California Environmental Protection Agency

California Regional Water Quality Control Board
Central Coast Region

Total Maximum Daily Load for Diazinon and Additive Toxicity with Chlorpyrifos in Arroyo Paredon Watershed in Santa Barbara County, California

Final Project Report

For the March 14-15, 2013 Water Board Meeting

Adopted by the
California Regional Water Quality Control Board
Central Coast Region
on _____, 2013

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101, San Luis Obispo, California 93401
Phone • (805) 549-3147
http://www.waterboards.ca.gov/centralcoast/

To request copies of the Draft TMDL Project Report for Diazinon in Arroyo Paredon Watershed, please contact Howard Kolb at (805) 549-3332, or by email at hkolb@waterboards.ca.gov.

Documents also are available at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/303d_and_tmdl_projects.shtml

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This report was prepared under the direction of

Christopher Rose, *Senior Environmental Scientist*

by

Howard Kolb, *Water Resources Control Engineer*

with the assistance of
Shanta Keeling, *Water Resources Control Engineer*
Pete Osmolovsky, *Engineering Geologist*
Larry Harlan, *Environmental Scientist*
Peter Meertens, *Environmental Scientist*
Mary Hamilton, *Environmental Scientist*
and support and input provided by
Stakeholders, including agencies, organizations, and individuals who have a special interest

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LIST OF ACRONYMS AND ABBREVIATIONS

CCRWQCB	Central Coast Regional Water Quality Control Board
CDPR	California Department of Pesticide Regulation
CDFG	California Department of Fish and Game
CCAMP	Central Coast Ambient Monitoring Program
CCC	Criterion Continuous Concentration
CMC	Criterion Maximum Concentration
CMP	Cooperative Monitoring Program
GIS	Geographic Information System
IBI	Index of Biological Integrity
MAA	Management Agency Agreement
mg/l	Milligram Per Liter
OP	Organophosphate
PPB	Part Per Billion
PUR	Pesticide Use Report
TMDL	Total Maximum Daily Load
UCSB	University California Santa Barbara
USEPA	United States Environmental Protection Agency
Water Board	Regional Water Quality Control Board, Central Coast Region
ºC	Degrees Centigrade
cm	Centimeter
ºF	Degrees Fahrenheit
µS	Microsiemens

EXECUTIVE SUMMARY

The following Total Maximum Daily Load Report (TMDL Report) for Diazinon and Additive Toxicity with Chlorpyrifos in Arroyo Paredon Watershed evaluates diazinon loading and assigns a TMDL for diazinon to Arroyo Paredon in Santa Barbara County.

Total Maximum Daily Load

This TMDL Report presents a TMDL for diazinon in the Arroyo Paredon watershed. A TMDL is a term used to describe the maximum amount of pollutants, in this case, diazinon, that a waterbody can receive and still meet water quality standards. A TMDL study identifies the probable sources of pollution, establishes the maximum amount of pollution a waterbody can receive and still meet water quality standards, and allocates that amount to all probable contributing sources. By "allocating" an amount to a contributing source, we are assigning responsibility to someone, an agency, group, or individuals, to reduce their contribution in order to meet water quality standards.

The federal Clean Water Act requires every state to evaluate its waterbodies and maintain a list of waters (303(d) Impaired Waters List) that are considered "impaired" either because the water exceeds water quality standards or does not achieve its designated use. For each waterbody on the Central Coast's 303(d) Impaired Waters List, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) must develop and implement a plan to reduce pollutants so that the waterbody is no longer impaired and can be de-listed.

Water Quality Impairments

Diazinon is a man-made organophosphate (OP) pesticide used almost exclusively for the control of agricultural pests. Arroyo Paredon was listed as impaired on the 2008-2010 Clean Water Act section 303(d) list because two out of two samples exceeded the water quality standards for diazinon. Arroyo Paredon is also listed as impaired on the 2008 Clean Water Act section 303(d) list as impaired for unknown toxicity; unknown toxicity 303(d) listings are toxicity impairments in the water column. Toxicity tests were positive for toxicity to invertebrates, which are target organisms of diazinon.

Impaired Waterbody

The geographic scope of this project includes the Arroyo Paredon watershed, which encompasses approximately 3,124 acres in Santa Barbara County. The upper watershed includes some National Forest land, orchards, vineyards, and rural residential areas in the foothills. Vegetation in the upland reaches of the watershed are characterized by ceanothus, scrub oak, and chamise. The lower third of the watershed is below Highway 192; here the creek flows between greenhouse facilities and urban areas. Agriculture, including cropland, orchards, and greenhouses, is the dominant land use in the lower watershed.

Numeric Targets, TMDLs and Allocations

Numeric targets are water quality targets developed to ascertain when and where water quality objectives are achieved, and hence, when beneficial uses are protected. The numeric targets for these TMDLs are identical to numeric water quality criteria that were derived by the California Department of Fish and Game and the Central Valley Regional Water Quality Control Board for diazinon, which were subsequently approved by USEPA. The Central Valley Regional Water Quality Control Board has used the same targets for several TMDLs that are USEPA approved. 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. Numeric targets for the TMDLs include acute and chronic water column numeric targets for diazinon and water column numeric targets for additive toxicity of chlorpyrifos and diazinon when both compounds are present.

These TMDLs are concentration-based TMDLs equal to the numeric targets.

Discharges of diazinon from irrigated agriculture caused exceedance of the water quality objectives for toxicity and pesticides. Owners and operators of irrigated lands are assigned allocations for diazinon to achieve the TMDL. Responsible parties are assigned allocations for diazinon equal to the numeric targets and TMDL as represented in the table below. Table 1 below identifies the numeric targets, allocations assigned to responsible parties, and TMDLs for the impaired waterbodies.

Table 1. Numeric Targets, TMDL, and Load Allocations for Arroyo Paredon Watershed

Numeric Targets, TMDL, and LOAD ALLOCATIONS

Waterbodies Assigned TMDLs	Responsible Party Assigned Allocation (Source)	Receiving Water Numeric Target, TMDL, and Load Allocation
• Arroyo Paredon	Owners/operators of irrigated agricultural lands in the Arroyo Paredon Watershed (Discharges from irrigated lands)	Allocation 1 & Allocation 2

Allocation 1: For diazinon

Compound	CMC [A] (ppb)	CCC [B] (ppb)
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.

Allocation 2: For additive toxicity of diazinon and chlorpyrifos when both are present.

$$S = \leq 1.0 = \frac{C_D}{LC_D} + \frac{C_C}{LC_C}$$

Where:
S = Sum of additive toxicity
C_D = Diazinon concentration in waterbody
C_C = Chlorpyrifos concentration in waterbody
LC_D = Criterion Continuous Concentration (0.10 µg/L) or Criterion Maximum Concentration (0.16 µg/L) diazinon loading capacity.
LC_C = 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.

