

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF JULY 11-12, 2013
Prepared May 13, 2013

ITEM NUMBER: 11

SUBJECT: Adopting a Total Maximum Daily Load for Chlorpyrifos and Diazinon in the Pajaro River Watershed, Monterey, San Benito, Santa Clara, and Santa Cruz Counties, California

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THIS ACTION: Adopt Resolution R3-2013-0011

SUMMARY

Staff recommends adoption of the proposed Total Maximum Daily Load (TMDL) for chlorpyrifos and diazinon in the Pajaro River Watershed.

The geographic scope of this TMDL (the project area) encompasses approximately 1,300 square miles of the Pajaro River Watershed located in Monterey, San Benito, Santa Clara, and Santa Cruz Counties. The watershed is almost 90 miles in length and varies from 7 to 20 miles in width. The Pajaro River watershed drains into the Monterey Bay and is the largest coastal stream between San Francisco Bay and the Salinas River. The watershed is about 60 miles southeast of San Francisco and Oakland and 120 miles southwest of Sacramento. The Pajaro River Watershed (including Pajaro River, Pajaro River Estuary and Llagas Creek) is impaired because the water quality objectives for pesticides and toxicity are not being met due to excessive concentrations of chlorpyrifos and diazinon.

The proposed TMDL, numeric targets, and load allocations for chlorpyrifos and diazinon will result in meeting narrative water quality objectives for pesticides and toxicity in the Pajaro River Watershed. Central Coast Water Board staff has identified sources of chlorpyrifos and diazinon that are causing or contributing to water quality impairment, has identified parties responsible for these sources, and has proposed load allocations necessary to achieve the TMDL.

Staff has identified the *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands in the Central Coast Region* (Agricultural Order) as the existing regulatory mechanism to achieve the TMDL. No new regulatory mechanism is being proposed to implement and achieve the TMDL.

This TMDL is being adopted through the Central Coast Water Board's approval of the resolution associated with this agenda item, which includes findings that the Agricultural Order will implement the TMDL (not a Basin Plan amendment). According to state policy, Regional Water Boards are encouraged to take this approach of TMDL approval when the impairments can be addressed through a single action by the Board; the approach conserves valuable state resources and avoids regulatory redundancy.

The Pajaro River and Llagas Creek are on the 2008-2010 Clean Water Act section 303(d) list of impaired waters due to chlorpyrifos. The Pajaro River and the Pajaro River Estuary are not on the 2008-2010 Clean Water Act 303(d) list of impaired waters for the pesticide diazinon but are impaired due to diazinon. The water quality objectives for pesticides and toxicity are not being met because concentrations of chlorpyrifos and diazinon are present at levels toxic to the environment. Based on available data, the Pajaro River and the Pajaro River Estuary will be listed as impaired for diazinon on the next Clean Water Act 303(d) list; staff is including the impairment with this project to maximize efficiency.

In this agenda item, staff recommends the Central Coast Water Board approve the resolution (Attachment 1 to this Staff Report) that establishes a TMDL for chlorpyrifos and diazinon in the Pajaro River Watershed.

Staff developed the technical basis for the TMDL and associated allocations, which is provided in the Final Project Report (Attachment 2 to this staff report). The Final Project Report is provided at the Central Coast Water Board's website:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/pajaro/pesticides/index.shtml

DISCUSSION

Project Development for the TMDL

Staff developed the TMDL using data and information from the Central Coast Ambient Monitoring Program (CCAMP), Central Coast Cooperative Monitoring Program (CMP), California Department of Pesticide Regulation (CDPR), and UC Davis – Marine Pollution Studies Lab at Granite Canyon. Staff also used land use data and conversations with staff from other agencies.

Numeric Targets

The Basin Plan contains general water quality objectives for all inland surface waters, enclosed bays, and estuaries. The narrative water quality objective for toxicity states, in part:

“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 aquatic life.”

The narrative water quality objective for pesticides states, in part:

“No individual pesticide or combination of pesticides shall reach concentrations that adversely affect beneficial uses.”

