State Water Resources Control Board

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TULARE LAKE GROUNDWATER SUSTAINABILITY PLAN, GROUNDWATER SUBBASIN NO. 5-022.12

The State Water Resources Control Board (State Water Board) staff are providing these comments in support of the Department of Water Resources' (DWR) review of the Groundwater Sustainability Plan (GSP) for the Tulare Lake Groundwater Subbasin (subbasin).

Our comments on the GSP focus on the following areas:

- Water Budget
- Groundwater Levels and Potential Drinking Water Impacts
- Groundwater Quality
- Land Subsidence
- Depletions of Interconnected Surface Water
- Projects and Management Actions
- Projects Reliant on New or Amended Water Rights
- Engagement

Water Budget

1. Based on the modeling results presented in the GSP, it appears that GSP projects and management actions will not achieve sustainable groundwater management conditions by 2040. While the overall decline in groundwater levels is projected to slow over time with projects, it appears that the GSP allows for continuing groundwater level declines past the year 2040 when the subbasin is required to reach sustainability. The GSP also appears to allow for continued long-term loss of groundwater storage and subsidence. In many of the projected groundwater level

trend lines for the area covered by each groundwater sustainability agency (GSA) (Figures 4-2 through 4-7), levels do not stabilize with time, but instead decline more slowly, remaining above the MTs through 2070. As indicated in the discussion of the modeling results, it appears that the GSP justifies continued overdraft by proposing "sustainable levels" of overdraft, rather than halting overdraft and further concludes that "the continued reduction in groundwater storage is also sustainable" and that "the continued subsidence is also sustainable" (Appendix D, p. 44). State Water Board staff finds that the GSP's conclusion that overdraft is sustainable is not consistent with the Sustainable Groundwater Management Act (SGMA), and further recommends that the GSP develop projects and management actions that achieve measurable objectives (MOs) within the implementation period.

Groundwater Levels and Potential Drinking Water Impacts

2. The GSP does not describe how water levels at or near the MOs or minimum thresholds (MTs) may impact domestic wells, public water systems, other beneficial users, or land use and property interests, nor does it describe how these interests were considered in setting the MOs and MTs. The GSP's discussion of its sustainable management criteria (SMC) should include a description of how groundwater conditions at or near MTs may affect beneficial uses and users of water and whether those effects do or do not constitute an undesirable result. MOs for year 2040 groundwater levels were set by assuming 15 years of "business as usual" groundwater declines.[1] The MTs were then set as one standard deviation from the average forecasted water level in July 2035 or 50 feet, whichever was greater, below the MOs. A potentially significant number of domestic wells may be impacted if groundwater elevations decline to the MOs or MTs.

   Estimates of wells that may be affected at groundwater elevation MOs and MTs in Central Valley GSPs are publicly available.[2] These technical resources are available for consideration by the GSAs. State Water Board staff conducted its own analysis for the subbasin by comparing the depths of wells[3] with well completion reports in DWR's Online System for Well Completion Reports (OSWCR) database to the MOs and MTs presented in the GSP for the subbasin. This analysis excluded

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[1] GSAs developed MOs by projecting groundwater levels expected in 2035, assuming historical water use and surface water deliveries, "normal" hydrology, and no projects or management actions.

[2] See reports and analyses by Pauloo, R., Bostic, D., Monaco, A. and Hammond, K., The Water Foundation and EKI; and UC Davis Center for Regional Change

[3] Where available, staff used the bottom of the well screen to represent well depth; otherwise, staff used the bottom of the well.

wells that were estimated to have already been dry in 2015.[4] Given uncertainties in the OSWCR data, staff present a range of values based on domestic and public water system well records with location and depth information. The lower bounds represent wells installed after 1991[5] and the upper bounds represent all wells regardless of installation date. The results of this analysis are summarized below.

- Of the 727 to 1,327 domestic wells, 33 to 98 (5% to 7%) may go dry at MOs and 249 to 473 (34% to 36%) may go dry at MTs.
- Of the 20 to 35 public water system wells, one may go dry at MOs and at MTs.

