December 15, 2014

VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)

2013-2014 Annual Monitoring Report

DRAFT

submitted to:

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

prepared by:

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On behalf of the:

VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)

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Acronyms

AMR	Annual Monitoring Report
BMP	Best Management Practice
CC	Calleguas Creek
CCW	Calleguas Creek Watershed
CCWTMP	Calleguas Creek Watershed TMDL Monitoring Program
DNQ	Detected Not Quantified
EST	Estimated
LA	Load Allocation
LARWQCB	Los Angeles Regional Water Quality Control Board (Regional Board)
MDL	Method Detection Limit
MRP	Monitoring and Reporting Plan
NA	Not Applicable
ND	Not Detected
NM	Not Measured
NOA	Notice of Applicability
NOI	Notice of Intent
NS	Not Sampled
OC	Organochlorine
OP	Organophosphorus
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RL	Reporting Limit
SCR	Santa Clara River
SCRW	Santa Clara River Watershed
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
VCAILG	Ventura County Agricultural Irrigated Lands Group
VR	Ventura River
VRW	Ventura River Watershed
WQMP	Water Quality Management Plan

Executive Summary

This document serves as the 2013-2014 VCAILG Annual Monitoring Report (AMR). Information regarding the sampling performed by VCAILG, TMDL compliance, and member progress completing the education requirement are all contained herein. Additionally, the "Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report" is being submitted with this VCAILG AMR; providing broader context and TMDL compliance information for the entire watershed.

Three VCAILG monitoring events were completed during the 2013-2014 monitoring year. Due to the dry conditions of the monitoring year, only one storm event was sampled.

Instances where exceedances occurred trigger the need to develop a WQMP; which will be submitted to the Regional Board May 26, 2015.

The following summary highlights compliance with standard water quality benchmarks.

- Five OC pesticides that have applicable water quality benchmarks have never been detected during VCAILG monitoring to date (Events 1-21). An additional five OC pesticides with benchmarks have only been detected a few times throughout the entire monitoring program considering all the sites. Though DDT and its breakdown products are often detected during wet weather, dry weather exceedances have greatly decreased and it is the breakdown products that are most commonly detected. This demonstrates the degradation of DDT in the environment and the minimization of transport during the irrigation season, over which farmers have some control. Additional OC pesticides exceedances include total chlordane during wet weather and toxaphene for both dry and wet weather conditions.
- This is third year of copper results. One freshwater site exhibited an exceedance of the copper benchmark. In addition, the three sites where the saltwater benchmark applies exhibited exceedances.
- For OP pesticides, the chlorpyrifos benchmark was exceeded at five sites during wet weather. No exceedances of the diazinon benchmark occurred during the monitoring year.
- Significant toxicity occurred during all three events at the S02T_TODD monitoring site. Significant toxicity to trigger a TIE was present in events 19 and 20. However, due to a downturn in test organism quality the Event 20 TIE was initiated but could not be concluded and interpreted. Chronic toxicity above the 1 TU_c benchmark was found in the S03T_BOULD Event 20 wet weather sample.
- Nitrate-N continues to be an issue at some monitoring locations (8 out of 15 VCAILGMP sites had exceedances).
- All samples were within the acceptable pH range. Temperature was always under the upper limit, where applicable. Measured dissolved oxygen levels were all above the benchmark minimum.
- Salts benchmarks were exceeded at four sites during the monitoring year.

During this monitoring year TMDL load allocations (LAs) were met at all applicable compliance sites or by completing required actions for the following TMDLs: Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL, Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL, Calleguas Creek Watershed Boron, Chloride, Sulfate, and TDS (Salts) TMDL, Revolon Slough and Beardsley Wash Trash TMDL, Ventura River Estuary Trash TMDL, and Santa Clara River Estuary Toxaphene TMDL. Monitoring was performed in compliance with the Harbor Beaches of Ventura County Bacteria TMDL and the McGrath Lake PCBs, Pesticides, and Sediment Toxicity TMDL.

In addition to monitoring and reporting, VCAILG works with cooperating organizations and commodity groups to provide education opportunities for its members related to Conditional Waiver requirements, local water quality issues, and best management practices (BMPs) to improve farm water quality. Eight hours of education are required by the Conditional Waiver. During this monitoring year, twenty-eight and a half hours of classes qualified for education credit and an additional fifteen hours were offered since the end of the monitoring year to the present. Since 2010, over fifty education classes have been offered, adding up to 169.5 hours. At this time, 840 VCAILG members have fulfilled the eight hour requirement; 535 of those members have completed more than eight hours, totaling 12,782 hours of water quality education. Through monitoring, education, targeted outreach, and the implementation of BMPs, VCAILG is working with its members to improve water quality in agricultural areas of Ventura County.

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Introduction

On October 7, 2010 the Los Angeles Regional Water Quality Control Board (Regional Board) adopted a *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region* ("Conditional Waiver", Order No. R4-2010-0186). The purpose of the Conditional Waiver is to assess the effects of and control discharges from irrigated agricultural lands in Los Angeles and Ventura Counties, including irrigation return flows, flows from tile drains, and storm water runoff. These discharges can affect water quality by transporting nutrients, pesticides, sediment, salts, and other pollutants from cultivated fields into surface waters, potentially impairing designated beneficial uses. Owners and operators of agricultural lands in Ventura and Los Angeles Counties must comply with provisions contained in the Conditional Waiver or be regulated under other Regional Board programs.

The Conditional Waiver allows individual landowners and growers to comply with its provisions by working collectively as a Discharger Group, or as an individual. A Discharger Group is defined by the Conditional Waiver as "any group of dischargers and/or organizations that forms to comply with this Order. Discharger Groups can be, but are not limited to, organizations formed on a geographic basis or formed with other factors in common such as commodities." The primary purpose of allowing Discharger Groups is to encourage collaboration on monitoring and reporting and to increase the effectiveness of management practices throughout a watershed to attain water quality standards. Those landowners and growers choosing to comply with the Conditional Waiver as a Discharger Group must signify by submitting a Group Notice of Intent and by developing a Discharger Group monitoring program.

To assist agricultural landowners and growers that farm within the boundaries of Ventura County, various agricultural organizations, water districts and individuals joined together to form the Ventura County Agricultural Irrigated Lands Group (VCAILG), which is intended to act as one unified "Discharger Group" for those agricultural landowners and growers that wish to participate. A Notice of Intent (NOI) to comply with the Conditional Waiver was submitted to the Regional Board by the VCAILG on April 7, 2011. The NOI included the VCAILG membership roster, as well as the required Quality Assurance Project Plan (QAPP) and Monitoring and Reporting Program Plan (MRP), which detail the water quality monitoring and reporting procedures being conducted in compliance with the terms of the Conditional Waiver. The Regional Board responded by issuing the Notice of Applicability (NOA) to the VCAILG on September 15, 2011, signifying the Regional Board's approval of the VCAILG and its Monitoring Program.

This document serves as the third Annual Monitoring Report (AMR) summarizing data collected under the 2010 Conditional Waiver (Order No. R4-2010-0186). This report provides a detailed summary of activities of the VCAILG during 2013-2014, including administration of the VCAILG, an overview of farming in Ventura County, coursework offered to VCAILG members to fulfill the Conditional Waiver's education requirement, a list of education hours completed to date by each member, and monitoring data collected during the wet and dry monitoring events conducted. Also included is a discussion of monitoring results that exceeded water quality benchmarks. In addition, a WQMP will be submitted by May 26, 2015 in response to water quality benchmark exceedances that occurred during the 2013-2014 monitoring year and will detail a plan to reduce water quality impacts from irrigated agricultural discharges.

Group Membership and Setting

The VCAILG was formed in 2006 to act as one unified "Discharger Group" in Ventura County for the purpose of compliance with the Conditional Waiver. VCAILG oversight is provided by an 18-member Steering Committee and a 7-member Executive Committee (also members of the Steering Committee). Steering Committee membership consists of agricultural organization representatives, agricultural water district representatives, landowners and growers from the three primary watersheds in Ventura County (Calleguas Creek, Santa Clara River, and Ventura River). Steering Committee membership also represents the major commodities grown in Ventura County (strawberries, nursery stock, citrus, vegetables, and avocados). The Steering Committee roster is presented in Table 1.

Because the VCAILG is an unincorporated organization, the Farm Bureau of Ventura County acts as the responsible entity for the collection of funds, contracting with consultants, and other fiscal and/or business matters that require an organization with some form of tax status; the Farm Bureau is a non-profit 501(c)(5) organization.

A list of VCAILG members and associated parcels is included as Appendix A. The membership list includes the following information:

- Landowner Name
- Mailing Address
- Parcel number(s)
- Irrigated acres per parcel
- Watershed associated with each parcel

Table 2 contains a summary of VCAILG membership statistics, including the number of landowners and parcels enrolled, as well as irrigated acreage enrolled in each watershed. All membership statistics represent group status in December of 2014. At that time, VCAILG represented 1,307 Ventura County agricultural landowners and 78,664 irrigated acres. According to the Ventura County Assessor's records, there are an estimated 413 landowners not enrolled in VCAILG. Therefore, VCAILG represents 76 percent of agricultural landowners in Ventura County covering approximately 87 percent of the estimated irrigated acreage.

Table 1. VCAILG Steering Committee Membership

Member, Organization [1]	Crop(s) Represented	Watershed(s) Represented
Edgar Terry, Terry Farms, Inc. (Committee Chair)	Strawberries, Vegetables	Calleguas Creek, Santa Clara River
Steve Bachman, United Water District*	N/A	N/A
Jonathan Chase, Hailwood, Inc.	Strawberries, Vegetables	Calleguas Creek
Jerry Conrow, Ojai Basin GMA*	Citrus	Ventura River
Robert Crudup, Valley Crest Tree Company	Nursery Stock	Santa Clara River
Paul DeBusschere, DeBusschere Ranch	Strawberries, Avocados	Calleguas Creek
Mike Friel, Laguna Grove Service	Citrus	Calleguas Creek
Jesse Gomez, Newhall Land & Farming	Citrus, Hay, Nursery Stock, Vegetables, Sod, Pasture	Santa Clara River
Jurgen Gramckow, Southland Sod Farms	Sod, Hay, Oats, Vegetables	Calleguas Creek, Santa Clara River, Ventura River
Gus Gunderson, Limoneira Company	Avocado, Citrus	Santa Clara River
John Krist, Farm Bureau of Ventura County*	N/A	N/A
Jim Lloyd-Butler, Lloyd Butler Ranch	Avocado, Citrus	Calleguas Creek, Santa Clara River
John Mathews, Arnold, Bleuel, LaRochelle, et al.*	N/A	N/A
Doug O'Hara, Somis Pacific Ag Management Company	Avocado, Citrus	Calleguas Creek, Santa Clara River
Kelle Pistone, Assoc. of Water Agencies of Ventura County*	N/A	N/A
Rob Roy, Ventura County Agricultural Association*	N/A	N/A
Dave Souza, Pleasant Valley County Water District*	N/A	N/A
Craig Underwood, Underwood Ranches	Avocado, Citrus, Vegetables	Calleguas Creek, Santa Clara River

N/A = Not Applicable

1. An asterisk denotes Executive Committee membership

Table 2. VCAILG Membership Statistics as of December 2014

Watershed	Landowner Count	Parcel Count	Irrigated Acres
Calleguas Creek	552	1,234	41,560
Oxnard Coastal	59	116	4,203
Santa Clara River	507	1,154	27,816
Ventura River	189	361	5,085
Total	*1,307* [1]	*2,865*	*78,664*

1. There are 1,255 unique landowners enrolled, a number of whom own property in more than one watershed.

IRRIGATED AGRICULTURE IN VENTURA COUNTY

Ventura County covers 1,843 square miles (approximately 1.2 million acres) with 43 miles of coastline (Figure 1). The Pacific Ocean forms its southwestern boundary, with Los Angeles County to the southeast, Kern County to the north and Santa Barbara County to the west. The Los Padres National Forest accounts for the northern half of the county, with residential, agricultural and business uses in the southern portion. According to the most recent Crop and Livestock Report, Ventura County has approximately 92,273 acres of irrigated cropland.[1] The Calleguas Creek Watershed contains the highest number of irrigated acres (approximately 48,000), followed by the Santa Clara River Watershed (approximately 32,000), Ventura River Watershed (approximately 6,500), and finally the Oxnard Plain Coastal Watershed (approximately 4,400).[2]

Agriculture is a major industry in Ventura County, generating over $2 billion in gross sales for 2013. This gross value is up 6.7 percent from 2012.[3] Strawberries are the number one grossing crop type in Ventura County, but there was a 12 percent decrease in gross sales between 2012 and 2013. Avocados were the second highest grossing crop in 2013 showing an 85 percent increase in gross value from 2012. Table 3 lists the County's ten leading crops in gross value for 2013. Characteristics of each of the three main watersheds in Ventura County are discussed in more detail in the following sections.

[1] Ventura County Agricultural Commissioner. *Ventura County Crop & Livestock Report 2013*. August 5, 2014.
[2] Estimates of irrigated agricultural acreage by watershed are based on the VCAILG membership database and also includes estimated irrigated acreage for parcels not enrolled in VCAILG.
[3] Ventura County Agricultural Commissioner. *Ventura County Crop & Livestock Report 2013*. August 5, 2014.

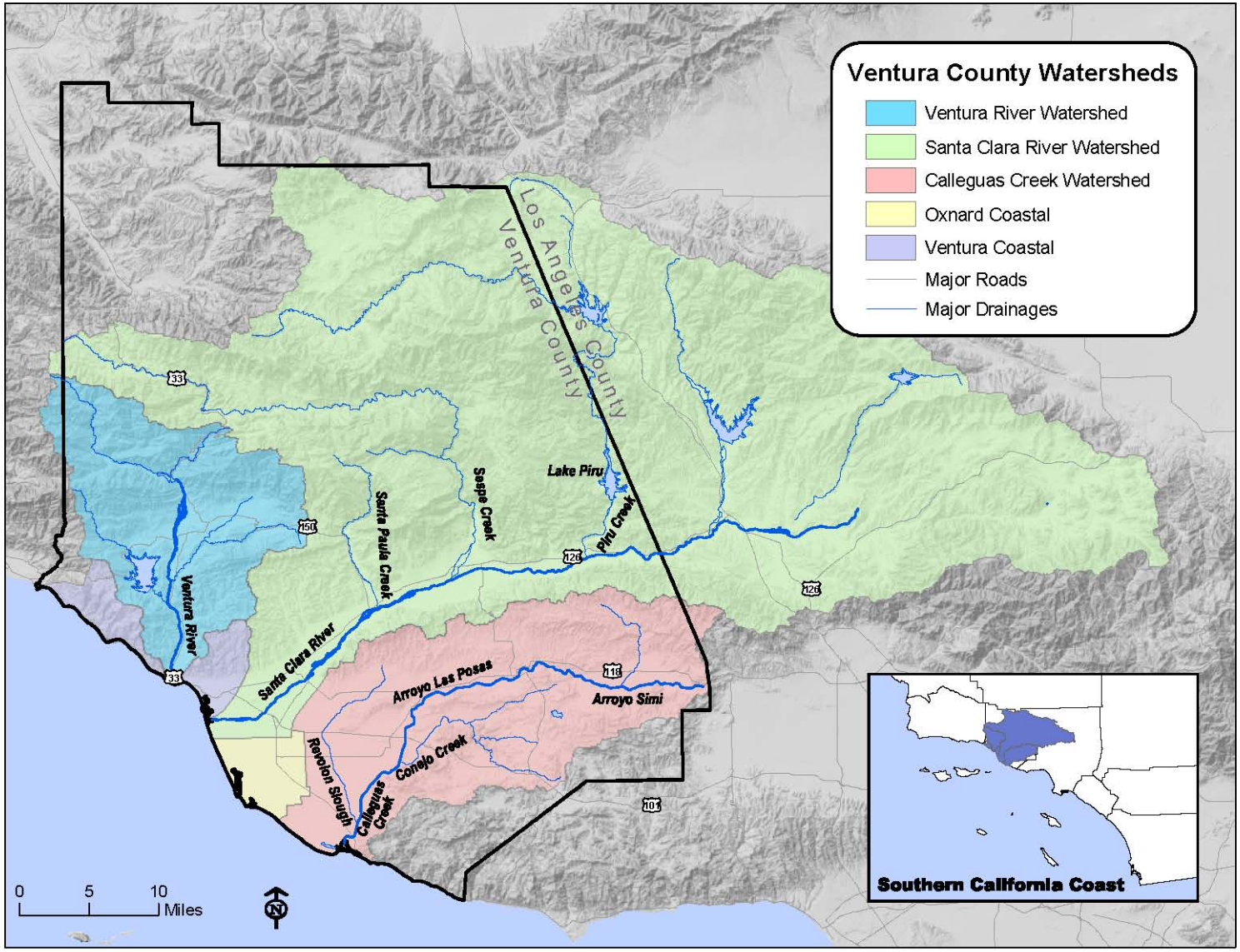


Figure 1. Ventura County Watersheds

Table 3. Ventura County's Leading Agricultural Commodities–2013

Commodity	Gross Value ($)
1. Strawberries	608,765,000
2. Avocados	209,723,000
3. Raspberries	196,370,000
4. Nursery Stock	190,889,000
5. Lemons	188,926,000
6. Celery	180,864,000
7. Tomatoes	72,512,000
8. Peppers	52,370,000
9. Cut Flowers	43,079,000
10. Cilantro	29,096,000

Source: Ventura County Agricultural Commissioner. *Ventura County's Agricultural Crop & Livestock Report 2013.* August 5, 2014.

Calleguas Creek Watershed

The Calleguas Creek Watershed (Figure 2) is approximately 30 miles long, 14 miles wide, and drains an area of approximately 343 square miles or 219,520 acres. Cities within the watershed include Camarillo, Thousand Oaks, Moorpark, and Simi Valley. The main surface water system drains from the mountains in the northeast part of the watershed toward the southwest, where it flows through the Oxnard Plain before emptying into the Pacific Ocean through Mugu Lagoon. The main waterbodies in the watershed include Calleguas Creek, Revolon Slough, Beardsley Channel, Conejo Creek, Arroyo Santa Rosa, Arroyo Las Posas and Arroyo Simi. All of these waterbodies appear on the federal 303(d) list of impaired waterbodies, triggering the requirement to develop Total Maximum Daily Loads (TMDLs) for specified pollutants identified as causing impairments. Runoff from irrigated agricultural lands has been identified as one of the sources of these water quality impairments for specified pollutants. To date, TMDLs have been adopted for Nitrogen Compounds, Trash, Organochlorine Pesticides, Polychlorinated Biphenyls (PCBs) and Siltation, Toxicity, Metals and Selenium, and Salts.

Approximately 70,000 acres or 32 percent of land in the Calleguas Creek Watershed is used for agricultural purposes. Avocados and citrus crops such as lemons and oranges are typically grown in flat or gently sloping foothill areas in the watershed. Agricultural land located on the Oxnard Plain is planted predominately in a wide variety of truck crops, including strawberries, raspberries, peppers, green beans, celery, and onions, as well as sod farms and nurseries. Many farms located in the watershed grow multiple crops during a single calendar year. This multi-cropping technique is most common in the lower parts of the watershed, adjacent to Revolon Slough and Lower Calleguas Creek.

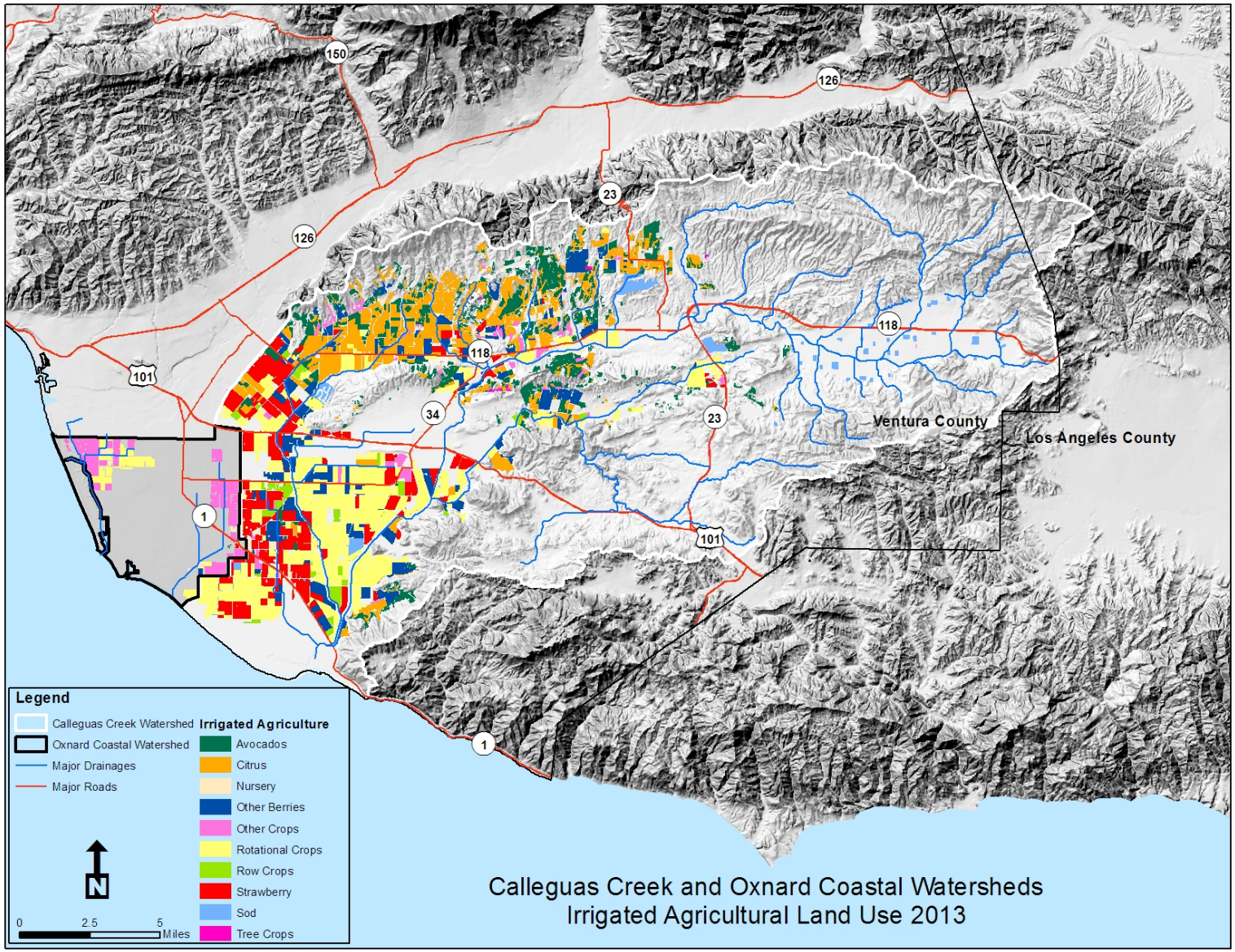


Figure 2. Calleguas Creek Watershed Agricultural Land Use

Santa Clara River Watershed

The Santa Clara River is the largest river system in southern California remaining in a relatively natural state. The river originates in the northern slope of the San Gabriel Mountains in Los Angeles County, traverses Ventura County, and flows into the Pacific Ocean halfway between the cities of San Buenaventura and Oxnard. The Santa Clara River and tributary system has a watershed area of about 1,634 square miles (Figure 3). Cities within the watershed include Ventura, Santa Paula, Fillmore, Piru, Santa Clarita, and Newhall. Major tributaries include Castaic Creek and San Francisquito Creek in Los Angeles County, and the Sespe, Piru, and Santa Paula Creeks in Ventura County. Approximately 40 percent of the watershed is located in Los Angeles County and 60 percent is in Ventura County. The most prevalent land use in the 500-year flood plain of the Santa Clara River is agriculture (62 percent), followed by industry (22 percent). Row crops and orchards are planted across the valley floor primarily in Ventura County and extend up adjacent slopes.

Several Santa Clara River reaches and tributaries appear on the federal 303(d) list of impaired waterbodies due to salts, nitrogen compounds, bacteria, and pesticides. TMDLs have been adopted for Nitrogen Compounds (upper and lower Santa Clara River reaches), Chloride (Reach 3) and Bacteria (Estuary and Reaches 3, 5, 6, and 7). A TMDL for toxaphene in the Santa Clara River Estuary was incorporated in the 2010 Conditional Waiver as a single regulatory action.

Just south of the Santa Clara River mouth lies a small coastal watershed that drains to McGrath Lake. A TMDL has been adopted to address pesticides and PCBs impairments in the lake. This TMDL addresses areas within the Oxnard Coastal Watershed that drain to the Central Ditch at Harbor Boulevard.

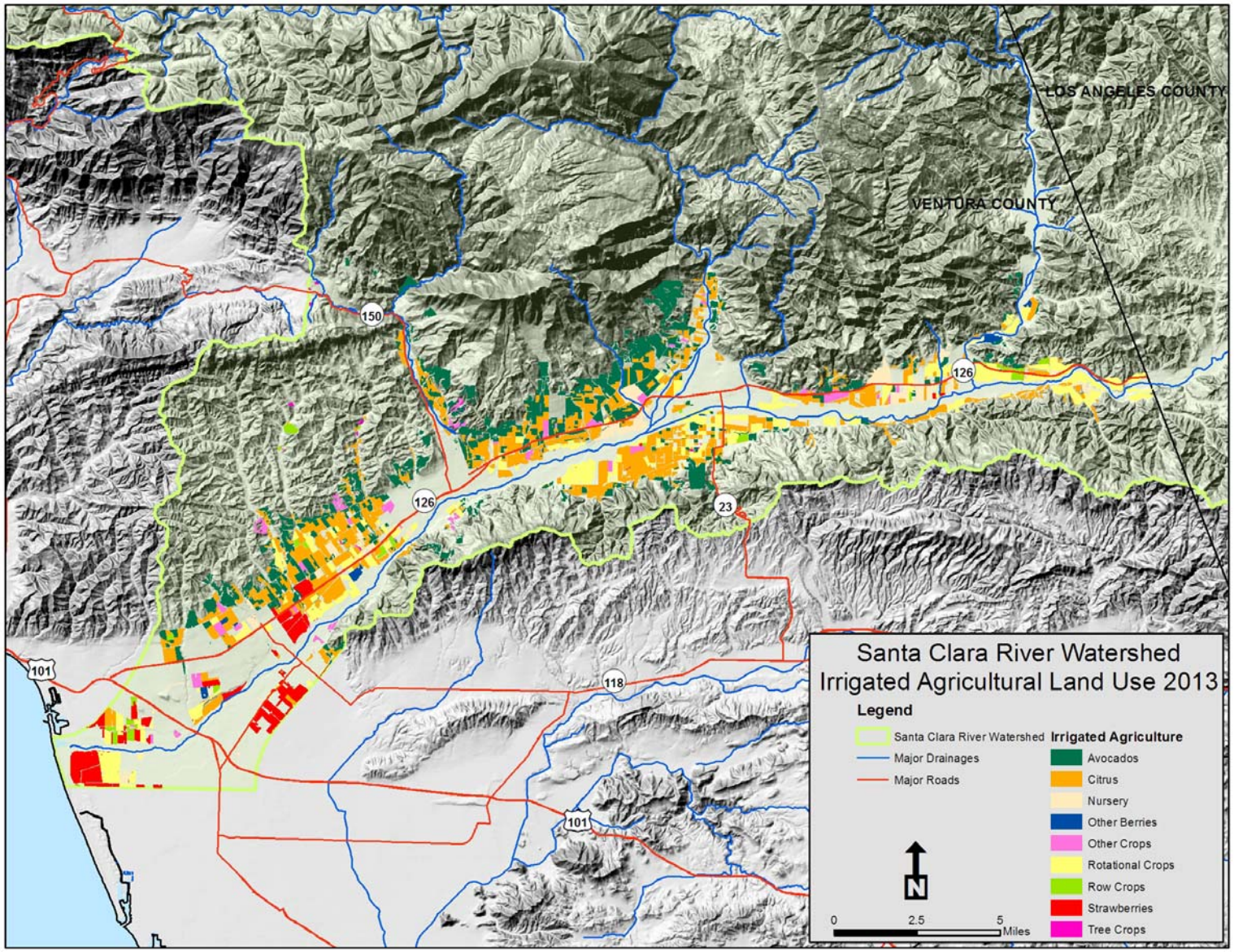


Figure 3. Santa Clara River Watershed Agricultural Land Use

Ventura River Watershed

The Ventura River and its tributaries drain a coastal watershed in western Ventura County. The watershed covers a fan-shaped area of 235 square miles, which is located within the western Transverse Ranges and is 31 miles long from upper Matilija Canyon to the Pacific Ocean (Figure 4). From the upper slopes of the Transverse Ranges, the surface water system in the Ventura River Watershed generally flows in a southerly direction to the estuary, located at the mouth of the Ventura River. Main tributaries in the watershed include Matilija Creek, Coyote Creek and San Antonio Creek. The City of Ojai and communities of Meiners Oaks, Oak View and Casitas Springs are located in the watershed, with surrounding suburban and agricultural areas comprising the Ventura River, Santa Ana, and Upper Ojai Valleys. Portions of the City of San Buenaventura border the lower reaches of the Ventura River. Irrigated agriculture constitutes approximately five percent of land uses in the watershed, with avocado and citrus as the predominant crops grown.

Several Ventura River reaches and tributaries appear on the federal 303(d) list of impaired waterbodies due to Algae/Eutrophic Conditions, Bacteria, Pumping/Water Diversion, and Trash. The Ventura River Estuary Trash TMDL became effective in 2008. A TMDL for algae, eutrophic conditions, and nutrients became effective in July 2013 (Algae TMDL). Upon approving the Algae TMDL, EPA determined that this TMDL addresses the same beneficial uses as those identified in the draft EPA TMDL for pumping and water diversion impairment listings. Therefore, a separate TMDL for pumping and water diversion will not be adopted.

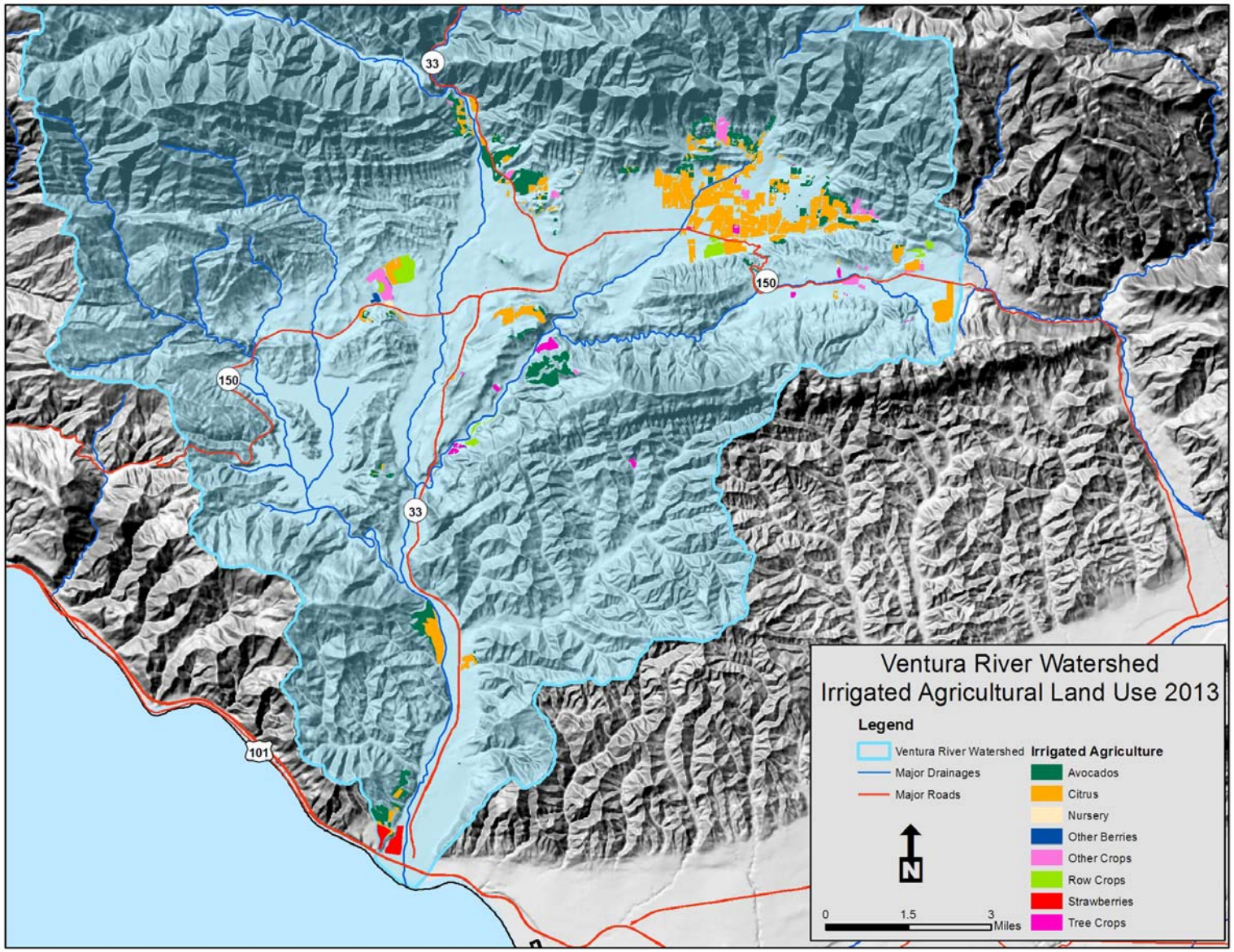


Figure 4. Ventura River Watershed Agricultural Land Use

VCAILG PARTICIPATION IN TMDLS

Within Ventura County, the VCAILG plays an active role in facilitating the participation of agriculture in TMDL development and implementation processes. Acting on behalf of its members, the VCAILG representatives participate in stakeholder meetings, provide comments, and contribute to cooperative agreements. For example, the VCAILG is a participant and funding partner of the Calleguas Creek Watershed TMDL implementation effort.

