August 15, 2009

VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)

2008 WATER QUALITY MANAGEMENT PLAN

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

BMP	Best Management Practice
CC	Calleguas Creek
CCWTMP	Calleguas Creek Watershed TMDL Monitoring Program
CWA	Clean Water Act
DPR	Department of Pesticide Regulation
DQO	Data Quality Objective
EPA	Environmental Protection Agency
IPM	Integrated Pest Management
LARWQCB	Los Angeles Regional Water Quality Control Board (Regional Board)
MRP	Monitoring and Reporting Program
NOA	Notice of Applicability
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
OC	Organochlorine
OP	Organophosphorus
QAPP	Quality Assurance Project Plan
RCD	Resource Conservation District
SCR	Santa Clara River
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UCCE	University of California Cooperative Extension
USDA	United Stated Department of Agriculture
VCAILG	Ventura County Agricultural Irrigated Lands Group
VR	Ventura River
WQMP	Water Quality Management Plan

Introduction

On November 3, 2005 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. R4-2005-0080). 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 stormwater 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 form to comply with this Conditional Waiver. 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 August 3, 2006. 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 December 18, 2006, signifying the Regional Board's approval of the VCAILG and its Monitoring Program.

The first Annual Monitoring Report was submitted by the VCAILG to the Regional Board on February 15, 2008 and provided a detailed summary of activities of the VCAILG during 2007, including administration of the VCAILG, an overview of farming in Ventura County and obstacles faced by the VCAILG members, coursework offered to Group 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 three monitoring events conducted. Also included in the Annual Monitoring Report was a discussion of monitoring results that exceeded water quality benchmarks.

As specified in the Conditional Waiver, if the monitoring results show that an applicable water quality benchmark has not been met, then a Water Quality Management Plan (WQMP) must be

developed. As outlined in the Monitoring and Reporting Program for discharger groups, the WQMP is designed to:

1. Assess the impacts of waste discharges from irrigated lands to surface waters through source identification.
2. Determine the degree of implementation of management practices to reduce discharge of specific wastes that impact water quality.
3. Determine the effectiveness of management practices and strategies to reduce discharges of waste that impact water quality.
4. Determine concentration and load of waste in these discharges to surface waters.
5. Construct or implement management practices to alleviate the impacts of the waste discharges.
6. Evaluate compliance with existing narrative and numeric water quality objectives to determine if additional implementation of management practices are necessary to improve and/or protect water quality.
7. Construct or implement additional management practices or provide technical documentation of natural, historical, or existing conditions.

The Conditional Waiver also includes language in various sections that require the WQMP to include:

- Concrete steps with specific milestones that work toward attainment of water quality objectives with best management practices.
- Plan to implement specific management measures and management practices to improve the discharge quality, including a date-specific time line.

On August 15, 2008, the 2007 VCAILG WQMP was submitted to address exceedances of water quality benchmarks that occurred during the 2007 monitoring year. All of the constituents for which benchmarks were exceeded were included in this WQMP. Also discussed were the water quality problems that can be caused by the benchmark exceedance and the degree to which agricultural discharges are contributing to the problem (where feasible and appropriate).

In addition, for the Calleguas Creek watershed, WQMPs are also required to be developed for the TMDLs that are effective in the watershed. Where WQMPs are also required by TMDLs, the 2007 plan included all necessary information to meet the TMDL requirement as well.

The 2007 WQMP contained four major sections. The first section provided a discussion of the VCAILG monitoring sites and monitoring results detailing benchmark exceedances. Constituent-specific information was provided in the second section to summarize the currently available information on sources of the constituents, discuss the water quality problems associated with the benchmark exceedances, and where feasible, the degree to which agriculture is contributing to the water quality problem. The third section discussed the process by which priority areas would be targeted to implement management practices, and how implementation would be tracked and used to evaluate management practice effectiveness through water quality monitoring efforts. The final section provided references and resource agency contact information to assist growers in implementing specific management measures to improve water quality.

This update to the 2007 WQMP provides information on benchmark exceedances that occurred during the 2008 monitoring year (as discussed in the 2008 Annual Monitoring Report) and

progress made in implementation of the WQMP. Additionally, Management Practice Surveys collected from growers within the first tier priority drainage areas are discussed. Second tier priority drainages were updated according to monitoring information collected in the past year.

Identification of Benchmark Exceedances

This section provides a summary of information that was included in the VCAILG 2008 Annual Monitoring Report. For more detailed information about monitoring sites, locations, and water quality monitoring results, please refer to that report.

MONITORING OBJECTIVES

The objectives of the VCAILG Monitoring Program are as follows:

- Assess the impact on waters of the State from wastes discharged from irrigated lands;
- Determine concentration and loading (where practicable) of pollutants present in surface waterbodies influenced primarily by irrigated agriculture land use;
- Evaluate compliance with applicable water quality benchmarks to determine whether modifying management practices is necessary to improve surface water quality;
- Attempt to identify pollutant sources, if necessary;
- Provide feedback to growers in areas where benchmarks are exceeded to facilitate implementation and monitoring of management practices employed for controlling pollutant loads, if necessary;
- Report results and other required information as specified in the Monitoring and Reporting Program (CI-8836);
- Monitor trends in ambient water quality over time (long term objective);
- 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 Calleguas Creek Watershed TMDL Monitoring Program).

SAMPLING SITE DESCRIPTIONS AND LOCATIONS

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. In some cases, sites were also located to facilitate distinguishing agricultural inputs from other sources, such as golf courses or landscaped areas – these are referred to herein as "background" ("BKGD") sites.

Additional site selection criteria included the following:

- Sub-watershed representation
- Acreage of agricultural irrigated lands represented
- Drainage into waterbodies included on the federal Clean Water Act 303(d) list of impaired waterbodies
- Safe access during dry and wet weather

Appendix C includes drainage area maps for each of the VCAILG monitoring sites. These maps will be used in mailings and outreach materials to assist growers in identifying where their property drains and if they are contributing to any water quality benchmark exceedances.

Monitoring site selection in the Calleguas Creek Watershed was coordinated with monitoring sites identified in the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP). Data collected at these coordinated sites are designed to augment TMDL implementation monitoring in that watershed by establishing loadings from agricultural inputs.

The format for the monitoring site ID/code is XXXA_YYYYY_ZZZZZ, 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 discharge (D) or a tributary (T) to the receiving water;
- YYYYY is a 3-, 4- or 5-character abbreviation for the site location;
- ZZZZZ is an optional 3-, 4- or 5-character abbreviation that provides additional site location information (*e.g.*, "BKGD" indicates a background site).

Examples:

05D_SANT_VCWPD signifies that the monitoring site is located in on the Santa Clara Drain, which is an agricultural discharge that flows into Calleguas Creek Watershed Reach 5 (Beardsley Channel). The site is located at the Ventura County Watershed Protection District stream gage.

SO4T_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 1 contains a detailed list of monitoring sites selected for the VCAILG Monitoring Program. Monitoring site IDs in bold type indicate CCW TMDL monitoring sites that were coordinated with that monitoring program starting in August 2008.

Maps of monitoring sites located in the Calleguas Creek / Oxnard Coastal, Santa Clara River and Ventura River watersheds are presented in Figure 1, Figure 2, and Figure 3 respectively.

Table 2 provides estimates of irrigated acreage by crop type represented by each monitoring site selected.

Maps of crops grown in the vicinity of each monitoring site in the Calleguas Creek / Oxnard Coastal, Santa Clara River and Ventura River watersheds are presented in Figure 4, Figure 5, and Figure 6, respectively.

Table 1. VCAILG Monitoring Program Monitoring Site Locations

Watershed / Subwatershed	Station ID [1]	Reach	Water-body Type [2]	Station Location	GPS Coordinates [3]	
					Latitude	Longitude
Calleguas Creek / Mugu Lagoon	**01T_ODD2_DCH**	1	T	Duck Pond/Oxnard Drain #2/Mugu Drain S. of Hueneme Rd.	34.139514	-119.118330
	01T_ODD3_ARN	1	T	Rio de Santa Clara/Oxnard Drain #3 at Arnold Rd.	34.123564	-119.156514
Calleguas Creek / Calleguas Creek	02D_BROOM	2	D	Discharge to Calleguas Creek at Broome Ranch Rd.	34.143353	-119.071306
	02D_CSUCI	2	B	02D_BROOM background site near CSUCI	34.159860	-119.049375
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_SANT_VCWPD**	5	D	Santa Clara Drain at VCWPD Gage #781	34.242667	-119.113736
	05D_SANT_BKGD	5	B	05D_SANT_VCWPD background site near the golf course	34.263213	-119.111314
	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_FC_BR**	6	T	Fox Canyon at Bradley Rd.	34.264653	-119.011128
	06T_LONG	6	T	Long Canyon at Hwy. 118	34.270083	-118.958664
Calleguas Creek / Conejo Creek	**9BD_GERRY**	9B	D	Drain Crossing Santa Rosa Rd. at Gerry Rd.	34.235847	-118.944675
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_HOPP	4	T	Hopper Creek at Hwy. 126	34.401616	-118.826799
	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] Station IDs indicated in **bold** type signify Calleguas Creek Watershed TMDL Monitoring Program sites that will be monitored through that program once that program is underway.
[2] T = Tributary to receiving water; D = agricultural Drain; B = Background site.
[3] All GPS coordinates presented in decimal degrees latitude and longitude in North American Datum 1983 (NAD83).

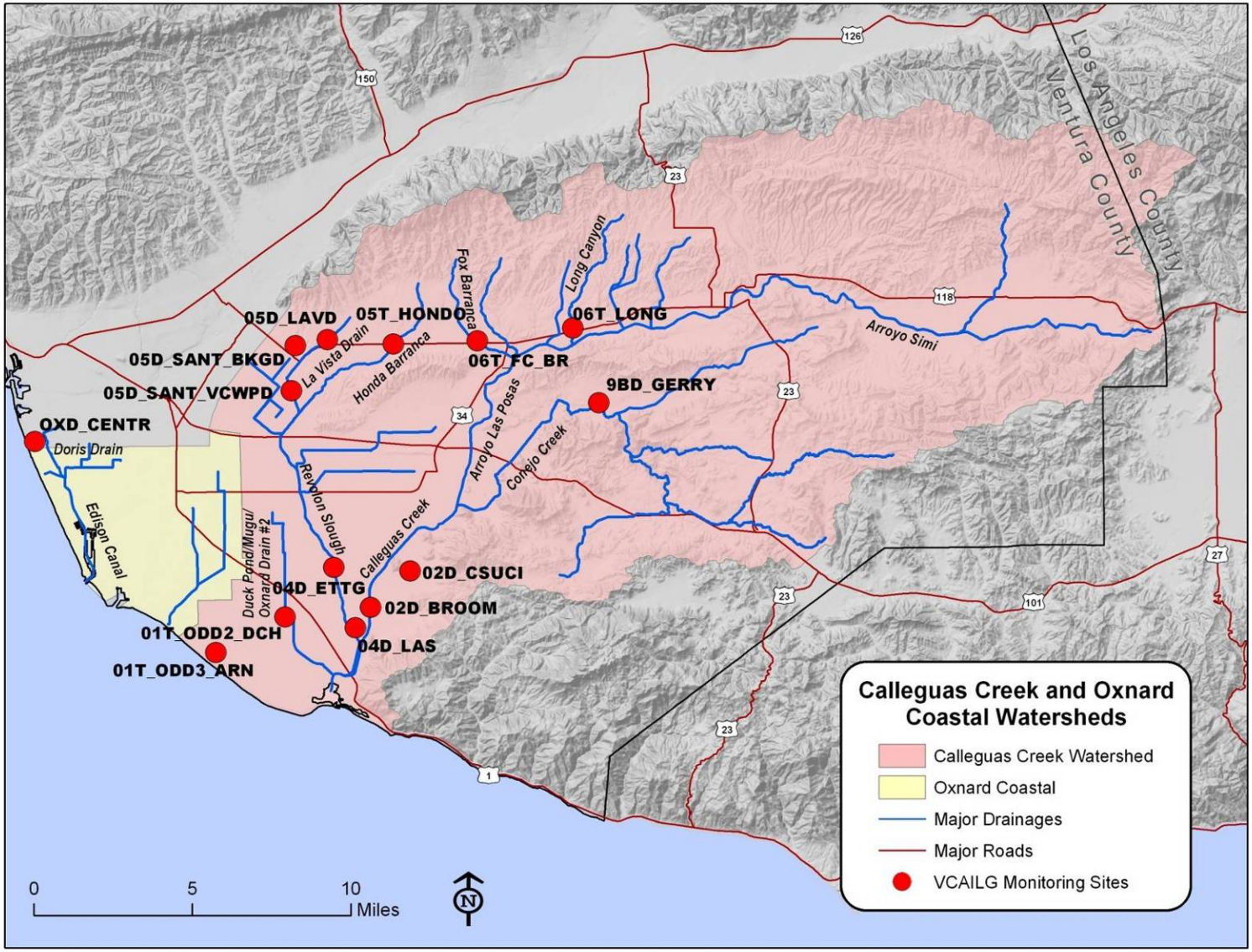


Figure 1. VCAILG Monitoring Sites Located in the Calleguas Creek / Oxnard Coastal Watersheds

