SIERRA CLUB
SANTA LUCIA CHAPTER

California Department of Water Resources
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RE: Paso Robles Basin Subbasin Final Groundwater Sustainability Plan

May 12, 2020

Sierra Club comments on 3-004.06 PASO ROBLES AREA

The Paso Robles basin Groundwater Sustainability Plan (Plan)) does not appear to be up to the task of preventing chronic lowering of groundwater levels, preventing degradation of groundwater quality and preventing reduction in groundwater storage. Failing these 3 sustainability indicators, additional depletion of interconnected surface waters will result.

Data Gaps

The Plan identifies numerous data gaps that will hinder the goals of the GSP but offers little guidance or mandatory prescriptions to remedy the data failures.

> Actual sustainable yield will be determined once data show undesirable results have not occurred. Thus, the sustainable yield estimate will be revised in the future as new data become available from monitoring data that evaluate the presence or absence of undesirable results. (GSP 6-2)
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> During early implementation of the GSP, additional data will be collected to refine Subbasin understanding. These new data will be used to recalibrate the GSP model after the GSP is adopted. New hydrologic data and the calibrated model will be used to adaptively implement sustainability management actions, and possibly projects, to ensure that progress toward the sustainability goal is being achieved. (GSP 6-6)
>
> The monitoring networks presented in this chapter are based on existing monitoring sites. It will be necessary to expand the existing monitoring networks and identify or install more monitoring sites to fully demonstrate sustainability…. (GSP 7-1)

Over the past two decades, the County and the City of Paso Robles have commissioned a series of basin studies to gather information on the state of the basin and options. Cumulatively the studies show a continuous decline in groundwater storage coupled to and exacerbated by expansion of irrigated agriculture.

The County has collected extensive data, which are the bases for the studies. The most recent report, “Refinement of the Paso Robles Groundwater Basin Model and Results of Supplemental Water Supply Options Predictive Analysis” (December 2016 GEOSCIENCE Support Services), developed an enhanced computer modeling platform that was carefully peer reviewed. I attended/participated in peer review subcommittees.

It’s beyond the time to take action rather than pretend there isn’t enough data to immediately initiate mandatory steps to halt the decline of the basin. We have sufficient data to act now – refine later. The Plan is wholly insufficient in detailing steps for immediate mandatory actions.

<u>Interconnected Surface Water</u>

We are concerned about the dismissal of thresholds for undesirable results for interconnected surface waters and the conclusion that “Therefore, the reduction in groundwater storage minimum thresholds is unrelated to interconnected surface water at this time.” (p 8-20)
Each of the previous groundwater basin studies has studied the interrelated mutual nature of the recharge of the formation and the alluvium. From FUGRO WEST Paso Robles Groundwater Basin Water Balance Review and Update march 2010:

> The alluvial aquifers are a significant source of recharge to the Paso Robles Formation, particularly along the western region of the Basin and Subbasin where the Salinas River alluvium is located. Although the shallow alluvium and the underlying Paso Robles Formation are distinctly different aquifers, the low permeable layer that separates them varies spatially in terms of thickness and permeability. Consequently, recharge of the Paso Robles Formation from alluvium underflow varies along the stretches of alluvial deposits in the Basin and Subbasin. In addition to the thickness and permeability of the sediments separating the alluvium from the Paso Robles Formation, the rate of recharge is also dependent on the hydraulic head gradient across these sediments (i.e., difference in groundwater levels between the alluvium and the Paso Robles Formation). Pumping in the Paso Robles Formation may result in significant drawdown of groundwater levels in this aquifer, thus increasing the hydraulic gradient and subsequently the recharge rate from the overlying alluvium.
>
> The hydraulic head gradient between the aquifers in a particular area can be determined by measuring groundwater levels in wells screened in the alluvium and subtracting those from measured groundwater levels in nearby wells screened in the Paso Robles Formation. The actual amount of groundwater in storage in the Paso Robles Formation is significantly greater than that of the shallow alluvial aquifers. Groundwater in storage within the Paso Robles Formation in the Basin from 1981 to 1997 was estimated to be 30,534,000 AF on an average annual basis. The combined area of alluvium in the Basin (i.e., including the Salinas River, Estrella River, Huer Huero Creek, San Juan Creek, and other small creeks in the Basin) is 49,500 acres. Using the

