CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

RESOLUTION R7-2026-0012

Amending Water Quality Control Plan for the Colorado River Basin
to Establish Total Maximum Daily Load and Implementation Plan
for Chloride and Indicator Bacteria in Alamo River, Imperial County

ATTACHMENT A

The California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) hereby revises the operative Water Quality Control Plan (Basin Plan) for the Colorado River Basin as set forth herein. Formatting may be subject to change upon incorporation into the existing document. Footnote numbering will also change in the resulting document.

Table of Contents

The following shall be added to the Basin Plan's Table of Contents, with all page numbers updated accordingly:

K. ALAMO RIVER CHLORIDE AND INDICATOR BACTERIA TMDL

Chapter 4—Implementation

The following language shall be added to Section V (Total Maximum Daily Loads [TMDLs] and Implementation Plans) in Chapter 4 To (Implementation), beginning on page 4-XX.

K. ALAMO RIVER CHLORIDE AND INDICATOR BACTERIA TMDL

SUMMARY

This TMDL was adopted by the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Board) on **[DATE]**.

This TMDL was approved by:

The State Water Resources Control Board (SWRCB) on **[DATE]**

The California Office of Administrative Law (OAL) on **[DATE]**

The U.S. Environmental Protection Agency (USEPA) on **[DATE]**

1. TMDL ELEMENTS

Elements of this Total Maximum Daily Load (TMDL), as described in the "State of California S.B. 469 TMDL Guidance: A Process for Addressing Impaired Waters in California, June 2005," are described in Table K-1:

Table K-1: Elements of the TMDL and Implementation Plan

ELEMENT	**DESCRIPTION**
Project Statement	The Alamo River in the Imperial Valley is polluted/impaired by chloride, *Escherichia coli* (*E. coli*), and enterococcus. This is in violation of the water quality objectives designated in the Water Quality Control Plan (Basin Plan) for the Colorado River Basin Region. This project establishes Total Maximum Daily Loads (TMDLs) for chloride and indicator bacteria in the water column to address the impairments that include numeric targets, load allocations, and implementation plans to control discharges of the above pollutants to the Alamo River.
Project Area	The Alamo River is located in the Imperial Valley of Imperial County, California. The Imperial Valley covers approximately 500,000 acres south of the Salton Sea, most of it irrigated agricultural land. The principal communities in the valley are El Centro, Imperial, Brawley, and Calexico. The valley is one of the most arid areas in the United States and is characterized by its hot, dry summers and cool winters. The Alamo River watershed includes approximately 340,000 acres within the Imperial Valley. It originates in Mexico, about one half mile south of the International Boundary, and runs north about 60 miles before it discharges into the Salton Sea.

Numeric Targets

Numeric targets are water quality measures used to determine when narrative or numeric water quality objectives (WQOs) are achieved, and hence, when beneficial uses are protected. Review of collected water quality data from the Alamo River indicates the presence of chloride and indicator bacteria in excess of the numeric targets. In the Alamo River, chloride and indicator bacteria have been found in SWAMP water samples at concentrations above such targets, which was the main factor for listing the waterbodies.

To address these impairments, the TMDLs for water column impairments have been set equal to the numeric targets to protect aquatic organisms, wildlife, and human health from potentially harmful effects associated with the pollutants.

Chloride and Indicator Bacteria Numeric Targets for Alamo River.

Impairment	Numeric Targets	Source
Chloride	230 mg/L as a criterion continuous concentration (CCC) expressed as a 4-day average	USEPA, 2006
E. coli	2000 MPN/100 mL as Maximum Allowable 100 cfu/100 mL as a 6-week rolling geometric mean	Basin Plan, 2023
Enterococcus	30 cfu/100 mL as a 6-week rolling geometric mean 110 cfu/100 mL as STV	Basin Plan, 2023