The TMDL numeric targets are numeric interpretations of the narrative water quality objectives for pesticides. The numeric targets for the proposed TMDL are the same as the numeric targets derived by the California Department of Fish and Game in 2004. These targets were also approved by the Central Coast Water Board on May 5, 2011, for the Lower Salinas River Watershed Chlorpyrifos and Diazinon TMDL, which was approved by USEPA on October 7, 2011. Achieving the proposed TMDL numeric targets will result in achieving the water quality objectives for pesticides in waterbodies degraded by chlorpyrifos and diazinon. Numeric targets for the TMDL include acute and chronic water column numeric targets for chlorpyrifos and diazinon.

The water column numeric targets for chlorpyrifos and diazinon are outlined in the table below:

Compound	CMC ^A (ppb)	CCC ^B (ppb)
Chlorpyrifos	0.025	0.015
Diazinon	0.16	0.10

^A CMC – Criterion Maximum Concentration or acute (1- hour average). Not to be exceeded more than once in a three-year period.

^B CCC – Criterion Continuous Concentration or chronic (4-day (96-hour) average). Not to be exceeded more than once in a three-year period.

Diazinon and chlorpyrifos have the same mechanism of toxic action and exhibit additive toxicity to aquatic invertebrates when they co-occur.

For additive toxicity of diazinon and chlorpyrifos when both are present, the numeric target is:

$$S \leq 1.0 = \frac{C_{\text{Diazinon}}}{LC_{\text{Diazinon}}} + \frac{C_{\text{Chlorpyrifos}}}{LC_{\text{Chlorpyrifos}}}$$

Where:

S = Sum of additive toxicity

C_{Diazinon} = Diazinon concentration in waterbody

C_{Chlorpyrifos} = Chlorpyrifos concentration in waterbody

LC_{Diazinon} = Criterion Continuous Concentration (0.10 µg/L) or Criterion Maximum Concentration (0.16 µg/L) diazinon loading capacity

LC_{Chlorpyrifos} = Criterion Continuous Concentration (0.015 µg/L) or Criterion Maximum Concentration (0.025 µg/L) chlorpyrifos loading capacity

Value of S cannot exceed 1.0 more than once in any consecutive three-year period.

The following standard aquatic toxicity tests will be used to determine compliance with the aquatic toxicity numeric target:

Parameter	Test	Biological Endpoint Assessed	Test Method #
Water Column Toxicity	Water Flea – <i>Ceriodaphnia</i> (7-day chronic)	Survival and reproduction	EPA 1002.0
Sediment Toxicity	<i>Hyallea Azteca</i> (10-day chronic)	Survival and reproduction	EPA 100.1

Source Analysis

Discharges from irrigated agriculture in the project area are the controllable source causing impairment due to chlorpyrifos and diazinon in this watershed.

In 2000, USEPA began a phase-out of allowable chlorpyrifos and diazinon use. Retail sales for all residential uses of chlorpyrifos ended in 2001. Retail sales for indoor uses of diazinon stopped in 2002 and retail sales for outdoor residential uses ended in 2004. Professional

application of these pesticides still occurs in urbanized areas. However, based on restrictions on how the pesticide is applied, the relatively low amount of pesticide applied to urban areas, and linkage to agricultural applications and water quality exceedances, staff concluded that professional uses in the urban environment are not a source causing impairment. Since approximately 2004, agricultural applications of chlorpyrifos and diazinon have been the significant use of these pesticides.

The impaired waterbodies in the project area are flanked by lands used for agricultural purposes where chlorpyrifos and diazinon are applied. Staff described chlorpyrifos and diazinon applications in the project area in Chapter 4 of the Final Project Report (which is Attachment 2 of this staff report). Staff found that an exceedance of numeric targets for chlorpyrifos or diazinon could typically be paired with an agricultural application of the pesticide nearby.

TMDL and Allocations

The TMDL for chlorpyrifos and diazinon in the Pajaro River Watershed is a concentration-based TMDL and is equal to the numeric targets as described in the numeric targets section above. Concentration-based TMDLs are an appropriate expression of TMDLs and meet USEPA requirements for TMDL approval. USEPA has approved concentration-based chlorpyrifos and diazinon TMDLs for the Central Coast and the Central Valley Regional Water Quality Control Boards. Owners and operators of agricultural lands using chlorpyrifos and diazinon are assigned load allocations equal to the TMDL and numeric targets.

