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COLORADO RIVER BASIN REGION

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Total Maximum Daily Loads for Chloride, Indicator Bacteria and Toxicity in Alamo River, Imperial County

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DRAFT STAFF REPORT

April 2025

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ACRONYMS AND ABBREVIATIONS

AAC	All-American Canal
afy	acre feet per year
BIOS	Biogeographic Information and Observation System
CAFO	Concentrated Animal Feeding Operation
CEDEN	California Environmental Data Exchange Network
CFR	Code of Federal Regulations
cfs	cubic feet per second
cfu	colony forming units
CWA	Clean Water Act or Federal Water Pollution Control Act, 33 U.S.C. § 1351 et seq.
Coalition	Imperial County Farm Bureau
Colorado River Basin Water Board	California Regional Water Quality Control Board, Colorado River Basin Region
Conditional Waiver	Conditional Waiver of Waste Discharge Requirements for Agricultural Wastewater Discharges and Discharges of Wastes from Drain Operation and Maintenance Activities Within the Imperial Valley
E. coli	*Escherichia coli*
Hatchery	Imperial Irrigation District Grass Carp Hatchery
IID	Imperial Irrigation District
ILRP	Irrigated Lands Regulatory Program

ACRONYMS AND ABBREVIATIONS

Imperial Valley General Order	General Waste Discharge Requirements for Discharges of Waste from Irrigated Agricultural Lands for Dischargers that are Members of a Coalition Group in the Imperial Valley
mg/L	milligrams per liter
MP	Management practice
MPN	most probable number
NPDES	National Pollution Discharge Elimination System
NSG	not significant, greater
NSL	not significant, less
OP	organophosphate
ppth	part per thousand
QAPP	Quality Assurance Project Plan
REC-1	Water Contact Recreation
REC-2	Non-Water Contact Recreation
Refuge	Sonny Bono Salton Sea National Wildlife Refuge
Region	Colorado River Basin Region as defined per subdivision (i) of Water Code section 13200
RMD	regulatory management decision
SG	significant, greater
SL	significant, less
State Board	State Water Resources Control Board
STV	statistical threshold value

ACRONYMS AND ABBREVIATIONS

SWAMP	Surface Water Ambient Monitoring Program
TDS	Total dissolve solids
TIE	toxicity identification evaluation
TMDL	Total Maximum Daily Load
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WET	Whole Effluent Toxicity
WQMP	Water Quality Management Plan (40 C.F.R. § 130.6)
WQO	Water Quality Objectives
WQS	Water Quality Standards

1. INTRODUCTION

This technical report presents recommendations with supporting data and analysis for the development of total maximum daily loads (TMDLs) for chloride, indicator bacteria (*Escherichia coli* and enterococcus), and toxicity in the Alamo River, Imperial County. This report also includes an Implementation Plan to attain water quality standards for the four impairments listed above. For the purposes of this report, the development of the TMDLs and Implementation Plan (and related elements) are collectively referred to as the "Project."

1.1. Regulatory Background

The federal Clean Water Act (33 U.S.C. § 1251 et seq.) gives states the primary responsibility for protecting and restoring surface water quality. The State Water Resources Control Board (State Water Board) is California's water pollution control agency for all federal purposes. (Wat. Code, § 13160.) The State Water Board, along with the nine Regional Water Quality Control Boards (collectively, Water Boards) protect and enhance the quality of California's water resources through implementing the Clean Water Act and California's Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.).

The California Regional Water Quality Control Board, Colorado River Basin Region (Colorado River Basin Water Board) has primary responsibility for the protection of groundwater and surface water quality within the Colorado River Basin Region. (Wat. Code, § 13200, subd. (i).) The Basin Plan for the Colorado River Basin Region contains water quality standards (WQS) consisting of the beneficial uses of a waterbody and the water quality objectives[1] (WQOs) designated to protect those beneficial uses, and also includes the federal and state antidegradation policies. (See Wat. Code, § 13240; 33 U.S.C. § 1313.)

Pursuant to Clean Water Act section 303(d), the Colorado River Basin Water Board is required to submit to the United States Environmental Protection Agency (USEPA) a list identifying waterbodies failing to meet water quality standards and the water quality parameter(s) (i.e., pollutant) causing the impairment. This is commonly referred to as the "303(d) List." The 303(d) List must include a description of the pollutants causing lack of attainment of water quality standards and a priority ranking of the water quality limited segments, taking into account the severity of the pollution and the uses to be made of the waters. (40 C.F.R. § 130.7(b)(iii)(4).) Federal regulations define a "water quality limited segment" as "[a]ny segment where it is known that water quality does not

[1] Or "water quality criteria" under federal terminology.

meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after application of technology-based effluent limitations required by sections 301(b) and 306 of the [Clean Water] Act." (40 C.F.R. § 130.2(j).)

To restore water quality, a TMDL or other planning tool must be developed for water quality limited segments on the 303(d) List. (See 33 U.S.C. § 1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1).) The elements of a TMDL are described in 40 Code of Federal Regulations sections 130.2 and 130.7, Clean Water Act section 303(d), as well as in U.S. Environmental Protection Agency (USEPA) guidance (USEPA, 2000b). A TMDL is the "sum of the individual [waste load allocations] for point sources and [load allocations] for nonpoint sources and natural background" (40 C.F.R. § 130.2(i)) such that the capacity of the waterbody to assimilate pollutant loads (the loading capacity) is not exceeded. The maximum load can be expressed in mass per time, toxicity, or other appropriate measure. (40 C.F.R. § 130.2(i).) A TMDL is also required to account for seasonal variations and include a margin of safety to address uncertainty in the analysis.

The TMDL must be incorporated into a state's Water Quality Management Plan (40 C.F.R. §§ 130.6(c)(1), 130.7), which in this case is the Colorado River Basin Region's Water Quality Control Plan (Basin Plan). The TMDL must also be reviewed and approved by both the State Water Board and the USEPA prior to becoming effective.

1.2. Impairments in Alamo River and Pollutants Addressed

This Project consists of a Basin Plan Amendment to establish TMDLs for the control of four impairments in the Alamo River: chloride, enterococcus, *Escherichia coli* (*E. coli*), and toxicity. The Alamo River is listed on the Clean Water Act Section 303(d) Impaired Waters List for 21 pollutants. Multiple TMDLs are in development to address many of the impairments such as organochlorine compounds and organophosphate pesticides. The Alamo River sedimentation/siltation TMDL was approved by the USEPA in June 2002. The Imperial Valley Organophosphate and Organochlorine Compounds TMDL was approved by USEPA on March 19, 2024. These two TMDLs address 11 pollutants and another three will be addressed by the Imperial Valley Pyrethroid Pesticides TMDL which is currently in development. These projects address all but three impairments which will be addressed in future projects.

Table 1: Waterbody Identification for TMDLs

Waterbody Name	Alamo River
Waterbody Identification Number	CAR723100001999020509302 3
Waterbody Location	Imperial County, California
Waterbody Length	59 miles
Listed Impairments	Ammonia, Chlordane, Chloride, Chlorpyrifos, Cyhalothrin-lambda, Cypermethrin, Dichlorodiphenyldichloroethane (DDD), Dichlorodiphenyldichloroethylene (DDE), Dichlorodiphenyldichoroethane (DDT), Diazinon, Dieldrin, Enterococcus, *E. coli*, Malathion, Polychlorinated biphenyls (PCBs), Pyrethroids, Sediment/Siltation, Selenium, Toxaphene, Toxicity
Pollutants Addressed	Chloride, *E. coli*, Enterococcus, Toxicity

Chloride in the Alamo River is from irrigation water sourced from the Colorado River, deposited from agricultural runoff containing fertilizers, and naturally occurring in the soil. Indicator bacteria, *E. coli* and enterococcus, are from numerous sources from agriculture to wildlife. Toxicity in the Alamo River has been previously attributed to specific pesticides but may be a combination of pollutants including the variety of pesticides utilized by growers in the Imperial Valley. There may be multiple pesticides that may be causing or contributing to toxicity in the Alamo River. Additional studies and monitoring as part of two other TMDLs, Imperial Valley Organophosphate and Organochlorine Compounds and Imperial Valley Pyrethroid Pesticides TMDL, are addressing the listed agricultural pesticides that are likely causing toxicity.

2. PROJECT AREA

The Alamo River is located in Imperial County, in the southeastern corner of California. It is one of three main tributaries to the Salton Sea and runs south to north through the agricultural Imperial Valley. The Alamo River originates in Mexico, about a half-mile south of the International Boundary, and runs north about 60 miles before it discharges into the Salton Sea. The Alamo River is one of the Salton Sea's largest tributaries and contributes about half of the Sea's annual inflow. The Alamo River is a sub-watershed that extends approximately 340,000 acres through highly productive agricultural lands within the Imperial Valley. In its flow, the Alamo River carries a mixture of agricultural return and wastewater from the Imperial Valley. This mixture of water contains a combination of pesticides, nutrients, selenium, and silt. The Alamo River flows north across the international boundary into California and terminates at the Salton Sea near Niland as seen in **Figure 1**.

Figure 1: Alamo River Watershed, Imperial County, California.

Seepage from the All-American Canal (AAC) creates the initial flow of the Alamo and downstream flows are sustained by runoff from Imperial Valley farms (deVlaming et al, 2004). United States Geological Society (USGS) data shows a decrease in annual flows over the last 20 years, as seen in **Figure 2** (USGS, 2020). In 2019, the Alamo River annual average discharge was 766.7 cubic feet per second (cfs), or 555,434 acre-feet per year (afy), into the Salton Sea compared to 900 cfs in the late 1990s (roughly 650,000 afy).

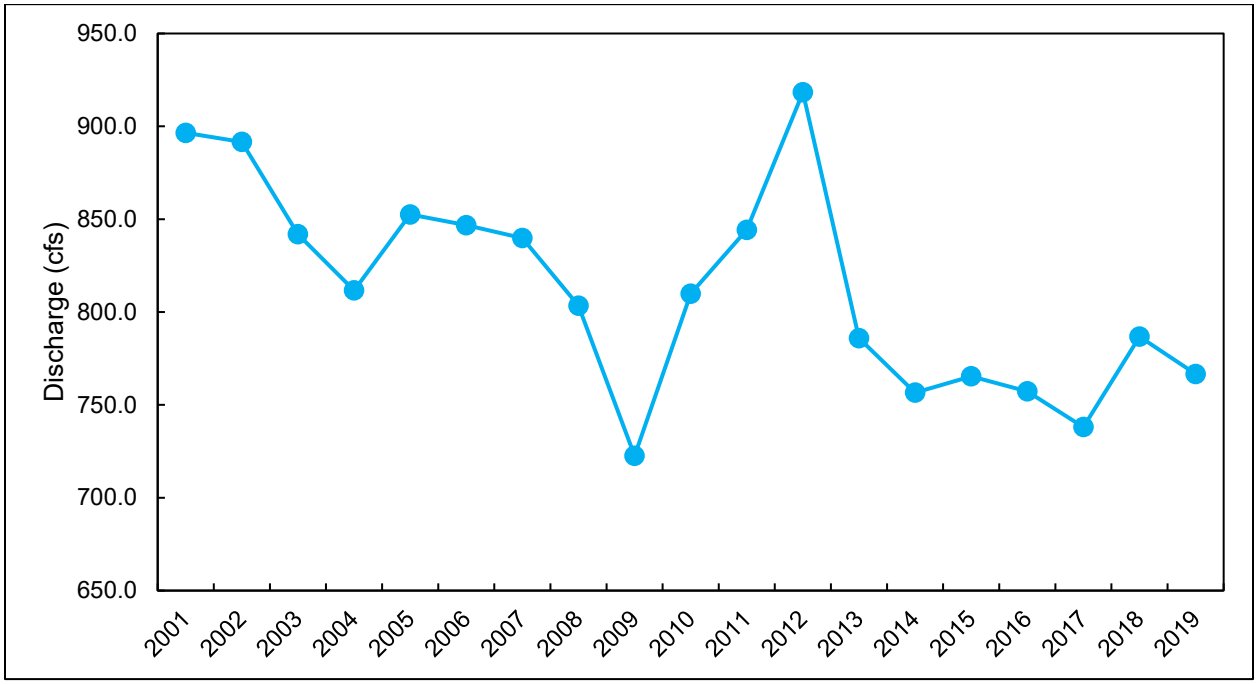

Figure 2: Annual Discharge Rates from Alamo River at Niland (USGS Natl Water Info System Data, Site No. 10254730)

The Alamo River is the largest tributary to the Salton Sea and contributes roughly 50 percent of the Sea's annual inflows. The Alamo River drains approximately 340,000 acres within the Imperial Valley, most of which is used for irrigated agriculture. Much of the flow of the Alamo is directly from farms or the extensive Imperial Valley Drain system maintained by Imperial Irrigation District (IID). These discharges contain mostly tail water (surface runoff) and tile water (subsurface runoff) from irrigated lands. The Imperial Valley also contains multiple National Pollutant Discharge Elimination System (NPDES) facilities that drain to the Alamo River via drains (Figure 3). The facilities marked in Figure 3 are all permitted through the NPDES program.

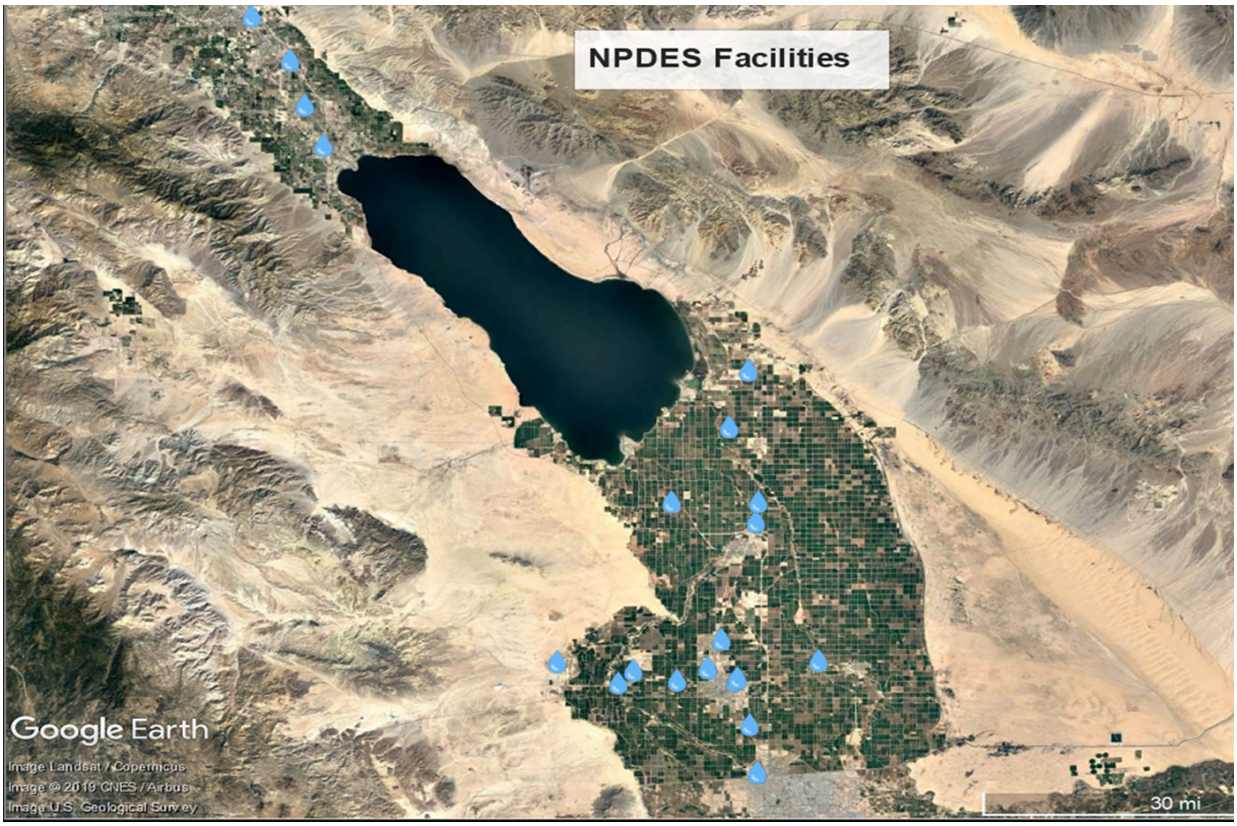

Figure 3: NPDES facilities in the Imperial and Coachella Valleys shown as water drops for locations

Confined Animal Feeding Operations (CAFO) are also present in the Imperial Valley and shown in Figure 4. The CAFO sites are covered under a general permit R7-2021-0029 which does not allow for discharges to area waters. Sites are required to ensure that no discharges leave the property.

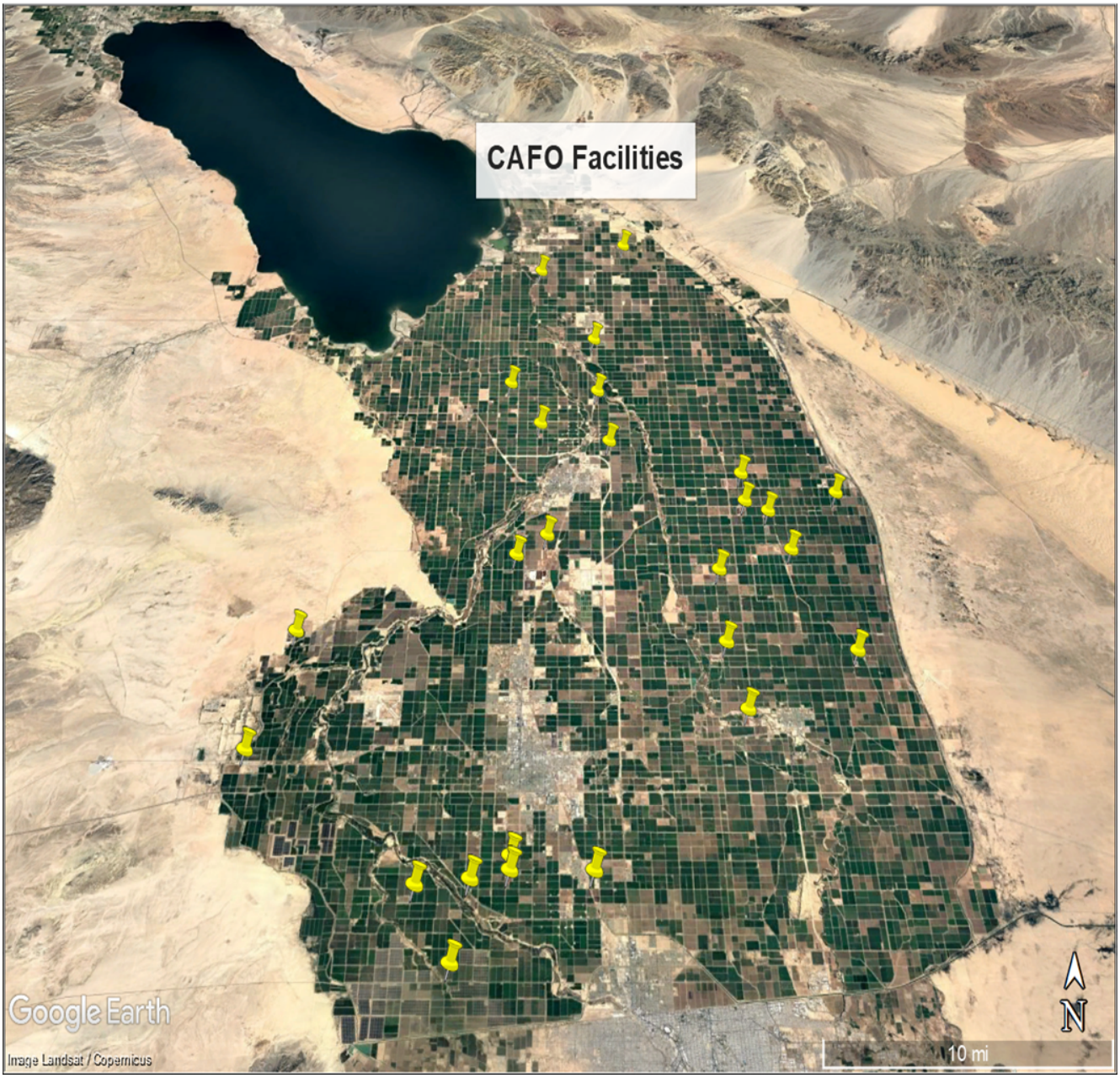

Figure 4: Confined Animal Feeding Operations in the Imperial Valley denoted with yellow pins

2.1. Salton Sea Watershed

The Salton Sea Transboundary Watershed encompasses most of southeastern California and part of northern Baja California in Mexico (**Figure 3**). The Salton Sea lies at the lowest point within the 8,360 square mile watershed and is a terminal saline lake.

Agriculture is the dominant land use within the Salton Sea Watershed, though there are a few small, urbanized areas. The Salton Sea was formed in 1905, when a project to divert the Colorado River into the Imperial Valley went awry. The Colorado River burst diversion dikes and flowed unabated into the Salton Trough for two years creating the Salton Sea and two of its main tributaries, the New and Alamo Rivers.

The Imperial Irrigation District (IID) distributes up to 3.1 million acre-feet/year of water from the Colorado River, mainly for agricultural purposes (IID, 2011). The water is delivered to nearly level farmland via a gravity driven system of supply canals and ditches. On the field, the water is used for crop irrigation and salinity control. Agricultural wastewater discharges, in the form of tail water and tile water, flow off the farmed land into drains that convey the water to the New and Alamo River, ultimately discharging to the Salton Sea.

