Non-Focus RMS wells with the well identifications, Figure 4-6 (page 4-36, pdf 268). Apparently the GSAs have determined that "undesirable results" have occurred in the Subbasin, because the Revised GSP now breaks the Representative Monitoring Site (RMS) wells into two groups based on the occurrence of undesirable results.

> Page ES-2, pdf 34:
> *The GSAs grouped the RMS wells into two categories for developing sustainable management criteria:*
>
> *• Focus RMS wells: Those RMS wells that are in close proximity to areas where undesirable results have occurred with respect to chronic lowering of groundwater levels (and reduction of groundwater storage, by proxy) and/or land subsidence.*
>
> *• Non-Focus RMS wells: All other RMS wells within the Subbasin that are not in close proximity to areas where undesirable results have occurred with respect to chronic lowering of groundwater levels (and reduction of groundwater storage, by proxy) and/or land subsidence.*
>
> Page 4-37, pdf 269:
> *When developing the sustainable management criteria for the RMS wells, the GSAs grouped the RMS wells into two categories:*
>
> *• Focus RMS wells: Those RMS wells that are in close proximity to areas where undesirable results have occurred with respect to chronic lowering of groundwater levels (and reduction of groundwater storage, by proxy). Focus RMS wells include those RMS wells within 3 miles of dry wells reported since 2015 (based on data from DWR's dry well reporting system[17]) and/or within (or adjacent to) public land survey system (PLSS) sections (1 square mile or 640 acres) where the total vertical displacement from June 2015 to June 2023 exceeded 1 foot (based on InSAR data). In total, 18 RMS wells were identified as Focus RMS wells. Those wells are described in greater detail in Chapter 5.*
>
> *• Non-Focus RMS wells: All other RMS wells within the Subbasin that are not in close proximity to areas where undesirable results have occurred with respect to chronic lowering of groundwater levels (and reduction of groundwater storage, by proxy), based on analysis using the same criteria. In total, 30 RMS wells were identified as Non-Focus RMS wells. Those wells are described in greater detail in Chapter 5.*
>
> Page 5-10, pdf 282:
> *The minimum thresholds described in Section 5.4.1.1 are defined for groundwater level RMS wells grouped into two categories:*

> *• Focus RMS wells: Those RMS wells that are in close proximity to areas where undesirable results have occurred with respect to chronic lowering of groundwater levels (and reduction of groundwater storage, by proxy). Focus RMS wells include those RMS wells within 3 miles of dry wells reported since 2015 (based on data from DWR's dry well reporting system[19]) and/or within (or adjacent to) PLSS sections (1 square mile or 640 acres) where the total vertical displacement from June 2015 to June 2023 exceeded 1 foot (based on InSAR data). These criteria were used to represent undesirable results that have already occurred with respect to drinking water well impacts and subsidence, and that are considered the most likely to occur in the future if groundwater sustainability is not achieved and maintained in the Subbasin. In total, 18 RMS wells were identified as Focus RMS wells, nine of which are located in the Orland-Artois area, and nine of which are located in the Arbuckle-College City area.*
>
> *• Non-Focus RMS wells: All other RMS wells within the Subbasin that are not in close proximity to areas where undesirable results have occurred with respect to chronic lowering of groundwater levels (and reduction of groundwater storage, by proxy), based on analysis using the same criteria. In total, 30 RMS wells were identified as Non-Focus RMS wells.*

b) The Revised GSP creates a new category of RMS monitoring wells for the areas (polygons?) that have already experienced undesirable results. This new category of wells is called the Focus RMS wells. As of January 2024, there are 18 out of the original 48 RMS wells, or 37.5%, that are now in the Focus RMS well group. It is unclear from Figure 5-4, attached, whether the Focused area around these Focus RMS wells included all of the Thiessen polygon area represented by the well. Figure 5-4 shows the areas of dry wells and subsidence, which apparently define the Focus areas. The boundary of these Focus areas doesn't appear to follow the Thiessen polygon boundaries (see the polygons in the attached Change in Groundwater Storage in the Primary Aquifer – Spring 2021 through Spring 2022, Figure 6-1 in the Colusa GSP Water Year 2022 Annual Report). (p. 34) If the entire polygon isn't considered part of the Focus area, then what are the sustainable management criteria for the area outside of the Focus area but still in the RMS well polygon? In other words, what are the Management Objectives and Minimum Thresholds (MOs and MTs) for these excluded areas?

<u>Minimum Thresholds</u>
The Revised GSP continues to follow the original GSP's requirement that multiple RMS wells must exceed the minimum thresholds (MTs) before an undesirable result can occur, except for subsidence (see Table ES-4, pp. ES-22 and ES-23, pdf pp. 41 and 42). For subsidence, the MT is a cumulative subsidence of 2 feet from January 2024, regardless of the amount of subsidence that occurred before 2024, see attached Figure 5-37 for historical subsidence.

The Colusa Subbasin occupies an area of 723,823 acres, or approximately 1,131 sq. miles or PLSS sections (page ES-4, pdf 23). The Revised GSP has selected 48 RMS wells for monitoring changes in groundwater levels (see attached Figure 4-7). The Revised GSP requires that for an undesirable result to occur from the chronic lowering of groundwater levels 6 or more of the 48

RMS wells must exceed their MTs for two (2) consecutive Fall measurements (seasonal lows). The number of wells required to simultaneously exceed the MT values varies with the sustainability criteria (see Table ES-4).

The Revised GSP notes that with the implementation of the GSP monitoring program:

> [*a] number of wells included within the groundwater monitoring network have not been consistently monitored every spring and fall, including eleven of the 48 RMS wells (23%) in 2023. Data availability has been impaired mainly due to access issues, although three of the wells have not been monitored in five or more years as of early 2024. The GSAs have actively reached out to DWR to coordinate more closely on groundwater monitoring efforts with the goal of increasing the consistency of monitoring.*
>
> *Limitations in data availability may impact the GSAs' ability to monitor groundwater conditions with sufficient resolution (spatially and temporally) to meaningfully inform groundwater management decisions in the Subbasin, particularly in areas experiencing undesirable results. The adequacy of the monitoring network will be evaluated during the 2027 GSP periodic evaluation. It is anticipated that groundwater monitoring network wells with severe data gaps will be prioritized for replacement at that time with alternate sites that are routinely monitored and that have more recent data.*

The Revised GSP doesn't appear to address how the missing monitoring data have or will affect the determination of undesirable results. For example, if one or more of the RMS wells isn't monitored in the Fall, does that prevent the determination of an undesirable result in the RMS well's Thiessen polygon area? Shouldn't the GSAs have a contingency plan for measuring an adjacent well when the intended RMS well is unavailable? The average area represented by each RMS well is approximately 15,080 acres or 23.56 square miles. Surely there is another well in the area that could be monitored. Note that information appears to be missing in the Revised GSP on the areas of each Thiessen polygon. The fact that three (3) of the RMS wells haven't been monitored for five (5) or more years suggests that the GSAs are failing to implement an adequate GSP monitoring program.

<u>Minimum Objectives/Minimum Thresholds/Interim Milestones</u>
The Revised GSP changed the MOs and MTs for the 18 Focus RMS groundwater monitoring wells by setting the revised MT at the 2020-2022 minimum groundwater elevation at that RMS (p. ES-4, pdf p. 43). The revised MO values appear to be set slightly higher than the original MOs (see revised Table 5-3, pp. 5-40 and 5-41, pdf pp. 312 and 313) and the original GSP Table 5-2 (pp. 5-24 and 5-25, pdf pp. 288 and 289; both tables attached).

The Revised GSP values for the Focus RMS well MT were generally set at an elevation higher than the original MTs, but the MTs in two of the wells were set slightly lower: wells 14N03W14Q003M and 22N03W24E002M. The MT in the 14N03W14Q003M well has gone from an original elevation of -89 feet to a revised elevation of -120.6 feet (31.6 feet lower; see attached hydrograph) while the MO has risen from an elevation of -13 feet to +53.5 feet. The MT in the 22N03W24E002M well has gone from an original elevation of +122 feet to a revised

elevation of +119.9 feet (2.1 feet lower; see attached hydrograph) while the MO has risen from an elevation of +176 feet to +179.4 feet. The apparent reason for lowering the MT is that the 2020-2022 groundwater level was lower than the original MT elevation.

Another change in the sustainability threshold elevation for the Focus RMS wells is the change in the 2027 Interim Milestone (IM) elevation. In the original GSP, the 2027 IM elevations for all the RMS wells were set equal to the MO elevations. For the Revised GSP, that condition still applies only to the Non-Focused RMS wells (see Table 2 in Appendix 5E, pp. 7 and 8, pdf pp. 9 and 10). For the revised Focus RMS well, the IM elevations are not set at the recent low (MT) minus a five-year continued decline in water surface elevation at the average annual rate of change in the water surface elevation. For example, the IM for Focus RMS well 22N03W24E002M has been lowered from the original elevation of +176 feet, to the revised IM elevation of 110.6 feet (65.4 feet lower; see attached hydrograph).

This lowering of the IM elevations for the Focus RMS wells to an elevation far below the original IM elevation, which is significantly different from that of the Non-Focus RMS wells, ***suggests that the Revised GSP isn't intent on correcting the conditions that caused the existing undesirable results, but instead on continuing those conditions or making them worse***. Allowing the decline in the groundwater elevations within the Focus RMS well areas seems to ignore the deficiencies that DWR identified in the 2021 GSP and may possibly result in an expansion of the area of undesirable results. The Focus RMS well IM elevations being set below the lowest historic elevation may result in continued subsidence and an increase in the number of dry wells. This is alarming!

<u>Domestic Well Mitigation Program</u>

The Revised GSP proposes to establish a Domestic Well Mitigation Program (Section 6.3.7 p. 6-67, pdf p. 406). This program is supposed to start no later than January 2026. The Revised GSP isn't clear on what mitigation the GSAs will undertake, if any, for those domestic wells that have gone dry or will go dry or stop pumping before January 2026. There is some information in the Domestic Well Impact histograms in Appendix A of the Revised GSP's Appendix 5E that shows the number of domestic wells per ten-foot depth intervals relative to the revised MT and IM elevations. The legend in these histograms shows the number of wells that have depths shallower than the listed threshold depth. For example, the Focus RMS well 22N03W24E002M shows that a high percentage of the 932 domestic wells in the Thiessen polygon around that well are shallower than the revised MT elevation of 119.9 feet. However, the number of wells that will be impacted by the revised MT is set at zero (n = 0). At the revised MT elevation of 122.0 feet, the number of wells that might be impacted is 9 (n = 9). ***Setting the number of wells impacted by the revised MT at zero suggests that the Revised GSP doesn't consider the wells that have been impacted prior to January 2024 as being eligible for the mitigation program***. In fact, the description of the Domestic Well Mitigation Program states that the Program's mitigation may benefit up to an estimated 166 drinking water wells during the GSP implementation period, presumably from now until 2042. Given the number of wells, 932, in the area surrounding just one Focus RMS well, 22N03W24E002M, and the fact that most of those wells appear to be shallower than the revised MT and IM, it seems that the Revised GSP plan to mitigate only 166 domestic wells from now until 2042 is insufficient to mitigate the known and potential loss of domestic wells due to the GSA's management of the Subbasin.