spatial distribution of specific yield and groundwater levels during the water year of 1980 from the Basin groundwater flow model, the volume of groundwater in storage in the combined area of alluvium was estimated to be 681,974 AF. In particular, the Salinas River alluvium and its tributaries accounted for 447,480 AF of this storage volume while the Estrella River and its tributaries accounted for 234,494 AF of this total. The combined groundwater in storage for both the alluvial aquifers and the underlying Paso Robles Formation is on the order of 31,215,974 AF. Overall, groundwater in storage in the alluvial aquifers within the Basin accounts for only about 2.1 percent of the total groundwater in storage in the entire Basin. Groundwater in storage within the Paso Robles Formation in the Subbasin from 1981 to 1997 was estimated to be 513,600 AF on an average annual basis. Within the Subbasin, groundwater in storage in the Salinas River alluvium was estimated to be 134,274 AF. The combined groundwater in storage for both the Salinas River alluvium and the underlying Paso Robles Formation within the Subbasin is on the order of 647,874 AF. Overall, groundwater in storage in the alluvium within the Subbasin accounts for 21 percent of the total groundwater in storage in the Subbasin. In contrast to the Basin where the total groundwater in storage is predominantly in the Paso Robles Formation, the alluvium in the Subbasin accounts for a significant percentage of the total groundwater storage in the Subbasin. Although the total groundwater in storage in the alluvial aquifers is small relative to the Paso Robles Formation, the alluvial aquifers are a significant source of recharge to the underlying Paso Robles Formation. For example, streambed percolation in the Basin accounts for approximately 38 percent of the total annual recharge on an average annual basis. Moreover, in the Subbasin streambed percolation accounts for as much as 62 percent of the total annual recharge on average. (P 13-4 5.0 INTERACTION OF SHALLOW ALLUVIUM AND PASO ROBLES FORMATION)

The GEOSCIENCE 2016 model refined interactive modeling. “Refinement of the Paso Robles Groundwater Basin Model and Results of Supplemental Water Supply Options Predictive Analysis” (December 2016 GEOSCIENCE Support Services):

The original Basin Model combined MODFLOW recharge and streamflow packages to simulate streamflow recharge and discharge. This method essentially simulates surface and subsurface flow as a continuum, for the purpose of considering all exchanges of water between the land surface and the underlying groundwater. Until recently, this was a widely applied and accepted method. However, the method is unable to account for the time delay which occurs for water to flow (percolate) from the surface water body (streams, etc.) to the water table. As shown in the conceptual profile, an alluvial groundwater basin located in an arid region (such as the Paso Robles Groundwater Basin), the depth to the water table (or unsaturated zone) can be substantial (typically from tens to hundreds of feet).

Therefore, the inability to account for this time delay within the unsaturated zone may result in less accurate representation of changes in water resources of the areas where an exchange between surface water and groundwater occurs. In order to improve a

> model's ability to simulate the interaction of surface water with groundwater, the USGS added a new MODFLOW Streamflow Routing (SFR) package[10]. Use of the SFR package provides a more accurate simulation of the stream-aquifer interaction occurring within a groundwater basin.
>
> Use of the SFR package provides a more accurate simulation of the stream-aquifer interaction occurring within a groundwater basin. (GEOSCIENCE Refinement of the Paso Robles Groundwater Basin Model and Results of Supplemental Water Supply Options Predictive Analysis 6-Dec-16 p 18-19)

In addition to these studies, the County commissioned "Paso Robles Groundwater Subbasin Water Banking Feasibility Study" 2008 to assess suitability of various alluvium for groundwater recharge.

Further, no mention was made of the County's current mapping project using the Aerial Electromagnetic Method to survey sand, rock and clay strata up to 1,500' deep in the basin. Overflights were concluded in November 2019. The report is expected mid-2020.

The Plan acknowledges importance of aquifer continuity in Section 4.9.1 Aquifer Continuity. "Aquifer continuity has a significant impact on how projects and management actions in one part of the Subbasin may influence sustainability in other parts of the Subbasin." Further, "Figure 4-12 shows a previous interpretation of a deep sand and gravel zone that is relatively continuous across the Subbasin. The continuity of this zone may prove to be important in how effective various projects and programs may promote sustainability. The extent and continuity of the Paso Robles Aquifer should be confirmed through existing or new well logs or other methods such as aerial geophysics." 4.9.3 comments on the importance of data on vertical gradients for assessing "vertical flows between the Alluvium and the Paso Robles Aquifer as well as vertical flows within the Paso Robles Aquifer."

Establishing thresholds for undesirable results for interconnected surface waters should be one of the highest priorities for the Plan. Failure to plan for robust ISW thresholds for undesirable results brings into question the viability of this GSP.

Groundwater Storage Deficit Projection

Figure 6-4 *Historic Annual Cumulative Change in Groundwater* illustrates a continuing overall disastrous trajectory in groundwater storage despite periods of wet years and illustrates the predominance of dry and average years over wet years, even before the recent five-year drought.

The GSP selects the period 2012-2016 to determine the current water budget and comments:

> The current water budget period corresponds to a drought period when the average annual precipitation averaged about 62% of the historical average annual precipitation and the average streamflow percolation was 10% of the historical average percolation.(6.4)

And concludes:

> As a result, the current water budget period represents a more extreme condition in the Subbasin and is not appropriate for sustainability planning in the Subbasin.(6.4)

For the period 1981-2011(Figure *6-4)*, five years are identified as average (16%) and fourteen years are identified as below average (46%), indicating that 63% of the years were dry or average. This doesn't appear to support the claim that the water budget period from 2012-2016 "represents a more extreme condition".