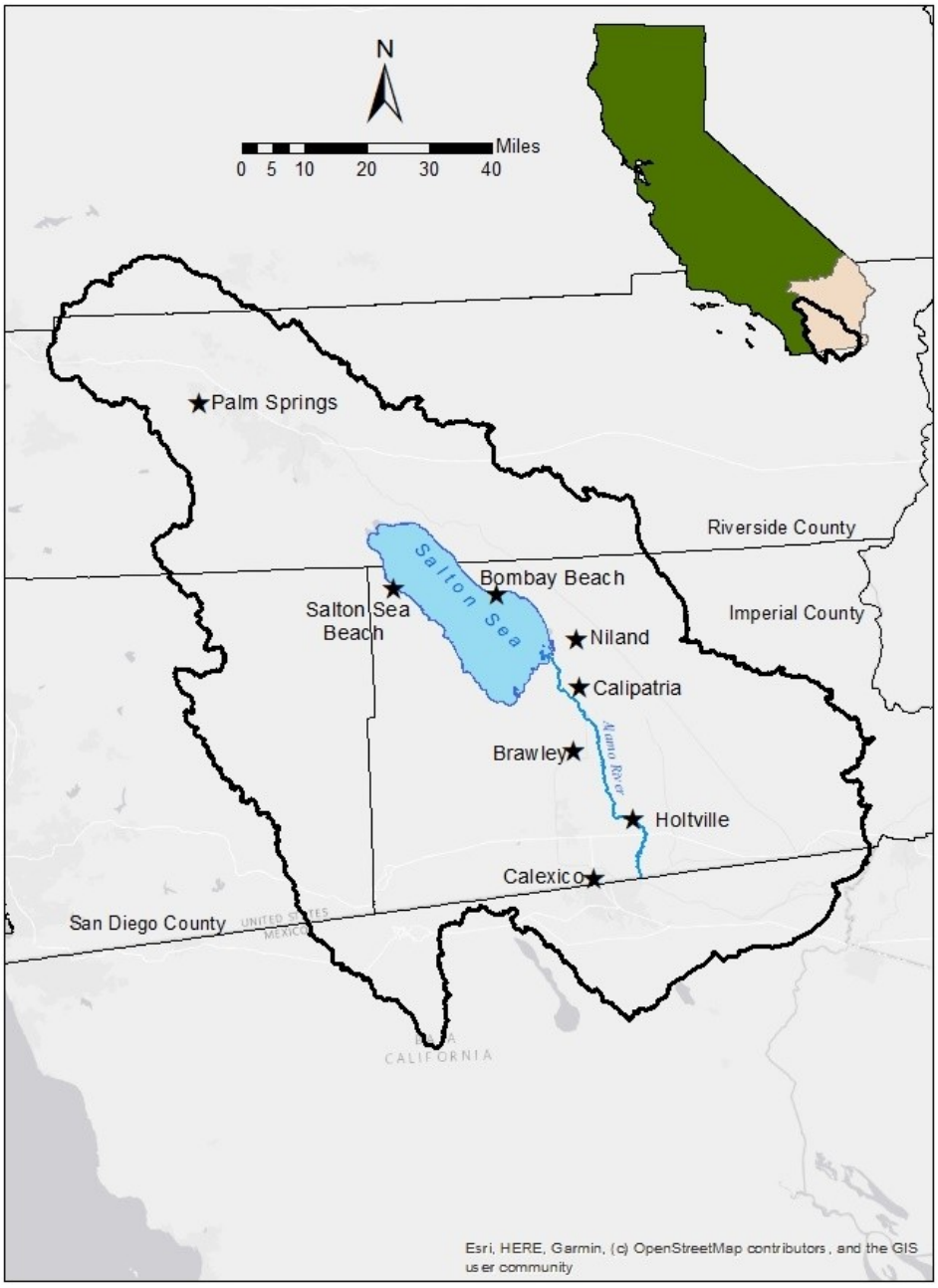

Figure 5: Map of Salton Sea Watershed

2.2. Climate

The climate of the area is extremely mild which allows for three growing seasons in the Imperial Valley. **Table 2** shows data from the Western Regional Climate Center for Imperial, CA (044224) from 1962 to 2016. The peak average temperature occurs in July and the lowest average temperature is in January with a roughly 30 degree Fahrenheit

difference between the seasons. Precipitation occurs during the late summer monsoon and winter, with an annual average total rainfall of 2.35 inches. The Imperial Valley is one of the most arid areas in the United States and is characterized by its hot, dry summers and cool, dry winters. The hot season typically lasts about four months with temperatures exceeding 100 degrees Fahrenheit. The cold season lasts about four months and coincides with the wet season, averaging about three inches of rainfall per year.

Table 2: Climate Data for Imperial, California, Feb. 1, 1962 to June 9, 2016 (Western Reg'l Climate Center)

Month	Avg Max Temp (°F)	Avg Min Temp (°F)	Avg Total Precip. (inches)
January	68.6	38.7	0.25
February	73.5	42.8	0.24
March	77.9	47.2	0.15
April	84.0	52.1	0.10
May	93.4	60.2	0.00
June	102.6	68.2	0.00
July	107.2	77.1	0.15
August	106.4	77.5	0.28
September	100.5	70.5	0.37
October	89.5	58.1	0.20
November	77.7	47.6	0.31
December	68.4	39.3	0.31
Annual	87.5	56.6	2.35

2.2.1. Soils

Soils in the Alamo River watershed are mainly comprised of alluvium deposited by the Colorado River and subsequent intermittent lakes over millennia. As such, it is highly

productive for agriculture given a reliable water source. The dominant soil series within the Imperial Valley, which includes the Alamo River watershed, are Imperial-Glenbar, Imperial, and Rositas; these soil types are mostly made up of wet silty clays and fine sands reflective of alluvial deposition origins (NRCS, 2019).

2.3. Land Use

The Alamo River watershed is located completely within Imperial County in the southeastern corner of California. A majority of the land area of the county is desert or mountains owned by federal, state, or tribal governments with another large portion in private hands. The second largest component is irrigated agriculture, the economic engine of the region. The Imperial Valley includes the Alamo River watershed and is dominated by agriculture with a few incorporated communities including Holtville and Calipatria.

Table 3: Imperial County Land Use Acreage (Imperial County General Plan, 2015)[2]

Land Use	Acreage	Percentage
Desert / Mountains	**2,177,884**	**74%**
Federal	1,459,926	
Private	669,288	
State	37,760	
Tribal	10,910	
Irrigated Agriculture	**534,328**	**18.2%**
Imperial Valley	512,163	
Bard Valley (including Reservation)	14,737	
Palo Verde Valley	7,428	
Salton Sea (230 ft. elevation)	**211,840**	**7.2%**
Developed Areas	**18,028**	**0.6%**
Incorporated	9,274	
Unincorporated	8,754	

[2] Percentages are the number of acres per use out of the total county acres.

2.3.1. Agriculture

Within the Salton Sea Watershed lies the Imperial Valley which contains the Alamo River and New River watersheds. The area is a heavily agricultural area that has three growing seasons due to the mild climate and abundant irrigation water from the Colorado River. Over 500,000 acres of land is in production in the Imperial Valley (**Table 3**) of which 340,000 acres are in the Alamo River watershed. Agricultural runoff from Imperial Valley farms is the main source of water for the Alamo River. Tail and tile drains are frequently used to carry salt-laden water away from fields and plant root zones. As farmers adopt water conservation measures (e.g., drip irrigation), less volume but higher concentrations of salts, fertilizers, and pesticides are carried to the Alamo River via drains. These measures ensure that no water is wasted by delivering it directly to each plant, but they do little to dilute salts or pesticides present in the soil.

2.3.2. Urban and Unincorporated communities

According to the 2015 Imperial County General Plan, most Imperial County acreage is either owned by the federal government (49.6%) or used for irrigated agriculture (18.2%); of the remainder, only 0.6 percent is occupied by urban areas or unincorporated communities, where the majority of the population lives. Imperial County is home to around 179,702 people living in the incorporated and unincorporated communities concentrated within the Imperial Valley (U.S. Census Bureau, 2021).

2.3.3. Sonny Bono Salton Sea National Wildlife Refuge

At the southern end of the Salton Sea lies the Sonny Bono Salton Sea National Wildlife Refuge (Refuge), which occupies 37,900 acres of mostly water and some land within the New River and Alamo River watersheds (map in **Appendix A**). The Refuge is an integral part of the Pacific Flyway, a major migratory path for dozens of bird species. Several bird species use the Refuge as well as the surrounding rivers, drains, and canals as habitat either on a permanent or transitory basis. Multiple plant and animal species listed on federal and state Endangered Species Lists exist within the Refuge and surrounding areas. A list of endangered or threatened species possibly present is located in **Appendix A**.

3. WATER QUALITY STANDARDS

Under the federal Clean Water Act, Water Quality Standards (WQSs) consist of designated Beneficial Uses and the Water Quality Criteria that protect such uses—as well as the state and federal antidegradation policies. Under California law, and for purposes of this report, Water Quality Criteria are referred to as Water Quality Objectives (WQOs). (Wat. Code, § 13241.) WQOs can be either numeric or narrative.

The operative Water Quality Control Plan for the Colorado River Basin Region (Basin Plan), including amendments adopted by the Colorado River Basin Water Board to date, designates beneficial uses, establishes WQOs to protect the beneficial uses, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan.

State Water Board Resolution 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*, contains the state's antidegradation policy (Antidegradation Policy). The Antidegradation Policy generally prohibits the Colorado River Basin Water Board from authorizing discharges that will result in the degradation of high quality waters, unless it is demonstrated that any change in water quality will (a) be consistent with maximum benefit to the people of the state, (b) not unreasonably affect beneficial uses, and (c) not result in water quality less than that prescribed in state and regional policies (e.g., violation of WQOs). The dischargers of waste must also employ best practicable treatment or control (BPTC) to minimize the degradation of high-quality waters. High quality waters are surface waters or areas of groundwater that have a baseline water quality better than required by water quality control plans and policies.

3.1. Beneficial Uses

Beneficial uses are designated according to the past, present, and possible future uses of a water body that can occur. The impairments addressed in this report are in exceedance of WQOs that protect the beneficial uses. The Alamo River has multiple beneficial uses but the most protective are those that address human health and wildlife habitat. All beneficial uses designated in the Alamo River are listed in **Table 4**. The complete list of surface water designations and all definitions can be found in Chapter 2 of the Basin Plan, specifically Tables 2-1 through 2-4.

Table 4. Designated Beneficial Uses for Alamo River (Basin Plan, Ch. 2)

Beneficial Use	Use Definition
Freshwater Replenishment (FRESH)	Uses for natural or artificial maintenance of surface water quantity or quality.
Water Contact Recreation (REC-1)	Uses for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
Water Non-Contact Recreation (REC-2)	Uses for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
Warm Freshwater Habitat (WARM)	Uses that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Wildlife Habitat (WILD)	Uses that support terrestrial ecosystems including, but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
Preservation of Rare, Threatened, or Endangered Species (RARE)	Uses that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
Hydropower Generation (POW)	Uses for hydropower generation.

3.2. Narrative Water Quality Objectives

Water Quality Objectives[3] (WQOs) are established to protect the beneficial uses and can be expressed as concentrations of pollutants that should not be exceeded, or as narrative descriptions of water characteristics that should be met.

Chapter 3 of the Basin Plan contains the following narrative WQOs applicable to Imperial Valley surface waters:

Basin Plan, Chapter 3, Section II-C (Toxicity):

> All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life.

Basin Plan, Chapter 3, Section II-N (Chemical Constituents):

> No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life.

Narrative WQOs are implemented through applicable numeric targets (i.e., limits) adopted and applied on a case-by-case basis, the California Toxics Rule (CTR), or other published and accepted applicable documents.

3.3. Numeric Water Quality Objectives

The numeric WQOs are set with regard to the beneficial uses designated for a water body. The most protective beneficial use is chosen to set the numeric WQOs as that ensures all uses are protected.

For chloride, the most protective beneficial uses are those that protect aquatic life. In the Alamo River those are: warm freshwater habitat (WARM), wildlife habitat (WILD), and preservation of rare, threatened, or endangered species (RARE). The numeric WQO associated with that level of protection is the criterion continuous concentration (expressed as a 4-day average) of 230 milligrams per liter (mg/L; USEPA, 2006).

Indicator bacteria standards chosen are for the REC-1 beneficial use and are the most stringent WQOs available for the protection of human health in the Alamo River. This beneficial use is for activities on or in water that may result in ingestion of water. The

[3] Under federal law, WQOs are referred to as “water quality criteria.”

Alamo River is impaired by the two main indicator bacteria used to determine human health hazards, enterococcus and *E. coli*.

The selected WQOs will reflect recent changes made to the Basin Plan that replaced the chosen indicator bacteria from *E. coli* to enterococcus for the Alamo River. Current WQOs in effect throughout the region use salinity to determine which bacteria indicator, *E. coli* or enterococcus, is used for water bodies with the beneficial use of water contact recreation (REC-1). The salinity threshold for choosing which indicator is used is 1 part per thousand (ppth) or 1000 mg/L. Concentrations above 1 ppth more than 5 percent of the time require enterococcus to be used. *E. coli* is used when the salinity is equal to or less than 1 ppth 95 percent or more of the time. Figure 4 shows the salinity concentrations for the Alamo River outlet (discharge point to the Salton Sea) from 2010 to 2020. These numbers are indicative of the entire length of the river and are consistently at least 0.25 to 1.25 ppth above the salinity threshold of 1 ppth. Because the salinity is above the threshold, the Alamo River bacteria indicator is enterococcus.

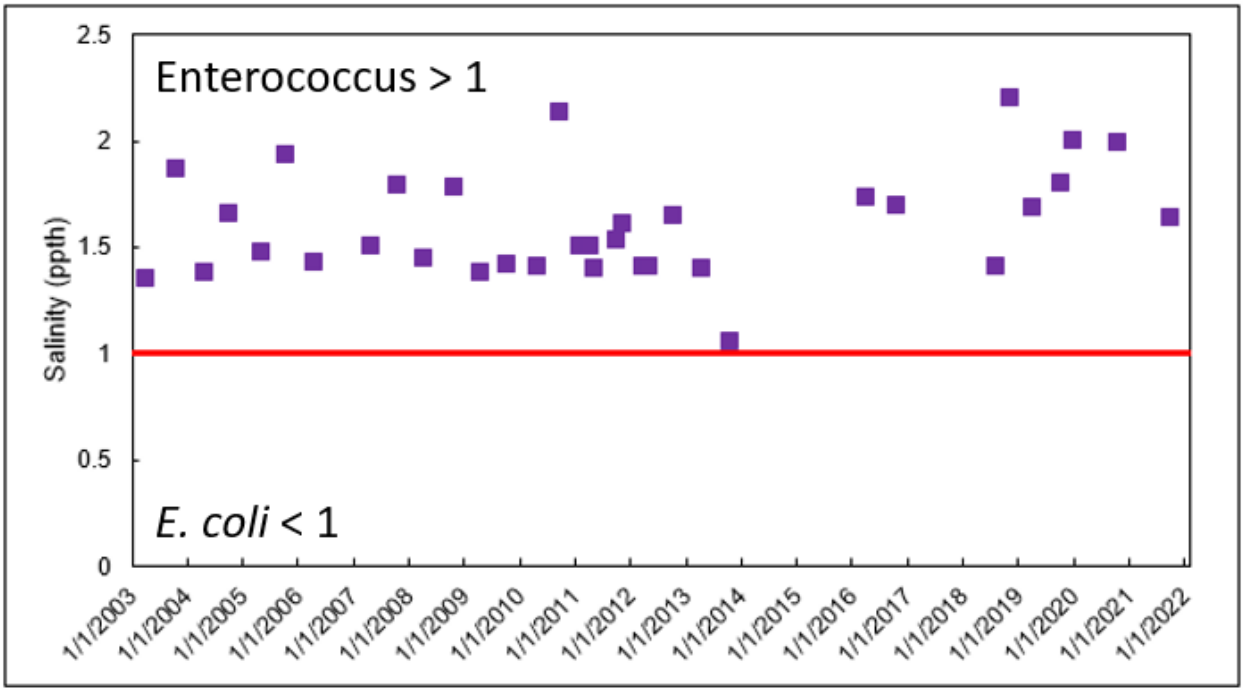

Figure 6: Concentrations of salinity at the Alamo River outlet site
The solid red line is the salinity threshold set at 1 ppth.

The enterococcus WQO is applicable where salinity is greater than 1 ppth more than five percent of the calendar year, a six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL calculated weekly, with a statistical threshold value (STV) of 110 colony forming units per 100 milliliters (cfu/100 mL) not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner (CRBRWQCB, 2023).

This TMDL also addresses *E. coli* in the Alamo River. The REC-1 objective is the most protective beneficial use for human health. Since that objective is applied for enterococcus, we will be using the next most stringent beneficial use for human health, REC-2. Non-contact water recreation has objectives set for both *E. coli* and enterococcus. A six-week rolling geometric mean of *E. coli* not to exceed 100 cfu/100 mL, calculated weekly and an STV of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner (CRBRWQCB, 2023).

3.4. Toxicity

The State Water Board has recently adopted numeric toxicity provisions that utilize the Test of Significant Toxicity (TST) approach. Acute and chronic aquatic toxicity test data would be assessed using the TST statistical approach as developed by United States Environmental Protection Agency (U.S. EPA 2010b). The TST approach is based on a type of modified hypothesis test referred to as bioequivalence testing. Bioequivalence is a statistical approach that has long been used in evaluating clinical trials in pharmaceutical products and by the Food and Drug Administration (FDA), in evaluating the attainment of soil cleanup standards for contaminated sites, and to evaluate the effects of pesticides in experimental ponds (U.S. EPA 2010a). The TST approach compares the organisms' response (e.g., survival, growth, and reproduction) in test water to the response of organisms held in control water. The TST approach improves upon the traditional hypothesis tests used to assess aquatic toxicity by incorporating regulatory management decisions (RMD) and through the reversal of the null and alternative hypothesis. The RMDs provide an unambiguous measurement of a test concentration's toxicity, while low false positive and false negative rates provide more statistical power to correctly identify a test concentration as "toxic" or "non-toxic." The restated acute and chronic null hypotheses provide dischargers with an incentive to improve the precision of test results (i.e., decrease within-test variability) by improving laboratory procedures and/or by increasing the number of replicates used in each aquatic toxicity test. Use of the TST will be applied by this TMDL with discussion of specific criteria in Sections 4 and 7. Detailed analysis and additional information is included in the *Staff Report, Including Substitute Environmental Documentation for State Policy for Water Quality Control: Toxicity Provisions* released by the State Water Board in October 2021.

Previously, toxicity data was analyzed using the Whole Effluent Toxicity (WET) Method. The WET method uses statistical qualifiers that have been used for listing purposes on the Section 303(d) Impaired Waters List. These statistical qualifiers are recorded as "significant effect codes" in CEDEN. There are four such codes (three of which signify compliance, and the fourth signifies exceedance):

- **Not Significant, Greater Similarity (NSG):** not significant compared to control sample based on statistical test at alpha level, calculated value equal to or greater than critical value

- **Not Significant, Less Similarity (NSL):** not significant compared to control sample based on statistical test at alpha level, calculated value equal to or greater than critical value

- **Significant, Greater Similarity (SG):** significant compared to control sample based on statistical test at alpha level, calculated value less than critical value

- **Significant, Less Similarity (SL):** significant compared to control sample based on statistical test at alpha level, calculated value less than critical value

Tests not showing significance or showing greater significance with the control sample are in compliance (NSG, NSL, SG). Tests showing significance and not similar to the control sample are in violation (SL).

The toxicity data going forward will utilize numeric water quality objectives for chronic and acute aquatic toxicity that are expressed as null hypotheses and incorporate an RMD. RMDs represent the allowable error rates and thresholds that would result in an unacceptable risk to aquatic life. For chronic toxicity, the RMD is set at 25 percent and for acute toxicity, the RMD is set at 20 percent. Attainment of both the acute and chronic water quality objectives would be demonstrated by rejecting the null hypotheses and accepting the alternative hypotheses in accordance with the TST statistical approach.

4. NUMERIC TARGETS

Numeric targets are water quality measures used to determine achievement of the WQOs, and thus protection of beneficial uses.

The numeric targets are set in accordance with the narrative WQOs discussed above for chloride, *E. coli*, enterococcus, and toxicity. The numeric targets are concentration based and protective of human health and aquatic life. Margins of safety, seasonality, critical conditions, and loading capacity have been taken into account when setting these targets.

The chloride criterion continuous concentration (expressed as a 4-day average) is 230 mg/L (USEPA, 2006). This concentration is protective of aquatic life in freshwater. The WARM, WILD, and RARE beneficial uses are the most protective of the Alamo River in relation to chloride.

The Alamo River is impaired by two indicator bacteria (*E. coli* and enterococcus), and both will be addressed in this TMDL. For enterococcus this TMDL will use the WQOs in place for REC-1, as they are the most protective beneficial use for the Alamo River. The salinity threshold for choosing which indicator is used is 1 part per thousand (ppth) or 1000 mg/L. The applicable WQO where salinity is greater than 1 ppth more than five percent of the calendar year, a six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL calculated weekly, with an STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner (CRBRWQCB, 2023).

For *E. coli*, this TMDL will use the WQOs in place for REC-2 because they are the most protective applicable to *E. coli*. For non-point discharges, sampling regimes are not frequent enough to qualify to use the rolling geometric average. Instead, the maximum allowable of 2000 Most Probable Number (MPN)/100 mL not to be exceeded will be used (CRBRWQCB, 2023). For point discharges, the REC-1 WQOs are being used by the NPDES programs with agreement from USEPA as the salinity is below the 1 ppth threshold as is the frequency of sampling to satisfy the rolling geometric average of 100 cfu/100 mL calculated weekly (CRBRWQCB, 2023).

This TMDL will utilize the new numeric TST targets for toxicity adopted by the State Water Board in 2021. These targets were developed to establish numeric water quality objectives for chronic and acute aquatic toxicity that are expressed as null hypotheses and incorporate a regulatory management decision (RMD). RMDs represent the allowable error rates and thresholds that would result in an unacceptable risk to aquatic life. For chronic toxicity, the RMD is set at 25 percent and for acute toxicity, the RMD is set at 20 percent. Attainment of both the acute and chronic water quality objectives would be demonstrated by rejecting the null hypotheses and accepting the alternative hypotheses in accordance with the TST statistical approach. (SWRCB, 2021).

Staff chose the chronic aquatic toxicity objective for the Alamo River due to the history and continued prevalence of toxicity and low sampling frequency. The WQO for chronic aquatic toxicity is expressed as a null hypothesis and an alternative hypothesis with an RMD of 0.75 for *Ceriodaphnia dubia* and 0.80 for *Hyalella azteca*. Essentially, the ambient water is toxic if the ambient water response of the test organisms is less than or equal to 75 or 80 percent of the test organisms' response in the control water sample. If the opposite is true, the ambient water is not toxic because the response of the test organisms in the ambient water sample is greater than 75 or 80 percent of the test organisms' response in the control water sample (SWRCB, 2021).

Table 5: Numeric Targets for Chloride, *E. coli*, Enterococcus, and Toxicity in 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
Chronic Toxicity – *Ceriodaphnia dubia*	Mean ambient water response ≤ 0.75 * mean control response Mean discharge In-stream Waste Concentration response ≤ 0.75 * mean control response	SWRCB, 2021
Acute Toxicity – *Hyalella azteca*	Mean ambient water response ≤ 0.80 * mean control response	SWRCB, 2021

The numeric targets in **Table 5** are the same WQOs (or more stringent) than those used to list the impairments on the Section 303(d) Impaired Waters List. Similarly, the newer bacteria standards are more stringent than those used for listing; these new standards have been approved by USEPA for REC-1 beneficial uses in California. The State Water Board adopted the new WQOs on August 8, 2018, and USEPA approved them on March 22, 2019. The Regional Water Board adopted the new bacteria WQOs as a

Basin Plan amendment on September 3, 2020, and the State Water Board approved the action on March 16, 2021.