E. Management Actions

The Revised Plan speaks somewhat confidently in parts, such as: "The GSAs' extensive portfolio of additional PMAs will be informed by continued monitoring of groundwater conditions and implemented, as needed, to achieve and maintain long-term sustainable groundwater management." (p.6-3) However, what follows are some acknowledgements of the serious conditions in the Colusa Subbasin.

- The model is inadequate.[3]
- "Based on analyses of observed changes in groundwater levels and estimated changes in groundwater storage, the GSAs have estimated the current overdraft in the Subbasin the [sic] be approximately 62 taf/year over the 2016-2021 period (see Section 3.3.6)."[4]
    - DWR reached *very different* conclusions: "Since the GSP submittal, annual report data submitted to the Department demonstrates that groundwater storage within the Subbasin has ***dramatically decreased***, deviating from the values reported in the GSP for the historical and projected water budgets. Specifically, the overdraft reported for water year (WY) 2021 (which represents change between October 1, 2020, and September 30, 2021) was -418,000 acre-feet and -377,170 acre-feet for WY 2022.45 Combined, these values represent a ***loss of storage of over 795,000 acre-feet in just a two-year period, which is more than double the anticipated overdraft predicted over the 50-year implementation horizon***. Department staff recognize WY 2021 and WY 2022 were critically dry years; however, the magnitude of the loss of storage observed during these two years is significantly greater than the average value provided in the historical water budget of -166,000 acre-feet for the previous critically dry water year types, indicating that overdraft is increasing.46[5] " [emphases added]
- "In addition to overdraft concerns, recognize that undesirable results have occurred or may occur in the future with regard to groundwater the GSAs also level decline and subsidence." [sic] (p. 6-3)

Sadly, the energy and commitment to address the known challenges are lacking – in the 2021 GSP as well as the Revised GSP (which uses a majority of the 2012 GSP text). The Revised GSP may contend that "The GSAs have expressed a clear and firm commitment to develop and implement these Programs on a clear and specific timeline to address and prevent overdraft, groundwater level decline, and subsidence and to mitigate potential undesirable results for drinking water well users during the GSP implementation period," but will delay domestic well mitigation until it writes a plan by January 2026 and demand management implementation until January 2027 ***if*** it is still needed and they have a program in place. The "clear and firm commitment" is just big talk for a Subbasin with people and the environment in deep trouble as

[3] "Although water budget estimates developed using the C2VSimFG-Colusa model do not indicate that appreciable changes in groundwater storage will occur, on average, over the simulated current and future conditions scenarios (Table 3-12), the GSAs recognize that persistent groundwater level decline and groundwater storage reduction have occurred in parts of the Subbasin in recent years that may not be fully represented in the C2VSimFG-Colusa model assumptions, calibration, and results. The GSAs recognize that these conditions are indicative of overdraft concerns in the Subbasin." p. 6-3.
[4] *Id.*
[5] DWR, 2023. *Sustainable Groundwater Management Program Groundwater Sustainability Plan Assessment Staff Report* [Colusa Subbasin]. pp. 8.

AquAlliance demonstrates in these comments. Future plans, programs, monitoring, reporting, "preparing to implement," "evaluation of groundwater conditions," "overdraft concerns," mean nothing when "In particular, the GSAs have identified declining groundwater levels over the past 15 to 20 years in the Orland-Artois and Arbuckle- College City areas." (p. 6-3) Who do the GSAs, power brokers in the Subbasin, local government, and the State of California think they are fooling?!

Lack of Impact Disclosure

There is such a deficit of information regarding the painful realities in the Colusa Subbasin. The historic and current impacts to third parties, including the environment, are absent. The public and the regulatory agencies deserve to have a consolidated presentation of the negative impacts from lax oversight in the Subbasin from January 2015 forward:

1. How many domestic wells have been repaired, replaced, or abandoned? Where?
2. How many agricultural wells have been repaired, replaced, or abandoned? Where?
3. How many new wells have been installed, omitting replacement wells? Where?
4. Where are sink holes located? Why are sink holes not discussed in the Plan?
5. How many complaints have been received regarding sink holes and subsidence? Where?
6. Where are written responses by Colusa or Glenn counties and/or the GSAs to complaints of sink holes and subsidence?
7. Has any assistance been given to landowners with sink holes and/or subsidence damage?
8. Will the GSA compensate well owners who have had to replace or repair wells since January 1, 2015?[6]
9. How many residents and/or small farmers have lost their land and how is it tracked?
10. What are the environmental impacts?

The Revised GSP is noticeably silent on the economic consequences of injured third parties not cooperatively agreeing on harm and compensation.

Recharge

The Plan assumes that groundwater sustainability of the Subbasin will be achieved in part because Central Valley Project and other surface waters will be available for recharge. It fails to note that groundwater recharge alters the rights to groundwater[7] and may not be a solution acceptable to Subbasin users. It also fails to demonstrate that creating the space for recharge harms groundwater dependent farms and residential property as well as streams and habitat for myriad species. Conjunctive use with recharge has long been the plan of Glenn Colusa Irrigation

[6] Cantor, Alida, et al., 2018. UC Berkeley School of Law. *Navigating Groundwater-Surface Water Interactions under the Sustainable Groundwater Management Act*. "While this obligation may sound far-reaching, SGMA qualifies it by setting a temporal baseline. 'The plan may, but is not required to, address undesirable results that occurred before, and have not been corrected by, January 1, 2015. … [A] groundwater sustainability agency has discretion as to whether to set measurable objectives and the timeframes for achieving any objectives for undesirable results that occurred before, and have not been corrected by, January 1, 2015.'51 In other words, SGMA limits the scope of GSAs' legal responsibilities— at least under SGMA itself—to addressing post-2014 impacts—but does not limit GSA's authority to address earlier impacts (see Section IV. C of this report for further discussion of this topic)." p. 13. https://www.law.berkeley.edu/research/clee/research/wheeler/gw-sw/

[7] Los Angeles v. Glendale (1943) 23 Cal.2d 68, 76-78; Los Angeles v. San Fernando (1975) 14 Cal.3d 199, 258-60; Stevens v. Oakdale Irrigation District (1939) 13 Cal.2d 343, 352-43; Crane v. Stevinson (1936) 5 Cal. 2d 387, 398.

District and the Bureau of Reclamation – to take over the basin and manipulate it for the benefit of moneyed interests, not the local people or environment.[8], [9] Communication to the Vina Subbasin's stakeholders clarified that "So long as the water was diverted pursuant to a valid water right prior to recharge, the recharged water would be owned by the diverter… The legal right to surface water that is imported and recharged into an aquifer is held by the project proponent… Depending upon the project scope, it could intend to export recharge water out-of-basin."[10] Repeating the mistakes of the Owens, San Fernando, and San Joaquin valleys is not in the best interests of the Colusa Subbasin's communities, businesses, groundwater dependent farms, and the environment.

F. Water Transfers and Conjunctive Use

The Colusa GSAs must not assume that local ordinances will in any way protect the population and environment of Glenn and Colusa counties from transfers and expanded conjunctive use. Historic facts and current proposals by DWR funded think tanks belie this:

- Water transfers are not protective of the public or the environment. Transfers implement the dreams of the California's Department of Water Resources, the U.S. Bureau of Reclamation, and State Water Project and Central Valley Project water sellers who have demonstrated over decades that their interests are not the same as the public's interest. Once the state recognized that they were considerably short on water after former Governor and President Ronald Reagan protected North Coast rivers with Wild and Scenic status, it began trolling for other water sources.
    - Some of the Butte GSA entities in Butte County sold surface water from Oroville Reservoir to the 1994 Drought Water Bank.[11] This led to an increase in groundwater withdrawals used for irrigating rice, called groundwater substitution transfers. Until the time of the water transfers, groundwater levels had sustained the normal demands of domestic and agricultural users in the region. The 1994

[8] U.S. Bureau of Reclamation, September 2006. Grant Assistance Agreement. "GCID shall define three hypothetical water delivery systems from the State Water Project (Oroville), the Central Valley Project (Shasta) and the Orland Project reservoirs sufficient to provide full and reliable surface water delivery to parties now pumping from the Lower Tuscan Formation. The purpose of this activity is to describe and compare the performance of three alternative ways of furnishing a substitute surface water supply to the current Lower Tuscan Formation groundwater users to eliminate the risks to them of more aggressive pumping from the Formation and to optimize conjunctive management of the Sacramento Valley water resources." (p. 5)

[9] *Id.* GCID's actual purpose is best expressed using their own words: to "…improve Central Valley system-wide water supply reliability through participation in the emerging water transfer markets…" (p. 2) that would "…integrate the Lower Tuscan Formation into the local water supply system and into the Central Valley wide water supply system;…" (p. 6)

[10] Gosselin, Paul and Valerie Kincaid, 2020. Memo to the Vina Stakeholder Advisory Committee. *Re: Legal Implications of Potential Projects and Management Actions*. p.3.

[11] Thomas, Gregory, 2001. Designing Successful Groundwater Banking Programs in the Central Valley: Lessons From Experience. "The Butte County/Basin districts that increased groundwater pumping during the 1991 State Drought Water Bank included: Western Canal Water District, the Joint Water Districts Board (Richvale Irrigation District, Biggs-West Gridley Water District, Butte Water District, and Sutter Extension Water District) Ramirez Water District, Cordua Irrigation District, Hallwood Irrigation Company, and Browns Valley Irrigation District." p. 30.

"Participants in the 1994 State Drought Water Bank were Richvale Irrigation District, Western Canal Water District, Browns Valley Irrigation District, Cordua Irrigation District, and Ramirez Water District." p. 30.

extractions, however, caused the water levels to suddenly fall in shallow domestic wells, water quality to deteriorate in the wells serving the town of Durham, irrigation wells to fail on several orchards, and one farm to enter bankruptcy because it didn't recover from the loss of its crop. Harmed farmers and residents were told to, "Go hire an attorney."