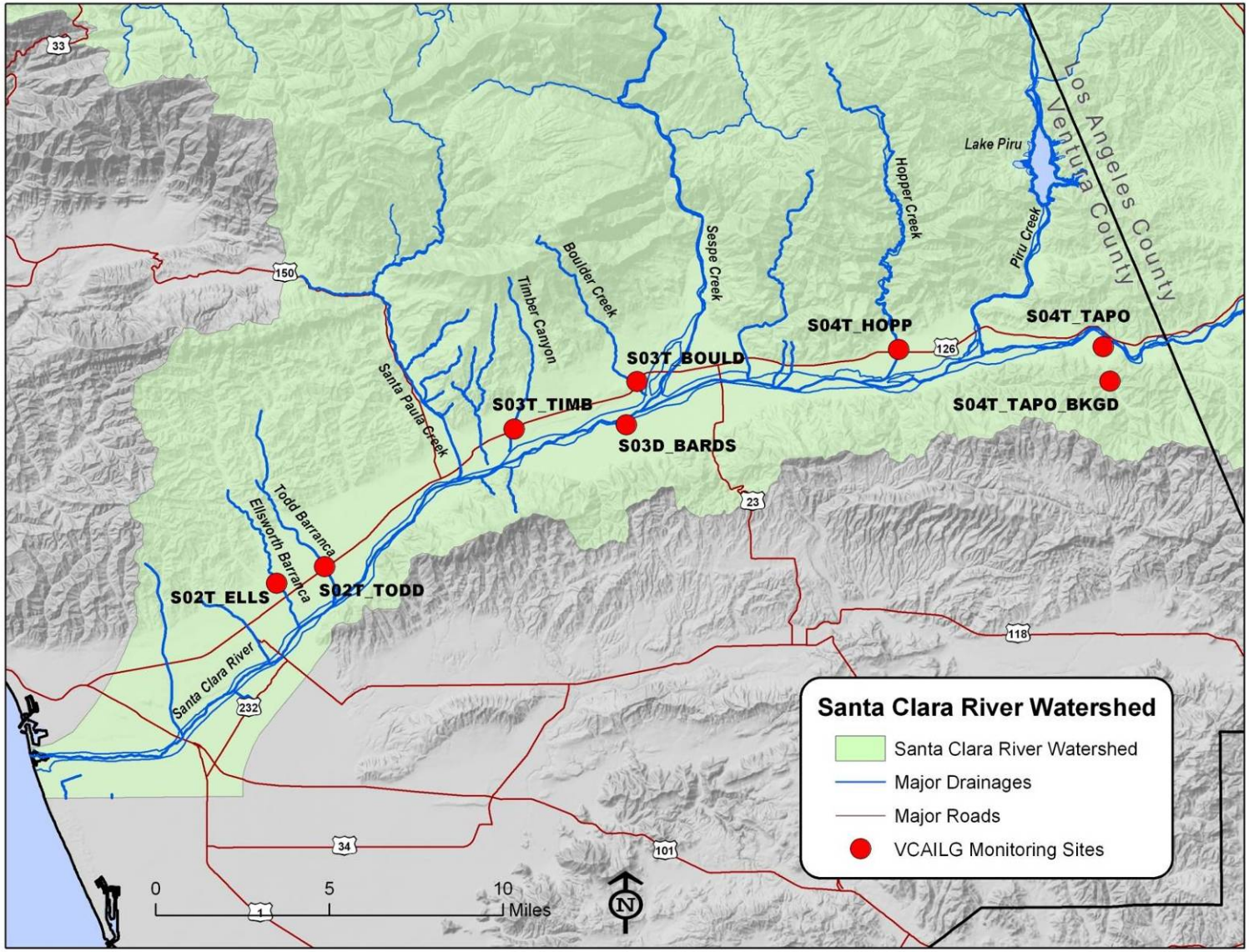


Figure 2. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

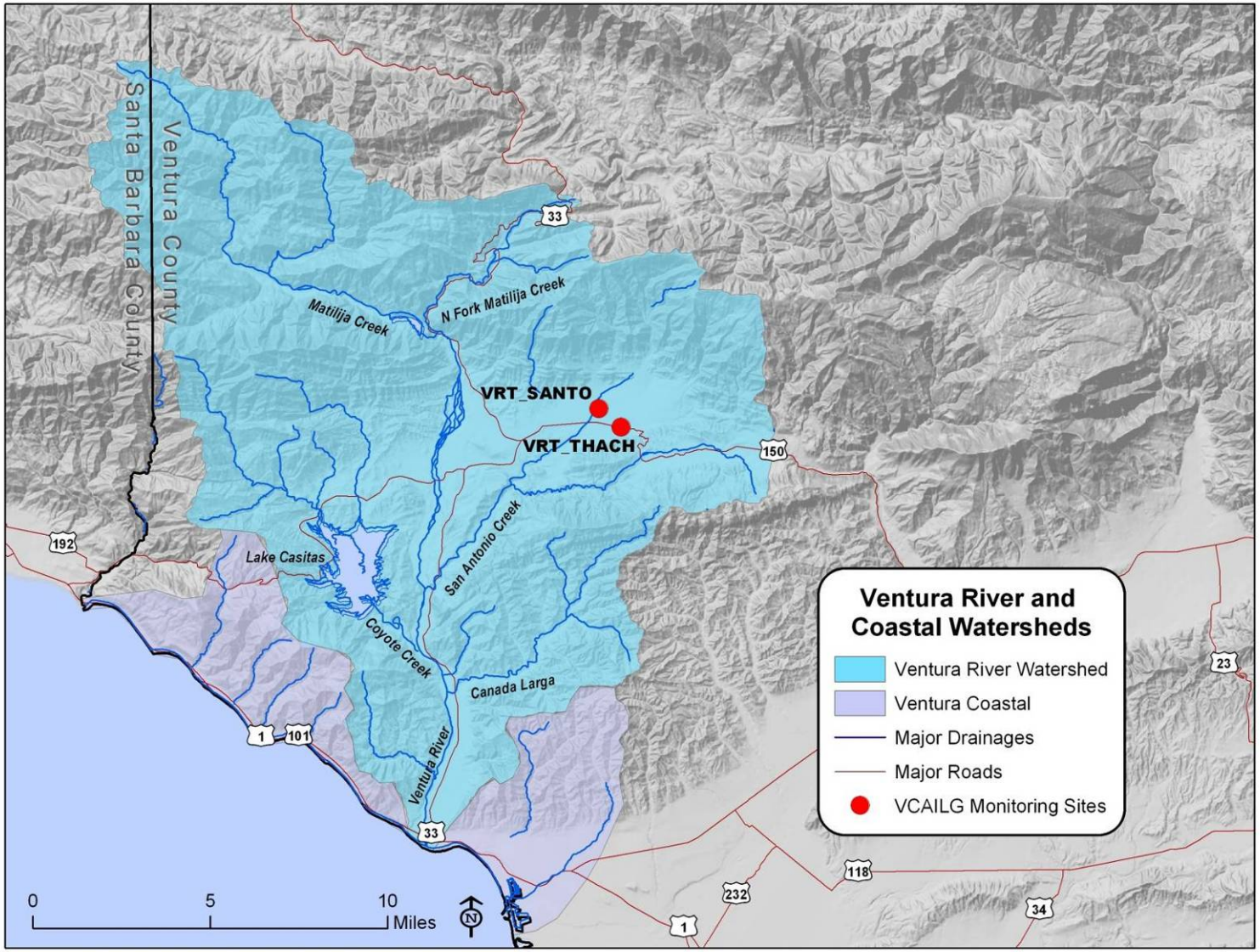


Figure 3. VCAILG Monitoring Sites Located in the Ventura River Watershed

Table 2. Estimated Irrigated Acreage Represented at Each VCAILG Monitoring Site

Station ID[1]	Irrigated Agricultural Acreage [2, 3]									Total Acres Drained
	Row Crops	Cut Flowers	Citrus	Avocados	Other Tree Crops	Strawberries	Other Berries	Sod	Nursery	
01T_ODD2_DCH	2,874	3	17			665		368		1,564
01T_ODD3_ARN	818					39		578		800
02D_BROOM	3,639		378	344		283	177		21	8,236
04D_ETTG	6,271		116			952	77			3,779
04D_LAS	2,212	42				209	41	178		1,339
05D_LAVD	12		219	139		199	77			877
05D_SANT_VCWPD	725		502	146		447				1,154
05T_HONDO	16	4	740	475	1	78	48		9	3,267
06T_FC_BR	129	19	1,029	117	2	15	72		65	3,121
06T_LONG	12		501	692		24	28		48	2,935
9BD_GERRY			58	100			91			447
OXD_CENTR	435	67	35			943			11	1,243
S02T_ELLS	74		277	524	1		21			9,015
S02T_TODD	51	33	227	160	1					5,748
S03D_BARDS	30		725	74					17	2,214
S03T_BOULD			165	680					167	3,764
S03T_TIMB	9		102	363	3					2,183
S04T_HOPP			7						14	15,141
S04T_TAPO	28		34						50	3,686
VRT_SANTO			279	251	13					7,220
VRT_THACH	6		620	130	8				2	6,003

[1] Background sites 02D_CSUCI (primarily runoff from the university), 05D_SANT_BKGD (runoff from a golf course and residential area), and S04T_TAPO_BKGD (runoff from non-irrigated agriculture) are not included in this table.

[2] Data Source Ventura Agricultural Commissioner's Office

[3] Some acreage is double or triple counted due to multi-cropping practices.