State Water Board staff strongly recommends that the GSAs conduct an independent analysis of the potential impacts of proposed MOs and MTs and projected groundwater management outcomes on active domestic wells and public water supply wells, update the GSP with this information, and consider how those effects compare with the GSAs' definition of an undesirable result related to declining groundwater levels. Additionally, the GSAs should estimate and describe the population served by the wells in the subbasin which are not protected at MTs. In order to ensure that all necessary and relevant information is considered in the GSP, the GSAs should engage domestic well users, public water systems and state small systems, and other stakeholders as part of both the analysis and the discussion of what constitutes an undesirable result.

3. If a reasonable conclusion, drawn from the GSAs' evaluation and projections including the analysis described in #2, is that the proposed allowable decline in groundwater levels could constitute a significant and unreasonable depletion of supply, the GSAs should adjust MTs (and amend the analysis described in #2) or otherwise mitigate for impacts to wells. For mitigation, the GSAs could develop and implement a well mitigation plan that would lessen the significance of the impact by replacing or repairing domestic or drinking water system wells impacted by groundwater level declines. The GSAs could also support expansion of public water system boundaries to private well communities or consolidation of smaller drinking water systems dependent on at-risk wells with larger public water systems. This would involve identifying vulnerable areas where consolidation or extension of service is feasible. Consolidation efforts may include: (1) providing financial assistance, particularly for low-cost intertie projects that are adjacent to larger systems, (2) working with County Planning agencies to ensure that communities

[4] Detailed methodology available upon request.

[5] See discussion of well retirement age on page 12 of the UC Davis Center for Regional Change's analysis.

served by at-risk wells are annexed into the service areas of larger water systems to limit barriers to future interties, and (3) facilitating outreach and introductions between small water systems and owners of domestic wells and larger water systems to assist in developing future partnerships.

4. While the GSP describes well permitting processes in each applicable county, and mentions that "Kings County Building Division will be engaged to modify the water well ordinance (Ordinance No. 587) to coordinate well permitting with the GSP" (Section 7.2.2.4), it lacks specific information regarding whether or how the GSAs will evaluate new permits, address possible impacts from new permits, or work with the county to address concerns. State Water Board staff recommends that GSAs work with county governments to encourage alignment between the GSP and county well permitting programs. As encouraged by SGMA, GSAs should request counties forward permit requests for new wells, for enlarging of existing wells, or for reactivation of abandoned wells. (Water Code, § 10726.4.) Shifting demand to sites near existing wells may cause groundwater level declines and effects on beneficial users of water in areas of the subbasin not well represented by an RMS. Increased production from these wells may also make it more difficult for the GSAs to avoid undesirable results and achieve sustainability within the implementation period.

Groundwater Quality

5. The GSP states that within the subbasin, "no correlation has been found between water quality and groundwater levels" (Section 4.4.1.4, p. 4-21) and "groundwater quality will not be significantly and unreasonably impacted by the implementation of this GSP" (Section 4.3.4.4, p. 4-19). The GSP further states that if groundwater quality degrades from current conditions (baseline) to exceeding regulatory standards (MTs), the GSAs will evaluate whether the implementation of the GSP caused the degradation.

   Not all water quality impacts to groundwater must be addressed in the GSP, but significant and unreasonable water quality degradation due to groundwater conditions occurring throughout the subbasin, and that were not present prior to January 1, 2015, must be addressed in the GSP. Both groundwater extraction and the implementation of projects to achieve sustainability may cause impacts from migration of contaminant plumes, changes in the concentration of contaminants due to reduction in the volume of water stored in the subbasin, or release of harmful naturally occurring constituents. The GSAs should particularly consider whether any groundwater quality constituents in the subbasin may impact the State's policy of protecting the right of every human being to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes (Water Code, §106.3). Coordination by the GSAs with agencies that oversee the

remediation of existing groundwater contamination is highly recommended, both in setting MTs and developing a plan of implementation.

