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Submitted electronically through:
https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization

Subject: Comments on Draft 2018 SGMA Basin Prioritization – Sonoma County Groundwater Basins and Subbasins

Dear Mr. Joseph:

This letter is submitted on behalf of the Groundwater Sustainability Agencies (GSAs) for the Petaluma Valley, Sonoma Valley, and the Santa Rosa Plain; in addition to the County of Sonoma and the Sonoma County Water Agency (Sonoma Water) to provide technical comments regarding the California Department of Water Resources (DWR) May 2018 Draft Basin Prioritization (2018 Basin Prioritization) pursuant to the requirements of the Sustainable Groundwater Management Act (SGMA). This letter is intended to supplement comments provided by the Chairs of the Board of Directors for the aforementioned GSAs and the Chair of the Board of Supervisors/Directors for Sonoma County and Sonoma Water. Our general comments are provided below with technical comments for the following specific basins provided in **Attachment A**: Alexander Area Subbasin, Healdsburg Area Subbasin, Petaluma Valley Basin, Santa Rosa Plain Subbasin, Sonoma Valley Subbasin and Wilson Grove Formation Highlands Basin.

General Comments

We acknowledge the challenges that DWR faces in developing a methodology that is consistent and fair for hundreds of basins statewide. However, since the Legislature and Governor placed the implementation of SGMA squarely at the local level, we believe that the criteria and methodology for prioritizing areas to comply with SGMA should likewise be based on actual local conditions. DWR should utilize local information and data where it is available and more

detailed or appropriate than statewide default estimates. Additionally, there are several instances where we believe that the draft methodology is inconsistent with the focus and scope of SGMA. Primary issues with DWR's criteria and methodology for 2018 Basin Prioritization are summarized below and focus on water quality impacts, estimates of water use, and scoring methodology for public water supply wells.

Water Quality: The draft methodology for assigning impact points for water quality counts as degraded those naturally occurring minerals which are not toxic to humans or to the environment, such as iron and manganese. ***These and other secondary water quality constituents should not be used as metrics to determine whether or not a basin needs to comply with SGMA and DWR should exclude them from the datasets used for Basin Prioritization.*** In Sonoma County and many other areas of the state, iron and manganese are naturally occurring minerals that are common in groundwater systems and are typically addressed by well owners using simple water treatment systems. There are no basin groundwater management responses for these naturally occurring minerals. Excess levels of these constituents impact aesthetic properties such as taste and odor, but are not harmful for consumption. Further, it is unnecessary to address these constituents under SGMA because for public water suppliers the exceedance of secondary maximum contaminant levels is already addressed by existing laws (22 CA ADC § 64449). These regulations specifically address iron and manganese levels and allow for the petition of waivers based upon customer satisfaction, engineering alternatives, and other factors. SGMA rightfully does not require that GSAs address the natural presence of these minerals in groundwater, which cannot be controlled by management actions within the basins.

Water Use: DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. A review of datasets made available by DWR reveals the following issues associated with water use estimates, which are further described below:

- Use of the 2014 Statewide Crop Mapping dataset for determining acreage of irrigated lands and agricultural water use rather than more focused land use information specific to Sonoma County results in DWR greatly overestimating the acreage of irrigated lands and water use.
- Use of the California Simulation of Evapotranspiration of Applied Water (Cal-SIMETAW) model for estimating agricultural irrigation significantly overestimates applied water for vineyard irrigation.
- The methods reported to calculate the percentage of agricultural water use supplied by groundwater pumping are not verifiable and appear to be based upon outdated data and methods.

Use of 2014 Statewide Crop Mapping

DWR should utilize the most detailed and accurate land use and cropping information available. In the 2014 Statewide Crop Mapping dataset used by DWR a large number of pasture lands in many Sonoma County basins were identified as irrigated acreage and assigned large volumes of applied water, while local information and DWR's own more detailed land and water use survey conducted in 2012 noted that the vast amount of pasture lands in these areas is not irrigated. In calculating the amount of irrigated acreage and developing water use estimates under Components Nos. 5 and 6, DWR should rely on its own more detailed land use mapping and water use estimates for Sonoma County (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Land-Use-Surveys). In calculating the amount of irrigated acreage and water use estimates, acreage that is classified as "non-irrigated" or "native vegetation" in the 2012 land and water use survey should not be included.

Use of Cal-SIMETAW Model rather than local water-use estimates

DWR should rely on the local and more accurate information on applied water use estimates when finalizing the 2018 Basin Prioritization. DWR's applied water estimates for several crops including vineyards (13.8 to 21.2 inches per year) are much higher than local estimates. As an example, the following **Table 1** summarizes known estimates from published studies of applied water for vineyard irrigation in Sonoma County which range from 3 to 10.8 inches per year, with the majority below 7.2 inches per year:

Table 1: Estimated applied water for Vineyards in Sonoma County

Area	Source	Irrigation Depth (inches)	Methodology Used to Estimate
Russian River	Davids Engineering, (2013)	4.8 to 7.2	SEBAL energy balance (satellite based), with root zone model
Santa Rosa Plain	USGS, Wolfenden and Nishikawa (2010)	10.8	Modeling, PRMS, PET, Crop Coefficients
Atascadero/Green Valley Watersheds (overlies portion of Wilson Grove Formation Highlands groundwater basin)	O'Conner Environmental, Inc. (2016)	3 to 3.6	Modeling, PET, Crop Coefficients
Sonoma Valley	USGS, Farrar et al (2006)	7.2	Scott Matyac, California Department of Water Resources, unpub. data, 2005.