5. DATA ANALYSIS

5.1. Project Location

A tributary to the Salton Sea, the Alamo River is located in Imperial County, California. The impairments addressed by this TMDL affect the river's entire 59-mile length, from the International Boundary to the Salton Sea.

5.2. Data Acquisition and Monitoring Stations

Multiple sources of data were used for chloride and indicator bacteria (i.e., *E. coli* and enterococcus). Chloride and indicator bacteria are monitored through various programs including the Irrigated Lands Regulatory Program (ILRP) and National Pollutant Discharge Elimination System (NPDES) permit program. ILRP data is predominantly from IID, which is required to monitor the New River, Alamo River and Imperial Valley Drains. Chloride was previously measured at the river outlet by the U.S. Bureau of Reclamation (USBR) as part of their Salton Sea monitoring program.

Toxicity data is sourced from California's Surface Water Ambient Monitoring Program (SWAMP). Much of the data is from the California Environmental Data Exchange Network (CEDEN), which is the storehouse for data collected by the State of California.

Data from SWAMP and IID monitoring presented in this report was collected from established sites shown on the Alamo River watershed map in **Figure 5** and listed in **Table 6**. SWAMP monitors select sites along the Alamo River in spring and fall each year. The sites are chosen based upon which parameters are being sampled at that time. IID conducts monthly, quarterly, and annual monitoring based on previous TMDLs and the Imperial Valley General Order. IID is required to monitor Drops 10, 8, 6A, 6, and 3 as well as the outlet to the Salton Sea. The Alamo River at the International Boundary has been abandoned as a monitoring location for the last decade due to little or no flow at that location.

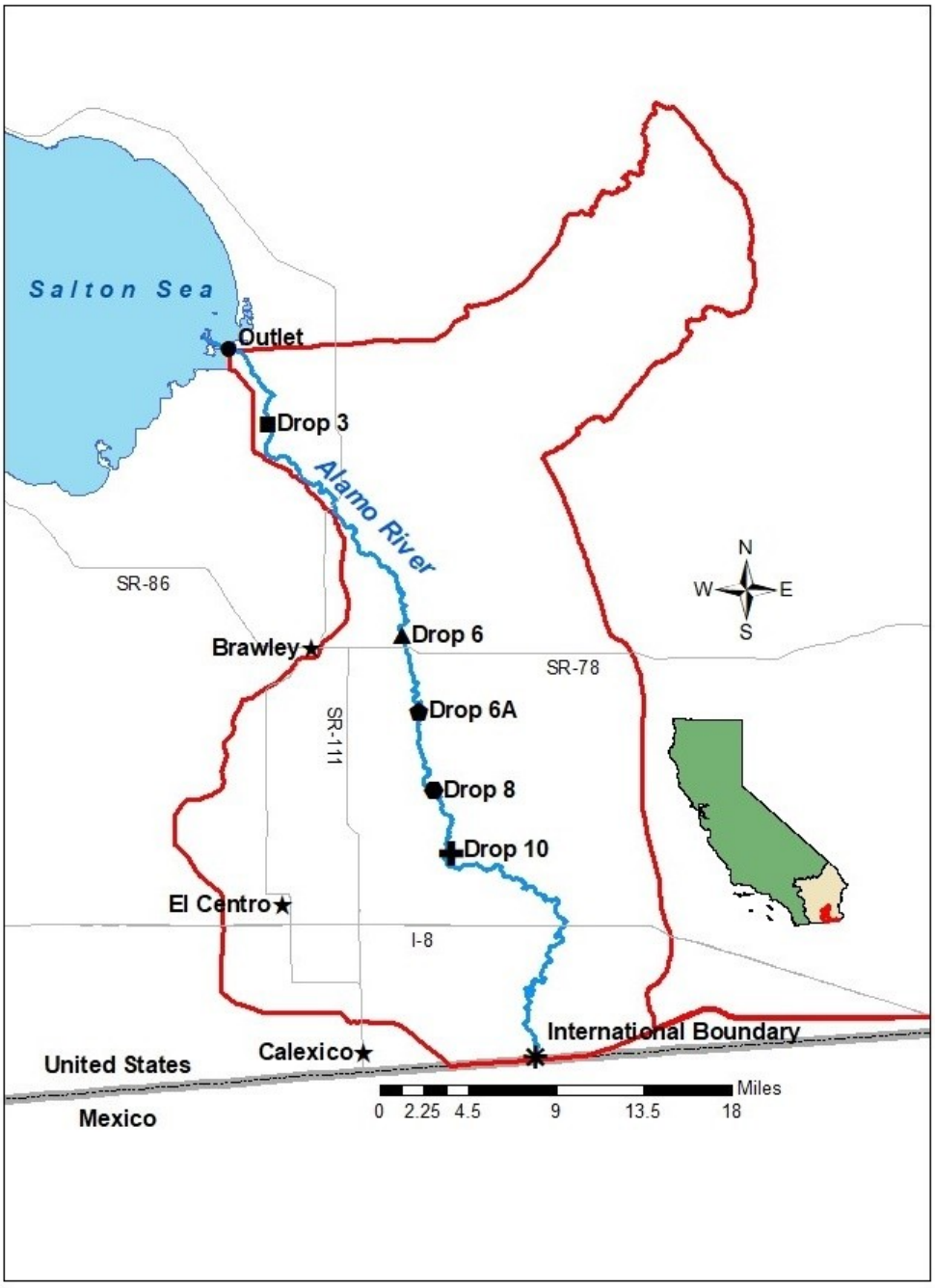

Figure 7: Map of Alamo River Sampling Sites

Table 6: SWAMP and IID Sampling Sites

Station Name	SWAMP Site ID	Latitude	Longitude
Alamo River Outlet	723ARGRB1	33.1992	-115.5970993
Alamo River at Drop 3	723ARDP03	33.14344	-115.5679169
Alamo River at Drop 6 Rose Drain	723ARDP06	32.987049	-115.4686203
Alamo River at Drop 6A Holtville Drain	723ARDP6A	32.931519	-115.4566193
Alamo River at Drop 8	723ARDP08	32.872849	-115.4456024
Alamo River at Drop 10 Central Drain	723ARDP10	32.826111	-115.4325027
Alamo River at International Boundary	723ARINTL	32.67506	-115.3700790

5.3. Chloride

At all regularly sampled sites along the Alamo River, the chloride concentrations are consistently above the WQO (230 mg/L). The sites shown in **Figure 8** and **Figure 9** encompass the breadth of the river from the beginning near the U.S.- Mexico international boundary to the outlet at the Salton Sea.

In the data record from 2002 to 2020, only one data point is below the WQO; the remaining chloride data ranges from 300 mg/L to 1,000 mg/L. The Alamo River outlet is highlighted in **Figure 9** due to its long continuous data record and multiple interagency monitoring programs.

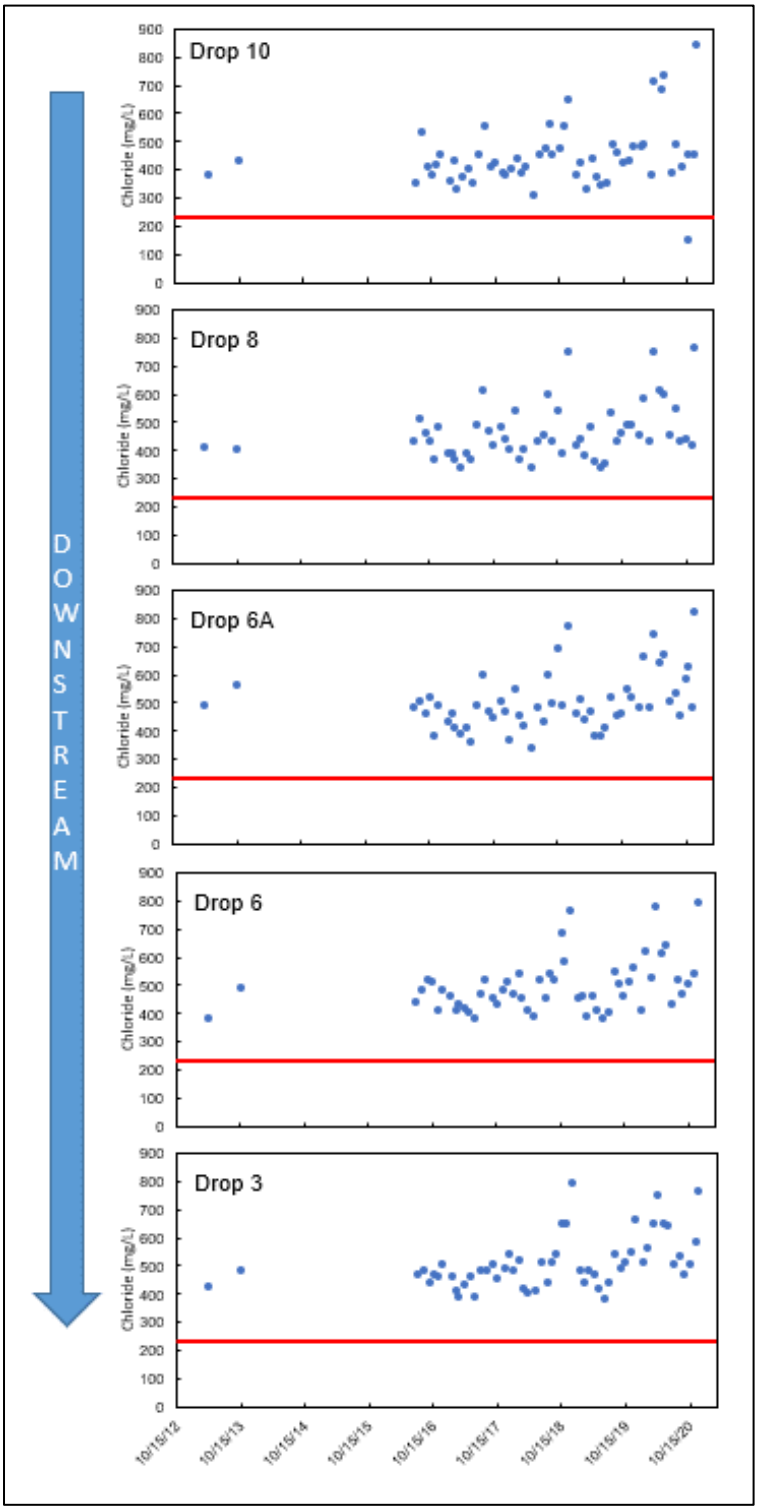

Figure 8: Chloride Concentrations at Multiple Sites on Alamo River

Sites are shown from upstream to downstream with Drop 10 closest to the beginning of the river and Drop 3 near the outlet. The solid red line denotes the 230 mg/L chloride WQO.

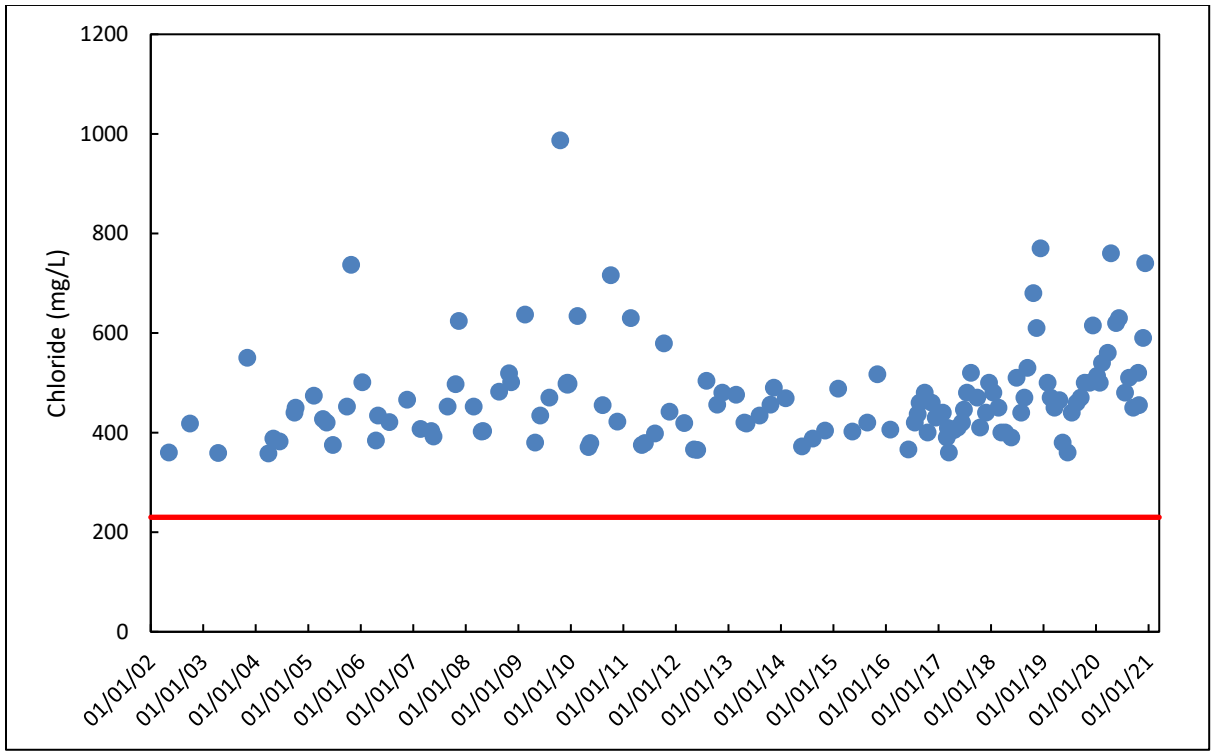

Figure 9: Chloride Concentration Data at Alamo River Outlet (SWAMP, IID, USBR Data Compilation, 2002-2020)[4]

5.4. Indicator Bacteria (*E. coli* and enterococcus)

The Alamo River is listed as impaired by two indicator bacteria, *E. coli* and enterococcus. This TMDL will focus on enterococcus due to the WQOs in place, but *E. coli* will also be presented and addressed. The previous indicator was *E. coli* because the Alamo River has a freshwater beneficial use. In Imperial Valley waters, *E. coli* has a long data record. However, with the new indicator bacteria objectives salinity threshold, the salinity data indicates enterococcus is the appropriate bacteria indicator.

[4] The red line is the WQO at 230 mg/L.

5.4.1. Enterococcus

The salinity of the Alamo River is above the 1 ppth threshold more than 95 percent of the calendar year (**Figure 7**). Therefore, enterococcus is the bacteria indicator that is currently recommended for the Alamo River. Because the Bacteria Provisions have been in effect for a short time, monitoring requirements in some cases does not reflect the change yet. **Table 7** shows the data available in CEDEN for all sites on the Alamo River from 2002 to 2020. All but one sample in 2002 at the International Boundary exceed the STV of 110 cfu/100 mL.

Table 7: Enterococcus in the Alamo River (CEDEN, 2002-2013)[5]

Site	Date	Most Probable Number (MPN) per 100mL	Meets WQO (110 cfu /100mL)
Int'l Boundary	5/8/2002	90	Yes
Int'l Boundary	10/1/2002	2300	No
Int'l Boundary	4/9/2003	1300	No
Int'l Boundary	10/25/2005	960	No
Drop 10	10/1/2002	5000	No
Drop 8	10/1/2002	5000	No
Drop 6A	10/1/2002	3000	No
Drop 6	5/8/2002	3000	No
Drop 6	4/23/2013	43000	No
Drop 3	5/6/2002	900	No
Drop 3	10/2/2002	11000	No
Outlet	5/6/2002	300	No
Outlet	10/2/2002	8000	No

[5] *MPN/100 mL is functionally equivalent to cfu/100 mL.

Site	Date	Most Probable Number (MPN) per 100mL	Meets WQO (110 cfu /100mL)
Outlet	4/9/2003	5000	No
Outlet	10/26/2005	1400	No

Subsequent Colorado River Basin Water Board SWAMP monitoring schedules will sample for enterococcus instead of *E. coli* in all waters with salinity concentrations that demonstrate that enterococcus is the appropriate indicator bacteria. Due to requirements in the Imperial Valley General Order, IID will begin monitoring enterococcus quarterly in addition to *E. coli*.

5.4.2. E. coli

Previously, *E. coli* was the primary bacteria indicator for all freshwaters in the region. Changes to the bacteria WQOs for waters designated for REC-1 established a salinity threshold of 1 ppth 95 percent or more of the time for using *E. coli* that some water bodies within the region do not meet including the Alamo River. For waters above the salinity threshold, enterococcus is the indicator that should be used and is discussed below.

Indicator bacteria monitoring, until recently, has been focused on *E. coli*. Permits and waste discharge requirements in place prior to the updated bacteria provisions required *E. coli* to be monitored to evaluate the presence of bacteria in the discharge. Because of this, the Regional Water Board has an extensive data record for *E. coli* in the Alamo River from multiple sites and across various programs. Data shown in **Table 8** and **Figure 8** are data compiled from SWAMP and IID as part of the ILRP program.

Table 8: Concentrations of *E. coli* in the Alamo River from 2003 to 2013 from CEDEN[6]

Site	Date	Most Probable Number (MPN) per 100mL	Meets WQO (2000 MPN/100mL)
Int'l Boundary	5/8/2002	20	Yes

[6] MPN/100 mL is functionally equivalent to cfu/100 mL.

Site	Date	Most Probable Number (MPN) per 100mL	Meets WQO (2000 MPN/100mL)
Int'l Boundary	10/1/2002	90	Yes
Int'l Boundary	4/9/2003	230	Yes
Drop 10	5/8/2002	500	Yes
Drop 10	10/1/2002	5000	No
Drop 8	10/1/2002	1700	Yes
Drop 6A	10/1/2002	500	Yes
Drop 6	5/8/2002	300	Yes
Drop 6	4/23/2013	770	Yes
Drop 3	5/6/2002	50	Yes
Drop 3	10/2/2002	170	Yes
Drop 3	4/23/2013	220	Yes
Outlet	5/6/2002	110	Yes
Outlet	10/2/2002	300	Yes
Outlet	4/9/2003	500	Yes
Outlet	10/26/2005	700	Yes

The irrigated lands of the Imperial Valley are currently regulated by *General Waste Discharge Requirements for Discharges of Waste from Irrigated Agricultural Lands for Dischargers that are Members of a Coalition Group in the Imperial Valley*, Order R7-2021-0050 (Imperial Valley General Order). The Imperial Valley General Order was preceded by a 2015 *Conditional Waiver of Waste Discharge Requirements for Agricultural Wastewater Discharges and Discharges of Wastes from Drain Operation and Maintenance Activities Within the Imperial Valley* (Conditional Waiver). Part of the implementation of the Conditional Waiver and the Imperial Valley General Order includes water quality sampling to ensure compliance with the WQOs. The Imperial Valley General Order requires that enterococcus be sampled on a monthly basis in the Alamo River. **Figure 11** shows data collected by IID at the Alamo River outlet from 2016

to 2020. The WQO used for this data is the maximum allowable of 2000 MPN/100 mL because the sampling frequency is too low to utilize the geometric mean.

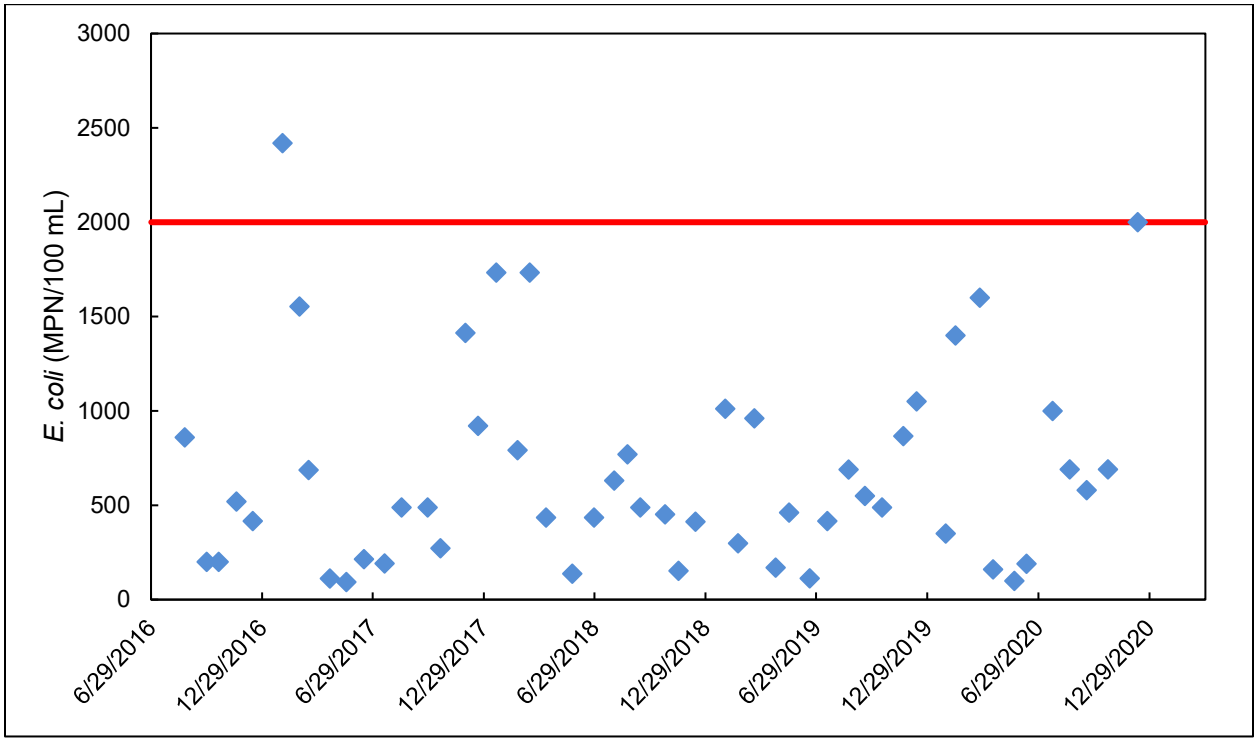

Figure 10: *E. coli* in Alamo River Outlet, 2016 to 2020[7]

There are eight NPDES facilities that indirectly discharge to the Alamo River via intermediary drains (no facilities directly discharge to the Alamo River). One of these facilities has no effluent limitations or monitoring requirements for bacteria: IID El Centro Generating Station Wastewater Treatment Plant (WWTP).