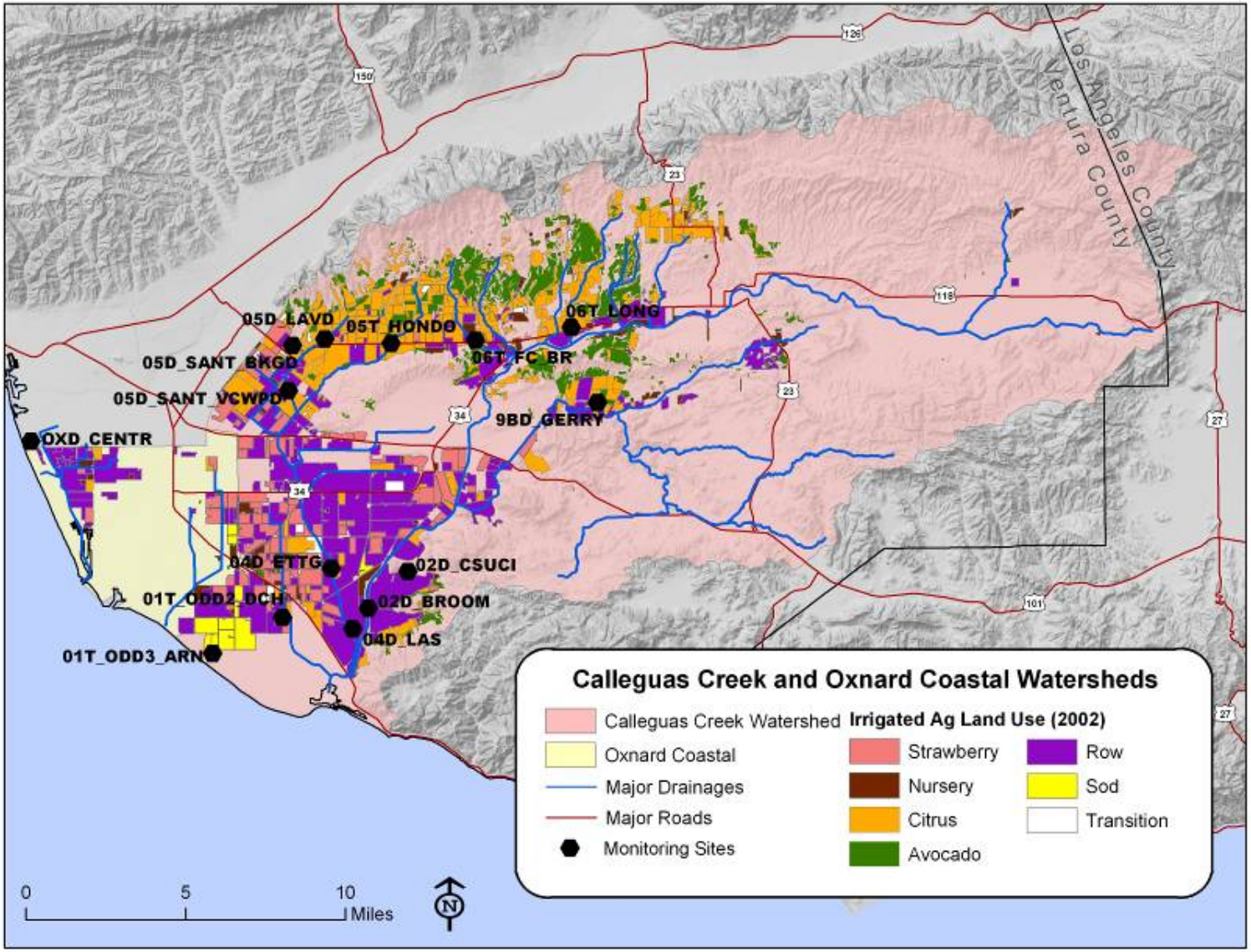


Figure 4. Calleguas Creek Watershed Monitoring Sites and Agricultural Land Use

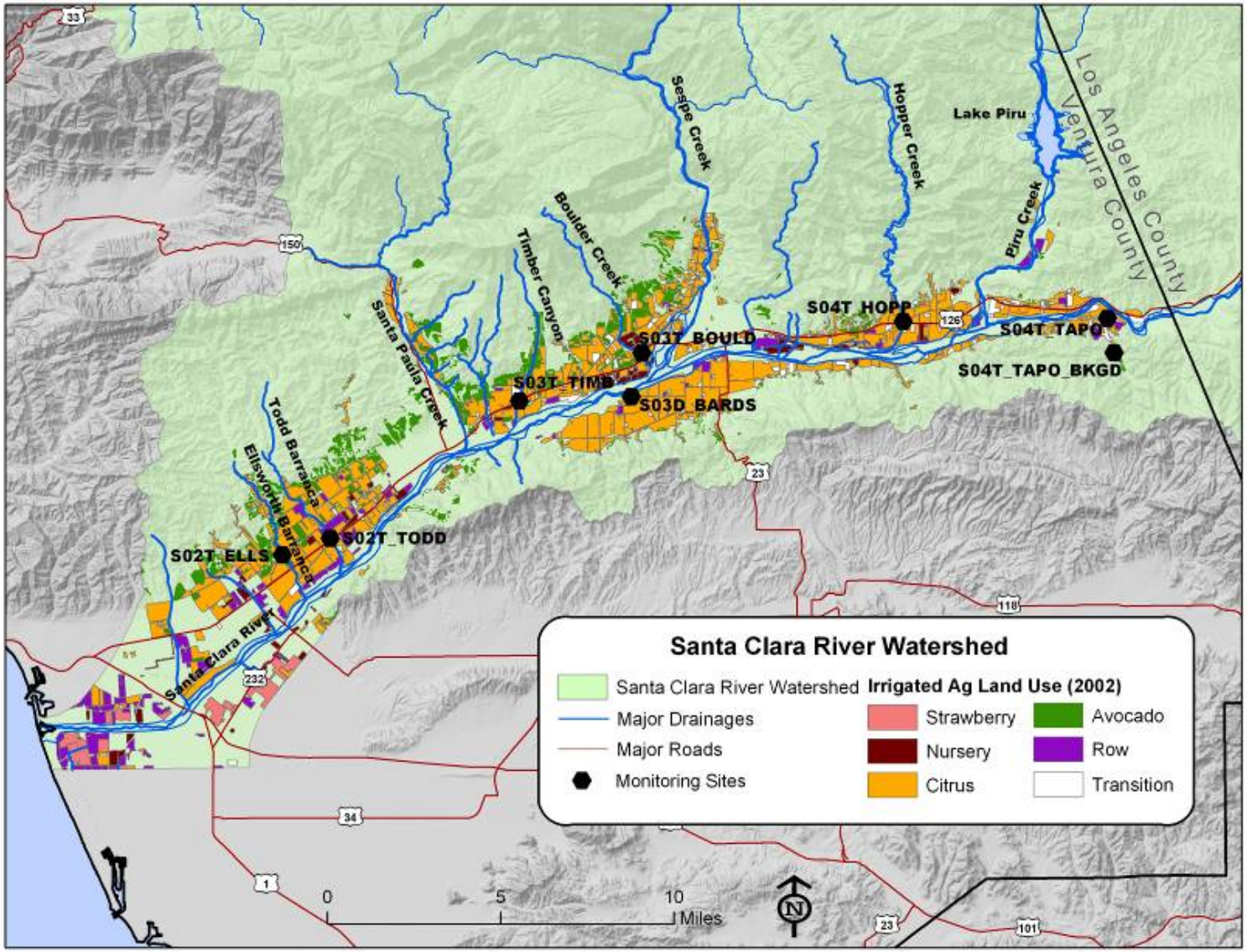


Figure 5. Santa Clara River Watershed Monitoring Sites and Agricultural Land Use

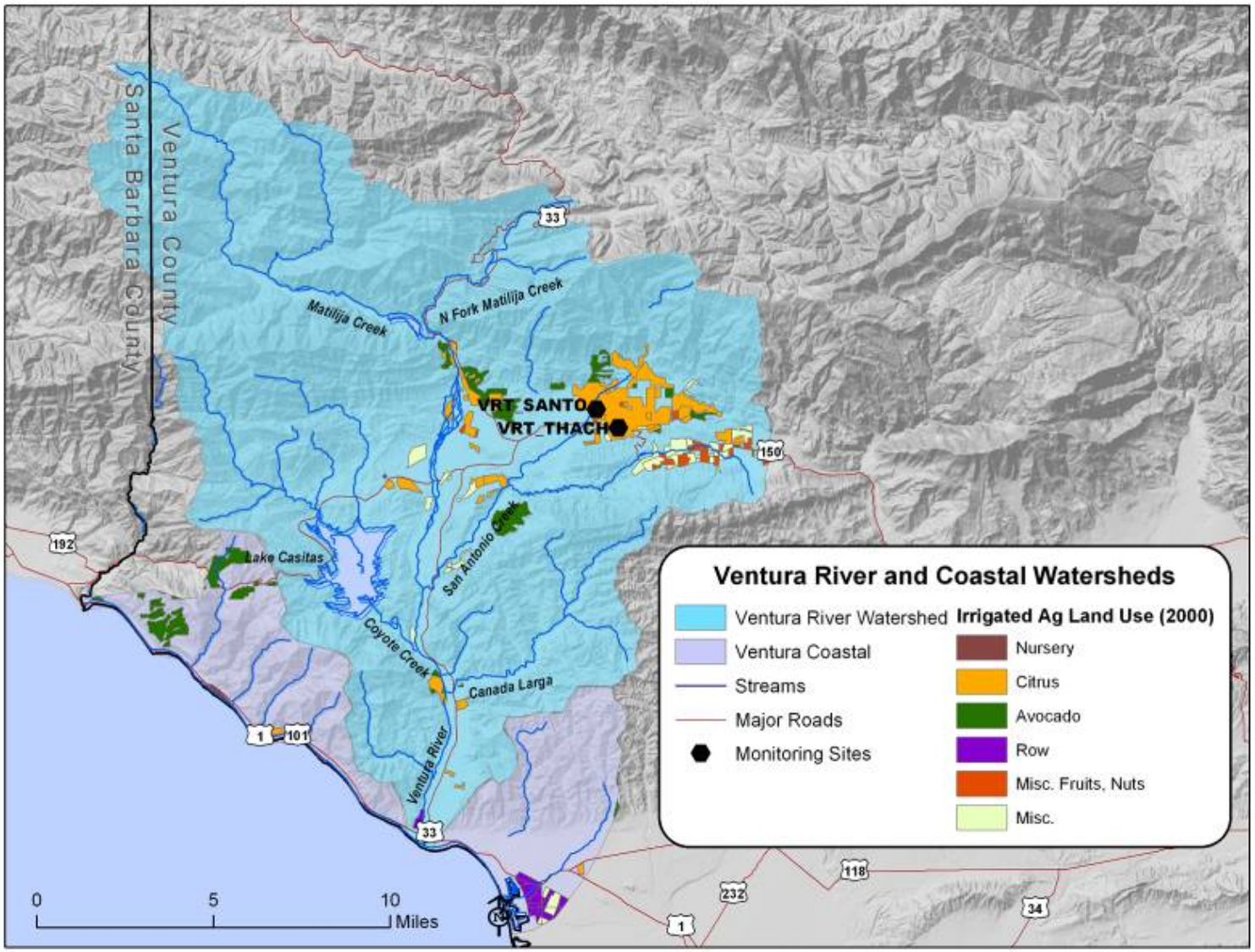


Figure 6. Ventura River Watershed Monitoring Sites and Agricultural Land Use

WATER QUALITY BENCHMARKS

This section presents the water quality benchmarks used to evaluate monitoring data collected at the VCAILG monitoring sites in 2008. Benchmarks used for this purpose include numeric and narrative water quality objectives contained in Appendix 1 and Appendix 2 in the Conditional Waiver, which includes narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule (CTR). TMDL load allocations were not used as benchmarks to determine whether WQMPs are necessary to reduce water quality impacts from irrigated agriculture. Rather, because effective TMDLs already contain the requirement to develop WQMPs regardless of whether monitoring data exceed benchmarks identified in the Conditional Waiver, all TMDL requirements are included in this WQMP.

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 in 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 were evaluated in the AMR 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.

Conditional Waiver benchmarks applicable to VCAILG monitoring sites are presented in Table 3 through Table 7.

Table 3. Conditional Waiver 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 Tables 12 and 13.
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 14,15, and 16
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 12 through 16.

[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. R4-2005-0077, Los Angeles Regional Water Quality Control Board, adopted November 3, 2005.

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

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

[1] The Nitrogen benchmarks listed are as Nitrate-N plus Nitrite-N.

[2] 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.

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

[4] The 100 mg/L benchmark for chloride is the revised water quality objective adopted by the Regional Board in Resolution 2003-015.

[5] In the 1997 Chloride Policy, the Basin Plan objectives for salts were defined to apply to Calleguas Creek above Potrero, Conejo Creek, Arroyo Las Posas, Arroyo Simi, and upstream tributaries. The Basin Plan objectives were not identified as applicable to Revolon Slough in the 1997 Basin Plan Amendment. However, the CCW Salts TMDL applied the Basin Plan Amendment as targets upstream of Laguna Road on Revolon Slough to be above the tidal influence. As a result, the benchmarks in this table are applied upstream of Laguna Road on Revolon Slough.

Table 5. Conditional Waiver Benchmarks for Organochlorine Pesticides

	CC Watershed		OXD, SCR Watersheds		VR Watershed	
Constituent	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	0.00057	CTR HHWO
2,4'-DDD	-----	-----	-----	-----	-----	-----
2,4'-DDE	-----	-----	-----	-----	-----	-----
2,4'-DDT	-----	-----	-----	-----	-----	-----
4,4'-DDD	0.00084	CTR HHO	0.00084	CTR HHO	0.00083	CTR HHWO
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	0.0002	CTR AFWC	0.0002	CTR AFWC	0.0002	CTR AFWC

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)
AFWC = Aquatic Life, Freshwater Chronic (4-day average)

Table 6. Conditional Waiver Benchmarks for Organophosphorus Pesticides

Constituent	CC, OXD, SCR, VR Watersheds Benchmark (ug/L) [1]
Bolstar	-----
Chlorpyrifos	0.025
Demeton	-----
Diazinon	0.10
Dichlorovos	-----
Dimethoate	-----
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 1 of the Conditional Waiver

Table 7. Conditional Waiver Benchmarks for Pyrethroid Pesticides

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

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River
[1] There are currently no Conditional Waiver benchmarks in effect for these watersheds.