North Sonoma County	Wagner & Bosignore (2007)	7.2	Average Applied Water from Six (6) Alexander Valley Vineyard Grower Interviews.
Russian River	Greenspan (2007 and 2008)	4 to 4.8	Post-Irrigation Season (2006 and 2007) Grower Surveys

While we feel strongly that locally-derived estimates of applied water, such as those provided above, should be utilized in the 2018 Basin Prioritization, DWR has indicated its intention to solely rely on the output of simulations using the Cal-SIMETAW model for 2018 Basin Prioritization. Cal SIMETAW is a model developed by DWR and University of California at Davis to estimate crop evapotranspiration (ET) and evapotranspiration of applied water. Our understanding is that the Cal-SIMETAW model is not a public domain model with open-source software. DWR's reliance on a model that is not usable by local agencies does not allow us to conduct a thorough analysis of the 2018 Basin Prioritization water-use estimates, which are a critical criterion used by DWR to prioritize basins and determine SGMA compliance. The use of a model that is not accessible to the public and local agencies is also inconsistent with requirements that DWR has imposed on GSAs through its own regulations, which require all groundwater models developed in support of GSPs after August 15, 2016, to be developed using public domain, open-source software (*Cal. Code of Regulations §352.4(f)(3)*).

Should DWR proceed with only using the Cal-SIMETAW model for estimating water use in finalizing the 2018 Basin Prioritization, we request that the following Cal-SIMETAW input parameters be incorporated and accounted for when DWR develops water-use estimates for the Final Basin Prioritization: (1) crop coefficients calculated from a local study (Davids Engineering, 2013) of crop and applied water ET, as identified in the below **Tables 2 and 3**; and (2) adjust the management allowable depletion value for vineyards from 55% to 20% to account for local regulated deficit irrigation practiced by local growers. Justification for these changes to the Cal-SIMETAW model input parameters is provided below.

Davids Engineering completed a study in 2013 that estimated applied water for Russian River agricultural crops. The report utilized satellite imagery and the Surface Energy Balance Algorithm for Land (SEBAL) method to determine crop ET demands. The SEBAL method uses multispectral satellite imagery (Landsat), information on the land surface and meteorological data to calculate the terms of an energy balance equation that allows for the estimation of evapotranspiration. The method produces an estimate of ET at a ~100 feet x ~100 feet resolution. The report also incorporated a one-dimensional soil model to approximate water provided by the soil itself, in order to estimate the amount of applied irrigation for

combinations of vineyards, soil types, and ET zones. The reference evaporation and applied water estimates were then used to estimate crop coefficients.

The crop coefficients were estimated based upon climate zone, crop type, and total available water holding capacity. The following **Table 2** identifies which climate zone each of the six groundwater basins or subbasins corresponds to.

Table 2: Davids Engineering, Inc Climate Zone

Basin	Subbasin	Climate Zone
NAPA-SONOMA VALLEY	NAPA-SONOMA VALLEY - SONOMA VALLEY	3
PETALUMA VALLEY	PETALUMA VALLEY	3
WILSON GROVE FORMATION HIGHLANDS	WILSON GROVE FORMATION HIGHLANDS	3
SANTA ROSA VALLEY	SANTA ROSA VALLEY - SANTA ROSA PLAIN	3
ALEXANDER VALLEY	ALEXANDER VALLEY - ALEXANDER AREA	2
SANTA ROSA VALLEY	SANTA ROSA VALLEY - HEALDSBURG AREA	2

The estimated crop coefficients for the climate zones, soil groups and time of year are shown below in **Table 3**. Crop coefficients were not estimated for the months between November to January because precipitation is assumed to provide the required crop demands during that period.

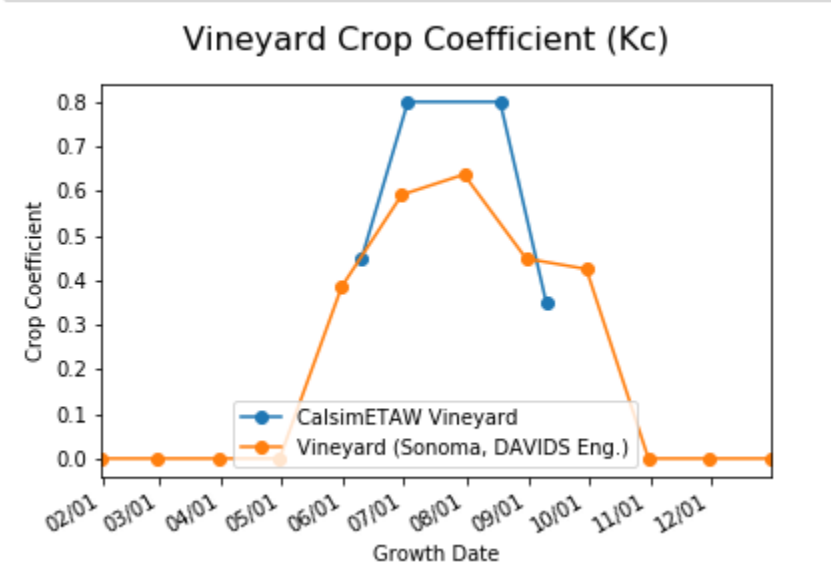
Table 3: Crop Coefficients from Davids Engineering Study

Crop	Soil Group	Climate Zone	2/1/08 - 3/4/08	3/5/08 - 4/14/08	4/15/08- 5/3/08	5/4/08 - 5/23/08	5/24/08 - 6/16/08	6/17/08 - 7/14/08	7/15/08 - 8/15/08	8/16/08 - 9/12/08	9/13/08 - 10/15/08
Vineyard	High WHC (AWHC (> 7 inches))	2	0.27	0.49	0.09	0.35	0.48	0.78	0.36	0.57	0.20
Vineyard	Low WHC (AWHC (≤ 7 inches))	2	0.27	0.48	0.08	0.30	0.47	0.77	0.35	0.57	0.18
Vineyard	High WHC (AWHC (> 7 inches))	3	0.21	0.67	0.34	0.45	0.42	0.99	0.44	0.58	0.39
Vineyard	Low WHC (AWHC (≤ 7 inches))	3	0.20	0.67	0.27	0.39	0.33	0.86	0.31	0.45	0.31
Pasture & Other	High WHC (AWHC (> 7 inches))	2 & 3	0.31	0.89	0.66	0.75	0.61	0.58	0.41	0.45	0.28
Pasture & Other	Low WHC (AWHC (≤ 7 inches))	2 & 3	0.23	0.93	0.51	0.64	0.48	0.28	0.27	0.27	0.17
Orchard	High WHC (AWHC (> 7 inches))	2 & 3	0.22	0.96	0.29	0.48	0.39	1.07	0.26	0.35	0.25

The soil groups are determined by calculating the total available water holding capacity (AWHC) for all soil layers above any impermeable layers, up to a depth of 60 inches. These values were estimated from the NRCS Soil Survey Geographic (SSURGO) Database for agricultural fields. Soils with higher AWHC have crop coefficients on average 5% greater than soils with low AWHC.