Effective TMDL monitoring requirements have been incorporated into the 2010 Conditional Waiver (Order No. R4-2010-0186). Therefore, the VCAILG will coordinate with established TMDL monitoring programs or conduct additional monitoring where necessary in order to meet TMDL requirements. Such TMDL data are included in this Annual Monitoring Report. The "Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report" is being submitted along with this VCAILG AMR.

Water Quality Monitoring

MONITORING OBJECTIVES

The objectives of the VCAILGMP required under the Conditional Waiver include the following:

- Monitor the discharge of wastes in irrigation return flows, tile drains, stormwater, and waters of the state and identify waste sources;
- Where discharges of waste cause or contribute to exceedances of water quality benchmarks or cause pollutions or nuisance, submit a Water Quality Management Plan (WQMP) to implement targeted management practices to reduce or eliminate the discharge of waste;
- Report results and other required information on an annual basis; and
- Coordinate monitoring efforts with existing and future monitoring programs so that data generated are complementary and not duplicative (*e.g.*, coordinate monitoring sites and sampling events with the TMDL Monitoring Programs within Ventura County).

MONITORING SITE SELECTION

The first step toward fulfilling monitoring program objectives was selecting appropriate monitoring sites. Because the focus of the program is on impacts to surface waterbodies from discharges from irrigated agricultural lands, monitoring sites were selected to best characterize agricultural inputs and are generally located at the lower ends of mainstem tributaries or agricultural drainages in areas associated primarily with agricultural activity. A background ("BKGD") site was chosen for one of the Santa Clara River Watershed sites in the natural area upstream. Calleguas Creek Watershed sites supplement monitoring performed under the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP) and retain consistency with previous VCAILG sampling. Monitoring sites in the Santa Clara River and Ventura River Watersheds were selected to continue building on existing data previously collected by VCAILG and meet TMDL requirements, where applicable.

The specific criteria for selection of monitoring sites are as follows:

- Land use (primarily agricultural drainages);
- Subwatershed representation;

- Acres of agricultural irrigated lands represented;
- Proximity to agricultural operations;
- Previous or existing monitoring locations under the *2005 Conditional Waiver* or TMDL monitoring programs;
- Drainage into waterbodies included on or proposed for the federal Clean Water Act 303(d) list of impaired waterbodies;
- Size and complexity of watershed;
- Size and flow of waterbodies; and,
- Safe access during dry and wet weather.

Table 4 lists monitoring sites selected in each watershed and associated global positioning system (GPS) coordinates for sampling Conditional Waiver Appendix 1, Table 1 constituents. Table 5 lists monitoring sites and GPS coordinates for effective TMDL monitoring locations. Figure 5 through Figure 11 show site locations for all monitoring sites within each watershed.

The format for the monitoring site ID/code is XXXA_YYYY_ZZZZ, where:

- "XXX" is a 2- or 3-character code that identifies the mainstem receiving water reach (where applicable) into which the monitored waterbody drains;
- "A" identifies the monitored waterbody as an agricultural drain (D) or a tributary (T) to the receiving water;
- "YYYY" is a 3-, 4-, or 5-character abbreviation for the site location;
- "ZZZZ" is an optional 3-, 4-, or 5-character abbreviation that provides additional site location information (*e.g.*, "BKGD" indicates a background site).

Examples:

S03D_BARDS signifies that the monitoring site is an agricultural drain located in the Santa Clara River Watershed. The site is located along Bardsdale Avenue.

S04T_TAPO_BKGD signifies that this a background monitoring site located on Tapo Creek, which is a tributary to the Santa Clara River, Reach 4.

Table 4. VCAILGMP Monitoring Locations for Conditional Waiver Constituents

Watershed / Subwatershed	Station ID	Reach	Waterbody Type [1]	Station Location	GPS Coordinates [2]	
					Latitude	Longitude
Calleguas Creek / Mugu Lagoon	01T_ODD3_ARN	1	T	Rio de Santa Clara/Oxnard Drain #3 at Arnold Rd.	34.123564	-119.156514
Calleguas Creek / Revolon Slough	04D_ETTG	4	D	Discharge to Revolon Slough at Etting Rd.	34.161797	-119.091419
	04D_LAS	4	D	Discharge to Revolon Slough at S. Las Posas Rd.	34.134208	-119.079767
Calleguas Creek / Beardsley Channel	05D_LAVD	5	T	La Vista Drain at La Vista Ave.	34.265950	-119.093589
	05T_HONDO	5	T	Hondo Barranca at Hwy. 118	34.263608	-119.057431
Calleguas Creek / Arroyo Las Posas	06T_LONG2	6	T	Long Canyon at Balcom Canyon Rd. crossing	34.281721	-118.958565
Oxnard Coastal	OXD_CENTR	--	D	Central Ditch at Harbor Blvd.	34.220555	-119.254983
Santa Clara River	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.306805	-119.141275
	S02T_TODD	2	T	Todd Barranca at Hwy. 126	34.313584	-119.117095
	S03T_TIMB	3	T	Timber Canyon at Hwy. 126	34.370172	-119.020939
	S03T_ BOULD	3	T	Boulder Creek at Hwy. 126	34.389578	-118.958738
	S03D_BARDS	3	D	Discharge along Bardsdale Ave. upstream of confluence with Santa Clara River	34.371535	-118.964470
	S04T_TAPO	4	T	Tapo Canyon Creek	34.401717	-118.723706
	S04T_TAPO_BKGD	4	B	S04T_TAPO background site upstream of agricultural operations	34.387316	-118.7204509
Ventura River	VRT_THACH	--	T	Thacher Creek at Ojai Avenue	34.446719	-119.210893
	VRT_SANTO	--	T	San Antonio Creek at Grand Avenue	34.454455	-119.221723

1. T = Tributary to receiving water; D = agricultural Drain; B = Background site.
2. All GPS coordinates presented in decimal degrees latitude and longitude in North American Datum 1983 (NAD83).

Table 5. Monitoring Locations for Effective TMDLs

Watershed/ Subwatershed	Site ID	Reach	Waterbody Type [1]	Site Location	GPS Coordinates [2]	
					Latitude	Longitude
Calleguas Creek/ Mugu Lagoon	01T_ODD2_DCH	1	T	Duck Pond/Oxnard Drain #2/Mugu Drain S. of Hueneme Rd.	34.1395	-119.1183
Calleguas Creek/ Calleguas Creek	02D_BROOM	2	D	Discharge to Calleguas Creek at Broome Ranch Rd.	34.1434	-119.0711
Calleguas Creek/ Revolon Slough	04D_WOOD	4	D	Agricultural drain on E. side of Wood Rd. N of Revolon	34.1707	-119.0960
	05D_SANT_VCWPD	5	D	Santa Clara Drain at VCWPD Gage #781	34.2425	-119.1114
Calleguas Creek/ Arroyo Las Posas	06T_FC_BR	6	T	Fox Canyon at Bradley Rd.	34.2646	-119.0115
Calleguas Creek/ Arroyo Simi	07D_HITCH_LEVEE_2	7	D	2nd corrugated pipe discharging on N. site of Arroyo Simi flood control levee off of Hitch Blvd.	34.2714	-118.9205
Calleguas Creek/ Conejo Creek	9BD_GERRY	9A [3]	D	Drain crossing Santa Rosa Rd. at Gerry Rd.	34.2369	-118.9473
Santa Clara River Estuary	S01D_MONAR	1	D	Drain entering SCR Estuary at Monarch Lane between Harbor Blvd. and Victoria Ave.	34.2333	-119.2413
Santa Clara River	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.3068	-119.1413
Oxnard Coastal	OXD_CENTR	--	D	Central Ditch at Harbor Blvd.	34.2206	-119.2550
Oxnard Coastal/ Channel Islands Harbor	CIHD_VICT	--	D	Discharge to Doris Drain at S. Victoria Ave.	34.2099	-119.2207

1. T = Tributary to receiving water; D = agricultural Drain
2. All GPS coordinates presented in decimal degrees latitude and longitude in North American Datum 1983 (NAD83).
3. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.

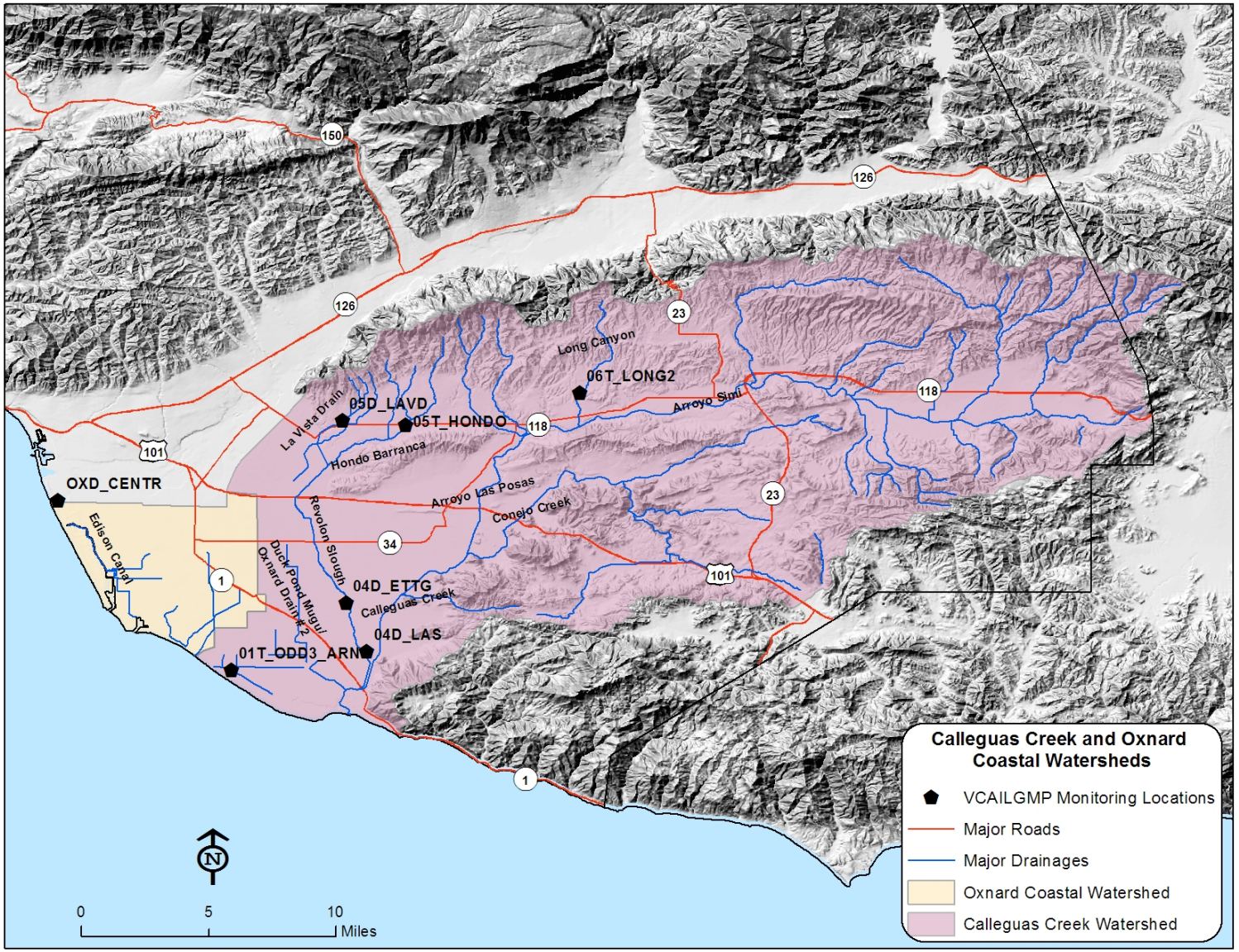


Figure 5. VCAILG Monitoring Sites in the Calleguas Creek/Oxnard Coastal Watersheds

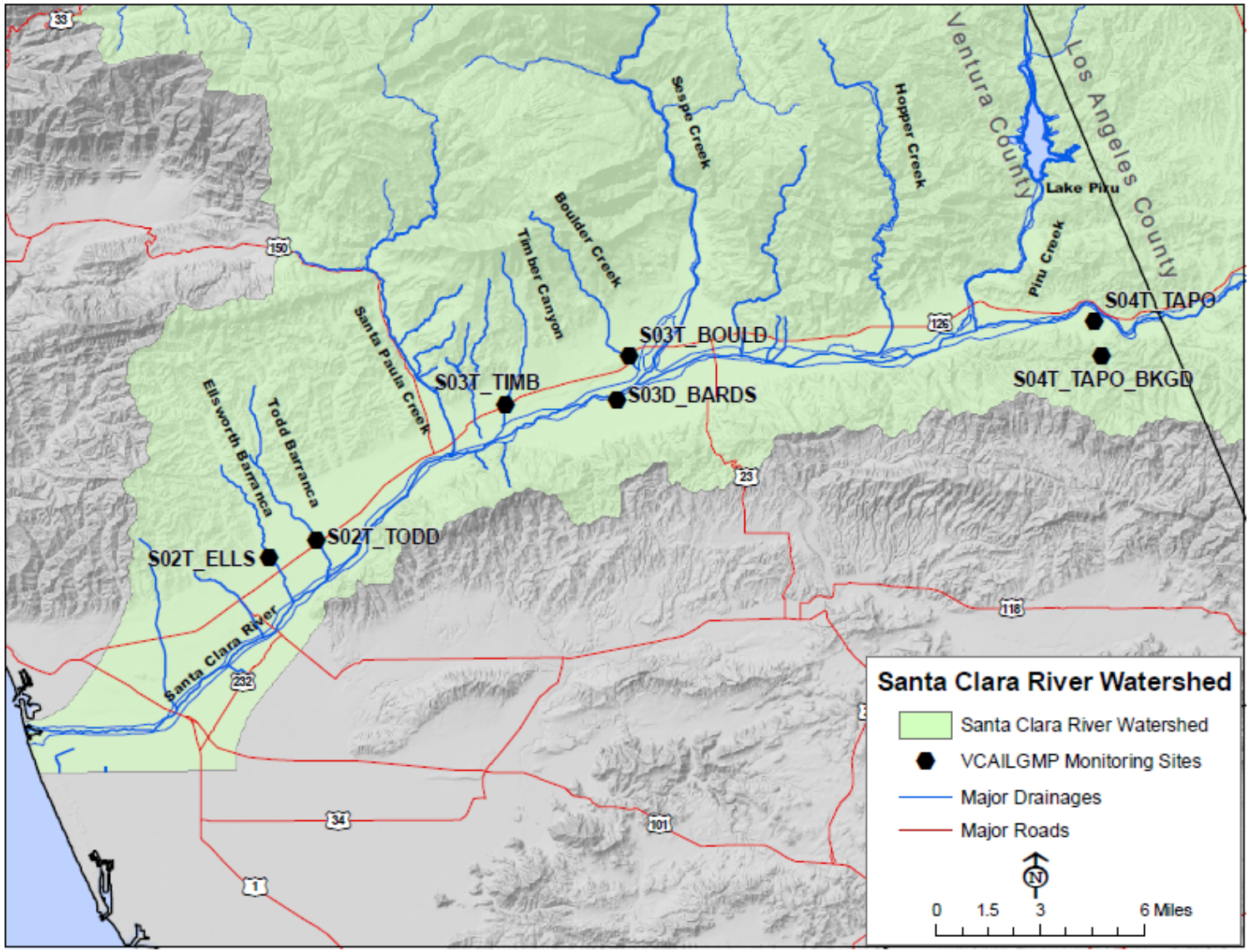


Figure 6. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

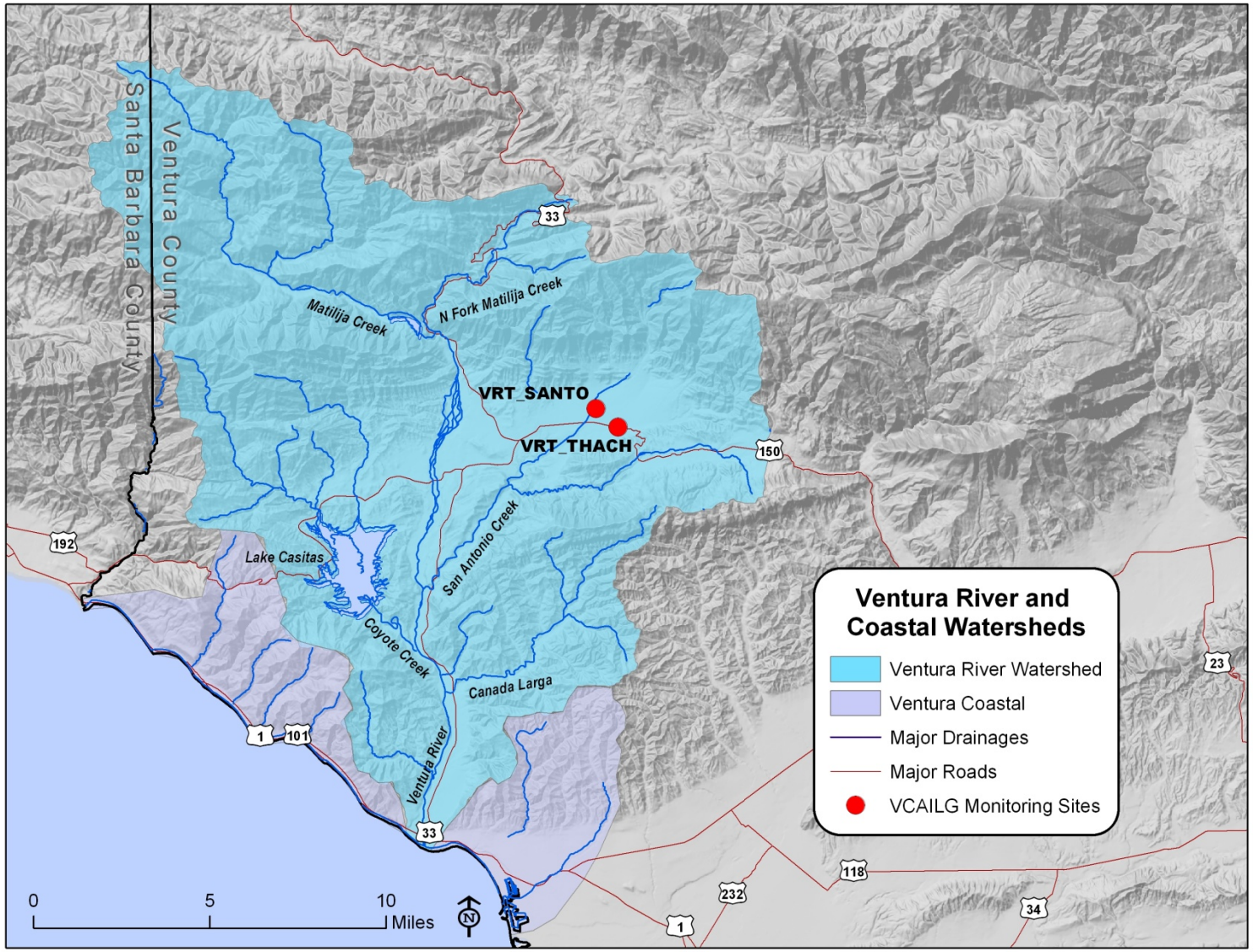


Figure 7. VCAILG Monitoring Sites Located in the Ventura River Watershed

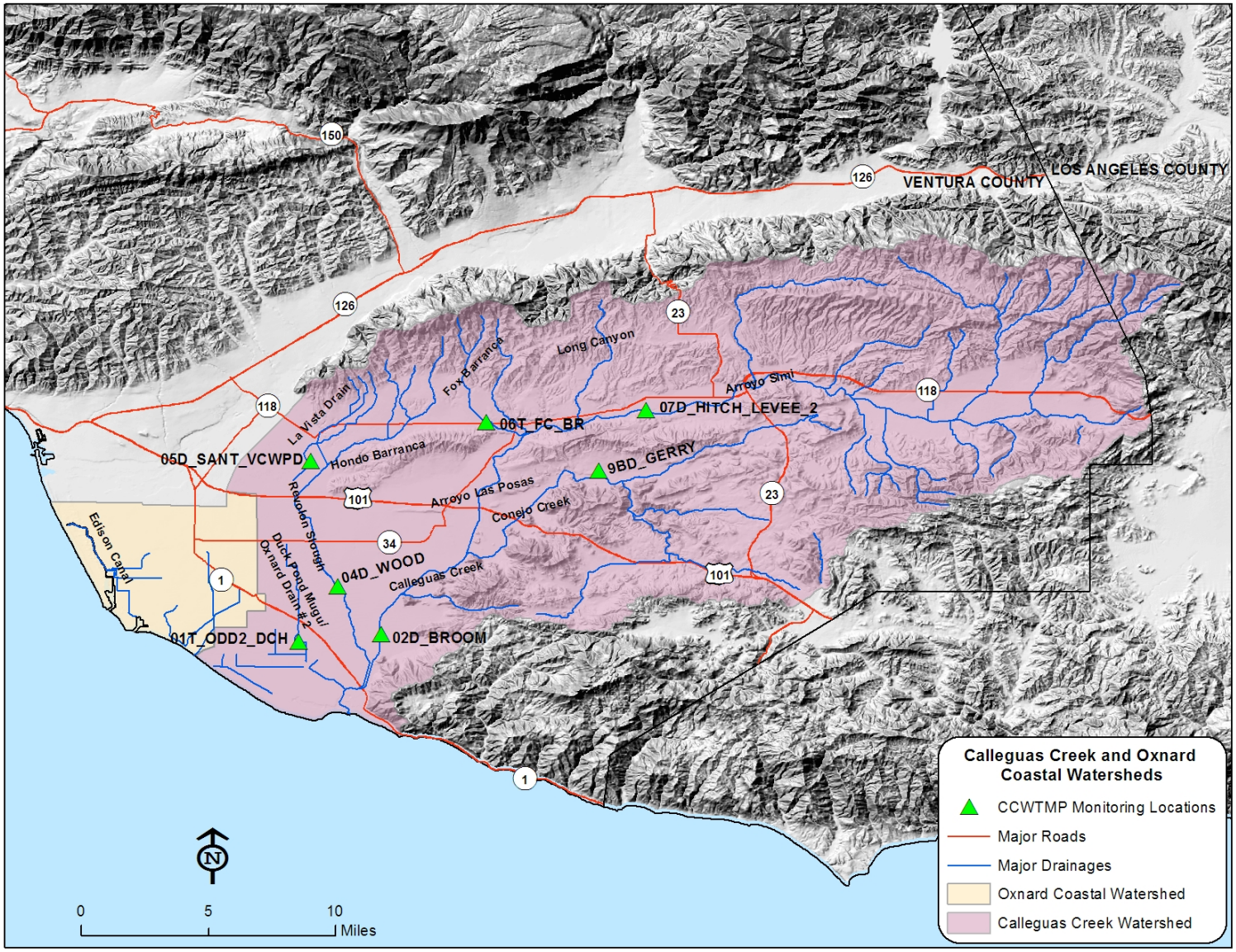


Figure 8. CCWTMP Monitoring Sites

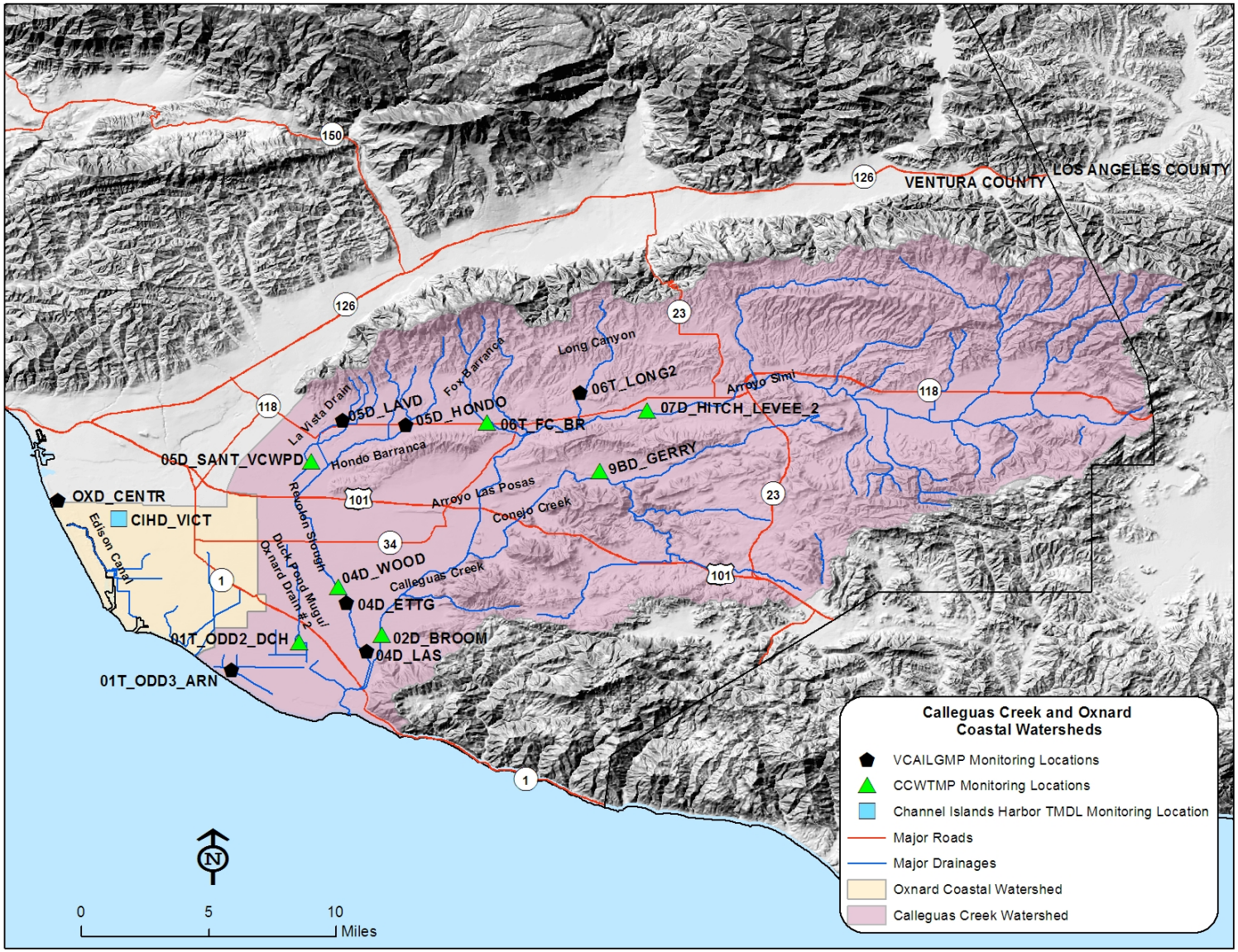


Figure 9. Calleguas Creek and Oxnard Coastal Watershed Monitoring Sites for All Programs

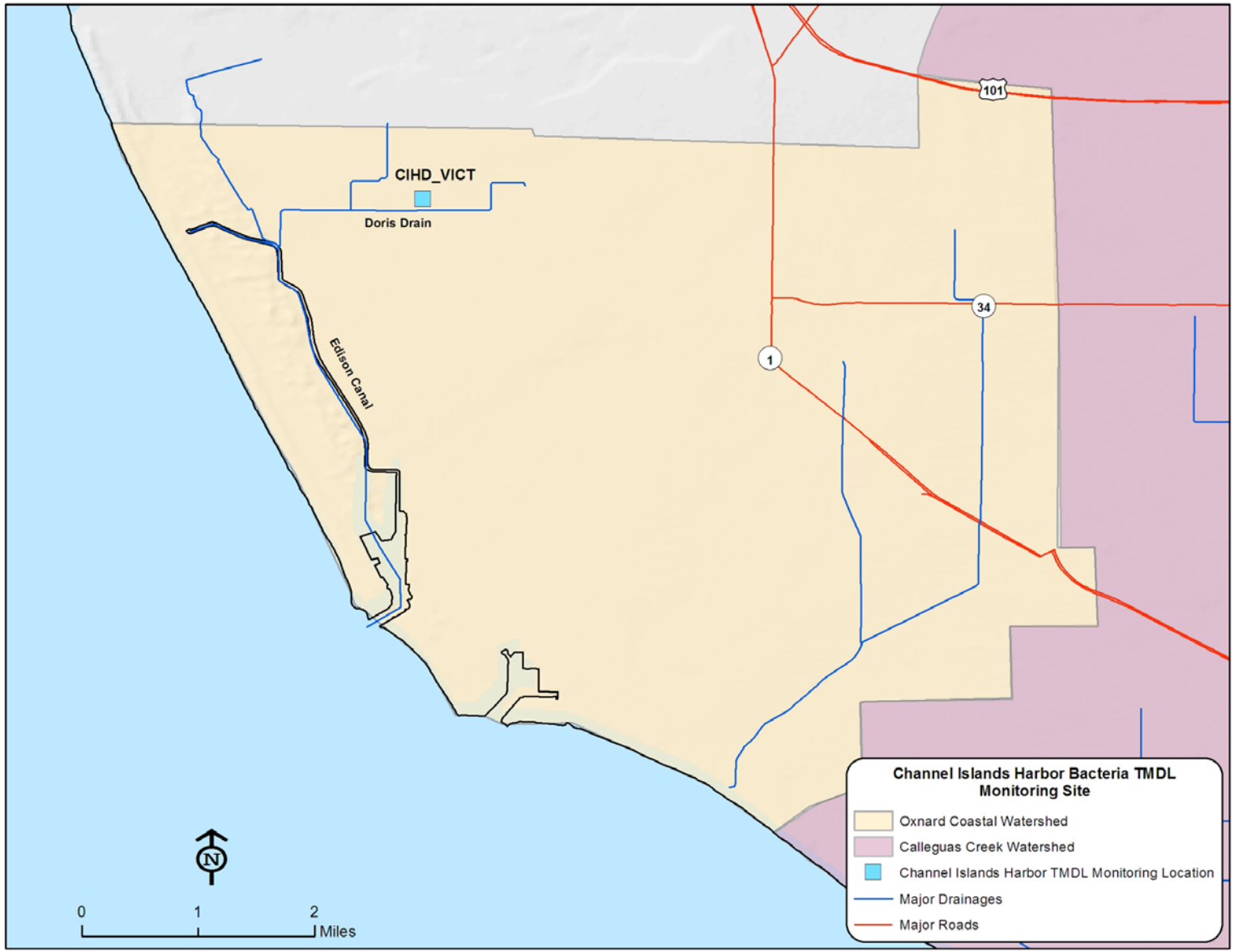


Figure 10. Channel Islands Harbor Bacteria TMDL Monitoring Site

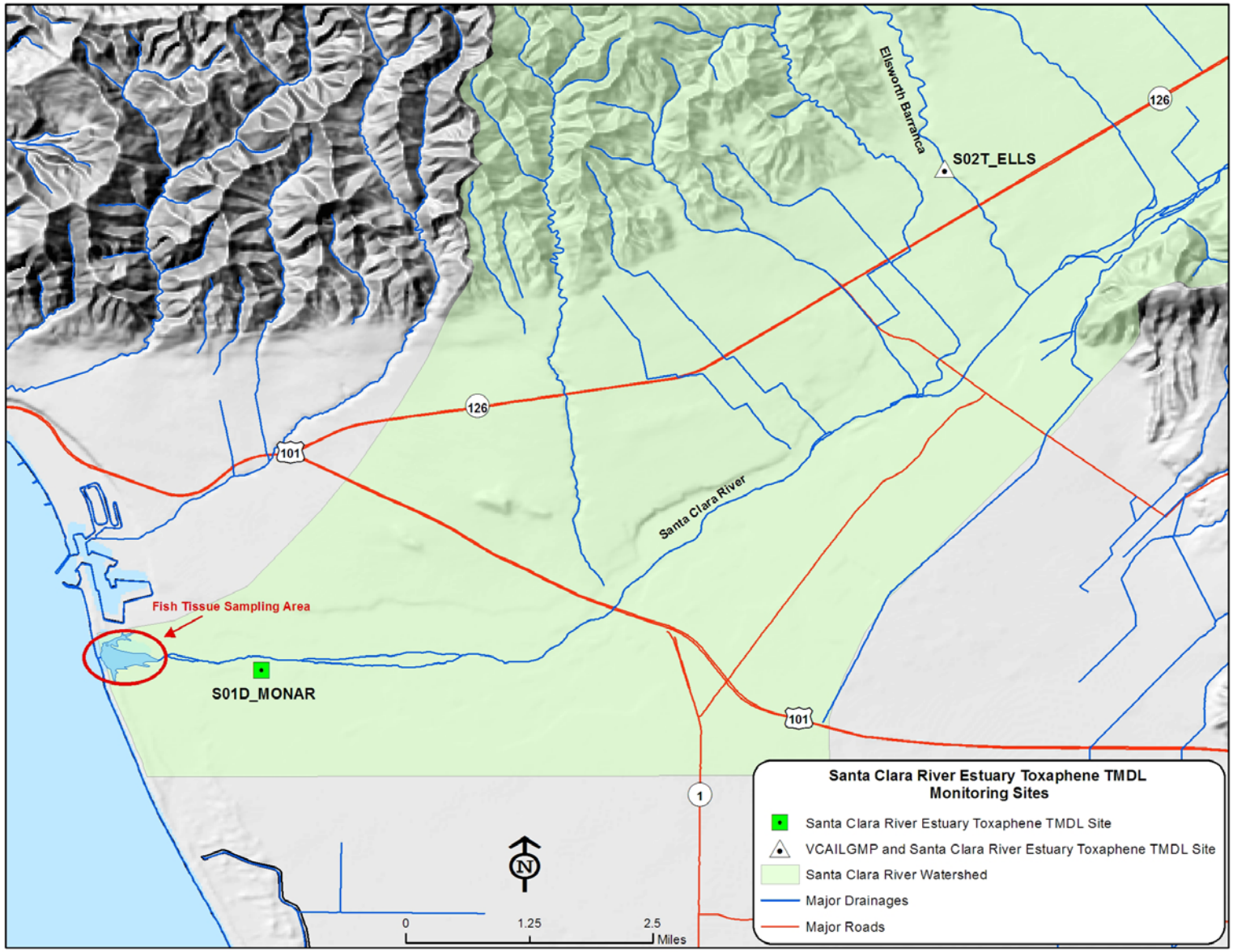


Figure 11. Santa Clara River Estuary Toxaphene TMDL Monitoring Sites

Table 6. Estimated Irrigated Acreage Represented at VCAILG Monitoring Sites

Station ID	Irrigated Agricultural Acreage [1, 2]										Total Drainage Area Acres
	Row Crops	Rotational Crops	Citrus	Avocados	Tree Crops	Strawberries	Other Berries	Sod	Nursery	Other Crops	
01T_ODD3_ARN		765						526			800
04D_ETTG	313	3218	116			533	474		17	164	3,779
04D_LAS	629	1370				549	0.2	47	3		1,339
05D_LAVD	31		151	260		22	198			274	877
05T_HONDO			1126	763			99		5	606	3,928
06T_LONG2		3	492	734		23	270		43	48	2,813
OXD_CENTR	21	1273				906			79		1,243
S02T_ELLS		123	273	379	0.5	27				767	9,015
S02T_TODD		151	288	137	11				46	255	5,748
S03D_BARDS		28	1022	306						2	2,214
S03T_BOULD		8	275	850					175	69	3,764
S03T_TIMB		9	86	381			1			65	2,183
S04T_TAPO		90	34						19		3,686
VRT_SANTO			504	430	2					49	7,220
VRT_THACH			678	124	7				2	186	6,003

1. Data Source: Ventura County Agricultural Commissioner's Office
2. Some acreage is double or triple counted due to multi-cropping practices.