Regarding the assertion that no causation or correlation can be drawn between groundwater levels and groundwater quality: although this assertion could be consistent with data currently available, the GSP should include a plan to revisit this issue at regular intervals when more data are available. This future review will allow the GSA to make decisions based on the data including the possibility of setting MOs and MTs associated with groundwater quality as it relates to groundwater levels. This is particularly important as it relates to drinking water quality, both of domestic private wells and wells used by state small and public water systems.

6. The GSP should outline the process the GSAs would use to decide whether GSP implementation caused or exacerbated an MT exceedance for water quality. In addition, the GSP should provide the data supporting its conclusions, which will allow reviewing regulatory bodies to consider how adequately the GSP addresses undesirable results related to water quality degradation. The GSAs should also coordinate and share the data with other local and regional groundwater monitoring efforts.

7. The GSP should more explicitly define its MTs and MOs for degradation of groundwater quality. The GSP includes maps, and the Basin Setting (Chapter 3) includes descriptions of water quality impacts from total dissolved solids, arsenic, nitrate and specific volatile organic compounds. The MOs are described as degradation from current baseline and MTs as exceedances of regulatory thresholds due to implementation of the GSP. The GSP notes that the GSAs will rely on existing groundwater quality monitoring programs, and monitoring wells are tabulated and mapped in the GSP. While it can be assumed that monitoring will include constituents described in the Basin Setting and maps, the GSP should explicitly state the constituents that will be tracked by the monitoring network as well as include tables of the baseline concentrations (MOs) for each monitoring well and regulatory threshold concentrations (MTs) for each constituent. The GSP should also explain what it means to set MOs as “degradation beyond existing groundwater conditions” (Section 4.4.1.4, p. 4-21).

8. While not discussed in the Basin Setting or maps, GSP implementation should also include MOs, MTs, and monitoring for uranium and gross alpha radioactivity based on their prevalence above their respective maximum contaminant levels in the subbasin. Staff have attached maps from the State Water Board Groundwater Ambient Monitoring and Assessment Program’s (GAMA) database (https://

gamagroundwater.waterboards.ca.gov/) showing uranium and gross alpha radioactivity impacts in subbasin groundwater (Figures 1 and 2 in Appendix).

In deciding which water quality constituents to consider when setting SMC, the GSAs should consider the best available water quality information for the subbasin, including data used to develop the hydrogeologic conceptual model, geochemistry of geological formations (for the potential of mobilization of natural constituents), and groundwater uses in the vicinity of the representative monitoring sites (RMS) and the subbasin as a whole when determining which constituents to evaluate for MTs. Different constituents may cause undesirable degradation of water quality in different areas based on the purposes for which groundwater is beneficially used.

9. Please note that historical and recent water quality monitoring information from public water systems can be accessed using the public version of the State Water Board's Drinking Water Watch database at https://sdwis.waterboards.ca.gov/PDWW/. The Drinking Water Watch database can be queried by public water system name or system number (see #15 below).

Land Subsidence

10. The GSP's discussion of subsidence ignores known, existing subsidence-related problems in the subbasin, including problems identified by one of the subbasin's GSAs. The GSP includes subsidence as an undesirable result but only considers subsidence impacts to the California Aqueduct, which is located along the western boundary of the subbasin, to be significant and unreasonable (Section 4.2.1.3, p. 4-8). This section of the California Aqueduct has experienced minimal subsidence and is located away from areas of significant groundwater pumping. The GSP also states that "while subsidence impacts to various facilities have been identified throughout the subbasin, it currently doesn't appear that the impacts are significant and unreasonable" (Section 4.2.2.3, p. 4-11). The GSAs should expand their analysis to include the following known subsidence-related impacts that are not discussed within the GSP:

    a) The area around the town of Corcoran, located within the subbasin, is known to have experienced substantial subsidence over time, which has resulted in the need to raise flood control levees.[6] Corcoran is located on the edge of the Tulare Lake dry lakebed, which can flood in wet years.