A comparison of the crop coefficients estimated by DWR and Davids Engineering are shown in **Figure 1**, below, for climate zone 3. It should be noted that Kc values of zero are shown during periods when grapes are not irrigated in order to directly compare the Davids Engineering values with DWR's crop coefficients.

Figure 1



Grape crops grown in Sonoma County are commonly irrigated under a regulated deficit irrigation schedule. According to Orang et al (2013; CalSimETAW) the management allowable depletion value set for each crop defines the soil moisture threshold under which irrigation must be applied to satisfy crop needs. The management allowable depletion value for grapes in Sonoma County is set at 55% for the Basin Prioritization simulations conducted by DWR. This value should be set lower to 20% as this will result in a more realistic delay in the beginning of irrigation consistent with agricultural practices similar to those applied in Sonoma County. These comments are based upon information shared by vineyard managers during a meeting with agricultural scientists from the UC Cooperative Extension and Sonoma Water on June 04, 2018 regarding irrigation practices on vineyards in SGMA basins.

Determination of percentage of surface water and groundwater use

The methods reported to calculate the percentage of agricultural water use supplied by groundwater pumping are not verifiable and appear to be based upon outdated data and methods. The 2018 Basin Prioritization document states that these ratios are derived from the

CA Water Plan 2018 update for each basin, but there is no document available with that data on the DWR's website. Only preliminary draft versions of that document are available. The CA Water Plan 2013 – Volume 2 – regional reports contain such ratios that are stated to be for the years 2005-2010. However, the CA Water Plan 2013 provides no reference for where those numbers were derived. Due to the lack of transparency in the methods used to estimate the proportion of surface water provided for agricultural use it is not possible under the provided time constraints, to estimate these values in a comprehensive and defensible manner.

For example, it is unclear from information provided by DWR whether the use of recycled water for irrigation was incorporated into the determination of the percentage of surface water and groundwater use. In Sonoma County (including the Healdsburg Area, Petaluma Valley, Santa Rosa Plain, and Sonoma Valley), a significant amount of recycled water is used for agricultural and landscape irrigation and offsets the use of potable water and groundwater. The volumes of recycled water delivered in each of the basins is included in Attachment A. ***DWR should incorporate the volume of recycled water into their assessment of the overall percentage of groundwater use and reduce the groundwater use estimates where applicable.*** Additionally, based on information made available by DWR to date, it remains unclear whether the determination of groundwater reliance and estimated water use accounts for water diverted under surface water rights as groundwater use. ***SGMA clearly states that existing surface water rights are not subject to modification by SGMA, therefore water diverted under surface water rights should not be accounted for as groundwater use.***

Public-Supply Wells: The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. Wells serving larger numbers of people will have a greater impact on the basin's sustainability. ***Therefore, a greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water.***

Prioritization Thresholds: In prioritizing basins statewide, DWR ranked all basins with an estimated groundwater use per year of less than 2,000 acre-feet or less than or equal to 9,500 acre-feet with no documented impacts as very low priority. These thresholds were developed by DWR during the 2014 Basin Prioritization process in recognition that these basin's estimated groundwater use represents less than 3% of California's annual groundwater use (basins pumping less than 9,500 acre-feet and 2,000 acre-feet were determined to represent 3% and 0.5% of all of California's groundwater use, respectively). While DWR has updated the estimates of groundwater use for the Draft 2018 Basin Prioritization it has not updated the 2,000 acre-foot and 9,500 acre-foot thresholds based on their updated (and significantly higher) statewide groundwater use estimates. ***In order to maintain a consistent process and rationale for determining groundwater reliance, DWR should recalculate the 0.5% and 3% threshold***

levels used for Sub-components 8.c and 8.d based on the statewide groundwater use estimated for the 2018 Basin Prioritization.

We appreciate the opportunity to provide comments on DWR's draft May 2018 basin reprioritization. Please do not hesitate to contact Marcus Trotta (Marcus.Trotta@scwa.ca.gov) or me (Jay.Jasperse@scwa.ca.gov) if you have any questions or require additional information.

Sincerely,

Jay Jasperse, P.E.

Plan Manager – Petaluma Valley, Sonoma Valley & Santa Rosa Plain Groundwater Sustainability Agencies

Chief Engineer & Director of Groundwater Management, Sonoma Water

Attachments:

List of References

Attachment A – Basin Specific Comments

Cc: Boards of Directors, Petaluma Valley, Santa Rosa Plain and Sonoma Valley Groundwater Sustainability Agencies
Sonoma County Board of Supervisors and Sonoma Water Board of Directors
Grant Davis, Sonoma Water
Ann DuBay, Petaluma Valley, Santa Rosa Plain and Sonoma Valley Groundwater Sustainability Agencies
Marcus Trotta, Sonoma Water
Tennis Wick, Permit Sonoma
John Mack, Permit Sonoma
Robert Pennington, Permit Sonoma
Terri Wright, Sonoma County Chief Administrator's Office
Brittany Jensen, Gold Ridge RCD
Sandi Potter, Town of Windsor
Toni Bertolero, Town of Windsor
Elizabeth Cargay, Town of Windsor
Jennifer Burke, Santa Rosa Water
Colin Close, Santa Rosa Water