Table 7. Estimated Irrigated Acreage Represented at TMDL Monitoring Sites

Station ID [1]	Irrigated Agricultural Acreage [2, 3]										Total Drainage Area Acres
	Row Crops	Rotational Crops	Citrus	Avocados	Tree Crops	Strawberries	Other Berries	Sod	Nursery	Other Crops	
01T_ODD2_DCH	33	1692				567	98	336		86	1,564
02D_BROOM	28	1297	421	358	1	96	705			516	8,236
04D_WOOD	72	843				10	509		5		470
05D_SANT_VCWPD	154	165	445	196		323	130			33	1,154
06T_FC_BR	2	31	796	155		72	115		55		2,602
07D_HITCH_LEVEE_2		67							47		142
9BD_GERRY			21	111			214			8	447
S01D_MONAR		462				241					209
CIHD_VICT		185				114					99

1. Sites OXD_CENTR and S02T_ELLS are also monitored for specific TMDL constituents; their drainage area and crop type information is listed in the previous table.
2. Data Source Ventura County Agricultural Commissioner's Office
3. Some acreage is double or triple counted due to multi-cropping practices.

PARAMETERS MONITORED AND MONITORING FREQUENCY

Conditional Waiver Monitoring Constituents and Frequency

The Conditional Waiver specifies the constituents to be monitored during each monitoring event (Table 8) as well as the monitoring frequency. Per the Conditional Waiver, monitoring is required twice during the wet season and twice during the dry season. In addition, toxicity monitoring is required during one wet event and once during the dry season each year. The wet season is October 15th through May 15th and the dry season is from May 16th through October 14th. Wet season samples shall be collected within 24 hours of a storm occurring with precipitation totals greater than 0.5 inch. The initial dry weather monitoring event shall be completed after the application of pesticides or fertilizers during the period when irrigation is required.

In 2013-2014, storm monitoring occurred on February 28, 2014. Wet weather toxicity monitoring was completed during this event. No additional storms were sufficient to meet the QAPP criteria for sampling, therefore, a second set of wet weather samples were not collected. Dry weather monitoring occurred on August 22, 2013 and May 29, 2014. A scheduling mistake occurred during the 2012-2013 monitoring year where dry weather toxicity was not monitored. To make up for this oversight, dry weather toxicity samples were collected during both dry weather events during the 2013-2014 monitoring year. Approval from Regional Board staff to make this adjustment to the monitoring schedule was received via email on November 20, 2013.

Table 9 provides a summary of monitoring sites and constituents that were monitored during the wet and dry weather monitoring events in 2013 and 2014. Field measurements were also collected at the sites where samples were collected.

Table 8. Constituents and Monitoring Frequency for the VCAILGMP

Constituent	Frequency [1]
Field Measurements	2 dry events; 2 wet events
Flow, pH, Temperature, Dissolved Oxygen, Turbidity, Conductivity	
General Water Quality Constituents (GWQC)	
Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Hardness, Chloride, Sulfate	
Nutrients	
Total Ammonia-N, Nitrate-N, Phosphate	
Pesticides	
Organochlorine Pesticides [2], Organophosphorus Pesticides [3], Pyrethroid Pesticides [4]	
Metals	
Dissolved Copper, Total Copper	
Trash	
Trash observations	
Aquatic Chronic Toxicity	1 wet event; second dry event

1. The "wet" season is defined as October 15th through May 15th; the "dry" season is defined as May 16th through Ocober 14th each year.
2. Organochlorine Pesticides include: 2,4'-DDD, 2,4'-DDE, 2,4'-DDT, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, adrin, BHC-alpha, BHC-beta, BHC-delta, BHC-gamma, chlordane-alpha, chlordane-gamma, dieldrin, endosulfan sulfate, endosulfan I, endosulfan II, endrin, endrin aldehyde, endrin ketone, and toxaphene.
3. Organophosphorus Pesticides include: bolstar, chlorpyrifos, demeton, diazinon, dichlorvos, disulfoton, ethoprop, fenchlorphos, fensulfothion, fenthion, malathion, merphos, methyl parathion, mevinphos, phorate, tetrachlorvinphos, tokuthion, and trichloronate.
4. Pyrethroid Pesticides include: allethrin, bifenthrin, cyfluthrin, cypermethrin, danitol, deltamethrin, esfenvalerate, fenvalerate, lambda-cyhalothrin, permethrin, and prallethrin.

Table 9. VCAILG Sites Monitored and Constituents Sampled in 2013-2014

Watershed / Subwatershed	Site ID	Reach	Yearly Events [1]		
			Dry 8/22/13	Wet 2/28/14	Dry 5/29/14
Calleguas Creek / Mugu Lagoon	01T_ODD3_ARN	1	WQ, TOX	WQ, TOX [2]	WQ, TOX
Calleguas Creek / Revolon Slough	04D_ETTG	4	WQ	WQ	WQ
	04D_LAS	4	WQ	WQ	WQ
Calleguas Creek / Beardsley Channel	05D_LAVD	5	WQ, TOX [3]	WQ, TOX	WQ, TOX [3]
	05T_HONDO	5	WQ, TOX [3]	WQ, TOX	WQ, TOX [3]
Calleguas Creek / Arroyo Las Posas	06T_LONG2	6	WQ, TOX [3]	WQ, TOX	WQ, TOX [3]
Oxnard Coastal	OXD_CENTR	--	WQ	WQ	WQ
Santa Clara River	S02T_ELLS	2	WQ, TOX [3]	WQ, TOX	WQ, TOX [3]
	S02T_TODD	2	WQ,TOX	WQ, TOX	WQ, TOX
	S03T_TIMB	3	WQ, TOX [3]	WQ, TOX	WQ, TOX [3]
	S03T_BOULD	3	WQ, TOX [3]	WQ, TOX	WQ, TOX [3]
	S03D_BARDS	3	WQ [3]	WQ	WQ
	S04T_TAPO	4	WQ, TOX	WQ, TOX	WQ, TOX
	S04T_TAPO_BKGD	4	WQ [3]	WQ [2]	WQ [3]
Ventura River	VRT_THACH	--	WQ, TOX [3]	WQ, TOX [3]	WQ, TOX [3]
	VRT_SANTO	--	WQ, TOX [3]	WQ, TOX [3]	WQ, TOX [3]

TOX = Toxicity

WQ = All water quality constituents listed in Table 8, excluding toxicity, which is noted separately

1. Toxicity testing was performed during both dry weather events and the storm event.
2. No samplies collected as site was innaccessible.
3. No samples collected due to insufficient flow/dry conditions.

TMDL Monitoring Constituents and Frequency

Monitoring for TMDL compliance is either prescribed in the adopted Basin Plan Amendment, or performed according to a TMDL Monitoring Plan, approved by the Regional Board Executive Officer. The following tables summarize the TMDL monitoring that was performed under the VCAILGMP. When appropriate, TMDL monitoring events were conducted at the same time as Conditional Waiver monitoring.

Calleguas Creek Watershed TMDL monitoring was completed per the CCWTMP QAPP and monitoring approach for the Calleguas Creek Watershed Salts TMDL. The *Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report* describes the TMDL monitoring program and results in detail.[4] All efforts have been made to coordinate the VCAILG monitoring program and CCWTMP when timing sampling events. CCWTMP monitoring is conducted quarterly with an additional two storm events each year. As with the VCAILGMP, only one storm event was sampled during the 2013-2014 monitoring year for the CCWTMP.

Table 10. Constituents and Frequency for TMDL Monitoring Performed Under the VCAILGMP

Site ID	Constituent [1]	Frequency
S01D_MONAR	Field Measurements TSS, toxaphene, chlordane, dieldrin (water)	2 dry events; 2 wet events
	Field Measurements Toxaphene, chlordane, dieldrin (filtered sediment)	2 wet events
S02T_ELLS	Toxaphene, chlordane, dieldrin (filtered sediment) [2]	2 wet events
Santa Clara River Estuary	Toxaphene, chlordane, dieldrin (fish tissue)	Every three years
CIHD_VICT	Field Measurements *E. coli*, enterococcus, total coliform, fecal coliform	2 dry events; 2 wet events
OXD_CENTR	Total organic carbon, total PCBs (water)	2 dry events; 2 wet events [2]
	Total organic carbon, total PCBs, DDT and derivatives, dieldrin, total chlordane (sediment)	Once after 1st rain event; once after the wet season [2]

1. This table only lists constituents necessary for data comparison with TMDL LAs that are not already collected at the specified site as part of the Table 8 VCAILGMP sampling.
2. TMDL monitoring at OXD_CENTR is for compliance with the McGrath Lake TMDL, which became effective after the adoption of the Conditional Waiver. Monitoring was conducted according to the September 21, 2012 conditional approval letter of the MRP and QAPP for the McGrath Lake TMDL Phase 1 Monitoring Program.

[4] Larry Walker Associates. 2014. Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report. December 15, 2014.

Table 11. TMDL Sites Monitored and Constituents Sampled in 2013-2014

TMDL	Site ID	Yearly Events			
		Dry 8/22/13	Wet 2/28/14	Post-Rain [1] 3/7/14	Dry 5/29/14
Santa Clara River Estuary Toxaphene TMDL	S01D_MONAR	OC-W TSS [2]	OC-W OC-S TSS		OC-W TSS [2]
	S02T_ELLS	OC-W TSS [2]	OC-W OC-S TSS [2]		OC-W TSS [2]
	Santa Clara River Estuary	Frequency is every three years. Fish collection was not required this monitoring year			
Channel Islands Harbor Bacteria TMDL	CIHD_VICT	Bact [2]	Bact		Bact [2]
McGrath Lake PCBs, Pesticides and Sediment Toxicity TMDL	OXD_CENTR	OC-PCB-W TOC TSS	OC-PCB-W TOC TSS	OC-PCB-S TOC	OC-PCB-W OC-PCB-S TOC TSS

OC-W = OC pesticides toxaphene, chlordane, and dieldrin in water
OC-S = OC pesticides toxaphene, chlordane, and dieldrin in filtered sediment
Bact = *E. coli*, enterococcus, total coliform, fecal coliform
OC-PCB-W = OC pesticides chlordane, dieldrin, DDT and derivatives, total PCBs in water
OC-PCB-S = OC pesticides chlordane, dieldrin, DDT and derivatives, total PCBs in sediment
TOC = Total Organic Carbon
TSS = Total Suspended Solids
1. Event specific to monitoring sediment for the McGrath Lake TMDL.
2. Site not sampled due to insufficient flow/dry conditions.

SAMPLING METHODS

The VCAILG QAPP contains requirements for sampling procedures that are designed to ensure that high-quality data are generated through the VCAILGMP. Field crews are trained to adhere strictly to standard operating procedures for all aspects of monitoring, including use of sample containers that are appropriate to each constituent or constituent group analyzed, avoiding potential sources of contamination, and accurately completing field log sheets and chain-of-custody forms, to name a few examples.

Samples collected during the wet event in January were collected either by the direct immersion technique or by using a secondary container; filled sample containers were immediately put on ice in an ice chest. A secondary container is always used at 01T_ODD3_ARN, where a grab pole with a secured secondary container must be used to reach out into the channel. During the wet event (Event 20), samples taken from 05D_LAVD, 05T_HONDO, and S04T_TAPO were collected using intermediate containers; all other samples were collected by direct immersion. For Event 19, intermediate containers were used at 01T_ODD3_ARN, S02T_TODD, and S04T_TAPO. Sediment collection at OXD_CENTR was performed using a scoop to fill the sample containers. Notes regarding sample bottle fill method and sample collection depth can be found in the field log sheets (Appendix B).

Flow measurements were performed according to the standard operating procedure included in Appendix C-1 of the QAPP using either current-meter or float measurements. During wet

events, the float method of measuring flow is most practical. At some sites, channel depth was estimated using a reference photo, painted gauge, or other appropriate tool. Estimated flows are qualified as such in the field data (Appendix C) and site summary tables. *Flow estimates made during the wet event, therefore, should be regarded as gross estimates and used with discretion.* Flow measurements were made according to the standard operating procedure included in Appendix C-1 of the QAPP, as previously noted.

During all monitoring events, a Hydrolab MS5 Data Sonde was used to measure a number of parameters in situ, including temperature, pH, dissolved oxygen, conductivity, and turbidity. Data and information collected at each monitoring site were recorded on a field log sheet. The completed field log sheets for each event are included with this Annual Report as Appendix B, which is included on the Annual Report Data CD. Information recorded on the field log sheet at each monitoring site includes the following:

- Field crew initials;
- Date and time samples were collected;
- Water quality results for constituents measured using field probes (pH, temperature, conductivity, etc.);
- Measurements supporting flow calculations (channel width, depth, water velocity);
- Observations regarding the weather, water color and odor, contact and non-contact recreation, instream activity, the presence of foreign matter, trash counts and types, wildlife, etc.;
- Vegetation and channel substrate (*i.e.*, concrete, cobble, sand, etc.) observations.

Information entered on field log sheets is ultimately entered into the VCAILGMP database for reporting. Field data are included with this Annual Report in Appendix C, which can be found on the Annual Report Data CD. Photo documentation of each monitoring site for all four events is also included on the Annual Report Data CD as Appendix D.

Samples were transported back to FGL Environmental Laboratory in Santa Paula, where chain-of-custody documentation was completed and toxicity samples were prepared for overnight delivery to the toxicity testing laboratory Pacific EcoRisk (PER). A courier picked up the samples to be analyzed at Physis Environmental Laboratories and delivered them according to the requirements of the QAPP.

The completed Chain-of-Custody (COC) forms are included this Annual Report as Appendix E; also included on the Annual Report Data CD.

ANALYTICAL METHODS

Table 12 provides a summary of analytical methods used by contract laboratories for analyzing samples collected for Conditional Waiver constituents during the 2013-2014 monitoring year. Table 13 lists analytical methods for TMDL constituents monitored as part of the VCAILGMP. Refer to the CCWTMP QAPP for methods used on samples collected at CCW agricultural land use sites.

Table 12. Analytical Methods for Conditional Waiver Constituents

Constituent	Analytical Method
Aquatic Chronic Toxicity [1]	
Ceriodaphnia dubia (water flea) [2]	EPA-821-R-02-013 and EPA 600-4-91-002
Pimephales promelas (fathead minnow) [3]	
Selenastrum capricornutum (green algae) [4]	
General Water Quality Constituents (WQ)	
Flow, pH, Temperature, Dissolved Oxygen, Conductivity, Turbidity	Field Measurement
Total Dissolved Solids (TDS)	SM 2540C
Total Suspended Solids (TSS)	SM 2540D
Chloride	EPA 300.0
Sulfate	EPA 300.0
Hardness	SM 2340B
Nutrients	
Total Ammonia-N	SM 4500-NH_3F
Nitrate-N	EPA 300.0
Phosphate (Total Orthophosphate as P)	SM4500-PE
Metals	
Total and Dissolved Copper	EPA 200.8
Organic Constituents [5]	
Organochlorine Pesticides [6]	EPA 625
Organophosphorus Pesticides	EPA 625
Pyrethroid Pesticides	EPA 625-NCI

1. Chronic toxicity tests were performed on three species for the first toxicity monitoring event where water was present at each particular site, after which the most sensitive species was selected for use in subsequent monitoring events.
2. If sample conductivity exceeded 3000 uS/cm, *Hyalella azteca* was used for toxicity testing.
3. If sample conductivity exceeded 3000 uS/cm, *Menidia beryllina* was used for toxicity testing.
4. If sample conductivity exceeded 3000 uS/cm, *Thalassiosira pseudonana* was used for toxicity testing.
5. See Table 8 for the list of constituents in each pesticide group.
6. Toxaphene is analyzed using EPA 625-NCI.

Table 13. TMDL Analytical Methods for Laboratory Analyses Performed Under the VCAILGMP

Constituent [1]	Analytical Method
OC Pesticides (filtered sediment)	EPA 8270C
OC Pesticides (fish tissue)	EPA 8280C
E. coli	9223B
Enterococcus	Indexx Enterolert
Total coliform	9221B
Fecal coliform	9221E
Total organic carbon (TOC) (water)	5310C
PCBs (water)	EPA 625
Total organic carbon (TOC) (sediment)	EPA 9060A
OC Pesticides (sediment)	EPA 8270C
PCBs (sediment)	EPA 8270C

1. Listed constituents are those that are required by a TMDL and not already listed in the previous table.

STANDARD WATER QUALITY BENCHMARKS

The Conditional Waiver requires that if monitoring data exceeds applicable benchmarks, a WQMP designed to reduce pollutant loading to surface waters must be developed to address those exceedances. This section presents the water quality benchmarks as specified in the Conditional Waiver (R4-2010-0186) used to evaluate monitoring data collected at VCAILG monitoring sites in 2013 through 2014. Benchmarks used for determining exceedances of the standard water quality benchmarks include numeric and narrative water quality objectives contained in Appendix 2 of the Conditional Waiver, which consist of narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule (CTR). In instances where the Conditional Waiver references the Basin Plan or CTR, without specifying a benchmark number, the lowest applicable number was selected for each watershed. The Conditional Waiver also includes effective TMDL LAs as water quality benchmarks. Following the compilation of standard water quality benchmarks, VCAILG monitoring sites, and corresponding monitoring data, is a section evaluating TMDL LAs attainment at the TMDL monitoring locations.

Several of the narrative water quality objectives contained in the Basin Plan specify that discharges of wastes to receiving waters cannot alter "natural" or "ambient" conditions above or below a stated level. Many of the VCAILG monitoring sites are located on agricultural drains that discharge to receiving waters. Because "natural" and "ambient" conditions have not been established in receiving waters or are non-existent on agricultural drains and ephemeral streams, monitoring data from sites located on agricultural drains are evaluated based on the assumption that if benchmarks are not exceeded in the agricultural drain, it is unlikely that the discharge from that drain will cause benchmark exceedances in the receiving water.

Table 14. Standard Water Quality Benchmarks Derived From Narrative Objectives and Toxicity

Constituent	Watershed [1]	Narrative Objective [2]	Applicable Benchmark
pH	CC, OXD, SCR, VR	The pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed by more than 0.5 pH units from natural conditions as a result of waste discharges.	$6.5 \leq pH \leq 8.5$ Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Temperature	CC, OXD, SCR, VR	For waters designated WARM, water temperature shall not be altered by more than 5°F above the natural temperature. At no time shall WARM-designated waters be raised above 80°F as a result of waste discharges.	WARM: $\leq$ 80°F Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
	SCR, VR	For waters designated COLD, water temperature shall not be altered by more than 5°F above the natural temperature.	COLD: No numeric benchmark. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Dissolved Oxygen	OXD	No single dissolved oxygen determination shall be less than 5 mg/L, except when natural conditions cause lesser concentrations.	$\geq$ 5 mg/L
	CC, SCR, VR	The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges.	WARM: $\geq$ 5 mg/L
	SCR, VR	The dissolved oxygen content of all surface waters designated as COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.	COLD, SPWN: $\geq$ 7 mg/L
Turbidity	CC, OXD, SCR, VR	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: ▪ Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%; ▪ Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.	No numeric benchmarks. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Biostimulatory Substances	CC, OXD, SCR, VR	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	No numeric benchmarks. Waterbody-specific benchmarks for nutrients are listed in Table 16.
Total Suspended Solids (TSS)	CC, OXD, SCR, VR	Wastes shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.	No numeric benchmarks.
Pesticides	CC, OXD, SCR, VR	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	No numeric benchmarks. Applicable benchmarks for specific pesticides are listed in Tables 18, 19, and 20.
Toxicity	CC, OXD, SCR, VR	All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal or aquatic life. There shall be no chronic toxicity in ambient waters outside mixing zones.	$\leq$ 1.0 TUc [3] Benchmarks for specific potentially toxic constituents are listed in Tables 16 through 20.

1. CC = Calleguas Creek Watershed OXD = Oxnard Coastal Watershed SCR = Santa Clara River Watershed VR = Ventura River Watershed
2. Source: Water Quality Control Plan, Los Angeles Region (Basin Plan), 1994.
3. Source: "Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands," Order No. R4-2010-0186, Los Angeles Regional Water Quality Control Board, adopted October 7, 2010.

Table 15. Standard Water Quality Benchmarks for Salts and Nutrients (Basin Plan Table 3-8 Numeric Water Quality Objectives)

Watershed / Reach	Reach Description	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Nitrogen (mg/L)	Ammonia [1] (mg/L)	Phosphate (mg/L)
CC below Potrero Rd.	-----	-----	-----	-----	10 [2]	pH, temperature dependent	-----
CC above Potrero Rd.	-----	150	250	850	10 [3]	pH, temperature dependent	-----
OXD	-----	-----	-----	-----	10 [2]	pH, temperature dependent	-----
SCR Reach 1	Tidally-influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----	10 [2]	pH, temperature dependent	-----
SCR Reach 2	Upstream of Hwy 101 Bridge to Freeman Diversion	150	600	1200	10 [2]	pH, temperature dependent	-----
SCR Reach 3	Upstream of Freeman Diversion to A Street Bridge in Fillmore	100 [4]	650	1300	5 [3]	pH, temperature dependent	-----
SCR Reach 4	Upstream of A Street Bridge in Fillmore to Blue Cut Gaging Station	100	600	1300	5 [3]	pH, temperature dependent	-----
VR Reach 4	Between Camino Cielo Rd. and Casitas Vista Rd.	60	300	800	5 [3]	pH, temperature dependent	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

1. Ammonia benchmarks are based on 1) freshwater ammonia objectives as calculated according to LARWQCB Resolutions 2002-011 and 2005-014, and 2) saltwater ammonia objectives as calculated according to LARWQCB Resolution 2004-022. Ammonia objectives are calculated based on the pH and temperature of the receiving water measured at the time of sample collection for ammonia analysis. Ammonia objectives used as benchmarks are chronic, 30-day averages.
2. There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N was used for comparison with VCAILG data collected at monitoring sites in this reach.
3. The Nitrogen benchmark listed is as Nitrate-N plus Nitrite-N.
4. The 100 mg/L benchmark for chloride is the revised water quality objective adopted by the Regional Board in Resolution 2003-015.

Table 16. Standard Water Quality Benchmarks for Copper

Constituent	Freshwater [1, 2]		Brackish or Saltwater [1]	
	Benchmark (µg/L)	Benchmark Source	Benchmark (µg/L)	Benchmark Source
Copper	$= \mathbf{0.96}e^{[\mathbf{0.8545}(\ln hardness)+(-\mathbf{1.702})]}$	CTR CCC [3]	3.1	CTR CCC [3]

1. Freshwater benchmark applies to discharges to waters with salinities <1 ppt at least 95% of the time. Saltwater benchmark applies when salinities are ≥10 ppt at least 95% of the time. For discharges between these categories, or tidally influenced freshwater that supports EST beneficial uses, the lower criteria of the two shall be used; which is the saltwater benchmark.
2. As per footnote "m" to the Table in Paragraph (b)(1) of the CTR; "The freshwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column." In instances where the measured hardness is >400 mg/L as $CaCO_3$, a hardness of 400 is used to calculate the benchmark. This was done in accordance with CTR §31692, f. Hardness.
3. CTR = California Toxics Rule (USEPA, May 18, 2000).
   CCC = Criteria Continuous Concentration

Table 17. Standard Water Quality Benchmarks for Organochlorine Pesticides

Constituent	CC Watershed		OXD, SCR Watersheds		VR Watershed	
	Benchmark (ug/L)	Benchmark Source [1]	Benchmark (ug/L)	Benchmark Source [1]	Benchmark (ug/L)	Benchmark Source [1]
Aldrin	0.00014	CTR HHO	0.00014	CTR HHO	0.00013	CTR HHWO
Alpha-BHC	0.013	CTR HHO	0.013	CTR HHO	0.0039	CTR HHWO
Beta-BHC	0.046	CTR HHO	0.046	CTR HHO	0.014	CTR HHWO
Gamma-BHC (Lindane)	0.063	CTR HHO	0.063	CTR HHO	0.019	CTR HHWO
Delta-BHC	-----	-----	-----	-----	-----	-----
Chlordane-alpha	-----	-----	-----	-----	-----	-----
Chlordane-gamma	-----	-----	-----	-----	-----	-----
Chlordane, sum	0.00059	CTR HHO	0.00059	CTR HHO	0.00059	CTR HHO
2,4'-DDD	-----	-----	-----	-----	-----	-----
2,4'-DDE	-----	-----	-----	-----	-----	-----
2,4'-DDT	-----	-----	-----	-----	-----	-----
4,4'-DDD	0.00084	CTR HHO	0.00084	CTR HHO	0.00084	CTR HHO
4,4'-DDE	0.00059	CTR HHO	0.00059	CTR HHO	0.00059	CTR HHWO
4,4'-DDT	0.00059	CTR HHO	0.00059	CTR HHO	0.00059	CTR HHWO
Dieldrin	0.00014	CTR HHO	0.00014	CTR HHO	0.00014	CTR HHWO
Endosulfan I	0.056	CTR AFWC	0.056	CTR AFWC	0.056	CTR AFWC
Endosulfan II	0.056	CTR AFWC	0.056	CTR AFWC	0.056	CTR AFWC
Endosulfan Sulfate	240	CTR HHO	240	CTR HHO	110	CTR HHWO
Endrin	0.036	CTR AFWC	0.036	CTR AFWC	0.036	CTR AFWC
Endrin Aldehyde	0.81	CTR HHO	0.81	CTR HHO	0.76	CTR HHWO
Endrin Ketone	-----	-----	-----	-----	-----	-----
Toxaphene	0.00075	CTR HHO	0.00075	CTR HHO	0.00075	CTR HHO

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

1. CTR = California Toxics Rule (USEPA, May 18, 2000).
   HHO = Human Health for Consumption of Organisms Only (30-day average)
   HHWO = Human Health for Consumption of Water and Organisms (MUN-designation) (30-day average)
   FWC = Aquatic Life, Freshwater Chronic (4-day average)

Table 18. Standard Water Quality Benchmarks for Organophosphorus Pesticides

Constituent	CC, OXD, SCR, VR Watersheds Benchmark (ug/L) [1]
Bolstar	-----
Chlorpyrifos	0.025
Demeton	-----
Diazinon	0.10
Dichlorvos	-----
Disulfoton	-----
Ethoprop	-----
Fenchlorophos	-----
Fensulfothion	-----
Fenthion	-----
Malathion	-----
Merphos	-----
Methyl Parathion	-----
Mevinphos	-----
Phorate	-----
Tetrachlorvinphos	-----
Tokuthion	-----
Trichloronate	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

1. Benchmarks are from Appendix 2 of the Conditional Waiver

Table 19. Standard Water Quality Benchmarks for Pyrethroid Pesticides

Constituent	CC, OXD, SCR, VR Watersheds Benchmark (ug/L) [1]
Allethrin	-----
Bifenthrin	-----
Cyfluthrin	-----
L-Cyhalothrin	-----
Cypermethrin	-----
Danitol	-----
Deltamethrin	-----
Esfenvalerate	-----
Fenvalerate	-----
Permethrin	-----
Prallethrin	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

1. There currently are no Conditional Waiver benchmarks in effect for these watersheds.

WATER QUALITY MONITORING RESULTS

This section contains a summary of water quality monitoring data collected at VCAILG sites where flow was present during the three monitoring events conducted in 2013-2014. Information presented for each VCAILG monitoring site includes the receiving water of the drainage monitored, a site location map, a site photo, and a narrative summary of which events were monitored, exceedances (if any) of standard water quality benchmarks, and unusual occurrences (if any) from each event. The predominant crop type(s) potentially contributing to the flow at each monitoring site is also noted in this section; this information is also listed in Table 6. All constituents listed in Appendix 2 of the Conditional Waiver are included in the data tables for each site. Additional constituents are listed only if they have been detected at a particular site. Non-detect data is included with all of the water quality monitoring data for 2013-2014 as Appendix F on the Annual Report Data CD. All hard copy laboratory reports are also included on the Data CD. Results summarized in this section are compared with Conditional Waiver standard water quality benchmarks from Appendix 2 and specified in Table 14 through Table 19 where applicable, all exceedances are indicated in **bold type** in the data tables.

Any data reported by the laboratory in units of ng/L were converted to µg/L for comparison with benchmarks expressed in units of µg/L. Results reported by the laboratory as "Total Orthophosphate as P" were converted to "Total Orthophosphate" by multiplying the result by the molecular weight of phosphate (95 g/mol) and dividing the product by the molecular weight of phosphorus (31 g/mole). The converted result is reported as "Total Orthophosphate" on data tables presented in this section. The electronic data file remains unconverted and is labeled "Total Orthophosphate-P."

Results of toxicity tests conducted during the 2013-2014 monitoring year are discussed separately in a subsequent section.

All analyses included in this report were conducted at a laboratory certified for such analyses by the California Department of Health Services – Environmental Laboratory Accreditation Program (ELAP) or the National Environmental Laboratory Accreditation Program (NELAP), and in accordance with current USEPA guidance procedures, or as specified in this Monitoring Program.

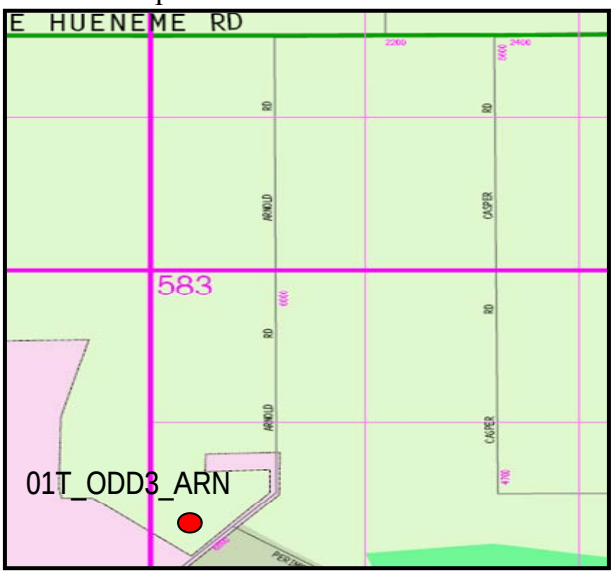
Calleguas Creek Watershed

The Calleguas Creek Watershed contains six VCAILG monitoring sites. Monitoring sites are discussed below in order of the Calleguas Creek reach into which they drain.

01T_ODD3_ARN

Rio de Santa Clara / Oxnard Drain No. 3. The monitoring site is located on an agricultural drain just upstream from the Arnold Road Bridge. Flow from this drain eventually discharges into the western arm of Mugu Lagoon (Calleguas Creek Reach 1). Because the site is tidally influenced, an attempt is made to conduct monitoring at this site approximately one-half hour after low tide.

Site Map



View downstream at sampling point

Samples were collected at this site during two of the three 2013-2014 monitoring events; the site was inaccessible due to the flooding and blockage of Arnold Road during Event 20. Table 20 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. Flow is not measured at this site because it is unsafe to do so. Table 21 summarizes the trash observations for each event. This area is frequently used by bird watchers and others participating in non-contact recreation. The trash found near the monitoring site is not specific to agriculture.

Exceedances of the nitrate and DDT compounds occurred during both dry events at this site during the 2013-2104 monitoring year. The dissolved copper benchmark was exceeded during the second dry event. There were no wet weather exceedances as no samples were collected during Event 20 due to the site being inaccessible. Row crops and sod are the primary crop types in the vicinity of this site.

Table 20. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD3_ARN

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		N/A		N/A
pH		6.5≤ pH ≤ 8.5	7.58		8.05
Temperature	°C		17.84		26.95
Dissolved Oxygen	mg/L	≥ 5	5.86		19.96
Turbidity	NTU		38		81.8
Conductivity	µS/cm		4390		7913
General Water Quality					
Total Dissolved Solids (TDS)	mg/L		3520		5560
Total Suspended Solids (TSS)	mg/L		40.8		116
Total Hardness as $CaCO_3$	mg/L		1607.5		1911.6
Chloride	mg/L		710		1720
Sulfate	mg/L		2050		1590
Nutrients					
Ammonia-N	mg/L	4.36/ NS/ 0.61[2]	0.07		0.05
Nitrate-N	mg/L	10[3]	**29.96**		**53.94**
Total Orthophosphate	mg/L		0.3984		0.6129
Metals					
Dissolved Copper	µg/L	3.1[4]	2.49	NS[1]	**4.08**
Total Copper	µg/L		4.07		5.38
Organochlorine Pesticides					
Aldrin	µg/L	0.00014	ND		ND
BHC-alpha	µg/L	0.013	ND		ND
BHC-beta	µg/L	0.046	ND		ND
BHC-gamma	µg/L	0.063	ND		ND
Chlrodane-alpha	µg/L		ND		ND
Chlordane-gamma	µg/L		ND		ND
Total Chlordane	µg/L	0.00059	ND		ND
4,4'-DDD	µg/L	0.00084	**0.0054**		**0.0082**
4,4'-DDE	µg/L	0.00059	**0.0152**		**0.0233**
4,4'-DDT	µg/L	0.00059	ND		**0.0056**
Dieldrin	µg/L	0.00014	ND		ND
Endosulfan-I	µg/L	0.056	ND		ND
Endosulfan-II	µg/L	0.056	ND		ND
Endosulfan Sulfate	µg/L	240	ND		ND
Endrin	µg/L	0.036	ND		ND
Endrin Aldehyde	µg/L	0.81	ND		ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Toxaphene	µg/L	0.00075	**0.19685**		DNQ
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	ND		ND
Diazinon	µg/L	0.1	ND		ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. No samples collected due to the site being inaccessible from road flooding.
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the Basin Plan Amendment to Update Saltwater Ammonia Objectives (LARWQCB Resolution No. 2004-022). The benchmarks are based on the chronic saltwater equation and are dependent upon the pH, temperature, and salinity of the water at the time of sample collection.
3. There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L nitrate-N was used for comparison with VCAILG data for this site.
4. Copper benchmark for saltwater applies at this site as prescribed in Table 16.

