



Medicine Lake Citizens for Quality Environment

MLCFQE
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June 24, 2020

Brett Wyckoff
Senior Engineering Geologist
Department of Water Resources
901 P Street
P.O. Box 942836
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Sent via electronic mail

Re: Bulletin 118 2020 update

Dear Mr. Wyckoff,

On behalf of the above-listed organizations, we would like to offer the following comments to inform and improve the 2020 Bulletin 118 update. This will be the first major update of Bulletin 118 since 2003¹, and policy and technical advances since that time provide an opportunity to vastly improve the 2020 edition.

While the Sustainable Groundwater Management Act (SGMA) has created new tools for protecting and understanding California's most productive groundwater basins, Bulletin 118 plays a critical role in providing an in-depth look at all groundwater in California. The advent of CASGEM, the effort to digitize hundreds of thousands of well drilling reports and the

¹ The California Groundwater Update 2013 and Bulletin 118 Interim Update provided guidance on identification of critically overdrafted basins and implementation of the Sustainable Groundwater Management Act.

development of GAMA Geotracker at the State Water Board have all dramatically increased our understanding of the importance of and threats to our groundwater supplies.

We appreciate the vision provided by staff when we met on this subject in 2019 and are excited about your plan to digitize Bulletin 118 by providing informative webpages about each of the state's 515 identified basins. However, we also believe a few fundamental changes could make the 2020 update more protective of this valuable resource for all Californians and the ecosystems that already rely on groundwater.

Inevitably, SGMA does not fully protect groundwater or everyone who depends upon it. Most strikingly, 40% of wells² and 70% of groundwater dependent ecosystems are located outside of the boundaries of a SGMA-regulated basin. While we understand that SGMA cannot cover every groundwater source in the state, we think that additional protections are appropriate, practicable and possible. Moreover, the cost of *not* protecting these resources will be disproportionately borne by residents reliant on shallow wells and by species reliant on those ecosystems.

We have identified the following as critical needs that need to be addressed in this update:

- Providing oversight for low priority basins
- Protecting currently unregulated groundwater sources
- Revising the definition of a groundwater basin
- Ensuring that recharge areas are properly identified and protected
- Including tribal water uses as a determining factor for basin prioritization and monitoring requirements
- Incorporating basin-specific climate change impacts into basin information pages

Low priority basins

The most recent basin boundary process has increased our concerns about how the Department intends to recognize and protect low-priority basins. These basins may be a comparatively low priority, but they provide significant surface water flow, support tens of thousands of domestic and production wells, and provide flow to streams that carry some of the state's irreplaceable and iconic salmon runs. Specifically, we are concerned that

- Basins with significant surface-groundwater interaction and groundwater dependent ecosystems are not considered priorities for protection³;
- Low-priority basins near SGMA-regulated basins are vulnerable to de-watering;
- Water quality data sources need to be expanded;
- Data collection that could change the status of basins is not being done.

The current CASGEM program in many basins is insufficient to monitor changes in groundwater levels that can impact shallow domestic wells and seasonal streamflow. The B118 update

² 3/11/20 email exchange with John Borkovich, PG, Groundwater Monitoring Section Chief, State Water Resources Control Board

³ Letter dated May 30, 2019 from the Department of Fish and Wildlife to the Department of Water Resources contesting the reprioritization of the Wilson Grove Highland Formation Groundwater Basin

provides an opportunity to improve our understanding of these basins by improving data collection to better inform basin health and more quickly identify when a basin's priority should be re-evaluated. Additionally, many, if not most, CASGEM networks were not designed to measure surface-groundwater interactions.

The digitizing of Bulletin-118 groundwater updates also provides an opportunity to integrate other state databases in the process of describing and assessing basins, pursuant to AB 1755 (Dodd, 2016). For example, the Department should include all water quality information from the State Water Board in its digital basin descriptions, not just data from GAMA and public supply wells.

Among the water quality data sources available are those developed pursuant to the requirements of SB 4 (Pavley, 2013). The US Geological Survey has undertaken a comprehensive assessment of groundwater quality in basins proximate to oil and gas wells subject to enhanced oil recovery efforts. One outcome of that effort has been a discovery of gases in the Fox Canyon GMA that could have water quality impacts for potable water supplies. Pending additional investigation of whether those gases are naturally occurring or a product of oil and gas operations, the Ventura County Board of Supervisors has taken the precautionary step of placing a moratorium on any new wells using steam injection. DWR should consider proximity of oil and gas production wells, particularly those that use steam injection, to low priority basins and when such proximity should trigger additional monitoring.