Jim Downey, Independent Water Suppliers
Damien Obid, City of Cotati
Craig Scott, City of Cotati
Mary Grace Pawson, City of Rohnert Park
Valerie Minton Quinto, Sonoma RCD
Colleen Ferguson, City of Sonoma
Dan Muelrath, Valley of the Moon Water District
Tito Sasaki, North Bay Water District
Leah Walker, City of Petaluma
Dan St. John, City of Petaluma
Terry Crowley, City of Healdsburg
Rebecca Ng, County of Marin
Lorene Jackson, County of Marin
Henry Mikus, City of Sebastopol
Patrick Lowe, County of Napa

List of References

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Wagner & Bonsignore. 2007. Volume I - Draft Report, North Sonoma County, Agricultural Reuse Project, Feasibility Study, July 2007. Prepared for Sonoma County Water Agency, Santa Rosa, CA. 84 p.
http://www.scwa.ca.gov/environmental-documents/

Woolfenden, L.R., and Nishikawa, Tracy, eds., 2014, Simulation of groundwater and surface-water resources of the Santa Rosa Plain watershed, Sonoma County, California: U.S. Geological Survey Scientific Investigations Report 2014–5052, 258 p.,
http://dx.doi.org/10.3133/sir20145052
https://pubs.er.usgs.gov/publication/sir20145052

Attachment A – Basin Specific Comments

Alexander Area

The following issues related to information, data and methodology used by DWR in prioritizing the Alexander Area Subbasin have been identified and are further described below:

- DWR's treatment of naturally occurring minerals such as iron and manganese that have secondary maximum contaminant levels (MCLs) for taste and odor equal to hazardous and toxic substances that have primary MCLs;
- DWR's overestimation of groundwater use which is higher than the local experience and studies suggests;
- Clarification of the degree to which surface water that is diverted under existing surface water rights was assigned to groundwater use by DWR.
- Equal weighting of public supply wells, regardless of the number of people served and amount of groundwater production.

Water Quality

As described in the General Comments, the methodology for assigning impact points for water quality should not use secondary MCLs as metrics to determine whether or not a basin needs to comply with SGMA. Review of datasets made available by DWR indicates that for the Alexander Area Subbasin, approximately 61% of the MCL exceedances which DWR used to identify water quality degradation for component 7.d are for constituents with only secondary MCLs, such as iron and manganese. Excluding constituents with only secondary MCLs from the dataset would reduce the number of points assigned in subcomponent 7.d from 2 to 1.

Water Use

As described in the General Comments, DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. Based on output from the Cal-SIMETAW model used by DWR to estimate applied water, DWR estimated that vineyards in the Alexander Area Subbasin use approximately 21 inches of water for irrigation. This value is significantly higher than known estimates from published studies of applied water for vineyard irrigation in Sonoma County identified in Table 1 of the General Comments, which range from 4.8 to 7.2 inches per year in the Russian River area. Additionally, DWRs own estimate of vineyard irrigation in the Alexander Area Subbasin conducted as part of annual land and water use estimates last conducted in 2010 was approximately 7 inches per year. DWR should utilize these locally-derived estimates of applied water in the Basin Prioritization rather than the Cal-SIMETAW estimates. Should DWR decide to utilize the Cal-SIMETAW model for final Basin Prioritization, we request that DWR adjust the crop coefficients and management allowed depletion input parameters to those identified in the General Comments, above.

It remains unclear whether DWR's determination of groundwater reliance and estimated water use accounts for water diverted under surface water rights as groundwater use. In the Alexander Area Subbasin, many wells divert surface water under surface water rights should not be accounted for as groundwater use. The water use associated with these wells should be counted as surface water rather than groundwater.

Public Water Supply Wells

The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. In the Alexander Area Subbasin, the vast majority of the public supply wells within the basin serve comparatively very few customers compared to the municipal water supply wells, yet they are weighted the same as the municipal wells which serve significantly more people (43 of the 46 public water supply wells within the basin identified by DWR serve less than 5% of the total population). A greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water

Healdsburg Area Subbasin

The following issues related to information, data and methodology used by DWR in prioritizing the Healdsburg Area Subbasin have been identified and are further described below:

- DWR's treatment of naturally occurring minerals such as iron and manganese that have secondary maximum contaminant levels (MCLs) for taste and odor equal to hazardous and toxic substances that have primary MCLs;
- Errors identified in the water quality dataset used by DWR to assign impact points for water quality;
- DWR's overestimation of groundwater use which is higher than the local experience and studies suggests;
- Clarification of the degree to which surface water that is diverted under existing surface water rights and recycled water was assigned to groundwater use by DWR.
- Equal weighting of public supply wells, regardless of the number of people served and amount of groundwater production.

Water Quality

As described in the General Comments, the methodology for assigning impact points for water quality should not use secondary MCLs as metrics to determine whether or not a basin needs to comply with SGMA. Review of datasets made available by DWR indicates that for the Healdsburg Area Subbasin, approximately 94% of the MCL exceedances which DWR used to identify water quality degradation for component 7.d are for constituents with only secondary MCLs, such as iron and manganese. Excluding constituents with only secondary MCLs from the dataset would reduce the number of points assigned in subcomponent 7.d from 4 to 1 and would eliminate any component 7 impact points. Based on the methodology described in the Draft 2018 Basin Prioritization Process and Results document ("*groundwater basins with an estimated groundwater use per year of greater than 2,000 and less than or equal to 9,500 acre-feet with no documented impacts are considered low priority*"), elimination of component 7 impact points reduces the priority of the Healdsburg Area subbasin from medium to low.

Additionally, review of water quality datasets provided by DWR indicate that three of the primary MCL exceedances are due to errors in the dataset. Specifically, fluoride concentrations are incorrectly reported for five samples from the City of Healdsburg on October 29, 2003. The corrected concentrations of fluoride reported in those samples range from 0.10 mg/l to 0.16 mg/l rather than the incorrect values 100 to 160 mg/l (related to a unit conversion error), as summarized below.