Table 21. 2013 - 2014 Trash Observations for 01T_ODD3_ARN

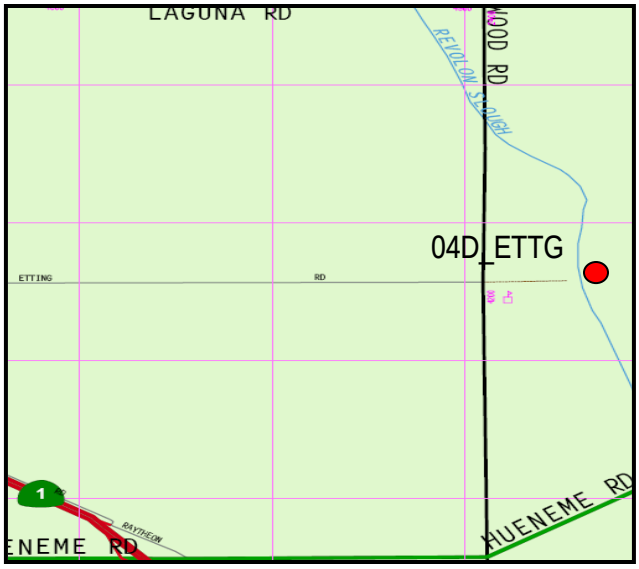
Event	Count	Types
Event 19	>10	Aluminum cans, Styrofoam
Event 20	NS[1]	N/A
Event 21	20-30	Plastic bottles, Styrofoam, tire

1. No samples collected due to the site being inaccessible because of road flooding.

04D_ETTG

This monitoring site is located on an agricultural drain just upstream from its confluence with Revolon Slough, just east of the intersection of Wood Road and Etting Road. Flow from this drain eventually discharges into Calleguas Creek Reach 4 (Revolon Slough).

Site Map



View toward SW looking downstream an ag drain before the confluence with Revolon

Flow was present at this site during every monitoring event. Table 22 contains a summary of concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. The approximate amount and types of trash observed at this site is recorded in Table 23.

Concentrations of nitrate, copper, and DDT compounds exceeded benchmarks during all three monitoring events. In addition, there were exceedances of the total chlordane, toxaphene, and chlorpyrifos benchmarks during wet weather (Event 20). Row crops are the most common crops grown within this site drainage area. Additional crop types include strawberries, other berries (such as raspberries or blueberries), and citrus.

Table 22. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_ETTG

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		7.91	71.66	2.49
pH		6.5≤ pH ≤ 8.5	19.87	7.45	7.9
Temperature	°C	≤ 26.67°C[1]	8.69	15.7	23.55
Dissolved Oxygen	mg/L	≥ 5	10.9	7.87	15.53
Turbidity	NTU		3736	1249	4.5
Conductivity	µS/cm		7.91	2087	3897
General Water Quality					
Total Dissolved Solids (TDS)	mg/L		3180	1570	3190
Total Suspended Solids (TSS)	mg/L		15.7	1510	5.11
Total Hardness as $CaCO_3$	mg/L		1711.7	746.4	1690.6
Chloride	mg/L		330	165	241
Sulfate	mg/L		1820	698	1550
Nutrients					
Ammonia-N	mg/L	1.95/ 4.22/ 1.56[2]	0.34	1.27	0.1
Nitrate-N	mg/L	10[3]	**45.48**	**42.68**	**47.51**
Total Orthophosphate	mg/L		5.2403	2.2065	1.7774
Metals					
Dissolved Copper	µg/L	3.1[4]	**6.34**	**4.59**	**4.30**
Total Copper	µg/L		5.00	79.68	3.75
Organochlorine Pesticides					
Aldrin	µg/L	0.00014	ND	ND	ND
BHC-alpha	µg/L	0.013	ND	ND	ND
BHC-beta	µg/L	0.046	ND	ND	ND
BHC-gamma	µg/L	0.063	ND	ND	ND
trans-Nonachlor	µg/L		ND	0.0091	ND
Chlordane-alpha	µg/L		ND	0.108	ND
Chlordane-gamma	µg/L		ND	0.0106	ND
Total Chlordane	µg/L	0.00059	ND	**0.0214**	ND
2,4'-DDD	µg/L		DNQ	0.0513	ND
2,4'-DDE	µg/L		ND	0.0235	ND
2,4'-DDT	µg/L		ND	0.0312	ND
4,4'-DDD	µg/L	0.00084	DNQ	**0.1665**	DNQ
4,4'-DDE	µg/L	0.00059	**0.0194**	**1.0488**	**0.006**
4,4'-DDT	µg/L	0.00059	ND	**0.0313**	ND
Dieldrin	µg/L	0.00014	ND	ND	ND
Endosulfan-I	µg/L	0.056	ND	ND	ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endosulfan-II	µg/L	0.056	ND	ND	ND
Endosulfan Sulfate	µg/L	240	ND	ND	ND
Endrin	µg/L	0.036	ND	ND	ND
Endrin Aldehyde	µg/L	0.81	ND	ND	ND
Toxaphene	µg/L	0.00075	**0.19796**	**0.61854**	DNQ
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	ND	**0.2056**	ND
Diazinon	µg/L	0.1	ND	0.0525	ND
Pyrethroid Pesticides					
Bifenthrin	µg/L		ND	0.1281	ND
Cypermethrin	µg/L		ND	0.0883	ND
Esfenvalerate	µg/L		ND	0.0046	ND
Fenvalerate	µg/L		ND	0.0023	ND
cis-Permethrin	µg/L		ND	0.1136	ND
trans-Permethrin	µg/L		ND	0.1634	ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L nitrate-N was used for comparison with VCAILG data for this site.
4. The copper benchmark for saltwater applies at this site as prescribed in Table 16.

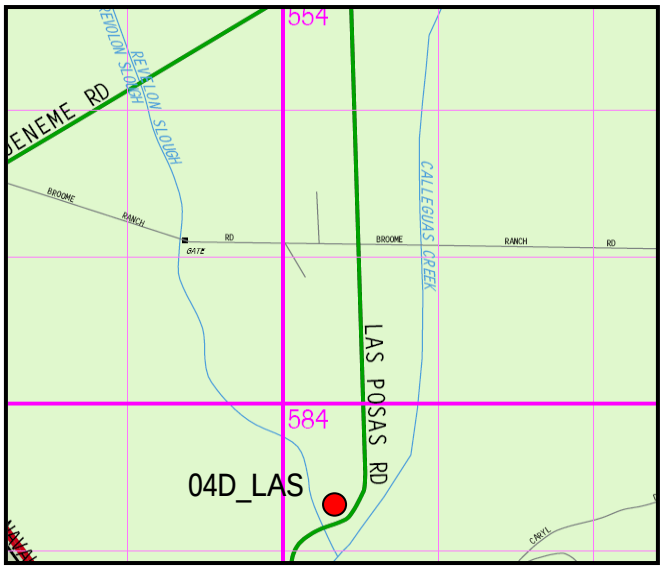
Table 23. 2013 - 2014 Trash Observations for 04D_ETTG

Event	Count	Types
Event 19	>25	Ag bags, cans, urban trash
Event 20	>100	Styrofoam, plastics, Ag trash
Event 21	25-50	Ag trash, gloves, bottles

04D_LAS

This monitoring site is located on an agricultural drain just upstream of its confluence with Revolon Slough just upstream of South Las Posas Road. A tile drain discharge is intermittently pumped into this ag drain upstream of the monitoring site. Flow from this drain eventually flows into Calleguas Creek Reach 4 (Revolon Slough).

Site Map



View toward S looking downstream on ag drain before the culvert draining into Revolon Slough

Flow was present at this site during all three 2013-2014 monitoring events. Table 24 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. Table 25 quantifies and describes trash found at this site.

There were exceedances of the nitrate-N benchmark and DDT compounds benchmarks during every event. In addition, the dissolved copper benchmark was exceeded during Event 20 (wet weather) and the toxaphene benchmarks were exceeded during Event 19 and Event 20. Row crops are the primary crop type along with significant acreage of strawberries being grown in the vicinity of this site.

Table 24. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_LAS

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		1.28	NS	1.2025
pH		6.5≤ pH ≤ 8.5	7.9	7.57	7.96
Temperature	°C	≤ 26.67°C[1]	19.07	15.85	27.28
Dissolved Oxygen	mg/L	≥ 5	10.48	7.66	14.74
Turbidity	NTU		41.3	579	30.4
Conductivity	µS/cm		3629	2608	4350
General Water Quality					
Total Dissolved Solids (TDS)	mg/L		2910	1860	3360
Total Suspended Solids (TSS)	mg/L		28.1	3090	48.2
Total Hardness as $CaCO_3$	mg/L		1412.4	867.6	1629
Chloride	mg/L		510	274	394
Sulfate	mg/L		1530	743	1330
Nutrients					
Ammonia-N	mg/L	2.09/ 3.76/ 1.13[2]	0.14	0.5	0.39
Nitrate-N	mg/L	10[3]	**31.7**	**44.21**	**51.3**
Total Orthophosphate	mg/L		1.1339	6.1903	1.2258
Metals					
Dissolved Copper	µg/L	3.1[4]	2.16	**8.44**	**3.74**
Total Copper	µg/L		3.42	34.96	4.82
Organochlorine Pesticides					
Aldrin	µg/L	0.00014	ND	ND	ND
BHC-alpha	µg/L	0.013	ND	ND	ND
BHC-beta	µg/L	0.046	ND	ND	ND
BHC-gamma	µg/L	0.063	ND	ND	ND
Chlordane-alpha	µg/L		ND	0.0085	ND
Chlordane-gamma	µg/L		ND	0.0067	ND
Total Chlordane	µg/L	0.00059	ND	**0.0152**	ND
2,4'-DDD	µg/L		DNQ	0.0291	DNQ
2,4'-DDE	µg/L		ND	0.0102	ND
2,4'-DDT	µg/L		DNQ	0.0076	ND
4,4'-DDD	µg/L	0.00084	DNQ	**0.0802**	**0.0086**
4,4'-DDE	µg/L	0.00059	**0.0176**	**0.3517**	**0.0195**
4,4'-DDT	µg/L	0.00059	ND	**0.0114**	**0.0068**
Dieldrin	µg/L	0.00014	ND	ND	ND
Endosulfan-I	µg/L	0.056	ND	ND	ND
Endosulfan-II	µg/L	0.056	ND	ND	ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endosulfan Sulfate	µg/L	240	ND	ND	ND
Endrin	µg/L	0.036	ND	ND	ND
Endrin Aldehyde	µg/L	0.81	ND	ND	ND
Toxaphene	µg/L	0.00075	**0.1315**	**0.2359**	DNQ
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	ND	0.0104	ND
Diazinon	µg/L	0.1	ND	ND	ND
Pyrethroid Pesticides					
Bifenthrin	µg/L		ND	0.1147	ND
Cyfluthrin	µg/L		ND	0.0028	ND
Cypermethrin	µg/L		ND	0.0113	ND
cis-Permethrin	µg/L		ND	0.068	ND
trans-Permethrin	µg/L		ND	0.0986	ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L nitrate-N was used for comparison with VCAILG data for this site.
4. The copper benchmark for saltwater applies at this site as prescribed in Table 16.

Table 25. 2013 - 2014 Trash Observations for 04D_LAS

Event	Count	Types
Event 19	0	N/A
Event 20	15-30	Glass, gloves, rubber
Event 21	5	Paper, cardboard, plastics

05D_LAVD

This monitoring site is located on the La Vista Drain just east of La Vista Avenue, north of Hwy 118. Flow from this drain eventually discharges into Calleguas Creek Reach 5 (Beardsley Channel). The Ventura County Watershed Protection District maintains a stormwater monitoring station just downstream of the VCAILG monitoring site.

Site Map

View upstream (NE) from sampling location

Sufficient flow to sample was present only during wet weather (Event 20) for the 2013-2014 monitoring year. Table 26 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. Table 27 quantifies and describes trash found at this site.

There were exceedances of the dissolved copper, total chlordane, 4,4'-DDD, 4,4'-DDE, and chlorpyrifos benchmarks. Citrus, avocados, and berries (other than strawberries) are the major crop types that drain to this monitoring location.

Table 26. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_LAVD

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements			Not Sampled; site dry		Not Sampled; site dry
Flow	CFS			1.25	
pH		6.5≤ pH ≤ 8.5		7.96	
Temperature	°C	≤ 26.67°C[1]		15.29	
Dissolved Oxygen	mg/L	≥ 5		9.76	
Turbidity	NTU			1266	
Conductivity	µS/cm			847.5	
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	850		576	
Total Suspended Solids (TSS)	mg/L			640	
Total Hardness as $CaCO_3$	mg/L			276.6	
Chloride	mg/L	150		44.1	
Sulfate	mg/L	250		242	
Nutrients					
Ammonia-N	mg/L	Dry/ 2.45/ Dry[2]		0.25	
Nitrate-N	mg/L	10		8.78	
Total Orthophosphate	mg/L			0.6742	
Metals					
Dissolved Copper	µg/L	Dry/ 21.36/ Dry[3]		**44.53**	
Total Copper	µg/L			135.41	
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	
BHC-alpha	µg/L	0.013		ND	
BHC-beta	µg/L	0.046		ND	
BHC-gamma	µg/L	0.063		ND	
Chlordane-alpha	µg/L			0.0061	
Chlordane-gamma	µg/L			DNQ	
Total Chlordane	µg/L	0.00059		**0.0061**	
2,4'-DDD	µg/L			0.007	
4,4'-DDD	µg/L	0.00084		**0.0332**	
4,4'-DDE	µg/L	0.00059		**0.1334**	
4,4'-DDT	µg/L	0.00059		ND	
Dieldrin	µg/L	0.00014		ND	
Endosulfan-I	µg/L	0.056		ND	
Endosulfan-II	µg/L	0.056		ND	
Endosulfan Sulfate	µg/L	240		ND	

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endrin	µg/L	0.036		ND	
Endrin Aldehyde	µg/L	0.81		ND	
Toxaphene	µg/L	0.00075		ND	
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		**0.223**	
Diazinon	µg/L	0.1		ND	
Pyrethroid Pesticides					
Bifenthrin	µg/L			0.108	
Cypermethrin	µg/L			0.0884	

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The benchmarks for copper are listed in order of monitoring event and were calculated for freshwater at this site as prescribed in Table 16.

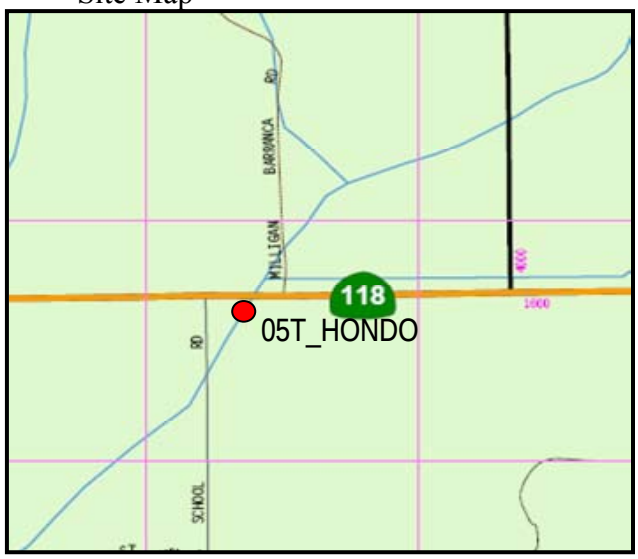
Table 27. 2013 - 2014 Trash Observations for 05D_LAVD

Event	Count	Types
Event 19	5	Plastic bottles, bags, cans
Event 20	0	N/A
Event 21	1	Bottle

05T_HONDO

This monitoring site is located on Hondo Barranca just downstream of the Hwy 118 Bridge. Hondo Barranca is a tributary to Calleguas Creek Reach 5 (Beardsley Channel).

Site Map



View downstream (S) at sampling location

Flow was only present at this site during Event 20 (wet weather). There were exceedances of the DDT compounds, total chlordane, and chlorpyrifos benchmarks during Event 20. Table 28 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks.

Table 29 quantifies and describes trash found at this site. The site is located directly adjacent to Hwy 118 and as noted in the table, a significant portion of the trash does not appear to come from an agricultural source. Hondo Barranca drains land planted primarily with citrus and avocado orchards.

Table 28. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: 05T_HONDO

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements			Not Sampled; site dry		Not Sampled; site dry
Flow	CFS			12.85	
pH		6.5≤ pH ≤ 8.5		7.76	
Temperature	°C	≤ 26.67°C[1]		14.04	
Dissolved Oxygen	mg/L	≥ 5		9.93	
Turbidity	NTU			>3000EST	
Conductivity	µS/cm			650.1	
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	850		488	
Total Suspended Solids (TSS)	mg/L			13900	
Total Hardness as $CaCO_3$	mg/L			272.5	
Chloride	mg/L	150		19.6	
Sulfate	mg/L	250		214	
Nutrients					
Ammonia-N	mg/L	Dry/ 3.44/ Dry[2]		0.62	
Nitrate-N	mg/L	10		5.51	
Total Orthophosphate	mg/L			4.8113	
Metals					
Dissolved Copper	µg/L	Dry/ 21.09/ Dry[3]		15.02	
Total Copper	µg/L			356.35	
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	
BHC-alpha	µg/L	0.013		ND	
BHC-beta	µg/L	0.046		ND	
BHC-gamma	µg/L	0.063		ND	
trans-Nonachlor	µg/L			0.0063	
Chlordane-alpha	µg/L			0.0062	
Chlordane-gamma	µg/L			0.0057	
Total Chlordane	µg/L	0.00059		**0.0119**	
2,4'-DDD	µg/L			0.0088	
2,4'-DDE	µg/L			0.0096	
2,4'-DDT	µg/L			0.0055	
4,4'-DDD	µg/L	0.00084		**0.0383**	
4,4'-DDE	µg/L	0.00059		**0.2351**	
4,4'-DDT	µg/L	0.00059		**0.0643**	
Dieldrin	µg/L	0.00014		ND	
Endosulfan-I	µg/L	0.056		ND	

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endosulfan-II	µg/L	0.056		ND	
Endosulfan Sulfate	µg/L	240		ND	
Endrin	µg/L	0.036		ND	
Endrin Aldehyde	µg/L	0.81		ND	
Toxaphene	µg/L	0.00075		ND	
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		**0.175**	
Diazinon	µg/L	0.1		ND	
Pyrethroid Pesticides					
Cypermethrin	µg/L			0.0289	

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The benchmarks for copper are listed in order of monitoring event and were calculated for freshwater at this site as prescribed in Table 16.

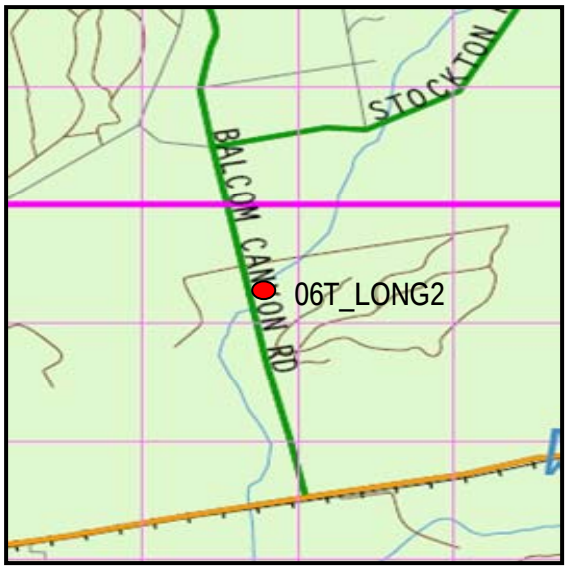
Table 29. 2013 - 2014 Trash Observations for 05T_HONDO

Event	Count	Types
Event 19	>20	urban trash, bags, bottles, wrappers
Event 20	>25	plastics, containers, Styrofoam, needles
Event 21	75-100	urban trash, bags, bottles, buckets

06T_LONG2

This monitoring site is located on Long Canyon where it crosses Balcom Canyon Road north of Highway 118. Long Canyon is a tributary to Calleguas Creek Reach 6 (Arroyo Las Posas).

Map of Sites



View upstream from sampling location

Flow was only present at this site during Event 20 (wet weather). There were exceedances of the DDT compounds, total chlordane, and chlorpyrifos benchmarks during Event 20. Table 30 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks.

Table 31 quantifies and describes trash found at this site. The drainage area for this monitoring site consists mostly of citrus and avocado orchards, with small portions used for growing nursery stock, berries, and cut flowers.

Table 30. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: 06T_LONG2

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS			6.38	
pH		6.5≤ pH ≤ 8.5		7.89	
Temperature	°C	≤ 26.67°C[1]		13.77	
Dissolved Oxygen	mg/L	≥ 5		9.99	
Turbidity	NTU			>3000EST	
Conductivity	µS/cm			283.8	
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	850		184	
Total Suspended Solids (TSS)	mg/L			13700	
Total Hardness as $CaCO_3$	mg/L			110.4	
Chloride	mg/L	150		9.39	
Sulfate	mg/L	250		47.2	
Nutrients					
Ammonia-N	mg/L	Dry/ 2.98/ Dry[2]		0.32	
Nitrate-N	mg/L	10		2.2	
Total Orthophosphate	mg/L			4.1677	
Metals			Not Sampled; site dry		Not Sampled; site dry
Dissolved Copper	µg/L	Dry/ 9.75/ Dry[3]		8.92	
Total Copper	µg/L			318.42	
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	
BHC-alpha	µg/L	0.013		ND	
BHC-beta	µg/L	0.046		ND	
BHC-gamma	µg/L	0.063		ND	
trans-Nonachlor	µg/L			0.008	
Chlordane-alpha	µg/L			0.0079	
Chlordane-gamma	µg/L			0.0072	
Total Chlordane	µg/L	0.00059		**0.0151**	
2,4'-DDD	µg/L			0.0052	
4,4'-DDD	µg/L	0.00084		**0.0198**	
4,4'-DDE	µg/L	0.00059		**0.1027**	
4,4'-DDT	µg/L	0.00059		**0.0511**	
Dieldrin	µg/L	0.00014		ND	
Endosulfan-I	µg/L	0.056		ND	
Endosulfan-II	µg/L	0.056		ND	
Endosulfan Sulfate	µg/L	240		ND	

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endrin	µg/L	0.036		ND	
Endrin Aldehyde	µg/L	0.81		ND	
Toxaphene	µg/L	0.00075		ND	
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		**0.1094**	
Diazinon	µg/L	0.1		ND	
Pyrethroid Pesticides					
Bifenthrin	µg/L			0.0463	

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The benchmarks for copper are listed in order of monitoring event and were calculated for freshwater at this site as prescribed in Table 16.

Table 31. 2013 - 2014 Trash Observations for 06T_LONG2

Event	Count	Types
Event 19	>30	urban trash, clothes, car seat, bottles, wrappers
Event 20	5	bags, plastic
Event 21	0	N/A

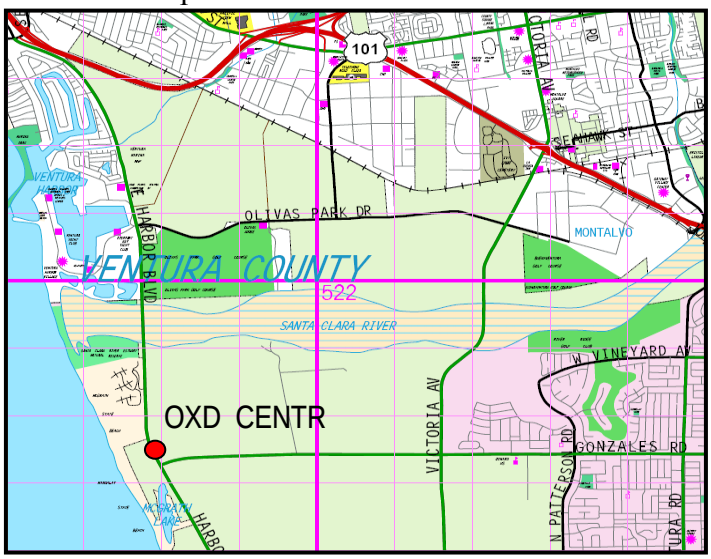
Oxnard Coastal Watershed

The Oxnard Coastal Watershed contains only one VCAILG monitoring site. The site is located on a drain used primarily for irrigated agriculture.

OXD_CENTR

This is the only VCAILG monitoring site in the Oxnard Coastal Watershed. The site is located on the Central Ditch, which flows under Harbor Boulevard and into McGrath Lake. Water from McGrath Lake is pumped periodically into the ocean to prevent the Central Ditch from backing up and flooding Harbor Boulevard.

Site Map



View looking downstream

Sufficient flow was present at this site during all three monitoring events. Table 32 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. Exceedances of the nitrate-N benchmark occurred during all three monitoring events. The toxaphene benchmark was exceeded during dry Event 19. There were exceedances of the total chlordane, DDT compounds, toxaphene, and dissolved copper benchmarks during wet Event 20.

Table 33 quantifies and describes trash found at this site. Strawberries and row crops are the predominant crop types that drain to this site.

Table 32. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: OXD_CENTR

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		0.6	NS	0.3
pH		6.5≤ pH ≤8.5	7.4	7.3	6.5
Temperature	°C		19.1	15.9	18.4
Dissolved Oxygen	mg/L	≥ 5	7.5	7.3	15.5
Turbidity	NTU		0.8	347.1	0
Conductivity	µS/cm		3542	1939	3737
General Water Quality					
Total Dissolved Solids (TDS)	mg/L		2920	1460	2990
Total Suspended Solids (TSS)	mg/L		1.84	245	1.84
Total Hardness as $CaCO_3$	mg/L		1617.6	828.1	1576.4
Chloride	mg/L		420	86.8	316
Sulfate	mg/L		1860	729	1460
Nutrients					
Ammonia-N	mg/L	3.57/ 4.63/ 5.18[1]	0.2	0.1	0.3
Nitrate-N	mg/L	10[2]	**12.2**	**24.6**	**15.5**
Total Orthophosphate	mg/L		0.1839	3.0645	0.1226
Metals					
Dissolved Copper	µg/L	3.1[3]	1.74	**6.26**	1.34
Total Copper	µg/L		1.62	25.00	1.55
Organochlorine Pesticides					
Aldrin	µg/L	0.00014	ND	ND	ND
BHC-alpha	µg/L	0.013	ND	ND	ND
BHC-beta	µg/L	0.046	ND	ND	ND
BHC-gamma	µg/L	0.063	ND	ND	ND
trans-Nonachlor	µg/L		ND	0.005	ND
Chlordane-alpha	µg/L		ND	0.008	ND
Chlordane-gamma	µg/L		ND	0.009	ND
Total Chlordane	µg/L	0.0059	ND	**0.017**	ND
2,4'-DDD	µg/L		ND	0.042	ND
2,4'-DDE	µg/L		ND	0.011	ND
2,4'-DDT	µg/L		ND	0.029	ND
4,4'-DDD	µg/L	0.00084	ND	**0.1408**	ND
4,4'-DDE	µg/L	0.00059	DNQ	**0.4019**	ND
4,4'-DDT	µg/L	0.00059	ND	**0.0711**	ND
Dieldrin	µg/L	0.00014	ND	ND	ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endosulfan-I	µg/L	0.056	ND	ND	ND
Endosulfan-II	µg/L	0.056	ND	ND	ND
Endosulfan Sulfate	µg/L	240	ND	ND	ND
Endrin	µg/L	0.036	ND	ND	ND
Endrin Aldehyde	µg/L	0.81	ND	ND	ND
Toxaphene	µg/L	0.00075	**0.089**	**0.27**	ND
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	ND	0.018	ND
Diazinon	µg/L	0.1	ND	ND	ND
Pyrethroid Pesticides					
Bifenthrin	µg/L		ND	0.082	ND
Cypermethrin	µg/L		ND	0.0037	ND
Danitol	µg/L		ND	0.0573	ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.
2. There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L nitrate-N was used for comparison with VCAILG data for this site.
3. The copper benchmark was applied for saltwater at this site as prescribed in Table 16.

Table 33. 2013 - 2014 Trash Observations for OXD_CENTR

Event	Count	Types
Event 19	<10	cans, plastic bag, paper bag
Event 20	50+	urban trash
Event 21	0	N/A

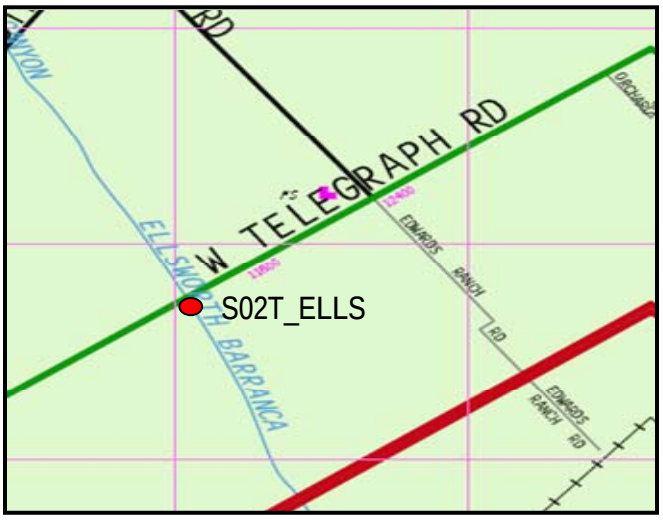
Santa Clara River Watershed

The Santa Clara River Watershed contains seven VCAILG monitoring sites, including one background site. Five of the sites are located on tributaries to the Santa Clara River. S03D_BARDS is the only monitoring site located on a drain used primarily for irrigated agriculture. Monitoring sites are discussed below in order of the Santa Clara River reach into which they drain.

S02T_ELLS

This monitoring site is located on Ellsworth Barranca just downstream of the Telegraph Road Bridge. Ellsworth Barranca drains the Aliso Canyon area and is a tributary to Santa Clara River Reach 2.

Site Map



View upstream at the bridge

Flow was present at this site only during wet Event 20. Table 34 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. There were exceedances of the chloride, total chlordane, 4,4'-DDE, and chlorpyrifos benchmarks during Event 20.

Table 35 describes trash found at this site. Citrus and avocados are the primary crop types associated with this site.

Table 34. 2013- 2014 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_ELLS

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements			Not Sampled; site dry		Not Sampled; site dry
Flow	CFS			25.336	
pH		6.5≤ pH ≤ 8.5		7.91	
Temperature	°C	≤ 26.67°C[1]		14.83	
Dissolved Oxygen	mg/L	≥ 5		9.2	
Turbidity	NTU			>3000EST	
Conductivity	µS/cm			1562	
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1200		1090	
Total Suspended Solids (TSS)	mg/L			2630	
Total Hardness as $CaCO_3$	mg/L			418	
Chloride	mg/L	150		**235**	
Sulfate	mg/L	600		427	
Nutrients					
Ammonia-N	mg/L	Dry/ 2.71/ Dry[2]		0.72	
Nitrate-N	mg/L	10		1.7	
Total Orthophosphate	mg/L			3.9226	
Metals					
Dissolved Copper	µg/L	Dry/ 29.28/ Dry[3]		4.3	
Total Copper	µg/L			164.5	
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	
BHC-alpha	µg/L	0.013		ND	
BHC-beta	µg/L	0.046		ND	
BHC-gamma	µg/L	0.063		ND	
trans-Nonachlor	µg/L			0.0083	
Chlordane-alpha	µg/L			0.0253	
Chlordane-gamma	µg/L			0.0158	
Total Chlordane	µg/L	0.00059		**0.041**	
4,4'-DDD	µg/L	0.00084		ND	
4,4'-DDE	µg/L	0.00059		**0.079**	
4,4'-DDT	µg/L	0.00059		ND	
Dieldrin	µg/L	0.00014		ND	
Endosulfan-I	µg/L	0.056		ND	
Endosulfan-II	µg/L	0.056		ND	
Endosulfan Sulfate	µg/L	240		ND	

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endrin	µg/L	0.036		ND	
Endrin Aldehyde	µg/L	0.81		ND	
Toxaphene	µg/L	0.00075		ND	
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		**0.06**	
Diazinon	µg/L	0.1		ND	
Pyrethroid Pesticides					
Bifenthrin	µg/L			0.013	

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 15 through 20 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The copper benchmarks are listed in order of monitoring event and were calculated for freshwater at this site as prescribed in Table 17.

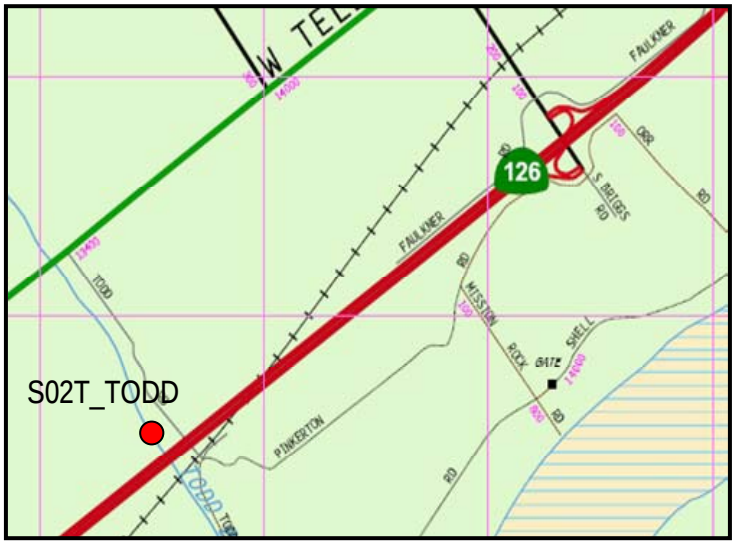
Table 35. 2013 - 2014 Trash Observations for S02T_ELLS

Event	Count	Types
Event 19	>10	food plastic, candy wrappers
Event 20	7	coffee cup, tape
Event 21	4	burlap, plastic bottles, plastic wrapper

S02T_TODD

This monitoring site is located on Todd Barranca upstream of Hwy 126. Todd Barranca drains the Wheeler Canyon area and is a tributary to Santa Clara River Reach 2.