This TMDL will require all of the NPDES facilities listed in **Table 9** to monitor for the indicator bacteria enterococcus in addition to *E. coli*. The current permit indicator bacteria and monitoring frequencies are listed in Table 9 and will need to be updated to reflect the new WQOs in effect. However, NPDES facilities discharges are below the salinity threshold and will need to continue monitoring *E. coli* as long as it is listed as an impairment. They will also be required to monitor enterococcus to ensure the discharge is compliant with WQOs established to protect the beneficial uses of the receiving waters.

[7] The solid red line is the STV set at 320 cfu/100 mL.

Table 9: NPDES-Permitted Facilities Discharging to Drains Tributary to the Alamo River and *E. coli* Monitoring Schedules

NPDES Facility	Current Permit	*E. coli* Monitoring Frequency
Country Life Mobile Home Park	CA0104264	5x/Month
El Centro POTW	CA0104426	5x/Month
Holtville POTW	CA0104361	5x/Month
Calipatria WWTP	CA0105015	Weekly
Imperial POTW	CA0104400	Weekly
Heber Public Utility District POTW	CA0104370	5x/Month
IID Grass Carp Hatchery	CA7000004	1x/Quarter
IID El Centro Generating Station WWTP	CA0104248	None

POTW = Public Owned Treatment Works
WWTP = Wastewater Treatment Plant

Data collected from the six facilities that sample for indicator bacteria is shown in **Figure 12**. The majority of the data, with only a few exceptions, shows that the NPDES permitted facilities are not a major source of bacteria to the Alamo River. IID Grass Carp Hatchery began sampling for *E. coli* after the adoption of its most recent permit in April 2022 and that data has not been included here since the data cutoff is 2020.

No enterococcus data is currently available from NPDES facilities. Because of the low salinity in these discharges, the REC-1 WQO applies and is used by regulators for permit compliance. Hence, the WQO shown in the graphs is 100 cfu per 100 mL *E. coli* calculated as a geometric mean.

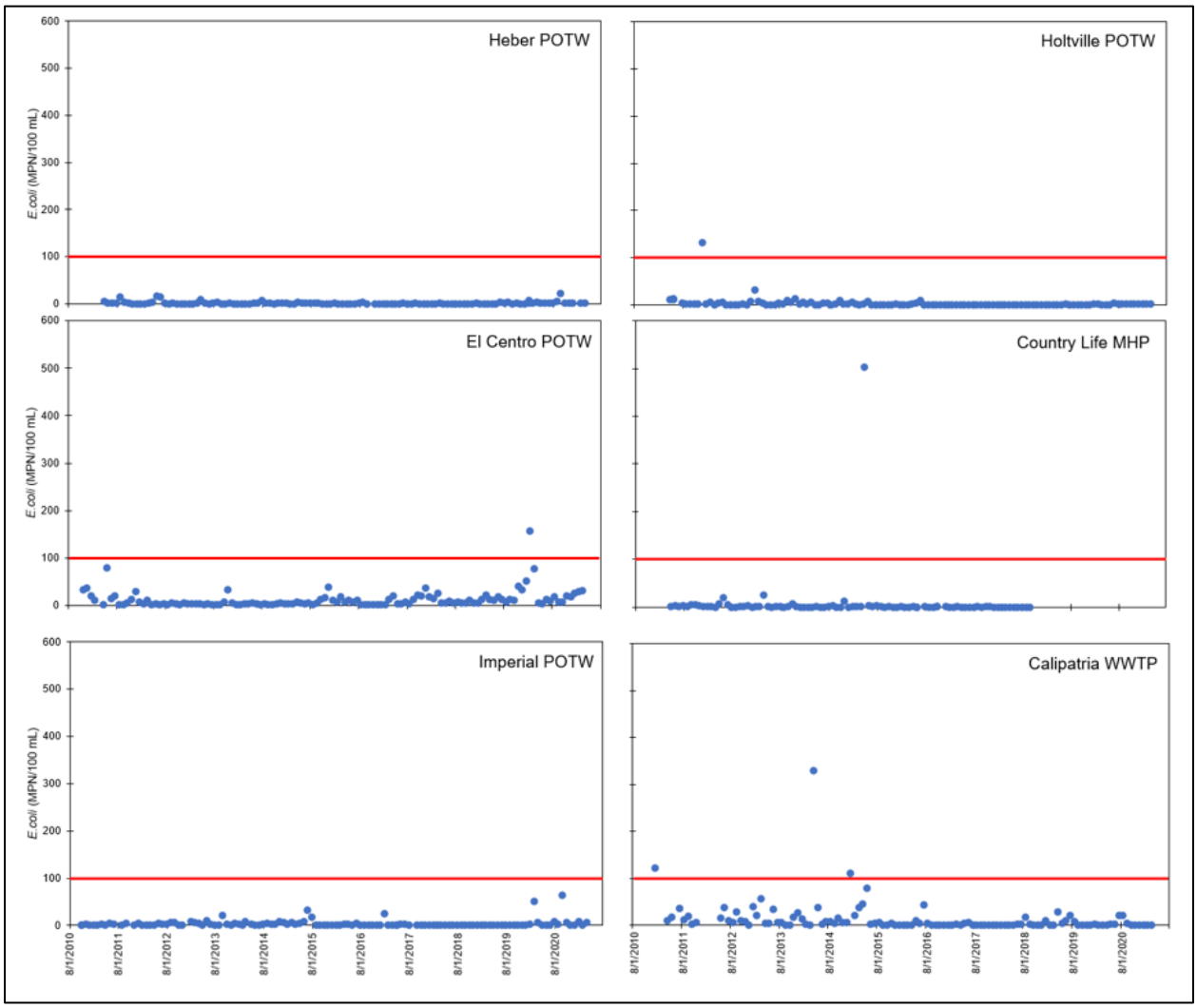

Figure 11: *E. coli* Data from NPDES Facilities Indirectly Draining to Alamo River[8]

[8] The red line is the WQO at 100 cfu/100 mL, since the data is collected at a frequency conducive to the calculation of a geometric mean.

5.4.3. Toxicity

Toxicity within the Alamo River has been an ongoing problem due to the overwhelming influence of agricultural discharge that constitutes its flow. As shown in **Table 10** and **Table 11**, toxicity has changed over the years and the available data does not allow for an analysis of spatiotemporal patterns to target a specific source or season in sediment or water (Tables 10 and 11).

Differences in testing species or methods do not explain the changes over time seen in the data as most of the tests were conducted on *Hyalella azteca* (*H. azteca*) or *Ceriodaphnia dubia* (*C. dubia*).

The State Water Board adopted new Toxicity Provisions (SWRCB, 2021) on October 5, 2021. These numeric standards are to be used for future data to ensure that control and response calculations adhere to the null hypothesis and utilize RMDs outlined in the provisions. Historical data has been calculated using the WET method and significant effect codes are shown in the table. Some of the historic data does not contain control data and therefore cannot be compared to the new provisions as new calculations cannot be made.

Table 10: Average Toxicity Survival Percentages of Four Species in Water at Alamo River Outlet, 2002 to 2019[9]

Survival Period	Date	Species	Survival Avg. (%)	Sig. Effect Code	Toxic?
4 Days	**4/3/2019**	***Hyalella azteca***	**44**	**SL**	**Yes**
4 Days	4/10/2019	*Hyalella azteca*	90	SG	No
4 Days	**10/15/2019**	***Hyalella azteca***	**50**	**SL**	**Yes**
4 Days	**10/15/2019**	***Hyalella azteca***	**48**	**SL**	**Yes**
4 Days	**10/29/2020**	***Hyalella azteca***	**4**	**SL**	**Yes**
7 Days	5/6/2002	*Ceriodaphnia dubia*	80	NSG	No

[9] See § 3.1.4 Toxicity Criteria for definition of Significant Effect Codes. Testing procedures have changed over time. This table shows survival percentages from tests for four-day, seven-day, and ten-day survival.

Survival Period	Date	Species	Survival Avg. (%)	Sig. Effect Code	Toxic?
7 Days	**10/2/2002**	***Ceriodaphnia dubia***	**0**	**SL**	**Yes**
7 Days	4/15/2003	*Ceriodaphnia dubia*	100	NSG	No
7 Days	5/3/2004	*Ceriodaphnia dubia*	80	NSG	No
7 Days	**10/5/2004**	***Ceriodaphnia dubia***	**0**	**SL**	**Yes**
7 Days	5/9/2005	*Pimephales promelas*	97	NSG	No
7 Days	5/1/2006	*Pimephales promelas*	97	NSG	No
7 Days	4/21/2008	*Hyalella azteca*	96	NSG	No
7 Days	5/4/2010	*Ceriodaphnia dubia*	80	NSG	No
10 Days	5/9/2005	*Hyalella azteca*	96	NSG	No
10 Days	10/26/2005	*Hyalella azteca*	96	NSG	No
10 Days	5/1/2006	*Hyalella azteca*	96	NSG	No
10 Days	5/7/2007	*Hyalella azteca*	100	NSG	No
10 Days	10/23/2007	*Hyalella azteca*	98	NSG	No
10 Days	10/28/2008	*Hyalella azteca*	100	NSG	No
10 Days	4/28/2009	*Hyalella azteca*	98	NSG	No
10 Days	**10/19/2009**	***Hyalella azteca***	**0**	**SL**	**Yes**
10 Days	5/4/2010	*Hyalella azteca*	100	NSG	No
10 Days	**10/6/2010**	***Hyalella azteca***	**51**	**SL**	**Yes**
10 Days	5/10/2011	*Hyalella azteca*	92	NSG	No
10 Days	**10/11/2011**	***Hyalella azteca***	**0**	**SL**	**Yes**

Survival Period	Date	Species	Survival Avg. (%)	Sig. Effect Code	Toxic?
10 Days	5/7/2012	*Hyalella azteca*	94	NSG	No
10 Days	**10/15/2012**	***Hyalella azteca***	**61**	**SL**	**Yes**
10 Days	4/22/2013	*Hyalella azteca*	79	SG	No
10 Days	**10/21/2013**	***Hyalella azteca***	**15**	**SL**	**Yes**
10 Days	3/27/2018	*Chironomus dilutus*	88	NR	NA
10 Days	3/27/2018	*Hyalella azteca*	65	NR	NA
10 Days	10/16/2018	*Chironomus dilutus*	98	NR	NA
10 Days	10/16/2018	*Hyalella azteca*	78	NR	NA
10 Days	11/14/2018	*Hyalella azteca*	72	NR	NA

Table 11: Average Toxicity Ten-Day Survival Percentages of Two Species in Alamo River Outlet Sediment, 2002-2020

Date	Species	Survival Avg (%)	Sig. Effect Code	Toxic?
5/6/2002	***Hyalella azteca***	**57**	**SL**	**Yes**
10/2/2002	*Hyalella azteca*	69	NSG	No
4/15/2003	*Hyalella azteca*	95	NSG	No
5/3/2004	*Hyalella azteca*	87	SG	No
10/5/2004	*Hyalella azteca*	86	NSG	No
5/9/2005	*Hyalella azteca*	84	NSG	No
10/26/2005	*Hyalella azteca*	90	NSG	No
5/1/2006	***Hyalella azteca***	**68**	**SL**	**Yes**

Date	Species	Survival Avg (%)	Sig. Effect Code	Toxic?
5/7/2007	*Hyalella azteca*	84	NSG	No
10/23/2007	*Hyalella azteca*	81	SG	No
4/21/2008	***Hyalella azteca***	**73**	**SL**	**Yes**
10/28/2008	*Hyalella azteca*	89	SG	No
4/28/2009	***Hyalella azteca***	**43**	**SL**	**Yes**
10/19/2009	*Hyalella azteca*	90	NSG	No
5/4/2010	***Hyalella azteca***	**54**	**SL**	**Yes**
10/6/2010	*Hyalella azteca*	95	NSG	No
5/10/2011	***Hyalella azteca***	**59**	**SL**	**Yes**
10/11/2011	***Hyalella azteca***	**66**	**SL**	**Yes**
10/15/2012	***Hyalella azteca***	**74**	**SL**	**Yes**
4/22/2013	***Hyalella azteca***	**30**	**SL**	**Yes**
10/21/2013	***Hyalella azteca***	**14**	**SL**	**Yes**
10/22/2014	***Hyalella azteca***	**43**	**SL**	**Yes**
10/21/2015	*Hyalella azteca*	86	SG	No
4/10/2019	*Hyalella azteca*	81	SG	No
10/10/2019	*Chironomus dilutus*	98	NSG	No
10/10/2019	***Hyalella azteca***	**48**	**SL**	**Yes**
10/15/2019	***Hyalella azteca***	**56**	**SL**	**Yes**
10/29/2020	*Chironomus dilutus*	96	NSG	No
10/29/2020	*Hyalella azteca*	73	SG	No

Most sampling is concentrated at the Alamo River outlet, which precludes opportunities to track where toxicity originates or is most detrimental. Timing is also a factor, as most toxicity sampling occurs in either spring or fall (leaving summer and winter unaccounted for in data). To better delineate toxicity in the river, more data along the entire length of the Alamo River and throughout the year is necessary. Future studies are planned to delineate the major sources of toxicity in the Alamo River.

6. SOURCE ANALYSIS

6.1. Chloride

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.

6.2. Indicator Bacteria

The sources of indicator bacteria in the Alamo River are unknown. Possible sources include stormwater runoff, concentrated animal feeding operations (CAFOs), runoff from agricultural fields that have been fertilized by animal waste and other non-point sources (Byappanahalli et al, 2012). 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 (Burkholder et al, 2007). Wildlife or other free-roaming animals can also contribute as shown in the Coachella Valley Stormwater Channel Bacterial Indicators TMDL (CRBRWQCB, 2011). 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.

6.3. Toxicity

Toxicity can be caused by a number of factors but in the Alamo River, a recent work into toxicity sources suggests it is most likely from organophosphate (OP) and pyrethroid pesticides. OP and pyrethroid pesticides are used on agricultural fields that drain to the Alamo River. In a 2004 study, diazinon and chlorpyrifos were found to be the causes of *C. dubia* toxicity in the Alamo River (de Vlaming et al, 2004). Because of the age of the study, those particular OP pesticides may or may not still be the source of toxicity. Chlorpyrifos has recently been banned for use in California and is not being used currently in any capacity (CDPR, 2019). Many other pesticides are still in use which may be causing the toxicity in the Alamo River now. The additive properties of multiple pesticides are also a possible cause of the toxicity given the variety of crops and acreage of irrigated lands in the watershed.

Given the number of impairments in the Alamo River, the specific cause of toxicity is not known but a toxicity identification evaluation (TIE) may be able to establish the cause or causes. Discharge from irrigated lands that make up the bulk of the flow of the Alamo River contains excess nutrients and multiple types of pesticides.

7. LOADS AND ALLOCATIONS

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 WQOs is not exceeded. Allocations are based on the source analysis and numeric target. The margin of safety accounts for uncertainty, and is recommended by USEPA's TMDL Guidelines (USEPA, 1991). "TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure." (40 C.F.R. § 130.2(i).)

A TMDL can be equated as follows:

TMDL =	**Wasteload Allocations**	(Point Sources)
	+ **Load Allocations**	(Non-Point Sources)
	+ **Natural Sources**	
	+ **Margin of Safety**	

7.1. Margin of Safety and Loading Capacity

A TMDL requires a margin of safety component that accounts for the uncertainty about the relationship between the pollutant loads and the quality of the receiving water. (33 U.S.C. § 1313(d)(1)(C).) The margin of safety may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the margin of safety. 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. 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.

7.2. Critical Conditions and Seasonal Variation

TMDLs must always include consideration of critical conditions and seasonal variation to ensure protection of the designated uses of the waterbody. 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 the 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 expressed as concentrations, which are set equal to the desired water quality condition. Consequently, there are no critical conditions.

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 appropriate in this case.

7.3. Load Allocations (Non-Point Sources)

The Alamo River's flow is almost exclusively comprised of discharge from irrigated agriculture. Load allocations are those set for discharges from non-point sources, such as agriculture. The impairments addressed in this TMDL are also presumed to be predominantly sourced from agricultural operations in the Imperial Valley. Because the impairments in this TMDL cannot be traced back to a specific discharger, concentration-based allocations have been set. **Table 12** outlines the load allocations for chloride and indicator bacteria (*E. coli*, and enterococcus). Toxicity load allocations will use the new TST statistical methodology included in the provisions set to the chronic numeric objective.

Table 12: Load Allocations for the Alamo River

Impairment	Load Allocation
Chloride	230 mg/L as a CCC expressed as a 4-day average
E. coli	2000 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
Toxicity – *Ceriodaphnia dubia*	Mean ambient water response ≤ 0.75 * mean control response
Toxicity – *Hyalella azteca*	Mean ambient water response ≤ 0.80 * mean control response

7.4. Wasteload Allocations (Point Sources)

Certain stormwater and NPDES-permitted facility discharges comprise the remainder of Alamo River flows (i.e., those not associated with discharges from irrigated agriculture). Whereas load allocations are assigned for non-point source discharges (e.g., irrigated agriculture and other runoff), wasteload allocations are assigned for point sources (e.g., NPDES-permitted facilities). A complete list of current NPDES permits is included in Table 13.

Although there is no data evidencing that point sources are the cause or contributor of any of the subject impairments in the Alamo River, wasteload allocations must nevertheless be assigned (i.e., regardless of possibility of discharge). **Table 14** specifies wasteload allocations for point source discharges to the Alamo River. Similar to the load allocations, these are concentration-based with adjustments made for the difference in salinity so that both indicator bacteria (*E. coli* and enterococcus) are using WQOs that are for the most protective beneficial use (REC-1). Toxicity wasteload allocations will use the whole effluent toxicity test results evaluated with the new TST statistical approach in the provisions to determine if the effluent passes or fails the toxicity test. NPDES permits that have incorporated TST include Holtville POTW, Heber Public Utility District POTW, and IID Grass Carp Hatchery.

Table 13: Facilities Permitted to Ultimately Discharge to the Alamo River

NPDES Facility	Current Permit	Design Flow (mgd)	Discharge Point	Lat/Long
Country Life Mobile Home Park	CA0104264	0.15	Alder Drain	32.781389/ -115.509167
El Centro POTW	CA0104426	8	Central Main Drain	32.818333/ -115.578889
Holtville POTW	CA0104361	0.85	Pear Drain	32.83/ -115.43
Calipatria WWTP	CA0105015	1.73	G Drain	32.1475/ -115.552778
Imperial POTW	CA0104400	2.4	Dolson Drain	32.855/ -115.558611
Heber Public Utility District POTW	CA0104370	1.2	Central Drain 3-D No. 1	32.7375/ -115.524167
IID Grass Carp Hatchery	CA7000004	2.52	Central Main Drain No. 5	32.798333/ -115.544167

NPDES Facility	Current Permit	Design Flow (mgd)	Discharge Point	Lat/Long
IID El Centro Generating Station WWTP	CA0104248	0.995	Central Drain No. 5	32.804083/ -115.544222
MS4 – Imperial County	CAS000004		Multiple	
MS4 – City of Imperial	CAS000004		Multiple	
MS4 – City of El Centro	CAS000004		Multiple	
Industrial General Stormwater	CAS000001		Multiple	
Construction General Stormwater	CAS000002		Multiple	
General Concentrated Animal Feeding Operations (CAFOs)	CAG017001		None	

Table 14: Wasteload allocations for the 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
Toxicity	Mean discharge In-stream Waste Concentration response ≤ 0.75 * mean control response

Point sources have not been shown to be a source of any of the pollutants addressed in this TMDL. The wasteload allocations have thus been set to WQOs that are consistent with NPDES program precedents. Point sources will be required to comply with the wasteload allocations. As NPDES permits are being renewed and updated, the TST provisions are included and the indicator bacteria WQOs are updated. Chloride will be the only additional pollutant that point sources will need to begin monitoring.

No new point sources are expected in the future, however, if any should arise they will be subject to the same wasteload allocations unless it is determined that more stringent facility-based allocations be set.

8. IMPLEMENTATION

8.1. Nonpoint Sources

The Alamo River's flow consists almost entirely of agricultural runoff. Because of this, implementation of this TMDL will rely primarily on the Imperial Valley General Order. Many of the waste discharge requirements (WDRs) to enforce this TMDL are already prescribed through the Colorado River Basin Water Board's 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 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.

8.2. Point Sources

The Code of Federal Regulations requires that WLAs for individual NPDES permittees, general NPDES permittees, general industrial stormwater permittees, and general

construction stormwater permittees will be incorporated as WQBELs in their NPDES permits at the time of permit issuance, modification, or renewal.

NDPES-permitted facilities are required to monitor for a suite of pollutants at various time intervals depending on the specific pollutant. Each facility is evaluated for discharged pollutants and effluent limitations are assigned according to the data record. No facilities draining to the Alamo River have any effluent limitations assigned for chloride, indicator bacteria, or toxicity. All but one facility, El Centro Generating Station, monitor *E. coli* at a frequency to facilitate generating a geometric mean. All facilities are required to monitor priority pollutants and toxicity. 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.

9. MONITORING

9.1. Existing Monitoring

The Colorado River Basin Water Board will continue monitoring chloride, indicator bacteria, and toxicity in the Alamo River through the SWAMP program. Sampling occurs twice a year, in spring (April) and fall (October). The spring sampling is for water and fall sampling is for water, sediment, and fish tissue. Monitoring is prioritized according to previous data and the 303(d) List of Impaired Waters.

Because the majority of the Alamo River's flow is comprised of agricultural return flow, the Imperial Valley General Order will provide vital information regarding the concentration of these pollutants discharged and the effectiveness of the MPs implemented. The Imperial Valley General Order requires surface and groundwater quality monitoring for multiple parameters (similar to those under its predecessor, the Conditional Waiver). Tables B-1, B-2, and B-3 in Attachment B of the Imperial Valley General Order include the parameters and sampling frequency for compliance. Targeted parameters include nutrients, indicator bacteria, pesticides, and toxicity (CRBRWQCB, 2022).

Under the Imperial Valley General Order (R7-2021-0050), non-point source dischargers are required to implement MPs that prevent or control discharges of waste that are causing or contributing to exceedances of WQOs. MPs are also implemented through the Water Quality Management Plan (Farm Plan), which identifies the type and location of management practices currently used on the individual growers irrigated agricultural lands. Additional management practices based on current conditions needed to minimize or prevent the discharge of waste to the State's waters through irrigation water runoff and infiltration, non-stormwater runoff, and stormwater runoff.