Chemical	*PWS*	*Well Name*	*Date*	*Reported Result*	*Actual Result*
Fluoride	City of Healdsburg	Fitch Well 02	29-Oct-03	140 MG/L	0.14 MG/L
Fluoride	City of Healdsburg	Fitch Well 06	29-Oct-03	120 MG/L	0.12 MG/L
Fluoride	City of Healdsburg	Dry Creek Well 02	29-Oct-03	150 MG/L	0.15 MG/L
Fluoride	City of Healdsburg	Dry Creek Well 03	29-Oct-03	100 MG/L	0.1 MG/L
Fluoride	City of Healdsburg	Dry Creek Well 04	29-Oct-03	160 MG/L	0.16 MG/L

The corrected values, which do not exceed the primary MCL for fluoride of 2 mg/l should be used by DWR.

Water Use

As described in the General Comments, DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. Based on output from the Cal-SIMETAW model used by DWR to estimate applied water, DWR estimated that vineyards in the Healdsburg Area Subbasin use approximately 14 inches of water for irrigation. This value is significantly higher than known estimates from published studies of applied water for vineyard irrigation in Sonoma County identified in Table 1 of the General Comments, which range from 4.8 to 7.2 inches per year in the Russian River area. Additionally, DWRs own estimate of vineyard irrigation in the Healdsburg Area Subbasin conducted as part of annual land and water use estimates last conducted in 2010 was approximately 6.3 inches per year. DWR should utilize these locally-derived estimates of applied water in the Basin Prioritization rather than the Cal-SIMETAW estimates. Should DWR decide to utilize the Cal-SIMETAW model for final Basin Prioritization, we request that DWR adjust the crop coefficients and management allowed depletion input parameters to those identified in the General Comments, above.

It remains unclear whether DWR's determination of groundwater reliance and estimated water use accounts for water diverted under surface water rights as groundwater use. In the Healdsburg Area Subbasin, many wells divert surface water under surface water rights should not be accounted for as groundwater use. The water use associated with these wells should be counted as surface water rather than groundwater.

It is also unclear from information provided by DWR whether the use of recycled water for irrigation was incorporated into the determination of the percentage of surface water and groundwater use. In the Healdsburg Area, the city of Healdsburg provides recycled water for vineyard irrigation which should be incorporated into DWR's calculation of the overall percentage of groundwater use in the basin.

Public Water Supply Wells

The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. In the Healdsburg Area Subbasin, the vast majority of the public supply wells within the basin serve comparatively

very few customers compared to the municipal water supply wells, yet they are weighted the same as the municipal wells which serve significantly more people (47 of the 60 public water supply wells within the basin identified by DWR serve less than 5% of the total population). A greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water

Wilson Grove Formation Highlands

The following issues related to information, data and methodology used by DWR in prioritizing the Wilson Grove Formation Highlands basin have been identified and are further described below:

- DWR's treatment of naturally occurring minerals such as iron and manganese that have secondary maximum contaminant levels (MCLs) for taste and odor equal to hazardous and toxic substances that have primary MCLs;
- DWR's overestimation of groundwater use which is higher than the local experience and studies suggests;
- Incorrect identification of irrigated versus non-irrigated croplands.
- Incorrect assignment of impact points related to saltwater intrusion;
- Equal weighting of public supply wells, regardless of the number of people served and amount of groundwater production.

Water Quality

As described in the General Comments, the methodology for assigning impact points for water quality should not use secondary MCLs as metrics to determine whether or not a basin needs to comply with SGMA. Review of datasets made available by DWR indicates that for the Wilson Grove Formation Highlands basin, approximately 45% of the MCL exceedances which DWR used to identify water quality degradation for component 7.d are for constituents with only secondary MCLs, such as iron and manganese. Excluding constituents with only secondary MCLs from the dataset would reduce the number of points assigned in subcomponent 7.d from 3 to 1 and coupled with the proposed change to the saltwater intrusion impact would eliminate any component 7 impact points.

Water Use

As described in the General Comments, DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. Based on output from the Cal-SIMETAW model used by DWR to estimate applied water, DWR estimated that vineyards in the Wilson Grove Formation Highlands basin use approximately 14 inches of water for irrigation. This value is significantly higher than known estimates from published studies of applied water for vineyard irrigation in Sonoma County identified in Table 1 of the General Comments, which range from 3 to 3.6 inches per year in the Russian River area. Additionally, DWRs own estimate of vineyard irrigation in the Wilson Grove Formation Highlands basin conducted as part of annual land and water use estimates last conducted in 2010 was approximately 7.8 inches per year. DWR should utilize these locally-derived estimates of applied water in the Basin Prioritization rather than the Cal-SIMETAW estimates. Should DWR decide to utilize the Cal-SIMETAW model for final Basin

Prioritization, we request that DWR adjust the crop coefficients and management allowed depletion input parameters to those identified in the General Comments, above.

In the 2014 Statewide Crop Mapping dataset used by DWR to determine the amount of irrigated acreage, a large number of pasture lands in Wilson Grove Formation Highlands basin were identified as irrigated acreage and assigned large volumes of applied water, while local information and DWR's own more detailed land and water use survey conducted in 2012 noted that the vast amount of pasture lands in these areas is not irrigated. Approximately 2,285 acres of pasture land and 292 acres of grain which DWR assumed was irrigated in the Draft 2018 Basin Prioritization is identified as non-irrigated in DWR's more detailed 2012 land and water use survey (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Land-Use-Surveys). Removal of these acres reduces the water use estimates for the basin by approximately 8,375 acre-feet.