    b) The Southwest Kings GSA (SWKGSA), one of the GSAs in the subbasin, reported in an April 29, 2020, public comment letter to DWR that lift stations

[6] Nidever, Seth. "Fearing flood, Corcoran raises levee." *The Sentinel,* 10 Mar. 2017.

have been installed in some canals because of land subsidence. SWKGSA also stated that most of their governing board and landowners have serious concerns regarding the groundwater overdraft and land subsidence within the subbasin and are concerned about the lack of clear management actions to address subsidence in the GSP.

c) A study that focused on subsidence and water quality in the subbasin area found that continued subsidence due to overdraft may result in increasing groundwater arsenic concentrations over time by releasing high arsenic containing pore water from compacting clay layers into the more transmissive aquifer materials.[7]

Depletion of Interconnected Surface Water

11. The GSP does not adequately demonstrate that depletions of interconnected surface water are not present in the subbasin. The GSP argues undesirable results related to depletion of interconnected surface water are not occurring in the subbasin and are not likely to occur. Since Tulare Lake was drained many years ago, the GSP argues surface waters are disconnected from the regional aquifer. However, first encountered groundwater, which is considered perched, is found between 0 and 20-feet-deep in most of the subbasin. Furthermore, wetlands and phreatophytic vegetation are present within and adjacent to the subbasin as discussed in the GSP (Section 3.2.8.1, pp. 3-35 through 3-37). The GSP does not include any analysis of the effects of continued overdraft on shallow groundwater and potentially interconnected surface water, and consequently ignores groundwater-dependent ecosystems. The GSP should provide additional information and analysis to consider all environmental beneficial uses of groundwater and to consider surface water and groundwater connectivity.

Projects and Management Actions

12. Descriptions of projects and management actions are too vague to understand whether their implementation is feasible and likely to prevent undesirable results in the subbasin, particularly in light of the informational deficiencies addressed above. Projects and management actions include demand reduction (voluntary fallowing, dry farming) and supply augmentation (groundwater recharge basins, surface storage in ponds, canal/ditch improvements). If implemented, the GSP states that, by 2040, demand reduction would save approximately 44,000 acre-feet per year (AF/Y) and supply augmentation would add approximately 137,000 AF/Y. Descriptions of projects and management actions are conceptual and do not

[7] Smith, R., Knight, R., & Fendorf, S. (2018). Overpumping leads to California groundwater arsenic threat. Nature Communications, 9(1), 2089.

specify: the criteria that would trigger implementation (Cal. Code Regs., tit. 23, §354.44, subd. (b)(1)(A)); a time-table for implementation (Cal. Code Regs., tit. 23, §354.44, subd. (b)(4)); a description of how the GSAs plan to meet costs (Cal. Code Regs., tit. 23, §354.44, subd. (b)(8)); or an explanation of the source and reliability of the water on which the projects rely (§354.44, subd. (b)(6)). The GSP does not include a clear commitment to implement the projects. The GSP states that project "locations will be identified by each GSA and their respective partners within their area as soon as the need arises and funding is available" (Section 6.3.1.1, p. 6-5). State Water Board staff recommends that the GSAs provide more information on the proposed projects and management actions, identify funding, identify water sources (where appropriate), and develop specific plans and timelines for implementation.

Projects Reliant on New or Amended Water Rights

13. Implementing some of the projects identified in the GSP may require new or amended water rights. If a project would rely on existing water rights, the GSAs should identify the water right identification numbers and other relevant details. It may be unreasonable for the GSP to assume that projects that currently lack adequate water rights for implementation can obtain either new water rights or modifications to existing water rights within a timeframe that will allow the project to contribute to the GSP achieving sustainability. For the GSP to demonstrate a likelihood of attaining the sustainability goal, the GSP should discuss the timing for obtaining approvals and describe any uncertainties, such as water availability in source streams (e.g., Will less surface water be available with projected Bay-Delta Plan implementation? Is the source on the inventory of fully appropriated streams? Can potential protests be anticipated from downstream water users?).