Source Analysis	Chloride is naturally occurring in the soil of the Salton Trough, but the main source of the chloride present in the Alamo River is of agricultural origin. The bulk of the flow of the Alamo River is from agricultural runoff from fields watered by the Colorado River. The Colorado River contains salts that are concentrated by plant uptake and evaporation, leading to salty water accumulating in the tail and tile drainage systems that flow to the Alamo River. Colorado River water is high in total dissolved solids (~800 ppm), most of which are salts and is used on agricultural fields that are saline. Fertilizers also account for some of the salts present and can be carried away in tile or tail drain discharges. Tile drainage carries salt-rich water from the crop root zone and flows to the Alamo River. Tail drainage drains water from the surface of the fields that contain salts brought in with the Colorado River water as well as from the soils themselves. There is no delineation between naturally occurring salts in the soil, salts from the Colorado River, or those from fertilizers and other soil additives. Point source facilities discharge little salts (WWTPs) or have no discharge (CAFOs) leaving the bulk of the chloride source to likely be agricultural or naturally occurring. The sources of indicator bacteria in the Alamo River are unknown. Possible sources include stormwater runoff, CAFOs, runoff from agricultural fields that have been fertilized by animal waste and other non-point sources. Both *E. coli* and enterococcus are present in the digestive tracts of livestock and can be present in waste used as manure or accumulated from CAFOs. Wildlife or other free-roaming animals can also contribute as shown in the Coachella Valley Stormwater Channel Bacterial Indicators TMDL. Data from NPDES facilities and CAFOs shows minimal to no discharge of *E. coli* to the Alamo River and no indication that enterococcus would be released in any harmful concentrations due to sterilization techniques present. CAFOs in the Alamo River watershed are regulated by the *General Waste Discharge Requirements and National Pollutant Discharge Elimination System (NPDES) Permit for Concentrated Animal Feeding Operations Within the Colorado River Basin Region* (Order R7-2021-0029). This permit does not allow the discharge of waste from CAFO operations to any surface waters. Each CAFO facility has a berm or berms in place to keep any runoff on the property and out of surface waters. For the last five years, there have been no discharges at any CAFO operation within the Alamo River watershed. Since there are no discharges to surface waters, it is largely unlikely that CAFOs are a substantial source of bacteria to the Alamo River. However, since they do contain large concentrations of animals that have the potential to be a source, they will be required to monitor for indicator bacteria to

	determine if there is any contamination. Based on the amount of land acreage in Imperial County and the amount of land used for agricultural purposes and wildlife habitat, nonpoint sources are likely the largest contributors. NDPES facilities are likely a minor contributor to both impairments. NPDES permitted Municipal Separate Storm Sewer Systems (MS4s) discharge urban stormwater into the surrounding waterbodies, however, due to the arid climate in Imperial Valley and limited developed lands, urban stormwater runoff is also a relatively insignificant source of these pollutants in the Alamo River. No source can be conclusively negated without further data.
Seasonal Variations and Critical Conditions	The Imperial Valley is characterized by its hot, dry summers and cool winters, with little variation in rainfall (less than 8 cm of rainfall annually). Given the dry climate, the Alamo River's flow primarily consists of, but not limited to, agricultural discharge from the Imperial Valley, which provides stable water flow within the watershed. With a steady local climate and little variation between the wet and dry seasons, TMDLs and allocations developed based on seasonal variation are not appropriate in this case. The TMDLs and allocations are expressed in terms of concentrations equal to the desired water quality conditions (targets), which are applicable to all seasons and flow-regimes. Therefore, TMDLs and allocations developed based on seasonal variation are not considered in this case. Critical conditions are the combination of environmental factors resulting in the water quality standard being achieved by a narrow margin (i.e., that a slight change in environmental factors could result in exceedance of a water quality standard). Such a phenomenon could be significant if TMDLs were expressed in terms of loads, and the allowed loads were based on achieving the water quality standards by a narrow margin. However, these TMDLs are set as concentrations, which are set equal to the desired water quality condition. Consequently, there are no critical conditions as there is no proven seasonal variation or narrow margin of attainment.

Linkage Analysis	The linkage analysis describes the relationship between the water quality standard and the identified pollutant sources and based on this linkage, identify what loadings are acceptable to achieve the water quality standard which may further be used to determine the loading capacity of the water body for the pollutant of concern. This ensures that the loading capacities specified in the TMDLs will result in attaining the desired water quality. For chloride and indicator bacteria TMDLs, this link is established because the wasteload and load allocations are equal to the numeric targets, which are the same as the TMDLs. Reductions in the loadings of these pollutants to the specified target allocation will result in attainment of WQOs.
TMDL Calculation	A TMDL is the sum of **wasteload allocations** for point sources (e.g., wastewater treatment facilities), **load allocations** for nonpoint sources (e.g., agricultural activities), allocations for **natural sources** (e.g., wildlife), and a **margin of safety**, such that the capacity of the water body to assimilate pollutant loads without violating water quality objectives is not exceeded. **TMDL = Wasteload Allocations** **+ Load Allocations** **+ Natural Sources** **+ Margin of Safety** Allocations are based on the source analysis and numeric target. The TMDLs for water column concentration-based impairments have been set equal to the numeric targets, averaged over a three-year period to account for short-term variations. There are possible natural sources, however, they have not been quantified and have not been included. Utilizing a concentration-based target is best in this situation as they are generally conservative and are calculated on large amounts of data.

Allocations and Margin of Safety

Source analysis determined chloride and indicator bacteria in the Alamo River come primarily from nonpoint sources. NPDES permitted municipalities and facilities are assigned chloride and indicator bacteria allocations, because if these facilities were not assigned allocations, their allocations would be zero and any detection would be a violation.