Saltwater Intrusion

The Draft 2018 Basin Prioritization assigned impact points to the Wilson Grove Formation Highlands basin for saltwater intrusion. The occurrence of saltwater intrusion in the Wilson Grove Formation Highlands basin is improbable, as the basin is not adjacent to nor does it have any connections to the Pacific Ocean or Tomales Bay, which would be the most likely source of saltwater intrusion to the basin if it were to occur.

The only evidence used by DWR to make this determination is the following excerpt from a Fact Sheet developed for the Groundwater Ambient Monitoring and Assessment (GAMA) Program: "*In the North San Francisco Bay study unit (Wilson Grove Formation Highlands, Alexander Valley, Santa Rosa Valley, Petaluma Valley, Lower Russian River Valley, Kenwood Valley, Volcanic Highlands, and Napa-Sonoma Valley GW basins), TDS was present at high concentrations (greater than the upper limit) in about 1% of the primary aquifers. About 7% of the primary aquifers had moderate TDS concentrations (between the recommended and upper limit), and about 92% had low concentrations (less than the recommended limit)*." The above excerpt lumps a number of groundwater basins and does not provide evidence for saltwater intrusion, as TDS (which was detected at high concentrations in only 1% of the primary aquifers) is not in itself an adequate determination of saltwater intrusion. Furthermore, review of the actual GAMA report for the North Bay Region (https://www.waterboards.ca.gov/water_issues/programs/gama/docs/nsfbay_sir.pdf) reveals that the highest concentrations of TDS are not located in the Wilson Grove Formation Highlands basin). The data points within the Wilson Grove Formation Highlands basin closest to sources of saltwater are identified as having low concentrations of TDS and chloride and provide no indication of saltwater intrusion. DWR should remove the impact points attributable to saltwater intrusion for the Wilson Grove Formation Highlands basin.

Public Water Supply Wells

The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. In the Wilson Grove Formation Highlands basin, the vast majority of the public supply wells within the basin serve comparatively very few customers compared to the municipal water supply wells, yet they are weighted the same as the municipal wells which serve significantly more people (95 of the 99 public water supply wells within the basin identified by DWR serve less than 5% of the total population). A greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water

Petaluma Valley

The following issues related to information, data and methodology used by DWR in prioritizing the Petaluma Valley basin have been identified and are further described below:

- DWR's treatment of naturally occurring minerals such as iron and manganese that have secondary maximum contaminant levels (MCLs) for taste and odor equal to hazardous and toxic substances that have primary MCLs;
- DWR's overestimation of groundwater use which is higher than the local experience and studies suggests;
- Incorrect identification of irrigated versus non-irrigated croplands.
- DWR's finding of documented groundwater-level decline impacts is inconsistent with preliminary findings from the nearly completed U.S. Geological Survey study of the basin; and
- Equal weighting of public supply wells, regardless of the number of people served and amount of groundwater production.

Water Quality

As described in the General Comments, the methodology for assigning impact points for water quality should not use secondary MCLs as metrics to determine whether or not a basin needs to comply with SGMA. Review of datasets made available by DWR indicates that for the Petaluma Valley basin, approximately 92% of the MCL exceedances which DWR used to identify water quality degradation for component 7.d are for constituents with only secondary MCLs, such as iron and manganese.

Water Use

As described in the General Comments, DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. Based on output from the Cal-SIMETAW model used by DWR to estimate applied water, DWR estimated that vineyards in the Petaluma Valley basin use approximately 14 inches of water for irrigation. This value is significantly higher than known estimates from published studies of applied water for vineyard irrigation in Sonoma County identified in Table 1 of the General Comments, which range from 3 to 10.8 inches per year in Sonoma County. Additionally, DWR's own estimate of vineyard irrigation in the Petaluma Valley conducted as part of annual land and water use estimates last conducted in 2010 was approximately 9 inches per year. DWR should utilize these locally-derived estimates of applied water in the Basin Prioritization rather than the Cal-SIMETAW estimates. Should DWR decide to utilize the Cal-SIMETAW model for final Basin Prioritization, we request that DWR adjust the crop coefficients and management allowed depletion input parameters to those identified in the General Comments, above.

In the 2014 Statewide Crop Mapping dataset used by DWR to determine the amount of irrigated acreage, a large number of grain and hay crops in Petaluma Valley basin were

identified as irrigated acreage and assigned large volumes of applied water, while local information and DWR's own more detailed land and water use survey conducted in 2012 noted that the vast amount of grain and hay crops in these areas is not irrigated. Approximately 4,757 acres of grain which DWR assumed was irrigated in the Draft 2018 Basin Prioritization is identified as non-irrigated in DWR's more detailed 2012 land and water use survey (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Land-Use-Surveys). Removal of these acres reduces the water use estimates for the basin by approximately 4,043 acre-feet per year.

It is also unclear from information provided by DWR whether the use of recycled water for irrigation was incorporated into the determination of the percentage of surface water and groundwater use. In the Petaluma Valley, the City of Petaluma provides recycled water for irrigation, which has recently averaged approximately 1,500 acre-feet per year. This important source of water supply should be incorporated into calculating the overall percentage of groundwater use in the basin by DWR.

Declining Groundwater Levels

The Draft 2018 Basin Prioritization assigned 7.5 impact points to the Petaluma Valley basin for Groundwater Level Declines. Data provided by DWR indicates that only 4 of the 29 wells with groundwater-level data in the basin indicate a decline in groundwater levels. Basins with such a small percentage of wells exhibiting groundwater level declines should not be characterized by DWR as having groundwater-level declines indicative of overdraft. Furthermore, the occurrence of groundwater declines that could be an indicator for groundwater overdraft does not match the information from a comprehensive study of the basin by the U.S. Geological Survey which is currently nearing publication (see pages 8, 9 and 10 in slides located here http://petalumavalleygroundwater.org/wp-content/uploads/10-26-17-USGS-Presentation-1.pdf). DWR should remove the impact points attributable to groundwater level declines, which would also result in the removal of impact points for habitat and streamflow, as only basins with both interconnected surface water and groundwater level declines are assigned impact points for habitat and streamflow.