The implementation plan proposed for these TMDLs will be similar for chloride, indicator bacteria, and pesticides which recent study shows is one source of toxicity. For the impairments addressed in this TMDL, the MPs outlined in the Imperial Valley General Order should control the discharge of soil or silt that typically is the vehicle for pollutants to enter waterbodies. With less discharge of the impairing pollutants into the Alamo River, compliance can be achieved. Data reports submitted to the Colorado River Basin Water Board as part of the compliance measures outlined in the Imperial Valley General Order will also be evaluated for TMDL compliance. Implemented MPs will be evaluated annually for effectiveness. If no improvement is shown, the Board may re-evaluate implemented MPs and require changes or upgrades.

Point sources are less likely to discharge pollutants that cause the impairments addressed in this TMDL. However, they will be required to monitor for chloride and enterococcus in addition to *E. coli* and toxicity. This monitoring will evaluate any point source discharges contributing to impairments.

9.2. Toxicity Source Determination

For toxicity, the implementation plan consists of two phases and begins 90 days following USEPA approval of the TMDL. “Phase I” actions will take three years to complete and focus on monitoring and determining the source or sources of toxicity. Responsible parties, point source and non-point source dischargers, will need to establish toxicity testing (if not in place) and collect data for water toxicity. Coalition members enrolled in the Imperial Valley General Order and most NPDES facilities are required to sample for toxicity. Those that do not will be required to establish a monitoring program and Quality Assurance Project Plan (QAPP) approved by the Colorado River Basin Water Board’s Executive Officer prior to implementation. Data will be submitted on an annual basis with the first report submitted for Board review one year from the start of “Phase I” for dischargers with established toxicity monitoring programs and one year from QAPP approval for those without. Data collected by the Board’s SWAMP program will also be used to determine if any sources or specific pollutants have been identified as the source of toxicity, and to evaluate trends noted in the Alamo River or its tributaries that correspond with MP implementation.

After data collection for three years, “Phase II” will evaluate if any new sources have been defined, MPs identified which effectively control pollutant transport, and determine future monitoring needs. Colorado River Basin Water Board staff will develop “Phase II” implementation when sources, site(s) or pollutant(s), have been identified which may occur prior to the completion of “Phase I,” depending on data collected.

10. ENVIRONMENTAL REVIEW

Although it constitutes a “project” under the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq., this Basin Plan Amendment is a “certified regulatory program” that has been categorically exempted from the requirement for preparation of an Environmental Impact Report (EIR). (Pub. Resources Code, § 21080.5; Cal. Code Regs., tit. 14, 1251, subd. (g).) Basin Plan Amendments must instead comply with the procedural requirements set forth in California Code of Regulations, title 23, section 3775 et seq. This Staff Report and the attached Environmental Review Checklist (Attachment B) constitute the Substitute Environmental Document (SED) that is required per California Code of Regulations, title 23, sections 3777 and 3779.5.

As demonstrated in **Attachment B**, no “fair argument” exists that the proposed Basin Plan Amendment could result in any reasonably foreseeable significant adverse environmental impacts. (See Cal. Code Regs., tit. 23, § 3777, subd. (e); Cal. Code Regs., tit. 14, § 15252, subd. (a)(2)(B).) Similarly, because the proposed Basin Plan Amendment will not require any additional affirmative actions, there are no significant adverse environmental impacts directly resulting from the foreseeable means of compliance.

11. ECONOMIC ANALYSIS

There are three conditions under which economic considerations must be considered in the context of a Basin Plan Amendment.

First, water quality objectives (WQOs) established under the Basin Plan must account for economic considerations. (Wat. Code, § 13241, subd. (d).) Because a total maximum daily load (TMDL) is not WQO, an economic analysis is not required under Water Code section 13241.

Second, prior to the Colorado River Basin Water Board's implementation of an agricultural water quality control program, the Basin Plan must include "an estimate of the total cost of such a program, together with an identification of potential sources of financing…." (Wat. Code, § 13141.) This requirement is inapplicable because such a program already exists in the form of the Board's current Irrigated Lands Regulatory Program (ILRP).

Third, economic considerations must be taken into account by the SED when analyzing impacts of reasonably foreseeable means of compliance with a new requirement or obligation imposed under the Basin Plan. (See Cal. Code Regs., tit. 23, § 3777, subds. (b)(4), (c).) As noted above, the proposed TMDL Implementation Program does not impose any new obligations or requirements. Consequently, no cost estimates are required.

12. PUBLIC PARTICIPATION

Colorado River Basin Water Board staff held several stakeholder meetings during the development of these TMDLs. The following is a summary of TMDL meetings and information items:

- August 10, 2021: CEQA scoping meeting
- June 3, 2025: Board Meeting Workshop on Proposed Basin Plan Amendment (TMDLs)
- TBD: Hearing on Adoption of Basin Plan Amendment (TMDLs)

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ATTACHMENT A: IMPERIAL COUNTY SPECIAL STATUS SPECIES

Imperial County and Salton Sea watershed are home to a diverse array of plant and animal life. **Figure 10** shows the boundary of the Sonny Bono Salton Sea National Wildlife Refuge, an important part of the Pacific Flyway utilized by multitudes of bird species. Many species present are listed as endangered or threatened by the federal Endangered Species Act and/or the California Endangered Species Act. Regional Board staff investigated the area for any and all special status species that may be present using California Department of Fish and Wildlife's Biogeographic Information and Observation System (BIOS). Full methodology is available in Attachment A of the Organophosphate and organochlorine Compounds Total Maximum Daily Loads for Imperial Valley Waters, Imperial County (CRBRWQCB, 2022). **Tables 14-15** contain special status species occurring or potentially occurring in the Imperial Valley and Salton Sea area.

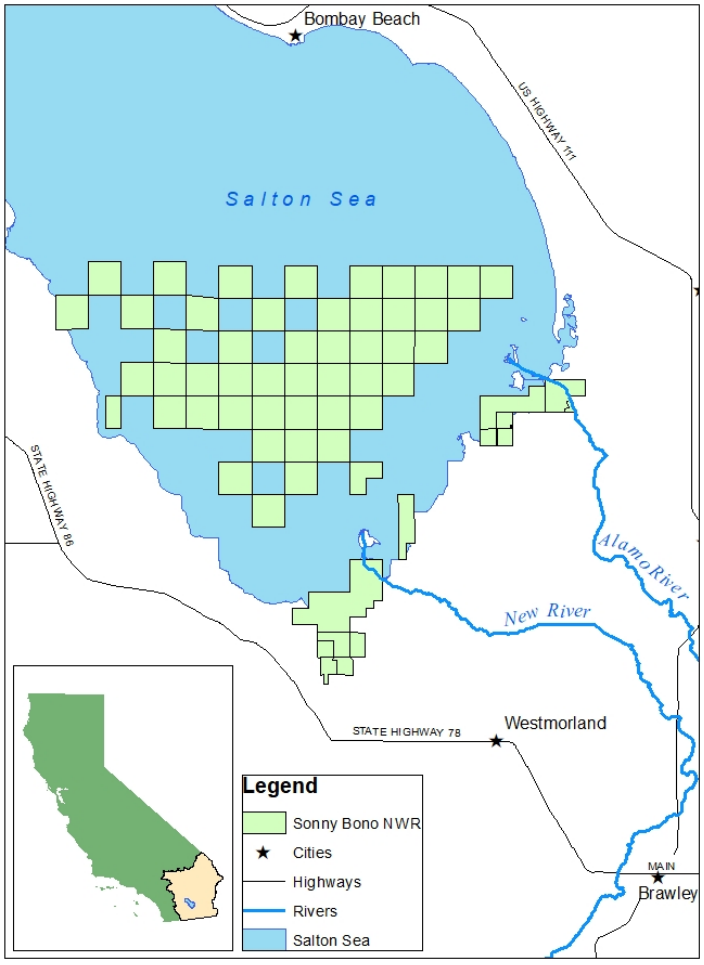

Figure 12: Sonny Bono Salton Sea National Wildlife Refuge boundary

Table 15: Special Status Plant Species Occurring or Potentially Occurring in Imperial Valley and Salton Sea Area

Common Name	Scientific Name	Protective Status
Peirson's milk-vetch	*Astragalus magdalenae var. peirsonii*	FT, SE
Algodones Dunes sunflower	*Helianthus niveus ssp. Tephrodes*	SE

Table 16: Special Status Animal Species Occurring or Potentially Occurring in Imperial valley and Salton Sea Area

Common Name	Scientific Name	Protective Status
Sonoran Desert toad	*Incilius alvarius*	SSC
Northern leopard frog	*Lithobates pipiens*	SSC
Lowland leopard frog	*Lithobates yavapaiensis*	SSC
Couch's spadefoot	*Scaphiopus couchii*	SSC
Cooper's hawk	*Accipiter cooperii*	WL
Sharp-shinned hawk	*Accipiter striatus*	WL
Golden eagle	*Aquila chrysaetos*	FP, WL
Short-eared owl	*Asio flammeus*	SSC
Burrowing owl	*Athene cunicularia*	SSC
Ferruginous hawk	*Buteo regalis*	WL
Western snowy plover	*Charadrius alexandrinus nivosus*	FT, SSC
Mountain plover	*Charadrius montanus*	SSC
Black tern	*Chlidonias niger*	SSC
Northern harrier	*Circus hudsonius*	SSC

ATTACHMENT A: IMPERIAL VALLEY SPECIAL STATUS SPECIES

Common Name	Scientific Name	Protective Status
White-tailed kite	*Elanus leucurus*	FP
Willow flycatcher	*Empidonax traillii*	SE
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE, SE
California horned lark	*Eremophila alpestris actia*	WL
Merlin	*Falco columbarius*	WL
Prairie falcon	*Falco mexicanus*	WL
American peregrine falcon	*Falco peregrinus anatum*	FP
Gull-billed tern	*Gelochelidon nilotica*	SSC
Yellow-breasted chat	*Icteria virens*	SSC
Least bittern	*Ixobrychus exilis*	SSC
Gray-headed junco	*Junco hyemalis caniceps*	WL
Loggerhead shrike	*Lanius ludovicianus*	SSC
California gull	*Larus californicus*	WL
California black rail	*Laterallus jamaicensis coturniculus*	ST, FP
Laughing gull	*Leucophaeus atricilla*	WL
Gila woodpecker	*Melanerpes uropygialis*	SE
Wood stork	*Mycteria americana*	SSC
Long-billed curlew	*Numenius americanus*	WL
Black storm-petrel	*Oceanodroma melania*	SSC
Osprey	*Pandion haliaetus*	WL

ATTACHMENT A: IMPERIAL VALLEY SPECIAL STATUS SPECIES

Common Name	Scientific Name	Protective Status
Harris' hawk	*Parabuteo unicinctus*	WL
Large-billed savannah sparrow	*Passerculus sandwichensis rostratus*	SSC
American white pelican	*Pelecanus erythrorhynchos*	SSC
California brown pelican	*Pelecanus occidentalis californicus*	FP
Double-crested cormorant	*Phalacrocorax auratus*	WL
Summer tanager	*Piranga rubra*	SSC
White-faced ibis	*Plegadis chihi*	WL
Black-tailed gnatcatcher	*Polioptila melanura*	WL
Vermilion flycatcher	*Pyrocephalus rubinus*	SSC
Yuma Ridgway's rail	*Rallus obsoletus yumanensis*	FE, ST, FP
Black skimmer	*Rynchops niger*	SSC
Yellow warbler	*Setophaga petechia*	SSC
California least tern	*Sternula antillarum browni*	FE, SE, FP
Crissal thrasher	*Toxostoma crissale*	SSC
Le Conte's thrasher	*Toxostoma lecontei*	SSC
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC
Desert pupfish	*Cyprinodon macularius*	FE, SE
Razorback sucker	*Xyrauchen texanus*	FE, SE, FP
Crotch bumble bee	*Bombus crotchii*	SC

ATTACHMENT A: IMPERIAL VALLEY SPECIAL STATUS SPECIES

Common Name	Scientific Name	Protective Status
Pallid bat	*Antrozous pallidus*	SSC
Western mastiff bat	*Eumops perotis californicus*	SSC
Western yellow bat	*Lasiurus xanthinus*	SSC
California leaf-nosed bat	*Macrotus californicus*	SSC
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC
Big free-tailed bat	*Nyctinomops macrotis*	SSC
Desert bighorn sheep	*Ovis canadensis nelson*	FP
Peninsular bighorn sheep DPS	*Ovis canadensis nelsoni pop. 2*	FE, ST, FP
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	SSC
Yuma hispid cotton rat	*Sigmodon hispidus eremicus*	SSC
American badger	*Taxidea taxus*	SSC
Palm Springs round-tailed ground squirrel	*Xerospermophilus tereticaudus chlorus*	SSC
Southern California legless lizard	*Anniella stebbinsi*	SSC
California glossy snake	*Arizona elegans occidentalis*	SSC
Coastal whiptail	*Aspidoscelis tigris stejnegeri*	SSC
Red-diamond rattlesnake	*Crotalus ruber*	SSC
Desert tortoise	*Gopherus agassizii*	FT, ST
Sonoran mud turtle	*Kinosternon sonoriense*	SSC
Flat-tailed horned lizard	*Phrynosoma mcallii*	SSC

ATTACHMENT A: IMPERIAL VALLEY SPECIAL STATUS SPECIES

Common Name	Scientific Name	Protective Status
Colorado Desert fringe-toed lizard	*Uma notata*	SSC
Sandstone night lizard	*Xantusia gracilis*	SSC

Table Key

FT = Federally Threatened, FE = Federally Endangered, ST = State Threatened, SE = State Endangered, SSC = Species of Special Concern, FP = Fully Protected, SC = State Candidate, WL = Watch List.

ATTACHMENT B: ENVIRONMENTAL REVIEW CHECKLIST

A. Project Title

Basin Plan Amendment to Establish Total Maximum Daily Loads for Chloride, Indicator Bacteria and Toxicity in the Alamo River, Imperial County

B. Lead Agency Name and Address

California Regional Water Quality Control Board,
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

C. Lead Agency Contact Person

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D. Project Description

The project is a proposed amendment to the Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Board). The amendment would incorporate in the Basin Plan Total Maximum Daily Loads (TMDLs) for chloride, indicator bacteria, and toxicity in the Alamo River in Imperial County, California. The pollutants addressed with these TMDLs have detected concentrations that are in violation of water quality objectives for protective beneficial uses and listed on the Clean Water Act Section 303(d). The Implementation Plan for these TMDLs includes monitoring of point and non-point discharges to determine sources and implementing management practices (MPs) included as part of the Imperial Valley Agricultural General Order and applicable NPDES permits.

E. Project Location

Colorado River Basin Region (southeastern California),
Alamo River, Imperial County, California

F. CEQA Checklist

The CEQA Checklist is a series of questions grouped by subject that identifies different types of potential environmental impacts that a project may cause. CEQA considers what are the existing conditions of the physical project site as a baseline. It then compares how much change will occur to the site if the project is implemented. Based on the CEQA Guidelines, the impact severity is rated on a scale of four impact levels. The four levels are: potentially significant impact, less than significant with mitigation incorporated, less than significant impact, or no impact.

1. Aesthetics

The level of impacts to aesthetics are evaluated based on the following questions posed under impact description in the matrix below, except as provided in Public Resources Code section 21099, will the project:

Table B-1: CEQA Checklist—Aesthetics

Impact Description		Determination
A.	Have a substantial adverse effect on a scenic vista?	No Impact
B.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No Impact
C.	Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	No Impact
D.	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	No Impact

2. Agriculture and Forestry Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

The level of impacts to agriculture and forestry resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-2: CEQA Checklist—Agriculture and Forestry Resources

Impact Description	Determination
A. Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	No Impact
B. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No Impact
C. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	No Impact
D. Result in the loss of forest land or conversion of forest land to non-forest use?	No Impact

Impact Description	Determination
E. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	No Impact

3. Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. The level of impacts to air quality are evaluated based on the following questions posed under impact description in the matrix below as to will the project:

Table B-3: CEQA Checklist—Air Quality

Impact Description	Determination
A. Conflict with or obstruct implementation of the applicable air quality plan?	No Impact
B. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality?	No Impact
C. Expose sensitive receptors to substantial pollutant concentrations?	No Impact
D. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	No Impact

4. Biological Resources

The level of impacts to biological resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-4: CEQA Checklist—Biological Resources

Impact Description	Determination
A. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	No Impact
B. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	No Impact
C. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No Impact
D. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	No Impact
E. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No Impact
F. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No Impact

5. Cultural Resources

The level of impacts to cultural resources are evaluated based on the following questions posed under impact description in the matrix below as to whether project will:

Table B-5: CEQA Checklist—Cultural Resources

Impact Description	Determination
A. Cause a substantial adverse change in the significance of a historical resource pursuant to section 15064.5?	No Impact
B. Cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5?	No Impact
C. Disturb any human remains, including those interred outside of dedicated cemeteries?	No Impact

6. Energy

The level of impacts to energy are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-6: CEQA Checklist—Energy

Impact Description	Determination
A. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	No Impact
B. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	No Impact

7. Geology and Soils

The level of impacts to geology and soils are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-7: CEQA Checklist—Geology and Soils

Impact Description	Determination
A. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	No Impact
B. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?	No Impact
C. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction?	No Impact

Impact Description	Determination
D. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving landslides?	No Impact
E. Result in substantial soil erosion or the loss of topsoil?	No Impact
F. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	No Impact
G. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	No Impact
H. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	No Impact
I. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	No Impact

8. Greenhouse Gas Emissions

The level of impacts to greenhouse gas emissions are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-8: CEQA Checklist—Greenhouse Gas Emissions

Impact Description	Determination
A. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	No Impact
B. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	No Impact

9. Hazards and Hazardous Materials

The level of impacts to hazards and hazardous materials are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-9: CEQA Checklist—Hazards and Hazardous Materials

Impact Description	Determination
A. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	No Impact
B. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	No Impact
C. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No Impact

Impact Description	Determination
D. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No Impact
E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	No Impact
F. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	No Impact
G. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	No Impact

10. Hydrology and Water Quality

The level of impacts to hydrology and water quality are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-10: CEQA Checklist—Hydrology and Water Quality

Impact Description	Determination
A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	No Impact
B. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	No Impact

Impact Description	Determination
C. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in a substantial erosion or siltation on- or off-site?	No Impact
D. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	No Impact
E. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	No Impact
F. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?	No Impact
G. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	No Impact
H. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	No Impact

11. Land Use and Planning

The level of impacts to land use and planning are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-11: CEQA Checklist—Land Use and Planning

Impact Description	Determination
A. Physically divide an established community?	No Impact
B. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	No Impact

12. Mineral Resources

The level of impacts to mineral resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-12: CEQA Checklist—Mineral Resources

Impact Description	Determination
A. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	No Impact
B. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	No Impact

13. Noise

The level of impacts to noise are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-13: CEQA Checklist—Noise

Impact Description	Determination
A. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	No Impact
B. Generate excessive ground-borne vibration or ground-borne noise levels?	No Impact
C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact

14. Population and Housing

The level of impacts to population and housing are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-14: CEQA Checklist—Population and Housing

Impact Description	Determination
A. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	No Impact

Impact Description	Determination
B. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	No Impact

15. Public Services

The level of impacts to public services are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

Table B-15: CEQA Checklist—Public Services

Impact Description	Determination
A. Fire protection?	No Impact
B. Police protection?	No Impact
C. Schools?	No Impact
D. Parks?	No Impact
E. Other public facilities?	No Impact

16. Recreation

The level of impacts to recreation are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-16: CEQA Checklist—Recreation

Impact Description	Determination
A. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	No Impact
B. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No Impact

17. Transportation

The level of impacts to transportation are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-17: CEQA Checklist—Transportation

Impact Description	Determination
A. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	No Impact
B. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	No Impact
C. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No Impact
D. Result in inadequate emergency access?	No Impact

18. Tribal Cultural Resources

The level of impacts to tribal cultural resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

Table B-18: CEQA Checklist—Tribal Cultural Resources

Impact Description	Determination
A. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	No Impact
B. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	No Impact

19. Utilities and Service Systems

The level of impacts to utilities and service systems are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will

Table B-19: CEQA Checklist—Utilities and Service Systems

Impact Description	Determination
A. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	No Impact
B. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	No Impact
C. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	No Impact
D. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	No Impact
E. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	No Impact

20. Wildfire

The level of impacts to wildfire are evaluated based on the following questions posed under impact description in the matrix below as to whether the project is located in or near state responsibility areas or lands classified as very high fire hazard severity zones will the project:

Table B-20: CEQA Checklist—Wildfire

Impact Description	Determination
A. Substantially impair an adopted emergency response plan or emergency evacuation plan?	No Impact
B. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	No Impact
C. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	No Impact
D. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	No Impact

21. Mandatory Findings of Significance

The level of impacts to mandatory findings of significance are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

Table B-21: CEQA Checklist—Mandatory Findings of Significance

Impact Description	Determination
A. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	No Impact
B. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)?	No Impact
C. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	No Impact

G. Discussion

This section provides detailed discussions on the items listed in the environmental checklist above.

1. Aesthetics Discussion

Will the project:

1A. Have any substantial adverse effect on a scenic vista?

N No impact. The proposed project will not have a substantial adverse effect on a scenic vista. The project applies predominantly to farmland that has been in cultivation for the past 60 to 100 years and established NPDES permitted facilities. The MPs used for implementation will be executed on privately owned farmland where many of the MPs are already in use as part of existing operations and regulatory compliance. Monitoring activities will be conducted at established points along the Alamo River currently in use by multiple entities for water quality monitoring.

1B. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No impact. The proposed project will not substantially damage scenic resources within a state scenic highway. No designated state scenic highways are in the project area.

1C. Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No impact. The proposed project will not substantially degrade the existing visual character or quality of the site and its surroundings. The project applies predominantly to farmland that has been in cultivation for the past 60 to 100 years. The MPs used for implementation will be executed on privately owned farmland where many of the MPs are already in use as part of existing operations and regulatory compliance. Monitoring activities will also be conducted at established points along the Alamo River currently in use by multiple entities for water quality monitoring and NPDES facilities.

1D. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No impact. The proposed project will not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

2. Agriculture and Forestry Resources Discussion

Will the project:

2A. Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No impact. The proposed project will not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use. The project will monitor runoff from farmland, other nonpoint sources, and point sources to identify sources of toxicity, bacteria, and chloride. It also requires farmers/growers and NPDES facilities to perform compliance monitoring.

2B. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No impact. The proposed project does not conflict with existing zoning for agricultural use, or the California Land Conservation Act known as the Williamson Act. Compliance monitoring will occur at existing sampling sites in use by multiple agencies and NPDES facilities.

2C. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No impact. The proposed project does not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production. Compliance monitoring will occur at existing sampling sites in use by multiple agencies and NPDES facilities.

2D. Result in the loss of forest land or conversion of forest land to non-forest use?

No impact. The proposed project will not result in the loss or conversion of forest land to non-forest use.