Point sources such as municipalities and facilities are subject to regulation under the NPDES program. Some stormwater discharges from Municipal Separate Storm Sewer Systems (MS4) are subject to regulation under the Municipal Storm Water Program which requires stormwater permits for large cities and counties with populations of 100,000 or more. The stormwater discharges from the cities of Imperial, El Centro, and the County of Imperial are regulated by State Water Board Order 2013-0011-DWQ, the general permit for stormwater discharges from Small MS4, as Phase II collection systems.

Discharges from NPDES-permitted facilities are regulated by individual permits adopted by the Colorado River Basin Water Board or are regulated by the Industrial or Construction NPDES general stormwater permits (2014-0057-DWQ, 2009-0009-DWQ, 2022-0057-DWQ) adopted by the State Water Board. A total of 8 individual permits and two Industrial or Construction NPDES general stormwater permits are issued to the NPDES-permitted facilities that discharge to the Alamo River. In addition, Concentrated Animal Feeding Operations are regulated under R7-2021-0029 and will also be assigned an allocation.

To address these impairments, waste load allocations for chloride and indicator bacteria have been assigned to all of the above NPDES permitted facilities or general permits. These TMDLs will utilize requirements put in place by either individual or general NPDES permits or WDRs. The waste load allocations shall be implemented as NPDES permit numeric effluent limits for chloride, *E. coli*, and enterococcus.

Wasteload Allocations for Chloride and Indicator Bacteria in Alamo River.

Impairment	Wasteload Allocation
Chloride	230 mg/L as a CCC expressed as a 4-day average

E. coli	100 cfu/100 mL as a 6-week rolling geometric mean
Enterococcus	30 cfu/100 mL as a 6-week rolling geometric mean

In the Imperial Valley, irrigated agricultural lands are considered nonpoint sources of pollutants. A review of water quality data from the Alamo River indicates chloride and indicator bacteria not meeting WQOs in water column samples. To address these impairments, allocations for chloride, *E. coli,* and enterococcus have been set equal to the numeric targets and will be implemented in permits as load allocations for the Alamo River. The Colorado River Basin Water Board adopted General WDRs for Discharges of Waste from Irrigated Agricultural Lands for agricultural dischargers in the Imperial Valley area (Order R7-2021-0050 and subsequent revised versions).

Load Allocations for Chloride and Indicator Bacteria in Alamo River.

Impairment	Load Allocation
Chloride	230 mg/L as a CCC expressed as a 4-day average
E. coli	2,000 MPN/100 mL as maximum allowable
Enterococcus	110 cfu/100 mL as STV not to be exceeded by more than 10% of samples collected in a calendar month

The margin of safety is incorporated into these TMDLs implicitly through conservative assumptions, namely, the desired water quality is conservatively achieved through allocations and targets set equal to desired water quality objectives and therefore an additional explicit margin of safety is not required. The allocations are equal to the loading capacity concentrations, and does not account for dilution in the water bodies receiving stormwater discharges. There will likely be dilution available in the water bodies because it is unlikely that all tributaries are discharging at concentrations approaching the proposed concentration goals. Thus, the available dilution provides a margin of safety for the water bodies. Because the WLAs and loading capacity are all defined on a concentration-basis, all seasonal variations and critical conditions are considered in the recommended method for defining the numeric triggers, loading capacity and allocations.

	However, if during the TMDL implementation phase, staff develops numeric targets and TMDLs that better reflect the desired water quality, the allocations will be set equal to these modified targets and TMDLs.
Monitoring Plan	The Imperial Valley Agricultural General Order contains monitoring and reporting provisions to provide a feedback mechanism for the assessment of progress toward attaining the WQOs. The Imperial Valley Irrigated Lands Coalition Group (IVILC) is currently collecting water samples from the Alamo River multiple times a year for chloride and indicator bacteria. NPDES permittees will monitor chloride and enterococcus in effluent water. All NPDES permittees are already monitoring for *E. coli* and will continue to do so. The individual and general permits contain provisions stating that the Monitoring and Reporting Programs (MRPs) may be modified to increase the number of parameters to be monitored, the frequency of the monitoring or the number and size of samples to be collected or minor clarifications on MRP requirements. These permits will be updated to include the associated targets and monitoring for the pollutants.

2. IMPLEMENTATION AND TIMELINE

To control discharges of chloride and indicator bacteria to the Alamo River, from irrigated agricultural lands, implementation will be through the Imperial Valley General Order. Many of the waste discharge requirements (WDRs) to enforce this TMDL are already prescribed through the Imperial Valley General Order.

