

Lower San Joaquin River - EC Water Quality Objective & Performance Goal (Preferred Alternatives)

June 26, 2015

After consideration of a broad spectrum of alternative water quality objectives (WQOs) and implementation actions, the following preferred alternatives for an electrical conductivity (EC) WQO and an EC Performance Goal are being recommended by the Lower San Joaquin River Committee (LSJRC). The purpose of this document is to provide guidance and recommendations to Regional Board staff as they develop the subsequent Staff Report and Basin Plan Amendment language.

Chapter III (Water Quality Objectives) of the Basin Plan

The Preferred Alternative for the EC WQO, which would be incorporated into Chapter III of the Basin Plan, is as follows:

Electrical Conductivity (EC) in the Lower San Joaquin River (Reach 83), as measured at Crows Landing, is 1550 µmhos/cm as a 30-day running average, except during an *Extended Dry Period*^{1,2}.

¹ Extended Dry Period is defined as follows:

The State Water Resources Control Board's (SWRCB's) San Joaquin Valley "60-20-20" Water Year Hydrologic classification^{1,2} shall be assigned the following indicator values:

- Wet – 5
- Above Normal – 4
- Below Normal – 3
- Dry – 2
- Critically Dry – 1

The indicator values will be used to determine when an Extended Dry Period is in effect:

- An Extended Dry Period shall be triggeredbegin when the sum of the current year's 60-20-20 indicator value and the previous two year's 60-20-20 indicator values total six (6) or less.
- An Extended Dry Period shall be deemed to exist for one water year (12 months) following a period with an indicator value total of six (6) or less.

² During an Extended Dry Period (defined in footnote 1 above), the following factors shall be taken into consideration to ensure that the beneficial uses are protected in Reach 83 of the LSR (as measured at Crows Landing):

- To protect the designated potential MUN beneficial use, EC WQO shall be 2200 µmhos/cm as 12-month running averagethe average of the previous four (4) month quarterly averages to protect the designated potential MUN beneficial use.

Commented [KA1]: It would be good to identify a reference for the classification system. I have two footnotes below – one from the Basin Plan which refers to the Bay-Delta Plan and one from D1641. Perhaps the Regional Board can provide some direction regarding which reference is best.

Commented [KA2]: Jim Brownell to define

¹ The calculation method for the 60-20-20 Water Year Hydrologic Classification is set forth in Figure 2 of the Water Right Decision 1641, March 2000.

² The water year classification will be established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification (as defined in Footnote 17-13 for Table 3 in the State Water Resources Control Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, May 1995 State Water Resources Control Board's Revised Water Right Decision 1641, March 2000) - at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series.

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- To protect the AGR beneficial use, EC in the Lower San Joaquin River (Reach 83 shall be 2240 µmhos/cm as a 30-day running average EC levels shall be managed to avoid a diminishment of water volumes for agricultural supply.
 - EC concentrations above 1550 µmhos/cm shall not result in requirements for increased water quality releases from New Melones reservoir to meet the Vernalis EC objectives.

Commented [AL3]: This is based Hoffman modelling for 80% yield with almonds. The committee still needs to weigh in on the options for a WQO to protect AGR during the Extended Dry Period.

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Chapter IV (Implementation) of Basin Plan

The Preferred Alternative for the implementation of the EC Performance Goal³ for the Lower San Joaquin River (Reach 83), which would be incorporated into Chapter IV of the Basin Plan, is as follows:

Water Year Type	Irrigation Season		Non-irrigation Season
	March – June	July - October	November - February
Wet	1350 (Performance Goal)		1550 (WQO)
Above Normal	1350 (Performance Goal)		1550 (WQO)
Below Normal	1350 (Performance Goal)	1550 (WQO)	1550 (WQO)
Dry	1350 (Performance Goal)		1550 (WQO)
Critical	1550 (WQO)		

EC WQO of 1550 µmhos/cm with a seasonal EC Performance Goal of 1350 µmhos/cm. Both the EC WQO and EC Performance Goal are as measured at Crows Landing and are 30-day running averages. The WQO and Performance Goal would apply as indicated above, except during an *Extended Dry Period*^{1,2}