    Here, for example, the GSP recognizes that surface water availability will decrease as GSAs in upstream subbasins implement their own GSPs. Some of the sources of water proposed in the GSP are "fully appropriated" for some of the year (e.g., Poso Creek) or year-round (e.g., Kings River, Tule River, Kaweah River, and Kern River), meaning those sources have insufficient supply for new water right applications. For projects reliant on new water rights on fully appropriated streams, the GSP should explain how the fully appropriated designation affects project timelines and feasibility.

    a) New surface water right permits: An applicant must gather all information necessary to complete the application, which could be extensive. Once the application is publicly noticed, other water right holders may protest the project based on potential injury to their water rights. Parties may also protest if the project has the potential to harm public trust resources. The GSAs should

contact the Division of Water Rights' Permitting and Licensing Division or consult the Division's Permitting and Licensing Frequently Asked Questions (https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/faqs.html) to develop an informed timeline for project implementation that includes necessary water right actions.

b) Amendment of an existing surface water right: The time required to amend an existing water right depends on multiple factors, including but not limited to whether the change is minor, major, or controversial. The GSAs can learn more from the Division of Water Rights' Petitions Frequently Asked Questions (https://www.waterboards.ca.gov/waterrights/water_issues/programs/petitions/faqs.html).

14. Given there is no certainty that a particular water right permit or petition will ultimately be approved, or when, it is important the GSP clarify proposed timelines for projects and management actions and consider how changes in those timelines could impact the subbasin's ability to achieve sustainability by 2040. The GSP should also identify alternative groundwater management strategies to achieve sustainability (e.g., demand reduction), if anticipated water supplies such as purchases or new or amended water rights are unsuccessful. This would ensure the GSAs can effectively evaluate when they should move towards implementing such contingency projects or management actions if primary projects or management actions are not implemented on projected timelines. To this end, the GSP should also identify well-developed demand management options with clearly defined triggers in the event that proposed supply augmentation volumes are not fully achieved.

Engagement

15. The GSAs should engage with all public water systems which rely on groundwater in the subbasin to ensure the GSP protects drinking water users. To facilitate this, State Water Board staff has attached a list of public water systems with wells in the subbasin as of August, 2021. Please contact the Board's Division of Drinking Water at DDW-SAFER-NAU@waterboards.ca.gov with any questions.

16. The GSP should be more explicit about how the concerns of local beneficial users, particularly disadvantaged communities reliant on groundwater, and other stakeholders were integrated into development of SMC and monitoring networks and selection of RMS and projects and management actions. SGMA requires consideration of the interests of diverse social, cultural, and economic elements of the populations within the subbasin during GSP development. Collaborative and inclusive processes can make GSPs more resilient by increasing buy-in and trust,

improving compliance, and enhancing the quality of information on which GSPs are based. It is important that GSAs send appropriate notices; hold meetings in times, places, and manners that support effective engagement; and acknowledge issues raised. GSAs should consult with individuals or groups when actions may impose direct or indirect costs on those entities. Good governance can build trust and reduce regulatory compliance risks. Consultation, for example, could help a GSA avoid or mitigate an action that might directly or indirectly cause a drinking water system to violate its permit or face new compliance costs due to reduced availability of water or lower water quality.

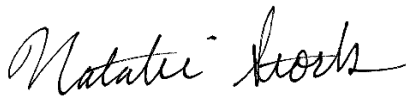
17. The Santa Rosa Rancheria of the Tachi-Yokut Tribe, which the GSP lists as the only California Native American Tribe located within the subbasin, relies primarily on groundwater to supply water for approximately 700 residents. According to Table 6-5 (Projects and Management Actions), development of groundwater allocations "may take into consideration" Native American Tribes. As the Tachi-Yokut Tribe is federally recognized, the GSP should also state that federally reserved groundwater rights shall be respected in full in the GSAs' management of the subbasin.