The Imperial Valley General Order was adopted by the Colorado River Basin Water Board on December 14, 2021. It replaced the Conditional Waiver of WDRs active from 2014 to 2021 with the approval of the Imperial Valley General Order. These regulatory documents implement the State Water Resources Control Board's (State Board) *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (Nonpoint Source Policy). The Imperial Valley General Order WDRs applies to owners/operators of irrigated agricultural lands (growers) operating within the Imperial Valley that are members of a Coalition Group (Coalition). If growers decide not to become a Coalition member, they are required to apply for individual WDRs instead. Management practices (MPs), as required by the Imperial Valley General Order, will be key to stopping the discharge of the impairments to the Alamo River. MPs were an integral part of the success of the Conditional Waiver and have been included in the Imperial Valley General Order. Properly designed and implemented MPs have been shown to improve water quality in water bodies that are impaired or impacted. In the Imperial Valley, sediment is the main vehicle for most pollutants to enter waterbodies. Reducing the amount of soil that leaves a field curbs an important pathway for pollution to enter a receiving water.

Chloride may need additional MPs or a site-specific objective to adequately address the impairment. Irrigation practices in use for water conservation and sediment control in addition to the use of Colorado River water will only increase the amount of chloride in the Alamo River over time. In addition, rising temperatures associated with climate change will further cause evapoconcentration of pollutants due to the shrinking amount of associated flow. A site-specific objective may need to be considered as the known salinity of the soils in the area are a natural source of chloride. Investigating and quantifying the effect of the natural salinity sources on the concentration of chloride in the Alamo River will take some time and likely require a study of the system.

To control the discharges of chloride and indicator bacteria from NPDES permitted municipalities and facilities, these TMDLs will dictate the requirements put in place by either individual or general NPDES permits or WDRs. Under the amendment, NPDES permits regulating discharges to water bodies with chloride and indicator bacteria TMDLs would need to contain requirements to achieve compliance with the proposed TMDL allocations. No facilities draining to the Alamo River have any effluent limitations assigned for chloride or indicator bacteria. All but one facility, El Centro Generating Station, monitor *E. coli* at a frequency to facilitate generating a geometric mean. The requirement to monitor for any of the impairments in this TMDL may be changed or modified under the discretion of the Executive Officer of the Colorado River Basin Regional Water Board.

The implementation plan for NPDES sources of impairments will be reassessed once enough acceptable data from these facilities is generated as described in the TMDL Review Schedule below.

The estimated target date to achieve the WQO for chloride in the Alamo River is unknown. The first 5 years after USEPA approval will comprise baseline monitoring in areas where chloride has not been thoroughly assessed. Monitoring plans may be adjusted with data analysis. There is no estimated target date for this impairment as we are still trying to quantify sources and will need to tailor control methods or establish site-specific objectives.

For indicator bacteria, the estimated target date for *E. coli* should be 3 years after USEPA approval of these TMDLs. NPDES individually permitted facilities have consistently been below the WQO for multiple years with no indication that there will be changes to operations. Nonpoint sources are below the WQO set by the TMDL and are likely to continue that same pattern in the future.

The estimated target date for enterococcus in the Alamo River is unknown. There is a large gap in data for enterococcus which makes estimation impossible. The first 5 years after USEPA approval will be used to conduct baseline monitoring to establish current trends and collect data from all sources. Monitoring plans may be adjusted with data analysis. There is no estimated target date for this impairment as there are sources that have no data or extremely outdated information.

Water Board staff will reevaluate chloride and indicator bacteria impairments when monitoring data is submitted. Staff will modify the conditions of the Order, if necessary, to address remaining impairments.

3. TMDL REVIEW SCHEDULE

Colorado River Basin Water Board staff will conduct a review of implementation activities when monitoring and reporting data is submitted as required by the Imperial Agricultural Order and NPDES permits. Colorado River Basin Water Board staff will pursue modification of Imperial Agricultural Order conditions, as necessary, to address remaining impairments from pyrethroid compounds during the TMDLs implementation phase.

It is the intent of the Regional Water Board to hold public hearings at least once every two years to review the effectiveness of the Imperial Valley Agricultural General Order, Coalition Groups and Individual Compliance Programs, and management practices; and evaluate compliance with applicable water quality objectives.

Table K-2: TMDL REVIEW SCHEDULE

Activity	Date*
Begin First TMDL Review	Two years after USEPA approves the TMDL
Terminate First TMDL Review and conduct Regional Water Board Public Hearing	Three years after USEPA approves the TMDL
Begin Second TMDL Review	Five years after USEPA approves the TMDL
Terminate Second TMDL Review, and conduct Regional Water Board Public Hearing	Six years after USEPA approves the TMDL

[Dates are contingent upon availability of Regional Water Board resources. Subsequent reviews will occur concurrently.]