TMDL Implementation, Monitoring, and TMDL Timeline

Owner and operators of irrigated lands in the project area are required to comply with the conditions and requirements of the current *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Agricultural Order) and any renewals, modifications or replacements thereof. Owners and operators are required to comply with the requirements described in this TMDL, Section 6, including:

- Implement proper handling, storage, application, disposal and management of pesticides to prevent or control discharge into surface waters to the extent that the TMDL numeric targets are achieved.

- Develop or update and implement Farm Plans to include specific measures aimed at preventing or controlling the discharge of pesticides into surface waters to the extent that the TMDL numeric targets are achieved.

- Develop and implement a monitoring plan aimed at assessing the effectiveness of management measures in place to prevent or control the discharge of diazinon into surface waters to the extent that the TMDL numeric targets are achieved. Monitoring efforts can be implemented individually, as a group effort with other interested parties, or a combination thereof. Note that current monitoring efforts through the Cooperative Monitoring Program and anticipated monitoring efforts of the Central Coast Ambient Monitoring Program may be used to help demonstrate compliance and progress.

The timeline to achieve this TMDL is by March 2019.

1 INTRODUCTION

1.1 Clean Water Act Section 303(d)

Section 303(d) of the federal Clean Water Act requires every state to evaluate its waterbodies and maintain a list of waters that are considered "impaired" either because the water exceeds water quality standards or does not achieve its designated use. For each water on the Central Coast's "303(d) Impaired Waters List," the Central Coast Water Board must develop and implement a plan to reduce pollutants so that the waterbody is no longer impaired and can be de-listed. Section 303(d) of the Clean Water Act states:

Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

The State complies with this requirement by periodically assessing the conditions of the rivers, lakes, and bays and identifying them as "impaired" if they do not meet water quality standards. These waters, and the pollutant or condition causing the impairment, are placed on the 303(d) List of Impaired Waters. In addition to creating this list of waterbodies not meeting water quality standards, the Clean Water Act mandates each state to develop TMDLs for each waterbody listed. The Central Coast Regional Water Quality Control Board (Water Board) is the agency responsible for protecting water quality consistent with the Basin Plan, including developing TMDLs for waterbodies identified as not meeting water quality objectives.

1.2 Project Area

The geographic scope of this TMDL (the project area) encompasses approximately 3,124 acres of the Arroyo Paredon watershed (CalWater hydrologic subarea 331534) located in Santa Barbara County. The watershed flows from the steep southern face of the Santa Ynez Mountains to the Pacific Ocean just northwest of Carpinteria.

1.3 Pollutants Addressed

This project addresses impairments due to diazinon, which is an organophosphate (OP) pesticide and additive toxicity of chlorpyrifos and diazinon when both compounds are present.

1.4 FIFRA/FQPA

The USEPA has mandated diazinon-use cancellations (phase-outs) and restrictions for urban and agricultural uses (USEPA Diazinon Interim Reregistration Eligibility Decisions (IREDs)). The USEPA has undertaken the reregistration process for diazinon to ensure that the pesticide meets the safety standards under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Food Quality Protection Act (FQPA) of 1996.

Under the diazinon IRED (USEPA, 2002), all indoor residential use product registrations were cancelled and retail sale of these products ended as of December 31, 2002. All outdoor residential use product registrations were cancelled and retail sale ended in December 31, 2004.

Many additional diazinon-use restrictions and cancellations apply to agricultural uses.

2 PROBLEM IDENTIFICATION

2.1 Watershed Description

The geographic scope of this TMDL encompasses approximately 3,124 acres of the Arroyo Paredon watershed (within the CalWater Carpinteria Hydrologic Sub-area 331534) located in Santa Barbara County (Figure 1). The watershed flows from the steep southern face of the Santa Ynez Mountains to the Pacific Ocean just northwest of Carpinteria (Figure 2). Elevations within the watershed range from sea level to 3,400 feet at an unnamed peak in the Santa Ynez Mountains. The upper watershed is mostly in National Forest land and also has some rural residential areas in the foothills. Located in the upper reaches of the watershed, the Arroyo Paredon debris basin upstream of the Oil Canyon confluence has a 24,000 cubic yard capacity (Santa Barbara County 2010). Upland reaches of the watershed are characterized by ceanothus, scrub oak, and chamise (UCSB Department of Geography, 2012).

The upstream watershed is made up of approximately 75 percent undisturbed wilderness and 25 percent agriculture (mostly orchards), with a few rural residences. The reach has a fairly intact riparian corridor composed of approximately 80 percent native cover, and a natural stream bottom and banks composed mostly of boulders, cobble, gravel, and sand. Stream bottom cobble and gravel is cemented in most places by mineral deposits from nearby springs. Water quality is characterized by low water temperature (15.6 ºC), and moderately high conductivity (1,560 µS). The Index of Biological Integrity (IBI) score for a sampling site on Arroyo Paredon (AP1) was 19 (Poor) (Project Clean Water, 2010).

After crossing Highway 192, the creek flows between greenhouse facilities and urban areas. Agriculture, including cropland, orchards, and greenhouses, is the dominant land use in the lower watershed (UCSB Department of Geography, 2012). In the lower

watershed the channel bottom is very rocky with various sized boulders and the substrate becomes more silty/sandy as the creek nears the ocean. The creek banks are well vegetated with willow, sycamore and oaks with an understory of mainly introduced cape ivy and blackberry along with species such as sagebrush, tree tobacco and deerweed (Santa Barbara County, 2010).

Table 2 shows the approximate percentage of each land use type within the watershed. The land uses shown on this table, derived from the tax-assessor's parcel data, indicate that much of the watershed is under agricultural use. Arroyo Paredon watershed contains more than 70 percent agricultural land use (Project Clean Water, 2000).

Table 2. Percent of Land in the Arroyo Paredon Watershed
(Project Clean Water, 2000)

Landcover	Percent of the watershed	Area in acres
Agriculture	73.84	2,307
Commercial	2.53	79
Residential	4.05	127
Rancho Estates	5.68	177
Recreational	8.26	258
Vacant	4.14	129
Other	0.27	8
Beaches and Dunes	1.23	38
Total	100%	3,124

Rainfall in the project area averages 18 inches of rain per year. On average, there are 282 sunny days per year and the July high is around 76ºF. The January low is 43ºF (Best Places, 2012). With regards to the hydrology of the Project Area, there is little or no flow in Arroyo Paredon except during the November to April wet season. During the summer months, the creek generally dries up except for flow supported by a spring that keeps the creek wet from the lagoon upstream approximately 1,000 feet (Santa Barbara County, 2010).