SUMMARY OF BENCHMARK EXCEEDANCES

Monitoring data from samples collected at 17 of the 21 VCAILG monitoring sites exceeded benchmarks and triggered the requirement to write this update to the VCAILG WQMP, which addresses the additional exceedances. Background sites are not included in the total number of monitoring sites because they are located upstream of irrigated agricultural operations. Exceedances of water quality benchmarks occurred in all watersheds.

Because TMDLs require the development of WQMPs regardless of whether monitoring data exceed TMDL load allocations, TMDL WQMP requirements are discussed separately in the next section.

Table 8 contains a summary of benchmark exceedances that occurred at each site during 2008. Table 8 also identifies sites that were sampled but where no exceedances occurred, as well as sites that were not sampled. Table 9 contains the same exceedance summary organized by constituent and by watershed. Organochlorine (legacy) pesticides, primarily DDT compounds, caused the highest number of exceedances overall, followed by nitrogen, organophosphorus pesticides, salts, and chronic toxicity. During the wet events there were fewer sites with flow that had exceedances than during the two dry events. However, during the dry events there are less total sites that are sampled.

Pesticides

Exceedances of benchmarks for organochlorine (OC) pesticides occurred at 16 VCAILG sites, 10 of which are located in the Calleguas Creek Watershed. Exceedances of benchmarks for DDT compounds occurred during all 3 events at the sites located in the Oxnard Coastal Watershed and at 4 sites in the Calleguas Creek Watershed. There were 10 sites with OP pesticides exceedances during 2008, 7 of those sites are in the Calleguas Creek Watershed. Chlorpyrifos was the most frequently detected OP pesticide. Also of note, there are OC and OP pesticides TMDLs in the Calleguas Creek Watershed.

Salts

Exceedances of salts benchmarks (TDS, chloride, sulfate, or any combinations thereof) occurred at 9 sites, six of which are located in the Santa Clara River Watershed. The Salts TMDL in the Calleguas Creek Watershed includes load allocations for boron, chloride, sulfate, and TDS. All of these constituents, except for boron are monitoring as part of the VCAILG Conditional Waiver monitoring program. A Chloride TMDL exists for the Santa Clara River Watershed; however, it does not include load allocations or implementation actions for agricultural dischargers.

Chronic Toxicity

Toxicity was detected at 7 sites during event 4. Toxicity was not detected in any of the event 7 samples. Only one site triggered a TIE during 2008 monitoring.

Nitrogen

Exceedances of nitrate-N and ammonia-N occurred at 12 VCAILG sites, 8 of which are in the Calleguas Creek Watershed. The nitrate-N benchmark applicable to the Oxnard Coastal monitoring site was exceeded during all four monitoring events. In the Santa Clara River Watershed, nitrogen objectives were exceeded at 4 monitoring sites. It should be noted here that there are nitrogen compounds TMDLs in both the Calleguas Creek and Santa Clara River Watersheds for which the VCAILG monitoring results can be compared to load allocations; exceedances of the applicable load allocations are discussed in the next section.

Dissolved Oxygen

An exceedance of the dissolved oxygen benchmark occurred during Event 7 at one site in the Calleguas Creek Watershed.

Temperature

An exceedance of the temperature benchmark occurred during Event 6 at one site in the Calleguas Creek Watershed.

pH

An exceedance in pH occurred during Event 7 at one site in the Santa Clara River Watershed. The pH at the site was slightly too basic to meet the water quality objective.

Table 8. Water Quality Benchmark Exceedances in 2008 – by Site & Event

Site ID	Event 4 – *Wet* January 5, 2008	Event 5 – *Wet* January 24, 2008	Event 6 – *Dry* May 20, 2008	Event 7 – *Dry* Sept. 16, 2008
01T_ODD2_DCH	Nitrate-N, Chlorpyrifos, Chronic Toxicity	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDE, Toxaphene
01T_ODD3_ARN	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE	*FTO*
02D_BROOM	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dieldrin	Nitrate-N, 4,4'-DDD, 4,4'-DDE	Dissolved Oxygen, Nitrate-N, Chlordane, , 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene
04D_ETTG	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Ammonia-N, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos
04D_LAS	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Temperature, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Diazinon	Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos
05D_SANT_VCWPD	TDS, Chloride, Sulfate, Nitrate-N, Chlordane, 4,4'-DDE, Chlorpyrifos	TDS, Chloride, Sulfate, Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos
05D_LAVD	*NS*	Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	*NS*	*NS*
05T_HONDO	Sulfate, 4,4'-DDE, 4,4'-DDT, Chronic Toxicity	Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	*NS*	*NS*
06T_FC_BR	TDS, Sulfate, Nitrate-N, Chronic Toxicity	Chlordane, 4,4'-DDE, 4,4'-DDT	*NS*	*NS*
06T_LONG	*NS*	*NS*	*NS*	*NS*
9BD_GERRY	*NS*	*NS*	*NS*	*NS*
OXD_CENTR	Nitrate-N, 4,4-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Nitrate-N, Chlordane, 4,4-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, Toxaphene
S02T_ELLS	TDS, Chloride, Sulfate, Chronic Toxicity	TDS, Sulfate	*NS*	pH, Chlorpyrifos
S02T_TODD	TDS, Sulfate, Chronic Toxicity	TDS, Sulfate, 4,4'-DDT	TDS, Sulfate, Nitrate-N	*FTO*
S03T_TIMB	Nitrate-N, Chlorpyrifos, Chronic Toxicity	Sulfate, 4,4'-DDT	*NS*	*NS*
S03T_ BOULD	Chronic Toxicity	Chlordane	TDS, Chloride, Sulfate, Ammonia-N, Nitrate-N	*FTO*
S03D_BARDS	*NS*	Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos, Diazinon	*NS*	*NS*
S04T_HOPP	*None*	*None*	TDS, Sulfate	*NS*
S04T_TAPO	TDS, Chloride, Sulfate, 4,4'-DDE	TDS, Chloride, Sulfate, Chlordane, 4,4'-DDD, 4,4'-DDE	TDS, Chloride, Sulfate, Nitrate-N	TDS, Chloride, Sulfate, Nitrate-N
VRT_THACH	*None*	4,4'-DDT	*NS*	*NS*
VRT_SANTO	*None*	*None*	*NS*	*NS*
Total Number of Sites Sampled	17	19	11	8
Total Number of Sites with Exceedances	14	17	11	8

NS = Not Sampled; insufficient or no flow. FTO = Fish Tissue Offset; site not visited.

Table 9. Water Quality Benchmark Exceedances in 2008 – by Pollutant & Watershed

Pollutant	VCAILG Monitoring Sites with Benchmark Exceedances		
	CC / OXN	SCR	VR
Salts	05D_SANT_VCWPD 05T_HONDO 06T_FC_BR	S02T_ELLS S02T_TODD S03T_TIMB S03T_BOULD S04T_TAPO S04T_HOPP	None
Nitrogen	01T_ODD2-DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 06T_FC_BR OXD_CENTR	S02T_TODD S03T_TIMB S03T_BOULD S04T_TAPO	None
Chronic Toxicity	01T_ODD2_DCH 05T_HONDO 06T_FC_BR	S02T_ELLS S02T_TODD S03T_TIMB S03T_BOULD	None
OC Pesticides	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO 06T_FC_BR OXD_CENTR	S02T_TODD S03T_TIMB S03T_BOULD S03D_BARDS S04T_TAPO	VRT_THACH
OP Pesticides	01T_ODD2-DCH 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO OXD_CENTR	S02T_ELLS S03T_TIMB S03D_BARDS	None
Dissolved Oxygen	02D_BROOM	None	None
pH	None	S02T_ELLS	None
Temperature	04D_LAS	None	None

CC = Calleguas Creek OXN = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

Monitoring results organized by constituent and site for each water quality benchmark exceedance can be found in Appendix B.

Table 10 is a comparison of water quality benchmark exceedances in each of eight constituent classes: salts, nitrogen, chronic toxicity, organochlorine pesticides, organophosphorus pesticides, dissolved oxygen, pH, and temperature, between the 2007 and 2008 monitoring years. The following sites had exceedances in the same classes of constituents during both years:

- 04D_ETTG
- OXD_CENTR

- S02T_TODD
- S03T_BOULD
- S03D_BARDS

Four sites had less exceedances in 2008 than previously, considering the constituents by class, not necessarily overall number; they are:

- 01T_ODD3_ARN
- 05D_SAND_VCWPD
- 05D_LAVD
- S04T_TAPO

05D_LAVD showed significant improvement between the two monitoring years. In 2007 there were exceedances in five classes of constituents and in 2008, only two. There are three sites that continue to not have any water quality benchmark exceedances, they are as follows:

- 06T_LONG
- 9BD_GERRY
- VRT_SANTO

The remaining sites showed an increase in benchmark exceedances by constituent class. All of the information presented in Table 10 was considered as part of the monitoring site drainage area prioritization for determining tier 2 drainages.

Table 10. Water Quality Benchmark Exceedance Comparison between 2007 and 2008 Monitoring Years

Site [1]	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	*Temperature*
01T_ODD2_DCH	2007		x		x	x			
	2008		x	x	x	x			
01T_ODD3_ARN	2007		x	x	x				
	2008		x		x				
02D_BROOM	2007		x		x				
	2008		x		x		x		
04D_ETTG	2007		x		x	x			
	2008		x		x	x			
04D_LAS	2007		x		x	x			
	2008		x		x	x			*x*
05D_SANT_VCWPD	2007	x	x		x	x			*x*
	2008	x	x		x	x			
05D_LAVD	2007	x	x	x	x	x			
	2008				x	x			
05T_HONDO	2007				x	x			
	2008	x		x	x	x			
06T_FC_BR	2007				x	x			
	2008	x	x	x	x	x			
OXD_CENTR	2007		x		x	x			
	2008		x		x	x			
S02T_ELLS	2007	x				x			
	2008	x		x		x		x	
S02T_TODD	2007	x	x	x		x			
	2008	x	x	x	x				
S03T_TIMB	2007	x							
	2008		x	x	x	x			
S03T_BOULD	2007	x	x	x			x		
	2008	x	x	x	x				
S03D_BARDS	2007				x	x			
	2008				x	x			
S04T_HOPP	2007								
	2008	x							
S04T_TAPO	2007	x	x	x	x				
	2008	x	x		x				
VRT_THACH	2007								
	2008				*x*				

x = Water quality benchmark exceedance during the corresponding year for the constituent noted in the above column.
[1] 06T_LONG and 9BD_GERRY are not included in the above table since they were not sampled during either monitoring year due to a lack of flow. VRT_SANTO is not included in this table because there were not any exceedances in water quality benchmarks during 2007 or 2008.

TMDL WATER QUALITY MANAGEMENT PLAN REQUIREMENTS

Because TMDLs require the development of WQMPs regardless of whether monitoring data exceed TMDL load allocations, all of the areas covered by a TMDL that require a WQMP are addressed by this plan. This section discusses the TMDLs that require WQMPs, other TMDLs that are effective in Ventura County, but do not require WQMPs and provides a comparison of the TMDL WQMP requirements to the Conditional Waiver benchmark exceedances.

The process and BMPs outlined in the 2007 WQMP are designed to result in compliance with the TMDL load allocations. Like the Conditional Waiver benchmarks, TMDL allocations are designed to result in receiving waters achieving water quality objectives. As a result, actions taken to achieve water quality benchmarks will also help achieve TMDL load allocations.

The schedule for achieving TMDL load allocations will, in most cases, be longer than the schedule assigned to address water quality benchmark exceedances in the WQMP because TMDL implementation schedules are generally longer than the Conditional Waiver time frame. As a result, TMDL exceedances that do not correspond with prioritized Conditional Waiver benchmark exceedance locations will be addressed during future implementation phases within the time frame of the TMDL implementation schedules. TMDL exceedances within the prioritized Conditional Waiver areas will begin BMP implementation prior to November 2010 (See Table 13). All TMDL load allocations will be addressed using the process and BMPs outlined in the 2007 WQMP and referenced in this 2008 update.