2E. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No impact. The proposed project does not involve other changes in the existing environment which could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

3. Air Quality Discussion

Will the project:

3A. Conflict with or obstruct implementation of the applicable air quality plan?

No impact. The implementation of compliance monitoring does not conflict with or obstruct implementation of the applicable air quality plan.

3B. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality?

No impact. The contribution attributable to the proposed project is not considered cumulatively in the Imperial County Air Quality Plans that and therefore, is less than significant. Imperial County is considered a nonattainment area for PM 2.5 and 8-hour ozone. The project requires to continue using MPs on farmland and NPDES facilities to control pollutants associated with discharges and compliance monitoring. MPs themselves are not sources of emissions. Construction, operation, and maintenance of some MPs (e.g., land leveling, sprinkler irrigation, drip irrigation, etc.) may involve the temporary use (one-time or once-per-year) of construction equipment (e.g., tractors, backhoes) that are sources of gasoline/diesel byproduct emissions and fugitive dust emissions (particulates). However, the equipment used for construction and operation and maintenance meets emission standards. Therefore, construction equipment emissions are not expected to violate or contribute substantially to an existing or projected air quality violation.

3C. Expose sensitive receptors to substantial pollutant concentrations?

No impact. The proposed project will not expose sensitive receptors to substantial pollutant concentrations. The MPs and compliance monitoring are not individually or cumulatively significantly different than current agricultural practices (e.g., preparing land for planting) or practices used in NPDES facilities. The project requires farmers/growers to continue using MPs on farmland to control agricultural wastewater discharge quality and control pollutants associated with discharges. It also requires NPDES dischargers to monitor for and if applicable identify any sources of toxicity and

indicator bacteria and remove chloride if the concentrations exceed WQOs. Particulate emissions associated with MP and water quality monitoring will occur primarily in agricultural fields where large numbers of people are not expected to congregate.

3D. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

No impact. The proposed project will not create objectionable odors. The project requires farmers/growers to continue using MPs on farmland to control agricultural wastewater discharge quality and control pollutants associated with discharges, NPDES dischargers to evaluate and control bacteria indicators, toxicity, and chloride discharges.

4. Biological Resources Discussion

Will the project:

4A. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No impact. The proposed project will not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Compliance water quality monitoring will not affect such resources negatively but will identify sources of pollutants and control the pollutant discharges and subsequently improve water quality.

4B. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No impact. The proposed project will not have a substantial adverse effect on riparian habitat or other sensitive natural communities identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

The Alamo River supports riparian habitat. Riparian habitat provides valuable vegetative cover for numerous sensitive bird species, including the endangered Yuma Clapper Rail, the Mountain Plover, Burrowing owl, Short-eared owl, Black-tailed gnatcatcher, Crissal thrasher, Yellow warbler, California gray-headed junco, and Colorado Valley

woodrat. The delta also provides critical habitat for sensitive fish species including the endangered Desert Pupfish. Reduction of pollutants to the drains will not alter this important vegetative cover nor will it affect sensitive wildlife in any adverse manner. Improving water quality will create a healthier habitat for all species.

In 2011, the Natural Resources Agency prepared an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Salton Sea Species Conservation Habitat Project. The Species Conservation Habitat Project is intended to serve as a proof of concept for the restoration of the shallow water habitat that currently supports fish and wildlife dependent on the Salton Sea. This habitat is being threatened and lost due to salinity increases and declining Sea elevation. The Species Conservation Habitat Project's goals are: (1) to develop a range of aquatic habitats that will support fish and wildlife species that depend on the Sea; and (2) develop and refine data needed to successfully manage the Project's habitat through adaptive management. The 2022 Annual Report on the Salton Sea Management Program can be downloaded from:

https://saltonsea.ca.gov/wp-content/uploads/2022/02/2022-Annual-Report_English_Feb-24-2022_Final.pdf?utm_medium=email&utm_source=govdelivery

The proposed project complements the Natural Resources Agency's Project and the Agency's overall efforts to restore the Salton Sea because it requires implementation of management practices to address water quality impairments, improve overall drain water quality—drain water is a vital source of flow for the Salton Sea, and all tributaries to the Alamo River.

4C. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No impact. The proposed project will not have a substantial adverse effect on federally protected wetlands through direct removal, filling, hydrological interruption, or other means. Control and reduction of pollutant discharges that could impair water quality will benefit water bodies in the project are. Improved water quality creates a healthier habitat for wildlife and other biological resources.

4D. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No Impact. The proposed project will not interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with an established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Control and reduction of pollutant discharges that could impair water quality will benefit water bodies in the project area. Improved water quality creates a healthier habitat for wildlife and other biological resources.

4E. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The proposed project does not conflict with any local policies or ordinances protecting biological resources. Control and reduction of pollutant discharges that could impair water quality will benefit water bodies in the project area. Improved water quality creates a healthier habitat for wildlife and other biological resources.

4F. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The proposed project does not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Control and reduction of pollutant discharges that could impair water quality will benefit water bodies in the project area. Please see discussion responding to Question 4B., above, for further discussion of the Natural Resources Agency Salton Sea Species Conservation Habitat Project.

5. Cultural Resources Discussion

Will the project:

5A. Cause a substantial adverse change in the significance of a historical resource pursuant to section 15064.5?

No impact. The proposed project will not cause a substantial adverse change in the significance of historical resources. The Colorado River Basin Water Board is not aware of these resources in the project area and the CEQA Scoping Meeting held on August 10, 2021, early in the development of this TMDL, did not disclose the presence of any such resources. The Colorado River Basin Water Board received no comments regarding the occurrence of sensitive or unique historical, archaeological, paleontological, or geological resources. Likewise, no information was obtained concerning the occurrence of ancient burial grounds, outside of formal cemeteries.

Control and reduction of pollutants that impair water quality is beneficial to water bodies in the project area, and will not affect historical resources.

5B. Cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5?

No Impact. The proposed project will not cause a substantial adverse change in the significance of archaeological resources. Please see discussion responding to Question 5A., above.

5C. Disturb any human remains, including those interred outside of dedicated cemeteries?

No Impact. The proposed project will not disturb any human remains, including those interred outside of formal cemeteries. Please see discussion responding to Question 5A., above.

6. Energy Resources Discussion

Will the project:

6A. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

No impact. The proposed project will not result in potentially significant environmental impact due to wasteful consumption of energy resources. MPs implementation and compliance monitoring on farmland and on NPDES facilities will not result in unnecessary consumption of energy. Control and reduction of pollutant discharges that could impair water quality will benefit the Alamo River.

6B. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No impact. The proposed project will not conflict with a state or local plan for renewable energy or energy efficiency. Sampling sites in use by multiple agencies and NPDES facilities.

7. Geology and Soils Discussion

Will the project:

7A. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No impact. The proposed project will not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic activity. While it is true that the Imperial Valley, the location of the Alamo River, is one of the most active seismic zones in North America, with numerous historic earthquakes, required monitoring is not individually or cumulatively significantly different than current monitoring practices.

7B. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?

No impact. The proposed project will not cause potential substantial adverse effects involving strong seismic ground shaking. Compliance monitoring, including pollutant source identification, will occur at existing sampling sites in use by multiple agencies and NPDES facilities.

7C. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction?

No impact. The proposed project will not cause potential substantial adverse effects involving seismic related ground failure, including liquefaction. Compliance monitoring will occur at existing sampling sites in use by multiple agencies and NPDES facilities. MPs and monitoring likely to be implemented do not involve structures that will affect or disturb soils to any significant degree, cause soils to become unstable, or result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

7D. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving landslides?

No Impact. The proposed project will not cause potential substantial adverse effects involving strong seismic ground shaking and landslides. Please see discussion responding to Question 7C., above.

7E. Result in substantial soil erosion or the loss of topsoil?

No impact. The proposed project will not result in substantial soil erosion or the loss of topsoil. MP implementation will occur on existing farmland and should reduce soil erosion or the loss of topsoil. Compliance monitoring will not result in soil erosion or the loss of topsoil but will likely result in less soil erosion by controlling total suspended solids, and total suspended solids transport int the receiving water, the Alamo River.

7F. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

No Impact. The proposed project will not be located on a geologic unit or soil that is unstable as a result of the project. Please see discussion responding to Question 7C., above.

7G. Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No Impact. The proposed project will not be located on expansive soil creating substantial direct or indirect risks to life or property. MPs and compliance monitoring to be implemented are unlikely to affect soil to any significant degree or create substantial risk to life or property.

7H. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The proposed project does not involve septic tanks or alternative wastewater disposal systems.

7I. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. The proposed project will not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. MP implementation and compliance monitoring will occur at existing sampling sites in use by multiple agencies and NPDES facilities.

8. Greenhouse Gas Emissions Discussion

Will the project:

8A. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

No Impact. The proposed project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. MPs and compliance monitoring themselves are not sources of emissions. Construction, operation, and maintenance of some MPs (e.g., land leveling, sprinkler irrigation, drip irrigation, etc.) may involve the temporary use (one-time or once-per-year) of construction equipment (e.g., tractors, backhoes) that generate mobile point source emissions. However, the equipment used for construction and operation and maintenance meets emission standards. Therefore, construction equipment emissions are not expected to violate or contribute substantially to greenhouse gas emissions.

8B. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

No Impact. The proposed project does not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases.

9. Hazards and Hazardous Materials Discussion

Will the project:

9A. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

No impact. The proposed project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The project requires farmers/growers to continue using MPs on farmland to control agricultural wastewater discharge quality and control pollutants associated with discharges. It also requires NPDES facilities to implement compliance monitoring and to control pollutants associated with discharges from those permitted facilities.

9B. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

No Impact. The proposed project will not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving

the release of hazardous materials into the environment. Please see discussion responding to Question 9A., above.

9C. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No impact. The proposed project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Please see discussion responding to Question 9A., above.

9D. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No impact. The proposed project will not be located on sites included on a list of hazardous materials sites that would result in creation of a significant hazard to the public or the environment.

9E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No impact. No portion of the proposed project is located within two miles of public airports and the proposed project will not result in a safety hazard for people residing or working in the project area.

9F. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No impact. The proposed project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

9G. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No impact. The proposed project will not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. MP construction and implementation will occur on existing farmland and compliance monitoring will occur at existing sampling sites in use by multiple agencies and NPDES facilities. MPs to be implemented are unlikely to increase the risk of loss, injury or death involving wildland fires.

10. Hydrology and Water Quality Discussion

Will the project:

10A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

No impact. The proposed TMDL requires implementation of actions to reduce pollutant discharges to the Alamo River and associated groundwaters and to discharge in compliance with Basin Plan water quality standards (WQS). Implementation of MPs will improve the water quality of receiving surface waters and groundwaters by reducing pollutant loading to receiving waters. The proposed TMDL also includes a comprehensive monitoring program for receiving waters to ensure compliance with WQS, and overall improvements in water quality.

10B. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No Impact. The proposed project does not require alteration of the existing drainage pattern of the site or area, and would not result in substantial erosion or siltation on or off site. Rather, the proposed project expects to reduce sediment/silt discharge, which can carry bacteria, chloride, and toxicity causing pollutants to surface waters by implementing MPs that minimize erosion and sediment deposition, identify sources of pollutants and subsequently minimize the discharge of pollutants to receiving waters.

10C. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in a substantial erosion or siltation on or off site?

No Impact. The proposed project does not require alteration of the existing drainage pattern of the site or area, and would not result in substantial erosion or siltation on or off site. Rather, the proposed project expects to reduce sediment/silt discharge to surface waters by implementing MPs that minimize erosion and sediment deposition.

10D. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?

No impact. The proposed project does require alteration of the existing drainage pattern of the site or area, and would not result in a substantial increase in the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. Alteration of

drainage patterns (e.g., re-routing surface waters, increasing paved areas, increasing agricultural runoff) is not a foreseeable method of compliance with this TMDL. Please see discussion responding to Question 10C., above.

10E. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

No impact. The proposed project will not substantially alter the existing drainage pattern of the area nor create or contribute runoff water. Rather, the proposed project should improve the quality of runoff from agricultural fields, thereby reducing substantially additional sources of pollution. Please see discussion responding to Question 10D., above.

10F. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?

No impact. The proposed project will not substantially alter the existing drainage pattern of the area nor impede or redirect flood flows. Please see discussion responding to Question 10D., above.

10G. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Impact. The proposed project will not expose people or structures to a significant risk release of pollutants due to project inundation by seiche, tsunami, or flood hazard.

10H. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No impact. The proposed project will not obstruct implementation of a water quality control plan or sustainable groundwater management plan. Rather, the proposed project requires implementation of actions to reduce pollutant discharges to the Alamo River and groundwaters resulting in these receiving waters demonstrates compliance with Basin Plan water quality standards (WQS).

11. Land Use and Planning Discussion

Will the project:

11A. Physically divide an established community?

No impact. The proposed project will not physically divide an established community. MP construction, implementation, and compliance monitoring will occur on existing fields and NPDES facilities and will not result in any land use or planning impacts.

11B. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No impact. The proposed project will not conflict with any applicable land use plan, policy, or regulation adopted by an agency with jurisdiction over the project for the purpose of avoiding or mitigating an environmental effect. MP implementation and compliance monitoring will occur on existing fields and drains, and will not impact land use or planning.

12. Mineral Resources Discussion

Will the project:

12A. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?

No impact. The proposed project will not result in the loss of availability of a known mineral resource of value to the region and the residents of the state.

12B. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No impact. The proposed project will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

13. Noise Discussion

Will the project:

13A. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

No impact. The proposed project will not result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan ordinance, or applicable standards of other agencies. Construction and/or installation of some MPs may involve the temporary use of farming and construction equipment (e.g., tractors, backhoe, caterpillars) that may emit noise at levels greater than 60 decibels. However, such activities will occur on farmland not typically surrounded by people.

13B. Generate excessive groundborne vibration or groundborne noise levels?

No impact. The proposed project will not expose persons to or generate excessive groundborne vibration or groundborne noise levels. Construction and/or installation of some MPs may involve the temporary use of farming and construction equipment (e.g., tractors, backhoe, caterpillars) that may emit groundborne vibration or noise. However, such activities will occur on farmland not typically surrounded by people. Once installed, the MPs themselves are not sources of significant groundborne vibration or noise.

13C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No impact. No portion of the proposed project is located within two miles of public airports and the proposed project will not expose people residing or working in the project area to excessive noise levels. According to the Airport Land Use Compatibility plan, Imperial County Airports (Imperial County, 1996), noise exposure in the vicinity of the airports for agricultural cropland will clearly be acceptable, which means that agricultural land use can be carried out with essentially no interference from the noise exposure. Construction and/or installation of some MPs may involve the temporary use of farming and construction equipment (e.g., tractors, backhoe, and caterpillars) that may increase ambient noise levels in the area. However, such activities will occur on farmland not typically surrounded by people, and once installed, the MPs themselves are not the sources of excessive noise.

14. Population and Housing Discussion

Will the project:

14A. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No impact. The proposed project will not induce substantial unplanned population growth in an area. MPs and compliance monitoring will not result in new homes and businesses nor extend other infrastructures that will induce population growth.

14B. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No impact. The proposed project will not displace substantial numbers of people or housing, necessitating the construction of replacement housing elsewhere. MPs and compliance monitoring will not displace people.

15. Public Services Discussion

Will the project create impacts to:

15A. Fire protection?

No impact. The proposed project will not result in adverse impacts on fire protection. MP implementation will occur on existing farmland cultivated for the last 60 to 100 years and compliance monitoring will occur at existing sampling sites in use by multiple agencies and NPDES facilities. MPs and monitoring to be implemented are unlikely to affect fire protection, police protection, schools, parks and other public facilities.

15B. Police protection?

No impact. The proposed project will not result in adverse impacts on police protection and associated activities related to acceptable service ratios, response times, or other performance objectives for this public service. Please see discussion responding to Question 15A., above.

15C. Schools?

No Impact. The proposed project will not result in adverse impacts on schools and associated activities. Please see discussion responding to Question 15A., above.

15D. Parks?

No Impact. The proposed project will not result in adverse impacts on parks and associated activities related to other performance objectives for this public service. Please see discussion responding to Question 15A., above.

15E. Other public facilities?

No Impact. The proposed project will not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for public services. Please see discussion responding to Question 15A., above.

16. Recreation Discussion

Will the project:

16A. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact. The proposed project will not increase the use of existing neighborhood and regional parks or other recreational facilities. MPs and monitoring to be implemented will not increase park or recreational facility use.

16B. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The proposed project will not include recreational facilities or require the construction or expansion of recreational facilities. MPs and monitoring to be implemented will not include or require recreational facility use.

17. Transportation Discussion

Will the project:

17A. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

No Impact. The proposed project does not conflict with adopted policies, plans, or programs addressing the circulation system, including transit, roadway, bicycle and

pedestrian facilities. MP and compliance monitoring implementation do not involve or affect alternative transportation. The proposed project will not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways. Construction and/or installation of some MPs and compliance monitoring may require use of vehicle and farming or construction equipment (e.g., tractors, backhoe, caterpillars). However, transportation and movement of farming equipment is common on the roads and highways serving the area where MPs are to be implemented. Potential traffic congestion may occur temporarily in isolated areas, but is not expected to exceed a level of service standard for designated roads or highways

17B. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

No Impact. The proposed project will not have impact on vehicle miles traveled nor cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections). Construction and/or installation of some MPs may require use of farming equipment (e.g., tractors, backhoe, caterpillars). However, transportation and movement of farming equipment is common on roads and highways serving the area where MPs are to be implemented. Traffic congestion may occur temporarily in isolated areas, but is not expected to increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections.

17C. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. The proposed project will not substantially increase hazards due to design features or incompatible uses. Construction and/or installation of some MPs and compliance monitoring may require use of vehicle, farming and construction equipment (e.g., tractors, backhoe, caterpillars). However, transportation and movement of farming and construction equipment is common on the roads and highways serving the area where MPs are to be implemented, and do not create an incompatible use hazard.

17D. Result in inadequate emergency access?

No Impact. The proposed project will not result in inadequate emergency access. Construction and/or installation of some MPs and compliance monitoring may require use of vehicle, farming and construction equipment (e.g., tractors, backhoe, caterpillars). However, transportation and movement of farming and construction equipment is common on the roads and highways serving the area where MPs are to be implemented, and should not create inadequate emergency access.

18. Tribal Cultural Resources Discussion

Will the project:

18A. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

No impact. MP implementation and compliance monitoring will occur on existing agricultural drains, on farmland under cultivation for at least 60 years and at NPDES permitted facilities. These activities are not expected to affect or change any Tribal cultural resources. Further, implementation of the TMDL is not expected to affect sites listed on the state or federal register of historic places. Pursuant to Public Resources Code section 21080.3.1, commonly referred to as AB 52, the Regional Water Board notified Tribal organizations that requested to be consulted and are affiliated with the Imperial Valley watershed and Imperial County of the project. In addition, the Regional Water Board notified the other Tribal organizations within Colorado River Basin Regional Water Board area that are on the California Tribal Consultation List and California Native American Tribal List. Regional Board received one letter from the Viejas Band of Kumeyaay Indians communicating that the project site has cultural significance or ties to Viejas Band of Kumeyaay Indians. The Viejas Band of Kumeyaay Indians requested that a Kumeyaay Cultural Monitor be on site for ground disturbing activities to inform them of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. Subsequently, the Regional Water Board Tribal Coordinator contacted the Viejas Band of Kumeyaay Indians by email and phone calls to inform that the project should not entail any new ground disturbing activities that could lead to an inadvertent discovery of cultural artifacts, cremation sites, or human remains. Since it is expected that one or a combination of the following approaches will be used for the project: reduced pesticide use, switching to other safer pesticides, and/or enhanced pesticide management practices. These approaches do not involve ground-disturbing activities. Regional Board staff did not receive a response from the email to the Viejas Band of Kumeyaay Indians.

18B. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

No impact. Please see the response at 18A. In addition, in the event that the ground disturbances uncover previously undiscovered or documented resources, California law protects Native American burials, skeletal remains, and associated grave goods

regardless of the antiquity and provides for the sensitive treatment and disposition of those remains. (Health & Saf. Code, § 7050.5; Pub. Resource Code, § 5097.9 et seq).

19. Utilities and Service Systems Discussion

Will the project:

19A. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

No Impact. The proposed project will not require or result in construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities. MPs and compliance monitoring will not require construction of new or expanded water or wastewater treatment. Implementation may involve new monitoring in wastewater treatment plants and storm water drainages.

19B. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No Impact. The proposed project will not require new water supplies to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years. MPs implementation and monitoring does not involve new water supplies.

19C. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. MP implementation and compliance monitoring will not increase demand on the wastewater treatment providers. The proposed project will not result in a determination regarding its capacity by the wastewater treatment provider.

19D. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

No Impact. The proposed project does not involve landfills, and will not generate additional solid waste to be accommodated by a landfill.

19E. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. The proposed project complies with federal, state, and local statutes and regulations related to solid waste. MP implementation and compliance monitoring does not involve solid waste.

20. Wildfire Discussion

Will the project:

20A. Substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact. The proposed project does not impair adopted emergency responses or evacuation plans. MPs implementation and compliance monitoring will occur on existing farmland, existing NPDES facilities and waterbodies, which generally are not corridors for emergency response or evacuation.

20B. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

No Impact. The proposed project does not exacerbate wildfire risks and expose project occupants to pollutant concentrations from wildfire. MPs implementation and compliance monitoring will occur on existing farmland, at NPDES facilities and surface waterbodies, which does not exacerbate wildfire risks.

20C. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

No Impact. The proposed project does not involve installation or maintenance of infrastructure that may exacerbate fire risk. MP implementation and compliance monitoring will occur on existing farmland and NPDES permitted facilities. MPs to be implemented are unlikely to increase the risk of loss, injury or death involving wildland fires.

20D. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact. The proposed project does not expose people or structures to significant risks from post-fire impacts. MPs and compliance monitoring will occur on existing fields, NPDES facilities and waterbodies that are generally in a plane area with a low gradient, which generally are not corridors for emergency response or evacuation.

21. Mandatory Findings of Significance Discussion

Will the project:

21A. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

No Impact. The proposed project will not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. Rather, the proposed project is expected to improve the environment by regulating the discharges of waste and thereby improve water quality in the area such that it meets the Water Quality Standards.

21B. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)?