- State and federal water agencies kept exploring how to manipulate groundwater systems during the 1990s to set up conjunctive use programs. CalFed was one such effort. **"**Potential projects at Stony Creek, Butte Basin, and the Cache-Putah Basin (Conaway Ranch) were eliminated because these aquifers are generally full. *Using these aquifers conjunctively would require initial extraction followed by active or passive recharge*. These may prove to be attractive projects in the future if potential third-party impacts are addressed adequately."**[12]** (emphasis added)
- Additional CalFed material recognized that conjunctive use will require an extra 100 feet of aquifer drawdown and "may be an issue." **[13]**
- Glenn Colusa ID received close to $3,000,000 of public money to study the Stony Creek Fan Conjunctive Water Management Program and Regional Integration of the Lower Tuscan Groundwater formation project. "GCID shall define three hypothetical water delivery systems from the State Water Project (Oroville), the Central Valley Project (Shasta) and the Orland Project reservoirs sufficient to provide full and reliable surface water delivery to parties now pumping from the Lower Tuscan Formation. The purpose of this activity is to describe and compare the performance of three alternative ways of furnishing a substitute surface water supply to the current Lower Tuscan Formation groundwater users to eliminate the risks to them of more aggressive pumping from the Formation and to optimize conjunctive management of the Sacramento Valley water resources."[14]
- Glenn Colusa ID, Western Canal WD, and Richvale ID actively planned to implement conjunctive use schemes: "Ultimately the project evaluated the effects of exercising both the northern Sacramento Valley's deep aquifer system, which is presently relatively undeveloped, and the shallower, regional aquifer, which is more heavily pumped for both domestic and agricultural needs."[15] "The project could be operated to obtain additional annual yield through classic conjunctive use, or the program could be operated on a longer cycle like a classic water bank."[16] The potential change in water rights for overlying landowners is not disclosed.

- Think tanks are already encouraging the California Legislature to override local ordinances. "Once GSAs establish sustainability plans that address undesirable impacts of

[12] CalFed Bay Delta Program, 1999. *Conjunctive Use Assessment*. p. 6.
[13] CalFed Bay Delta Program. Groundwater Storage Attribute Matrices, Appendix B. p. B-5.
[14] U.S. Bureau of Reclamation, *2006. Grant Assistance Agreement.* p. 5.

[15] Glenn Colusa ID, et al, 2012. *Feasibility Investigation of Re-Operation of Shasta and Oroville Reservoirs in Conjunction with Sacramento Valley Groundwater Systems to Augment Water Supply and Environmental Flows in the Sacramento and Feather Rivers*. p. ii.
[16] Natural Heritage Institute, 2005. *Regional Integration of the Lower Tuscan Groundwater Formation into the Sacramento Valley Surface Water System Through Conjunctive Water Management.* p. 3.

> pumping, it should be possible to ease the coarser restrictions on this practice found in most county ordinances—which effectively preclude trades if they entail water leaving the county. If counties with restrictive groundwater export ordinances fail to amend their laws to conform to SGMA*, the legislature should consider preempting local laws that discriminate against out-of-county uses or place undue burdens on groundwater and groundwater-substitution transfers* that would not jeopardize sustainable groundwater management of the source aquifer."[17] (emphasis added)

Sustainability is not found in the Colusa GSP, let alone *equitable* sustainability for all residents, farms, businesses, and the environment. The Colusa and Butte GSAs are dominated by large, local as well as non-residential landowners, many of whom have sought to play in the lucrative water market already to the detriment of their neighbors, streams, rivers, and species. Sadly, SGMA opened this door further: "Non-residential landowners and future banking partners may find it in their common interest to interpret the legislative intent (74)[18] and lax definitions of safe yield and overdraft provided in the Act (75)[19] based on the opinion in *Los Angeles v. San Fernando*, which encourages drawing down basins to create additional storage space and prevent water "wasting."(76)[20] Thus, in addition to exports, it is foreseeable that future GSAs will encourage drawdown of the aquifer to satisfy massive crop thirst as a drought continues, which will then create extra storage space for imported waters to "recharge" the Basin. As a result of future water exchanges and banking, local residents will bear the additional cost of digging deeper wells just to maintain their straws in the aquifer, and will increasingly compete with each other over a diminishing percolated supply while banked supplies increase. Unless this Plan is stopped, losing overlying rights to groundwater with years of water banking and recharge could be the death blow for the NorthState, as it was to people in the San Fernando Valley.

G. Conclusion

The purpose of a GSP is to facilitate the achievement of a basin's sustainability goal (Water

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[17] Ayres, Andrew, et al., 2021. *Improving California's Water Market: How Water Trading and Banking Can Support Groundwater Management*. p. 34.

[18] Keats, Adam et al., 2016. *Not All Water Stored Underground is Groundwater: Aquifer Privatization and California's 2014 Groundwater Sustainable Management Act*. Footnote: *2014 Act, § 10720.1(g) (It is the intent of the Legislature "[t]o increase groundwater storage and remove impediments to recharge.").* p. 106.

[19] *Id. Footnote: 2014 ACT, § 10721(v) ("Sustainable yield" is defined as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result."); 2014 ACT, § 10735(a) ("Condition of long-term overdraft" means the condition of a groundwater basin where the average annual amount of water extracted for a long-term period, generally 10 years or more, exceeds the long term average annual supply of water to the basin, plus any temporary surplus. Overdraft during a period of drought is not sufficient to establish a condition of long-term overdraft if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.").*

[20] *Id. Los Angeles v. San Fernando 14 Cal. 3d 199, 280 (1975) ("We agree with plaintiff that if a ground basin's lack of storage space will cause a limitation of extractions to safe yield to result in a probable waste of water, the amount of water which if withdrawn would create the storage space necessary to avoid the waste and not adversely affect the basin's safe yield is a temporary surplus available for appropriation to beneficial use. Accordingly, overdraft occurs only if extractions from the basin exceed its safe yield plus any such temporary surplus.").*

Code § 10727(a)), which is the "implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield." (Water Code § 10727(u).) Unfortunately, the 2021 GSP allowed and the Revised GSP here continues to allow undesirable results to occur. The Plan asserts that, "[t]he GSAs have a clear and direct strategy for addressing overdraft, groundwater level decline, and subsidence in the Subbasin, and a plan for adapting and responding to any future changes to groundwater conditions," yet there isn't even a thought about addressing the impacts to the Colusa Subbasin since 2015. The Revised GSP seeks more delay to implement actions and to reset the baseline for subsidence. The creation of a domestic well mitigation program isn't expected until January 2026 and a demand management program will be further delayed until January 2027 "if undesirable results are still occurring in the Subbasin." (p. 6-2) DWR's conclusion that "The GSAs do not appear to have an urgency to implement the necessary projects and management actions to mitigate overdraft and Department staff are concerned that continued overdraft will exacerbate the current problems the basin is experiencing, which include dry wells and worsening land subsidence" was correct when it was written October 16, 2023, and it is still true six months later with the Revised GSP. The GSAs are failing under SGMA, but even more importantly, failing the people, the land, and the environment in Colusa and Glenn counties.

Respectfully submitted,

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GeoTracker 4.16.2024

Search for a Project

Search for an Address

Nord

Wyo

Cory

Hamilton City

Mills Orchard

Lely Park

Greenwood

Grapit

Rotavele

Murphy's Slough/
Golden State Island

Capay Unit P

Sacramento River

Artois

Rice Researchers

Wine[illegible] Walnut

Rancho
Llano Seco

Glenn Golf &
Country Club

Bluegum

Jacinto

Well STAR/Wells

- Active Gas Storage
- Idle Gas: Dry Gas; Liquid Gas
- Plugged Gas: Dry Gas; Liquid Gas
- Permitted Gas: Dry Gas; Liquid Gas

LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE
- DTSC Cleanup Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - REMOVE
- WellSTAR - All Wells - REMOVE

Sites Shown on Map: 264 Total Sites | 21 Open Sites | 190 Closed Sites | 41 Sites w/Water Quality Data

GeoTracker 4.16.2024

Search for a Project

Search for an Address

Glenn Golf & Country Club

Bluegum

Bayliss

Jacinto

Unruh Ag Repair

Church of God In Christ, Mennonite

J & S Transportation

Willows

Glenn

Sacramento River

Howard Wildlife

Cool Roof Solutions

Butte City

Cohora

Butte City Cemetery

Packer Island wildlife refuge

Sacramento National Wildlife Refuge

Norman

Sacramento Wildlife Refuge Check Station

Afton

Princeton

PINTAIL II 4

Well STAR/Wells

- Active Gas Storage
- Idle Gas: Dry Gas; Liquid Gas
- Plugged Gas: Dry Gas; Liquid Gas
- Permitted Gas: Dry Gas; Liquid Gas

LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE
- DTSC Cleanup Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - - REMOVE
- WellSTAR - All Wells - - REMOVE

Sites Shown on Map: 59 Total Sites | 5 Open Sites | 45 Closed Sites | 18 Sites w/Water Quality Data

GeoTracker 4.16.2024

Search for a Project

Search for an Address

Norman

Sacramento Wildlife Refuge Check Station

PINTAIL II 4

Stegeman

Sacramento River

Delevan

5185 Lenahan Rd

Delevan National Wildlife Refuge

Grow West Maxwell

Mills Orchards

Oke Labradors

Colusa Casino Resort

Cortena

Colusa-Sacramento River State Recreation Area

Colusa National Wildlife Refuge

Delphos

Well STAR/Wells

- Active Gas Storage
- Idle Gas: Dry Gas; Liquid Gas
- Plugged Gas: Dry Gas; Liquid Gas
- Permitted Gas: Dry Gas; Liquid Gas

LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE
- DTSC Cleanup Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - - REMOVE
- WellSTAR - All Wells - - REMOVE

Sites Shown on Map: 65 Total Sites | 6 Open Sites | 43 Closed Sites | 16 Sites w/Water Quality Data

GeoTracker 4.16.2024

Search for a Project

Search for an Address

Cortena

Delphos

Colusa-Sacramento River State Recreation Area

Colusa National Wildlife Refuge

Noyesburg Cemetery

West Butte

Sutter B

Butte San

Correias Peach Farm

Meridian

Sycamore

Little Shrine Our Lady of Sorrows

Grimes

Grand Island

The Charter Family Fruit Stand

American Commodity Company

Viking Pools

Jeffreys Ranch Pecans

Colusa NWR Check Station

Genevra

T & P Farms

Well STAR/Wells

- Active Gas Storage
- Idle Gas: Dry Gas; Liquid Gas
- Plugged Gas: Dry Gas; Liquid Gas
- Permitted Gas: Dry Gas; Liquid Gas

LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE
- DTSC Cleanup Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - REMOVE
- WellSTAR - All Wells - REMOVE

Sites Shown on Map: 129 Total Sites | 13 Open Sites | 79 Closed Sites | 29 Sites w/Water Quality Data

GeoTracker 4.16.2024

Search for a Project

Search for an Address

T & P Farms

Arbuckle Golf Club

Arbuckle

College City

Pioneer Baby Gravesite

Fraziers Landing

Harrington

Boyers Landing

Carport Concepts

Hershey

Dunnigan

Raahauge

Tyndall Landing

El Camino De J

Guinda

Well STAR/Wells

- Active Gas Storage
- Idle Gas: Dry Gas; Liquid Gas
- Plugged Gas: Dry Gas; Liquid Gas
- Permitted Gas: Dry Gas; Liquid Gas

LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE
- DTSC Cleanup Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - - REMOVE
- WellSTAR - All Wells - - REMOVE

Sites Shown on Map: 62 Total Sites | 8 Open Sites | 46 Closed Sites | 17 Sites w/Water Quality Data

GeoTracker 4.16.2024

Search for a Project

Search for an Address

Cortina Hulling & Shelling

Genevra

T & P Farms

Arbuckle Golf Club

Arbuckle

College City

Grimes

Grand Island

Pioneer Baby Gravesite

Fraziers Landing

Harrington

Carport Concepts

Hershey

Dunnigan

Boyers Landing

Tyndall Landing

Well STAR/Wells

- Active Gas Storage
- Idle Gas: Dry Gas; Liquid Gas
- Plugged Gas: Dry Gas; Liquid Gas
- Permitted Gas: Dry Gas; Liquid Gas

LEGEND - CHOOSE MORE SITES

- LUST Cleanup Sites - REMOVE
- Cleanup Program Sites - REMOVE
- Military Cleanup Sites - REMOVE
- Military Privatized Sites - REMOVE
- Military UST Sites - REMOVE
- DTSC Cleanup Sites - REMOVE

Signifies a Closed Site

ACTIVE MAP COVERAGES:

- Military Bases - REMOVE
- WellSTAR - All Wells - REMOVE

Sites Shown on Map: 79 Total Sites | 9 Open Sites | 54 Closed Sites | 12 Sites w/Water Quality Data

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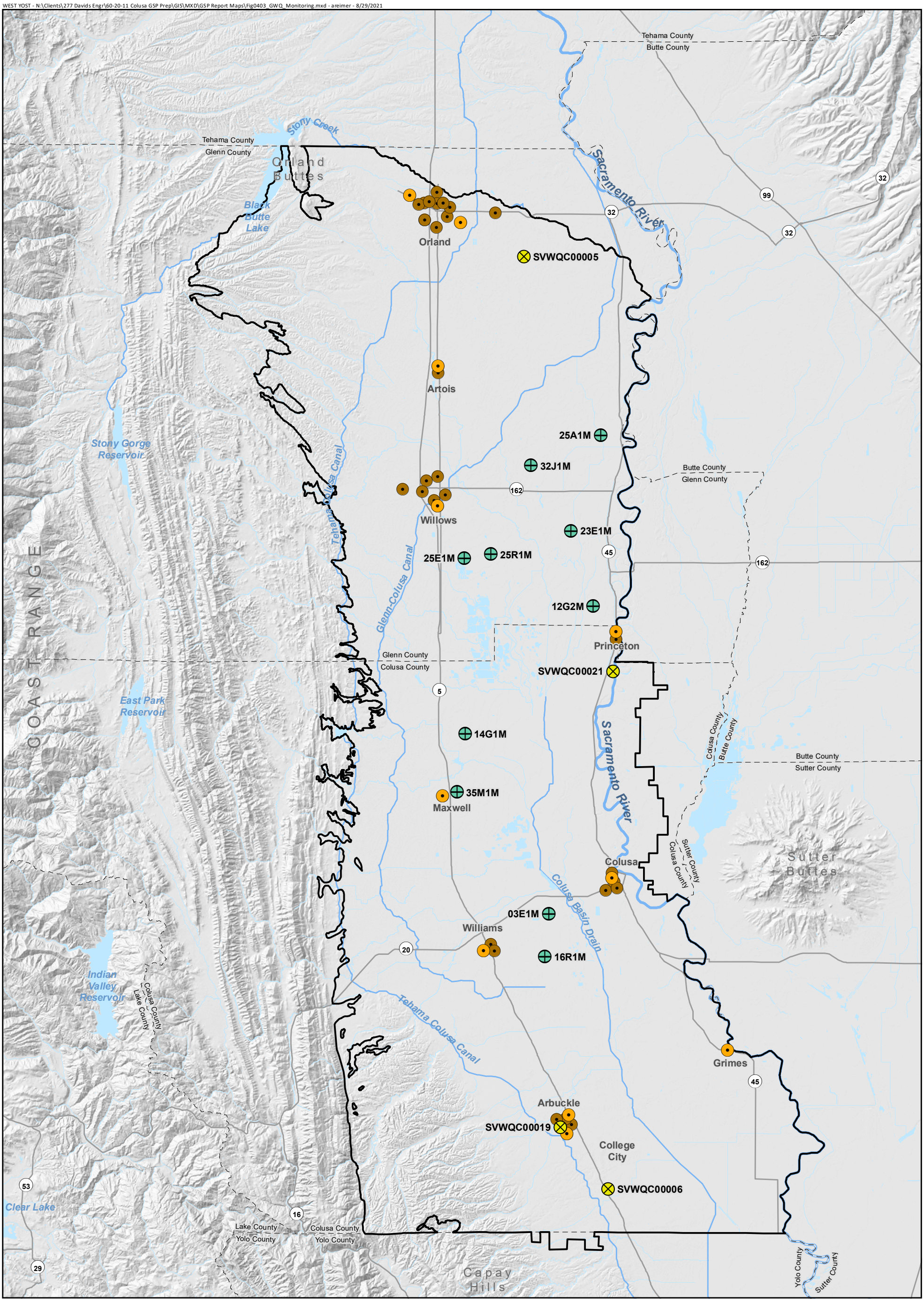


Colusa Subbasin

Representative California Rice Commission Groundwater Monitoring Well

Representative Sacramento Valley Water Quality Coalition Groundwater Monitoring Well

Representative Public Water Supply Well

Other Active Public Water Supply Well

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

N

0 2.5 5

Scale in Miles

Figure 4-3

Groundwater Quality Monitoring Network Wells

Colusa Groundwater Authority and Glenn Groundwater Authority

Colusa Subbasin

Groundwater Sustainability Plan

Vina Groundwater Sustainability Agency
308 Nelson Avenue, Oroville, California 95965
(530) 552-3592 • VinaGSA@gmail.com

December 18, 2020

To: Vina Stakeholder Advisory Committee (SHAC)

From: Paul Gosselin, Vina GSA Administrator
Valerie Kincaid, Vina Legal Counsel

Re: Legal Implications of Potential Projects and Management Actions

The Vina SHAC voiced concerns about the ability to proceed with identifying potential Projects and Management Actions (PMA) without a greater understanding of the legal implications, particularly those involving recharge. Legal implications are one of many considerations whether a PMA is suitable for inclusion in a GSP. Since there are not specific proposed projects, the discussion of legal implications and other considerations are hypothetical. However, the general discussion of legal implications may identify aspects of potential projects requiring limitations that the Vina GSA Board may need to impose through management actions. The SHAC may identify and recommend management actions that would allow for projects to proceed consistent with the Vina GSP and without harming the basin or groundwater uses. Management actions could involve establishing rules, ordinances, policies and procedures governing projects.

Currently, there are no specific projects proposed in the Vina subbasin. Evaluating the acceptability of a PMA must be based on the specific project's scope, design and intent. However, management actions could be identified through an evaluation of potential characteristics of projects that have negative aspects or are inconsistent with the GSP. For the purposes of this discussion paper, potential projects involve those that result in increased groundwater in the basin. Recharge, conservation and recycling projects could result in increased groundwater in the basin that could be put to beneficial use by the project proponent. Refer to the glossary of potential PMAs.

The following are questions concerning potential legal implications of potential projects. If there are other questions, please let me know prior to the January meeting.

1. Does a project proponent gain water rights over recharged groundwater?
   Yes. A project proponent maintains the right to water that is recharged whether it results from recharge projects or groundwater demand reduction projects (e.g., conservation, recycling). If a project uses or obtains a surface water supply and recharges into the aquifer, the project proponent would have a legal right to the recharged water. Water does not legally become "common" or "native" supply available to overlying groundwater right holders unless it is abandoned by the project proponent. (Los Angeles v. Glendale (1943) 23 Cal.2d 68, 76-78; Los Angeles v. San Fernando (1975) 14 Cal.3d 199, 258-60; Stevens v. Oakdale Irrigation District (1939) 13 Cal.2d 343, 352-43; Crane v. Stevinson (1936) 5 Cal. 2d 387, 398.) Abandonment occurs when there is no evidence the recharger intended to account for recharged water and later extract that water and put it to beneficial use. The recharger is only allowed to extract the amount of water that recharged to the basin. Therefore, usually, when extracting recharged

water, there must be some accounting for "leave behind" or "loss" depending on the local practices and technical components of the subbasin/recharge.

A recharge project could result in recharged water becoming "common" or "native" supply. A project proponent could agree to certain terms of recharge, for example, a leave behind of a certain percent of the total recharge. Alternatively, the GSA may consider an ordinance or other enforcement mechanism that requires some portion of recharged water to be water dedicated to "common" or "native" supply. The recharging party or agency adopting any sort of ordinance would need to be cautious that the agreement/ordinance would not result in exposure to forfeiture for the recharging party (as recharge without later extraction and application to beneficial use is not itself a beneficial use of water).

2. What rights could a project proponent exercise over recharged water?

   If a project includes the application for a new right to recharge water, it would need to obtain a water right permit from the State Water Resources Control Board (SWRCB) through a surface water right application and a supplemental groundwater recharge form. The water right permit application would need to identify the "beneficial use" that the project intends to meet. Recharging groundwater is not considered a beneficial use, however, meeting the sustainable management criteria in a GSP may be determined to be a beneficial use. The amount of recharged water that could be put to future use would be determined from project specific analysis and would be included in the water right permit. Depending upon the water source and the intent of the project, it may be eligible for a streamlined water right permit process established by the SWRCB to facilitate Flood Managed Aquifer Recharge (Flood MAR) and other GSP programs.

   If a water right holder diverts surface water pursuant to an existing right, the diversion of that water makes it the possession of the diverter. Recharging the water into an aquifer changes the location or storage of diverted surface water, but it does not change the ownership. For this reason, recharged water remains the possession of the diverter/recharger and the diverter/recharger may exercise full control over that water unless it can be established that the diverter/recharger abandoned the recharged water or it is subject to reasonable losses.

3. Could a project affect groundwater users rights to pump groundwater or have it limited?

   Not directly. Overlying groundwater rights are held by landowners whose land overly the groundwater aquifer. (Pasadena v. Alhambra (1949) 33 Cal.2d 908, 925.) An overlying water right is not quantified, but allows the water right holder to divert as much water as is reasonable to support beneficial uses on the overlying land. (Katz v. Walkinshaw (1902) 141 Cal. 116; Pasadena, at 925.) These rights are appurtenant to land and cannot be sold or otherwise detached from the land.

   However, recharge projects could decrease the amount of water that has previously been abandoned. In this situation, there would be a decrease in native groundwater supplies available for groundwater right holders. Groundwater users would not lose their right to divert groundwater to support beneficial uses on the overlying land, but lower groundwater elevations may increase cost or make it impracticable. It is also possible that recharge projects may underestimate the amount of water that migrates or is "lost", which could result in allowing the recharger to extract more water than is reasonable, which could result in decreasing the amount of water available for overlying groundwater users.