The Conditional Waiver currently does not include monitoring for metals and selenium. However, in the Calleguas Creek watershed, a Metals and Selenium TMDL is effective and requires the development of a WQMP. As a result, metals and selenium were included in the previous 2007 WQMP to meet the requirements of the TMDL. Due to the fact that metals and selenium are not currently monitored under the waiver program, metals and selenium will not be specifically addressed during the first phase of WQMP implementation. However, BMPs are identified that address metals and selenium. Growers in priority areas in the Calleguas Creek watershed will be notified that a Metals and Selenium TMDL is in place and provided with BMP information. As many BMPs address multiple pollutants, actions taken to address other constituents are likely to address discharges of metals and selenium as well. Monitoring conducted as part of the Calleguas Creek Watershed TMDL Monitoring Program will be used to assess metals and selenium discharges from agriculture.

Table 11. Effective TMDLs in Calleguas Creek Watershed Requiring WQMPs

Constituent	Arroyo Simi	Arroyo Las Posas	Conejo Creek	Calleguas Creek [1, 2]	Revolon Slough [2]	Mugu Lagoon [2]
Organochlorine Pesticides and PCBs TMDL						
Chlordane	X	X	X	X	X	X
4,4'-DDD	X	X	X	X	X	X
4,4'-DDE	X	X	X	X	X	X
4,4'-DDT	X	X	X	X	X	X
Dieldrin	X	X	X	X	X	X
PCBs	X	X	X	X	X	X
Toxaphene	X	X	X	X	X	X
Sediment						X
Toxicity TMDL						
Diazinon	X	X	X	X	X	X
Chlorpyrifos	X	X	X	X	X	X
Toxicity	X	X	X	X	X	X
Metals and Selenium TMDL						
Copper			X	X	X	X
Nickel			X	X	X	X
Mercury			X	X	X	X
Selenium					X	
Salts TMDL						
Chloride	X	X	X	X	X	
TDS	X	X	X	X	X	
Sulfate	X	X	X	X	X	
Boron	X				X	

Blanks in table indicate constituent is not included in TMDL for that subwatershed.

1. Calleguas Creek covers Camarillo and Pleasant Valley subwatersheds for Salts TMDL.
2. Salts TMDL doesn't apply to Mugu Lagoon and only applies to Calleguas Creek above Potrero Road and Revolon Slough above Laguna Road.

Table 12. Other Effective TMDLs in Ventura County Not Requiring WQMPs [1]

Constituent	Arroyo Simi	Arroyo Las Posas	Conejo Creek	Calleguas Creek	Revolon Slough	Mugu Lagoon	Santa Clara River [2]	Ventura River Estuary
Nitrogen TMDL								
Ammonia	X	X	X	X	X	X		
Nitrate	X	X	X	X	X	X		
Nitrite	X	X	X	X	X	X		
Nitrate+Nitrite	X	X	X	X	X	X		
Ammonia+Nitrate+Nitrite							X	
Chloride TMDL							[3]	
Trash TMDL					X			X

1. Although WQMPs are not required for these TMDLs, BMPs may be needed to meet the requirements of the TMDLs. This WQMP may assist with agricultural compliance with these TMDLs, but specific activities will not be outlined in this WQMP to address these TMDLs above and beyond where the TMDLs overlap with benchmark exceedances.
2. For the Nitrogen TMDL, the Santa Clara River includes Reach 3, Mint Canyon Reach 1, Wheeler Canyon/Todd Barranca, Brown Barranca/Long Canyon.
3. The Chloride TMDL is effective in the Santa Clara River Reach 3, but does not include any requirements for agricultural actions.

The following table summarizes where TMDL requirements for the development of WQMPs overlaps with agricultural waiver benchmark exceedances that trigger WQMPs. The table addresses the Calleguas Creek TMDLs that require the development of WQMPs and the nitrogen TMDLs for the Calleguas Creek and Santa Clara River watershed. Although the nitrogen TMDLs do not require the development of WQMPs, benchmark exceedances of nitrogen exist and BMP implementation in those areas will assist with TMDL implementation. This table provides a mechanism for comparing where nitrogen BMPs will be implemented as compared to TMDL requirements. As growers implement BMPs to address the water quality benchmark exceedances, they will also be implementing actions to achieve TMDL load allocations. The Trash TMDLS and Santa Clara Chloride TMDL are not addressed in this WQMP and are not included in the table.

Table 13. Comparison of Effective TMDLs to Waiver Monitoring Location Benchmark Exceedances

WQMP TMDL Subwatershed and Corresponding VCAILG Monitoring Sites	Organochlorine Pesticides	Organophosphorus Pesticides	Salts	Toxicity	Nitrogen	Metals and Selenium
Arroyo Simi	T	T	T	T	T	
None						
Arroyo Las Posas	T	T	T	T	T	
06T_FC_BR	A		A	A	A	
06T_LONG						
Conejo Creek	T	T	T	T	T	T
9BD_GERRY						
Calleguas Creek	T	T	T [1]	T	T	T
02D_BROOM	A		[3]	A		
Revolon Slough	T	T	T [2]	T	T	T
04D_ETTG	A	A	[3]		A	
04D_LAS	A	A	[3]		A	
05D_SANT_VCWPD	A	A	A		A	
05D_LAVD	A	A				
05T_HONDO	A	A	A	A		
Mugu Lagoon	T	T	[3]	T	T	T
01T_ODD2_DCH	A	A	[3]	A	A	
01T_ODD3_ARN	A		[3]		A	
Santa Clara Reach 3					T	
S03T_TIMB	A	A	A	A	A	
S03T_BOULD	A		A	A	A	
S03D_BARDS	A	A				
Mint Canyon Reach 1					T	
None						
Brown Barranca/Long Canyon					T	
None						
Wheeler Canyon/Todd Barranca					T	
S02T_TODD	A		A	A	A	
Other Santa Clara River Sites						
S02T_ELLS		A	A	A		
S04T_HOPP			A			
S04T_TAPO	A		A		A	

Note: VCAILG monitoring sites (except background sites and those in the Ventura River Watershed) are listed under their appropriate reach or subwatershed to allow for easy comparison with where TMDLs are in effect.
T=TMDL in effect for the corresponding reach or subwatershed
A=Ag Waiver benchmark exceedance
Blank cell=Either samples were collected and an exceedance was not found or the site has been dry and therefore not sampled

1. Salts TMDL only applies to discharges above Potrero Road.
2. Salts TMDL only applies to discharges above Laguna Road.
3. Salts objectives and TMDL do not apply to these locations because they are tidally influenced.

Constituent-Specific Water Quality Problems and Sources

The example WQMP in Appendix 7 of the Conditional Waiver includes requirements to discuss the water quality problem, including a discussion of the potential sources of the constituents. In the 2007 WQMP, the "Constituent Specific Water Quality Problems and Sources" section provided a discussion of the following aspects of the example WQMP:

- Describe the water quality problem identified by monitoring or other methods
- Describe the pollutant associated with this water quality problem
- Describe the sources of the pollutant or water quality problem

For each constituent group, characteristics of the pollutant and a summary of potential sources were discussed in the 2007 WQMP and are not repeated in this document. Details of the monitoring sites where exceedances of benchmarks occurred are presented in the previous section and exceedance results for 2008 are summarized in Appendix B. Specifically for chronic toxicity, the Conditional Waiver requires that the WQMP propose the most relevant species for toxicity testing. VCAILG submitted recommendations for subsequent toxicity testing in a letter to the Executive Officer on July 30, 2008. On September 11, 2008, VCAILG received instructions regarding single species tests for future toxicity monitoring; therefore, a proposal of sensitive species is not included in this report.

Management Practice Identification, Implementation, and Tracking

This section of the 2007 WQMP defined the process to be utilized by VCAILG to identify the need for management practices, implement specific management practices, and track the implementation and effectiveness of those management practices to mitigate water quality benchmark exceedances and achieve TMDL load allocations. The process that was identified addressed required elements of the WQMP (as provided in Appendix 7 to the Conditional Waiver) and included a timeline during which VCAILG and its members would carry out the approved steps.

The VCAILG 2007 WQMP should be referred to regarding plan specifics, detailed explanations of the process, and mechanisms for completing implementation actions. However, integral figures and some components of the WQMP implementation process are duplicated in this 2008 WQMP for easy reference. Accomplishments in WQMP implementation since submittal of the 2007 plan are described in the following section.

WQMP IMPLEMENTATION PROCESS

Figure 7 outlines the WQMP implementation process and Figure 8 provides a timeline for task completion as well as how and when each priority tier will be targeted. New in this WQMP are Figure 9 and Table 14, which list the implementation achievements since submittal of the 2007 WQMP. Many outreach tasks were completed by VCAILG in addition to the steps required by the WQMP. Table 14 summarizes the education outreach classes, which were approved for Conditional Waiver education credits, only two of which were required by the WQMP.

Most completed tasks were focused on outreach to the first tier priority growers, however outreach to the entire VCAILG membership and some specific commodities also took place. An explanation of each element of the WQMP process is discussed in the 2007 report.