Saltwater Intrusion

The Draft 2018 Basin Prioritization assigned impact points to the Petaluma Valley basin for saltwater intrusion. The only evidence used by DWR to make this determination is the following excerpt from a 1995 U.S. Geological Survey Atlas (CoastalBasins-USGS_GW_Atlas1995(HA730-B_CoastalBasinsAquifers): *" Sources of chloride in the north San Francisco Bay area aquifers include seawater intrusion, thermal water, and dissolved minerals from marine and volcanic rocks. The valleys most affected by large chloride concentrations are the Petaluma, the Sonoma, and the Napa, in which seawater intrusion caused by excessive ground-water withdrawals has been the primary source (fig. 110). Reduced withdrawals and increased surface-water imports have helped alleviate the salinity problem."*

The lower reaches of Petaluma River is a tidal slough and it is expected that saltwater intrusion would occur near the slough. There is no evidence of sea water intrusion in wells located away from the slough, and based on the absence of declining groundwater levels in the southern portions of the basin, nothing to suggest that the basin is at current risk of seawater intrusion. As noted in the above excerpt from the 1995 Atlas, the increased surface-water imports have reduced groundwater withdrawals and helped alleviate the salinity problem. DWR should remove the impact points attributable to saltwater intrusion for the Petaluma Valley basin.

Public Water Supply Wells

The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. In the Petaluma Valley basin, many public supply wells within the basin serve comparatively very few customers compared to other water supply wells, yet they are weighted the same (16 of the 31 public water supply wells within the basin identified by DWR serve less than 5% of the total population). A greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water

Santa Rosa Plain

The following issues related to information, data and methodology used by DWR in prioritizing the Santa Rosa Plain Subbasin have been identified and are further described below:

- DWR's treatment of naturally occurring minerals such as iron and manganese that have secondary maximum contaminant levels (MCLs) for taste and odor equal to hazardous and toxic substances that have primary MCLs;
- DWR's overestimation of groundwater use which is higher than the local experience and studies suggests;
- Incorrect identification of irrigated versus non-irrigated croplands;
- Clarification as to whether DWR incorporated recycled water as a source of water supply in the basin; and
- Equal weighting of public supply wells, regardless of the number of people served and amount of groundwater production.

Water Quality

As described in the General Comments, the methodology for assigning impact points for water quality should not use secondary MCLs as metrics to determine whether or not a basin needs to comply with SGMA. Review of datasets made available by DWR indicates that for the Santa Rosa Plain Subbasin, approximately 64% of the MCL exceedances which DWR used to identify water quality degradation for component 7.d are for constituents with only secondary MCLs, such as iron and manganese. Excluding constituents with only secondary MCLs from the dataset would reduce the number of points assigned in subcomponent 7.d from 5 to 3.

Additionally, review of water quality datasets provided by DWR indicate that three of the primary MCL exceedances are due to errors in the dataset. Specifically, fluoride concentrations are incorrectly reported for 17 water samples in the dataset, as summarized below. The corrected concentrations of fluoride reported in those samples range from 0.10 mg/l to 0.18 mg/l rather than the incorrect values 100 to 180 mg/l (related to a unit conversion error).

Chemical	*PWS*	*Well Name*	*Date*	*Reported Result*	*Actual Result*
Fluoride	Santa Rosa Mobile Estates	Well 02	19-Apr-06	160 MG/L	0.16 MG/L
Fluoride	Santa Rosa Mobile Estates	Well 03	19-Apr-06	140 MG/L	0.14 MG/L
Fluoride	Balletto Vineyards	Well 01	27-Apr-05	180 MG/L	0.18 MG/L
Fluoride	City of Rohnert Park	Well 08	12-Aug-02	110 MG/L	0.11 MG/L
Fluoride	City of Rohnert Park	Well 08a	12-Aug-02	130 MG/L	0.13 MG/L
Fluoride	City of Rohnert Park	Well 10	12-Aug-02	140 MG/L	0.14 MG/L
Fluoride	City of Rohnert Park	Well 11	12-Aug-02	170 MG/L	0.17 MG/L
Fluoride	City of Rohnert Park	Well 14	12-Aug-02	170 MG/L	0.17 MG/L
Fluoride	City of Rohnert Park	Well 16	12-Aug-02	160 MG/L	0.16 MG/L
Fluoride	City of Rohnert Park	Well 37 - inactive	12-Aug-02	140 MG/L	0.14 MG/L
Fluoride	City of Rohnert Park	Well 41	12-Aug-02	170 MG/L	0.17 MG/L
Fluoride	City of Rohnert Park	Well 42	12-Aug-02	130 MG/L	0.13 MG/L
Fluoride	Sonoma County Water Agency	todd rd. Well 01	25-Aug-03	170 MG/L	0.17 MG/L
Fluoride	Sonoma County Water Agency	Occidental rd Well 02	25-Aug-03	180 MG/L	0.18 MG/L
Fluoride	Sonoma County Water Agency	Sebastopol rd Well 02	25-Aug-03	130 MG/L	0.13 MG/L
Fluoride	California-American Larkfield (PUC)	Well 04a	26-Feb-02	100 MG/L	0.1 MG/L
Fluoride	California-American Larkfield (PUC)	Well 05	24-Jul-01	100 MG/L	0.1 MG/L

The corrected, actual values, which do not exceed the primary MCL for fluoride of 2 mg/l should be used by DWR.

Water Use

As described in the General Comments, DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. Based on output from the Cal-SIMETAW model used by DWR to estimate applied water, DWR estimated that vineyards in the Santa Rosa Plain Subbasin use approximately 14 inches of water for irrigation. This value is significantly higher than known estimates from published studies of applied water for vineyard irrigation in Sonoma County identified in Table 1 of the General Comments, which range from 3 to 10.8 inches per year in Sonoma County. Additionally, DWRs own estimate of vineyard irrigation in the Santa Rosa Plain conducted as part of annual land and water use estimates last conducted in 2010 was approximately 7.3 inches per year. DWR should utilize these locally-derived estimates of applied water in the Basin Prioritization rather than the Cal-SIMETAW estimates. Should DWR decide to utilize the Cal-SIMETAW model for final Basin Prioritization, we request that DWR adjust the crop coefficients and management allowed depletion input parameters to those identified in the General Comments, above.