Figure 1. Location of the Arroyo Paredon Watershed

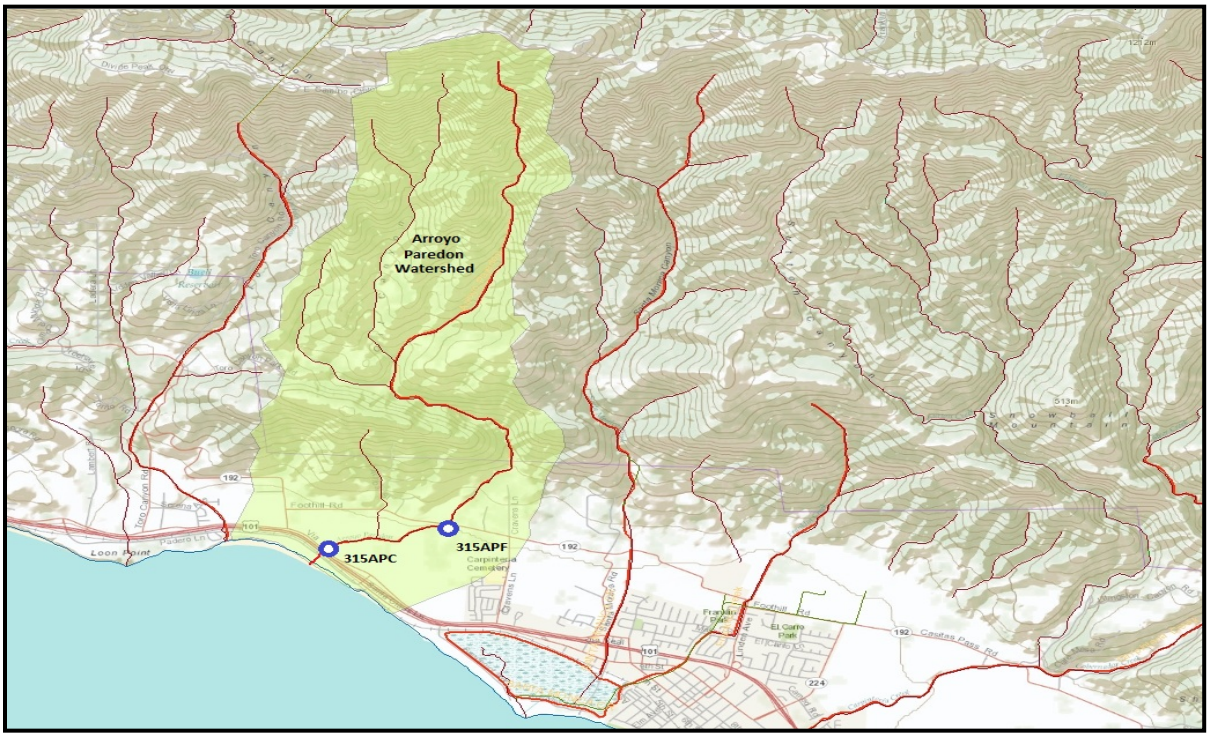

Figure 2. The Arroyo Paredon Watershed

2.2 Beneficial Uses

The designated beneficial uses identified in the Basin Plan (CCRWQCB, 1994) for the Arroyo Paredon are shown in Table 3.

Table 3. Basin Plan designated beneficial uses

Waterbody Names	MUN	AGR	PRO	IND	GWR	REC1	REC2	WILD	COLD	WARM	MIGR	SPWN	BIOL	RARE	EST	FRESH	COMM	SHELL
Arroyo Paredon	X	X			X	X	X	X		X	X	X		X	X	X	X	

Beneficial uses are regarded as existing whether the water body is perennial or ephemeral or the flow is intermittent or continuous.

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply. According to State Board Resolution No. 88-63, "Sources of Drinking Water Policy" all surface waters are considered suitable, or potentially suitable, for municipal or domestic water supply except where:

a. TDS exceeds 3000 mg/l (5000 uS/cm electrical conductivity);
b. Contamination exists, that cannot reasonably be treated for domestic use;
c. The source is not sufficient to supply an average sustained yield of 200 gallons per day;
d. The water is in collection or treatment systems of municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff; and
e. The water is in systems for conveying or holding agricultural drainage waters.

Agricultural Supply (AGR) - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Ground Water Recharge (GWR) - Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers. Ground water recharge includes recharge of surface water underflow.

Water Contact Recreation (REC-1) - Uses of water 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, white water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating tidepool and marine life

study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

*Wildlife Habitat (WILD) - Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

*Warm Fresh Water Habitat (WARM) - Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

*Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

*Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

*Rare, Threatened, or Endangered Species (RARE) - Uses of water 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.

*Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds). An estuary is generally described as a semi-enclosed body of water having a free connection with the open sea, at least part of the year and within which the seawater is diluted at least seasonally with fresh water drained from the land. Included are water bodies which would naturally fit the definition if not controlled by tidegates or other such devices.

Freshwater Replenishment (FRESH) - Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity) which includes a water body that supplies water to a different type of water body, such as, streams that supply reservoirs and lakes, or estuaries; or reservoirs and lakes that supply streams. This includes only immediate upstream water bodies and not their tributaries.

Commercial and Sport Fishing (COMM) - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

* = Aquatic habitat beneficial use.

2.3 Water Quality Objectives

The Central Coast Region's Water Quality Control Plan (Basin Plan) contains specific water quality objectives that apply to all inland surface waters, enclosed bays and estuaries (CCRWQCB, 1994, pg. III-3). Relevant water quality objectives for this project include:

2.3.1 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 aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, toxicity bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

Survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality conditions, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in Standard Methods for the Examination of Water and Wastewater, latest edition. As a minimum, compliance with this objective shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances is encouraged.

2.3.2 Pesticides

No individual pesticide or combination of pesticides shall reach concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

2.3.3 Prohibitions

Section IV.B. Inland Waters (pg. V-8) of the Basin Plan states that, "Wastes discharged to surface waters shall be essentially free of toxic substances, grease, oil, and phenolic compounds. Waste discharges to the following inland waters are prohibited:

IV.B.1 All surface freshwater impoundments and their immediate tributaries.

IV.B.4 All coastal surface streams and natural drainageways that flow directly to the ocean within the…Santa Barbara Coastal Subbasins **except** where discharge is associated with an approved wastewater reclamation program."

2.3.4 Water Quality Criteria (USEPA recommended)

In 2000, CDFG published freshwater water quality criteria for diazinon (CDFG, 2000) using USEPA methodology (USEPA, 1985). Water Board staff used the criterion maximum concentration (CMC) or acute (1- hour average) of 0.16 µg/L to assess compliance with water quality standards. The CMC is not to be exceeded more than once in a three year period. Please see Table 4.

Table 4. USEPA recommended water quality criteria for diazinon

Compound	CMC [A] (ppb)	CCC [B] (ppb)
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

Note that although Arroyo Paredon is impaired for diazinon and not chlorpyrifos, which is also an organophosphate, chlorpyrifos is also present in the water column. Diazinon and chlorpyrifos act synergistically resulting in potential additive toxicity. Please see section 3.2 for discussion of addressing additive toxicity.

2.4 Pollutants Addressed

Arroyo Paredon was listed on the 2008-2010 303(d) list for diazinon in accordance with the State Water Resources Control Board Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) list, September 2004 (SWRCB, Listing Policy, 2004). Table 3.1 of the Listing Policy specifies the minimum number of measured exceedances needed to place a water segment on the section 303(d) list for toxicants (SWRCB, 2004, pg. 9). Arroyo Paredon exceeded the water quality criteria for diazinon 2/2 times (see Table 5 below for water quality data), which met the minimum number of measured exceedances needed to place Arroyo Paredon on the 303(d) list.