Site Map



View upstream of the sampling site

Sufficient flow was present during all three 2013-2014 monitoring events. Table 36 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. There were exceedances of the TDS, chloride, sulfate, nitrate-N, and toxaphene benchmarks during dry weather.

Table 37 lists trash observation made at the site. Row crops, cut flowers, and orchards drain to this site.

Table 36. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_TODD

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		0.03	5.08	0.21
pH		6.5≤ pH ≤8.5	7.9	7.1	7.5
Temperature	°C	≤ 26.67°C[1]	18.3	14.5	18.1
Dissolved Oxygen	mg/L	≥ 6	8.4	8.3	9.8
Turbidity	NTU		0	>3000EST	18.9
Conductivity	µS/cm		2595	1387	2931
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1200	**2110**	1000	**2450**
Total Suspended Solids (TSS)	mg/L		ND	1520	1
Total Hardness as $CaCO_3$	mg/L		1224.4	490.9	1398.6
Chloride	mg/L	150	**170**	82.7	110
Sulfate	mg/L	600	**1480**	447	**1130**
Nutrients					
Ammonia-N	mg/L	2.22/ 5.73/ 3.48[2]	DNQ	1.33	ND
Nitrate-N	mg/L	10	7.1	4.2	**14.9**
Total Orthophosphate	mg/L		0.1532	3.371	0.1532
Metals					
Dissolved Copper	µg/L	29.28[3]	4.3	5.7	2.3
Total Copper	µg/L		4.6	74.6	2.5
Organochlorine Pesticides					
Aldrin	µg/L	0.00014	ND	ND	ND
BHC-alpha	µg/L	0.013	ND	ND	ND
BHC-beta	µg/L	0.046	ND	ND	ND
BHC-gamma	µg/L	0.063	ND	ND	ND
Chlordane-alpha	µg/L		ND	ND	ND
Chlordane-gamma	µg/L		ND	ND	ND
Total Chlordane	µg/L	0.00059	ND	ND	ND
4,4'-DDD	µg/L	0.00084	ND	ND	ND
4,4'-DDE	µg/L	0.00059	ND	ND	ND
4,4'-DDT	µg/L	0.00059	ND	ND	ND
Dieldrin	µg/L	0.00014	ND	ND	ND
Endosulfan-I	µg/L	0.056	ND	ND	ND
Endosulfan-II	µg/L	0.056	ND	ND	ND
Endosulfan Sulfate	µg/L	240	ND	ND	ND
Endrin	µg/L	0.036	ND	ND	ND
Endrin Aldehyde	µg/L	0.81	ND	ND	ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Toxaphene	µg/L	0.00075	**0.05956**	ND	ND
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND
Pyrethroid Pesticides					
Bifenthrin	µg/L		ND	0.0241	ND
Cyfluthrin	µg/L		ND	0.0142	ND
Cypermethrin	µg/L		ND	0.9874	ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The copper benchmark was calculated for freshwater at this site as prescribed in Table 16. It was the same for all three events.

Table 37. 2013 - 2014 Trash Observations for S02T_TODD

Event	Count	Types
Event 19	0	N/A
Event 20	2	chip bag, plastic cup
Event 21	1	candy wrapper

S03T_TIMB

This monitoring site is located on Timber Canyon Creek just upstream of Hwy 126, east of Santa Paula. Timber Creek is a tributary to Santa Clara River Reach 3.

Site Map

View of site (S) toward Hwy 126

Sufficient flow to monitor was only present for Event 20 during the 2013-2014 monitoring year. Table 38 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. There were exceedances of the TDS, chloride, and sulfate benchmarks for Event 20.

Trash observations are provided in Table 39. This site drains mostly avocado and citrus orchards.

Table 38. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_TIMB

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS			0.34	
pH		6.5≤ pH ≤ 8.5		7.71	
Temperature	°C	≤ 26.67°C[1]		14.26	
Dissolved Oxygen	mg/L	≥ 5		NS	
Turbidity	NTU			635	
Conductivity	µS/cm			3691	
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300		**3170**	
Total Suspended Solids (TSS)	mg/L			150000	
Total Hardness as $CaCO_3$	mg/L			814	
Chloride	mg/L	150		**304**	
Sulfate	mg/L	600		**1820**	
Nutrients					
Ammonia-N	mg/L	Dry/ 3.6/ Dry[2]		2.2	
Nitrate-N	mg/L	5		2.8	
Total Orthophosphate	mg/L			0.2145	
Metals			Not Sampled; site dry		Not Sampled; site dry
Dissolved Copper	µg/L	Dry/ 29.28/ Dry[3]		13.38	
Total Copper	µg/L			1258.29	
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	
BHC-alpha	µg/L	0.013		ND	
BHC-beta	µg/L	0.046		ND	
BHC-gamma	µg/L	0.063		ND	
Chlordane-alpha	µg/L			ND	
Chlordane-gamma	µg/L			ND	
Total Chlordane	µg/L	0.00059		ND	
4,4'-DDD	µg/L	0.00084		ND	
4,4'-DDE	µg/L	0.00059		ND	
4,4'-DDT	µg/L	0.00059		ND	
Dieldrin	µg/L	0.00014		ND	
Endosulfan-I	µg/L	0.056		ND	
Endosulfan-II	µg/L	0.056		ND	
Endosulfan Sulfate	µg/L	240		ND	
Endrin	µg/L	0.036		ND	
Endrin Aldehyde	µg/L	0.81		ND	

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Toxaphene	µg/L	0.00075		ND	
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		ND	
Diazinon	µg/L	0.1		ND	

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The copper benchmark was calculated for freshwater at this site as prescribed in Table 16. It was the same for all three events.

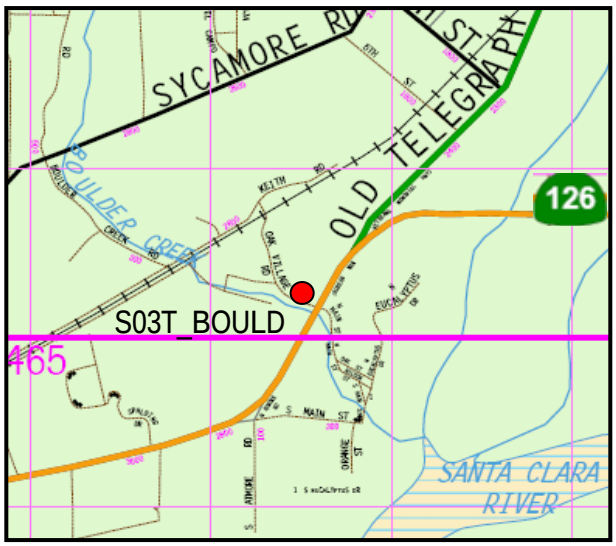
Table 39. 2013 - 2014 Trash Observations for S03T_TIMB

Event	Count	Types
Event 19	>10	Plastic bags, styrofoam
Event 20	2	tape, drip hose
Event 21	2	plastic water bottles

S03T_BOULD

This monitoring site is located on Boulder Creek just upstream of Hwy 126, west of Fillmore. Boulder Creek is a tributary to Santa Clara River Reach 3.

Site Map



View of sampling location (upstream)

Sufficient flow to monitor was only present for Event 20 during 2013-2014. Table 40 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. There were exceedances of the nitrate-N, DDT compounds, and total chlordane benchmarks for Event 20.

Trash observations for this site can be found in Table 41. Citrus, avocados, and nurseries are the primary crop types associated with this site.

Table 40. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_BOULD

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS			6.5	
pH		6.5≤ pH ≤ 8.5		7.6	
Temperature	°C	≤ 26.67°C[1]		14.45	
Dissolved Oxygen	mg/L	≥ 5		9.8	
Turbidity	NTU			2377	
Conductivity	µS/cm			6135	
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300		968	
Total Suspended Solids (TSS)	mg/L			1550	
Total Hardness as $CaCO_3$	mg/L			574.1	
Chloride	mg/L	150		32.2	
Sulfate	mg/L	600		478	
Nutrients					
Ammonia-N	mg/L	Dry/ 4.1/ Dry[2]		1.5	
Nitrate-N	mg/L	5		**14.5**	
Total Orthophosphate	mg/L			2.3903	
Metals			Not Sampled; site dry		Not Sampled; site dry
Dissolved Copper	µg/L	Dry/ 29.28/ Dry[3]		9.7	
Total Copper	µg/L			65.4	
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	
BHC-alpha	µg/L	0.013		ND	
BHC-beta	µg/L	0.046		ND	
BHC-gamma	µg/L	0.063		ND	
trans-Nonachlor	µg/L			0.0071	
Chlordane-alpha	µg/L			0.0097	
Chlordane-gamma	µg/L			0.0068	
Total Chlordane	µg/L	0.00059		**0.0165**	
4,4'-DDD	µg/L	0.00084		DNQ	
4,4'-DDE	µg/L	0.00059		**0.0132**	
4,4'-DDT	µg/L	0.00059		**0.0164**	
Dieldrin	µg/L	0.00014		ND	
Endosulfan-I	µg/L	0.056		ND	
Endosulfan-II	µg/L	0.056		ND	
Endosulfan Sulfate	µg/L	240		ND	
Endrin	µg/L	0.036		ND	

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endrin Aldehyde	µg/L	0.81		ND	
Toxaphene	µg/L	0.00075		ND	
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		0.0092	
Diazinon	µg/L	0.1		ND	
Pyrethroid Pesticides					
Bifenthrin	µg/L			1.07	
Cyfluthrin	µg/L			0.02	
Danitol	µg/L			0.15	
Fluvalinate	µg/L			0.03	
cis-Permethrin	µg/L			0.14	
trans-Permethrin	µg/L			0.15	

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The copper benchmark was calculated for freshwater at this site as prescribed in Table 16. It was the same for all three events.

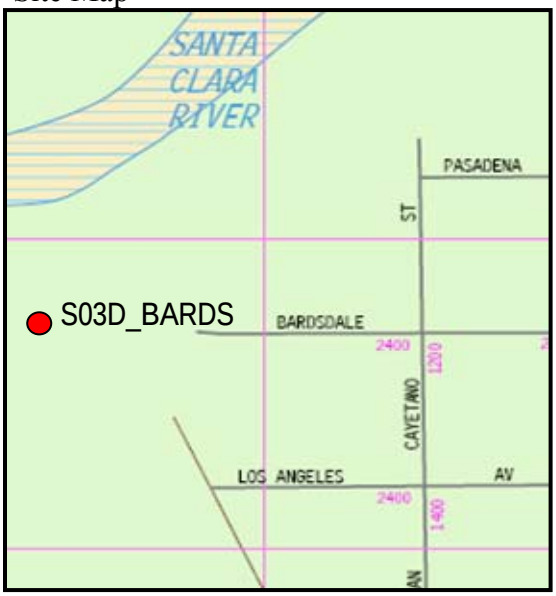
Table 41. 2013 - 2014 Trash Observations for S03T_BOULD

Event	Count	Types
Event 19	>10	agriculture plastic
Event 20	20	coffee cup, plastic bags, glass bottles
Event 21	8	plastic water bottles, Styrofoam cups, plastic wrapper

S03D_BARDS

This monitoring site is located near the end of the agricultural drain that runs parallel to Bardsdale Avenue in Bardsdale. The drain is located on the south side of the Santa Clara River and eventually discharges into Santa Clara River Reach 3.

Site Map



View of site looking upstream

Sufficient flow to monitor was present for Event 20 and Event 21 during the 2013-2014 monitoring year. Table 42 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. There were exceedances of nitrate-N, DDT compounds, and total chlordane benchmarks for Event 20 and exceedances of DDT compounds benchmarks during Event 21.

Trash observations for S03D_BARDS are provided below in Table 43. This site drains mostly citrus orchards with small proportions of the area used for avocados and row crops.

Table 42. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: S03D_BARDS

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		Not Sampled; site dry	3.8	0.02
pH		6.5≤ pH ≤8.5		7.6	8.2
Temperature	°C	≤ 26.67°C[1]		14.22	19.6
Dissolved Oxygen	mg/L	≥ 5		9.2	9.1
Turbidity	NTU			>3000EST	194.5
Conductivity	µS/cm			904.3	1270
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300		708	920
Total Suspended Solids (TSS)	mg/L			3400	200
Total Hardness as $CaCO_3$	mg/L			254.5	513.7
Chloride	mg/L	150		43	54
Sulfate	mg/L	600		303	386
Nutrients					
Ammonia-N	mg/L	Dry/ 4.01/ 1.31[2]		0.6	DNQ
Nitrate-N	mg/L	5		**9.2**	1.8
Total Orthophosphate	mg/L			3.8306	1.2871
Metals					
Dissolved Copper	µg/L	Dry/ 19.9/ 29.28[3]		7.9	5.6
Total Copper	µg/L			76.9	14.5
Organochlorine Pesticides					
Aldrin	µg/L	0.00014		ND	ND
BHC-alpha	µg/L	0.013		ND	ND
BHC-beta	µg/L	0.046		ND	ND
BHC-gamma	µg/L	0.063		ND	ND
cis-Nonachlor	µg/L			0.0052	ND
trans-Nonachlor	µg/L			0.0126	ND
Chlordane-alpha	µg/L			0.0095	ND
Chlordane-gamma	µg/L			0.0067	ND
Total Chlordane	µg/L	0.00059		**0.0162**	ND
4,4'-DDD	µg/L	0.00084		**0.0067**	ND
4,4'-DDE	µg/L	0.00059		**0.0574**	**0.0219**
4,4'-DDT	µg/L	0.00059		**0.03**	**0.0275**
Dieldrin	µg/L	0.00014		ND	ND
Endosulfan-I	µg/L	0.056		ND	ND
Endosulfan-II	µg/L	0.056		ND	ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endosulfan Sulfate	µg/L	240		ND	ND
Endrin	µg/L	0.036		ND	ND
Endrin Aldehyde	µg/L	0.81		ND	ND
Toxaphene	µg/L	0.00075		ND	ND
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025		0.021	ND
Diazinon	µg/L	0.1		ND	ND
Pyrethroid Pesticides					
Bifenthrin	µg/L			0.167	ND
Cypermethrin	µg/L			0.098	ND
Esfenvalerate	µg/L			0.007	ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The copper benchmark was calculated for freshwater at this site as prescribed in Table 16. It was the same for all three events.

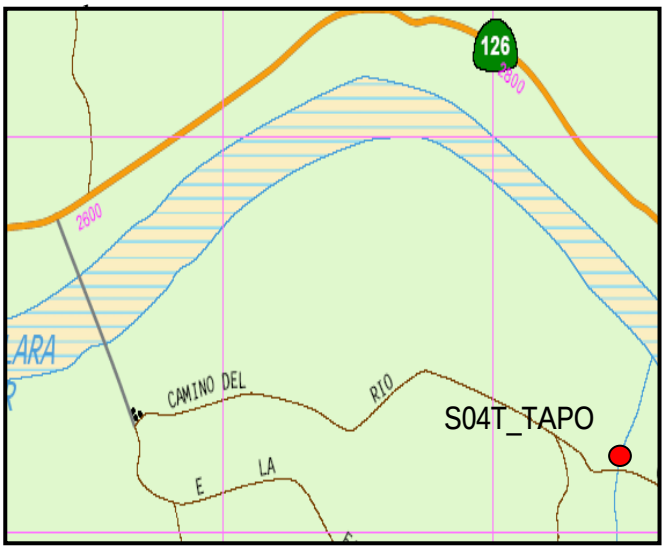
Table 43. 2013 - 2014 Trash Observations for S03D_BARDS

Event	Count	Types
Event 19	>5	agriculture plastic trash
Event 20	5	drip hose, pipe, plastic bag, shirt
Event 21	3	burlap bag, concrete pipe, corrugated pipe

S04T_TAPO

This monitoring site is located on Tapo Creek near the Ventura / Los Angeles County line, south of Hwy 126 and the Santa Clara River. Tapo Creek is a tributary to Santa Clara River Reach 4.

Site Map



View upstream toward the sample site at the

Sufficient flow was present for sampling at this site during all three monitoring events. Table 44 contains a summary of the concentrations for select constituents and provides a comparison of measured concentrations with applicable water quality benchmarks. TDS, chloride, sulfate and nitrate-N benchmarks were exceeded during the two dry weather events. The benchmarks for 4-4'-DDE and total chlordane were exceeded during the wet weather event.

Table 45 summarizes trash observations for this site. Citrus, row crops, and nursery stock are grown in the vicinity of this monitoring site.

Table 44. 2013 - 2014 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_TAPO

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Field Measurements					
Flow	CFS		0.03	24.59	4.91
pH		6.5≤ pH ≤8.5	7.95	8	7.89
Temperature	°C	≤ 26.67°C[1]	18.71	13.17	16.5
Dissolved Oxygen	mg/L	≥ 5	9.01	9.26	9.41
Turbidity	NTU		0	>3000EST	0
Conductivity	µS/cm		3347	1506	3468
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300	**2660**	1030	**2730**
Total Suspended Solids (TSS)	mg/L		1.53	2190	ND
Total Hardness as $CaCO_3$	mg/L		1256.7	357.2	1296.7
Chloride	mg/L	100	**260**	78.6	**190**
Sulfate	mg/L	600	**1620**	450	**1260**
Nutrients					
Ammonia-N	mg/L	1.99/ 2.65/ 2.5[2]	ND	0.16	DNQ
Nitrate-N	mg/L	5	**11.92**	1.37	**21.85**
Total Orthophosphate	mg/L		0.2452	3.1871	0.0919
Metals					
Dissolved Copper	µg/L	29.28/ 26.58/ 29.28[3]	6.36	8.23	4.69
Total Copper	µg/L		7.15	133.11	5.61
Organochlorine Pesticides					
Aldrin	µg/L	0.00014	ND	ND	ND
BHC-alpha	µg/L	0.013	ND	ND	ND
BHC-beta	µg/L	0.046	ND	ND	ND
BHC-gamma	µg/L	0.063	ND	ND	ND
cis-Nonachlor	µg/L		ND	0.0099	ND
trans-Nonachlor	µg/L		ND	0.0264	ND
Chlordane-alpha	µg/L		ND	0.0312	ND
Chlordane-gamma	µg/L		ND	0.0216	ND
Total Chlordane	µg/L	0.0059	ND	**0.0528**	ND
2,4'-DDE	µg/L		ND	0.0503	ND
4,4'-DDD	µg/L	0.00084	ND	ND	ND
4,4'-DDE	µg/L	0.00059	ND	**1.3075**	ND
4,4'-DDT	µg/L	0.00059	ND	ND	ND
Dieldrin	µg/L	0.00014	ND	ND	ND
Endosulfan-I	µg/L	0.056	ND	ND	ND
Endosulfan-II	µg/L	0.056	ND	ND	ND

Constituent	Units	Benchmark	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
Endosulfan Sulfate	µg/L	240	ND	ND	ND
Endrin	µg/L	0.036	ND	ND	ND
Endrin Aldehyde	µg/L	0.81	ND	ND	ND
Toxaphene	µg/L	0.00075	ND	ND	ND
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND
Pyrethroid Pesticides					
Bifenthrin	µg/L		ND	0.289	ND
Cypermethrin	µg/L		ND	0.0551	ND
Esfenvalerate	µg/L		ND	0.0381	ND
Fenvalerate	µg/L		ND	0.0264	ND

Concentrations in **bold** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 14 through 19 for a list of benchmarks applicable to this site.

1. The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).
2. The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.
3. The copper benchmark was calculated for freshwater at this site as prescribed in Table 16.

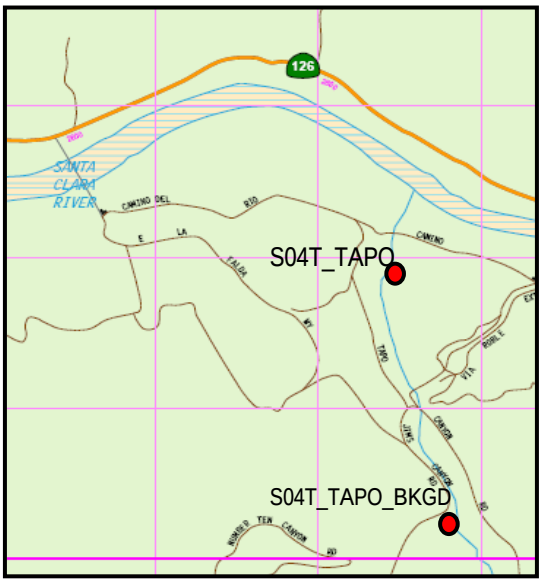
Table 45. 2013 - 2014 Trash Observations for S04T_TAPO

Event	Count	Types
Event 19	0	N/A
Event 20	0	N/A
Event 21	0	N/A

S04T_TAPO_BKGD

This monitoring site is a background site for S04T_TAPO that is located upstream of irrigated agricultural land that drains to S04T_TAPO. This site was selected to determine whether high salts concentrations are a background condition for the area. Since this site can only be reached by dirt roads, it has been too muddy to gain access for sampling during storm events.

Site Map



View of monitoring location

Sufficient flow was not present for any of the dry monitoring events during 2013-2014 when the site was accessible. Table 46 summarizes trash observations for this site.

Table 46. 2013 - 2014 Trash Observations for S04T_TAPO_BKGD

Event	Count	Types
Event 19	0	N/A
Event 20	N/A[1]	N/A[1]
Event 21	0	N/A

1. Site was inaccessible during this event.

Ventura River Watershed

There are two VCAILG monitoring sites located in this watershed, both tributaries to the Ventura River and located on the east end of the City of Ojai.

VRT_THACH

This monitoring site is located on Thacher Creek just upstream of Ojai Avenue in Ojai. Thacher Creek is a tributary of San Antonio Creek, which is a tributary of the Ventura River.

Site Map

View downstream from site looking towards Ojai Ave. bridge

Sufficient flow was not present for any of the monitoring events during 2013-2014. Table 47 provides trash observations for this site. Avocados and citrus are the predominant crop types associated with this site.

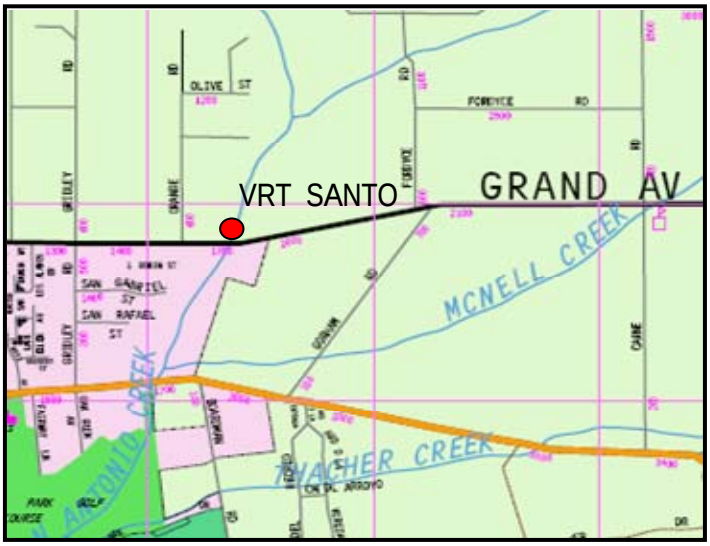
Table 47. 2013 - 2014 Trash Observations for VRT_THACH

Event	Count	Types
Event 19	0	N/A
Event 20	1	wrapper
Event 21	2	metal pipe, food wrapper

VRT_SANTO

This monitoring site is located on San Antonio Creek just upstream of Grand Avenue in Ojai. San Antonio Creek is a tributary of the Ventura River.

Site Map



View downstream at the Grand Ave. bridge

Sufficient flow was not present for any of the monitoring events during 2013-2014. Table 48 includes the number and types of trash observed at the monitoring site. Citrus and avocados are the predominant crop types associated with this site.

Table 48. 2013 - 2014 Trash Observations for VRT_SANTO

Event	Count	Types
Event 19	0	N/A
Event 20	0	N/A
Event 21	1	glass bottle

CHRONIC TOXICITY TEST RESULTS

During the 2013-2014 monitoring year, PER performed single-species short-term chronic toxicity tests for samples collected during all three events. The toxicity reports submitted by PER contains test results and raw data. PER submitted two types of reports, an electronic data deliverable (EDD), which is compatible with the Surface Water Ambient Monitoring Program (SWAMP), and a narrative report. The reports are included as Appendix G on the Annual Report Data CD. Dry weather toxicity samples were not collected during the 2012-2013 monitoring year due to a scheduling mistake. To adjust for this error, toxicity samples were collected during both dry events in the 2013-2014 monitoring year.

Determination of Most Sensitive Species at Toxicity Monitoring Sites

There are 11 toxicity sites that are part of the VCAILGMP. The Conditional Waiver requires that three-species chronic toxicity testing be performed on samples collected at each site to determine the most sensitive species among the invertebrate, vertebrate, and algae; the most sensitive species is then used for subsequent toxicity testing for the duration of the VCAILGMP.

Based on previously conducted three-species screening tests at eight of the eleven VCAILGMP sites, the Regional Board approved a single-species to be used at each of these sites for the remainder of this Conditional Waiver in a June 28, 2012 letter. Sites with conductivity measuring less than 3,000 µS/cm at the time of sampling will be evaluated based on the survival and reproduction of the invertebrate *Ceriodaphnia dubia* (*C. dubia*). High conductivity sites (>3,000 µS/cm) will be tested using *Hyalella azteca* (*Hyalella*) (Table 49).

There were three remaining sites where flow had not been present during any of the toxicity sampling events to be able to conduct a three-species screening test. However, one of these sites, S03T_TIMB, had enough flow present during Event 20 to collect toxicity sample and so PER conducted a three-species screening test (the other two sites will have three-species screening the first time they are sampled during a toxicity event). As the conductivity of the sample water collected at the S03T_TIMB site was greater than 3,000 µS/cm, toxicity testing was conducted using organisms that are tolerant of water with high conductivity. The organisms included the invertebrate *Hyalella*, the algae *Thalassiosira pseudonana* (*Thalassiosira*), and the vertebrate *Cyprinodon variegates* (*Cyprinodon*). No toxicity was observed for *Hyalella* and *Thalassiosira*; however, there was 100 percent mortality of the *Cyprinodon* organisms. However, PER indicated the sample was extremely turbid. It was PER's best professional judgment that the matrix was not conducive to performing aqueous phase testing and therefore, prohibited their capacity to interpret the presence/absences of toxicity in the sample. As such, a most sensitive species was not identified upon completion of the three-species screening test. As a result, another three-species screening test will be performed at the S03T_TIMB site and the other two remaining sites when there is sufficient flow during any future toxicity monitoring events. The results of the three-species screening test are presented in Table 50.

Table 49. Most Sensitive Species Selected for Toxicity Testing

Site ID	Species
01T_ODD3_ARN	*Hyalella azteca*
05D_LAVD	*Ceriodaphnia dubia*
05T_HONDO	*Ceriodaphnia dubia*
06T_LONG2	*Ceriodaphnia dubia*
S02T_ELLS	*Ceriodaphnia dubia*
S02T_TODD	*Ceriodaphnia dubia*
S03T_BOULD	*Ceriodaphnia dubia*
S04T_TAPO	*Hyalella azteca*

Table 50. Three-Species Screening Test Results for S03T_TIMB

		Hyalella [1]	*Thalassiosira* [2]	*Cyprinodon* [3]		
Site	Event	Survival Toxicity	96-hr Growth	Survival Toxicity	Growth Toxicity	TIE Triggered?
S03T_TIMB	20: 2/28/14	No	No	Yes [4]	Yes [4]	No

1. *Hyalella azteca* (invertebrate – crustacean) is evaluated for the survival endpoint.
2. *Thalassiosira pseudonana* (algae) is evaluated for the growth endpoint.
3. *Cyprinodon variegates* (vertebrate – fish) is evaluated for the survival and growth endpoints.
4. There was complete mortality of all *Cyprinodon* organisms in the test sample. However, the sample was extremely turbid. It was the lab's best professional judgment that the matrix was not conducive to performing aqueous phase testing and therefore, prohibited their capacity to interpret the presence/absences of toxicity in the sample.

Single-Species Test Results

Toxicity samples were collected during all three monitoring events during the 2013-2014 monitoring year. Toxicity testing was conducted using either *C. dubia* or *Hyalella* using the Regional Board-approved species for the specific sites (Table 49). The *C. dubia* chronic test consisted of the 3-brood (6- to 8-day) survival and reproduction test and the *Hyalella* test consisted of a 10-day survival test.

Toxicity testing during Event 19 indicated reproduction toxicity for *C. dubia* at the S02T_TODD site. The duplicate sample from S02T_TODD exhibited a greater than 50% reduction in survival on day 4 of the test. A TIE test targeted for organics was triggered by these results of the duplicate sample. During TIE testing, there was a reduction in survival and reproduction in the baseline TIE treatment for the site water, indicating that toxicity was persistent. There were blank interferences present in the 100 µg/L Piperonyl Butoxide (PBO) blank for reproduction. There was no removal of toxicity via the test treatments. As a result, the contaminant classes responsible for the toxicity in the initial test could not be identified.

Toxicity testing during Event 20 indicated survival toxicity for *C. dubia* at the S02T_TODD site and reproduction toxicity for *C. dubia* at the S02T_TODD site and the S03T_BOULD site. TIE testing was not initiated for the S02T_TODD sample as the survival percent reduction of 55.6 percent was above the testing initiation threshold of a 50 percent reduction.

Toxicity testing during Event 21 indicated reproduction toxicity for *C. dubia* at the S02T_TODD site. TIE testing was not triggered by these results as the initiation threshold for *C. dubia* is

based on survival, not reproduction. Single species test results for freshwater and high conductivity sites for Events 19, 20, and 21 are found in Table 51.

Table 51. Chronic Toxicity Results for Single-Species Testing for 2013-2014

Site	Event	*C. dubia* [1]			*Hyalella* [2]	TIE Triggered?
		Survival Toxicity	Reproduction Toxicity	Reproduction % Reduction	Survival Toxicity	
S02T_TODD	19: 8/22/13	No	Yes	72% [3]		No
S02T_TODD dup	19: 8/22/13	Yes	Yes	78.6%		Yes
S04_TAPO	19: 8/22/13				No	No
01T_ODD3_ARN	19: 8/22/13				No	No
05D_LAVD	20: 2/28/14	No	No	7.9%		No
05T_HONDO	20: 2/28/14	No	No	8.1%		No
06T_LONG2	20: 2/28/14	No	No	11.8%		No
S02T_ELLS	20: 2/28/14	No	No	4.8%		No
S02T_TODD	20: 2/28/14	Yes [3]	Yes	100% [3]		No
S03T_BOULD	20: 2/28/14	No	Yes	42.8% [3]		No
S04T_TAPO	20: 2/28/14	No	No	11.6%		No
S02T_TODD	21: 5/29/14	No	Yes	54% [3]		No
S04_TAPO	21: 5/29/14				No	No
01T_ODD3_ARN	21: 5/29/14				No	No

1. *Ceriodaphnia dubia* (invertebrate – water flea) is evaluated for the survival and reproduction endpoints.
2. *Hyalella azteca* (invertebrate – crustacean) is evaluated for the survival endpoint.
3. The response at this test treatment was significantly less than the Lab Control treatment response ($p < 0.05$).

TMDL LOAD ALLOCATIONS AND MONITORING RESULTS

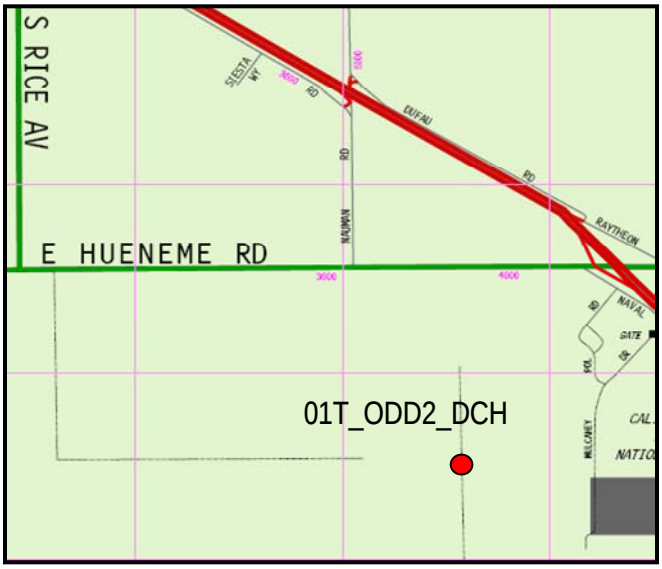
Calleguas Creek Watershed Agricultural Land Use Monitoring Sites

Seven agricultural land use sites are monitored under the CCWTMP. Site descriptions, maps, and photos are included below. Following the site information, are TMDL LAs and compliance information related to each of the CCW TMDLs that have benchmarks listed in the Conditional Waiver. Receiving water site information and files with all monitoring data collected at CCWTMP sites can be found in the CCW sixth year annual monitoring report.

01T_ODD2_DCH

Duck Pond Agricultural Drains / Mugu Drain / Oxnard Drain No. 2. The monitoring site is located on an agricultural drain just south of Hueneme Road near the Duck Ponds. Flow from this drain eventually discharges into the western arm of Mugu Lagoon (Calleguas Creek Reach 1).

