

EXECUTIVE SUMMARY

The purpose of this Staff Report is to provide the rationale and supporting documentation for proposed amendments to the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (Basin Plan) to establish salinity water quality objectives (WQOs) in the Lower San Joaquin River (LSJR) in Reach 83 from the confluence of the Merced River to Vernalis. This report proposes amendments to the Basin Plan to add:

- Salinity water quality objectives (WQOs) that are protective of beneficial uses in the LSJR. An electrical conductivity (EC) at 25 degrees Celsius¹ water quality objective of 1,550 micro Siemens per centimeter ($\mu\text{S}/\text{cm}$) as a 30-day running average is proposed, except during Extended Dry Periods² when the objective will be 2,470 $\mu\text{S}/\text{cm}$ as a 30-day running average and 2,200 $\mu\text{S}/\text{cm}$ as the average of the previous four consecutive quarterly samples.
- An implementation program to achieve proposed salinity WQOs and a performance goal of 1,350 $\mu\text{S}/\text{cm}$ during certain months and water year types, based on modeling results of expected water quality.
- A monitoring and surveillance program to evaluate the effectiveness of the implementation program.

These proposed amendments provide protection of designated existing or potential beneficial uses in this section of the Lower San Joaquin River, including the two most sensitive to salinity impacts: Agricultural Supply (AGR) and Municipal and Domestic Supply (MUN). In addition, use of an implementation EC performance goal promotes achievement of the best possible water quality under variable conditions.

In Revised *Water Right Decision 1641* (March, 2000), the California State Water Resources Control Board (State Board) directed the Central Valley Regional Water Quality Control Board (Central Valley Water Board) to develop and adopt salinity objectives and a program of implementation for the main stem of the San Joaquin River upstream of Vernalis (State Board 2000). In 2004, the Central Valley Water Board adopted and in 2006 the US EPA approved, a Control Program (TMDL) addressing electrical conductivity and boron in the San Joaquin River at Airport Way (Vernalis). The TMDL is implemented through waivers of waste discharge requirements (WDRs) or WDRs to apportion load

¹An EC measurement made or corrected to 25 °C is equivalent to specific conductance

² An Extended Dry Period is defined using the State Water Board's San Joaquin Valley "60-20-20" Water Year Hydrologic Classification¹ to assign a numeric indicator to a water year type as follows:

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

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

- An Extended Dry Period shall begin 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.

allocations to different geographic subareas in the valley. As an alternative to strict load allocations, the TMDL encourages discharger participation in a real-time management program as a means to attain salinity water quality objectives, while maximizing the export of salts out the watershed to help protect the region's agricultural production and long term sustainability. The Control Program also required a second phase TMDL to prepare and implement new salinity and boron objectives for the San Joaquin River, upstream of Vernalis.

An initial CEQA scoping meeting for a basin planning effort to develop the upstream water quality objectives in the LSJR was held on 11 May 2005. However, staff turnover and budgetary constraints limited progress on the project. A second CEQA scoping meeting was held on 30 March 2009 and limited the geographic scope of the project to the section of the river upstream of Vernalis to the Merced River. Staff released a draft report, *Salt Tolerance of Crops in the Lower San Joaquin River (Merced to Stanislaus River Reaches)* (LSJR Crop Tolerance Report) in March 2010 that presented the application of crop salt sensitivity parameters needed to establish EC water quality criteria in the LSJR (Central Valley Water Board, 2016). At that same time, the Central Valley Water Board requested that the Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS) continue the effort on the upstream San Joaquin River beneficial use and salt and boron objectives evaluation and work on the policy and science to develop a basin plan amendment that would address those issues. CV-SALTS is a collaborative stakeholder driven and managed program to develop sustainable salinity and nitrate management planning for the Central Valley. The proposed WQOs herein are the result of a stakeholder-driven effort led by the LSJR Committee, which is a subcommittee of the CV-SALTS. It includes members of irrigation, water, and resource conservation districts, city, county, state and federal agencies, producers, growers, irrigators, water quality and watershed coalitions, drainage authorities, clean water and wastewater associations, consultants of various organizations and other interested parties.

Between May 2010 and the end of 2015, the LSJR Committee developed recommendations for EC WQOs that are protective of beneficial uses in the Lower San Joaquin River and an implementation plan for consideration by the Central Valley Water Board. The Committee began by conducting reviews of beneficial uses and water quality data for the LSJR, and concluded that the Agricultural Supply (AGR) beneficial use is the most sensitive to salinity, followed by the potential Municipal and Domestic Use (MUN) beneficial use. The Committee also decided there was not enough information available to support a change to the current boron WQOs for the LSJR and instead focused their efforts on the EC WQOs. Next, the Committee developed agricultural use policies to assist with development of EC WQOs and vetted them with the CV-SALTS Executive Committee. The policies recommend key components to consider when determining reasonable protection of AGR and include a leaching fraction to represent irrigation practices when site-specific data are not available, crop yield values acceptable to stakeholders under certain conditions, and metrics for identifying the most salt sensitive commercial crop that requires protection. In addition, an Extended Dry Period definition was developed to assist with establishing reasonable salinity objectives in the LSJR during time periods when water supplies are constrained.

