CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

RESOLUTION R7-2022-0032

Amending Water Quality Control Plan for the Colorado River Basin
to Establish Total Maximum Daily Load and Implementation Plan
for Organophosphate and Organochlorine Compounds
in Imperial Valley Waters, Imperial County

ATTACHMENT A

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

Table of Contents

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

Chapter 4—Implementation

The following language shall be added to Section V (Total Maximum Daily Loads [TMDLs] and Implementation Plans) in Chapter 4 To (Implementation), beginning on page 4-65.

I. IMPERIAL VALLEY ORGANOPHOSPHATE AND ORGANOCHLORINE COMPOUNDS TMDL

SUMMARY

This TMDL was adopted by the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Board) on **May 10, 2022.**

This TMDL was approved by:

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

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

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

1. TMDL ELEMENTS

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

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

ELEMENT	**DESCRIPTION**
Project Statement	The Alamo River, Imperial Valley Drains, New River, and Wiest Lake, all surface waters in the Imperial Valley, are polluted/impaired by organophosphate (OP) and/or organochlorine (OC) compounds that are toxic to humans and aquatic life. This is in violation of water quality standards in the Water Quality Control Plan for the Colorado River Basin Region (Basin Plan). This project establishes Total Maximum Daily Loads (TMDLs) to address the impairments that include numeric targets, load allocations, and implementation plans to control discharges of OP and OC compounds in Imperial Valley waters.
Project Area	The Alamo River, Imperial Valley Drains, New River and Wiest Lake are in the Imperial Valley. The Imperial Valley covers approximately 500,000 acres south of the Salton Sea, most of it irrigated agricultural land in Imperial County. The principal communities in the Imperial Valley are El Centro, Imperial, Brawley, and Calexico.

Numeric Targets

Numeric targets are water quality measures used to determine when water quality objectives (WQOs) are achieved, and hence, when beneficial uses are protected.

Review of collected water quality data from Imperial Valley waters indicates the presence of OP compounds in various environmental compartments. The concentrations found in fish tissue and sediment samples did not exceed the screening values. The concentrations found in water samples frequently exceeded the screening values, which was the main factor for listing the waterbodies. In order to address these impairments, numeric targets for water were selected to protect benthic and aquatic organisms, and wildlife from potentially harmful effects (toxicity) associated with these OP compounds.

OP Compounds Water Column Numeric Targets for Alamo River, Imperial Valley Drains, and New River.

Compound	CMC[1] (µg/L)	CCC[2] (µg/L)
Chlorpyrifos	0.02	0.015
Diazinon	0.16	0.1
Malathion	0.17	0.028

A review of water quality data collected from Imperial Valley waters indicates the presence of OC compounds in various environmental compartments. In order to address these impairments, water, fish, and sediment numeric targets were selected. Inclusion of water, fish tissue, and sediment numeric targets adequately protects benthic and aquatic organisms, wildlife, and human health from potentially harmful effects associated with these OC compounds.

OC Compounds Water Column Numeric Targets for the Alamo River, Imperial Valley Drains, New River, and Wiest Lake.

Compound	Target (µg/L)
Chlordane	0.0043
DDT (as p, p'-DDT)	0.00059
DDE (as p, p'-DDE)	0.00059
DDD (as p, p'-DDD)	0.00084
Dieldrin	0.00014
PCBs	0.00017[3]
Toxaphene	0.00075

OC Compounds Fish Tissue Numeric Targets for Alamo River, Imperial Valley Drains, New River, and Wiest Lake.

Compound	Target (ng/g)
Chlordane	3.9
DDTs	15
Dieldrin	0.32
Total PCBs[4]	2.6
Toxaphene	4.3

OC Compounds Sediment Numeric Targets for Alamo River, Imperial Valley Drains, New River, and Wiest Lake.

Compound	Target (ng/g DW)
Chlordane	17.6
Total DDTs[5]	572
Sum DDD[6]	28
Sum DDE[7]	31.3
Dieldrin	61.8
Total PCBs[8]	676
Toxaphene	N/A[9]

[1] CMC – Criteria Maximum Concentration: one-hour average, not to be exceeded more than once in a three-year period.
[2] CCC – Criteria Continuous Concentration: four-day average, not to be exceeded more than once in a three-year period.
[3] The sum of all congener or isomer of homolog or aroclor analyses.
[4] The sum of all PCB congeners and aroclors.
[5] The sum of the p,p'- and o,p'- isomers of DDT, DDE, and DDD.
[6] The sum of the o,p- and p,p'- isomers of DDD.
[7] The sum of the o,p- and p,p'- isomers of DDE.
[8] The sum of all PCB congeners and aroclors.
[9] No toxaphene Numeric Target has been set. Toxaphene has not been detected in samples above the analytical limits.