No impact. The proposed project will not have impacts that are individually limited or cumulatively. There are several existing and proposed projects involving water quality of the Alamo River, Alamo River Sediment TMDL, Imperial Valley Agricultural General Order of Waste Discharge Requirements, Wetlands Demonstration Projects, Colorado River Quantification Settlement Agreement (QSA) and California Natural Resources Agency's Salton Sea Management Program (SSMP). These projects have been providing benefits to the water quality of the affected waterbodies and to the biological

resources and environment by reducing the amount of pollutants inflow into the waterbodies. For example, the QSA projects provided for mitigation of the adverse water quality impacts that the QSA projects might create, and further enhances water quality by creating the Species Conservation Habitat (SCH) Project to restore the Salton Sea. In connection with the SCH Project, this project compliments the SCH Project and overall efforts to restore the Salton Sea because this project requires implementation of management practices to address water quality impairments and improve overall drain water quality.

In addition, implementation of existing laws/regulations/treaties, better coordination with third party cooperating agencies/organizations, and monitoring of water quality are activities that are not cumulatively considerable. Rather, the proposed project is expected to reduce negative cumulative effects, if any, through better agency coordination, and to protect beneficial uses of the Alamo River and the Salton Sea by reducing the pollutants in all discharges.

21C. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

No Impact. The proposed project does not have environmental effects which will cause substantial adverse effects on human beings either directly or indirectly. Implementation of existing laws/regulations/treaties, better coordination with third party cooperating agencies/organizations, and monitoring are activities that do not adversely affect human beings. Rather, the proposed project is expected to reduce water quality related problems (e.g., unsafe fish consumption) that may adversely affect human beings.

ATTACHMENT C: STAFF RESPONSE TO PEER REVIEW COMMENTS

1. Preface

The Colorado River Basin Water Board staff will propose adoption of the Basin Plan amendment to establish Total Maximum Daily Loads (TMDLs) for the Alamo River because of Chloride, Indicator Bacteria and Toxicity.

Pursuant to Health and Safety Code section 57004, all California Environmental Protection Agency (CalEPA) organizations to submit the scientific basis and scientific portion of all proposed policies, plans and regulations for external scientific review. The peer reviewer's responsibility is to determine whether the scientific findings, conclusions, and assumptions are based upon sound scientific knowledge, methods, and practices.

The University of California (UC) facilitated peer reviewer selection. The detailed step-by-step guidance for setting up and obtaining reviews appears in an Interagency Agreement between the CalEPA and the UC (see Exhibit F of guidance document). A January 7, 2009 Supplement to the Guidelines, provides, among other things, additional guidance to ensure confidentiality of the process. No person may serve as an external scientific peer reviewer if that person participated in the development of the scientific basis or scientific portion of the proposed rule, regulation, or policy.

Three individuals were selected to review this document for scientific adequacy:

1. **Teamrat A. Ghezzehei, Ph.D.**
   Professor, Soil Science, University of California, Merced
2. **Michael J. Lydy, Ph.D.**
   Distinguished Professor, Center for Fisheries
   Aquaculture and Aquatic Sciences and Department of Zoology,
   Southern Illinois University
3. **Rebecca Logsdon Muenich, Ph.D.**
   Associate Professor, Biological & Agricultural Engineering,
   University of Arkansas

These researchers collectively have substantial research expertise in irrigated agriculture, hydrology, agricultural pollutants, hydrology, desert irrigated agriculture and pollutant load assessment and toxicity for Total Maximum Daily Loads (TMDLs).

Health and Safety Code section 57004 further provides that if the peer reviewers find that an agency failed to demonstrate that the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices, the reviewer's report shall state that finding, and the reasons explaining the finding.

The staff of California Regional Water Quality Control Board, Colorado River Basin (Colorado River Basin Water Board or Board) asked the reviewers to comment on whether the scientific portions of the TMDL Staff Report and Implementation Plan are based upon sound scientific knowledge, methods, and practices. Specifically, the reviewers were asked to comment on five specific areas:

A. Numeric Targets—Whether the selection of numeric targets for chloride, indicator bacteria and toxicity are adequate in protecting the beneficial uses of the Alamo River in Imperial County.

B. Data Analysis to Determine Impairment Concentrations in Water Samples—Whether the water sampling had been sufficiently explained in the Data Analysis section.

C. Source Analysis—Whether the primary contributor to the impairments being agricultural discharges has been clearly explained.

D. Loading Capacity, TMDLs, and Allocations—Whether the proposed loading capacity and load/wastewater allocations were adequately protective and reasonably accounted for seasonal/critical conditions.

E. Implementation—Whether the proposed implementation plan is accurate and effective.

In addition to the findings, assumptions, and conclusions each individual agreed to review, reviewers were also invited to identify and address additional subjects that should be considered as part of the scientific basis of the TMDL project and to comment whether the entirety of the proposed TMDL project is based on sound scientific knowledge, methods, and practices. Other assumptions, knowledge, methods, and practices that are in addition to the agreed upon review are included within the reviewer's comments.

Colorado River Basin Water Board staff appreciates the thorough reviews provided by the external scientific peer reviewers. Staff have taken their comments and expertise into consideration in an effort to improve the technical information in the TMDL Staff Report.

2. **Comments by Dr. Teamrat A. Ghezzehei:**

A. Comments on Numeric Targets:

Chloride Threshold: The 230 mg/L chloride criterion continuous concentration (CCC), measured as a 4 day average, is a science-based threshold established by USEPA to protect aquatic life from chronic toxicity effects. The value was derived from extensive laboratory toxicity studies examining how different aquatic organisms respond to prolonged chloride exposure. The 4-day averaging period was specifically chosen to reflect the time needed to observe chronic effects while being practically implementable for monitoring purposes.

Enterococci Threshold: The scientific basis for these enterococci water quality criteria reflects a comprehensive approach to protecting human health in marine recreational waters. The criteria structure incorporates both chronic and acute exposure protection

through a dual component system based on extensive epidemiological studies and statistical analysis of health outcomes.

The six-week rolling geometric mean of 30 cfu/100 mL represents the long term, chronic exposure threshold. This geometric mean was specifically chosen because bacterial concentrations in water bodies typically follow a lognormal distribution, and the geometric mean provides a more accurate representation of central tendency in such distributions. The six-week duration ensures sufficient data collection while maintaining sensitivity to changing conditions, with weekly calculations providing regular assessment opportunities.

The Statistical Threshold Value (STV) of 110 cfu/100 mL addresses acute exposure risks by setting an upper limit that shouldn't be exceeded by more than 10% of samples in a calendar month. This allowance for limited exceedances acknowledges natural variability in bacterial concentrations while maintaining protective levels. The STV was statistically derived to correspond with an acceptable illness rate in marine recreational waters.

The salinity threshold of 1 ppth for more than 5% of the calendar year ensures these criteria are applied appropriately to marine waters where enterococci serve as the most reliable indicator of fecal contamination. This distinction is important because enterococci demonstrate better survival patterns in marine environments compared to other bacterial indicators, making them more reliable for predicting potential health risks in these conditions.

Together, these criteria components form a scientifically defensible approach to water quality protection, based on EPA's epidemiological studies.

E. Coli Threshold: The water quality standards for E. coli employ a dual approach based on discharge type and monitoring capabilities. For point source discharges, where frequent sampling is feasible and salinity remains below 1 ppth, the criterion uses a rolling geometric mean of 100 cfu/100 mL calculated weekly, as agreed upon with USEPA. This value is more stringent than EPA's recommended criterion of 126 cfu/100 mL established in the 2012 Recreational Water Quality Criteria, which was derived from epidemiological studies linking E. coli concentrations to illness rates in freshwater recreation. For nonpoint source discharges where sampling frequency is insufficient for geometric mean calculations, the REC2 standard using a single sample maximum threshold of 2000 MPN/100 mL has been established as the implementing criterion. This two-tiered approach ensures appropriate water quality protection while accounting for the practical limitations of different monitoring programs.

Toxicity: The selection of Ceriodaphnia dubia, Pimephales promelas, Atherinops affinis, and Hyalella azteca as toxicity test organisms provides comprehensive coverage of potential ecological impacts across aquatic ecosystems. These species represent key trophic levels and distinct environmental compartments and enable assessment of both water column and sediment toxicity. The regulatory management decision criteria of 0.75 and 0.80 for these species reflect their relative sensitivities to environmental stressors and establish protective thresholds for aquatic life.

Therefore, I can confirm that reasonable toxicity limits were presented and the limits follow presented information.

Staff Response: Colorado River Basin Water Board staff appreciate your feedback validating numeric limits used. Please note that the Alamo River is freshwater and while EPA Enterococci STV is shared between these systems this is not considered a marine recreational area.

B. Comments on Data Analysis to Determine Impairment Concentrations in Water Samples:

The water column sampling methodology and results are thoroughly documented in the Data Analysis section (Section 5) of the report.

Therefore, I can confirm that sampling data collected from water column sufficiently explained in Data Analysis section

Staff Response: Colorado River Basin Water Board staff appreciate your feedback validating data analysis methods.

C. Comments on Source Analysis:

Various lines of direct and indirect evidence provided to support that agricultural lands are major sources of impairment in the Alamo River basin.

- E. coli: although CAFO is known for high loads of bacteria, data reported in Figure 9 of the report clearly indicates that E. coli indirectly entering the Alamo River indirectly from National Pollutant Discharge Elimination System (NPDES) Facilities is insignificant.
- Enterococci: there is no hard evidence like that of E. Coli. Since, enterococci can withstand higher salinity condition, it is not possible to easily extend the E. coli data to enterococci and confidently conclude that CAFO effluent is not a significant source of enterococci to Alamo River. However, since CAFOs are not permitted to release discharge to surface waters, it is unlikely for them to be regular sources of enterococci.
- Chloride: The primary source water for the Alamo River is agricultural run off, which in turn is primarily fed by the Colorado River. Considering the high salinity of the Colorado (800 ppm) and that the irrigated farm receive substantial quantities of agrochemicals, the report makes a credible argument for agriculture to be the primary source of chloride.
- Toxicity: older literature suggests organophosphates (now banned) and pyrethroid as sources of toxicity in the River. Although the current mix of possible causes of toxicity is not known, considering that the river is predominantly fed by agricultural runoff, that modern agricultural relies on a mix of agrochemicals, that pesticide residues sorbed on soil particles can persist for a long time after application, and

that toxicity can be impacted by a mixture of various pollutants, it is safe to assume that agricultural runoff is a primary source of toxicity for the river.

However, because there is no direct evidence to eliminate the risk of nonagricultural sources of chloride, Enterococci, and toxicity it is prudent to place regular monitoring until this conclusion can be fully substantiated by empirical evidence.

Overall, I can confirm that sufficient evidence was provided to support that agriculture discharges are primary contributor to impairments.

Staff Response: Colorado River Basin Water Board staff agree that monitoring will provide vital evidence necessary to pinpoint sources of the contaminants. The Surface Water Ambient Monitoring Program (SWAMP), monitoring from CAFOs, other point source discharges, as well as required monitoring from the Imperial Valley General Order [Waste Discharge Requirements Order R7-2021-0050 (*General Waste Discharge Requirements for Discharges of Waste from Irrigated Lands for Dischargers that are Members of a Coalition Group in the Imperial Valley*)].

D. Comments on Loading Capacity, TMDLs, and Allocations:

The TMDLs and associated allocations are expressed as target concentrations that directly correspond to desired water quality conditions, as established by USEPA standards. This approach provides scientifically defensible and implementable values for water quality management. The use of concentration-based targets inherently incorporates conservative assumptions, thereby providing an implicit margin of safety without requiring additional explicit allocations. Furthermore, the concentration-based approach naturally accounts for seasonal variations in water body conditions and pollutant loading patterns, eliminating the need for separate seasonal considerations.

Therefore, I can confirm that loading capacity, and load/wasteload allocations are reasonable and align with information laid out in Section 7; TMDL reasonably accounts for seasonal and critical conditions; and margin of safety is reasonably detailed.

Staff Response: Colorado River Basin Water Board staff appreciate your feedback validating Loading Capacity, TMDLs, and Allocations used.

E. Comments on Implementation:

The implementation methods for point-source are clear. Although the role of on-farm management practices to reduce erosion and thereby pollutants that enter Alamo River is articulated clearly, it is not clear to what extent these practices can achieve the desired outcomes. The challenges of reducing chloride from farmlands are explained well. Given the source water (Colorado) already has high salinity, that water conserving irrigation practices (e.g., drip and trickle) concentrate salts, and that climate-change-induced increases in ET will exacerbate salt accumulation, there is no easy route for managing chloride. The report acknowledges that management practices that address farm-level

specifics are needed, albeit it does not provide additional details of what these may be and who will be responsible in developing and testing these practices.

Therefore, I can confirm that the proposed TMDL implementation methods are reasonably explained.

As indicated in the report, many of the waste discharge requirements (WDRs) to enforce this TMDL are already prescribed through the Colorado River Basin Water Board's Imperial Valley General Order (adopted December 14, 2021), which was preceded by the Conditional Waiver of WDRs (2014 to 2021). The data presented in Figures 6, 7, 8, and 9 mostly predate the Imperial Valley General Order of 2021 and do not show any discernible pattern that suggest effects of the conditional Waiver of WDRs. Likewise, Tables 7, 8, 10, and 11 either predate the Imperial Valley General Order or do not show any discernible pattern during the Conditional Waiver of WDRs period.

Therefore, based on the information provided I cannot confirm that the data presented in Figures 6, 7, 8, and 9 and Tables 7, 8, 10, and 11 indicate concentration trends that could reasonably be expected to continue with implementation measures laid out in section 8.

Staff Response: Colorado River Basin Water Board staff plan to utilize all data collection possible with available resources. Once established, the TMDL will be implemented through the Imperial Valley General Order [Colorado River Basin Water Board Waste Discharge Requirements Order R7-2021-0050 (*General Waste Discharge Requirements for Discharges of Waste from Irrigated Lands for Dischargers that are Members of a Coalition Group in the Imperial Valley*)] and subsequent revisions thereof. The tables indicated by reviewers are presented for TMDL as the initial data provided since Order R7-2021-0500 data points have not been verified into trends and member reporting issues are being addressed. The Imperial Valley General Order is intended to effectively regulate the quality of agricultural wastewater discharges from irrigated agricultural lands in the Imperial Valley into waters of the State and ensure that such discharges are not causing or contributing to exceedances of the numeric or narrative water quality standards (SWRCB, 2021). In addition, the Colorado River Basin Water Board is charged with protecting the beneficial uses of the Alamo River allowing Board staff to regulate projects in the watershed and provide support through permitting and developing other regulatory tools (TMDLs and Basin Plan Amendments).

3. **Comments by Michael J. Lydy, Ph.D.:**

A. Comments on Numeric Targets:

The numerical water quality objectives (WQO; toxicity limits) presented in the proposed TMDL document are set using the most conservative beneficial uses for the system to ensure all uses are protected. In addition, the TMDL analysis for indicator bacteria takes a conservative approach by providing load and wastewater allocations for small loading sources, which ensures that the numerical objectives are met. This seems like a reasonable approach for indicator bacteria and chloride. Please note that for nonpoint source discharges of *E. coli*, a rolling average geometric average cannot be used since

sampling efforts are not frequent enough to allow this type of calculation. Instead, a 2000 most probable number / 100 mL of water calculation as a maximum allowable is proposed, and this value should not be exceeded.

Assessment of toxicity is a bit more challenging. Previously, toxicity data was analyzed using the Whole Effluent Toxicity (WET) method. However, many agencies have moved to using the Test of Significant Toxicity (TST). The TST approach to define toxicity, which represents a statistical method that uses hypothesis testing, is inherently more conservative than the standard WET testing method since a permittee has a to prove a negative response (that the effluent is safe to organisms) versus disproving a positive response (that the effluent is not toxic to organisms). There's an uncertainty area between safe and not toxic that the TST approach addresses better. Overall, it is a well proven method with greater statistical power and is appropriate for use in this TMDL. Fewer data are included in the report showing toxicity with the TST approach (due to the lack of control data) and having a mix of toxicity data where we are not comparing apples to apples makes this assessment challenging.

It was positive that a chronic aquatic toxicity objective was used to be protective since exposures often are chronic in nature and toxicity has been found in the system over time. However, it is unclear whether the chronic testing was for lethal or sublethal endpoints or both. Is the endpoint set as a lethal or effective concentration? Which species or group of test species will be used in assessing toxicity in the effluents? Options can include *Ceriodaphnia dubia*, *Pimephales promelas*, *Selenastrum capricornutum*, *Americamysis bahia*, *Arbacia punctulate*, *Cyprinodon variegatus* and *Menidia beryllina*. This type of detail is provided in Attachment 1: Plain English Summary of the Draft ESPRReqAlamo TMDL-final document and in the Imperial Irrigation District report (e.g. endpoints are larval survival and growth for fatheads and survival and reproduction for Ceriodaphnia and growth for green algae), but not in this TMDL document. Inclusion of these details into the text of the TMDL document would clarify this point significantly. It is also unclear whether the numerical target for toxicity (Table 5) “mean ambient water response ≤75 x means control response” represents the effluent itself or ambient water in a defined mixing zone. The same question applies to the alternative numerical target “Mean discharge instream waste concentration 3 response ≤75 x means control response”. This point should be better defined in the TMDL document.

Yes, the limits presented in this draft TMDL document follow the presented information and methods used for other TMDL documents for the state of California. The numerical targets for toxicity are the same Water Quality Objectives (or are more stringent) than those used for impairment as part of the 303(d) lists. The information presented in this proposed TMDL follows the approach used by the State Water Board in their statewide method for analyzing toxicity data (SWRCB, 2021). The use of chronic versus acute aquatic toxicity results serves as the more conservative method for assessing risk.

Staff Response: Colorado River Basin Water Board staff appreciates the feedback on E. Coli and TST toxicity methods and the explanation. The E. coli maximum allowable of 100 colony forming units (cfu) per 100 milliliters (mL) is the current requirement in General WDR for Imperial Valley Irrigated Agricultural Lands Order R7-2021-0050. To address your TST concerns, Colorado River Basin Regional Board staff have updated the wording utilized in the section describing toxicity as well as clarified the numeric targets using the State Board explanation on the subject (SWRCB, 2021). Updates were applied to Sections 3.4: WQS toxicity, 4: Numeric Targets, and 9.1: Existing Monitoring.

Typically, the most common statistics include median lethal concentration (LC50) for acute methods and a 25 percent effect or inhibition concentration (EC25 or IC25) for chronic methods. The LC50 is a point estimate of toxicant concentration that would cause mortality to 50 percent of the test organisms, while EC25 and IC25 are the concentration that would cause an observable adverse effect in 25 percent of the test organisms.

Permits require the use of either three species tests (one vertebrate, one invertebrate, and one plant), a combination of two species, or a single most sensitive species. For freshwater discharges, species selected were limited to fathead minnows (*Pimephales promelas*), water flea (*Ceriodaphnia dubia*) or green alga (*Selenastrum capricornutum* also named *Raphidocelis subcapitata*) for chronic toxicity.

The TST approach improves upon the traditional hypothesis tests used to assess aquatic toxicity by incorporating regulatory management decisions (RMD) and through the rejection of of the null hypothesis and acceptance of alternative hypothesis. The RMDs provide an unambiguous measurement of a test concentration’s toxicity, while low false positive and false negative rates provide more statistical power to correctly identify a test concentration as “toxic” or “non-toxic.”

B. Comments on Data Analysis to Determine Impairment Concentrations in Water Samples:

Chloride and indicator bacteria were monitored in the water column by the Irrigated Lands Regulatory Program and National Pollutant Discharge Elimination System permitting program. The U.S. Bureau of Reclamation previously monitored chloride concentrations at the river outlet. The California’s Surface Water Ambient Monitoring Program (SWAMP) monitored toxicity. The California Environmental Data Exchange Network (CEDEN) serves as a repository for much of the ambient water quality data.

Six sampling locations have been used by SWAMP and the Imperial Irrigation District for monitoring chloride, enterococcus and *E. coli* concentrations and include drop sites 3, 6, 6A, 8, 10 and the outlet to the Salton Sea. An additional site in the Alamo River at the International Boundary no longer in monitored due to the lack of water flow at the

site. *E. coli* data is also presented for six NPDES sites and toxicity data following mostly WET calculations are presented at the Alamo River outlet.

The sampling data presented from the water column in this proposed TMDL document shows impairment due to elevated chloride concentrations at all six sampling sites (Table 6). Enterococcus bacteria concentrations were also elevated above the WQO for all samples except for a single sample collected at the international boundary site in 2002 (Table 7). Conversely, *E. coli* concentrations were mostly below the level of concern at the Alamo River outlet and at NPDES facilities directly discharging into the Alamo River, mostly due to the elevated chloride levels in the surface water and presumed lower concentrations being discharged from the POTWs (Figures 8 and 9). Finally, toxicity data indicates that the waters sampled at the Alamo River outlet from 2002 through 2020 was mostly toxic to *Hyalella azteca*.

Overall, the dataset presented tells a convincing story of impairment due to elevated chloride and enterococcus concentrations and noted toxicity, but the dataset is limited. For example, the chloride data only goes through 10/15/2020 (Figure 6) and 01/01/2021 (Figure 7). The enterococcus data run from 2002 through 2013, and the toxicity data is limited to one site (e.g. Alamo River Outlet) and the most recent data were from 2020 with most of the presented data being from the early 2000's. No data was presented on the toxicity results from the NPDES facilities which could play a role in the noted toxicity when they fail their toxicity testing requirements. These impacts could be significant over shorter periods of time based on the relatively large loading to the system. Inclusion or more recent data is merited especially since there appears to be a trend with increasing variability and higher chloride concentrations in recent years and considerable variation in the enterococcus data. The toxicity dataset is very limited and much of it is based on the older WET standards. Additional testing is merited at sites throughout the Alamo River. You may want to consider performing toxicity bioassays at the same six locations where chloride and enterococcus are measured and potentially include some Toxicity Evaluation Evaluations (TIE) of water from toxic sites to help identify the toxic components.

Staff Response: Colorado River Basin Water Board staff plan to utilize all data collection possible including discharge monitoring and SWAMP. The flow of publicly owned treatment works (POTW) effluent is insignificant compared to the river flow and ag discharge. Once established, the TMDL will be implemented through the Imperial Valley General Order [Colorado River Basin Water Board Waste Discharge Requirements Order R7-2021-0050 (*General Waste Discharge Requirements for Discharges of Waste from Irrigated Lands for Dischargers that are Members of a Coalition Group in the Imperial Valley*)] and subsequent revisions thereof. The Imperial Valley General Order is intended to effectively regulate the quality of agricultural wastewater discharges from irrigated agricultural lands in the Imperial Valley into waters of the State and ensure that such discharges are not causing or contributing to exceedances of the numeric or narrative water quality standards (SWRCB, 2021). In

addition, the Colorado River Basin Water Board is charged with protecting the beneficial uses of the Alamo River allowing Board staff to regulate projects in the watershed and provide support through permitting and developing other regulatory tools which should allow further focus for testing as evidence of sources is provided through current programs.