¹ Extended Dry Period is defined as follows:

The State Water Resources Control Board's (SWRCB's) San Joaquin Valley "60-20-20" Water Year Hydrologic classification shall be assigned the following indicator values:

- Wet – 5
- Above Normal – 4
- Below Normal – 3
- Dry – 2
- Criticaly Dry – 1

The indicator values will be used to determine when an Extended Dry Period is in effect:

- An Extended Dry Period shall be triggeredbegin when the sum of the current year's 60-20-20 indicator value and the previous two year's 60-20-20 indicator values total six (6) or less.
- An Extended Dry Period shall be deemed to exist for one water year (12 months) following a period with an indicator value total of six (6) or less.

³ The Performance Goal will be used to measure progress towards achievement of EC levels during certain water types and times of year that are of higher quality than the current EC WQO for Reach 83 of the LSJR.

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² During an Extended Dry Period (defined in footnote 1 above), the following factors shall be taken into consideration to ensure that the beneficial uses are protected in Reach 83 of the LSR (as measured at Crows Landing):

- To protect the designated potential MUN beneficial use, EC WQO shall be 2200 $\mu\text{hos/cm}$ as 12-month running average to protect the designated potential MUN beneficial use the average of the previous four (4) quarter averages.
- To protect the AGR beneficial use, EC in the Lower San Joaquin River (Reach 83) shall be 2240 $\mu\text{hos/cm}$ as a 30-day running average EC levels shall be managed to avoid a diminishment of water volumes for agricultural supply.
 - EC concentrations above 1550 $\mu\text{hos/cm}$ shall not result in requirements for increased water quality releases from New Melones reservoir to meet the Vernalis-EC objectives.

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Supplemental Information

Establishment of 1350 $\mu\text{hos/cm}$ as the Performance Goal

A Performance Goal of 1350 $\mu\text{hos/cm}$ is recommended to be established as a Performance Goal during throughout the irrigation season during specific water year types to enhance the ability to manage salts for multiple benefits. 1350 This value was established as a Performance Goal since because:

Commented [KA5]: There may be other bullets that we can add here.

- 1350 $\mu\text{hos/cm}$ provides the same level of protection as 1550 $\mu\text{hos/cm}$ (protection of 95% of the crop, 95% yield in all of the 5% driest year), however it would occur at a lower leaching fraction (10-15%).
- The WARMF modelling of the Planned Bundle conducted to date indicates that, after full implementation of the key actions underway within the LSJR Basin, that the ambient water quality within Reach 83 of the LSJR will not exceed may be able to meet an EC value of 1350 $\mu\text{hos/cm}$. However, due to model uncertainty, the WQO was set at 1550 $\mu\text{S/cm}$ which is the value that is protective of agriculture the most sensitive crop based on Hoffman modeling results.
- Agricultural supply water at 1350 $\mu\text{hos/cm}$ would provide a higher level of protection during irrigation season by increasing crop yield above 95 percent, based on Hoffman modeling results.
- and allow for more comprehensive salinity management within the Basin it would result in the help maintain the soil salinity balance by flushing the of salt accumulated during Extended Dry Periods below the soil root zone.

Effective Date for the EC WQO and EC Performance Goal

The proposed EC WQO and Performance Goal should take effect at a future date (e.g. 2020) on January 1, 2020, to allow for full implementation of Grasslands Bypass project and other planned actions affecting salinity levels in Reach 83.

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Evaluation of the EC Performance Goal and Basin Plan Re-Opener