Source Analysis	Sources of OP and OC compounds in Imperial Valley are primarily from irrigated agricultural lands based upon pesticide use restrictions, the uses of the compounds, the amount of land used for agricultural purposes, and water quality data. Discharges from irrigated agricultural lands are considered nonpoint source (NPS) discharges. Mexico is also considered as a source of diazinon and OC compounds in the New River based upon water quality data. Discharges from Mexico conveyed via the New River are considered NPS discharges. The amount of OP and OC compounds coming from NPDES facilities is unknown at this time due to a lack of OP compound water quality data, and OC compound reporting limits for the analysis being much higher than the numeric targets. But the pesticide use restrictions for chlorpyrifos and diazinon, and the amount of land used for urban purposes when compared to the amount of land used for agricultural purposes indicate that NPDES facilities may be a de-minimis source of OC and OP compounds. MS4 permittees are also considered de-minimis sources because of the compounds uses, urban land use, and desert weather.
Seasonal Variations and 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. Additionally, legacy pollutants, chlordane, DDT, dieldrin, PCBs and toxaphene have persisted in the environment for many years, and their impacts and impairments are not expected to vary seasonally. Due to these TMDLs being expressed as concentrations set equal to the desired water quality condition, there are no critical conditions.

Linkage Analysis	For OP compounds chlorpyrifos, diazinon, and malathion TMDLs, the connection between pollutant load and desired water quality is established because the load allocations are equal to the numeric targets, which are the same as the TMDLs. Therefore, reductions in chlorpyrifos, diazinon and/or malathion loading to the extent allocated will result in achieving the WQSs. Since OC compounds have an extremely high affinity to bind to sediments, the transport of sediment is the primary pathway from land use to the polluted receiving waterbody. Therefore, a reduction of OC loading into surface waters necessitates minimizing sediment transport from areas where sediment is contaminated with OC compounds. Sediment loading must be minimized to the maximum extent practical to achieve the TMDLs, and therefore the desired water quality. An adaptive management approach must be taken to derive the allowable sediment loading that achieves the OC TMDLs; pollutant concentrations will be monitored during the implementation phase.

TMDL Calculation	A TMDL is the sum of **wasteload allocations** for point sources (e.g., wastewater treatment facilities), **load allocations** for nonpoint sources (e.g., agricultural activities, Mexico), allocations for **natural sources** (e.g., wildlife), and a **margin of safety**, such that the capacity of the water body to assimilate pollutant loads without violating water quality objectives is not exceeded. **TMDL = Wasteload Allocations** **+ Load Allocations** **+ Natural Sources** **+ Margin of Safety** The TMDL targets for chlorpyrifos, diazinon, and malathion in water are set equal to the Numeric Targets, averaged over a three-year period to account for short-term variations. The TMDL targets for chlordane, DDT, DDE, DDD, dieldrin, PCBs, and toxaphene in water are set equal to the Numeric Targets, averaged over a three-year period to account for short-term variations. The TMDL targets for chlordane, DDT, dieldrin, PCBs, and toxaphene in fish tissue are set equal to the Numeric Targets, averaged over a three-year period to account for short-term variations. Chlorpyrifos, diazinon, malathion, chlordane, DDT, DDE, DDD, dieldrin, PCBs and toxaphene are all manmade compounds; there are no natural sources. Since there are no natural sources of these compounds, natural sources have an allocation of zero for them.

Allocations and Margin of Safety

Allocations are based on the source analysis and the OP and OC numeric targets. Source analysis indicated that OP and OC compounds in Imperial Valley waters come primarily from irrigated agricultural lands and Mexico. The amount of OP and OC compounds, if any, coming from NPDES permitted municipalities and facilities is unknown currently due to a lack of OP compound water quality data, and for OC compounds the reporting limits for the analysis being much higher than the Numeric Targets. NPDES permitted municipalities and facilities are assigned OP and OC compound allocations, because if these facilities were not assigned allocations for OP and OC compounds, their allocations would technically be zero. Municipalities and facilities regulated by NPDES permits are considered point sources of pollutants. The amount of OP and OC compounds, if any, coming from NPDES permitted municipalities and facilities is unknown currently due to a lack of OP compound water quality data, and for OC compounds the reporting limits for the analysis is much higher than the numeric targets.