Staff used the evaluation guideline (CMC) of 0.16 micrograms per liter (µg/L) for diazinon (CDFG, 2000; CDFG, 2004) for the development of the 2008-2010 Clean Water Act section 303(d) list. The CMC concentration is protective of aquatic life beneficial uses under acute exposure. Similarly, the CCC is protective of aquatic life beneficial uses under chronic exposure (see section 2.2 Beneficial Uses for the aquatic life beneficial uses assigned to this waterbody).

Water samples drawn in 2001-2002, and 2006 from Arroyo Paredon were toxic to invertebrate test organisms, leading to a Clean Water Act section 303(d) listing for unknown toxicity.

2.5 Data Analysis

This section provides information pertaining to data sources and an analysis of water quality data used to assess water quality conditions and impairment.

To assess water quality conditions and impairment, staff used evaluation guidelines of 0.16 micrograms per liter (µg/L) for diazinon (CDFG, 2000; CDFG, 2004) to protect aquatic life beneficial uses. The CDFG concentrations are criterion maximum concentrations (CMC) expressed as 1-hour averages (acute); however, because water quality data was only available on a daily interval (e.g., not hourly), staff conducted the impairment assessment by treating the daily instantaneous water quality results as a 1-hour average. In addition to the CMCs, CDFG published criterion continuous concentrations (CCC) for diazinon (CDFG, 2000; CDFG, 2004), which are expressed as a 4-day average (chronic). Staff was not able to assess chronic toxicity conditions because water quality data for comparison to the 4-day average was not available. Additional information pertaining to numeric targets and their derivation are contained in Section 3.

Staff used the following data for the development of these TMDLs:

- Central Coast Ambient Monitoring Program (CCAMP) Sediment Chemistry Data from Region 3 Harbors, 2004
- Central Coast Cooperative Monitoring Program (CMP)
- California Department of Pesticide Regulation's (CDPR) Surface Water Database, Pesticide Use Reports that report pesticide usage

2.5.1 Central Coast Ambient Monitoring Program (CCAMP) and Central Coast Cooperative Monitoring Program (CMP)

The Central Coast Ambient Monitoring Program conducted a sediment toxicity study between 2001 and 2007 throughout Region 3. As part of that study, CCAMP collected samples from one site within the Arroyo Paredon watershed (315APC - Arroyo Paredon Creek at Via Real; please see Figure 3).

CCAMP collected samples at site 315APC on December 7, 2001 and March 17, 2002 (Figure 3 and Table 5). Both samples exceeded the numeric target for diazinon of 0.16 µg/L. In August 2009, CMP collected one sample at 315APF (315APF - Arroyo Paredon Creek at Foothill Road) (Table 5). This site is located upstream of 315APC. This sample did not exceed the water quality standard for diazinon of 0.16 µg/L.

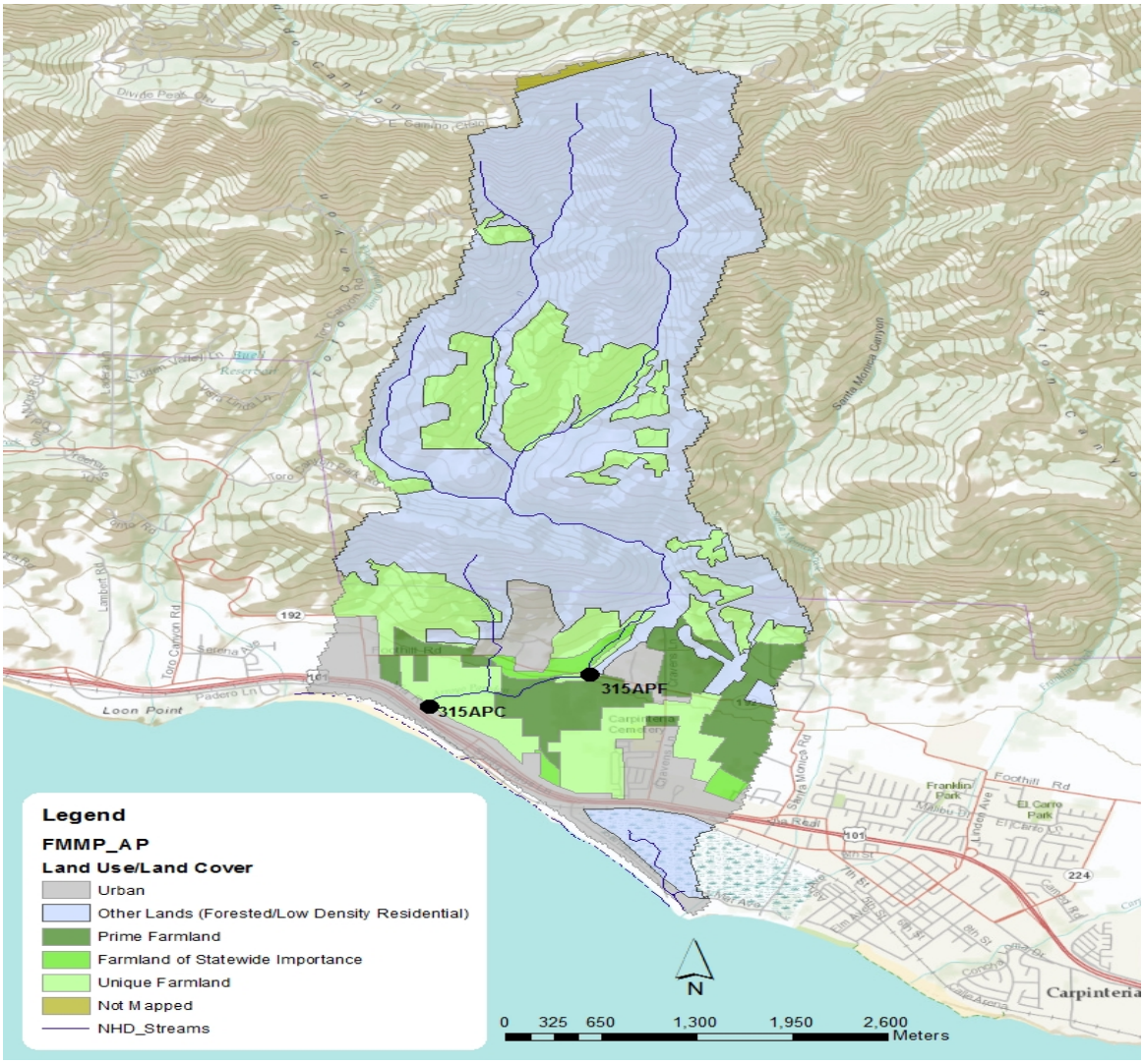

Figure 3. The Arroyo Paredon Watershed showing sampling sites.