C. Comments on Source Analysis:

The Alamo River receives most of its water from discharge from irrigated agriculture and from NPDES facilities. The agricultural discharge into the river represents nonpoint source pollution that is challenging to control, while the discharge from the NPDES facilities represents point source pollution that is, in theory, more easily regulated through the permitting process. Because NPDES facilities are required to monitor the toxicity of their effluent and meet testing standards it is unlikely that their effluent would present a significant and continued impact of the health of the Alamo River. However, short-term issues may present themselves if the NPDES facility fails their toxicity testing requirement. As stated in my comments for conclusion #2.1, no data was presented on the failure rate of the testing requirements for the NPDES facilities nor were potential contaminants in their effluent presented. Therefore, the relative importance of the point source effluent from the NPDES facilities is challenging to assess. On page 50 of the proposed document, it states “that point sources have not been shown to be a source of any of the pollutants addressed in this TMDL”. This is likely true for chloride and indicator bacteria but without NPDES toxicity results it in unclear whether toxicity from pesticides (like pyrethroids) could play a role in toxicity from their discharging waters. Pyrethroids have been shown to pass through POTWs at concentrations toxic to *Hyalella* and *Daphnia* (Weston et al. 2013a).

Due to the amount of irrigation occurring in the watershed, the expectation is that agricultural discharges are the most likely sources of chloride and toxicity, with the toxicity originating from elevated concentrations of pesticides in the runoff. The test species used to assess toxicity presented in Table 10, namely *Hyalella azteca* and *Ceriodaphnia dubia* are especially susceptible to pyrethroid and organophosphate insecticides (Weston et al. 2013b) and the noted toxicity most likely are due to exposure to these classes of insecticides. There appears to be previous/current TMDLs that cover organochlorine and organophosphate insecticides and maybe pyrethroids. In terms of the source of the indicator bacteria, it is difficult to discern the potential role NPDES facilities may be playing for enterococcus concentrations since the monitoring was for *E. coli*. Based on the data presented in the TMDL document, it is impossible to tell the relative roles NPDES facilities, concentrated animal feeding operations (CAFOs), leakage from septic systems or wildlife (e.g. migrating birds) may be having on the river. Microbial Source Tracking (DNA) could be used as a genetic maker to identify the source of the bacteria to determine whether it is originating from humans, livestock or wildlife. This has been suggested in other TMDL documents and should be included in this proposed document as well.

Staff Response: Colorado River Basin Water Board staff appreciate your response. The nature of NPDES facilities allows for testing and permitting of facilities and CAFOs as noted, and staff found further testing of NPDES permitting outside of the scope of this TMDL. Beyond the toxicity test from NPDES facility, the NPDES permit requires extensive monitoring for its effluent including priority pollutants monitoring. No NPDES facility's effluent showed a reasonable potential impacting receiving water from pesticide. The monitoring from both SWAMP and as covered in the agricultural order listed in your previous comment would be the best indicator for possible permit failures allowing the possibility of further resources to this issue.

There are separate TMDLs for all three insecticides you discussed including Pyrethroids which is in the process of approval. Staff will consider the suggestion on Microbial Source Tracking (DNA) when developing improvements/amendments to the Imperial Valley General Order as well as during NPDES permitting. Staff has taken the recommendation for Microbial Source Tracking under advisement and while this process would cost several tens of thousands of dollars according to initial assessment the value to Alamo River testing will be further explored.

D. Comments on Loading Capacity, TMDLs, and Allocations:

Environmental factors including stream flow (high and low), as well as seasonal fluctuations in temperature and weather can affect water quality and therefore should be factored into the development of a TMDL. The argument made in this proposed document is that the TMDLs are expressed as concentrations and not loads and are set equal to the desired water quality condition (e.g. targets). The document then argues that critical conditions and seasonal variation in water quality are not relevant or in some way already been accounted for in the target measures. What is missing here is an explanation of how the protective concentration considers critical conditions and seasonal variation. I realize that the flow and sedimentation pattern within the Alamo River are relatively stable and there is very limited precipitation to impact runoff; however, if it is to be protective, the target concentration would have to be set to the lowest concentration that would still be protective at any temperature and consider temperature dependent toxicity. This is especially important for exposure to pyrethroid insecticides since their toxicity is inversely related to temperature (Harwood et al. 2009; Weston et al. 2009a). Similarly, the target concentration should be protective enough to deal with different timescales of exposure including pulsed exposures. Have these points been factored into the target measures? I realize safety factors are added to the targets, but a clear description of how critical and seasonal factors have been accounted for is needed. What modelling or data bases were used to make this conclusion? Do the numerical water quality objectives consider when crops are in and out of production which will drive the amount of irrigation water entering the Alamo River?

A margin of safety needs to be included in the TMDL calculation to allow for uncertainty associated with the relationship between contaminant loads and quality of the receiving waters and to consider impacts of critical and seasonal variation of the target measure. The margin of safety for this document was not quantitatively defined but instead "implicitly incorporated through conservative assumption of the analysis". How scientific uncertainty including future growth (or changes in the system) are incorporated into the measure is not addressed. A better explanation of how the margin of safety was incorporated into the target measure as a conservative assumption is needed.

Staff Response: Colorado River Basin Water Board staff took your comments about growing days and temperature issues into account and updated information in Section 2: Project Area. The project area has overlapping growing seasons that vary by individual growers and leasing out of land for other crop usage is common. There is a separate TMDL developed for pyrethroid insecticides as noted in the response to #3C focused on specific compound exposures. Staff appreciated your comments but found compound specific testing for toxicity outside of the scope of testing until more data is available. The focus for the margin of safety in these methods will utilize TST for toxicity which was updated to be clearer as discussed in response to comment #3A.

E. Comments on Implementation:

The proposed TMDL is going to follow the Colorado River Basin Water Board's imperial Valley General order which was adopted in December 2021. This order applies to growers and NPDES permitted facilities. Few if any details of that plan are included in the proposed document. Adding a few of the most important/pertinent features of that plan here would be helpful. The document argues that sediment is the main route for most contaminants into the Alamo River and that contaminants are associated with those soil particles. It then suggests that management practices that limit the runoff of particles from the field would reduce this issue. However, no suggested management practices are proposed. I would like to see some possible options included in this proposed document like the ones presented in the Colorado River Basin Region Water Quality Control Plan from the Colorado River Basin (Recommended Management Practices pages 438 through 441). Weston et al. (2009b) used anionic polyacrylamide formulations to reduce soil particles movement from fields and I am sure there are several other options that could be included on this topic. The document also argues that chloride is an issue, which is true, and that it will require a site-specific objective to address the impairment due to chloride. What will that site-specific objective look like? More specifics are needed here. The document does not address toxicity and how it will be addressed. This might be the most important objective to address since it is the only one that addresses cumulative effects of multiple stressors. Should a site-specific objective be developed for toxicity as part of this TMDL? What would it look like?

The existing monitoring plan for the Alamo River is directed by the Colorado River Basin Water Board through the SWAMP program. Water sampling occurs in the spring and

fall, and sampling includes water, sediment and fish tissue. If sediment and fish tissues supporting information? Unless I missed it, the only data presented on sediment and fish is toxicity data for sediments shown in Table 11. The document states that NPDES facilities are less likely to discharge indicator bacteria, chloride and cause toxicity that impacts the receiving waters because of the permitting process monitors and controls (at least the indicator bacteria and toxicity) these stressors. I would agree with this statement. However, the current document does not address the failure rate and potential ramifications of the discharge of toxic effluent when the NPDES fails testing. This could be important in terms of short-term effects in the system due to the amount of water released from these facilities each day. At a minimum, this point should at least be mentioned in the document and the potential impact acknowledged. In terms of toxicity testing, the plan is to implement a two-phase assessment that will be required by point and nonpoint source dischargers. Phase I will include routine sampling for toxicity in discharged waters or development of a QAPP and monitoring program. The details for how this would be completed are not included. Even though it is mentioned in associated documents the proposed TMDL document does not address the following points: Will farmers be required to monitor their runoff waters for toxicity? Phase II of the plan will include development of new and better management practices targeted towards the toxic components and sources identified in phase I. Will a Toxicity Identification Evaluation (TIE) approach be used to identify the toxic components of the effluent? How will mixture toxicity be handled? Will this be required by NPDES facilities and growers? How will the effectiveness of the implementations be assessed? I assume that duty will be performed by personnel from Regional Board (though that is not stated in the current document). This assessment should include measures of success and how will failures be evaluated, and alternative measures implemented. These are all important issues that are not yet addressed in this proposed document.

Overall, I expected to see a list of proposed management practices that could/would be implemented to address the indicator bacteria, chloride and toxicity issues as part of this implementation plan. This is a critical issue that should be included in the current document and the reader should not need to go to the Imperial Valley General order to find these lists. Also, is relying on the management practices currently in use and detailed in the order the best approach since the water quality standards are not being achieved with these management practices? Doesn’t the data argue for different and better management practices? The document suggest that the board may reevaluate management practices if they need improvement. That question seems to be already answered in that the current management practices are not working at least for chloride and toxicity.

I agree that the presented data suggests that the impacts of chloride and the noted toxicity in the Alamo River will likely continue to be an issue unless different and more effective management practices are identified to reduce their impact. This is why inclusion of a list of proposed management practices and justification for their inclusion is imperative. The elevated chloride levels will not be easily controlled and possibly

never reach targeted objective concentrations since the issue is intrinsic to the soils of the region. In terms of indicator bacteria, these are better controlled within the system, however incorporation of microbial source tracking could be used as a genetic maker to identify the source of the bacteria to determine whether it is originating from humans, livestock or wildlife and allow for a further lowering of indicator bacteria in the system. This would allow for better monitoring and source identification so that corrective management practices could be implemented. Finally, the magnitude of the toxicity issue within the Alamo River is unknown due to the lack of adequate sampling. There is no clear direction presented to address this issue, only that there is a problem, and more testing is needed. A detailed plan should be included in this TMDL document.

Staff Response: Colorado River Basin Water Board staff appreciates the detailed feedback. The Imperial Valley General Order (R7-2021-0050) does address the issues discussed with a focus on getting more data for more specific actions to follow as information, staffing, and budget allows. Staff did include NPDES and CAFO facilities mapped in Section 2: Project Area as updated Figures 3 and 4. More detailed information would need to come from additional research leading to reevaluation of permitting as staff and budget limitations do not allow secondary checking at this time. For response to microbial source tracking please refer to response following #3C.

4. **Comments by Rebecca Logsdon Muenich, Ph.D.:**

A. Comments on Numeric Targets:

Comments were not included for this section.

B. Comments on Data Analysis to Determine Impairment Concentrations in Water Samples:

Overall, the Data Analysis Section (Section 5), and specifically Sections 5.2 – 5.4 provide a relatively clear and transparent overview of the data used in the analysis. The data sources are clearly described, and the sampling locations are provided in a map in Figure 5. The data used for indicator bacteria and toxicity (Section 5.4) are even provided within the tables within that section. For the chloride data (Section 5.3), it is unclear how many samples are available for comparison unless you physically count the points in Figure 6 and Figure 7. Therefore, to provide more clarity to this section, I would recommend expanding Table 6 (or adding an additional table) to include columns for chloride, indicator bacteria, and toxicity which would include the total number of samples available, date ranges, and observational ranges across each of the sites corresponding to the map in Figure 5.

To support analysis and conclusions made later in the report, I would suggest adding (1) tributaries, and (2) land use data to Figure 5. From the current version of Figure 5 it is difficult to understand what the size and land use variations for each of the sampling

points are. It would also help to individually delineate the contributing areas to each point and provide the boundaries of said delineations to the map as well.

An additional clarification, which may or may not be feasible given data constraints, would be to clarify if the samples are primarily from baseflow or storm conditions. It seems that there is at least discharge data available at the outlet (Figure 2), so some indication of flow conditions could be attributed even at a high level for the data. I understand that this watershed may be complicated by low rainfall and high irrigation return flow which may be the actual “base flow” but some description of the varying flow regimes and what has typically been sampled would be helpful.

Staff Response: Colorado River Basin Water Board staff appreciate your detailed feedback. Staff updated parts of the Data Analysis Section (Section 5) though the tables/data separation is for ease of reading which is why combining tables was not utilized. Staff updated Land Use Section (Section 2) but elected not to include that information further recommended in section 5. The additional flow data was not available in the manner described though data should reasonably be considered baseflow condition.

C. Comments on Source Analysis:

In Section 6. Source Analysis of this report, the staff have described their justifications for identifying primarily agriculture as a source of impairment for chloride, indicator bacteria, and toxicity. While the justification seems reasonable, the underlying data, assumptions, and situational contexts are not always included, which, if provided, could greatly improve the defensibility of this conclusion. Overall, one missing piece of evidence was that a variation on the statement first seen in Section 2.3.1, but repeated in Section 6.1, Section 6.3, Section 7.3, Section 8.1, and Section 9.1, that said, “Agricultural runoff from Imperial Valley farms is the main source of water for the Alamo River,” or similar. However, this statement was not full described and supported by any calculations, though one reference to a paper from 2004 was provided in Section 2. Supporting this strong statement with a recent source or calculation would provide more defensibility for this section overall, even if the statement is obvious for this watershed. Another key piece of information missing is land use. Only land use for the county has been provided in Section 2, but there is no specific information on land use in the watershed, or a map providing the land use of the watershed. This is needed to help support these assumptions.

<u>Chloride</u>

In Section 6.1. Chloride, the section concludes that the “bulk” of the chloride source is likely to be “agricultural or naturally occurring”. This is based on statements that the irrigation water used for agricultural lands is from the high salinity Colorado River, fertilizers with salts, and the connection of agricultural lands to the river system through tile and tail drains. They also note the natural occurrence of chloride in the soil. While these statements certainly support the conclusion, they are lacking specific evidence.

For example, the following direct statements are provided, but could use clear evidence as suggested below each statement:

- Chloride is naturally occurring in the soil of the Salton Trough”
  - Provide data on the concentrations of chloride in soils, especially in the topmost layer that interacts with runoff.
- “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.”
  - There are likely many references about the impact of reuse of Colorado River water throughout the system (e.g. Siddiqui et al., 2020) that could be added. Could also note how far down along the Colorado River the extraction point is for this area which would be tied to more significant reuse of the water by the time it reaches end users in 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.”
  - Provide a source that the 800ppm number is derived from.
- “Fertilizers also account for some of the salts present and can be carried away in tile or tail drain discharges.”
  - Could review fertilizer sales data for Imperial County and comment on most common fertilizer types and potential for salt additions to the system.
- “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.”
  - Maps or estimates of tile drains and tail drain locations in the watershed would help support his argument. At least what percentage of the lands are estimated to drain through these?
  - There is a U.S. wide dataset that estimates tile drains (Valayamkunnath et al., 2020), and the USDA’s NASS Census also provides some county level reported data (USDA National Agricultural Statistics Service, 2022).
- “Point source facilities discharge little salts (WWTPs).”
  - Are any data available to support this comment? If not directly from point source emitters in this watershed, then from the literature?
  - Would also be beneficial to provide a map of the point source locations in one of the watershed maps (e.g. Figure 1 or Figure 5), or in a new map with land use.

<u>Indicator Bacteria</u>

In Section 6.2. Indicator Bacteria, the report indicates that sources of indicator bacteria in the Alamo River are unknown, yet due to monitoring data from NPDES permitted facilities and CAFOs having no discharge in last 5 years, they imply that point sources are unlikely to be the major source of indicator bacteria. Similar to the chloride section, the statements in this section could benefit from evidence or support that will improve their defensibility. For example, the report could directly reference Figure 9 from section

5 when describing the low indicator bacteria levels in the NPDES permitted facilities. I would repeat my comment from above though and note that having the locations of these facilities as well as the CAFOs on the map in Figure 1 or Figure 5 would benefit interpretation of conclusions.

With respect to the discussion around CAFOs, I think some additional clarification is needed. While the description of how CAFOs are permitted in this region is clear, what is unclear is (1) how many and what type of CAFOs are present and (2) how many additional, smaller and unregulated livestock production facilities or farms are present. In recent work we have demonstrated the potential influence of smaller, unregulated facilities on nutrients when they are numerous and spatially concentrated (Miralha et al., 2022) so these should not be overlooked, especially if pursuing additional monitoring strategies. It should also be noted that while a CAFO may not have a direct discharge,

thus violating their permit, they are allowed to apply their manure to the landscape under certain conditions. If these facilities are indeed applying their manure to the land, this should be noted as it could be an additional source of indicator bacteria (e.g., Li et al., 2020). Any conditions under which they can apply (e.g. nutrient restrictions) should also be listed. The manure storage techniques used (e.g. lagoons) should also be mentioned as these can also be sources of pollutants to the environment, e.g. McLaughlin et al., 2009. If instead of land application CAFOs are using alternative manure management strategies (e.g. anaerobic digestors), these should be listed. I also suggest wording the statements that there have been no discharges at CAFOs in the watershed to “there have been no reported/documented” discharges, due to the fact that discharges are often selfreported and subject to errors and omission. Manure applied to the landscape can be significant sources of indicator bacteria, not just directly discharged manure. To sum, without more detail on CAFOs in the watershed and their manure management it is difficult to support the statement that “it is largely unlikely that CAFOs are a substantial source of bacteria to the Alamo River.” It could be reworded to say that “it is largely unlikely that direct manure discharges from CAFOs are a substantial source of bacteria to the Alamo River.”

Finally, it is worth noting whether or not any microbial source tracking methods have been applied to investigate the sources of indicator bacteria, or if they will be used in the future process of this TMDL implementation.

Toxicity

In Section 6.3. Toxicity, it is noted that “the specific cause of toxicity is not known”, but there is evidenced based on previous work that pesticides from agricultural production are likely to be a major driver of toxicity in this watershed. This section is reasonably supported with prior scientific studies.

Staff Response: Colorado River Basin Water Board staff appreciate your detailed feedback. The points made were taken into advisement, and response to CAFO/NPDES issues were addressed with updates to the Land Use section from comments #3D and #4B. Alamo River is an effluent dominate water body; ag runoff is the major contribution and POTW discharge is insignificant. Most CAFO facilities are feedlots with NPDES

permit for zero discharge. Manures generated onsite are shipping off-site to Arizona for further process; no land application should be conducted from the CAFO facilities.

D. Comments on Loading Capacity, TMDLs, and Allocations:

The proposed TMDL load allocations are concentration-based for chloride and fecal indicator bacteria due to the large non-point source contributions in the watershed and are set using conservative assumptions. Therefore, they are reasonably protective by development.

Given the proposed TMDL approach is concentration-based, there are no critical conditions and the target concentrations are applicable to all seasons and flow regimes. The proposed concentration-based TMDL approach conservative, providing an implicit margin of safety. The report also outlines a plan to modify this approach if anything changes with respect to the numeric targets.

Staff Response: Colorado River Basin Water Board staff appreciate your feedback regarding the adequacy of the documentation included in the Loading Capacity, TMDLs, and Allocations section of the TMDL.

E. Comments on Implementation:

The implementation methods proposed in Section 8 are clear. Some additional details could be provided to improve this section. Management practices (MPs) are mentioned as key for implementation in non-point sources, but no detail on what MPs might be most effective for chloride, indicator bacteria, and toxicity are described. Additionally, there is some discussion on the role of sediment movement in pollutant transport which is certainly true, but chloride specifically is a highly mobile contaminant and controlling sediment alone will not be enough—so especially more discussion on MP opportunities focused on chloride would be beneficial. Some of this difficulty is described in the last paragraph of Section 8.1, but more explicitly noting any possible MPs or alternative technologies that maybe aren't currently MPs would improve the depth of this section. There could also be some trade-offs or synergies between indicator bacteria, chloride, and toxicity which could be discussed. For example, chloride and indicator bacteria may be negatively correlated, such that if chloride concentrations are decreased, indicator bacteria could increase, or positively correlated depending on other ions present. A synergistic effect may exist for chloride and toxicity, where increasing chloride concentrations could lead to increasing toxicity (Kaushal et al., 2005), complicating understanding of drivers of toxicity and thus subsequent management or implementation outcomes.

Figures 6 and 7 provide chloride concentrations over time at multiple sites (Figure 6) and at the outlet of the Alamo River (Figure 7). To conclude that these trends "could reasonably be expected to continue with implementation measure laid out in Section 8" would require more details. For example, in Figure 6 there appears to be higher observations in recent data, with the lower values also being higher in recent years. A slight upward shift in Figure 7 data is also seen, but without statistical testing it is hard to

say if this is a significant shift. However, given that all of these data points are above the 230 mg/L chloride WQO it can be reasonably expected that that the chloride exceedance could be expected to continue even with implementation measures laid out in Section 8.

Figure 8 provides *E. coli* concentrations at the Alamo River Outlet while Figure 9 provides *E. coli* concentrations reported from NPDES permitted facilities indirectly draining to the Alamo River. No observable trend is seen in either Figure 8 or Figure 9 such that these trends could be expected to continue and remain below the WQO of the maximum allowable 2000 MPN/100mL concentration value, especially given implementation measure laid out in Section 8.

For Figures 6-8, it would also be beneficial to overlay these observations with at least the flow seen at the outlet of the watershed to better assess the flow conditions under which the observations were made (or at least include a statement). Trends in water quality across surface water systems are highly dependent on flow so this key detail would be beneficial.

Assessing the trends for enterococcus concentrations, *E. coli concentrations*, and toxicity survival percentages in water and sediment in the Alamo River (Tables 7, 8, 10, 11, respectively) is difficult for a variety of reasons. First, there are very few observations per site and second it is difficult to visualize trends from a table. Additionally, most of the indicator bacteria data is relatively old with the most recent data across the Tables from 2013. For the indicator bacteria, I do not believe there is enough data to draw any conclusions on trends. For the toxicity data presented in Tables 10 and 11, since there is more frequent and recent information, it does seem that especially the 10-day survival of *Hyalella azteca* seems to be decreasing in recent years, especially in the sediments (Table 11) so that trend could be expected to be continued. However, data for the other species and tests would be too few to draw trend conclusions from.

Staff Response: Colorado River Basin Water Board staff appreciate your detailed feedback. The MPs that are being referenced are focused on Irrigated Agricultural Lands for Dischargers in Imperial Valley Order, Colorado River Basin Region (Order R7-2021-0050). The Imperial Valley General Order lays out management practices for growers in the region as well as thresholds for monitoring that will trigger further management plans (i.e., Water Quality Restoration Plans). The resources for attaining additional data through the Imperial Valley General Order should provide more information following current conditions and requirements. The Colorado River Basin Water Board also has the discretion to amend the Imperial Valley General Order in the future as more data and information are acquired and trends become clearer.

ATTACHMENT D: STAFF RESPONSE TO PUBLIC COMMENTS

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