Another emerging data source is the requirement in the State Water Boards' Irrigated Lands Regulatory Program, which requires nitrate testing of on-farm agricultural wells throughout the state. That data can provide key information about the prevalence of the state's most ubiquitous man-made contaminant.

Finally, inclusion of water quality data from monitoring wells provides basic information about the location and extent of groundwater plumes and provides a good resource for determining whether a basin warrants a higher priority.

At a minimum, CASGEM monitoring wells in each basin should be reviewed to ascertain whether they are sufficient to track impacts to interconnected surface waters and shallow wells in these basins. Where low priority basins abut SGMA regulated basins, monitoring wells should be required at the border between the basins to ensure that low priority basins aren't dewatered. Additionally, the development of the stream gage monitoring network mandated by SB 19 (Dodd, 2019) provides an opportunity to identify and track surface and groundwater interconnections in these areas and could provide important data for future basin priority processes. Promising research⁴ on alternative methods of measuring the impacts of groundwater depletion on streamflow could aid these efforts.

Recommendation: As part of B118 digitization process, identify additional data needs for low-priority basins to track interconnected surface waters and areas of shallow wells. Develop more precise triggers for re-evaluating a basin priority, perhaps by developing metrics to identify a

⁴ Zipper, Gleeson, et. al., Rapid and accurate estimates of streamflow depletion caused by groundwater pumping using analytical depletion functions, <https://agupubs.onlinelibrary.wiley.com/action/showCitFormats?doi=10.1029%2F2018WR024403>

basin as “at risk.” Metrics could include drilling of new production wells that significantly increase basin production, proximity of a SGMA-regulated basin, or identification of ecosystem impacts.

Unregulated groundwater sources

One of the most productive basins in California is not recognized as a groundwater basin and remains unprotected. The groundwater basin underlying the Medicine Lake Highlands provides significant flows to the Fall River, Pit River, Shasta Lake Reservoir and the Sacramento River, and is threatened by extensive industrial geothermal development involving hydraulic fracturing. Because it is a volcanic feature, it is not recognized as a groundwater basin. This resource is unique, but not unusual; the Southern Cascade volcanic aquifers are strikingly unprotected, despite being major sources of surface water recharge and domestic supply.

The same circumstance occurs in the Mount Shasta Area, specifically on the SW side of the mountain, where the Headwaters of the Sacramento River are located at Big Springs. This area was once included in Bulletin 118 but removed in a past update. The area is surrounded by approximately 100 domestic wells and is now at risk due to industrial groundwater extraction at the spring water locations by the Water Bottling Industry.

Finally, a significant number of California residents, particularly in the Trinity Alps and Sierra Nevada range, rely on fractured rock aquifers for their drinking water supplies. Recent studies conducted by the US Geological Survey in the Butte County area show that groundwater of significant age is being extracted to serve a growing population⁵. A better understanding of the recharge characteristics and storage potential of the largest of these aquifers is needed, given the increasing reliance on these supplies.

Recommendation: Develop a plan to review key volcanic and/or fractured rock basins that should be identified as groundwater basins in Bulletin 118, added to the CASGEM monitoring program and prioritized for potential SGMA oversight. We recommend beginning with the Medicine Lake basin, for which a significant level of information is available (see Appendix A) as well as consideration of returning the Mount Shasta area to Bulletin 118 as a Low Priority Basin.

Definition of a Groundwater Basin

We recommend updating the definition of a groundwater basin as it has been used in recent versions of this report:

- Limiting basins to “alluvial aquifers” eliminates consideration of water resources in large swaths of the state. The Trinity Alps, for example, have significant volcanic deposits storing large amounts of water that provide important surface water flows to the State Water Project. Under the current definition, these flows are neither recognized nor protected. The case study in Appendix A provides substantial evidence as to the need to identify and protect this resource.

⁵ Levy, Z.F., Fram, M.S., and Taylor, K.A., 2020, Effects of surface-water use on domestic groundwater availability and quality during drought in the Sierra Nevada foothills, California: U.S. Geological Survey Fact Sheet 2019–3077, 4 p., <https://doi.org/10.3133/fs20193077>.

- By limiting horizontal extent of basin boundaries to soil characteristics rather than actual production, we end up with situations like the Shasta Valley aquifer. The process to expand the boundaries of this basin was made more difficult by the limitations of the definition and allowed some areas (in the vicinity of Weed) to be excluded from the revised basin boundary. Those areas are now vulnerable to overdraft because areas of the basin are not recognized, even though water extracted from those areas impacts groundwater within the recognized basin boundaries.
- By limiting the vertical extent (basin bottom) to the base of freshwater (BFW; TDS<1000ppm), we exclude 76-79% of usable groundwater in California⁶. Groundwater wells in 20% of subbasins are deeper than the reported BFW, meaning that brackish groundwater is already being utilized statewide. Further, the recently adopted basin plan amendments for salt and nitrate control in the Central Valley allow salinity levels at 1000ppm TDS as a long-term average, with the ability to rise to short-term levels of up to 1,500 TDS.⁷ Finally, the State Water Resources Control Board's Sources of Drinking Water Policy (Resolution No. 88-63) considers waters up to 3000 TDS suitable for use as a drinking water source. This definition is not just impractical, but it could inhibit the ability of some GSAs to comply with mandated sustainability indicators by allowing unlimited extraction of groundwater below the BFW.