4. For managed recharge projects, does it matter what the source of the water is or if it comes from another basin?

   No, the source of the water only matters to the extent that it affects ownership. The water source could come from high storm flows, surface water held by the project proponent or surface water supply held by another agency. So long as the water was diverted pursuant to a valid water right prior to recharge, the recharged water would be owned by the diverter.

   There has been discussion and interest of having local surface water supplies be used for recharge projects (e.g., in-lieu, recharge basins) in groundwater dependent areas. Surface water sources would come from outside the Vina subbasin. The legal right to surface water that is imported and recharged into an aquifer is held by the project proponent (importer). (Los Angeles v. San Fernando (1975) 14 Cal.3d 199, 245-55; Water Code 7075.)

   In-lieu recharge occurs when a groundwater right holder does not extract groundwater due to an alternate supply of water (usually surface water deliveries). The water "recharged" in this situation is water that the groundwater holder had a right to extract, but did not, due to the alternate supply. The amount of in lieu recharge would depend on the amount of water available to the groundwater right holder and the amount of groundwater that remained in the ground (not pumped). For example, if an overlying water right holder had the right to pump 100 acre feet and they only pumped 20 because they purchased 80 acre feet of surface water, they would have a right to the 80 acre feet of in lieu recharge. (Water Code 1005.1)

5. Could the owner of a surface water lose their ownership/water right by making their water available to a project proponent?

   Not if they are careful. As noted above, recharge is not a beneficial use of water. (Water Code, 1242.) Therefore, if a surface water right holder diverted surface water and recharged that water into the aquifer without any intent to later extract it and put it to beneficial use for a period of 5 consecutive years, the surface water right could be subject to forfeiture. More likely, the surface water right holder would sell or transfer the surface water through a contract to a project proponent. The transfer of water is a beneficial use. (Water Code, 1745.07.) Water sale/transfer arrangements are not unique and have not resulted in losing ownership or water rights. The owner of a surface water supply would only lose their ownership/water right through a permanent sale and filing of a change in water rights with the SWRCB.

6. How would projects affect groundwater users, the environment (streams, GDEs, all species), and water quality (surface and groundwater)?

   Recharge projects have the potential to affect groundwater users, groundwater quality and/or environmental beneficial uses. Recharge projects will be subject to environmental evaluation under the California Environmental Quality Act (CEQA). Prior to project approval, the project proponent would be required to identify and evaluate the impacts of the proposed project on the environment hydrology, housing, traffic, agriculture, etc. However, CEQA does not require that projects consider or comply with GSPs. The exception is that general plan updates and zoning ordinances must consider the applicable GSP.

7. Could a project be available for out-of-basin export?

   Potentially. Depending upon the project scope, it could intend to export recharge water out-of-basin.

8. Could a project in the Vina subbasin benefit users downslope subbasins?

   Potentially. The Vina and the other subbasins in the Northern Sacramento Valley are interconnected to certain degrees. Depending upon the scope and location of a project, the

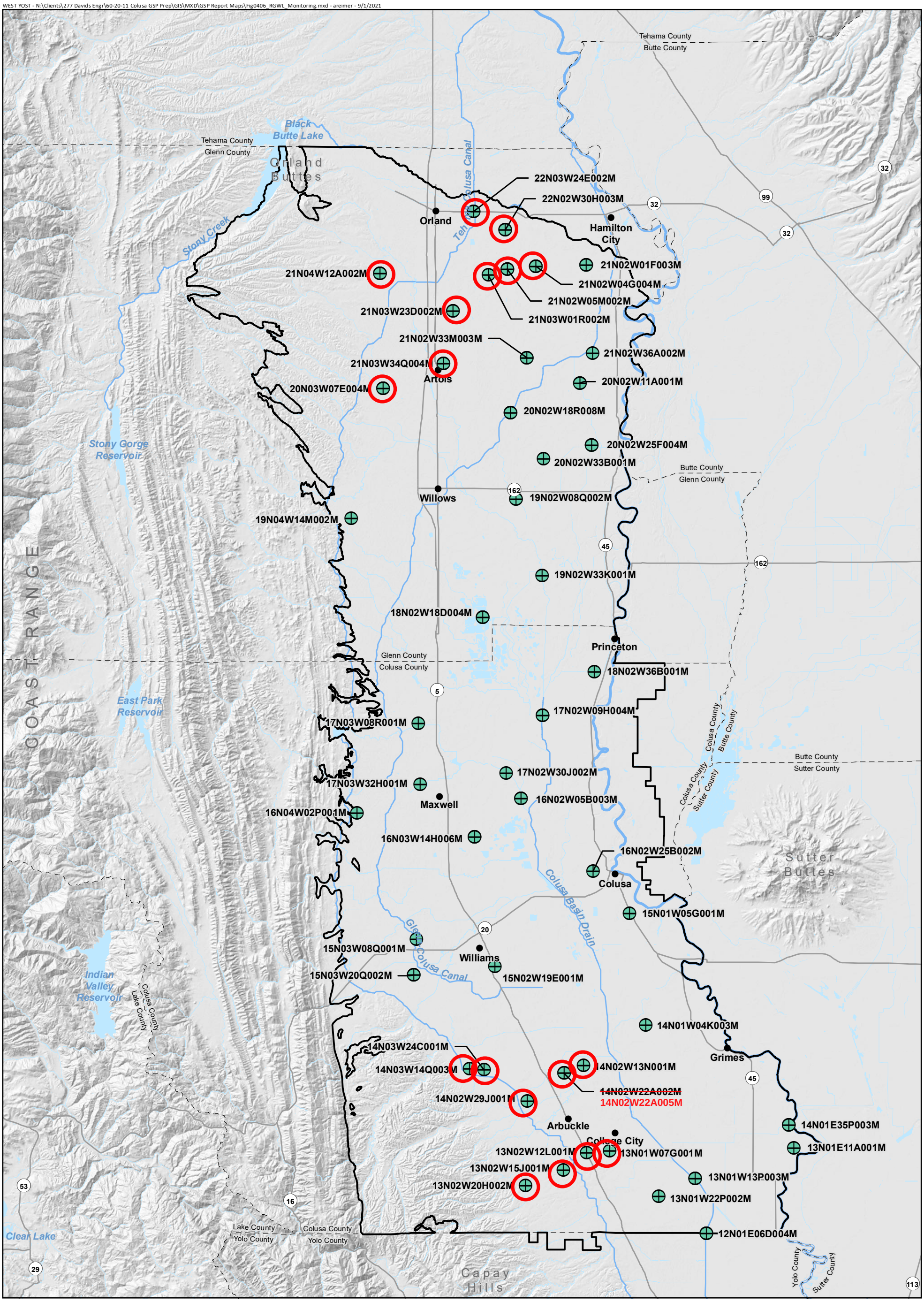
benefits could extend beyond the Vina subbasin. As part of the project design, the benefit of the project would be analyzed and monitored.

Potential Management Actions

Management actions would allow the Vina GSA to protect the Vina subbasin and the implementation of the GSP from negative implications from artificial recharge projects through enactment of rules, ordinances and/or policies.

1. Require any recharge project, in lieu project or other project that affects the sustainable management criteria in the GSP be subject to review and approval by the Vina GSA Board for consistency with the GSP.

2. Evaluate ordinances or policies that the GSA may adopt to ensure recharge projects are operating without adverse impact to the basin or the GSA's ability to achieve sustainability.



Representative Groundwater Level Monitoring Network Site

Colusa Subbasin

Focus RMS well

2024 Revised GSP

Horizontal Datum: North American Datum of 1983 (NAD 83), California State Plane Zone II, feet.

N

0 2.5 5

Scale in Miles

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Modified **Figure 4-6**

Representative Groundwater Level Monitoring Network

Colusa Groundwater Authority and Glenn Groundwater Authority

Colusa Subbasin

Groundwater Sustainability Plan

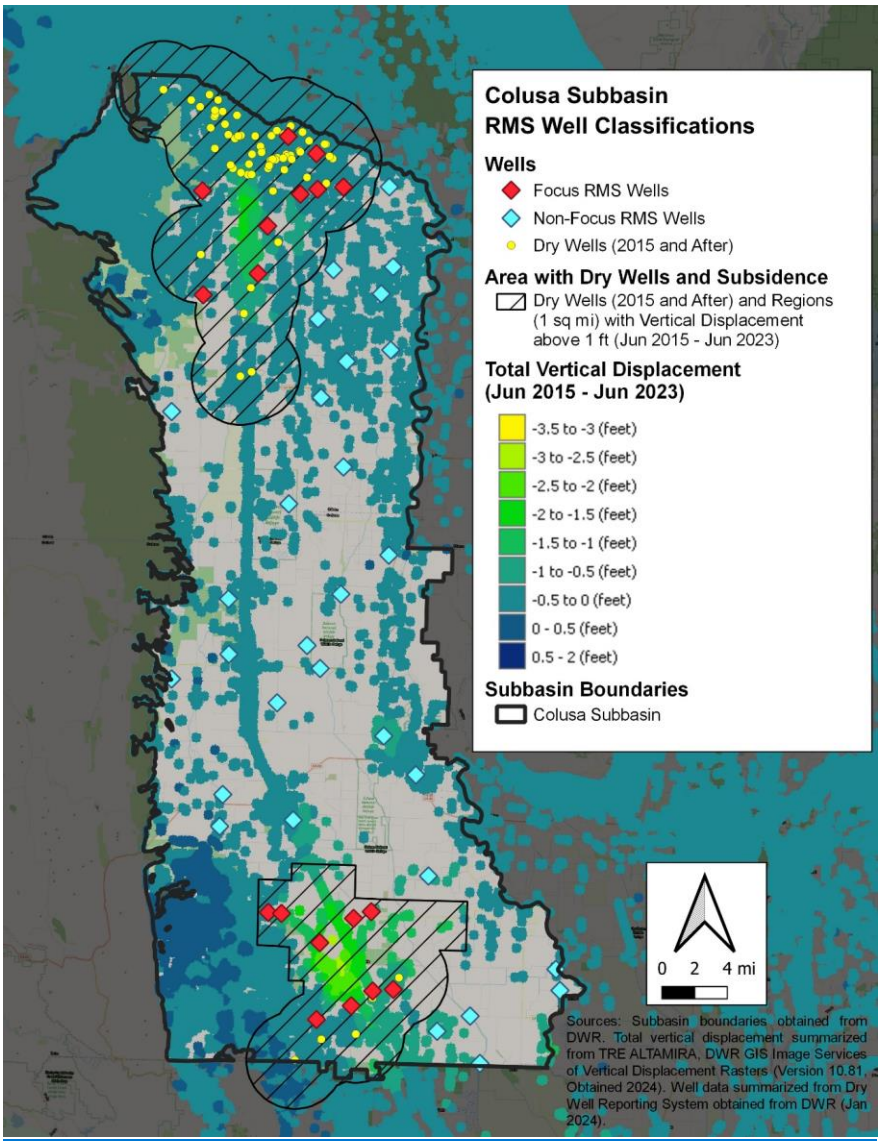

Figure 5-4. Groundwater Level Representative Monitoring Network and Identification of Focus and Non-Focus RMS Wells.