The LSJR Committee then established EC water quality criteria for consideration as WQOs protective of AGR for this Basin Plan Amendment by entering existing and recently acquired scientific data, and applying the recommended policies into the Hoffman Model, a peer-reviewed steady-state soil water salinity model used in the LSJR Crop Tolerance Report. The proposed EC WQO of 1,550 $\mu\text{S}/\text{cm}$ is

derived from the model by applying a 95 percent almond crop yield, during a 5th percentile annual rainfall year utilizing a leaching fraction of 15 percent. In conformance with the water quality objectives and sampling regimes established in the San Joaquin River at Vernalis for the protection of agricultural uses of water entering the Delta, the LSJR Committee recommended maintaining the same water quality compliance period of a maximum 30-day running average of mean daily electrical conductivity (State Water Resources Control Board, 2000). The proposed WQO likewise falls within the recommended range (900 to 1600 $\mu\text{S}/\text{cm}$) of the Title 22 of the California Code of Regulation's Secondary Maximum Contaminant Level (MCL) for specific conductance, which is considered protective of the MUN use in the Basin Plan. The preferred project alternative also incorporates EC WQOs during an Extended Dry Period that are reflective of a lower crop yield expectation of at least 75 percent. During these periods, an EC WQO of 2,470 $\mu\text{S}/\text{cm}$ as a maximum 30-day running average is proposed as reasonably protective of irrigation supply water. A concurrent EC WQO of 2,200 $\mu\text{S}/\text{cm}$ as the average of the previous four consecutive quarterly samples is also proposed for an Extended Dry Period to reasonably protect the potential MUN beneficial use by equaling the short term Title 22 Secondary Maximum Contaminant Level (MCL) for specific conductance.

The Watershed Analysis Risk Management Framework (WARMF) watershed modeling tool, using historic conditions to simulate salt loading in the LSJR, was applied to evaluate the ability of different implementation strategies to meet the proposed salinity WQOs. The preferred implementation plan selected by the LSJR Committee includes the execution of current and currently planned activities to manage irrigation return flows to the LSJR. An estimated 55,305 acres of the San Joaquin River Basin have the rights to divert and use water and subsequently drain back into this stretch of the river. A key activity within the selected implementation plan is the completion of the Grassland Bypass Project, which will lead to zero discharge of agricultural return flows from the Grassland Subarea to tributaries of the LSJR. The planned activities in the watershed are predicted to result in the LSJR reaching compliance with the proposed EC and existing boron WQOs for this stretch of the river by the end of 2019. The proposed objectives are also predicted to reduce the reliance on New Melones fresh water releases to meet the salt and boron objectives downstream at Vernalis.

Watershed analyses also suggested that the selected implementation plan might result in the attainment of an EC value of 1,350 $\mu\text{S}/\text{cm}$ in the LSJR, relative to certain seasonal and water year conditions. However, these findings were not conclusive and, as a result, the LSJR Committee stakeholders recommended that an EC value of 1,350 $\mu\text{S}/\text{cm}$ be established as an implementation performance goal during specific months of the irrigation season of certain water year types to promote the best possible water quality. The Staff Report includes a monitoring plan to verify compliance with the LSJR EC and boron WQOs and attainment of the EC performance goal. The LSJR Committee proposed that the Central Valley Water Board use future monitoring data to reevaluate the EC WQOs ten years after adoption of the Basin Plan Amendment and determine whether or not an adjustment to lower the WQOs is appropriate.

This Staff Report also evaluates the proposed Basin Plan Amendment's consistency with existing federal and state laws, regulations and policies, contains an environmental analysis that complies with the applicable requirements of the California Environmental Quality Act (CEQA) and includes antidegradation and economic analyses that evaluate potential impacts of this project. The Board's Basin Planning Program is considered a certified regulatory program, which means that the Board is exempt from the requirement to prepare an environmental impact report for basin planning activities

under the California Environmental Quality Act. (Pub. Res. Code, § 21080.5; Cal. Code Regs., tit. 14, § 15251(g).) The Board's environmental review of the proposed Basin Plan Amendments is instead contained in this Staff Report, which is considered to be "substitute environmental documentation" or "SED".

REFERENCES

Central Valley Water Board. (2016). *Revisions to the 2010 Salt Tolerance of Crops in the Lower San Joaquin River (Merced to Stanislaus River Reaches) and 2016 Addendum.*

State Water Resources Control Board. (2000). *Revised Water Right Decision 1641 In the Matter of: Implementation of Water Quality Objectives for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.*

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