Site Map

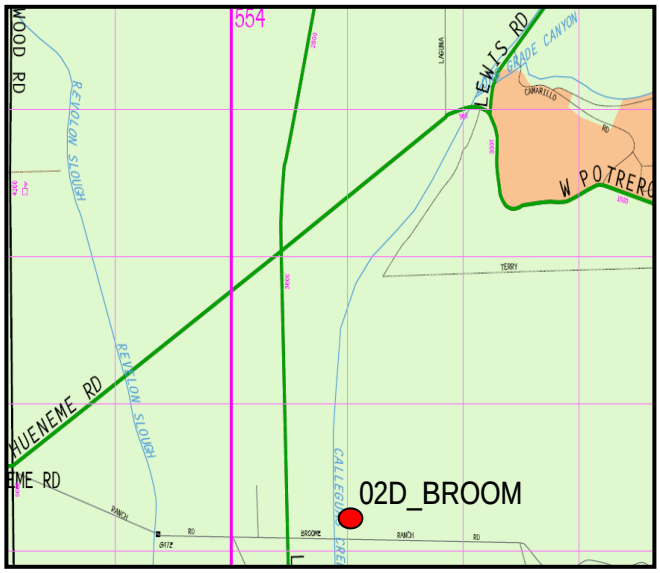


View toward the NE (looking downstream)

02D_BROOM

The monitoring site is located on an agricultural drain that discharges into Calleguas Creek Reach 2 at Broome Ranch Road.

Site Map



View of discharge (looking upstream on Calleguas Creek)

04D_WOOD

The monitoring site is located on an agricultural drain on the east side of Wood Road. Flow from this drain discharges into Calleguas Creek Reach 4 (Revolon Slough) above the 04_WOOD monitoring site.

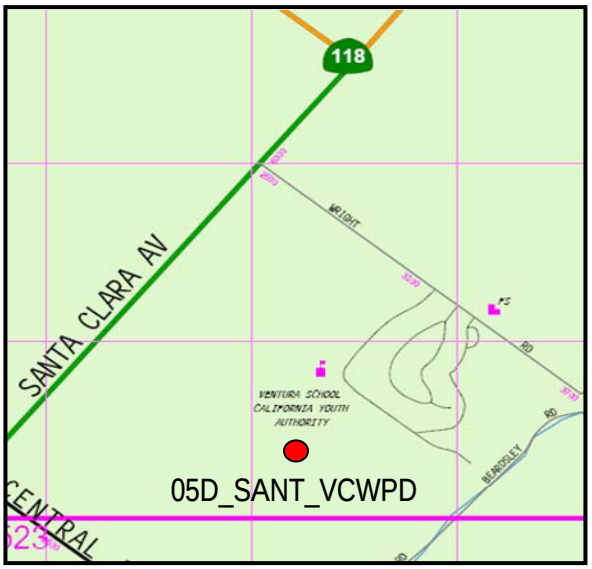
Site Map

View at site looking upstream

05D_SANT_VCWPD

This monitoring site is located on the Santa Clara Drain east of Santa Clara Avenue at the Ventura County Watershed Protection District's Stream Gage #781. Flow from this drain eventually discharges into Calleguas Creek Reach 5 (Beardsley Channel).

Site Map

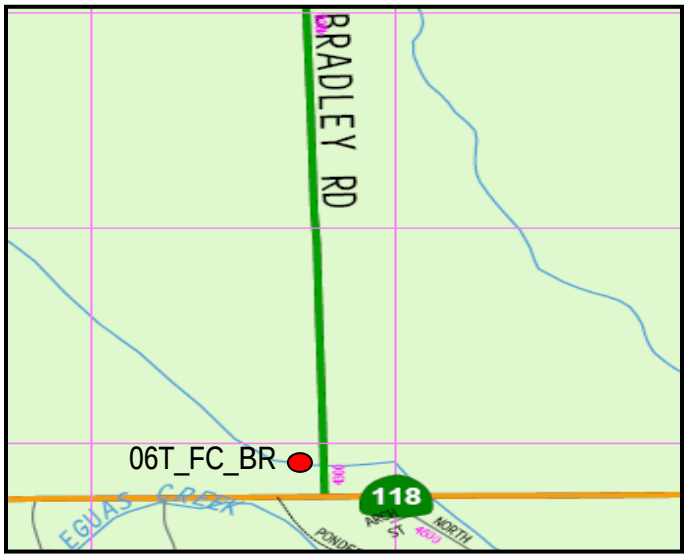


View upstream (NW) facing gage #781

06T_FC_BR

This monitoring site is located on Fox Barranca just upstream of the Bradley Road Bridge, north of Hwy 118. Fox Barranca is a tributary to Calleguas Creek Reach 6 (Arroyo Las Posas).

Site Map



View downstream (E) from sampling location toward Bradley Road

07D_HITCH_LEVEE_2

The site is sampled from a corrugated pipe discharging on the north side of the Arroyo Simi Flood Control Levee off of Hitch Blvd, directly into Calleguas Creek Reach 7 (Arroyo Simi).

Site Map

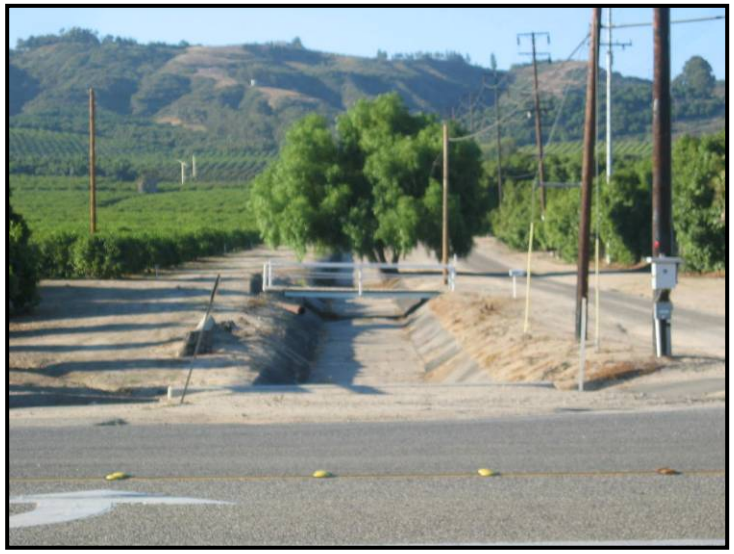
View of pipe discharging into Arroyo Simi

9BD_GERRY

This monitoring site is located on an agricultural drain adjacent to Gerry Road north of Santa Rosa Road. Flow from this drain eventually discharges into Calleguas Creek Reach 9B (Conejo Creek).

Site Map

View (N) of the sampling site



Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL

Interim Load Allocations

Interim sediment LAs are currently in effect for this TMDL (Table 52). Compliance with these LAs is measured at the base of each subwatershed.

Table 52. CCW OC Pesticides and PCBs Interim Sediment Load Allocations

		Subwatershed					
Constituent	**Units [1]**	**Mugu Lagoon [2]**	**Calleguas Creek**	**Revolon Slough**	**Arroyo Las Posas**	**Arroyo Simi**	**Conejo Creek**
Chlordane	ng/g	25.0	17.0	48.0	3.3	3.3	3.4
4,4'-DDD	ng/g	69.0	66.0	400.0	290.0	14.0	5.3
4,4'-DDE	ng/g	300.0	470.0	1,600.0	950.0	170.0	20.0
4,4'-DDT	ng/g	39.0	110.0	690.0	670.0	25.0	2.0
Dieldrin	ng/g	19.0	3.0	5.7	1.1	1.1	3.0
PCBs	ng/g	180.0	3,800.0	7,600.0	25,700.0	25,700.0	3,800.0
Toxaphene	ng/g	22,900.0	260.0	790.0	230.0	230.0	260.0

1. ng/g = nanograms/ gram
2. The Mugu Lagoon subwatershed includes Duck Pond/Agricultural Drain/Mugu/Oxnard Drain #2.

Monitoring Results and Compliance

The following table (Table 53) includes sediment monitoring results from receiving waters at the base of each subwatershed. The data were collected as part of the CCWTMP. Additional information related to the sample collection and upstream land use data can be found in the "Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report." Monitoring at sites within Mugu Lagoon only occurs every three years; as such, sediment samples were not collected during the 2013-2014 monitoring year and therefore, not reported.

Table 53. OC Pesticides and PCBs TMDL Load Allocations Compared to Sediment Monitoring Data

Site & Constituent	**Units**	**Interim LA [1]**	**Event 39 Aug-2013**
Calleguas Creek – Hwy 1 Bridge (02_PCH)			
Total Chlordane [2]	ng/g dw	17	ND
4,4'-DDD	ng/g dw	66	ND
4,4'-DDE	ng/g dw	470	7.5
4,4'-DDT	ng/g dw	110	ND
Dieldrin	ng/g dw	3	ND
PCBs [3]	ng/g dw	3,800	ND
Toxaphene	ng/g dw	260	ND

Table continued on next page.

Site & Constituent	Units	Interim LA [1]	Event 39 Aug-2013
Revolon Slough – Wood Road (04_WOOD)			
Total Chlordane [2]	ng/g dw	48	ND
4,4'-DDD	ng/g dw	400	ND
4,4'-DDE	ng/g dw	1,600	39.9
4,4'-DDT	ng/g dw	690	DNQ
Dieldrin	ng/g dw	5.7	ND
PCBs [3]	ng/g dw	7,600	ND
Toxaphene	ng/g dw	790	69.3
Calleguas Creek – University Drive CSUCI (03_UNIV)			
Total Chlordane [2]	ng/g dw	17	ND
4,4'-DDD	ng/g dw	66	ND
4,4'-DDE	ng/g dw	470	DNQ
4,4'-DDT	ng/g dw	110	ND
Dieldrin	ng/g dw	3	ND
PCBs [3]	ng/g dw	3,800	ND
Toxaphene	ng/g dw	260	DNQ
Conejo Creek – Adolfo Road (9B_ADOLF)			
Total Chlordane [2]	ng/g dw	3.4	ND
4,4'-DDD	ng/g dw	5.3	ND
4,4'-DDE	ng/g dw	20	DNQ
4,4'-DDT	ng/g dw	2	ND
Dieldrin	ng/g dw	3	ND
PCBs [3]	ng/g dw	3,800	ND
Toxaphene	ng/g dw	260	ND
Arroyo Las Posas – Somis Road (06_SOMIS)			
Total Chlordane [2]	ng/g dw	3.3	ND
4,4'-DDD	ng/g dw	290	DNQ
4,4'-DDE	ng/g dw	950	10.4
4,4'-DDT	ng/g dw	670	ND
Dieldrin	ng/g dw	1.1	ND
PCBs [3]	ng/g dw	25,700	ND
Toxaphene	ng/g dw	230	ND

Table continued on next page.

Site & Constituent	Units	Interim LA [1]	Event 39 Aug-2013
Arroyo Simi – Hitch Boulevard (07_HITCH)			
Total Chlordane [2]	ng/g dw	3.3	ND
4,4'-DDD	ng/g dw	14	ND
4,4'-DDE	ng/g dw	170	DNQ
4,4'-DDT	ng/g dw	25	ND
Dieldrin	ng/g dw	1.1	ND
PCBs [3]	ng/g dw	25,700	ND
Toxaphene	ng/g dw	230	ND

ng/g dw=nanograms/ gram dry weight; ND=not detected; DNQ=detected not quantified

Concentrations in **bold** indicate an exceedance of the interim LA for the specified constituent applicable to the specific site.

1. Interim LAs for agricultural dischargers; effective until March 24, 2026 (R4-2005-010).
2. Total chlordane is the sum of alpha and gamma-chlordane.
3. PCBs concentrations are the sum of the seven aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260).

As shown in the table above, there were no exceedances of the toxaphene interim LA during the 2013-2014 monitoring year.

Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL

Interim Load Allocations

Interim LAs are currently in effect for this TMDL (Table 54). Compliance with these LAs is measured at the base of each subwatershed.

Table 54. CCW Toxicity, Chlorpyrifos, and Diazinon Interim Load Allocations

	Interim LA [1]	
Constituent	**Acute (1 hour) (µg/L) [2]**	**Chronic (4 day) (µg/L) [3]**
Chlorpyrifos	2.57	0.81
Diazinon	0.278	0.138
Toxicity	1 TU_c	1 TU_c

1. These TMDL LAs apply to the receiving water at the base of each subwatershed.
2. Acute interim LAs are used for assessing wet-weather data.
3. Chronic interim LAs are used for assessing dry-weather data.

Monitoring Results and Compliance

The following table (Table 55) includes monitoring results from receiving waters at the base of each subwatershed. The data was collected as part of the CCWTMP. Additional information related to the sample collection and upstream land use data can be found in the "Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report."

Table 55. Toxicity, Chlorpyrifos, and Diazinon TMDL Load Allocations Compared to Monitoring Data

Site & Constituent	Units	Dry Interim LA[1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014	Wet Interim LA[1]	Event 42 Wet Feb-2014
Mugu Lagoon – Ronald Reagan Bridge (01_RR_BR)								
Chlorpyrifos	µg/L	0.81	ND	ND	ND	ND	2.57	0.0924
Diazinon	µg/L	0.138	ND	ND	ND	ND	0.278	0.0095
Revolon Slough – Wood Road (04_WOOD)								
Chlorpyrifos	µg/L	0.81	ND	0.0026	0.0117	ND	2.57	0.1691
Diazinon	µg/L	0.138	ND	ND	ND	ND	0.278	0.0232
Calleguas Creek – University Drive CSUCI (03_UNIV)								
Chlorpyrifos	µg/L	0.81	ND	ND	0.0054	0.0046	2.57	0.0314
Diazinon	µg/L	0.138	ND	ND	ND	ND	0.278	0.0094
Conejo Creek – Adolfo Road (9B_ADOLF)								
Chlorpyrifos	µg/L	0.81	ND	ND	ND	ND	2.57	ND
Diazinon	µg/L	0.138	ND	ND	ND	ND	0.278	ND
Arroyo Las Posas – Somis Road (06_SOMIS)								
Chlorpyrifos	µg/L	0.81	ND	ND	0.0027	NS	2.57	0.1325
Diazinon	µg/L	0.138	ND	ND	ND	NS	0.278	ND
Arroyo Simi – Hitch Boulevard (07_HITCH)								ND
Chlorpyrifos	µg/L	0.81	ND	ND	0.008	0.0027	2.57	ND
Diazinon	µg/L	0.138	ND	ND	ND	ND	0.278	0.0158

ND=not detected

NS=no sample, site dry

1. Interim dry and wet weather LAs are effective until March 24, 2016 (R4-2005-009).

During year six of CCWTMP monitoring, there were no exceedances of the interim LAs for agriculture as measured at the sites located at the base of each subwatershed. If an exceedance of an interim LA occurs during future events, the contributing agricultural land use data will be assessed to evaluate whether agricultural discharges were potentially causing the exceedances.

Calleguas Creek Watershed Boron, Chloride, Sulfate, and TDS (Salts) TMDL

Interim Dry Weather Load Allocations

Interim dry weather LAs are measured as in-stream monthly averages at the base of each subwatershed, except for chloride which is measured as an instantaneous maximum (Table 56). Dry weather LAs apply when flow rates are below the 86th percentile and there was no measurable precipitation in the previous 24 hour period.

Table 56. CCW Boron, Chloride, Sulfate, and TDS (Salts) Interim Dry Weather Load Allocations

Constituent	Interim Dry Weather LA (mg/L)
Boron Total	1.8
Chloride Total	230
Sulfate Total	1,962
TDS Total	3,995

Monitoring Results and Compliance

Compliance monitoring for salts was required starting September 9, 2012. The following table (Table 57) includes monthly dry weather mean salt concentrations for the five compliance sites. Data was collected as part of the CCWTMP and additional information related to salts monitoring can be found in the "Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report." Interim LAs for salts constituents are currently being met at all sites, with the exception of boron at 04_WOOD representing the Revolon Slough subwatershed. There is one agricultural land use site where salts are measured upstream of the compliance site. The results for boron from the 04D_WOOD agricultural land use site alongside the receiving water data are presented in Table 58. When comparing the receiving water and land use data for boron, it is important to keep in mind that quarterly dry weather grab samples are collected at 04D_WOOD as compared to monthly dry weather means reported for 04_WOOD, generated from daily averages of five-minute sensor data. During the August, February, and May quarterly events, the agricultural land use site 04D_WOOD was dry. Grab samples collected for boron in November were below the interim LA.

Table 57. Salts Load Allocations Compared to Monitoring Data

	Units	Interim LA	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14
Revolon Slough – Wood Road (04_WOOD)														
Total Dissolved Solids	mg/L	3995	3689	3713	3858	2940	3368	3392	3365	3525	3628	3525	3488	3767
Chloride	mg/L	230	187	188	195	151	171	173	171	179	184	179	177	191
Sulfate	mg/L	1962	1850	1862	1935	1475	1690	1702	1688	1768	1820	1768	1750	1889
Boron	mg/L	1.8	**1.89**	**1.91**	**1.98**	1.52	1.74	1.75	1.73	**1.81**	**1.86**	**1.81**	1.79	**1.93**
Calleguas Creek – University Drive CSUCI (03_UNIV)														
Total Dissolved Solids	mg/L	3995	1021	1059	1085	1060	1038	1049	1030	1001	962	996	1007	1007
Chloride	mg/L	230	199	207	213	207	202	205	201	195	186	194	196	196
Sulfate	mg/L	1962	248	257	264	258	252	255	251	243	234	242	245	245
Conejo Creek – Howard Road Bridge (9A_HOWAR)														
Total Dissolved Solids	mg/L	3995	942	1009	1034	1000	977	992	980	934	897	928	936	934
Chloride	mg/L	230	189	203	209	201	196	200	197	187	179	186	188	187
Sulfate	mg/L	1962	234	251	258	249	243	247	244	232	223	231	233	232
Conejo Creek – Baron Brothers Nursery (9B_BARON)														
Total Dissolved Solids	mg/L	3995	651	651	643	657	653	664	669	679	728	726	707	699
Chloride	mg/L	230	145	146	143	147	146	149	150	152	165	164	159	157
Sulfate	mg/L	1962	138	138	136	139	138	140	141	144	153	153	149	148
Arroyo Simi – Tierra Rejada Road (07_TIERRA)														
Total Dissolved Solids	mg/L	3995	1090	1091	1082	1094	1101	1112	1107	1106	1171	1173	1170	1154
Chloride	mg/L	230	156	156	154	156	157	159	158	158	167	168	167	165
Sulfate	mg/L	1962	407	407	404	409	411	416	414	413	438	439	438	432
Boron	mg/L	1.8	0.67	0.67	0.66	0.67	0.68	0.68	0.68	0.68	0.72	0.72	0.72	0.71

Notes:

a. Monthly dry weather mean salt concentrations were generated using mean daily salt concentrations (from 5-min data) for days that met the definition of dry weather in the Salts TMDL (i.e., discharge < 86th percentile flow *and* no measureable rain in preceding 24 hrs). The 86th percentile of mean daily discharge at 03_Univ (generated using 5-min discharge data for the period July 1, 2012-June 30, 2013) was used as the flow-related threshold for distinguishing wet and dry days for all five compliance sites. Daily precipitation records for 23 gages in the CCW watershed (accessed via the VCWPD Hydrologic Data Server) were used to determine days with "measureable precipitation". Days were considered as having measureable precipitation if two or more rain gages in the watershed received 0.1 inch or more of precipitation.

Concentrations in **bold** indicate an exceedance of the interim LA for the specified constituent applicable to the specific site.

Table 58. Boron Monitoring Data (mg/L) in Revolon Slough

Site ID	Site Type	Interim LA	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13
04_WOOD [1]	Receiving Water	1.8	**1.89**	**1.91**	**1.98**	1.52	1.74	1.75	1.73	**1.81**	**1.86**	**1.81**	1.79	**1.93**
04D_WOOD [2]	Ag	1.8		NS			1.2			NS			NS	

NS=no sample, dry
1. Data presented are monthly means
2. Data presented are quarterly dry weather grabs
Results in **bold type** exceed the interim LA

Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL

Interim Load Allocations

Dry weather LAs apply to days when flows in the stream are less than the 86th percentile flow rate for each subwatershed. Wet weather LAs apply to days when flows in the stream exceed the 86th percentile flow rate for each subwatershed. Interim LAs for total recoverable metals and selenium are applied in the receiving water at the compliance points (Table 59).

Table 59. Interim Load Allocations for Total Recoverable Metals and Selenium

	Calleguas and Conejo Creeks			Revolon Slough		
Constituent	Dry Daily Max (µg/L)	Dry Monthly Avg. (µg/L)	Wet Daily Max (µg/L)	Dry Daily Max (µg/L)	Dry Monthly Avg. (µg/L)	Wet Daily Max (µg/L)
Copper	24	19	1,390	24	19	1,390
Nickel	43	42	---	43	42	---
Selenium	---	---	---	6.7 [1]	6 [1]	---

1. Attainment of interim LAs will be evaluated in consideration of background loading data, if available.

Interim LAs for mercury are evaluated based on suspended sediment measured in-stream at the base of Revolon Slough and Calleguas Creek (Table 60).

Table 60. Interim Load Allocations for Mercury in Suspended Sediment

Flow Range (Million gallons/year)	Calleguas Creek (lbs/yr)	Revolon Slough (lbs/yr)
0-15,000	3.9	2
15,000-25,000	12.6	4.8
>25,000	77.5	12.2

Monitoring Results and Compliance

As shown in the table below, the interim allocations are being met in the receiving waters for all metals constituents; the exception is selenium in Revolon Slough during dry weather conditions. It has been noted in the current and previous CCW TMDL annual reports that rising groundwater is a large background source of selenium in the Revolon Slough subwatershed. There are two agricultural land use sites located in this subwatershed and their selenium monitoring results are provided below (Table 62). Of the two agricultural land use sites, 05D_SANT_VCWPD is located further upstream in the subwatershed and also has significantly higher selenium concentrations. Samples from the agricultural land use site 04D_WOOD were all below the total selenium LA. Further investigation of selenium sources will be conducted through special studies as required by the TMDL.

Table 61. Metals and Selenium Interim Load Allocations Compared to Monitoring Data

Site & Constituent	Units	Dry Interim LA [1]	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 43 Dry May-2014	Wet Interim LA [2]	Event 42 Wet Feb-2014	Annual Average [3]
Revolon Slough – Wood Road (04_WOOD)									
Total Copper	µg/L	19	4.68	3.80	5.69	2.78	1,390	70.28	--
Total Nickel	µg/L	42	6.7	8.09	6.93	7.21	---	47.32	--
Total Selenium	µg/L	6	**17.72**	**17.77**	**20.98**	**20.98**	---	4.31	--
Total Mercury [4]	lbs/yr	2	--	--	--	--	--	--	0.012
Calleguas Creek – University Drive CSUCI (03_UNIV)									
Total Copper	µg/L	19	2.28	2.2	2.78	2.55	1,390	72.31	--
Total Nickel	µg/L	42	6.40	5.33	5.46	5.97	---	59.79	--
Total Selenium	µg/L	---	0.65	0.49	0.57	0.62	---	1.52	--
Total Mercury [4]	lbs/yr	3.9	--	--	--	--	--	--	0.035

1. Dry interim LAs are listed as the dry monthly average concentrations.
2. Wet interim LAs are the daily maximum.
3. The mercury LA is assessed as an annual load in suspended sediment. The water column mercury concentrations were used in calculating the loads, conservatively assuming that all mercury is on suspended sediment rather than being dissolved. The loads at each site are based on estimated annual concentrations (average of all monitored events at each site) and total annual flow calculated from preliminary streamflow data received from real time data loggers recording 5-minute flow data in the creeks.
4. Interim LAs for mercury are expressed as annual loads. Total annual flow for 07/01/12 to 6/31/13 into Mugu Lagoon from Calleguas Creek and Revolon Slough is calculated as 4,926 Mgal/yr. As such, the interim LA shown corresponds to the flow range of 0 to 15,000 Mgal/yr, per R4-2006-0012.

Table 62. Selenium Interim Load Allocation Compared to Revolon Slough Receiving Water and Agricultural Land Use Monitoring Data

	Dry Weather Events & Dates					Wet Weather Event & Date	
Site ID [1]	Interim LA	39 Aug-13	40 Nov-13	41 Feb-14	43 May-14	Interim LA	42 Feb-14
04_WOOD	6	**17.72**	**17.77**	**20.98**	**20.98**	---	4.3
04D_WOOD	6	NS	2.5	NS	NS	---	4.1
05D_SANT_VCWPD	6	**46.5**	**62.6**	**53.0**	**76.6**	---	4.4

NS = Not Sampled; site dry

1. 04_WOOD is the receiving water site; 04D_WOOD and 05D_SANT_VCWPD are both agricultural land use sites further upstream of the receiving water monitoring location.

Calleguas Creek Watershed Nitrogen Compounds TMDL

Load Allocations

The LA for the Calleguas Creek Watershed Nitrogen Compounds TMDL is expressed as the sum of nitrate-nitrogen and nitrite-nitrogen (Table 63).

Table 63. Load Allocations for Nitrogen Compounds

Constituent	Load Allocation (mg/L)
Nitrate-N + Nitrite-N	9

Monitoring Results and Compliance

Monitoring sites located in the lower part of the watershed consistently exceed the nitrogen LAs, whereas sites in the upper reaches are typically below the allocation. The following two tables (Table 64 and Table 65) include monitoring data from CCWTMP agricultural land use sites and VCAILGMP sites located within the CCW for comparison to the Nitrogen TMDL LAs.

Table 64. Nitrogen Load Allocations Compared to CCW TMDL Agricultural Land Use Site Data

Site	Constituent	Allocation (mg/L)	Event 39 Dry Aug-2013	Event 40 Dry Nov-2013	Event 41 Dry Feb-2014	Event 42 Wet Feb-2014	Event 43 Dry May-2014
01T_ODD2_DCH	Nitrate-N + Nitrite-N	9	**53.3**	**69.2**	**71.1**	**24.3**	**63.3**
02D_BROOM	Nitrate-N + Nitrite-N	9	NS	**48.1**	**64.6**	0.07	**52.9**
04D_WOOD	Nitrate-N + Nitrite-N	9	NS	**27.2**	NS	**51.7**	NS
05D_SANT_VCWPD	Nitrate-N + Nitrite-N	9	**32.6**	**37.5**	**33.9**	**9.7**	**33.8**
06T_FC_BR	Nitrate-N + Nitrite-N	9	NS	4.9	NS	6.3	NS
07D_HITCH_LEVEE_2	Nitrate-N + Nitrite-N	9	NS	NS	NS	**50.4**	**34.1**
9BD_GERRY	Nitrate-N + Nitrite-N	9	NS	NS	NS	2.5	**9.9**

NS = Not Sampled; site dry.

Table 65. Nitrogen Load Allocations Compared to CCW VCAILGMP Site Data

Site	Constituent	Allocation (mg/L)	Event 19 Dry Aug-2012	Event 20 Wet Jan-2013	Event 21 Dry May-2013
01T_ODD3_ARN	Nitrate-N	9	**30.0**	NS [1]	**53.9**
04D_ETTG	Nitrate-N	9	**45.5**	**42.7**	**47.5**
04D_LAS	Nitrate-N	9	**31.7**	**44.2**	**51.3**
05D_LAVD	Nitrate-N	9	NS [2]	8.8	NS[2]
05T_HONDO	Nitrate-N	9	NS [2]	5.5	NS[2]
06T_LONG2	Nitrate-N	9	NS [2]	2	NS[2]

Concentrations in **bold** indicate an exceedance of the LA.

1. No samples collected due to the site being inaccessible because of road flooding.
2. No samples collected due to the site being dry.

Revolon Slough and Beardsley Wash Trash TMDL

Load Allocation

The LA for this TMDL is zero trash. Dischargers may achieve compliance with the LAs by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. By March 6, 2010, agricultural dischargers were required to demonstrate full compliance and attainment of the zero trash target and assure that trash is not accumulating in deleterious amounts between the required trash assessment and collection events.

Compliance

VCAILG members are complying with the Trash TMDL requirements through a MFAC/BMP Program. The MFAC program includes regular collection and assessment of trash. VCAILG members are in compliance with the TMDL requirement to ensure zero trash immediately after each MFAC event. Additionally, VCAILG has implemented additional BMPs to control trash and reduce the accumulation of trash between collection events. The importance of collecting and properly disposing of trash has also been a reoccurring topic at multiple VCAILG education classes. The VCAILG WQMP Management Practice Survey has also included BMPs related to trash and property management. For additional information, please refer to the "2015 Revolon Slough/Beardsley Wash Trash TMDL TMRP/MFAC Annual Report."

Santa Clara River Nitrogen Compounds TMDL

Load Allocations

The LA for the Santa Clara River Nitrogen Compounds TMDL applicable to VCAILG monitoring sites is listed in Table 66.

Table 66. Load Allocations for Nitrogen Compounds

Constituent	Load Allocation (mg/L) [1]
Ammonia-N + Nitrate-N + Nitrite-N	10

1. The specified load allocation applies to all Santa Clara River reaches within Ventura County.

Monitoring Results and Compliance

Table 67 lists the data collected at the VCAILGMP monitoring sites located within the Santa Clara River Watershed for comparison to the nitrogen LA. The LA was exceeded at three monitoring sites, S02T_TODD, S03T_BOULD, and S04T_TAPO. The S02T_TODD site was sampled during all three events with only the concentration from Event 21 exceeding the LA. The S03T_BOULD site was only sampled during the wet Event 20; the concentration exceeded the LA. The S04T_TAPO site was sampled during all three events with the concentration from Event 19 and Event 21 exceeding the LA.

Table 67. Nitrogen Load Allocations Compared to SCR VCAILGMP Site Data

Site	Constituent	LA [1] (mg/L)	Event 19 Dry Aug-2013	Event 20 Wet Feb-2014	Event 21 Dry May-2014
S02T_ELLS	Ammonia-N + Nitrate-N	10	NS	1.79	NS
S02T_TODD	Ammonia-N + Nitrate-N	10	7.05	5.57	**14.98**
S03T_TIMB	Ammonia-N + Nitrate-N	10	NS	4.99	NS
S03T_BOULD	Ammonia-N + Nitrate-N	10	NS	**16.04**	NS
S03D_BARDS	Ammonia-N + Nitrate-N	10	NS	9.78	1.84
S04T_TAPO	Ammonia-N + Nitrate-N	10	**11.92**	1.53	**21.88**

NS = Not Sampled; site dry.

Bold numbers indicate the value is greater than the Load Allocation.

1. Nitrite-N concentrations are not monitored as part of the VCAILGMP, however, levels of nitrite are typically insignificant compared to the other nitrogen compounds that are measured.

Ventura River Estuary Trash TMDL

Load Allocation

The LA for the Ventura River Estuary Trash TMDL is zero trash. Dischargers may achieve compliance with the LA by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. By March 6, 2010 agricultural dischargers must demonstrate full compliance and attainment of the zero trash target and the requirement that trash is not accumulating in deleterious amounts between the required trash assessment and collection events.

Compliance

Non-point source dischargers are complying with the Trash TMDL requirements through a MFAC/BMP Program, which was revised for the 2013-2014 monitoring year. VCAILG members are in compliance with the TMDL requirement to ensure zero trash immediately after each MFAC event. Additionally, the VCAILG has implemented additional BMPs to control trash and reduce the accumulation of trash between collection events. The importance of collecting and properly disposing of trash has also been a reoccurring topic at multiple VCAILG education classes. The VCAILG WQMP Management Practice Survey has also included BMPs related to trash and property management. For additional information, please refer to the "2013-2014 Ventura River Estuary Trash TMDL TMRP/MFAC Annual Report."

Santa Clara River Estuary Toxaphene TMDL

The Santa Clara River Estuary Toxaphene TMDL was adopted as a single regulatory action through the Conditional Waiver. Conditional Waiver Appendix 1, Monitoring and Reporting Requirements, specifies the following constituents be monitored as part of this TMDL: chlordane, dieldrin, and toxaphene. The constituents are also required to be analyzed in various media: fish tissue (every three years in the Estuary), water, and suspended sediment (during wet weather events). Two sites were selected to meet the TMDL requirements of having one water quality monitoring site representing agricultural discharges directly to the Estuary and one representative discharge to the Santa Clara River upstream of the Estuary. The existing VCAILGMP site S02T_ELLS is monitored as the upstream TMDL site by collecting additional

sample volume for suspended sediment analysis, which is beyond normal Conditional Waiver monitoring. Site S01D_MONAR was selected to represent agricultural discharges to the Estuary. A description of S02T_ELLS was provided previously with the Conditional Waiver monitoring results for that site. Analogous information regarding S01D_MONAR is provided below:

S01D_MONAR

This monitoring site is located on an agricultural drain that discharges directly to the Santa Clara River Estuary between Harbor Boulevard and Victoria Avenue.

Site Map

View downstream towards Estuary

Load Allocations

The Conditional Waiver incorporated toxaphene LAs for suspended sediment and fish tissue as Water Quality Benchmarks (Appendix 3) shown in the table below.

Table 68. Load Allocations for Toxaphene

Reach	Toxaphene in Fish Tissue (µg/kg)	Toxaphene in Suspended Sediment (µg/kg)
Santa Clara River Estuary	6.1	0.1

Monitoring Data and Compliance

LAs for the Santa Clara River Estuary Toxaphene TMDL were established for toxaphene measured in fish tissue and suspended sediment. Additionally, monitoring of chlordane and dieldrin is required; however, these constituents do not have LAs. In the VCAILG QAPP, it was specified that if possible, targeted fish should be those that are commonly consumed by humans, but based on the results of other studies in the Estuary that may not be feasible. Fish were collected in 2012; therefore, fish collection and analysis was not required for the 2013-2014 monitoring year. The next fish sampling will be in the summer of 2015. Chlordane, dieldrin, and toxaphene were not detected in any of the suspended sediment samples. No exceedances of

the toxaphene LA in suspended sediment occurred this monitoring year. In the water samples collected, there were concentrations of chlordane at the S01T_ELLS site and there were concentrations of chlordane and toxaphene at the S01D_MONAR site. The results of monitoring for the Santa Clara River Estuary Toxaphene TMDL are presented in Table 69.