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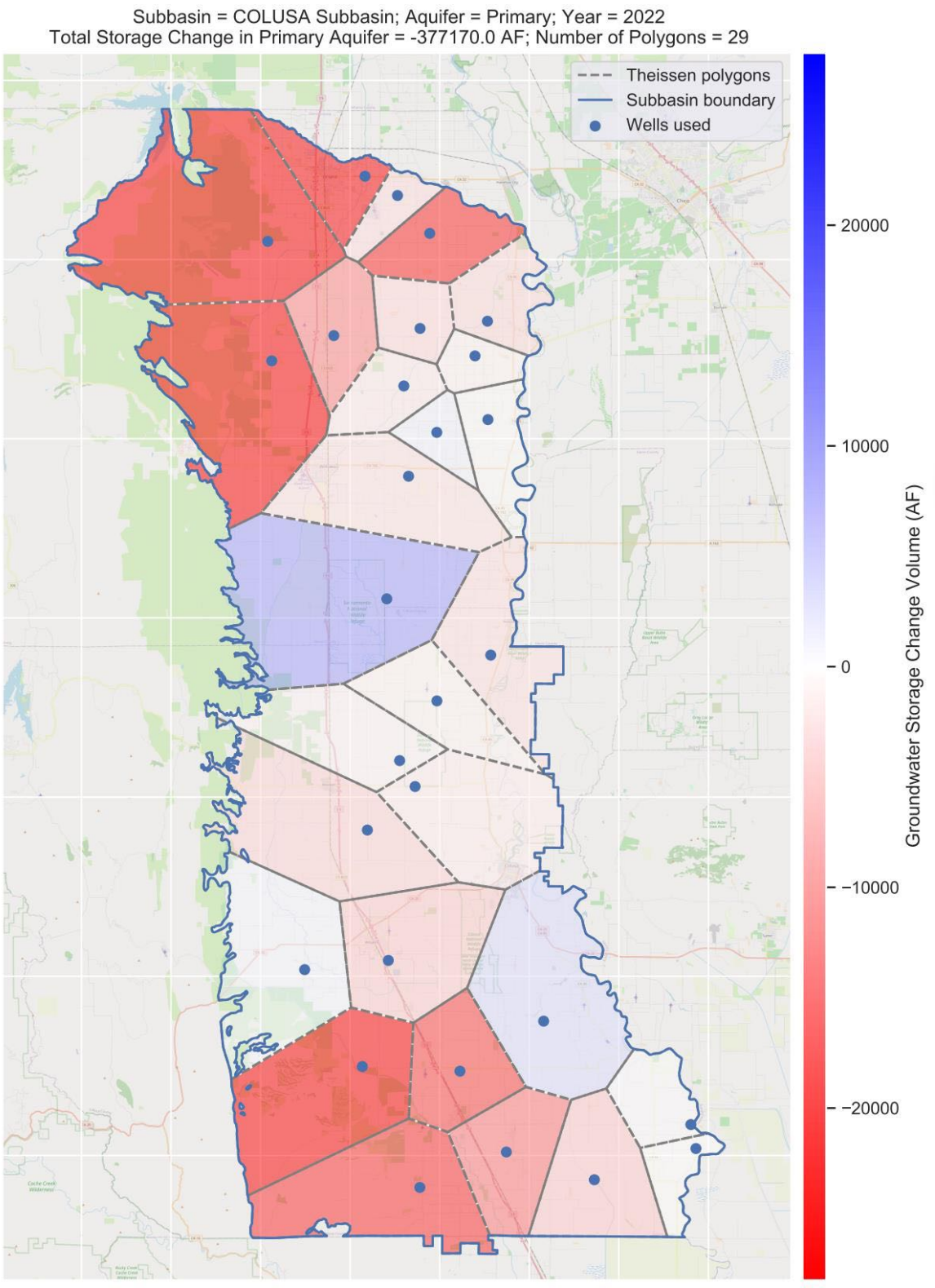


Figure 6-1. Change in Groundwater Storage in the Primary Aquifer – Spring 2021 through Spring 2022.

Table 5-3. Groundwater Level Representative Monitoring Network and Sustainability Criteria

SWN	CASGEM ID	RMS Well Designation	Ground Surface Elevation, ft	Minimum Threshold GWE, ft amsl	Measurable Objective GWE, ft amsl	Interim Milestone (2027) GWE, ft amsl	Interim Milestone (2032) GWE, ft amsl	Interim Milestone (2037) GWE, ft amsl	Minimum Threshold Method
12N01E06D004M	16331	Non-Focus	28	-67.8	1.1	1.1	1.1	1.1	2020-2022 low minus margin (25.0 ft)
13N01E11A001M	18534	Non-Focus	34	-8.1	26.0	26.0	26.0	26.0	2020-2022 low minus margin (25.0 ft)
13N01W07G001M	36246	Focus	90	-36.2	12.7	-47.4	-36.2	-11.8	2020-2022 low
13N01W13P003M	18549	Non-Focus	32	-47.6	8.2	8.2	8.2	8.2	2020-2022 low minus margin (25.0 ft)
13N01W22P002M	16357	Non-Focus	60	-11.7	28.6	28.6	28.6	28.6	2010-2022 low minus margin (25.0 ft)
13N02W12L001M	31899	Focus	135	-40.3	24.7	-56.0	-40.3	-7.8	2020-2022 low
13N02W15J001M	39884	Focus	213	-4.0	58.0	-11.7	-4.0	27.0	2010-2022 low
13N02W20H002M	25005	Focus	343	167.7	189.6	155.0	167.7	178.7	2020-2022 low
14N01E35P003M	38718	Non-Focus	47	-16.0	28.2	28.2	28.2	28.2	2020-2022 low minus margin (25.0 ft)
14N01W04K003M	18554	Non-Focus	37	-2.2	32.2	32.2	32.2	32.2	2020-2022 low minus margin (25.0 ft)
14N02W13N001M	18563	Focus	62	6.8	25.1	0.5	6.9	16.0	2020-2022 low
14N02W22A005M	54756	Focus	84	-82.7	1.1	-94.8	-82.7	-40.8	2020-2022 low
14N02W29J001M	18566	Focus	163	18.0	55.5	0.2	18.0	36.7	2015-2022 low
14N03W14Q003M	32324	Focus	173	-120.6	53.5	-132.7	-120.6	-33.5	2020-2022 low
14N03W24C001M	16691	Focus	173	36.3	59.3	24.2	36.3	47.8	2020-2022 low
15N01W05G001M	14309	Non-Focus	47	0.6	34.7	34.7	34.7	34.7	2020-2022 low minus margin (25.0 ft)
15N02W19E001M	14319	Non-Focus	87	36.5	73.6	73.6	73.6	73.6	2020-2022 low minus margin (22.8 ft)
15N03W08Q001M	N/A	Non-Focus	115	75.6	109.5	109.5	109.5	109.5	2020-2022 low minus margin (25.0 ft)
15N03W20Q002M	38293	Non-Focus	129	83.2	113.1	113.1	113.1	113.1	2020-2022 low minus margin (25.0 ft)
16N02W05B003M	25511	Non-Focus	65	1.1	49.0	49.0	49.0	49.0	2020-2022 low minus margin (25.0 ft)
16N02W25B002M	33868	Non-Focus	55	7.4	35.6	35.6	35.6	35.6	2020-2022 low minus margin (15.8 ft)
16N03W14H006M	24683	Non-Focus	66	8.5	51.4	51.4	51.4	51.4	2020-2022 low minus margin (25.0 ft)
16N04W02P001M	16308	Non-Focus	163	101.2	144.3	144.3	144.3	144.3	2020-2022 low minus margin (25.0 ft)
17N02W09H004M	25514	Non-Focus	67	0.9	56.2	56.2	56.2	56.2	2020-2022 low minus margin (25.0 ft)
17N02W30J002M	16960	Non-Focus	63	6.1	51.1	51.1	51.1	51.1	2020-2022 low minus margin (25.0 ft)
17N03W08R001M	39127	Non-Focus	107	63.6	92.4	92.4	92.4	92.4	2020-2022 low minus margin (25.0 ft)
17N03W32H001M	35475	Non-Focus	100	67.4	95.1	95.1	95.1	95.1	2020-2022 low minus margin (25.0 ft)
18N02W18D004M	24953	Non-Focus	82	-2.3	62.0	62.0	62.0	62.0	2020-2022 low minus margin (25.0 ft)

Table 5-3. Groundwater Level Representative Monitoring Network and Sustainability Criteria

SWN	CASGEM ID	RMS Well Designation	Ground Surface Elevation, ft	Minimum Threshold GWE, ft amsl	Measurable Objective GWE, ft amsl	Interim Milestone (2027) GWE, ft amsl	Interim Milestone (2032) GWE, ft amsl	Interim Milestone (2037) GWE, ft amsl	Minimum Threshold Method
18N02W36B001M	16914	Non-Focus	75	24.1	62.4	62.4	62.4	62.4	2020-2022 low minus margin (25.0 ft)
19N02W08Q002M	25762	Non-Focus	108	34.7	99.2	99.2	99.2	99.2	2020-2022 low minus margin (25.0 ft)
19N02W33K001M	19793	Non-Focus	87	52.8	80.5	80.5	80.5	80.5	2020-2022 low minus margin (18.3 ft)
19N04W14M002M	25787	Non-Focus	186	117.0	157.7	157.7	157.7	157.7	2020-2022 low minus margin (25.0 ft)
20N02W11A001M	17170	Non-Focus	125	79.6	119.4	119.4	119.4	119.4	2020-2022 low minus margin (25.0 ft)
20N02W18R008M	23986	Non-Focus	131	73.3	121.1	121.1	121.1	121.1	2020-2022 low minus margin (25.0 ft)
20N02W25F004M	23989	Non-Focus	102	66.0	97.5	97.5	97.5	97.5	2020-2022 low minus margin (21.0 ft)
20N02W33B001M	17174	Non-Focus	105	55.1	99.1	99.1	99.1	99.1	2020-2022 low minus margin (25.0 ft)
20N03W07E004M	37860	Focus	179	51.7	116.5	32.6	51.7	84.1	2020-2022 low
21N02W01F003M	38535	Non-Focus	162	76.8	125.7	125.7	125.7	125.7	2020-2022 low minus margin (25.0 ft)
21N02W04G004M	24993	Focus	178	62.8	125.7	56.5	62.8	94.3	2020-2022 low
21N02W05M002M	39676	Focus	189	91.8	153.4	82.5	91.8	122.6	2020-2022 low
21N02W33M003M	38536	Non-Focus	149	77.8	121.4	121.4	121.4	121.4	2020-2022 low minus margin (25.0 ft)
21N02W36A002M	21239	Non-Focus	135	62.5	106.8	106.8	106.8	106.8	2020-2022 low minus margin (21.6 ft)
21N03W01R002M	25232	Focus	203	101.6	155.8	91.0	101.6	128.7	2020-2022 low
21N03W23D002M	23992	Focus	205	108.2	146.2	96.5	108.2	127.2	2020-2022 low
21N03W34Q004M	25789	Focus	167	97.9	119.2	90.2	97.9	108.5	2020-2022 low
21N04W12A002M	24650	Focus	248	22.3	94.2	-4.2	22.3	58.3	2020-2022 low
22N02W30H003M	25726	Focus	204	82.9	160.5	73.6	82.9	121.7	2020-2022 low
22N03W24E002M	25236	Focus	231	119.9	179.4	110.6	119.9	149.7	2020-2022 low

SWN = State Well Number
CASGEM ID = California Statewide Groundwater Elevation Monitoring Identification Code
GWE = groundwater elevation
DTW = depth to water
ft = feet
amsl = above mean sea level
bgs = below ground surface
* Insufficient data in 2020-2022, minimum threshold is based on the low in an earlier period of available data.