Table 5. Sample stations, dates, and results of diazinon sampling in Arroyo Paredon

Station Code	Sample Date	Matrix Name	Method Name	Analyte Name	Unit	Result
315APC	12-07-2001	samplewater	ELISA SOP 3.3	Diazinon	µg/L	0.398
315APC	03-17-2002	samplewater	ELISA SOP 3.3	Diazinon	µg/L	0.335
315APF	8-xx-2009	samplewater	ELISA SOP 3.3	Diazinon	µg/L	0.002

2.5.2 Department of Pesticide Regulations Pesticide Use Reports

The California Department of Pesticide Regulation develops pesticide use reports. Staff looked at the pounds of diazinon applied between 2000 and 2010. Staff determined that diazinon has been applied in certain areas of the Arroyo Paredon watershed between 2000 and 2010 (Figure 4).

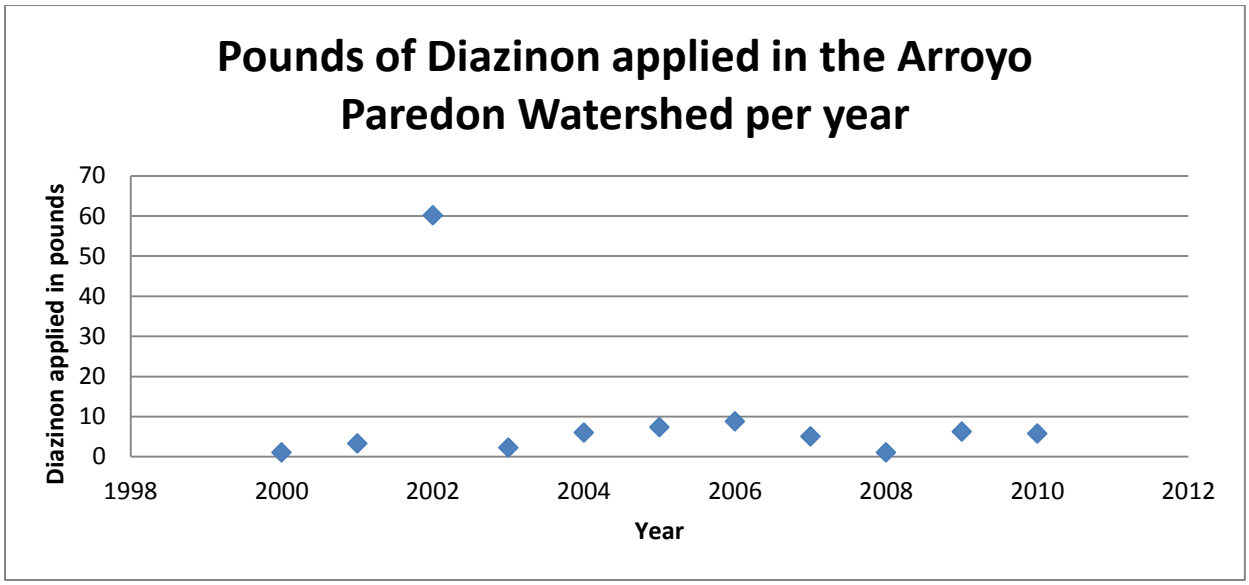

Figure 4. Pounds of diazinon applied in the Arroyo Paredon Watershed per year

Between 2000 and 2010, application of diazinon was approximately 9.7 pounds per year. Usage of diazinon spiked in 2002 when 60 pounds of diazinon were applied. Since 2003 the usage of diazinon has averaged 5.3 pounds per year.

Staff reviewed when diazinon was applied (CDPR PUR 2000-2010) and compared this information to when the December 7, 2001 and March 17, 2002 water quality standards were exceeded. Based on application dates, staff concluded that the exceedances were likely caused by an October 2001 application of diazinon (D.Z.N. Diazinon AG600 WBC) on nursery-greenhouse grown cut flowers or greens.

Staff used these pesticide use reports to confirm that diazinon was being applied in the watershed.

2.5.3 Problem statement

The Arroyo Paredon is impaired due to exceedance of the water quality objectives for pesticides and toxicity. The pesticide, diazinon, is present in Arroyo Paredon at levels not protective of beneficial uses associated with aquatic life. This project identifies the causes of impairment and describes solutions to achieve water quality objectives and protection of beneficial uses.

3 NUMERIC TARGETS

This section describes the numeric targets used to develop the TMDL. Numeric targets are water quality targets developed to ascertain when and where water quality objectives are achieved and when beneficial uses are protected. Although the Basin Plan water quality objectives for toxicity and pesticide are narrative (see Section 2.3), the targets presented below are consistent with the numeric targets approved by the Central Coast Water Board on May 5, 2011, for diazinon TMDLs for Salinas River Watershed Chlorpyrifos and Diazinon TMDLs[1]. These targets are also consistent with other approved TMDLs for diazinon in California.

3.1 Water Column Numeric Targets

Staff selected water column numeric target values for diazinon as a direct measure of water quality conditions for the protection of aquatic life that are consistent with the toxicity and pesticide objectives described in Section 2.3.

In 2000, CDFG published freshwater water quality criteria for diazinon (CDFG, 2000) using USEPA methodology (USEPA, 1985). Staff selected the CDFG water quality criteria as numeric targets for these TMDLs. The numeric targets are presented in Table 6.

Table 6. Water column numeric targets for diazinon

Compound	CMC [A] (ppb) µg/L	CCC [B] (ppb) µg/L
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

3.2 Additive Toxicity Numeric Target

Data collected in the Arroyo Paredon watershed indicates that chlorpyrifos[2] is also present and needs to be considered in terms of additive toxicity. Diazinon and chlorpyrifos have the same mechanism of toxic action and exhibit additive toxicity to aquatic invertebrates when they co-occur (Bailey et al., 1997; CDFG, 2000). Mixtures of compounds acting through the same mechanism suggest there is no concentration below which a compound will no longer contribute to the overall toxicity of the mixture (Deneer et al., 1988). Therefore, the total potential toxicity of co-occurring diazinon and

[1] http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/salinas/pesticide/index.shtml

[2] Chlorpyrifos concentrations do not exceed applicable water quality standards

chlorpyrifos needs to be assessed, even when one or both of their individual concentrations would otherwise be below thresholds of concern. Technical guidance developed by staff of the Central Valley Regional Water Quality Control Board (CVRWQCB) ("Policy for Application of Water Quality Objectives" and policy on "Pesticide Discharges from Nonpoint Sources") include formulas for addressing additive toxicity. Additive toxicity can be evaluated by the following formula from *Basin Plan Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers* (CVRWQCB, 2007); the following additive toxicity numeric target formula is a numeric target of this TMDL:

For additive toxicity of diazinon and chlorpyrifos when both are present:

$$S = \leq 1.0 = \frac{C_D}{LC_D} + \frac{C_C}{LC_C}$$

Where:

S = Sum of additive toxicity
C_D = Diazinon concentration in waterbody
C_C = Chlorpyrifos concentration in waterbody
LC_D = Criterion Continuous Concentration (0.10 µg/L) or Criterion Maximum Concentration (0.16 µg/L) diazinon loading capacity.
LC_C = 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 additive toxicity numeric target formula will be applied when both diazinon and chlorpyrifos are present in the water column.