In the 2014 Statewide Crop Mapping dataset used by DWR to determine the amount of irrigated acreage, a large number of pasture lands in the Santa Rosa Plain Subbasin were identified as irrigated acreage and assigned large volumes of applied water, while local information and DWR's own more detailed land and water use survey conducted in 2012 noted that the a large number of pasture lands in these areas is not irrigated. Approximately 1,215 acres of pastures which DWR assumed was irrigated in the Draft 2018 Basin Prioritization is

identified as non-irrigated in DWR's more detailed 2012 land and water use survey (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Land-Use-Surveys). Removal of these acres reduces the water use estimates for the basin by approximately 4,762 acre-feet per year.

It is also unclear from information provided by DWR whether the use of recycled water for irrigation was incorporated into the determination of the percentage of surface water and groundwater use. In the Santa Rosa Plain, the City of Santa Rosa, Town of Windsor and the Airport-Larkfield Wastewater Treatment Plant provide recycled water for irrigation which should be incorporated into DWR's calculation of the overall percentage of groundwater use in the basin. In 2014 approximately 6,000 acre-feet of recycled water was delivered for irrigation within the basin in 2014. This important source of water supply should be incorporated into calculating the overall percentage of groundwater use in the basin by DWR.

Public Water Supply Wells

The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. In the Santa Rosa Plain Subbasin, many public supply wells within the basin serve comparatively very few customers compared to other water supply wells, yet they are weighted the same (123 of the 158 public water supply wells within the basin identified by DWR serve less than 5% of the total population). A greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water

Sonoma Valley

The following issues related to information, data and methodology used by DWR in prioritizing the Sonoma Valley Subbasin have been identified and are further described below:

- DWR's treatment of naturally occurring minerals such as iron and manganese that have secondary maximum contaminant levels (MCLs) for taste and odor equal to hazardous and toxic substances that have primary MCLs;
- DWR's overestimation of groundwater use which is higher than the local experience and studies suggests;
- Incorrect identification of irrigated versus non-irrigated croplands;
- Clarification as to whether DWR incorporated recycled water as a source of water supply in the basin; and
- Equal weighting of public supply wells, regardless of the number of people served and amount of groundwater production.

Water Quality

As described in the General Comments, the methodology for assigning impact points for water quality should not use secondary MCLs as metrics to determine whether or not a basin needs to comply with SGMA. Review of datasets made available by DWR indicates that for the Sonoma Valley Subbasin, approximately 12% of the MCL exceedances which DWR used to identify water quality degradation for component 7.d are for constituents with only secondary MCLs, such as iron and manganese. Excluding constituents with only secondary MCLs from the dataset would reduce the number of points assigned in subcomponent 7.d from 2 to 1.

Water Use

As described in the General Comments, DWR's estimates of water use, particularly for agricultural water use, are significantly higher than local estimates of water use. Based on output from the Cal-SIMETAW model used by DWR to estimate applied water, DWR estimated that vineyards in the Sonoma Valley Subbasin use approximately 16 inches of water for irrigation. This value is significantly higher than known estimates from published studies of applied water for vineyard irrigation in Sonoma County identified in Table 1 of the General Comments, which are approximately 7.2 inches per year in Sonoma Valley. Additionally, DWRs own estimate of vineyard irrigation in the Sonoma Valley Subbasin conducted as part of annual land and water use estimates last conducted in 2010 was approximately 7.3 inches per year. DWR should utilize these locally-derived estimates of applied water in the Basin Prioritization rather than the Cal-SIMETAW estimates. Should DWR decide to utilize the Cal-SIMETAW model for final Basin Prioritization, we request that DWR adjust the crop coefficients and management allowed depletion input parameters to those identified in the General Comments, above.

In the 2014 Statewide Crop Mapping dataset used by DWR to determine the amount of irrigated acreage, a large number of grain and hay crops and pasture lands in the Sonoma

Valley Subbasin were identified as irrigated acreage and assigned large volumes of applied water, while local information and DWR's own more detailed land and water use survey conducted in 2012 noted that the a large number of pasture lands in these areas is not irrigated. Approximately 6,471 acres of grain and hay crops and 534 acres of pastures which DWR assumed was irrigated in the Draft 2018 Basin Prioritization is identified as non-irrigated in DWR's more detailed 2012 land and water use survey (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Land-Use-Surveys). Removal of these acres reduces the water use estimates for the basin by approximately 7,600 acre-feet per year.

It is also unclear from information provided by DWR whether the use of recycled water for irrigation was incorporated into the determination of the percentage of surface water and groundwater use. In Sonoma Valley, the Sonoma Valley County Sanitation District provides recycled water for irrigation which should be incorporated into DWR's calculation of the overall percentage of groundwater use in the basin. In 2014 approximately 600 acre-feet of recycled water was delivered for irrigation within the basin. This important source of water supply should be incorporated into calculating the overall percentage of groundwater use in the basin by DWR.

Public Water Supply Wells

The draft methodology for determining the density of public water supplies served by groundwater places equal weight on a municipal well serving thousands of residents and a well serving a single business, such as a winery or restaurant. In the Sonoma Valley Subbasin, many public supply wells within the basin serve comparatively very few customers compared to other water supply wells, yet they are weighted the same (40 of the 42 public water supply wells within the basin identified by DWR serve less than 5% of the total population). A greater emphasis and weighting should be placed on wells serving a larger population and a relatively lower weighting should be applied to wells that serve a smaller number of users or a single business and use a relatively lower volume of water