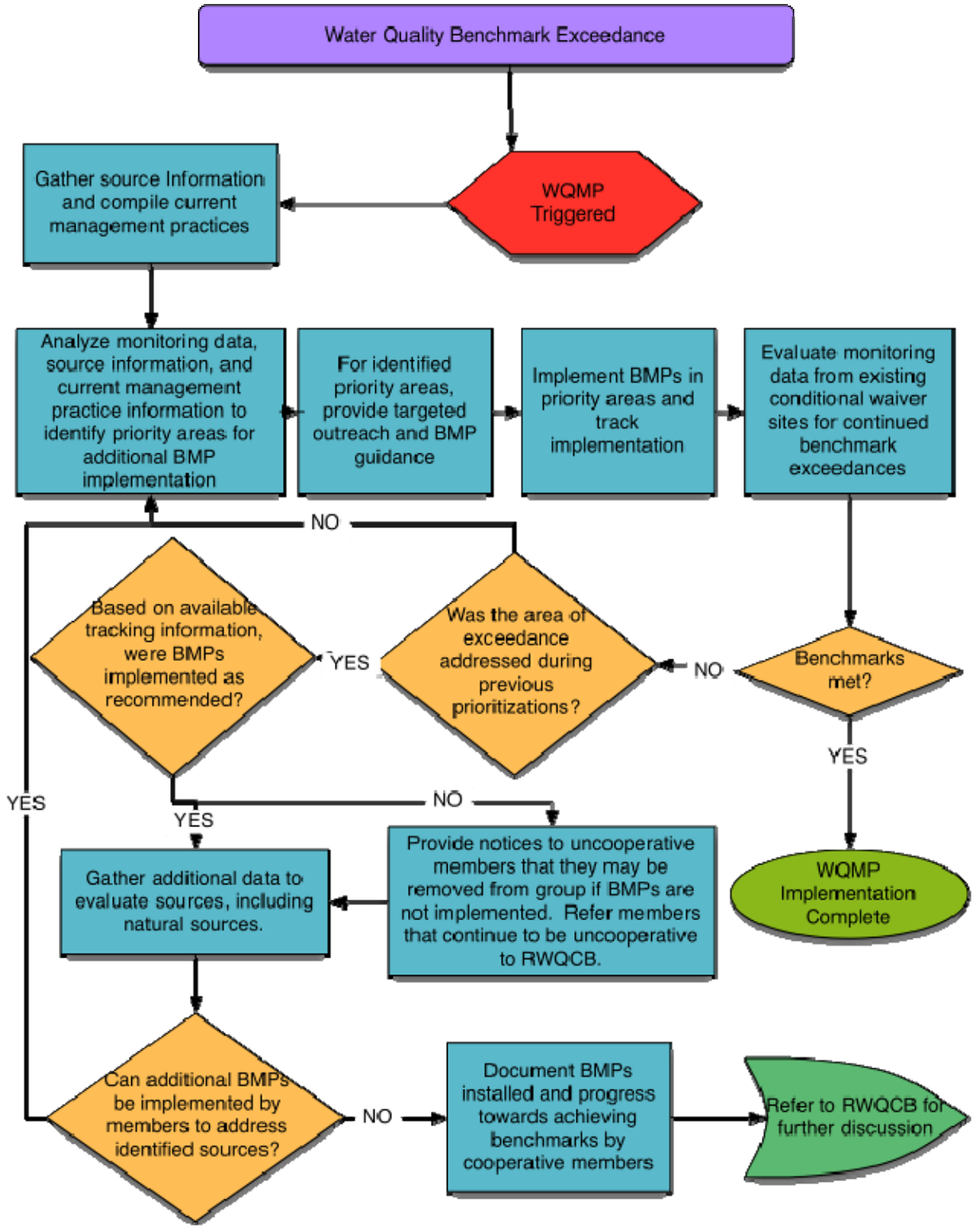


Figure 7. WQMP Implementation Process

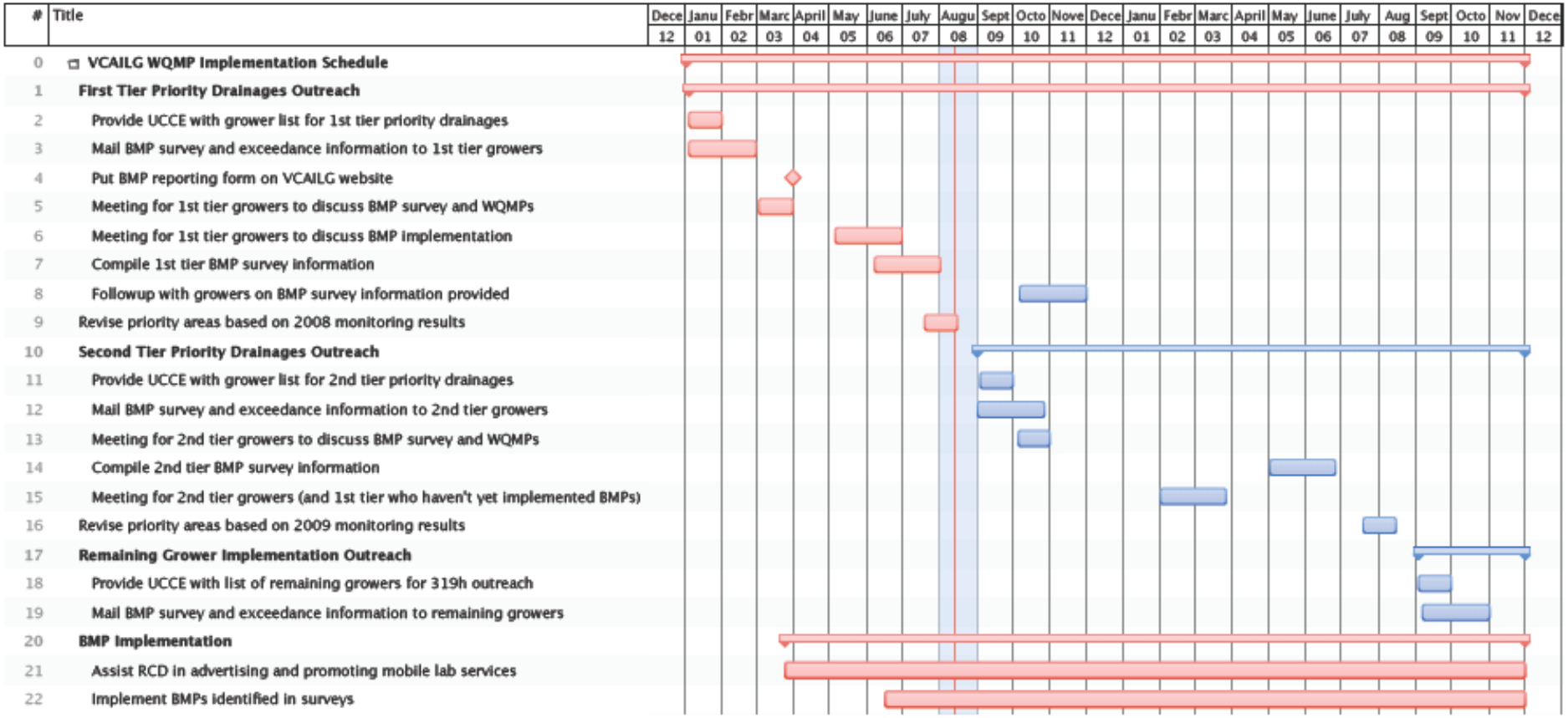


Figure 8. Task and Date-specific Implementation Timeline

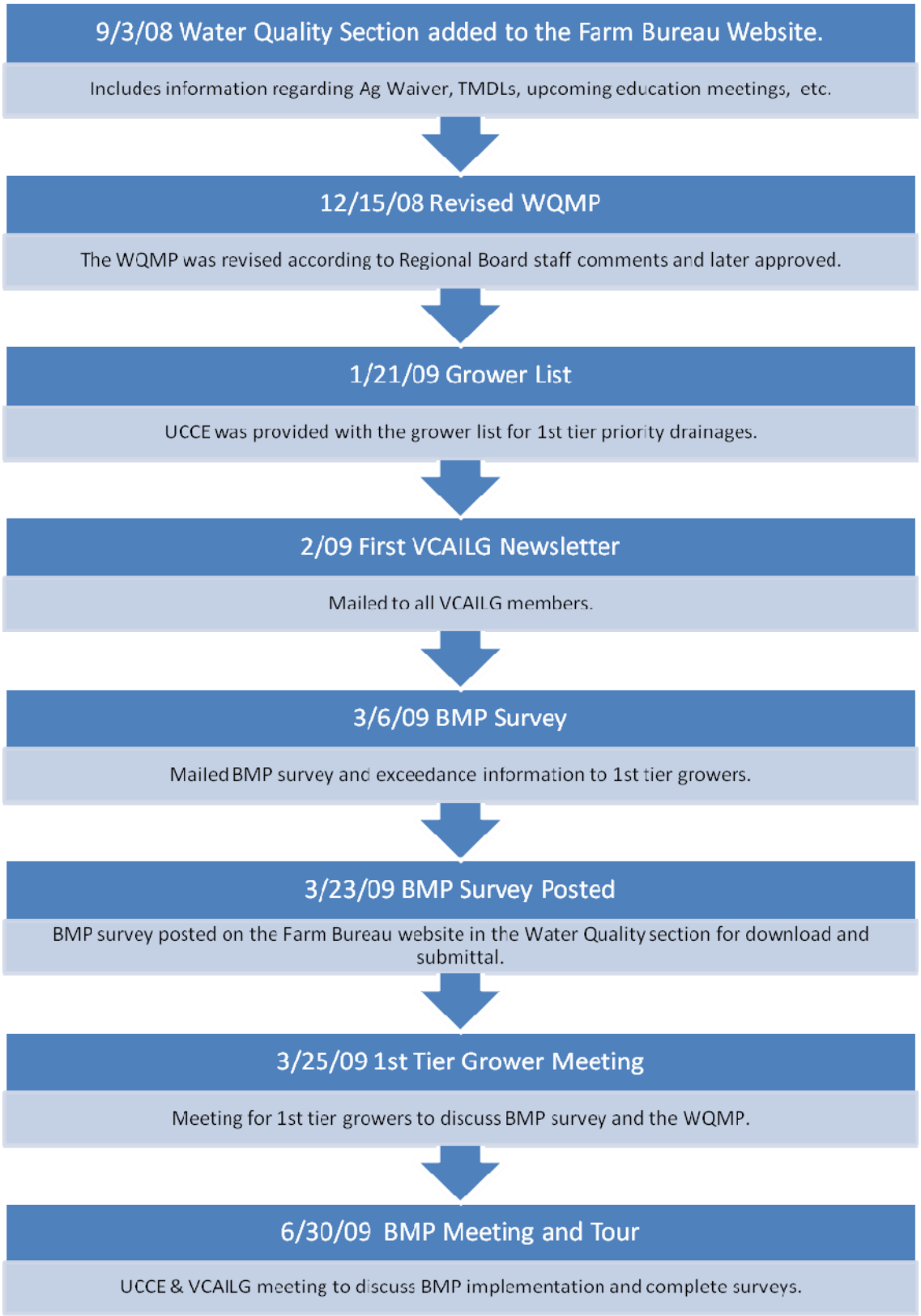


Figure 9. WQMP Specified Implementation Actions

Table 14. Education Outreach Classes

Date	Class	VCAILG Members in Attendance	Course Topics
11/13/08	Water and Agriculture in Ventura County: The Conditional Waiver and You	4	Hosted by the Strawberry Commission, this meeting summarized up to date monitoring information and explained the WQMP process. BMPs to address benchmark exceedances were also discussed and information was provided regarding resources and agencies available to assist with BMP implementation.
3/25/09	**Water Quality Management Plan Survey: First Priority**	44	Growers and landowners in the first tier priority drainages were invited to this meeting. VCAILG representatives and consultants explained the WQMP process and what it means to be in a first tier drainage. Finally, the Management Practice Survey was explained in detail and attendees were given the opportunity to complete their survey or ask questions.
4/2/09	CORF IPM Practices for Bedding Plants and Container Color	10	Hosted by CORF and UCCE, this meeting provided Integrated Pest Management practice information specifically for nursery crops.
4/15/09	California Avocado Grower's Seminar: Creating Our Future	37	Hosted by the Avocado Commission and UCCE, this meeting focused on pest research and updates relevant to avocados.
6/10/09	Water Best Management Practices	54	Hosted by the Strawberry Commission with support from the Ventura County RCD and VCAILG, presentations were given regarding the Mobile Irrigation Lab and the importance of effective irrigation scheduling for plant health and runoff reduction. VCAILG representatives gave a short introduction of the Management Practice Survey and provided assistance as needed.
6/30/09	**Vegetated Treatment Systems: Seminar and Tour**	58	Growers and landowners in the first tier priority drainages were invited to this meeting hosted by VCAILG, UCCE, and RCD. The seminar and tour focused on the uses and implementation of vegetated treatment systems as a BMP to address a variety of water quality issues. Time was also allotted for filling out the Management Practice Survey.

Education classes held to fulfill 2007 WQMP implementation are noted in **bold**.

IDENTIFICATION OF PRIORITY AREAS

Identifying priority areas is important for focusing outreach efforts and promoting the implementation of BMPs in the areas with water quality benchmark exceedances. Four criteria categories were used to determine first, second, and third tier priority drainage areas:

- The total number of constituent exceedances at the monitoring site. This is the exceedance total from each site as listed in Table 8.
- Number of classes of pollutants with exceedances at the monitoring site. The pollutant classes are those listed in Table 9 (salts, nitrogen, chronic toxicity, OC pesticides, OP pesticides, dissolved oxygen, and temperature).
- The number of TMDLs effective at the monitoring site as shown in Table 11.
- Percentage of agricultural acreage enrolled in VCAILG. Figure 10 through Figure 12 show the drainage areas of each VCAILG monitoring site and the location of parcels that are not currently enrolled in VCAILG (as of July 15, 2009). Area close-ups of VCAILG monitoring site drainages can be found in Appendix C. This fourth category will be considered when determining the feasibility of monitoring water quality improvements at current VCAILG monitoring sites. In cases where a monitoring site drainage area has a significant proportion of un-enrolled landowners or there are un-enrolled parcels adjacent to the monitoring site location, those drainages' priority level may be downgraded until enrollment in VCAILG improves.

The following two tables detail the results of monitoring site drainage prioritization based on the above criteria. Prioritizations determined according to 2007 monitoring data and presented in the previous WQMP can be found in Table 15. In Table 16 the prioritization information is updated according to 2008 information. Two changes were made in site prioritization, 02D_BROOM was upgraded from third to second tier due to a significant increase in constituent exceedances and S03T_BOULD was downgraded to third tier because of low VCAILG enrollment in the drainage area.