The graphing in Figure 6-7 *Current (2012-2016) Annual and Cumulative Change in Groundwater Storage* shows very similar downward trajectory and loss of groundwater storage as Figure 6-4. It appears that the "extreme conditions" indicated from 2012-2016 are representative of previous 3 decades and may be normal conditions into the future and that an annual decrease in groundwater in storage of 13,700 AFY understates the problem. (6.5.3.3 Future Sustainable Yield)

## Rural Residential Water Use

Of the 5,164 wells documented in the subbasin, most are domestic wells, and approximately 600 are irrigation wells (County of SLO Public Health Department, June 2019 GSP 3-13). There are approximately 12,000-15,000 rural residents over the Paso basin who depend solely on groundwater pumping for domestic needs. We believe the assumptions for future rural domestic pumping are inaccurate. We are concerned that any future costs for remediating and balancing the basin will be inaccurately and unfairly burdened on rural users if based on the assumptions in the GSP.

Table 6-5 reports the annual rural domestic pumping average 2500 AFT. Table 6-4 reports the total groundwater pumping average 72,400 AFY. 72,400/2500 = 3% water use for rural domestic pumping for years 1981-2011.

Table 6-9 shows total groundwater pumping for 2012-2016 averaging 85,800 AFY. Table 6-10 shows rural domestic pumping for the same period averaging 3,500AFY. 85,800/3,500 = 4% average rural domestic pumping for 2012-2016.

The GSP states that with a 2.3% growth rate in rural build out, rural residential pumping in 2025 will be 16,504 AFY.(GSP 3-34) 2.3% growth year based on the current 3,500 average AFY equals 4293 AFY rural domestic pumping in 2025 based on the current base average 3,500 AFY.

The County reports there are 4,564 domestic wells in the basin. If there is a 2.3% increase in new wells drilled, the basin will see an additional 1030 wells by 2025. At a rate of 2 AFY per well, 1030 new wells equals 2,060 additional AFY in rural domestic pumping. There is no data that would suggest that current users would greatly increase current pumping behavior and that domestic use would be 16,504AFY.

As we said at the outset, our concerns about the accuracy of data on rural domestic use pertain to issues of how the costs/benefits analyses of future management and possible projects might impact rural residents who are clearly minority users but have no alternatives for drinking water.

Management and Thresholds

It is unclear how sustainability will be achieved. For Example:

> 8.5.4.3 Effects on Beneficial Users and Land Use: The practical effect of this GSP for protecting against the reduction in groundwater storage undesirable result is that it encourages no net change in groundwater elevations and storage during average hydrologic conditions and over the long-term. Therefore, during average hydrologic conditions and over the long-term, beneficial uses and users will have access to the same amount of groundwater in storage that currently exists, and the beneficial users and uses of groundwater are protected from undesirable results.

How is it possible to for users to have access to the same amount of groundwater in storage that currently exists when the data presented shows that the basin is in continual decline, the trajectory of which continues during "average hydrologic conditions"? We see nothing that indicates that wet years provided sufficient recovery to reverse the decline.

And in the same section:

> Pumping at the long-term sustainable yield during dry years would likely temporarily lower groundwater elevations and reduces the amount of groundwater in storage. Such short-term impacts, due to drought, are anticipated in SGMA and management actions should contain sufficient flexibility to accommodate them by ensuring they are offset by increases in groundwater levels or storage during normal or wet periods. Prolonged reductions in the amount of groundwater in storage could lead to undesirable results affecting beneficial users and uses of groundwater. In particular, groundwater pumpers that rely on water from shallow wells may be temporarily impacted by temporary reductions in the amount of groundwater in storage drops and lower water levels in their wells.

Before adopting a starting point that allows for no reduction in pumping in average years, and lower groundwater levels in dry years, the Plan needs to have a plan to immediately remedy the currently declining water levels. Increasing storage during wet years is aspirational at best at this point in time, and the basin is distressed now.

Chapter 8 includes extensive discussion about water quality exceedance as the bases for determining detrimental impacts from pumping. Water quality testing to determine unreasonable impacts is to occur at 5-year intervals, starting 5 years after approval of the GSP. This is too little, too late. The testing intervals are much too long. If water quality is degrading annually as the result of the continual deficit of at least 13,400 AFY, water quality could be permanently degraded as the result of migration of very poor water quality from lower aquifers.

Systems of monitoring wells (data gaps) are recognized as woefully deficient and the plan to rectify the deficiencies are wishful at best. Specific immediate remedies such as installation of dedicated monitoring wells need to be identified and implemented ASAP.

De minimis users account for a minor percent of water use, however those rural residential users have no other source of water, and no access to low interest loans to drill deeper wells or invest in technologies that could improve water quality to rectify the continued degradation of water quality. Any review of the basins rural areas supports the observation that the rural residential user has modest financial means or lives on a fixed income.

Chapter 9 concludes the Plan with lists of conceptual projects to ameliorate some of the basin's problems. These projects do not offer the public much insight or hope that the basin will be sustainably managed anytime soon, or indeed ever. The projects require long term planning and financing to be fully implement and generally only of benefit to a very limited portion of the basin and are of limited benefit for solving a basin-wide problem of over-drafting, and declining water levels.

We request that the Department of Water Resources consider the comments we have made and those of other concerned organizations and agencies, and move to require monitoring, testing, and data collection elements that will result in immediate benefits to the basin.

Sincerely,

Susan Harvey, Chair
Conservation Committee

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