Recommendation: The Department should revise its definition of a groundwater basin to consider

- actual and potential production of a basin rather than an exclusive reliance on the presence of alluvial soils.
- Eliminating the salinity limit for determining BFW, where wells are extracting water below BFW.
- Changing the BFW salinity limit to the 3000 TDS figure used in the State Water Resources Control Board's Sources of Drinking Water Policy.

Recharge areas

As currently defined, the state's groundwater basins often exclude significant recharge areas. These areas are then vulnerable to overdraft from agricultural and industrial pumpers located outside of the basin and not subject to oversight. Groundwater managers struggle to protect recharge areas that are located outside of defined basins boundaries. We are concerned that limiting basin boundaries strictly to dimensions of the underground water storage discourages Groundwater Sustainability Agencies (GSAs) from considering management of the full watershed as a mechanism to ensure sustainability.

⁶ Kang, M., D. Perrone, Z. Wang, S. Jasechko, M. Rohde. Beneficial use and contamination potential of deep groundwater in California. Submission to PNAS.

⁷ Sacramento River and San Joaquin River Basin Plan and the Tulare Lake Basin Plan - 1 - Salt and Nitrate Control Program, Adopted per Central Valley Regional Water Quality Control Board Resolution R5-2018-0034, final adoption per State Water Resources Control Board Resolution No. 2019-0057

AB 359 (Huffman, 2011) instituted requirements for local groundwater management entities to map recharge areas as a pre-requisite for state funding. To the extent such information is available for any of the low priority basins not covered by SGMA, it should be included on the basin webpage. Other available data sources, such as USGS groundwater investigations, should also be used to identify recharge areas.

Recommendation: Post maps of recharge areas for SGMA priority basins (as provided by submitted Groundwater Sustainability Plans) on B118 webpages. Identify and map agricultural and industrial production wells outside of basin boundaries whose operation could impact basin sustainability. As part of digitization of B118 low priority basins, include maps of recharge areas as available and identify gaps in understanding of recharge processes to be addressed in future updates. Approve applications for basin boundary changes that are intended to incorporate recharge areas into the planning area of a Groundwater Sustainability Agency.

Tribal engagement

GSA's are falling short in their responsibility to identify tribes in their area and invite them to participate "fully" in the activities of the GSA. For basins not protected by SGMA, even those limited statutory obligations are missing. The digitization of B 118 basins provides an opportunity for DWR to address its own obligation to recognize and support tribal sovereignty through consultation to identify and protect basins that support tribal water uses.

Recommendation: DWR should actively consult with tribes in order to

- 1) identify and map basins with tribal water rights;
- 2) include tribal beneficial uses of groundwater and interconnected surface waters as a weighting factor in basin prioritization;
- 3) Implement sufficient monitoring to understand current and potential impacts to tribal beneficial uses.

Incorporating climate projections

We recognize that the update will assess impacts from climate change on groundwater resources. As the agency responsible for the state's climate assessment, we are interested in learning your plans for incorporating climate modeling into the B 118 update. We encourage the agency to assess impacts under a range of wet and dry future alternatives and at different periods. The current selected models for wet and dry consider state-wide averages that may not necessarily represent dry and wet conditions for specific basins.

Recommendation:

- In the climate change assessment, consider not only yearly and monthly averages but also analyze how intra and interannual climate projections may impact groundwater resources in the basin (e.g., multiyear droughts).
- Assess impacts throughout the following 80 years (as climate change intensifies and impacts develop).
- Provide basin-specific impacts under dry and wet future scenarios.

Conclusion

We are excited to be part of the discussion of how to protect all groundwater resources in California. We look forward to partnering with the Department to make this happen in a timely and science-based process.

Sincerely,

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Emily, Finnegan, Water Project Manager, Local Government Commission

Esperanza Vielma, Executive Director, EJCW

Janie Painter, Director, Medicine Lake Citizens for Quality Environment

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Jose Pablo Ortiz Partida, Western States climate and water scientist, Union of Concerned Scientists

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cc: Wade Crowfoot, Secretary, California Natural Resources Agency

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