Table 15. Monitoring Site Drainage Area Prioritizations-2007

Site ID	Category 1 Total # Constituent Exceedances	Category 2 # of Classes of Pollutants with Exceedances	Category 3 # of Effective TMDLs	Category 4a Total Ag Acres in Drainage Area	Category 4 % Ag Acres Enrolled in VCAILG
01T_ODD2_DCH	9	3	5	1700.85	95.7%
01T_ODD3_ARN	10	3	5	690.50	100.0%
02D_BROOM	4	2	5	5867.56	99.9%
04D_ETTG	11	3	5	4060.51	99.9%
04D_LAS	11	3	5	3192.63	96.1%
05D_SANT_VCWPD	19	5	6	1633.98	90.1%
05D_LAVD	12	5	6	2003.92	100.0%
05T_HONDO	5	2	6	3208.98	97.3%
06T_FC_BR	4	2	5	2405.24	99.4%
06T_LONG	0	0	5	2628.89	96.0%
9BD_GERRY	0	0	6	1066.76	100.0%
OXD_CENTR	10	3	0	1589.22	100.0%
S02T_ELLS	4	2	0	3835.15	99.6%
S02T_TODD	10	4	1	2797.71	99.6%
S03T_TIMB	3	1	1	1632.74	100.0%
S03T_ BOULD	7	4	1	2514.05	73.6%
S03D_BARDS	2	2	1	1628.88	91.6%
S04T_HOPP	0	0	0	508.22	92.3%
S04T_TAPO	19	4	0	3768.47	100.0%
VRT_THACH	0	0	0	1734.67	98.0%
VRT_SANTO	0	0	0	1208.01	91.8%

	High Priority	#1: > 10	#2: > 4	#3: > 4
	Medium Priority	#1: 5-10	#2: 2-3	#3: 2-3
	Low Priority	#1: < 5	#2: < 2	#3: < 2

	1st tier prioritized drainages
	2nd tier prioritized drainages
	3rd tier prioritized drainages

Table 16. Monitoring Site Drainage Area Prioritizations-updated with 2008 data

Site ID	Category 1 Total # Constituent Exceedances	Category 2 # of Classes of Pollutants with Exceedances	Category 3 # of Effective TMDLs	Category 4a Total Ag Acres in Drainage Area	Category 4 % Ag Acres Enrolled in VCAILG
01T_ODD2_DCH	14	4	5	1700.85	95.7%
01T_ODD3_ARN	13	2	5	708.72	100.0%
02D_BROOM	20	3	5	5478.45	96.5%
04D_ETTG	23	3	5	3857.58	99.9%
04D_LAS	25	4	5	2350.57	88.4%
05D_SANT_VCWPD	29	4	6	1114.13	85.5%
05D_LAVD	5	2	6	1086.25	100.0%
05T_HONDO	9	4	6	3112.78	98.6%
06T_FC_BR	7	4	5	2396.27	99.8%
06T_LONG	0	0	5	2665.67	93.6%
9BD_GERRY	0	0	6	1066.76	97.9%
OXD_CENTR	17	3	0	1266.83	100.0%
S02T_ELLS	8	4	0	3909.81	99.6%
S02T_TODD	9	4	1	2111.55	99.5%
S03T_TIMB	5	5	1	1504.29	100.0%
S03T_ BOULD	7	4	1	2516.03	73.6%
S03D_BARDS	6	2	1	1769.98	92.2%
S04T_HOPP	2	1	0	508.22	92.3%
S04T_TAPO	18	3	0	2091.67	100.0%
VRT_THACH	1	1	0	1736.17	98.0%
VRT_SANTO	0	0	0	1165.73	95.1%

	High Priority	#1: > 10	#2: > 4	#3: > 4
	Medium Priority	#1: 5-10	#2: 2-3	#3: 2-3
	Low Priority	#1: < 5	#2: < 2	#3: < 2

	1st tier prioritized drainages
	2nd tier prioritized drainages
	3rd tier prioritized drainages

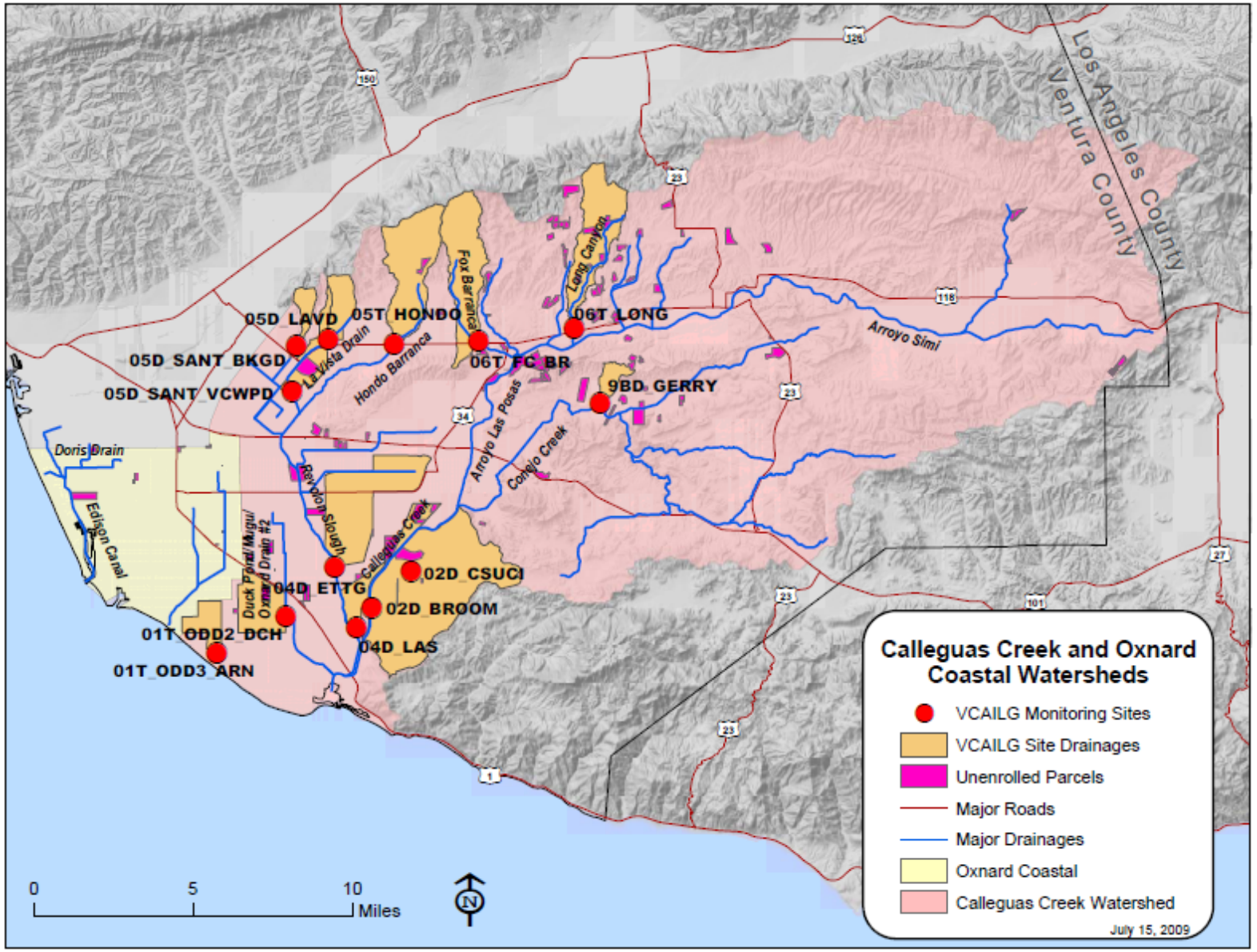


Figure 10. Calleguas Creek and Oxnard Coastal Watersheds Monitoring Site Drainages and Un-enrolled Parcels

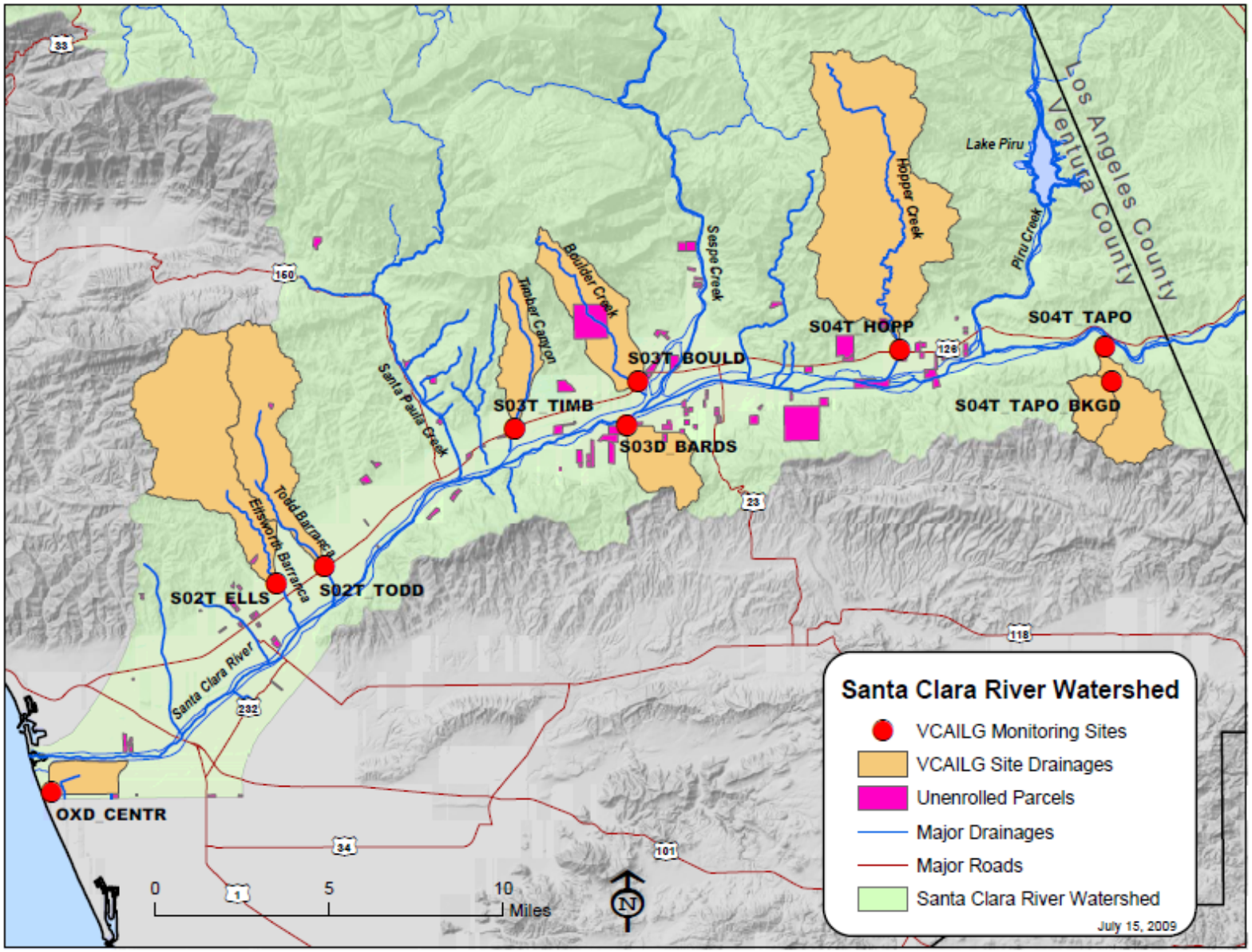


Figure 11. Santa Clara River Watershed Monitoring Site Drainages and Un-enrolled Parcels