3.3 Aquatic Toxicity Numeric Target

The aquatic toxicity numeric target is the evaluation of the Basin Plan general objective for toxicity using standard aquatic toxicity tests to determine toxicity in the water column. The general objective for toxicity is:

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. Compliance with the objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, toxicity bioassays of appropriate duration, or other appropriate methods.

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

Table 7. Standard Aquatic Toxicity Tests

Parameter	Test	Biological Endpoint Assessed
Water Column Toxicity	Water Flea – *Ceriodaphnia (7-day chronic)*	Survival and reproduction

4 SOURCE ANALYSIS

4.1 Introduction

Diazinon is a man-made pesticide. Agricultural sources of diazinon found in the Arroyo Paredon watershed have likely caused exceedances of water quality objectives.

4.1.1 Agricultural Sources

The pesticide diazinon has been applied in the Project Area and was found in the water column. Staff tracked agricultural application location and amount applied using the Pesticide Use Reports (PUR) provided by the Department of Pesticide Regulation. Staff evaluated applications of diazinon between 2000 and 2010. Applications of currently registered pesticides are reported at the section, or square mile, level. The PUR allows for fairly accurate identification of sources in time and space.

4.1.2 Urban Storm Water Sources

USEPA has severely restricted non-agricultural use of diazinon. Diazinon was restricted for general public indoor use and retail sale ended in Dec. 31, 2002. Additionally, all outdoor residential use product registrations were cancelled and retail sales ended in December 31, 2004 (USEPA, 2004). Based on the restriction of diazinon by the general public and based on the small amount of urban land use in the watershed (approximately 5%), staff does not consider urban storm water sources to be a current source of diazinon in the Arroyo Paredon watershed.

4.2 Diazinon Use in the Arroyo Paredon Watershed

Diazinon has been applied within the Arroyo Paredon watershed. This pesticide can be found in the water column (including suspended material). The source analysis is based on application data from 2000 through 2010 contained in the Pesticide Use Reports (PUR) provided by the Department of Pesticide Regulation (CDPR).

4.2.1 Approach and Methods

Staff queried how much diazinon was applied in the Arroyo Paredon watershed using PUR provided by the CDPR.

The PUR data for agricultural pesticide use is reported at the section (square mile) level in pounds of chemical applied. Staff used GIS to assign sections, and portions of sections, to specific watersheds. This allowed the application data to be summed at the watershed level. Table 8 shows the pounds of diazinon applied per year in the Arroyo Paredon watershed and Figure 4 is a graphical display of the same information. PUR data confirmed that diazinon was being applied within the watershed.

Staff reviewed when diazinon was applied (CDPR PUR 2000-2010) and compared this information to when the December 7, 2001 and March 17, 2002 numeric targets were exceeded. Based on application dates, staff concluded that the exceedances were likely caused by an October 2001 application of diazinon (D.Z.N. Diazinon AG600 WBC) on nursery-greenhouse grown cut flowers or greens.

Table 8. Pounds of diazinon applied per year in the Arroyo Paredon watershed and Crop Type

Year applied	Total Pounds of Diazinon per Year	Crop Type	Pounds per Crop	Date Applied
2000	1.05	N-GRNHS GRWN CUT FLWRS OR GREENS	0.05	8/24/2000
		N-GRNHS GRWN CUT FLWRS OR GREENS	1.0	2/12/2000
2001	3.28	N-GRNHS GRWN CUT FLWRS OR GREENS	0.94	3/29/2001
		N-GRNHS GRWN CUT FLWRS OR GREENS	2.34	10/10/2001
2002	60.16	N-GRNHS GRWN CUT FLWRS OR GREENS	60.0	10/29/2002
		N-GRNHS GRWN CUT FLWRS OR GREENS	0.16	9/11/2002
2003	2.20	LANDSCAPE MAINTENANCE	1.50	7/7/2003
		N-GRNHS GRWN CUT FLWRS OR GREENS	0.70	10/31/2003
2004	5.93	N-GRNHS GRWN CUT FLWRS OR GREENS	0.94	9/24/2004
		N-GRNHS GRWN CUT FLWRS OR GREENS	4.99	6/19/2004
2005	7.30	LANDSCAPE MAINTENANCE	3.75	5/25/2005

Year applied	Total Pounds of Diazinon per Year	Crop Type	Pounds per Crop	Date Applied
		N-GRNHS GRWN CUT FLWRS OR GREENS	3.55	7/23/2005
2006	8.75	N-GRNHS GRWN CUT FLWRS OR GREENS	7.50	6/21/2006
		N-GRNHS GRWN CUT FLWRS OR GREENS	1.25	8/29/2006
2007	5.00	N-GRNHS GRWN CUT FLWRS OR GREENS	4.00	10/11/2007
		N-GRNHS GRWN CUT FLWRS OR GREENS	1.00	9/15/2007
2008	1.25	N-GRNHS GRWN CUT FLWRS OR GREENS	1.00	5/16/2008
		N-GRNHS GRWN PLANTS IN CONTAINERS	0.25	12/19/2008
2009	6.22	N-GRNHS GRWN CUT FLWRS OR GREENS	2.50	9/5/2009
		LETTUCE, LEAF (ALL OR UNSPEC)	3.72	11/19/2009
2010	5.72	N-GRNHS GRWN CUT FLWRS OR GREENS	2.00	12/30/2010
		LETTUCE, LEAF (ALL OR UNSPEC)	3.72	1/16/2010

Staff concludes that discharges from agricultural lands are the primary source of diazinon in Arroyo Paredon. This conclusion is based on the following:

- Agricultural lands are adjacent to Arroyo Paredon that have applied diazinon.
- The monitoring point where the exceedances occurred is flanked by and downstream of agricultural landuse.
- Residential indoor use of these pesticides ended in 2002 and outdoor uses ended in 2004

Staff concludes that urban stormwater discharges of diazinon are not causing exceedances of water quality criteria within the project area. This conclusion is based on the following:

- Two applications for landscape maintenance in 2003 and 2005, i.e., after the exceedances of the numeric targets in 2001 and 2002.
- Unreported residential use of diazinon is likely low because urban areas make up approximately 5% of the watershed, and the pesticide is no longer available for residential use.

4.2.2 Natural Background Sources

USEPA requires states to assign an allocation to natural background sources of pollutant stressors and identification of sources of the pollutants for which allocations are assigned. USEPA describes background levels as representing pollutant loading from natural geomorphological processes, e.g. weathering.

Diazinon is not a natural pollutant and therefore there are no background levels. Because natural background sources of this chemical does not exist, staff has assigned an allocation to background equal to zero.

4.3 Conclusions from Source Analysis

Staff concludes that discharges of diazinon from agricultural lands are the source of diazinon causing impairment.

5 LOADING CAPACITY AND ALLOCATIONS

5.1 Introduction

TMDLs are "[t]he sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure" in accordance with Code of Federal Regulations, Title 40, §130.2[i].

Staff proposes concentration-based TMDLs in accordance with this provision of the Clean Water Act.