18. State Water Board staff appreciate that the Communication and Engagement Plan (C&E Plan) indicates that the GSAs sent a Sacred Lands File & Native American Contacts List Request to the Native American Heritage Commission. The South Fork Kings GSA (SFKGSA) sent a letter to the Tachi-Yokut Tribe. The Tribe's EPA director attended an SFKGSA meeting and is included on an interested parties list. According to the C&E Plan, the letter from the SFKGSA to the Tribe should be included with the C&E Plan, but the letter appears to be missing from the GSP. Staff recommend the letter be added to the C&E Plan for transparency. Also, the C&E Plan should clarify whether the Native American Heritage Commission request included the entire subbasin or just a subset of the GSAs. Finally, the GSAs should continue to engage the tribes, particularly at key milestones of the implementation process.

In conclusion, State Water Board staff is concerned that the GSP allows for continued groundwater overdraft without any plan to mitigate potential impacts to domestic wells or drinking water systems. Potential issues associated with groundwater quality, subsidence, and interconnected surface water are not adequality analyzed. The proposed projects and management actions, as described in the GSP, do not appear to achieve long-term sustainability based on the model results presented. The feasibility of the GSP is uncertain because the GSP does not describe specific projects or management actions and thus lacks sufficient information regarding how the projects and management actions will be implemented.

If you any have questions regarding these comments, please do not hesitate to contact State Water Board Groundwater Management Program staff by email at SGMA@waterboards.ca.gov or by phone at 916-322-6508.

Sincerely,



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Enclosures: Appendix – Select constituents in Tulare Lake Subbasin wells

Public water systems with wells in the Tulare Lake Subbasin as of August, 2021 (see .xlsx attachment within PDF file)

Appendix – Select constituents in Tulare Lake Subbasin wells

Non-detects are green, detections are yellow and orange, and MCL exceedances are red. Figures developed from [State Water Board Groundwater Ambient Monitoring and Assessment (GAMA) Program's database](https://gamagroundwater.waterboards.ca.gov/) (https://gamagroundwater.waterboards.ca.gov/)