Table 69. Santa Clara River Estuary Toxaphene TMDL Monitoring Data: Water and Suspended Sediment

Site	Constituent	Units	Load Allocation	Event 19 Dry Aug-2013	Event 20 Wet Feb-2014	Event 21 Dry May-2014
S01T_ELLS	***Water***					
	TSS	mg/L	---	NS	2630	NS
	Chlordane [1]	µg/L	---	NS	0.041	NS
	Dieldrin	µg/L	---	NS	ND	NS
	Toxaphene	µg/L	---	NS	ND	NS
	Suspended Sediment (>63 µg/kg)					
	Chlordane [1]	µg/kg	---	NR	ND	NR
	Dieldrin	µg/kg	---	NR	ND	NR
	Toxaphene	µg/kg	0.1	NR	ND	NR
S01D_MONAR	***Water***					
	TSS	mg/L	---	NS	673	NS
	Chlordane [1]	µg/L	---	NS	0.07	NS
	Dieldrin	µg/L	---	NS	ND	NS
	Toxaphene	µg/L	---	NS	0.7	NS
	Suspended Sediment (>63 µg/kg)					
	Chlordane [1]	µg/kg	---	NR	ND	NR
	Dieldrin	µg/kg	---	NR	ND	NR
	Toxaphene	µg/kg	0.1	NR	ND	NR

NS = Site Dry
ND = Not detected at the applicable reporting limit.
NR = Not Required; filtered sediment sampling is only required during wet weather sampling events.
1. Reported total chlordane is the sum of alpha- and gamma-chlordane.

Harbor Beaches of Ventura County Bacteria TMDL

The Harbor Beaches of Ventura County Bacteria TMDL does not specify LAs for agricultural dischargers, but does include a provision for monitoring. The VCAILG QAPP specified a site, monitoring frequency, and constituents to comply with the implementation actions specified for agricultural dischargers in the TMDL. A site description, map, and photo are provided below for the site used to evaluate agricultural discharges upstream of the Channel Islands Harbor.

CIHD_VICT

The monitoring site is located along Victoria Avenue, just north of Doris Avenue and the Doris Drain.

Site Map

View at sampling point looking upstream

Monitoring Data

As specified in the VCAILG QAPP, the CIHD_VICT site is visited at the same frequency as Conditional Waiver monitoring. At each event flow and field meter parameters are measured in addition to water samples collected for bacteria testing. Flow was present at this site during Event 20 of the 2013-2014 monitoring year. *E. coli*, fecal coliform, and total coliform data are presented in Table 70.

Table 70. Harbor Beaches of Ventura County Bacteria TMDL Monitoring Data

		Bacteria Concentrations (MPN/100mL)		
Site	**Event**	***E. coli***	**Fecal Coliform**	**Total Coliform**
CIHD_VICT	20: 2/28/2014	3,065	1,700	160,000

McGrath Lake PCBs, Pesticides, and Sediment Toxicity TMDL

The TMDL for PCBs, Pesticides, and Sediment Toxicity in McGrath Lake became effective June 30, 2011; after the adoption of the current Conditional Waiver. Though the agricultural LAs for this TMDL have not been incorporated into the Conditional Waiver as water quality benchmarks, actions have been taken by VCAILG to comply with the TMDL Implementation Schedule. The VCAILG QAPP and MRP were revised to include the Phase 1 Central Ditch monitoring specified in the McGrath Lake TMDL. Inclusion of monitoring data within this AMR also fulfills the TMDL requirement for annual reporting.

The existing VCAILGMP site OXD_CENTR is located at the Central Ditch, which drains into McGrath Lake. Information and Conditional Waiver monitoring results related to this site can be found in the previous data compilation section. Using the OXD_CENTR site, attainment of TMDL LAs in the inflow to the lake can be assessed. At this time, until the incorporation of the

McGrath Lake TMDL LAs (Table 71) as water quality benchmarks, exceedances of the LAs will not trigger the need for a WQMP. However, the existence of this TMDL will influence prioritization and BMP implementation within the McGrath Lake subwatershed.

TMDL Monitoring and Load Allocations

Phase 1 of the McGrath Lake TMDL requires water and sediment sampling in the Central Ditch. Water samples are to be analyzed for:

- Total Organic Carbon (TOC)
- Total Suspended Solids (TSS)
- Total PCBs
- DDT and derivatives
- Dieldrin
- Total Chlordane

All of the above listed constituents except for PCBs and TOC are already required as standard Conditional Waiver monitoring constituents.

Sediment samples are analyzed for the following:

- Total Organic Carbon (TOC)
- Total PCBs
- DDT and derivatives
- Dieldrin
- Total Chlordane

Field parameters and flow are also required at each sampling event, which is already a Conditional Waiver requirement.

Table 71. McGrath Lake Central Ditch Load Allocations

Constituent	Water Column Load Allocation (µg/L)	Sediment Load Allocation (µg/dry kg)
Chlordane	0.00059	0.5
Dieldrin	0.00014	0.02
4,4'-DDD	0.00084	2
4,4'-DDE	0.00059	2.2
4,4'-DDT	0.00059	1
Total DDT	---	1.58
Total PCBs	0.00017	22.7

Monitoring Data

The QAPP and MRP revisions and Regional Board approval to incorporate the proposed monitoring for compliance with the McGrath Lake TMDL occurred midway through the 2012 monitoring year. This is the second full monitoring year since the TMDL monitoring approach was approved. Water sampling occurred concurrently with VCAILG monitoring and included the additional total organic carbon (TOC) and PCBs constituents. Sediments were collected

during the two dry weather events. An additional sediment collection took place approximately a week after the storm event when water levels were safe to enter. Results applicable to this TMDL are reported in the tables below.

Table 72. McGrath Lake TMDL Central Ditch Monitoring Data in Water: OXD_CENTR

Constituents in Water	Units	Water LA	Event 19 Dry 8/22/2013	Event 20 Wet 2/28/2014	Event 21 Dry 5/29/2014
TOC	mg/L	---	4.21	10.6	1.4
TSS	mg/L	---	1.84	245	1.84
Total PCBs [1]	µg/L	0.00017	ND	ND	ND
4,4'-DDD	µg/L	0.00084	ND	0.1408	ND
4,4'-DDE	µg/L	0.00059	DNQ	0.4019	ND
4,4'-DDT	µg/L	0.00059	ND	0.0711	ND
Dieldrin	µg/L	0.00014	ND	ND	ND
Total Chlordane [2]	µg/L	0.00059	ND	0.0173	ND

1. Total PCBs include the 7 aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, 1260).
2. Total chlordane is considered the sum of alpha- and gamma-chlordane.

Table 73. McGrath Lake TMDL Central Ditch Monitoring Data in Sediment: OXD_CENTR

Constituents in Sediment	Units	Sediment LA	Event 19 Dry 8/22/2013	Event 20.1 Post-Rain 3/7/2014	Event 21 Dry 5/29/2014
TOC	% dry wt.	---	5.96	3.7	2.93
Total PCBs [1]	ng/dry g	22.7	ND	ND	ND
4,4'-DDD	ng/dry g	2	22.1	141.2	43.6
4,4'-DDE	ng/dry g	2.2	131	458.1	258.3
4,4'-DDT	ng/dry g	1	8.1	144.3	66
Total DDT [2]	ng/dry g	1.58	161.2	743.6	367.9
Dieldrin	ng/dry g	0.02	ND	ND	ND
Total Chlordane [3]	ng/dry g	0.5	DNQ	16	5.5

1. Total PCBs include the 7 aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, 1260).
2. Total DDT is the sum of 4,4'-DDD, 4,4'-DDT, and 4,4'-DDT.
3. Total chlordane is considered the sum of alpha- and gamma-chlordane.

EVALUATION OF DATA QUALITY

The VCAILG QAPP specifies monitoring program requirements and procedures designed to ensure that the quality of data generated through the VCAILGMP are such that data can be used to 1) accurately assess environmental conditions and 2) make environmentally-sound decisions. This section provides a summary of the data quality evaluation performed on data collected through the VCAILGMP in 2013 through 2014. An evaluation of the data quality for Calleguas Creek Watershed TMDL monitoring is included as Appendix E in the sixth year annual

monitoring report for that program.[5] The evaluation herein is based on data quality objectives and quality control requirements specified in the VCAILG QAPP.

Data Quality Objectives

Data quality objectives specified in the QAPP for the VCAILGMP include requirements pertaining to maximum detection limits achieved by field methods and analytical laboratories, and acceptance criteria for quality control samples. Additional data quality objectives were defined in the QAPP for percent completeness. Table 74, Table 75, and Table 76 provide data quality objectives for field measured constituents and laboratory analyzed constituents.

Detection Limits

All project detection limits were met in 2013 to 2014 monitoring year for field measurements. MDLs for sulfate, TSS, and dimethoate were not met during 2013. RLs for sulfate and TSS were met, and levels of these analyses in environmental samples greatly exceeded the MDLs. Therefore, higher MDLs for these constituents are not considered quality control failures. For dimethoate, the best possible science does not meet the project limits, but were very close.

RL for total orthophosphate and TOC in water were not met. Both orthophosphate and TOC was found to be higher than the RL in all cases and therefore, this reporting limit is not considered quality control failures. The laboratory dropped the analysis for merphos from their suite of organophosphorus pesticides last year.

Table 74. Analytical Methods and Project Reporting Limits for Field Measurements

Parameter	Method	Range	Project Reporting Limit
Flow	Electromagnetic	-0.5 to +20 ft/s	0.05 ft/s
pH	Electrometric	0 – 14 pH units	NA
Temperature	High stability thermistor	-5 – 50°C	NA
Dissolved Oxygen	Luminescent dissolved oxygen	0 – 50 mg/L	0.5 mg/L
Turbidity	Nephelometric	0 – 3000 NTU	0.2 NTU
Conductivity	Graphite electrodes	0 – 10 mmhos/cm	2.5 µmhos/cm

NA = Not Applicable

[5] Larry Walker Associates. Calleguas Creek Watershed TMDL Compliance Monitoring Program Sixth Year Annual Monitoring Report. December 15, 2014.

Table 75. VCAILGMP Analytical Methods and Project Detection Limits / Project Reporting Limits for Laboratory Analyses

Parameter	Analytical Method	Units	Project MDL	Lab Reported MDL	Project RL	Lab Reported RL
Aquatic Chronic Toxicity						
Pimephales promelas (fathead minnow)	EPA-821-R-02-013 and EPA 600-4-91-002	N/A	N/A	N/A	N/A	N/A
Ceriodaphnia dubia (water flea)	EPA 821-R-02-013 and EPA 600-4-91-002	N/A	N/A	N/A	N/A	N/A
Selenastrum capricornutum (green algae)	EPA 821-R-02-013 and EPA 600-4-91-002	N/A	N/A	N/A	N/A	N/A
General Water Quality Constituents						
Total Dissolved Solids (TDS)	SM 2540C	mg/L	13	6.4	20	20
Total Suspended Solids (TSS)	SM 2540D	mg/L	0.4	0.49	1	1
Chloride	EPA 300.0	mg/L	0.04	0.042	1	1
Sulfate	EPA 300.0	mg/L	0.13	0.18	2	1
Hardness	SM 2340B	mg/L	1	0.1	5	0.5
Nutrients						
Total Ammonia-N	SM 4500-NH_3D	mg/L	0.03	0.02	0.06	0.05
Nitrate-N	EPA 300.0	mg/L	0.01	0.01	0.05	0.05
Total Orthophosphate-P	SM 4500-PE	mg/L	0.01	0.01	0.01	0.02
Metals						
Dissolved Copper	EPA 200.8	µg/L	0.4	0.005	0.8	0.01
Total Copper	EPA 200.8	µg/L	0.4	0.005	0.8	0.01
Organochlorine Pesticides						
Aldrin	EPA 625	ng/L	1	1	5	5

Parameter	Analytical Method	Units	Project MDL	Lab Reported MDL	Project RL	Lab Reported RL
BHC-alpha	EPA 625	ng/L	1	1	5	5
BHC -beta	EPA 625	ng/L	1	1	5	5
BHC-delta	EPA 625	ng/L	1	1	5	5
BHC-gamma (Lindane)	EPA 625	ng/L	1	1	5	5
Chlordane-alpha	EPA 625	ng/L	1	1	5	5
Chlordane-gamma	EPA 625	ng/L	1	1	5	5
2,4'-DDD	EPA 625	ng/L	1	1	5	5
2,4'-DDE	EPA 625	ng/L	1	1	5	5
2,4'-DDT	EPA 625	ng/L	1	1	5	5
4,4'-DDD	EPA 625	ng/L	1	1	5	5
4,4'-DDE	EPA 625	ng/L	1	1	5	5
4,4'-DDT	EPA 625	ng/L	1	1	5	5
Dieldrin	EPA 625	ng/L	1	1	5	5
Endosulfan I	EPA 625	ng/L	1	1	5	5
Endosulfan II	EPA 625	ng/L	1	1	5	5
Endosulfan Sulfate	EPA 625	ng/L	1	1	5	5
Endrin	EPA 625	ng/L	1	1	5	5
Endrin Aldehyde	EPA 625	ng/L	1	1	5	5
Endrin Ketone	EPA 625	ng/L	1	1	5	5
Toxaphene	NCI/GCMS	ng/L	10	10	50	50

Parameter	Analytical Method [1]	Units	Project MDL	Lab Reported MDL	Project RL	Lab Reported RL
Organophosphorus Pesticides						
Bolstar	EPA 625	ng/L	2	2	4	4
Chlorpyrifos	EPA 625	ng/L	1	0.5	2	1
Demeton	EPA 625	ng/L	1	1	2	2
Diazinon	EPA 625	ng/L	2	0.5	4	1
Dichlorvos	EPA 625	ng/L	3	3	6	6
Dimethoate	EPA 625	ng/L	3	5	6	10
Disulfoton	EPA 625	ng/L	1	1	2	2
Ethoprop	EPA 625	ng/L	1	1	2	2
Fenchlorphos	EPA 625	ng/L	2	2	4	4
Fensulfothion	EPA 625	ng/L	1	1	2	2
Fenthion	EPA 625	ng/L	2	2	4	4
Malathion	EPA 625	ng/L	3	3	6	6
Methyl Parathion	EPA 625	ng/L	1	1	2	2
Mevinphos	EPA 625	ng/L	8	5	16	10
Phorate	EPA 625	ng/L	6	5	12	10
Tetrachlorvinphos	EPA 625	ng/L	2	2	4	4
Tokuthion	EPA 625	ng/L	3	3	6	6
Trichloronate	EPA 625	ng/L	1	1	2	2

Parameter	Analytical Method [1]	Units	Project MDL	Lab Reported MDL	Project RL	Lab Reported RL
Pyrethroid Pesticides						
Allethrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Bifenthrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Cyfluthrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Cypermethrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Danitol	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Deltamethrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Esfenvalerate	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Fenvalerate	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Fluvalinate	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
L-Cyhalothrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
cis-Permethrin	EPA 625 (NCI)	ng/L	5	5	25	10
trans-Permethrin	EPA 625 (NCI)	ng/L	5	5	25	10
Prallethrin	EPA 625 (NCI)	ng/L	0.5	0.5	2	2
Resmethrin	EPA 625 (NCI)	ng/L	5	5	10	10

MDL = Method Detection Limit RL = Reporting Limit

Table 76. TMDL Analytical Methods and Project Method Detection Limits / Project Reporting Limits for Laboratory Analyses Performed Under the VCAILGMP

Parameter [1]	Analytical Method	Units	Project MDL	Lab Reported MDL	Project RL	Lab Reported RL
Total Organic Carbon (TOC) (water)	SM 5310C	mg/L	0.2	0.15	0.3	0.5
Total Organic Carbon (TOC) (sediment)	EPA 9060	% dry weight	0.01	0.01	0.05	0.02
OC Pesticides (filtered sediment)	EPA 8270C	ng/L	1 [2]	1	5 [2]	5
OC Pesticides (sediment)	EPA 8270C	ng/ dry g	1	1	5	5
OC Pesticides (fish tissue)	EPA 625	ng/L	1 [3]	1	5 [3]	5
PCBs (aroclors) (water)	EPA 8270C	ng/ dry g	10	10	20	20
PCBs (aroclors) (sediment)	SM 9223B	MPN/100mL	10	10	20	20
E. coli	SM 9221B or SM 9223B	MPN/100mL	<2	N/A	<2	1
Total Coliform	SM 9221B	MPN/100mL	<2	N/A	<2	1
Fecal Coliform	SM 5310C	mg/L	<2	N/A	<2	0.25

MDL = Method Detection Limit RL = Reporting Limit

1. Table lists only those TMDL constituents not included in the previous table
2. MDL for toxaphene is 10 ng/L; RL for toxaphene is 50 ng/L
3. MDL for toxaphene is 10 ng/g; RL for toxaphene is 50 ng/g

Data Quality Objectives for Precision and Accuracy

Table 77 and

Table 78 list data quality objectives for precision and accuracy for field measurements and laboratory analyses.

Table 77. VCAILGMP Data Quality Objectives for Precision and Accuracy

Parameter	Accuracy	Precision	Recovery
Water Velocity (for Flow calc.)	± 2%	NA	NA
pH	± 0.2 pH units	± 0.5 pH units	NA
Temperature	± 0.5 °C	± 5%	NA
Dissolved Oxygen	± 0.5 mg/L	± 10%	NA
Turbidity	± 10%	± 10%	NA
Conductivity	± 5%	± 5%	NA
Aquatic Chronic Toxicity	[1]	[2]	NA
Total Suspended Solids (TSS)	NA	30%	NA
Total Dissolved Solids (TDS)	NA	10%	NA
Hardness (as $CaCO_3$)	NA	30%	NA
Chloride	NA	3%	94-113%
Sulfate	NA	4%	92-113%
Ammonia-Nitrogen	NA	30%	70-130%
Nitrate-Nitrogen	NA	30%	70-130%
Orthophosphate-P	NA	30%	70-130%
Dissolved Copper	NA	30%	75-125%
Total Copper	NA	30%	75-125%
Organochlorine Pesticides	NA	30% [3]	50-150% [3]
Organophosphorus Pesticides	NA	30% [3]	50-150% [3]
Pyrethroid Pesticides	NA	30% [3]	50-150% [3]
Trash	NA	NA	NA

NA = Not Applicable

1. Must meet all method performance criteria relative to the reference toxicant test.
2. Must meet all method performance criteria relative to sample replicates.
3. Or control limits established as the mean ± 3 standard deviations based on laboratory precision and recovery data.

Table 78. TMDL Specific Data Quality Objectives [1]

Parameter	Accuracy	Precision	Recovery
Total Organic Carbon (water)	NA	30%	80-120%
Total Organic Carbon (sediment)	NA	30%	80-120%
PCBs (water)	NA	30%	50-150%
PCBs (sediment)	NA	30%	50-150%
Toxaphene (filtered sediment)	NA	30%	50-150% [1]
Chlordane (filtered sediment)	NA	30%	50-150% [1]
Dieldrin (filtered sediment)	NA	30%	50-150% [1]
E. coli (water)	NA	30%	NA
Total Coliform (water)	NA	30%	NA
Fecal Coliform (water)	NA	30%	NA

1. This table lists only those constituents not included in the previous table.

Field Data Quality

Hydrolab MS5 Data Sondes and DS4A Data Sonde (field meters) were calibrated within 24 hours of each monitoring event, and calibration was verified for each probe by analyzing a mid-range standard. If a calibration failure occurred, the probe that failed calibration was not used for monitoring. At the end of each event, mid-range standards were re-run to verify that each probe was still in calibration. Calibration data were recorded on the calibration sheet in the field logbook, and ultimately entered into the VCAILG Monitoring Database. One of the dissolved oxygen field meters did not work properly during events 20 and 21; site measurements taken with this meter were flagged as estimates. Part-way through Event 20 the DO sensor was displaying readings of 0.0. A different meter was used in Event 21 and that sensor would not meet the post calibration standards. All other calibration checks performed on field meters met data quality objectives for accuracy, signifying the validity of those field measurements.

Flow results for all events were obtained using a velocity meter or estimated by measuring stream width and average depth, and multiplying those estimates by the reciprocal of the time required for a floating object to travel over a measured distance. At some sites during the storm event, width and depth were estimated from past and current photos.

Blank Contamination

Overall there was very little blank contamination detected during the 2013-2014 monitoring year. The field blank detections were found in chloride, sulfate, and TOC only. The lab blank detections were all found in chloride and sulfate samples. An equipment blank was performed on sediment gathering equipment and detections were found only for TOC. All these detections were at levels less than ten times the expected levels found in all the field samples. Details of all the blank detections are reported in Table 79 below. The following lists a basic summary of the blank contamination results:

- Field Blanks – 282 analyzed – 6 detections above the RL (2.1%) (does not include surrogates)
- Laboratory Blanks – 970 analyzed – 20 detections above RL (2.1%) (does not include surrogates)

- Equipment Blanks – 271 analyzed – 0 detections above RL (0.0%) (does not include surrogates)

Table 79. Blank Sample Contamination Detected – 2013-2014

Constituent	Matrix	Event	Lab Batch	Field Blank	Lab Blank	Equip Blank	Program Qualifier	Comments
General Water Quality								
Chloride (mg/L)	Blankwater	020.0	2P1402645-001:A		0.27		b, J	Analyte Found in Blank, below PQL, Estimated - detected below the RL but above the MDL
Chloride (mg/L)	BlankWater	020.0	2A1403709	0.86			J:Jb	Estimated - detected below the RL but above the MDL, Analyte Found in Blank, below PQL
Chloride (mg/L)	Blankwater	020.0	2P1402896-053:C		0.85		b, J	Analyte Found in Blank, below PQL, Estimated - detected below the RL but above the MDL
Chloride (mg/L)	BlankWater	021.0	2A1408456	0.64			J	Estimated - detected below the RL but above the MDL
Chloride (mg/L)	Blankwater	021.0	2P1406642-001:A		0.56		b, J	Analyte Found in Blank, below PQL, Estimated - detected below the RL but above the MDL
Chloride (ppm)	Blankwater	019.0	2A1312645-002:A		0.60		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-013:A		0.65		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-025:A		0.91		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-037:A		0.75		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-049:A		0.48		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-061:A		0.57		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-071:A		0.54		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-083:A		0.97		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-095:A		0.68		b	Analyte Found in Blank, below PQL
Chloride (ppm)	Blankwater	019.0	2A1312645-105:A		0.47		b	Analyte Found in Blank, below PQL
Sulfate (mg/L)	Blankwater	020.0	2P1402645-001:A		0.33		b, J	Analyte Found in Blank, below PQL, Estimated - detected below the RL but above the MDL
Sulfate (mg/L)	BlankWater	020.0	2A1403709	1.11			J:Jb	Estimated - detected below the RL but above the MDL, Analyte Found in Blank, below PQL
Sulfate (mg/L)	Blankwater	020.0	2P1402896-053:C		1.68		b, J	Analyte Found in Blank, below PQL, Estimated - detected below the RL but above the MDL
Sulfate (mg/L)	Blankwater	020.0	2P1403040-001:A		0.30		b, J	Analyte Found in Blank, below PQL, Estimated -

Constituent	Matrix	Event	Lab Batch	Field Blank	Lab Blank	Equip Blank	Program Qualifier	Comments
								detected below the RL but above the MDL
Sulfate (ppm)	Blankwater	019.0	2A1312645-002:A		0.90		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-013:A		0.96		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-025:A		1.01		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-037:A		1.21		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-049:A		1.45		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-061:A		0.95		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-071:A		0.92		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-083:A		1.78		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-095:A		1.63		b	Analyte Found in Blank, below PQL
Sulfate (ppm)	Blankwater	019.0	2A1312645-105:A		0.76		b	Analyte Found in Blank, below PQL
Total Organic Carbon (mg/l)	Blankwater	019.0	3082711			0.40	J	Estimated - detected below the RL but above the MDL
Total Organic Carbon (mg/l)	Blankwater	019.0	3082711			0.37	J	Estimated - detected below the RL but above the MDL
Total Organic Carbon (mg/L)	BlankWater	020.0	2A1403832	0.29			J:Jb	Estimated - detected below the RL but above the MDL, Analyte Found in Blank, below PQL
Total Organic Carbon (mg/L)	Blankwater	021.0	QC1147090			0.70	J	Estimated - detected below the RL but above the MDL
Nutrients								
None								
OC Pesticieds								
None								
PCBs								
None								
OP Pesticides								
None								
Pyrethroid Pesticides								

Constituent	Matrix	Event	Lab Batch	Field Blank	Lab Blank	Equip Blank	Program Qualifier	Comments
None								
Metals & Selenium								
None								

Precision

The purpose of analyzing sample duplicates is to demonstrate precision of sample collection, preparation, and analytical methods. The relative percent difference (RPD) is reported for field duplicates, lab duplicates, blank spike duplicates, laboratory control spike (LCS) duplicates, and matrix spike duplicates (MSDs). QA failures for precision are noted when the RPD between a sample and its duplicate are greater than the acceptance value. See Table 80 below for details of all the precision failures. See Table 77 and

Table 78 above for the VCAILG acceptance values for precision. The following list summarizes the precision analysis results:

- Field Duplicates – 567 analyzed – 24 failed RPD (4.2%) (does not include surrogates)
- Laboratory Duplicates – 577 analyzed – 14 failed RPD (2.4%) (includes surrogates)
- Blank Spike/LCS Duplicates – 897 analyzed – 5 failed RPD (0.56%) (includes surrogates)
- Matrix Spike Duplicates – 529 analyzed – 9 failed RPD (1.7%) (includes surrogates)

Table 80. Precision Control Failures – 2013-2014

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
General Water Quality										
Solids, Total Suspended (TSS) (mg/L)	Water	021.0	2A1408460	04D_LAS	38	X	X	X	FD RPD	FD failed RPD
Nutrients										
None										
OC Pesticides										
2,4'-DDD (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	73	3	0	3		
2,4'-DDD (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	61	10	22	NH	Homogeneity could not be achieved in sample
2,4'-DDE (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	28	49	5	2	SL	results was < 10x the MDL
2,4'-DDE (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	89	7	5	SL	results was < 10x the MDL
2,4'-DDT (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	70	11	4	2	BS >UL	Estimate due to BS above upper limit
2,4'-DDT (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	35	4	6	NH	Homogeneity could not be achieved in sample
2,4'-DDT (µg/L)	Water	020.0	O-5123	OXD_CENTR	78	70	0	1	NH, LD RPD, FD RPD	Homogeneity could not be achieved in sample, LD and FD both failed the RPD
4,4'-DDD (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	59	9	2	1		
4,4'-DDD (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	59	8	30	NH	Homogeneity could not be achieved in sample
4,4'-DDD (µg/L)	Water	020.0	O-5123	OXD_CENTR	42	1	2	12	FD RPD	FD failed RPD
4,4'-DDE (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	60	17	8	2		
4,4'-DDE (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	27	2	5	518	SH, MS <LL, EST MS/MSD	Sample concentration exceeded the spike amount, MS < Lower Limit, Estimate due to MS/MSD RPD Failure

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
4,4'-DDE (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	61	8	167	SH, NH	Sample concentration exceeded the spike amount, Homogeneity could not be achieved in sample
4,4'-DDT (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	18	41	3	15		
4,4'-DDT (µg/L)	Water	020.0	O-5123	OXD_CENTR	90	44	1	14	NH, LD RPD, FD RPD	Homogeneity could not be achieved in sample, LD and FD both failed the RPD
4,4'-DDT (µg/L)	Water	021.0	O-6032	04D_LAS	31	6	5	7		
Aldrin (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	0	7	55	M	Matrix interference
Chlordane-alpha (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	52	3	6	3	J	Estimate - detected below RL but above MDL
Chlordane-alpha (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	58	6	6	SL	results was < 10x the MDL
Chlordane-gamma (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	69	30	3	2	J	Estimate - detected below RL but above MDL
Chlordane-gamma (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	45	2	3	14		
Chlordane-gamma (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	60	8	8	SL	results was < 10x the MDL
cis-Nonachlor (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	0	32	2	9	J,SL	Estimate - detected below RL but above MDL, results was < 10x the MDL
cis-Nonachlor (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	47	27	2	0	J	Estimate - detected below RL but above MDL
Endosulfan-II (µg/dry g)	Water	019.0	O-5017	OXD_CENTR	0	0	33	48	R	Random error < 5%
trans-Nonachlor (µg/dry g)	Sediment	019.0	O-5017	OXD_CENTR	60	32	12	6	J,SL	Estimate - detected below RL but above MDL, results was < 10x the MDL
trans-Nonachlor (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	39	10	2	8	J	Estimate - detected below RL but above MDL

Constituent	Matrix	Event	Lab Batch	Site	Field Dup RPD	Lab Dup RPD	BS/ BSD RPD	MS/ MSD RPD	Program Qualifier	Comments
PCBs										
PCB003 (µg/dry g)	Water	019.0	O-5017	LABQA	0	0	87	0	R	Random error < 5%
PCB008 (µg/dry g)	Water	019.0	O-5017	LABQA	0	0	42	2	R	Random error < 5%
PCB028 (µg/dry g)	Sediment	021.0	O-6034	OXD_CENTR	X	0	8	41	M	Matrix interference
PCB169 (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	0	0	1	33	M	Matrix interference
PCB206 (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	0	0	2	33	M	Matrix interference
PCB209 (µg/dry g)	Sediment	020.1	O-5148	OXD_CENTR	0	0	5	39	M	Matrix interference
OP Pesticides										
Phosmet (Imidan) (µg/L)	Water	019.0	O-4150	LABQA	0	0	60	5	R	Random error < 5%
Pyrethroid Pesticides										
Bifenthrin (µg/L)	Water	020.0	O-5123	OXD_CENTR	66	8	15	X	FD RPD	FD failed RPD
Cypermethrin (µg/L)	Water	020.0	O-5123	OXD_CENTR	0	58	2	X	SL, LD RPD	results was < 10x the MDL, LD Failed RPD
Danitol (Fenpropathrin) (µg/L)	Water	020.0	O-5123	OXD_CENTR	78	7	20	X	BS >UL, FD RPD	Estimate due to BS above upper limit, FD failed RPD
Resmethrin (µg/L)	Water	021.0	O-6032	LABQA	0	0	34	0	R, EST BS/BSD	Random error < 5%, Estimate due to BS/BSD failure
Metals and Selenium										
Dissolved Copper (µg/L)	Water	019.0	E-5138	04D_ETTG	52	1	X	1	FD RPD	FD failed RPD
Bacteria										
E.Coli (MPN/100ml)	Water	020.0	2A1403125	CIHD_VICT	39	X	X	X	FD RPD	FD failed RPD
Total Coliform (MPN/100ml)	Water	020.0	2A1403167	CIHD_VICT	100	X	X	X	FD RPD	FD failed RPD

BS/BSD = Blank Spike/Blank Spike Duplicate
MS/MSD = Matrix Spike/Matrix Spike Duplicate
RPD = Relative Percent Difference

Accuracy

Percent recoveries of blank spike (BS) samples, LCS samples, and matrix spike (MS) samples check the accuracy of lab reported sample concentrations. BS samples that fell outside the acceptable range occurred within the pesticide constituent class. Three BS samples outside the acceptable range were OC pesticides, two were PCBs, and one each were from the OP and pyrethroids pesticides. The BS samples outside the acceptable range occurred in Events 19 and 20 in sediment and in water samples. The MS samples that fell outside the acceptable range were generally evenly spread across all events and across both water and sediment. Table 81 provides the accuracy control failures for 2013-2013. The following summarizes the results of the accuracy analyses:

- Blank Spike/LCS Samples – 1820 Analyzed – 8 fell outside the range (0.44%) (does not include surrogates)
- Matrix Spike Samples – 1011 Analyzed – 65 fell outside the range (6.4%) (does not include surrogates)

Table 81. Accuracy Control Failures – 2013-2014

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
General Water Quality											
Chloride (mg/L)	Samplewater	019.0	2P1309835-002:A	94	113	109	X	**127**	**126**	H	Holdtime exceeded
Sulfate (mg/L)	Samplewater	019.0	2P1309835-003:A	92	113	109	X	**126**	**127**	H	Holdtime exceeded
Nutrients											
Ammonia-N (mg/L)	Samplewater	020.0	C-16047	70	130	92	96	**216**	**220**	SH, MS >UL	Concentration in sample exceeded spike amount, Recovery limits do not apply, MS greater than upper limit
Orthophosphate as P (mg/L)	Samplewater	019.0	C-13113	70	130	90	95	**-615**	**-615**	SH	Concentration in sample exceeded spike amount, Recovery limits do not apply
Orthophosphate as P (mg/L)	Samplewater	020.0	C-16076	70	130	105	105	**60**	70	SH, MS >UL	Concentration in sample exceeded spike amount, Recovery limits do not apply, MS greater than upper limit
OC Pesticides											
2,4'-DDT (µg/dry g)	Blankwater	019.0	O-5017	25	125	**129**	124	122	125		
4,4'-DDE (µg/dry g)	Sediment	020.1	O-5148	50	150	101	96	**-27**	61	SH, MS <LL, EST MS/MSD	Concentration in sample exceeded spike amount, Recovery limits do not apply, MS less than lower limit, Estimate due to MS/MSD RPD failure
4,4'-DDE (µg/dry g)	Sediment	021.0	O-6034	50	150	86	93	**15**	**165**	SH	Concentration in sample exceeded spike amount, Recovery limits do not apply
4,4'-DDT (µg/dry g)	Blankwater	020.1	O-5148	25	125	**129**	122	94	89		
Aldrin (µg/dry g)	Sediment	021.0	O-6034	50	150	100	107	**28**	**16**	M	Matrix Interference

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
Endosulfan-I (µg/dry g)	Sediment	020.1	O-5148	50	150	53	54	**31**	**35**	M, MS <LL	Matrix Interference, MS less than lower limit
Endrin (µg/dry g)	Sediment	021.0	O-6034	25	125	103	124	117	**128**	M	Matrix Interference
Endrin (µg/L)	Samplewater	020.0	O-5123	25	125	**126**	121	**168**	**178**	M, R	Matrix Interference, Random error, < 5%
Methoxychlor (µg/dry g)	Sediment	020.1	O-5148	50	150	102	105	**234**	**201**	M	Matrix Interference
Oxychlordane (µg/dry g)	Sediment	019.0	O-5017	50	150	95	95	**367**	**324**	M	Matrix Interference
Oxychlordane (µg/dry g)	Sediment	021.0	O-6034	50	150	83	79	**168**	**179**	M	Matrix Interference
Perthane (µg/dry g)	Sediment	020.1	O-5148	50	150	147	141	**158**	**154**	M	Matrix Interference
PCBs											
PCB003 (µg/dry g)	Blankwater	019.0	O-5017	50	150	**32**	81	97	97	R	Random error, < 5%
PCB123 (µg/dry g)	Sediment	020.1	O-5148	50	150	144	146	**154**	120	M	Matrix Interference
PCB126 (µg/dry g)	Sediment	020.1	O-5148	50	150	149	148	**155**	138	M	Matrix Interference
PCB168+132 (µg/dry g)	Sediment	020.1	O-5148	50	150	53	55	51	**44**	M	Matrix Interference
PCB169 (µg/dry g)	Sediment	020.1	O-5148	50	150	148	149	**214**	**154**	M	Matrix Interference
PCB170 (µg/dry g)	Sediment	020.1	O-5148	50	150	**152**	148	**176**	137	M, R	Matrix Interference, Random error, < 5%
PCB180 (µg/dry g)	Sediment	020.1	O-5148	50	150	149	147	**162**	128	M	Matrix Interference
PCB189 (µg/dry g)	Sediment	020.1	O-5148	50	150	149	147	**202**	**154**	M	Matrix Interference
PCB194 (µg/dry g)	Sediment	020.1	O-5148	50	150	149	148	**197**	**155**	M	Matrix Interference
PCB195 (µg/dry g)	Sediment	020.1	O-5148	50	150	**151**	143	**186**	149	M, R	Matrix Interference, Random error, < 5%
PCB206 (µg/dry g)	Sediment	020.1	O-5148	50	150	149	146	**210**	**151**	M	Matrix Interference
PCB209 (µg/dry g)	Sediment	020.1	O-5148	50	150	146	139	**178**	120	M	Matrix Interference
OP Pesticides											

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
Dimethoate (µg/L)	Samplewater	021.0	O-6032	50	150	91	87	**166**	**158**	M	Matrix Interference
Fensulfothion (µg/L)	Samplewater	019.0	O-4150	50	150	53	57	**38**	**34**	M	Matrix Interference
Fensulfothion (µg/L)	Samplewater	020.0	O-5123	50	150	88	102	**205**	**221**	M	Matrix Interference
Fensulfothion (µg/L)	Samplewater	021.0	O-6032	50	150	137	128	**221**	**204**	M	Matrix Interference
Methamidophos (Monitor) (µg/L)	Samplewater	019.0	O-4150	50	150	88	105	**0**	**0**	M	Matrix Interference
Methidathion (µg/L)	Samplewater	021.0	O-6032	50	150	89	93	**174**	**173**	M	Matrix Interference
Methyl parathion (µg/L)	Samplewater	019.0	O-4150	50	150	54	60	**45**	**41**	M	Matrix Interference
Methyl parathion (µg/L)	Samplewater	021.0	O-6032	50	150	113	107	**165**	**151**	M	Matrix Interference
Phosmet (Imidan) (µg/L)	Samplewater	019.0	O-4150	50	150	**28**	52	**39**	**37**	M, R	Matrix Interference, Random error, < 5%
Phosmet (Imidan) (µg/L)	Samplewater	021.0	O-6032	50	150	119	132	**234**	**233**	M	Matrix Interference
Pyrethroid Pesticides											
Danitol (Fenpropathrin) (µg/L)	Blankwater	020.0	O-5123	50	150	128	**156**	X	X	R, FD RPD	Random error, < 5%, FD failed RPD
Prallethrin (µg/L)	Samplewater	019.0	O-4150	50	150	121	123	**166**	138	M	Matrix Interference
Resmethrin (µg/L)	Samplewater	019.0	O-4150	50	150	131	134	**179**	**154**	M	Matrix Interference
Metals and Selenium											
None											

MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Lab Control Spike
LCSD = Lab Control Spike Duplicate
Rec. = Recovery

Completeness

Data completeness is a measure of the amount of successfully collected and validated data relative to the amount of data planned to be collected for the project. It is usually expressed as a percentage. A project objective for percent completeness is typically based on the percentage of the data needed for the program or study to reach valid conclusions.