5.2 Loading Capacity (TMDL)

The TMDLs for Arroyo Paredon are equal to the numeric targets. This is a water column concentration-based Total Maximum Daily Load and is applicable to each day of all seasons as indicated in Table 9. Additionally, there is a TMDL to address additive toxicity when diazinon and chlorpyrifos are both present.

5.2.1 Diazinon TMDLs

Table 9. Concentration-based TMDL for diazinon

Waterbody Assigned TMDL	TMDL	
	Diazinon	
	CMC[A] (ppb)	CCC[B] (ppb)
Arroyo Paredon[1]	0. 16	0. 10

[1] *Including waterbodies tributary to Arroyo Paredon*

[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

5.2.2 Additive Toxicity TMDLs

TMDL to address additive toxicity of diazinon and chlorpyrifos when both are present.

$$S = \leq 1.0 = \frac{C_D}{LC_D} + \frac{C_C}{LC_C}$$

Where:

S = Sum of additive toxicity

C_D = Diazinon concentration in waterbody

C_C = Chlorpyrifos concentration in waterbody

LC_D = Criterion Continuous Concentration (0.10 µg/L) or Criterion Maximum Concentration (0.16 µg/L) diazinon loading capacity.

LC_C = 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.

5.2.3 Aquatic Toxicity TMDLs

The TMDLs for water column and sediment toxicity is the aquatic toxicity numeric target.

5.3 Linkage Analysis

The goal of the linkage analysis is to establish a link between pollutant loads and desired water quality. This ensures that the loading capacity specified in the TMDLs will result in attaining the desired water quality. For these TMDLs, this link is established because the load allocations are equal to the numeric targets, which are the same as the TMDLs. Therefore, reductions in diazinon loading will result in achieving the water quality standards.

5.4 Load Allocations

Table 10 shows load allocations assigned to responsible parties. The allocations are equal to the TMDLs. The allocations are receiving water allocations.

Table 10. Load allocations for Arroyo Paredon Watershed

LOAD ALLOCATIONS

Waterbodies Assigned TMDLs	Responsible Party Assigned Allocation (Source)	Receiving Water Allocation
• Arroyo Paredon	Owners/operators of irrigated agricultural lands in the Arroyo Paredon Watershed (Discharges from irrigated lands)	Allocation-1 & Allocation-2

Allocation 1: For diazinon

Compound	CMC [A] (ppb)	CCC [B] (ppb)
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.

Allocation 2: For additive toxicity of diazinon and chlorpyrifos when both are present.

$$S = \leq 1.0 = \frac{C_D}{LC_D} + \frac{C_C}{LC_C}$$

Where:
S = Sum of additive toxicity
C_D = Diazinon concentration in waterbody
C_C = Chlorpyrifos concentration in waterbody
LC_D = Criterion Continuous Concentration (0.10 µg/L) or Criterion Maximum Concentration (0.16 µg/L) diazinon loading capacity.
LC_C = 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.

Available samples collected within the applicable averaging period (e.g., 1-hour CMC and 4-day CCC) for the numeric targets will be used to determine compliance with the allocations and loading capacity.

5.5 Margin of Safety

This TMDL uses an implicit margin of safety. The margin of safety for this TMDL is implicit in the water column numeric targets selected for diazinon.

The assigned TMDL assumes no significant reductions in diazinon loading due to removal from the water column by degradation and/or adsorption to sediment particles and subsequent sediment deposition. Since these processes are likely to take place, this assumption contributes to the implicit margin of safety in the proposed allocation methodology. This is a conservative assumption resulting in an implicit margin of safety.

Staff used water column numeric criteria for diazinon, developed by the California Department of Fish and Game (CDFG, 2000: CDFG, 2004) following USEPA protocols (USEPA 1985), to establish the loading capacity. Therefore, the loading capacity has the same conservative assumptions used in those procedures.

5.6 Critical Conditions, Seasonal Variation

A critical condition is the combination of environmental factors resulting in the water quality standard being achieved by a narrow margin, i.e., that a slight change in one of the environmental factors could result in exceedance of the water quality standard. Such a phenomenon could be significant if the TMDL were expressed in terms of load, and the allowed load was determined on achieving the water quality standard by a narrow margin. However, this TMDL is expressed as a concentration, which is equal to the desired water quality condition. Consequently, there are no critical conditions.

Exceedance of the water quality criteria occurred in December of 2001 and March of 2002. Much of the impaired water is dry during the summer months. The TMDL and allocations are expressed in terms of concentration and applicable when water is present to protect aquatic life, regardless of season. Therefore, the TMDL is applicable during all seasons.

6 IMPLEMENTATION AND MONITORING

6.1 Introduction

This TMDL is being implemented by 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 thereof. Central Coast Water Board staff will conduct a review of implementation activities when monitoring and reporting data is submitted as required by the Agricultural Order. Central Coast Water Board staff will pursue modification of Agricultural Order conditions or other regulatory means (e.g. waste discharge requirements), as necessary, to address remaining impairments from diazinon during the TMDL implementation phase.

Note that the current Agricultural Order requires dischargers to comply with applicable TMDLs. If the Agricultural Order did not provide the necessary requirements to implement this TMDL, staff would propose modifications of the Agricultural Order in order to achieve this TMDL. Staff has concluded that the current Agricultural Order provides the requirements necessary to implement this TMDL. Therefore, no new requirements are proposed as part of this TMDL.

Note that the Agricultural Order states that compliance is determined by: a) management practice implementation and effectiveness, b) treatment or control measures, c) individual discharge monitoring results, d) receiving water monitoring

results, and e) related reporting. The Agricultural Order also requires that dischargers comply by implementing and improving management practices and complying with the other conditions, including monitoring and reporting requirements, which is consistent with the Nonpoint Source Pollution Control Program (NPS Policy, 2004). Finally, the Agricultural Order states that dischargers shall implement management practices, as necessary, to improve and protect water quality and to achieve compliance with applicable water quality objectives. Therefore, compliance with this TMDL is demonstrated through compliance with the Agricultural Order, which provides several avenues for demonstrating compliance, including management practices that improve water quality that lead to ultimate achievement of water quality objectives.

The TMDL implementation plan also utilizes an interagency approach among the California Department of Pesticide Regulation (DPR), the State Water Resources Control Board, and the Central Coast Water Board to address impairments. The approach is described in the California Pesticide Management Plan for Water Quality (California Pesticide Plan), which is an implementation plan of the Management Agency Agreement (MAA) between DPR and the Water Boards. The agricultural commissioners of Santa Barbara and San Luis Obispo counties are also responsible for implementing the California Pesticide Plan.

The Department of Pesticide Regulation, the county agricultural commissioners, and USEPA are taking regulatory steps to address pesticide impairments. In accordance with the MAA, DPR has approved urban pesticide regulations to address pyrethroid pesticide water quality pollution. Also as part of the MAA, the Central Coast Water Board, DPR, and the commissioners are coordinating on county chlorpyrifos use permits. USEPA has recently implemented label restrictions and requirements on agricultural uses of diazinon and pyrethroids to address water quality problems.