Implementation and Monitoring

The TMDL will be implemented through the requirements established in the *Conditional Waiver of Waste Discharge Requirements For Discharges from Irrigated Lands* (Agricultural Order); this includes the order currently in effect and renewals or modifications of it. Requirements outlined in the Agricultural Order will prioritize implementation efforts in the Pajaro River Watershed aimed at addressing discharges of chlorpyrifos and diazinon, including requirements to:

- Enroll in the Agricultural Order.
 - Current enrollment requirements inform staff whether chlorpyrifos or diazinon is applied; growers update this information annually.
- Implement monitoring and reporting requirements described in the Agricultural Order.
 - Current reporting requirements include a description of discharges leaving the growers field, which can be a primary mode of pesticide transport, and management practices used to mitigate pesticide loading. Reporting requirements also include analysis of chlorpyrifos and diazinon and toxicity tests at cooperative monitoring sites.
- Implement, and update as necessary, management practices to reduce pesticide loading.
- Develop, update, and implement Farm Plans. The Farm Plans should incorporate measures designed to achieve load allocations assigned in this TMDL.

The Agricultural Order includes monitoring and reporting requirements. The Cooperative Monitoring Program and the Central Coast Ambient Monitoring Program's sampling efforts will inform progress toward achieving this TMDL.

Time Schedule for Tracking Progress and Achieving the TMDL

The target date to achieve the allocations, numeric targets, and TMDL in the impaired waterbody addressed in this TMDL is October 2016. This date coincides with the decrease in

chlorpyrifos and diazinon use in the Pajaro River Watershed and associated progress being achieved. This date is also consistent with goals described in the Agricultural Order.

The Central Coast Water Board Agricultural Order has established milestones to achieve water quality standards; achieving water quality standards will result in achieving the TMDL. Dischargers will show verifiable progress towards achieving water quality objectives through requirements described in the Agricultural Order.

Water Board staff will reevaluate impairments caused by chlorpyrifos and diazinon when monitoring data is submitted and during renewals of the Agricultural Order. Water Board staff will propose modifications of the Agricultural Order or other regulatory mechanisms, if necessary, to address remaining impairments.

ANTI-DEGRADATION

The proposed TMDL is consistent with the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" and 40 CFR 131.12. The TMDL requires actions that will result in improved water quality throughout the watershed and maintenance of the level of water quality necessary to protect existing and anticipated beneficial uses. The TMDL is implemented through the Agricultural Order, which is adopted in compliance with Water Code section 13269. The Agricultural Order includes conditions and prohibitions requiring compliance with water quality standards, implementation of management practices to attain water quality objectives, and monitoring and reporting programs. The Agricultural Order is enforceable and subject to review at least every five years.

PUBLIC INVOLVEMENT

Staff conducted stakeholder outreach efforts during TMDL development. Staff held a public outreach meeting on August 22, 2012. Staff mailed and emailed factsheets in advance of the meeting. Staff made a presentation and engaged with stakeholders during the meeting to answer questions and receive comments. Staff held another public outreach meeting on December 3, 2012, and once again made a presentation and engaged with stakeholders. A preliminary draft Project Report was posted on our website from December 3, 2012, to March 26, 2013, for stakeholder's early review.

Staff provided a formal written comment period from March 27, 2013, to April 29, 2013, where comments were solicited from interested parties.

Comments were received from:

1. Ms. Abby Taylor-Silva, Vice President, Policy & Communications, Grower-Shipper Association of Central California, in an email attachment received April 29, 2013.
2. Ms. Janet Parrish, TMDL Liaison, US EPA, in an email attachment received April 29, 2013.
3. Ms. Janet Parrish, TMDL Liaison, US EPA, detailed comments included in an email attachment, received April 29, 2013.

Staff has provided responses to the comments received (please see attachment 4).

RECOMMENDATION

Adopt Resolution No. R3-2013-0011.

ATTACHMENTS:

The attachments are available at:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/pajaro/pesticides/index.shtml

1. Resolution No. R3-2013-0011
2. Final Project Report: "Total Maximum Daily Loads for Chlorpyrifos and Diazinon for the Pajaro River Watershed, Monterey, Santa Clara, Santa Cruz, and San Benito County"
3. Notice of Public Hearing
4. Public Comment and Staff Responses