Because the VCAILGMP is intended to be a long-term monitoring program, data that are not successfully collected for a specific monitoring event will not be collected at a later date. Rather, subsequent events conducted over the course of the program will provide a sufficient data set to appropriately characterize conditions at individual sampling sites. Moreover, some monitoring sites will often be dry (particularly during the dry season), which is important information necessary to identify areas where discharge from irrigated agricultural lands is nonexistent. For these reasons, most of the data planned for collection cannot be considered absolutely critical, and it is difficult to set a meaningful objective for data completeness. As explained in the QAPP, some reasonable objectives for data are desirable, if only to measure the effectiveness of the program. Program goals for data completeness were established at the 90% level for field measurements, general water quality constituents, organic constituents, and aquatic toxicity.

Table 82 lists the percent completeness of data collected during 2013-2014 in comparison with the established data quality objective.

Table 82. VCAILG MP and Associated TMDL Data Completeness – 2013-2014

Monitoring Element	Completeness Objective	Completeness Achieved
Field Measurements	90%	96%
General Water Quality Constituents	90%	96%
Total & Dissolved Copper	90%	96%
Organic Constituents - Pesticides	90%	96%
Organic Constituents – Filtered Sediment	90%	100%
Organic Constituents - Sediment	90%	100%
Bacteria	90%	100%
Aquatic Toxicity	90%	97%

Values listed for percent completeness achieved are based on successfully collecting samples at all VCAILG monitoring sites with sufficient flow present, and successfully generating analytical data for all planned constituents. For Event 20, two sites were inaccessible due to road closures and those were counted toward the percent completeness, since there was sufficient flow, yet no sample was taken.

To make up for a scheduling error last year, we sampled aquatic toxicity during both of the dry weather monitoring events.

Additional Program Requirements

Data quality is dependent on samples that are collected properly by following established protocols. To ensure that samples are collected properly, the QAPP requires field crews to receive sampling training prior to initiation of sampling. Refresher training is required annually thereafter.

Sampling refresher training took place November 1, 2013. Training included a PowerPoint presentation detailing program goals, requirements, monitoring sites, constituents, field protocols, sample handling, safety, and a field visit to one site. Training documentation is kept on file with other VCAILG MP documents and is available for review upon request.

Summary of Water Quality Benchmark Exceedances

Exceedances of water quality benchmarks occurred in all watersheds, except Ventura River, and triggered the requirement to prepare a Water Quality Management Plan. The WQMP will include specific steps to attain water quality benchmarks through the use of best management practices.

STANDARD WATER QUALITY BENCHMARK EXCEEDANCES

The following summarizes the exceedances of standard water quality benchmarks as specified in Conditional Waiver Appendix 2 or included by reference to narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule. Any exceedances were previously noted in the data tables of each VCAILGMP site, the following is a compilation to evaluate the sites overall. Table 83 lists the exceedances that occurred at each site for each monitoring event.

pH

All sites were within the acceptable pH range of 6.5 to 8.5 during the 2013-2014 monitoring year.

Temperature

No exceedances of the temperature benchmark occurred during the 2013-2014 monitoring year.

Dissolved Oxygen

No exceedances of the DO benchmark occurred during the 2013-2014 monitoring year.

Salts

Exceedances of the salts benchmarks (TDS, chloride, sulfate, or any combinations thereof) occurred at four monitoring sites in the Santa Clara River Watershed. Benchmarks for TDS, chloride, and sulfate were exceeded at the S02T_TODD and S04T_TAPO sites during Event 19. For Event 20, the benchmark for chloride was exceeded at the S02T_ELLS site and the benchmarks for TDS, chloride, and sulfate were exceeded at the S03T_TIMB site. Benchmarks for TDS, chloride, and sulfate were exceeded at the S02T_TODD and S04T_TAPO sites during Event 21.

Nitrogen

Exceedances of the nitrate-N benchmark occurred at eight of the monitoring sites. Sites with nitrate-N exceedances were split between watersheds with three sites located in the Calleguas Creek Watershed, four in the Santa Clara River Watershed, and one in the Oxnard Coastal Watershed.

Copper

Exceedances of dissolved copper benchmarks occurred at four sites in the Calleguas Creek Watershed. Benchmarks were exceeded at 01T_ODD3_ARN during one dry weather event, at 04D_ETTG and 04D_LAS during dry and wet weather, and at 05D_LAVD during wet weather.

Pesticides

During wet weather, at least one DDT compound was detected at nine of the twelve sites sampled during the storm event. In addition, there were exceedances of the total chlordane, chlorpyrifos, and toxaphene benchmarks during wet weather.

During dry weather, DDT compound detections were less consistent with only four of the seven sites monitored having concentrations of DDT compounds exceeding the applicable benchmark. Additionally, there were exceedances of the toxaphene benchmark at four of the seven sites monitored.

Chronic Toxicity

Toxicity sampling took place during all three monitoring events during 2013-2014. An exceedance of the 1.0 TU_c benchmark occurred during all three events at the S02T_TODD site and during the wet weather event at S03T_BOULD.

Table 83. 2013 – 2014 Exceedances of Standard Water Quality Benchmarks by Site and Event

Site	Event 19 – Dry August 22, 2013	Event 20 – Wet February 28, 2014	Event 21 – Dry May 29, 2014
01T_ODD3_ARN	Nitrate-N 4,4'-DDD, 4,4'-DDE	*NS*	Nitrate-N Dissolved copper 4,4'-DDD, 4,4'-DDE, 4,4'-DDT
04D_ETTG	Nitrate-N Dissolved Copper 4,4'-DDE Toxaphene	Nitrate-N Dissolved Copper Total Chlordane 4,4'-DDD, 4,4'-DDE, 4,4'-DDT Toxaphene Chlorpyrifos	Nitrate-N Dissolved Copper 4,4'-DDE
04D_LAS	Nitrate-N 4,4'-DDE Toxaphene	Nitrate-N Dissolved Copper Total Chlordane 4,4'-DDD, 4,4'-DDE, 4,4'-DDT Toxaphene	Nitrate-N Dissolved copper 4,4'-DDD, 4,4'-DDE, 4,4'-DDT
05D_LAVD	*NS*	Dissolved Copper Total Chlordane 4,4'-DDD, 4,4'-DDE Chlorpyrifos	*NS*
05T_HONDO	*NS*	Total Chlordane 4,4'-DDD, 4,4'-DDE, 4,4'-DDT Chlorpyrifos	*NS*

Site	Event 19 – Dry August 22, 2013	Event 20 – Wet February 28, 2014	Event 21 – Dry May 29, 2014
06T_LONG2	*NS*	Total Chlordane 4,4'-DDD, 4,4'-DDE, 4,4'-DDT Chlorpyrifos	*NS*
OXD_CENTR	Nitrate-N Toxaphene	Total Chlordane 4,4'-DDD, 4,4'-DDE, 4,4'-DDT Toxaphene	Nitrate-N
S02T_ELLS	*NS*	Chloride Total Chlordane 4,4'-DDE Chlorpyrifos	*NS*
S02T_TODD	TDS, Chloride, Sulfate Toxaphene Chronic Toxicity	Chronic Toxicity	TDS, Chloride, Sulfate Nitrate-N Chronic Toxicity
S03T_TIMB	*NS*	TDS, Chloride, Sulfate	*NS*
S03T_BOULD	*NS*	Nitrate-N Total Chlordane Chronic Toxicity	*NS*
S03D_BARDS	*NS*	Nitrate-N Total Chlordane 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	4,4'-DDE, 4,4'-DDT
S04T_TAPO	TDS, Chloride, Sulfate Nitrate-N,	Total Chlordane 4,4'-DDE	TDS, Chloride, Sulfate Nitrate-N
VRT_SANTO	*NS*	*NS*	*NS*
VRT_THACH	*NS*	*NS*	*NS*
Total Number of Sites Sampled	6	12	7
Total Number of Sites with Exceedances	6	12	7

NS = Not Sampled; site dry, ponded, or inaccessible

TMDL BENCHMARK EXCEEDANCES

Appendix 3 of the Conditional Waiver specifies water quality benchmarks that come from TMDL LAs. Exceedances of these benchmarks are another way of triggering a WQMP. The following evaluates TMDL load allocation benchmark compliance and required actions.

Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL

Benchmarks for this TMDL are the interim sediment LAs, which are assessed at the base of each subwatershed. The interim LAs for OC pesticides and PCBs were not exceeded at any of the compliance monitoring locations; however, this TMDL includes the requirement to develop an agricultural WQMP. The actions to be taken to implement the VCAILG WQMP will be designed to maintain compliance with the interim LAs and eventually achieve compliance with final LAs.

Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL

Interim LAs are currently in effect for this TMDL and are used as the benchmarks. Compliance with these LAs is measured at the compliance sites, located at the base of each subwatershed. No exceedances of the chlorpyrifos or diazinon interim LAs were observed during the monitoring year. This TMDL also includes the requirement to develop an agricultural WQMP. The VCAILG WQMP will consider this TMDL and include BMPs to continue meeting interim LAs and lead to the achievement of final LAs.

Calleguas Creek Watershed Boron, Chloride, Sulfate, and TDS TMDL

Benchmarks for this TMDL are interim dry weather LAs, which are assessed at the five compliance monitoring sites and compared to monthly dry weather mean salt concentrations. Interim LAs were met at all sites and for all salts constituents, with the exception of boron at site 04_WOOD. Data from the upstream agricultural land use site did not exceed the interim LA. However, the Salts TMDL also requires an agricultural WQMP, which will be addressed by VCAILG.

Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL

The evaluation of receiving water data show that copper, nickel, and mercury allocations are all being attained. Exceedances did occur for the selenium interim dry weather LA at the Revolon Slough receiving water site as well as one of the upstream agricultural land use sites. These selenium results trigger the need for a WQMP, however, it is already a requirement of the TMDL.

Calleguas Creek Watershed Nitrogen Compounds TMDL

Exceedances of the nitrogen LA were observed at six out of the seven CCWTMP agricultural land use sites and three out of the six VCAILGMP sites located in the Calleguas Creek Watershed. Most of the sites with consistent exceedances are located in the lower parts of the watershed. Though this TMDL does not require a WQMP, the data demonstrates that one is required due to LA exceedances.

Revolon Slough and Beardsley Wash Trash TMDL

VCAILG members are complying with the Trash TMDL requirements through a MFAC/BMP Program. VCAILG members are in compliance with the TMDL requirements to ensure zero trash immediately after each MFAC event. To ensure that trash does not accumulate to deleterious amounts, trash BMPs are included in the WQMP.

Santa Clara River Nitrogen Compounds TMDL

The Santa Clara River Watershed LA for nitrogen was exceeded at three of the six monitoring sites during dry and wet weather over the 2013-2014 monitoring year. These observed exceedances trigger a WQMP.

Ventura River Estuary Trash TMDL

VCAILG members are complying with the Trash TMDL requirements through a MFAC/BMP Program. VCAILG members are in compliance with the TMDL requirements to ensure zero trash immediately after each MFAC event. To ensure that trash does not accumulate to deleterious amounts, trash BMPs are included in the WQMP.

Santa Clara River Estuary Toxaphene TMDL

There were no exceedances of the toxaphene sediment LA during the monitoring year. Data collected during the AMR reporting period does not trigger the need for a WQMP.

Monitoring Trends

With multiple years of monitoring data completed, the following sections describe trends observed at the VCAILG monitoring sites. It is important to note that not all constituents with standard water quality benchmarks were evaluated for trends. Field measurements (pH, DO, temperature), for example rarely exceed applicable benchmarks. In addition, many OC pesticides have very rarely been detected. Considering all 2005 Conditional Waiver events and the first three years of 2010 Conditional Waiver monitoring (Events 1-21), Table 84 lists the OC pesticides not considered for trend analysis and the number of detections that occurred for those constituents. In the monitoring trends evaluation that follows, the focus is on the constituents with benchmarks that are the most often detected.

Table 84. Rarely Detected OC Pesticides with Water Quality Benchmarks

OC Pesticide	# of Detections Considering VCAILG Events 1-21
Aldrin	0
Alpha-BHC	0
Beta-BHC	1
Gamma-BHC	0
Dieldrin	1
Endosulfan I	1
Endosulfan II	1
Endosulfan sulfate	1
Endrin	0
Endrin Aldehyde	0

Trend analysis was performed for all collected water samples at the VCAILGMP sites in the receiving waters. Data was collected between June 2007 and May 2014. For water column samples, trends for dry weather data and for wet weather data at each site were analyzed.

Concentration trends over time were determined by correlating the measured constituent concentrations and their sample date. Nonparametric Kendall's Tau statistical method was used for analysis. Nonparametric methods have the benefit of not possessing an underling assumption of normality, therefore analysis of the distribution of the data or additional transformations were not needed. Correlation analysis was carried out for all constituent-water body combination for which at least 10 percent of the samples had detected concentrations. Detected but not quantifiable (DNQ) concentrations were analyzed using the laboratory calculated values. As a conservative estimate, not detected (ND) concentrations were analyzed at one half of the method detection limit (MDL). Trends were considered to be statistically significant at $p < 0.05$.

The results of the trends analysis are graphically presented in Table 85 through Table 90. Arrows are used to show statistically significant increasing or decreasing trends. Dashed lines are used to show constituent-water body combinations that had sufficient data for analysis, but did not have significant trends (i.e., $p \geq 0.05$). An "x" indicates there were insufficient data to conduct an analysis.

Table 85. Dry Weather Water Quality Trends at Calleguas Creek Watershed Monitoring Sites

	01T_ODD3_ARN	04D_ETTG	04D_LAS	05D_LAVD	05D_HONDO	06T_LONG2
Nutrients						
Ammonia-N	--	--	--	--	x	x
Nitrate-N	--	--	↑	--	x	x
Salts						
TDS	--	--	--	--	x	x
Chloride	--	↑	↑	--	x	x
Sulfate	--	--	--	--	x	x
OC Pesticides						
Total Chlordane	--	x	--	--	x	x
4,4'-DDD	↓	↓	--	--	x	x
4,4'-DDE	--	↓	--	--	x	x
4,4'-DDT	--	--	--	--	x	x
Toxaphene	--	--	--	x	x	x
OP Pesticides						
Chlorpyrifos	--	--	--	--	x	x
Diazinon	↑	--	↓	x	x	x
Metals						
Dissolved Copper	--	--	--	--	x	x

Green arrows indicate statistically significant decreasing trends. **Red** arrows indicate statistically significant increasing trends
"--" indicates no significant trends observed
"x" indicates insufficient data to perform the trend analysis

Table 86. Dry Weather Water Quality Trends at Santa Clara River Watershed Monitoring Sites

	S02T_ELLS	S02T_TODD	S03T_TIMB	S03T_BOULD	S03T_BARDS	S04T_TAPO
Nutrients						
Ammonia-N	--	--	x	--	x	--
Nitrate-N	--	--	x	--	x	--
Salts						
TDS	--	--	x	--	x	--
Chloride	--	--	x	--	x	--
Sulfate	--	--	x	↑	x	--
OC Pesticides						
Total Chlordane	x	--	x	--	x	x
4,4'-DDD	x	x	x	x	x	--
4,4'-DDE	--	--	x	x	x	--
4,4'-DDT	--	--	x	x	x	--
Toxaphene	x	--	x	x	x	--
OP Pesticides						
Chlorpyrifos	--	--	x	x	x	--
Diazinon	x	↓	x	x	x	--
Metals						
Dissolved Copper	x	--	x	x	x	--

Green arrows indicate statistically significant decreasing trends. **Red** arrows indicate statistically significant increasing trends
"--" indicates no significant trends observed
"x" indicates insufficient data to perform the trend analysis

Table 87. Dry Weather Water Quality Trends at Oxnard Coastal and Ventura River Watershed Monitoring Sites

	Oxnard Coastal	Ventura River	
	OXD_CENTR	**VRT_THACH**	**VRT_SANTO**
Nutrients			
Ammonia-N	--	x	x
Nitrate-N	--	x	x
Salts			
TDS	--	x	x
Chloride	--	x	x
Sulfate	↑	x	x
OC Pesticides			
Total Chlordane	x	x	x
4,4'-DDD	↓	x	x
4,4'-DDE	↓	x	x
4,4'-DDT	--	x	x
Toxaphene	--	x	x
OP Pesticides			
Chlorpyrifos	--	x	x
Diazinon	--	x	x
Metals			
Dissolved Copper	--	x	x

Green arrows indicate statistically significant decreasing trends. **Red** arrows indicate statistically significant increasing trends
"--" indicates no significant trends observed
"x" indicates insufficient data to perform the trend analysis

Table 88. Wet Weather Water Quality Trends at Calleguas Creek Watershed Monitoring Sites

	01T_ODD3_ARN	04D_ETTG	04D_LAS	05D_LAVD	05D_HONDO	06T_LONG2
Nutrients						
Ammonia-N	--	--	--	--	--	x
Nitrate-N	--	--	--	--	--	x
Salts						
TDS	--	--	↑	--	--	x
Chloride	↑	--	--	--	--	x
Sulfate	--	--	↑	--	--	x
Total Chlordane	--	--	--	--	--	x
4,4'-DDD	--	--	--	--	--	x
4,4'-DDE	--	--	--	--	--	x
4,4'-DDT	--	--	--	--	--	x
Toxaphene	--	--	--	--	--	x
Chlorpyrifos	--	↓	--	--	--	x
Diazinon	--	--	↓	--	--	x
Metals						
Dissolved Copper	--	--	--	↑	x	x

Green arrows indicate statistically significant decreasing trends. **Red** arrows indicate statistically significant increasing trends
"--" indicates no significant trends observed
"x" indicates insufficient data to perform the trend analysis

Table 89. Wet Weather Water Quality Trends at Santa Clara River Watershed Monitoring Sites

	S02T_ELLS	S02T_TODD	S03T_TIMB	S03T_BOULD	S03T_BARDS	S04T_TAPO
Nutrients						
Ammonia-N	--	--	--	--	--	--
Nitrate-N	--	--	--	--	--	--
Salts						
TDS	--	--	--	--	--	--
Chloride	--	--	--	--	--	--
Sulfate	--	--	--	--	--	--
OC Pesticides						
Total Chlordane	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--
Toxaphene	--	--	x	--	x	x
OP Pesticides						
Chlorpyrifos	--	--	--	--	--	--
Diazinon	--	--	--	--	--	--
Metals						
Dissolved Copper	--	--	x	--	x	--

"--" indicates no significant trends observed
"x" indicates insufficient data to perform the trend analysis

Table 90. Wet Weather Water Quality Trends at Oxnard Coastal and Ventura River Watershed Monitoring Sites

	Oxnard Coastal	Ventura River	
	OXD_CENTR	**VRT_THACH**	**VRT_SANTO**
Nutrients			
Ammonia-N	--	--	--
Nitrate-N	--	--	--
Salts			
TDS	--	--	--
Chloride	--	--	--
Sulfate	--	--	--
OC Pesticides			
Total Chlordane	--		x
4,4'-DDD	--	x	x
4,4'-DDE	--	x	x
4,4'-DDT	--	--	x
Toxaphene	--	x	x
OP Pesticides			
Chlorpyrifos	--	x	x
Diazinon	--	x	x
Metals			
Dissolved Copper	--	x	x

"--" indicates no significant trends observed
"x" indicates insufficient data to perform the trend analysis

Chronic toxicity trends were not analyzed in the manner described above. Chronic toxicity occurring during the 2005 Conditional Waiver period and during the first three years of the 2010 Conditional Waiver period was reviewed to determine any trends. Table 91 details the chronic toxicity that occurred at the VCAILGMP sites during the 2005 and 2010 Conditional Waiver periods. For chronic toxicity during dry weather, the occurrences of chronic toxicity at the VCAILGMP sites have decreased, indicating a downward trend of toxicity in the CCW. For chronic toxicity during wet weather, toxicity was observed during the 2008, 2012, 2012-13, and 2013-2014 monitoring years. Since 2013 the number of sites exhibiting chronic toxicity in wet weather samples has greatly decreased from five and six sites in 2008 and 2012, respectively, down to two sites per year in 2012-2013 and 2013-2014. A similar decline in the number of sites with observed toxicity is also true for dry weather events.

Table 91. Summary of Chronic Toxicity Occurring During Dry and Wet Weather for 2007-2014

Site	Monitoring Year						
	2007	2008	2009	2010	2012	2012-13	2013-14 [1]
01T_ODD3_ARN	Dry	--	--	--	--	--	--
05D_LAVD	Dry	--	--	--	Wet	Wet	--
05T_HONDO	--	Wet	--	--	Wet	--	--
06T_LONG2	--	--	--	--	Wet	--	--
S02T_ELLS	--	Wet	--	Dry	Wet	--	--
S02T_TODD	Dry	Wet	Dry	Dry	Wet	Wet	Dry/Wet/Dry
S03T_BOULD	Dry	Wet	Dry	--	Wet	--	Wet
S03T_TIMB	--	Wet	--	--	--	--	--
S04T_TAPO	Dry	--	Dry	--	--	--	--
VRT_SANTO	--	--	--	--	--	--	--
VRT_THACH	--	--	--	--	--	--	--

1. Toxicity testing was performed during all three events for 2013-2014 to make up for a missed event during the 2012-2013 monitoring year

Dry=an exceedance of the chronic toxicity benchmark during a dry weather toxicity event
Wet=an exceedances of the chronic toxicity benchmark during a storm toxicity event

Many of the VCAILG monitoring sites have been dry during monitoring conducted under the 2005 Conditional Waiver and the first three monitoring years of the 2010 Conditional Waiver. This indicates that agricultural entities are not causing or contributing to any Conditional Waiver or TMDL benchmark exceedances in these water bodies under the sampling conditions. As Ventura County continues to experience significant drought and irrigation methods continually improve, it is likely the trend of dry monitoring sites will continue. The following table details the number of times a VCAILG site was dry and the percentage it was dry during monitoring Events 1-21.

Table 92. Number and Percent of Times Monitoring Sites Were Dry

VCAILG Site	# of Events where Site was Dry	% of Events where Site was Dry
01T_ODD3_ARN	0	0
04D_ETTG	0	0
04D_LAS	0	0
05D_LAVD	8	38
05T_HONDO	15	71
06T_LONG2 [1]	19	90
OXD_CENTR	0	0
CIHD_VICT [2]	8	80
S02T_ELLS	10	48
S02T_TODD	1	5
S03D_BARDS	15	71
S03T_BOULD	9	43
S03T_TIMB	14	67
S04T_TAPO	0	0
VRT_SANTO	18	86
VRT_THACH	18	86

1. Monitoring of Long Canyon began during Event 1. However, monitoring was moved to the 06T_LONG2 site, which is just upstream of the original monitoring site, beginning with Event 12.
2. Monitoring at the CIHD_VICT site began during Event 12; ten events total where the site was visited.

Education Requirement

Since the adoption of this Conditional Waiver, VCAILG members have completed over 12,780 hours of water quality education. To date, 840 VCAILG members have fulfilled the eight hour requirement; 535 of those members have completed more than eight hours. The large number of members going above and beyond the education requirement is an indicator of the perceived value and benefit of the information being presented regarding specific water quality problems and the management practices and tools available to the farmers for addressing them.

During this Conditional Waiver period alone, over fifty-four education opportunities have been offered to VCAILG members, adding up to 171 hours. Education classes have been organized by VCAILG, Ventura County Resource Conservation District (RCD), University of California Cooperative Extension – Ventura, as well as commodity groups such as the California Avocado and Strawberry Commissions. Table 93 lists the courses that have been offered to date during this Conditional Waiver. Appendix H lists the number of education hours earned by each VCAILG member.

The effort to provide classes and encourage VCAILG members to obtain education credits is for compliance with the Conditional Waiver provision that within two years of issuance of the NOA, all dischargers shall complete eight hours of education. Course agendas are approved by the Executive Officer for a specified number of credit hours to ensure that the education classes meet the training requirements related to water quality impairments, regulatory requirements, and management practices that control waste discharges.

Table 93. Courses Offered for Education Credit

Date	Course Title	Education Hours
Ongoing	Online FCGMA Irrigation Allowance Index Training	2
11/01/2010	ABC's of Fertilizer and Irrigation Management	6
11/02/2010	ABC sobre Manejo de Fertilizantes y Riego	6
02/28/2011	Strawberry Irrigation Field Day	2
06/20/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
06/21/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
06/22/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
06/23/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/25/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/26/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/27/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/28/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
09/13/2011	Erosion and Pesticide Runoff Management in Nurseries	4
9/14/2011	Erosion and Pesticide Runoff Management in Orchards	4
11/02/2011	Managing Nitrogen in Row Crops	2
11/15/2011	Irrigation and Nutrient Management	2
11/16/2011	General Conditional Waiver Education (Spanish)	4
02/23/2012	Reducing runoff through tailwater capture and reuse	2
03/21/2012	Nutrient Management, Grassed Waterways, & IPM for Improved Water Quality	4
04/05/2012	Irrigation and Nutrient Management	2
04/19/2012	Manejo de Irrigacion en Fresas	2
04/24/2012	Site Planning to Improve Water Quality from Farm Runoff	2
06/05/2012	Effective Use of Pesticides to Produce Healthy Ornamental Plants	4
06/06/2012	Irrigation Management	2
07/17/2012	Nursery Farm and Orchard Seminar	8
08/31/2012	Strawberry Production Meeting	2
09/11/2012	The New FCGMA Irrigation Allocation Index	2
10/10/2012	Managing Nitrogen in Row Crops	2
10/11/2012	Irrigation and Nutrient Management – Vendor Fair	2
10/17/2012	UC Hansen Ag Center Field Day	2
11/13/2012	Nutrient Management, Grassed Waterways, and IPM for Improved Water Quality	2
11/26/2012	Private Applicator Seminar	1
11/29/2012	Conditional Waiver – General overview	4
01/22/2013	NGA Water School	4
02/19/2013	4Rs of Nutrient Stewardship and Moisture Sensors	2
03/06/2013	Nutrient Trials and Moisture Sensors in Row Crops	2
03/20/2013	BMP's for California Nurseries	4

Date	Course Title	Education Hours
04/23/2013	Detention Basins and Nutrient Management for Improved Water Quality	2
05/08/2013	Algae TMDL Update and Nutrient Needs of Tree Crops	2
07/24/2013	Avocado Irrigation (Spanish)	3
08/07/2013	Farming without Fumigants, Grower Demonstration Field Day	2
09/05/2013	Strawberry Production Meeting	3
09/17/2013	BMPs for California Nurseries	3
09/19/2013	LAILG Summer Water School	5
09/26/2013	Strawberry Field Day, Water Saving Practices	2
01/27/2014	Strawberry Irrigation and Nutrient Management	4
01/28/2014	Programma Educativo del Manejo de Nutrientes y Riego en Fresas	4
03/04/2014	Conditional Waiver Educational Class	2
03/26/2014	Water Management in Strawberry: Field Day	2
04/08/2014	Vegetable Production Meeting	1.5
06/10/2014	Grower Demonstration Field Day Raised Bed Trough Experimental Site	2
06/24/2014	RCD Ag Education Breakfast	2.5
08/27/2014	Annual Strawberry Production Meeting	3
08/28/2014	Irrigation Management Efficiency in Nurseries	7.5
10/16/2014	Crop Production Services Grower Meeting	1.5

Conclusions

Submittal of this report fulfills the Annual Monitoring Report requirements specified in Appendix 1 of the Conditional Waiver. All required elements are included in this narrative report and with the accompanying appendices.

This report presents monitoring data for evaluating agricultural discharges as compared to standard water quality benchmarks as well as compliance with effective TMDL LAs that were incorporated in the Conditional Waiver as benchmarks. Instances where exceedances occurred of either type of benchmark triggers the need to develop a WQMP; which will be submitted to the Regional Board May 26, 2015.

The following summary highlights compliance with standard water quality benchmarks.

- Five OC pesticides that have applicable water quality benchmarks have never been detected during VCAILG monitoring to date (Events 1-21). An additional five OC pesticides with benchmarks have only been detected a few times throughout the entire monitoring program considering all the sites. Though DDT and its breakdown products are often detected during wet weather, dry weather exceedances have greatly decreased and it is the breakdown products that are most commonly detected. This demonstrates the degradation of DDT in the environment and the minimization of transport during the irrigation season, over which farmers have some control. Additional OC pesticides exceedances include total chlordane during wet weather and toxaphene for both dry and wet weather conditions.
- This is the third year of copper results. One freshwater site exceeded the copper benchmark. The three sites where the saltwater benchmark applies exhibited exceedances.
- For OP pesticides, the chlorpyrifos benchmark was exceeded at five sites during wet weather. No exceedances of the diazinon benchmark occurred during the monitoring year.
- Significant toxicity occurred during all three events at the S02T_TODD monitoring site. Significant toxicity to trigger a TIE was present in events 19 and 20. However, due to a downturn in test organism quality the Event 20 TIE was initiated but could not be concluded and interpreted. Chronic toxicity above the 1 TU_c benchmark was found in the S03T_BOULD Event 20 wet weather sample.
- Nitrate-N continues to be an issue at some monitoring locations (8 out of 15 VCAILGMP sites had exceedances).
- All samples were within the acceptable pH range. Temperature was always under the upper limit, where applicable. Measured dissolved oxygen levels were all above the benchmark minimum.
- Salts benchmarks were exceeded at four sites during the monitoring year.

Overall, this was another sampling year with significantly lower than normal rainfall. Additionally, fewer sites had flow during dry events than in previous monitoring years. With the

support of BMP data gathered through the WQMP, this may prove to be the result of irrigation method upgrades and management, but that cannot be confirmed at this time.

During this monitoring year TMDL load allocation benchmarks were met at all applicable compliance sites or by completing required actions for the following TMDLs: Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL, Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL, Calleguas Creek Watershed Boron, Chloride, Sulfate, and TDS (Salts) TMDL, Revolon Slough and Beardsley Wash Trash TMDL, Ventura River Estuary Trash TMDL, and Santa Clara River Estuary Toxaphene TMDL. Monitoring was performed in compliance with the Harbor Beaches of Ventura County Bacteria TMDL and the McGrath Lake PCBs, Pesticides, and Sediment Toxicity TMDL.

Using the process described in the WQMP, VCAILG members will continue implementing and installing BMPs to improve water quality and achieve Conditional Waiver benchmarks.