Table 5-2. Groundwater Level Representative Monitoring Network and Sustainability Criteria

SWN	CASGEM ID	Ground Surface Elevation, ft	Minimum Threshold GWE, ft amsl	Minimum Threshold DTW, ft bgs	Minimum Threshold Method	Measurable Objective GWE, ft amsl	Measurable Objective DTW, ft bgs	Interim Milestone GWE, ft amsl	Interim Milestone DTW, ft bgs	Margin of Operational Flexibility, ft	20th Percentile Domestic Wells, ft bgs	50% of Range Below Historical Low, ft bgs
12N01E06D004	16331	28	-108	136	(a)	-1	29	-1	29	107	136	94
13N01E11A001	18534	32	-75	106	(a)	22	10	22	10	96	106	28
13N01W07G001	36246	90	-106	196	(b)	-9	99	-9	99	97	153	196
13N01W13P003	18549	32	-88	120	(a)	8	24	8	24	96	120	67
13N01W22P002	16357	60	-124	184	(a)	26	34	26	34	150	184	116
13N02W12L001	31899	135	-72	208	(b)	9	126	9	126	82	200	208
13N02W15J001	39884	213	-62	274	(b)	61	152	61	152	122	215	274
13N02W20H002	25005	343	95	248	(a)	174	169	174	169	79	248	201
14N01E35P003	38718	47	-118	165	(a)	28	19	28	19	146	165	32
14N01W04K003	18554	37	-86	124	(a)	12	25	12	25	99	124	44
14N02W13N001	18563	62	-80	142	(a)	24	38	24	38	104	142	78
14N02W22A002	54756	84	-126	210	(a)	84	0	84	0	210	210	0
14N02W29J001	18566	163	-86	248	(b)	22	141	22	141	107	216	248
14N03W14Q003	32324	173	-89	261	(b)	-13	186	-13	186	75	115	261
14N03W24C001	16691	173	-5	178	(b)	38	135	38	135	43	138	178
15N01W05G001	14309	47	-54	101	(a)	28	19	28	19	82	101	51
15N02W19E001	14319	87	-13	100	(a)	73	14	73	14	86	100	50
15N03W08Q001	N/A	113	43	70	(a)	107	6	107	6	64	70	10
15N03W20Q002	38293	129	60	69	(a)	113	16	113	16	53	69	28
16N02W05B003	25511	65	-71	136	(a)	47	18	47	18	118	136	48
16N02W25B002	33868	55	-25	80	(a)	30	25	30	25	55	80	54
16N03W14H006	24683	66	-94	160	(a)	51	15	51	15	145	160	40
16N04W02P001	16308	163	63	100	(a)	139	24	139	24	76	100	42
17N02W09H004	25514	67	-52	119	(a)	56	11	56	11	108	119	32
17N02W30J002	16960	63	-119	182	(a)	44	19	44	19	163	182	51
17N03W08R001	39127	107	-13	120	(a)	88	19	88	19	101	120	28
17N03W32H001	35475	100	-38	138	(a)	92	8	92	8	130	138	35
18N02W18D004	24953	85	-80	165	(a)	62	23	62	23	142	165	62

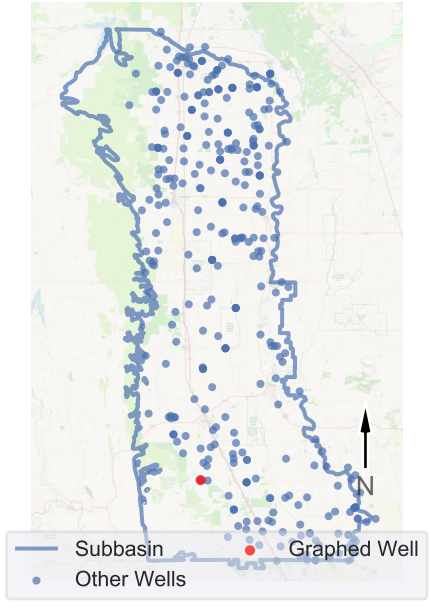
Table 5-2. Groundwater Level Representative Monitoring Network and Sustainability Criteria

SWN	CASGEM ID	Ground Surface Elevation, ft	Minimum Threshold GWE, ft amsl	Minimum Threshold DTW, ft bgs	Minimum Threshold Method	Measurable Objective GWE, ft amsl	Measurable Objective DTW, ft bgs	Interim Milestone GWE, ft amsl	Interim Milestone DTW, ft bgs	Margin of Operational Flexibility, ft	20th Percentile Domestic Wells, ft bgs	50% of Range Below Historical Low, ft bgs
18N02W36B001	16914	75	-3	78	(a)	53	22	53	22	56	78	59
19N02W08Q002	25762	108	12	96	(a)	98	10	98	10	86	96	40
19N02W33K001	19793	87	21	66	(a)	71	16	71	16	50	66	53
19N04W14M002	25787	186	46	140	(a)	151	35	151	35	105	140	50
20N02W11A001	17170	125	49	76	(a)	119	6	119	6	70	76	22
20N02W18R008	23986	131	47	84	(a)	120	11	120	11	73	84	18
20N02W25F004	23989	102	37	65	(a)	97	5	97	5	60	65	12
20N02W33B001	17174	105	31	74	(a)	100	5	100	5	69	74	17
20N03W07E004	37860	179	31	148	(a)	100	79	100	79	69	148	124
21N02W01F003	38535	161	71	90	(a)	124	37	124	37	53	90	67
21N02W04G004	24993	178	51	127	(b)	121	57	121	57	70	92	127
21N02W05M002	39676	189	55	134	(a)	140	49	140	49	85	134	112
21N02W33M003	38536	149	67	82	(a)	119	30	119	30	52	82	52
21N02W36A002	21239	135	24	112	(b)	91	44	91	44	68	81	112
21N03W01R002	25232	203	48	155	(b)	151	52	151	52	103	108	155
21N03W23D002	23992	205	84	121	(b)	140	65	140	65	56	89	121
21N03W34Q004	25789	167	42	125	(a)	112	55	112	55	70	125	89
21N04W12A002	24650	248	18	230	(b)	73	175	73	175	55	98	230
22N02W30H003	25726	204	82	122	(b)	150	54	150	54	68	76	122
22N03W24E002	25236	231	122	109	(b)	176	55	176	55	54	90	109

SWN = State Well Number
CASGEM ID = California Statewide Groundwater Elevation Monitoring Identification Code
GWE = groundwater elevation
DTW = depth to water
ft = feet
amsl = above mean sea level
bgs = below ground surface
Minimum Thresholds were calculated as either (a) the 20th percentile of domestic well depth near the monitoring well, or (b) 50 percent of the measured water level range below the historical low within the monitoring well.

COLUSA Subbasin - State Well Number (SWN): 14N03W14Q003M (Focus RMS Well)

Well Location Map

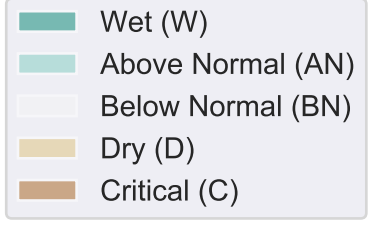


Sustainable Management Criteria:

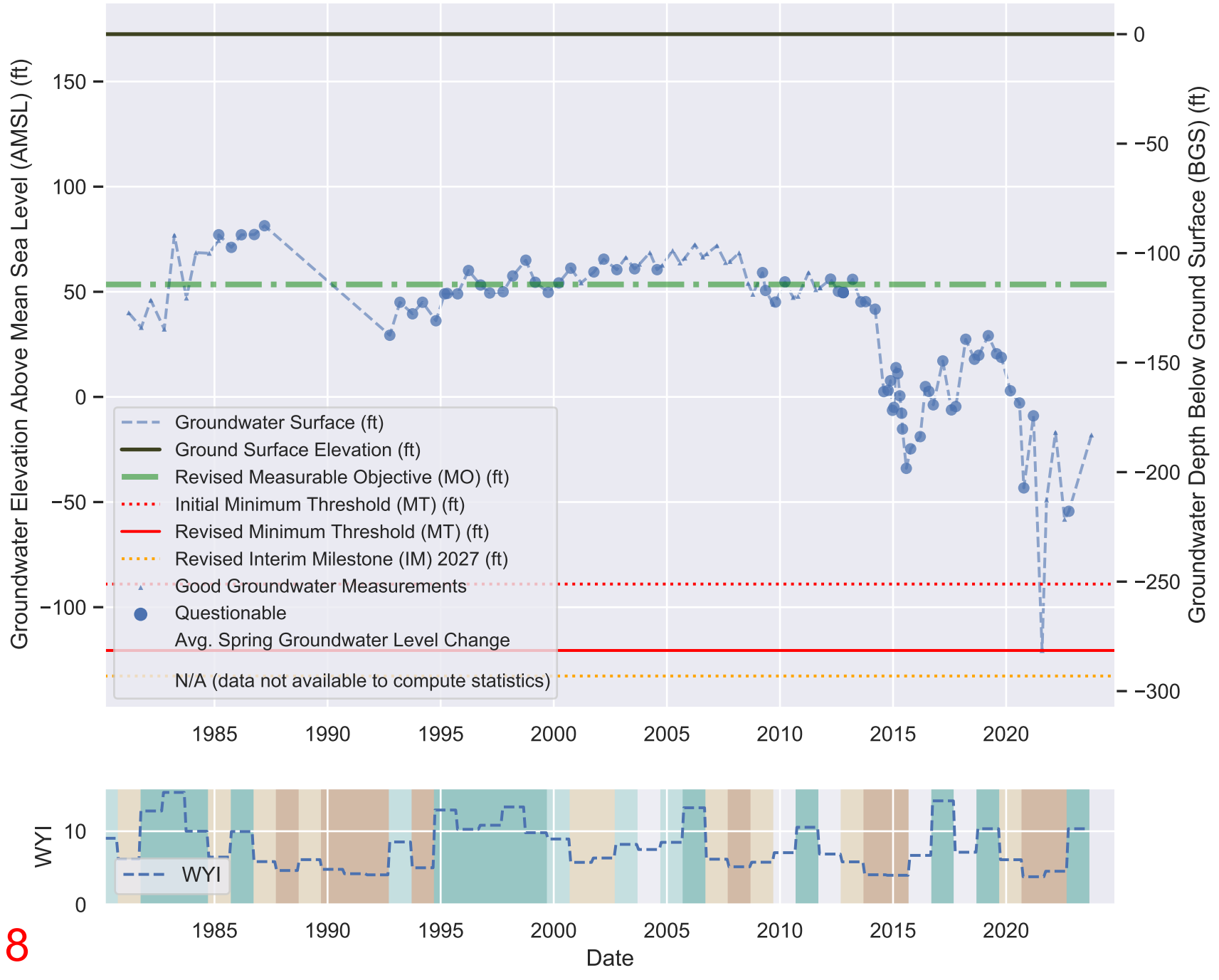
Proposed IM (2027) = -132.7 ft AMSL
Proposed MO = 53.5 ft AMSL
Proposed MT = -120.6 ft AMSL

Minimum Threshold is the 2020-2022 low.