The Porter-Cologne Water Quality Control Act grants the Water Boards the authority to implement and enforce water quality laws. Water Board staff ensures compliance with the Agricultural Order using the authority and regulatory mechanisms granted through the California Water Code, including application of enforcement actions described in the Water Quality Enforcement Policy. Therefore, the Central Coast Water Board does not need an additional regulatory program (e.g., a new plan or policy adopted through a Basin Plan Amendment) to address impairments caused by diazinon in the project area, because the Agricultural Order is the regulatory mechanism in place to address these impairments.

The implementation requirements, and monitoring and reporting requirements identified below are actions recommended to achieve and demonstrate progress toward achieving the TMDL. The requirements identified below are not additional requirements above and beyond those described in the Agricultural Order and are not intended to be an exhaustive list of actions necessary to achieve the TMDL; the implementation and monitoring requirements described in the Agricultural Order are sufficient to achieve and demonstrate progress.

The parties with allocations for this TMDL include any agricultural operation that uses diazinon on their crops. Please see section 6.5, Timelines and Milestones for the timeline and milestones associated with complying with this TMDL.

6.2 Implementation Requirements

Implementing parties must comply with the Conditional Waiver of Waste Discharge Requirements for Irrigated Lands (Order R3-2012-0011) and the Monitoring and Reporting Programs in accordance with Orders R3-2012-0011-01, R3-2012-0011-02, and R3-2012-0011-03, or its renewals or replacements to meet load allocations and achieve the TMDL. The requirements in these orders, and their renewals or replacements in the future, will implement the TMDLs and rectify the impairments addressed in this TMDL.

Current requirements in the Agricultural Order that will result in achieving the load allocations include:

a. Enroll in the Agricultural Order.
    - Current enrollment requirements inform staff whether chlorpyrifos or diazinon is applied; growers update this information annually.
b. 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 diazinon and toxicity tests at cooperative monitoring sites, including the Arroyo Paredon.
c. Implement, and update as necessary, management practices to reduce pesticide loading.
d. Develop and update and implement Farm Plans. The Farm Plans should incorporate measures designed to achieve load allocations assigned in this TMDL.

6.3 Monitoring and Reporting Requirements

Growers required to monitor must meet the monitoring requirements of the *Conditional Waiver of Waste Discharge Requirements For Discharges from Irrigated Lands* (Agricultural Order)

The Agricultural Order includes monitoring and reporting requirements that assess progress toward achieving these TMDLs. Current monitoring requirements fulfill the

information necessary to assess progress of this TMDL. Monitoring requirements include:

1. Water column diazinon monitoring consistent with numeric targets outlined in Section 3.1. There should be a minimum of one sample during wet the season when there is flow in the Arroyo Paredon (approximately November – April). Water column sampling will be performed after diazinon application, ideally within 30-60 days after application. If diazinon is applied a second time, a second sampling event is encouraged. Dry season monitoring is not required because there is typically no flow during the dry season.
2. Laboratory analytical methods rigorous enough for data comparison with the numeric targets.
3. Sampling site locations shall be consistent with CCAMP and CMP sites (Table 11).
4. Water column toxicity tests using *Ceriodaphnia spp.*
5. Results submitted to the Water Board, upon request.

Table 11. Recommended receiving water monitoring sites for TMDL progress assessment.

Impaired Waterbody	Recommended Monitoring Sites
Arroyo Paredon	315APC (CCAMP coastal confluences site) 315APF (CMP agriculture monitoring site)

CCAMP is currently scheduled to conduct rotational sampling in the Arroyo Paredon watershed in 2014. If needed, their sampling may include sampling for diazinon. The CMP is currently scheduled to sample in 2013 for toxicity and pesticides in water and in 2014 for toxicity and pesticides in sediment.

6.4 Determination of Compliance with Load Allocations

Demonstration of compliance with the load allocations is consistent with compliance with the Agricultural Order. Load allocations will be achieved through a combination of implementation of management practices and strategies to reduce pesticide loading, and water quality monitoring. Flexibility to allow owners and operators from irrigated lands to demonstrate compliance with load allocations is a consideration; additionally, staff is aware that not all implementing parties are necessarily contributing to or causing surface water impairments.

To allow for flexibility, Central Coast Water Board staff will assess compliance with load allocations using one or a combination of the following:

A. Attaining the load allocations in receiving waters.
B. Attaining zero toxicity attributable to pesticides in receiving waters.

C. Implementing management practices that are capable of achieving load allocations identified in this TMDL.
D. Owners and operators of irrigated lands may provide sufficient evidence to demonstrate that they are and will continue to be in compliance with the load allocations; such evidence could include documentation submitted by the owner or operator to the Executive Officer that the owner or operator is not causing waste to be discharged to impaired waterbodies resulting or contributing to violations of the load allocations.

6.5 Timeline and Milestones

Discharge of pesticides at levels toxic to the environment affects a spectrum of beneficial uses and is a serious water quality problem. As such, implementation should occur at an accelerated pace to achieve the allocations and TMDL in the shortest time-frame feasible.

The target date to achieve the allocations, numeric targets, and TMDLs in the impaired waterbodies addressed in this TMDL is March 2019. This date coincides with planned monitoring efforts to help defray costs to implementing parties and reflects the apparent decrease in diazinon use in the Arroyo Paredon watershed and associated ease with which the TMDL can likely be achieved (please see Section 6.7 Existing Implementation Efforts). The Agricultural Order should establish timeframes for individual dischargers to achieve water quality standards; achieving water quality standards will result in achieving TMDL allocations.

Water Board staff will reevaluate impairments caused by diazinon when monitoring data is submitted and during renewals of the Agricultural Order. Water Board staff will modify the conditions of the Agricultural Order, if necessary, to address remaining impairments.

6.6 Cost Estimate

Existing regulatory requirements are sufficient to attain water quality standards for diazinon in the project area. The Regional Board is not approving any new activity, but merely finding that ongoing activities and regulatory requirements are sufficient. Therefore, this TMDL is not a “project” that requires compliance with the California Environmental Quality Act (California Public Resources Code § 21000 et seq.) and the Central Coast Water Board is not directly undertaking an activity, funding an activity or issuing a permit or other entitlement for use by this action (Public Resources Code § 21065; 14 Cal. Code of Regs. §15378).

6.7 Existing Implementation Efforts

Staff learned at an August 2012 outreach meeting that many growers are no longer applying diazinon. Staff confirmed this through a review of recent Agricultural Order

enrollment information and found only one out of 26 agriculture operations in the Arroyo Paredon watershed used diazinon in 2011. For the period of 2000 through 2010 there were two users per year and diazinon was used for greenhouse grown cut flowers and/or greens, landscape maintenance, and lettuce. Greenhouse grown cut flowers or greens account for 88% of reported diazinon use for the period 2000 – 2010 (PUR reports 2000-2010).

Based on the above information, staff concludes that the risk of exceeding the numeric targets for diazinon is less now than when data leading to impairment was collected in the early 2000s. .

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