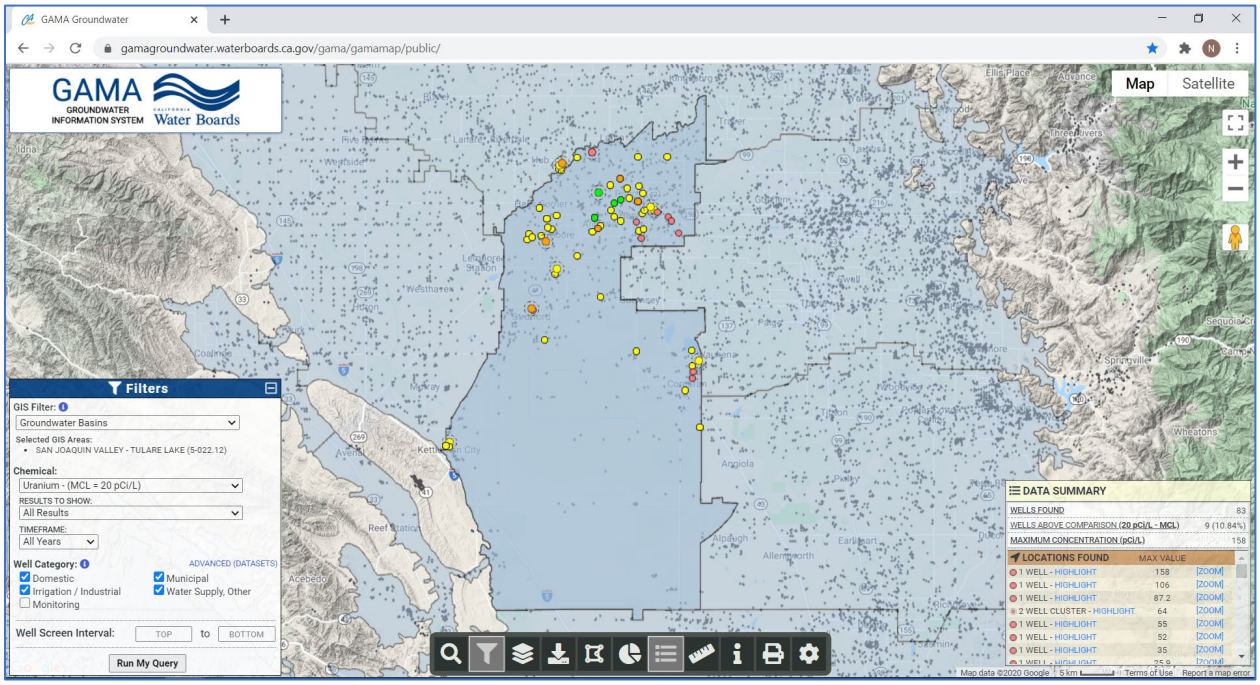

Figure 1. Uranium in Tulare Lake Subbasin wells

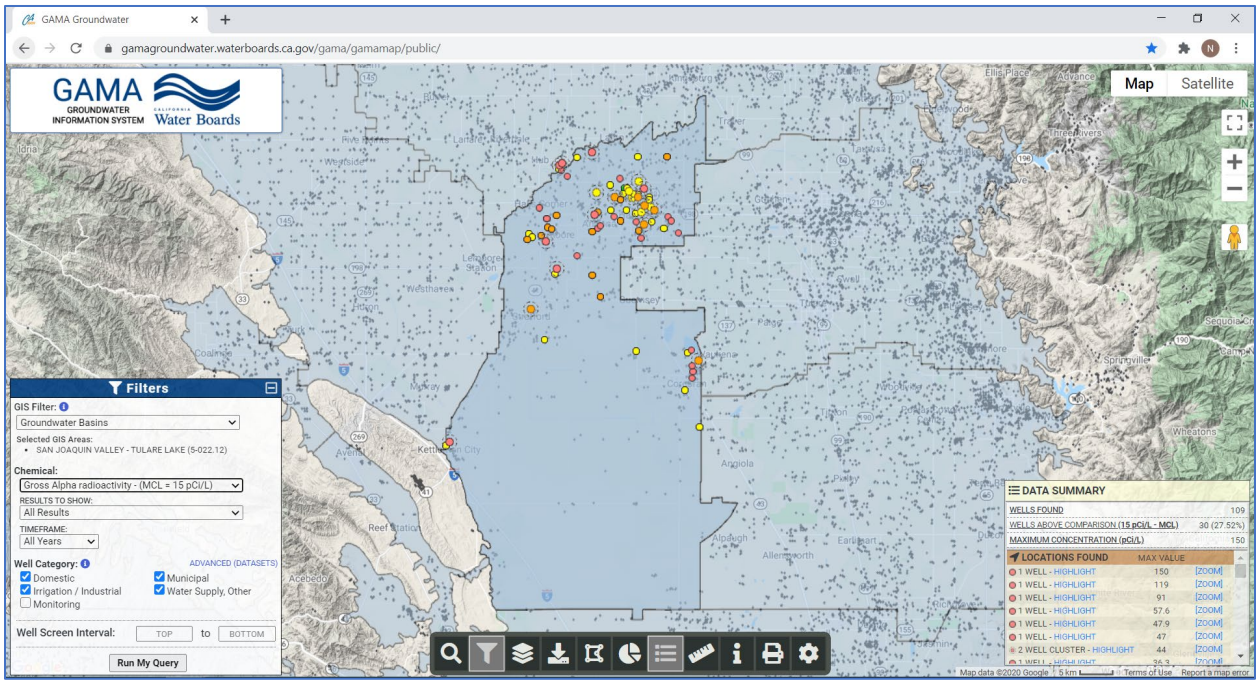

Figure 2. Gross Alpha Radioactivity in Tulare Lake Subbasin wells