A re-opener should be established in the Basin Plan ~~as soon as possible, but no later than~~ ten (10) years after ~~the effective date of the EC WQO~~ adoption of the amendment to consider an EC value of ~~1350 less than 1550~~ $\mu\text{mhos/cm}$ as the numeric WQO in Reach 83. ~~At that time~~ As part of the evaluation, the ~~historic EC data should be evaluated to determine if the planned actions assumed for the Planned Bundle modeling have resulted in ambient river EC water quality less than 1550 $\mu\text{mhos/cm}$. Based on findings from the the evaluation~~ evaluation, the Central Valley Water Board may consider the following actions: 1) ~~a Amendment to the Basin Plan will~~ Initiating a basin plan amendment effort to establish a ~~new EC WQO, or 2) ,the~~ Maintaining the current EC WQO ~~will not be changed and with no further evaluation planned~~ planned evaluation, or 3) Scheduling additional time ~~will be allowed for collection of more data and another evaluation scheduled~~ a future evaluation to allow for additional data collection and analysis. ~~The date must be far enough into the future to allow for evaluation of the ability to achieve this EC concentration in ambient water quality within Reach 83 under varying water year types and seasonal conditions. As a part of the Triennial Review process, the available data will be evaluated to determine if there is enough data for the water year types to initiate the re-opener. The EC 1350 $\mu\text{mhos/cm}$ Performance Goal would only become a numeric WQO through a future Basin Plan amendment. Such action would require information to demonstrate that EC 1350 $\mu\text{mhos/cm}$ would be consistently achievable in the long term.~~

Salinity Management Plan

The Basin Plan should include language in the implementation section that would emphasize the intent to attain the 1350 $\mu\text{mhos/cm}$ EC Performance Goal through implementation of ~~currently planned a~~ salinity management ~~actions such as, full implementation of the Grassland Bypass Project. plan. If the~~ planned salinity management actions do not result in the attainment of the EC Performance Goal as expected, Regional Water Board staff will evaluate why the EC Performance Goal was not achieved. Such evaluation may include requesting reports from dischargers in reach 83, soliciting input from interested parties, or other appropriate actions. Specific actions to be taken in the event the goal is not achieved should include:

- * ~~Reporting by responsible parties~~ including evaluation of the reason(s) for the inability to attain the Performance Goal.
- * ~~Review by Regional Water Board staff~~
- * ~~Appropriate follow up actions~~
- ~~A stakeholder group should be formed to support sustainable salinity management in the Lower San Joaquin River, especially during Extended Dry Periods. The Salt and Boron TMDL for the San Joaquin River, adopted in 2006, resulted in the establishment of a Real Time Management effort for salinity management in the Reach 83 watershed to meet current EC WQOs at Vernalis. Stakeholders involved in the Real Time Management effort could provide information to the Regional Board staff to help evaluate the ability to meet the EC Performance Goal.~~ should be

Commented [D6]: The salinity management group was originally considered as a vehicle to help interpret a narrative extended drought period water quality objective as well as to provide guidance for relaxing the 1550 EC objective in the winter month to provide greater ability to move salts out of the basin during times that would not impact beneficial uses. If these two actions are not required the group has no role and should not be included in the Basin Plan. Reference to the Vernalis Realtime Group could be helpful to document the role the group could play in future salinity actions if necessary.

Commented [AL7]: Who are the responsible parties?

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Commented [AL8]: How are these determined?

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encouraged to take on the additional responsibilities for salinity management to meet the proposed EC WQO and Performance Goal in Reach 83.

The proposed stakeholder group would provide a forum for collaborative management of salts in balance with water supply needs within the basin. The stakeholder group would provide input to Regional Water Board staff to support salinity management within the LSJR Basin, especially as it pertains to:

- EC levels necessary to protect the designated potential MUN beneficial use;
- EC levels necessary to protect the AGR beneficial use while avoiding a diminishment of water volumes for agricultural supply;
- An evaluation of EC levels and their corresponding impact on water quality releases from New Melones reservoir to meet the Vernalis EC objectives;
- The ability of the ambient water quality in Reach 83 of the LSJR to meet the EC Performance Goal; and
- The ability of the stakeholders to collaboratively and sustainably manage salt in the LSJR.

It is recommended that the group encompass all stakeholders in the LSJR basin, including, but not limited to: those using water from the river and downstream waters, those discharging agricultural runoff to Reach 83 and upstream tributaries, those operating wetlands and refuges, municipalities discharging treated effluent to Reach 83, operators of east side reservoirs, users of water from east side reservoirs, regulatory agencies, USBR, and DWR.

Commented [AL9]: Talked in the meeting about listing annual reports that could be provided to the Central Valley Water Board that would contain the information needed to conduct a reopener evaluation.