Point sources are assigned waste load allocations and nonpoint sources are assigned load allocations. Following are the applicable numeric targets which will be implemented in permits as waste load and load allocations in the Alamo River, Imperial Valley Drains and the New River for pollutants in the water column, fish tissue and sediment. The TMDLs are allocated to point sources and non-point sources in the Imperial Valley as follows:

OP Compounds Water Column Allocations

Compound	CMC (µg/L)	CCC (µg/L)
Chlorpyrifos	0.02	0.015
Diazinon	0.16	0.1
Malathion	0.17	0.028

OC Compounds Water Column Allocations

Compound	Target (µg/L)
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Compound	Target (ng/g)
Chlordane	3.9
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Total PCBs	2.6
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OC Compounds Sediment Allocations

Compound	Target (ng/g DW)
Chlordane	17.6
Total DDTs	572
Sum DDD	28
Sum DDE	31.3
Dieldrin	61.8
Total PCBs	676
Toxaphene	N/A[10]

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<tr><td><u>Monitoring Plan</u></td><td>The IID-ICFB Coalition Group is currently collecting water samples from the New and Alamo River twice annually and analyzing the samples for chlorpyrifos, diazinon, and malathion. The Coalition is also collecting fish samples annually and analyzing the samples for OC compounds under the current Agricultural Order. This monitoring is expected to continue under the renewed Imperial Agricultural Order.</td></tr>
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2. IMPLENTATION AND TIMELINE

This TMDL is being implemented by the operative Colorado River Basin Water Board Waste Discharge Requirements General Order for Discharges of Waste from Irrigated Lands for Dischargers that are Members of a Coalition Group in the Imperial Valley (Imperial Agricultural Order). As of 2022, Order R7-2021-0050 is the operative Imperial Agricultural Order.

The Imperial Agricultural Order requires management practices implementation, water quality monitoring and improved management practices implementation where monitoring shows impacts by irrigated agricultural discharges. Owners and/or operators

[10] No toxaphene numeric target has been set. Toxaphene has not been detected in samples above the analytical limits.

of irrigated agricultural land are required to enroll their land for regulatory coverage under the Imperial Agricultural Order, or alternatively, submit a report of waste discharge and apply for an individual waste discharge permit.

The Imperial Agricultural Order is primarily a representative-based order where a coalition group, formed by the Imperial Irrigation District and the Imperial County Farm Bureau (IID-ICFB Coalition Group), to assist individual owners and operators of irrigated agricultural land in Imperial Valley (Irrigated Agricultural Dischargers) in complying with requirements of the Agricultural Order. No individual owners/operators elected not to enroll in the IID-ICFB Coalition Group and be regulated through an individual waste discharge permit, although this is an option.

Chlorpyrifos is estimated to achieve water quality standards prior the approval of the TMDL by the USEPA This estimate is based on the ban on the manufacturing and most uses of chlorpyrifos in California, and the relatively short half-life of chlorpyrifos in soil (7–120 days), as well as current trends showing a decrease in the concentration of chlorpyrifos present in water samples

The estimated target date to achieve the water quality standards for diazinon is three years after approval of these TMDLs by the USEPA. This estimate is based on use trends showing apparent decreased use, implementation of management practices to mitigate loadings, and regulatory efforts to lessen loading if voluntary actions fail to achieve the water quality standards.

The estimated target date to achieve the water quality standards for malathion is ten years after approval of the TMDL by the USEPA. This estimate is based on the current usage and limited restrictions on its use. Malathion may be an increasing water quality problem if malathion use increases due to restrictions on the use of chlorpyrifos and diazinon.

The estimated target date to achieve the water quality standards for the OC compounds (chlordane, DDT, DDD, DDE, dieldrin, PCBs, and toxaphene) varies from zero to thirty years after approval of the TMDLs by the USEPA. These estimates are based on plots of the concentrations of OC compounds found in fish tissue samples over time and development of a trendline. The target date is estimated to be when the trendline meets the Numeric Target. This process yielded a mix of results. For chlordane, dieldrin, PCBs and toxaphene, the trendlines indicate that the Imperial Valley waters may already be at or near the Numeric Targets. For DDT, the trendlines indicate that it may take from ten to thirty years before the Imperial Valley waters meet the Numeric targets.

All OC compounds in fish tissue show a negative trend when plotting their concentrations over time. OC compounds are extremely persistent in the environment, but water quality data has shown that they do ultimately degrade. For example, the use of DDT was discontinued over 40 years ago, but DDT is still detected in Imperial Valley fish tissue. More recent monitoring data shows that the DDT degradates, DDD and DDE, are present in the watershed, which indicates that DDT is breaking down.

3. TMDL REVIEW SCHEDULE

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

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

Table I-2: TMDL REVIEW SCHEDULE

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

[etc.]

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