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.



Perforation 1 (P1): 390.0 - 480.0; P2: 500.0 - 590.0; P3: 614.0 - 685.0 ft BGS



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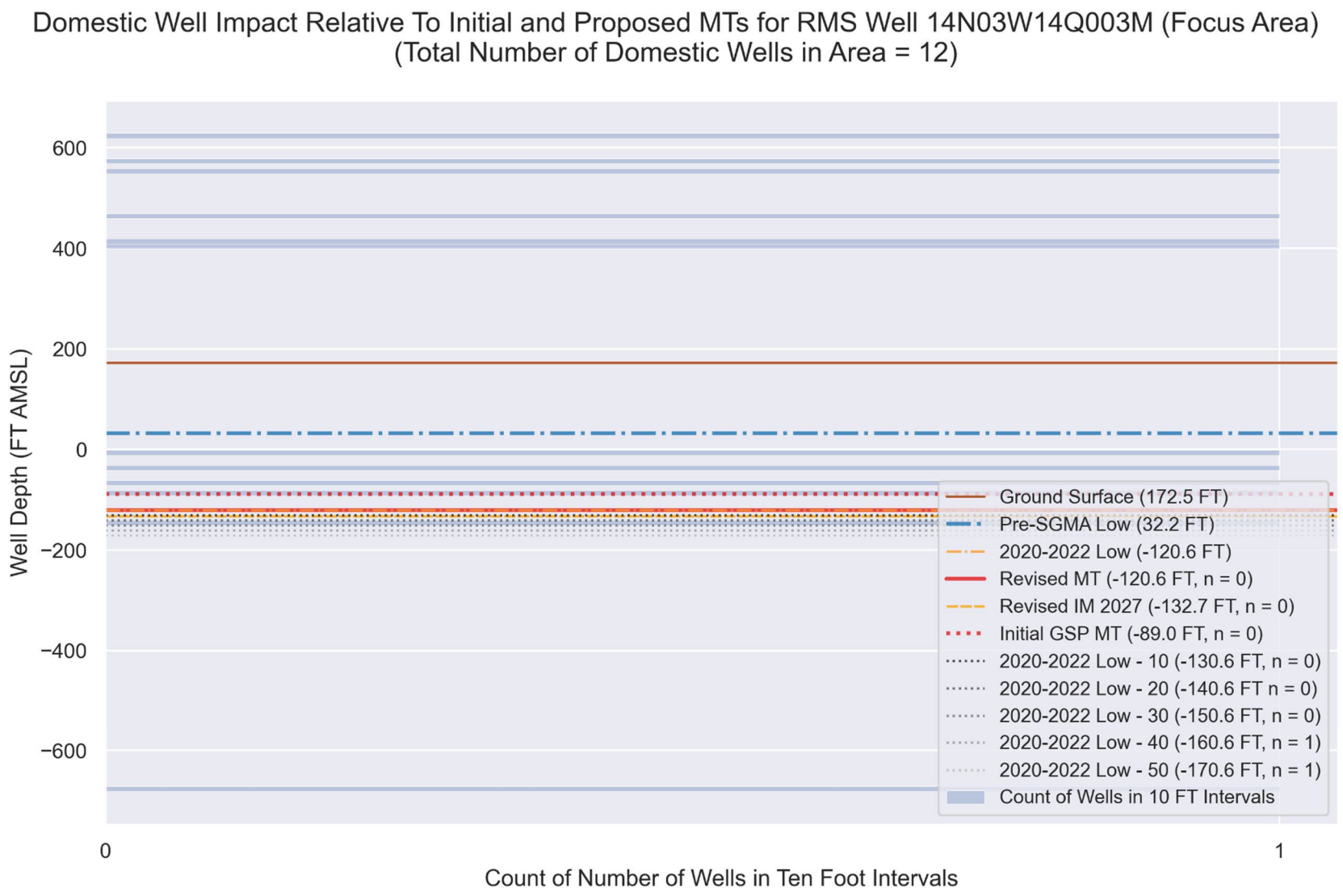

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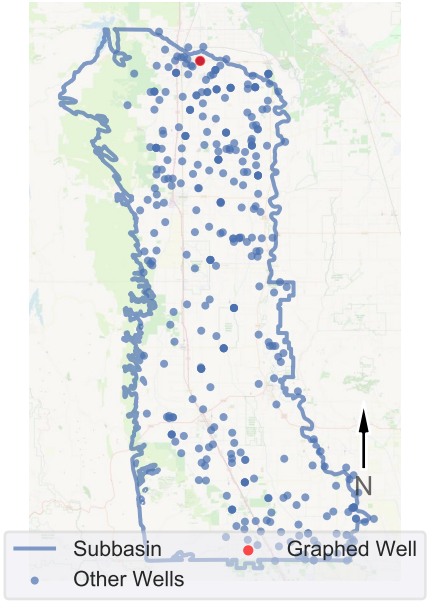
COLUSA Subbasin - State Well Number (SWN): 22N03W24E002M (Focus RMS Well)

Well Location Map



Sustainable Management Criteria:

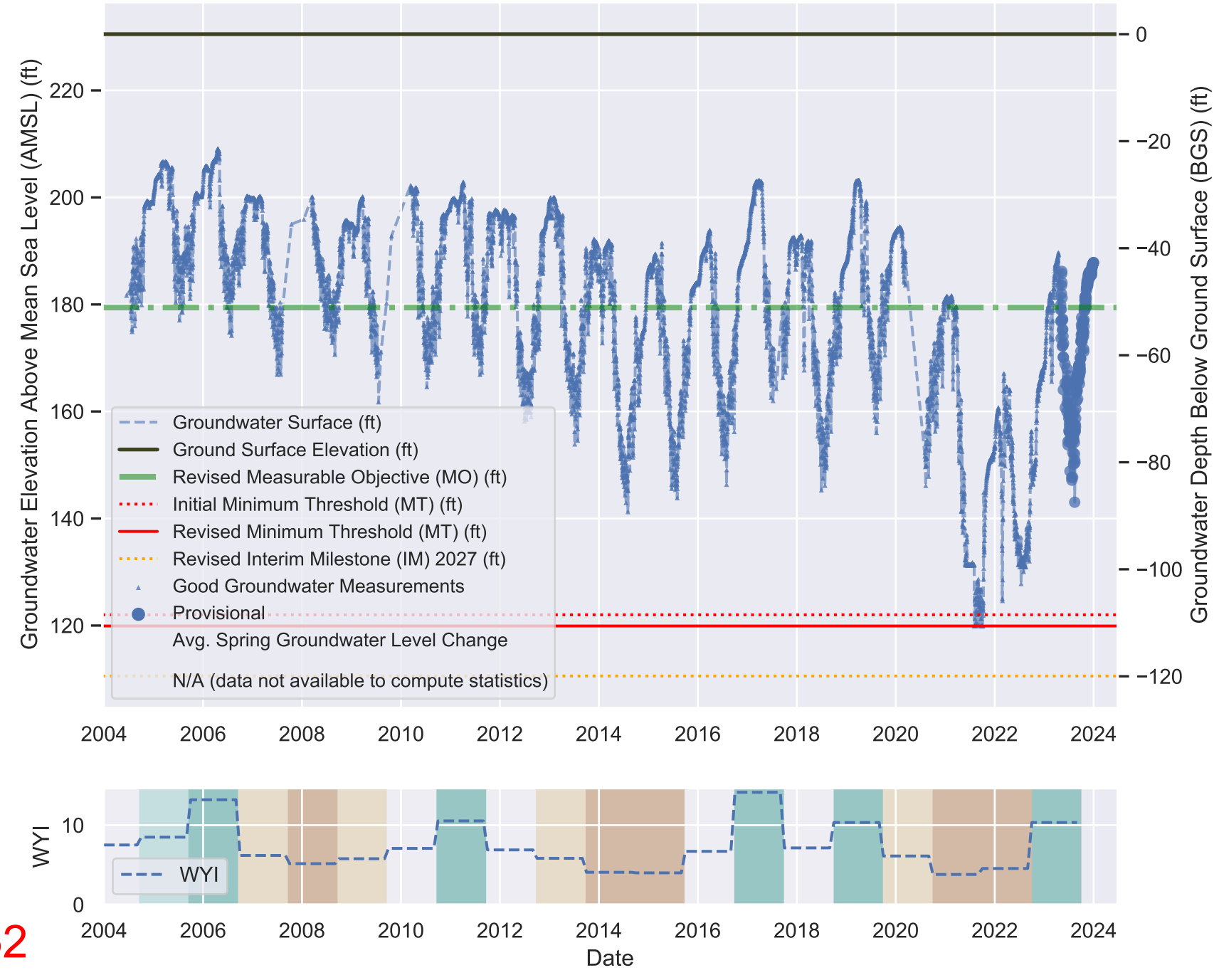
Proposed IM (2027) = 110.6 ft AMSL
Proposed MO = 179.4 ft AMSL
Proposed MT = 119.9 ft AMSL

Minimum Threshold is the 2020-2022 low.

Sacramento Valley Water Year Index (WYI) shown on lower right. Meaning of colors defined below.

- Wet (W)
- Above Normal (AN)
- Below Normal (BN)
- Dry (D)
- Critical (C)

Perforation 1 (P1): 130.0 - 150.0; P2: 170.0 - 180.0 ft BGS



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