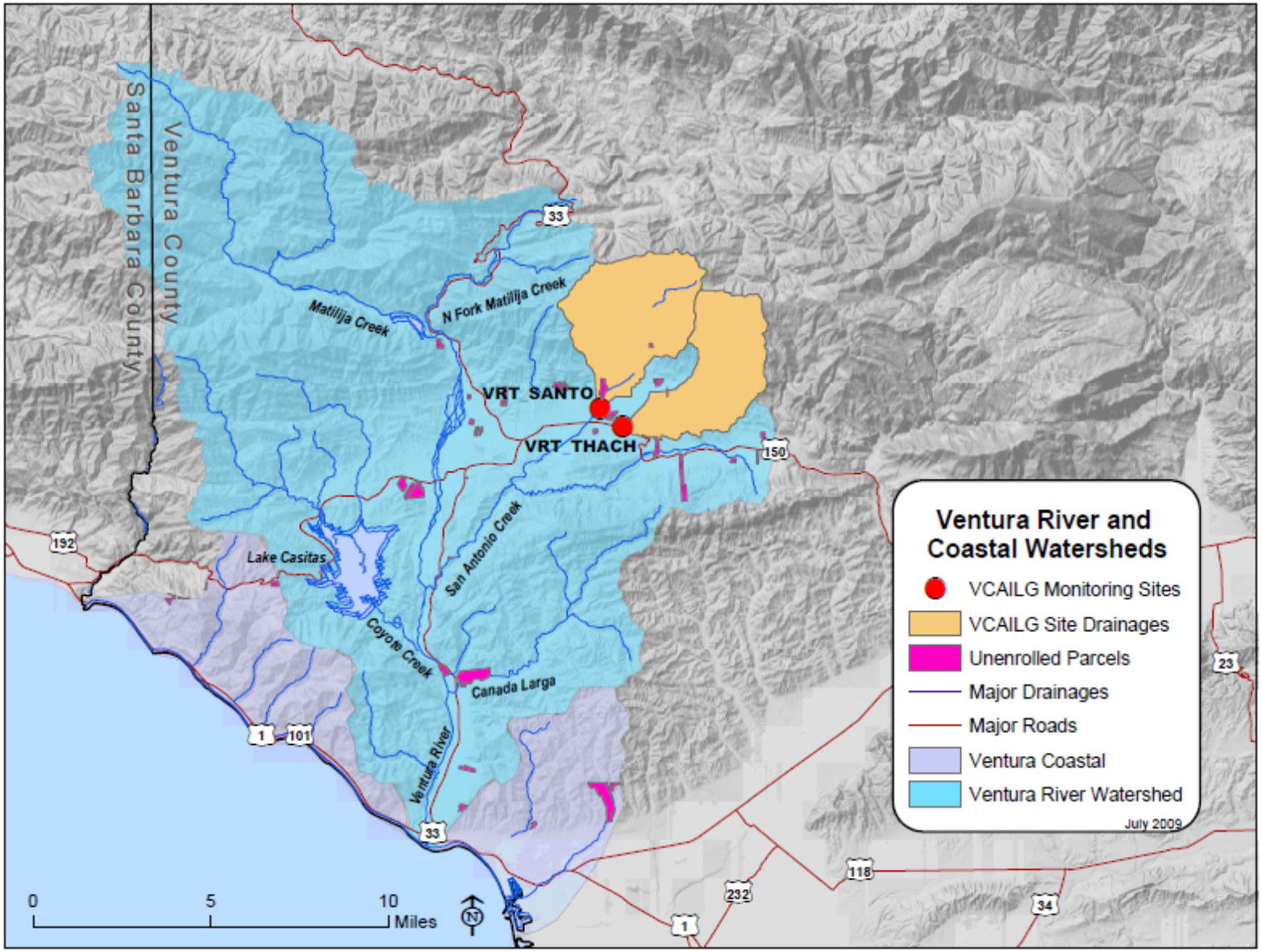


Figure 12. Ventura River Watershed Monitoring Site Drainages and Un-enrolled Parcels

First tier priority drainage areas were targeted for BMP implementation and management practice survey reporting during the past year according to the timeline and task list presented in the 2007 WQMP, which can also be found as Figure 8 in this version. The revised second tier priority drainage areas can be found Table 16 and are listed as follows:

- 01T_ODD2_DCH
- 01T_ODD3_ARN
- 02D_BROOM
- 04D_ETTG
- 04D_LAS
- S03T_BOULD

Landowners and growers within the second tier priority areas will be receiving outreach and BMP information beginning in August. Follow-up with those in the priority areas will take place as part of the 319h grant outreach. Additionally, VCAILG maintains contact with those submitting surveys to ensure completion and accuracy of submitted documents. Appendix C shows the drainage areas for each VCAILG monitoring site, which are also the priority area boundaries.

Growers that are not in priority areas will be notified of the need to implement management practices, provided with resources for selecting appropriate management measures, and may download and complete and Management Practice Survey for inclusion in the VCAILG grower database. However, they will not receive targeted outreach or BMP assistance during this Conditional Waiver.

Priority areas will continue to evolve (as shown in the flow chart) as future monitoring data becomes available; sites that are currently a priority may show significant water quality improvements and areas where there has previously been no runoff could have water quality impairments that will need to be addressed. Any changes to priority tier status of a monitoring site drainage will be noted in subsequent WQMPs, including the rational for the change, as was noted for tier 2 in this document.

The following two sections are evaluation steps of the WQMP process. The first section includes a compilation of pesticide use data as a first step in assessing trends in pesticide application and water quality data. An analysis of the Management Practice Survey results for the first tier priority areas can be found following the pesticide use evaluation.

2008 PESTICIDE USE EVALUATION

As stated in the Conditional Waiver, should pesticide concentrations exceed a benchmark, an assessment of pesticide usage in relation to amount and timing of applications must be completed. To fulfill this requirement, the following is an analysis of pesticide use records for 2007 and 2008 as compared with VCAILG monitoring data for the same years. The evaluation focuses on diazinon and chlorpyrifos since those are the only two presently permitted pesticides with water quality benchmarks. Site specific application data was obtained from the Ventura County Agricultural Commissioner's office for 2007 and 2008, whereas County-wide application totals were available only for 2007 from DPR. To evaluate the pesticide use records, first site application locations had to be linked to the appropriate monitoring site drainage area. Not all pesticide applications took place within a monitoring drainage area. Additional manipulation of the pesticide use data included converting the percent concentration of active

ingredient based on the product name to an amount of active ingredient applied during each application. Depending on the product formulation, the conversion was either into gallons or pounds of active chlorpyrifos or diazinon. In the following discussion, the pounds of pesticide refer to pounds of active ingredient applied. The dates and amounts of pesticides applied were then compared to any benchmark exceedances. Table 17 through Table 20 include the available pesticide application information for 2007 and 2008 that occurred within the VCAILG monitoring drainages as compared to the monitoring data.

Chlorpyrifos

For agricultural application, chlorpyrifos is the active ingredient in Lorsban. Use of chlorpyrifos is common on lemons in Ventura County. Based on the 2007 DPR Annual Pesticide Use Report for Ventura County, 18,610 pounds of chlorpyrifos were applied to 5,251 acres of lemons. These applications account for 68% of the chlorpyrifos used in Ventura County for the year. Strawberries are second to lemons in pounds of chlorpyrifos applied with 6,489 pounds spread over 6,702 acres. Other commodities, separately under 800 pounds of chlorpyrifos each, accounted for the remaining 2,143 pounds applied to agricultural crops throughout the County for the year.

In 2007 and 2008, chlorpyrifos was applied within 19 out of 21 VCAILG monitoring sites (not including background sites). S04T_HOPP and S04T_TAPO are the two sites that did not have any chlorpyrifos applications during either of the monitoring years. Of the 19 sites with chlorpyrifos applications, 11 had exceedances of the water quality benchmark during the 2007 monitoring year and 10 had exceedances in 2008. All exceedances in 2007 occurred during the December 19th storm event, except for the dry weather exceedances at 05D_LAVD. During 2008, four dry weather chlorpyrifos exceedances took place, though the majority were during wet weather as in the previous monitoring year. The following factors are likely to contribute to the likelihood chlorpyrifos is transported off-site: pesticide formulation and application method, date of application in relation to subsequent rain events, mobilization of sediment during rain events, and proximity to a drainage channel, stream, or tributary. Table 17 and Table 18 provide chlorpyrifos application details within the VCAILG monitoring site drainage areas and exceedances of the 0.025 µg/L benchmark that occurred during 2007 and 2008.

Table 17. Chlorpyrifos Applications and Exceedances by Monitoring Site for 2007

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs.)	Total Amount of Active Ingredient Applied per Site in 2007 (gal)	Total Amount of Active Ingredient Applied per Site in 2007 (lbs)	2007 Date Benchmark Exceeded	Dry or Wet Event ?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
	1/6/2007	Broccoli		41.43			12/19/2007	Wet	2.146	
01T_ODD2_DCH	11/19/2007	Strawberry	7.97		12.46	41.43				1,564
	12/13/2007	Strawberry	4.49							
01T_ODD3_ARN	7/5/2007	Cabbage		2.50	0.00	2.50	none		N/A	800
	3/26/2007	Lemon	85.88				none		N/A	
	4/17/2007	Cabbage		21.38						
02D_BROOM	8/24/2007	Lemon	22.49		141.15	21.38				8,236
	10/12/2007	Lemon	32.78							
	1/10/2007	Broccoli		89.25			12/19/2007	Wet	1.38	
	1/11/2007	Broccoli	7.70							
	1/17/2007	Broccoli/Cabbage		88.87						
	1/22/2007	Broccoli	1.01							
	6/7/2007	Cabbage		29.93						
04D_ETTG	6/28/2007	Cabbage		35.25	32.62	368.92				3,779
	7/20/2007	Cabbage		114.00						
	8/7/2007	Cabbage		11.63						
	8/11/2007	Strawberry	3.03							
	11/5/2007	Strawberry	18.07							
	11/21/2007	Strawberry	2.81							
	8/17/2007	Strawberry	2.81				12/19/2007	Wet	0.033	
04D_LAS	8/17/2007	Strawberry	10.96		13.77	30.92				1,339
	10/3/2007	Cabbage		30.92						

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs.)	Total Amount of Active Ingredient Applied per Site in 2007 (gal)	Total Amount of Active Ingredient Applied per Site in 2007 (lbs)	2007 Date Benchmark Exceeded	Dry or Wet Event ?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
05D_LAVD[1]	4/25/2007	Lemon	2.25		22.65	0.00	6/5/2007	Dry	0.1094	877
	9/5/2007	Lemon	14.86				6/5/2007	Dry	0.0775	
	11/2/2007	Strawberry	3.30							
	11/19/2007	Strawberry	2.25							
05D_SANT_ VCWPD	5/2/2007	Lemon	19.03		48.66	6.39	12/19/2007	Wet	0.292	1,154
	6/11/2007	Kale/Collard		6.39						
	11/9/2007	Lemon	23.46							
	11/10/2007	Strawberry	4.27							
	11/20/2007	Strawberry	1.91							
05T_HONDO	11/10/2007	Lemon	25.93		91.33	0.00	12/19/2007	Wet	0.192	3,267
	8/29/2007	Lemon	7.61							
	8/31/2007	Lemon	3.82							
	11/30/2007	Lemon	13.47							
	8/29/2007	Lemon	40.50							
06T_FC_BR	9/10/2007	Lemon	45.68		105.61	0.00	12/19/2007	Wet	0.054	3,121
	9/24/2007	Lemon	18.32							
	9/28/2007	Lemon	9.52							
	10/19/2007	Lemon	14.79							
	10/19/2007	Tangerine	5.97							
	11/2/2007	Orange	1.23							
	11/9/2007	Lemon	10.10							

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)[2]	Total Amount of Active Ingredient Applied per Site in 2007 (gal)	2007 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
06T_LONG	5/17/2007	Lemon	5.06	76.33	none		N/A	2,935
	7/17/2007	Orange	0.08					
	10/5/2007	Lemon	0.39					
	10/10/2007	Lemon	4.21					
	10/26/2007	Lemon	44.14					
	11/18/2007	Lemon	2.25					
	12/13/2007	Lemon	20.21					
9BD_GERRY	10/31/2007	Lemon	7.39	43.31	none		N/A	447
	11/29/2007	Lemon	35.92					
OXD_CENTR	7/28/2007	Strawberry	50.40	50.40	12/19/2007	Wet	1.452	1,243
S02T_ELLS	8/28/2007	Lemon	4.49	22.45	12/19/2007	Wet	0.038	9,015
	10/5/2007	Lemon	17.96					
S02T_TODD	8/9/2007	Lemon	4.71	25.48	12/19/2007	Wet	0.16	5,748
	10/1/2007	Lemon	20.77					
S03D_BARDS	4/4/2007	Orange	0.88	30.16	12/19/2007	Wet	0.322	2,214
	4/9/2007	Orange	0.01					
	4/16/2007	Orange	2.92					
	10/31/2007	Tangerine/Lemon	26.35					
S03T_BOULD	10/4/2007	Lemon	9.77	9.77	none		N/A	3,764
S03T_TIMB	10/4/2007	Lemon	7.37	7.37	none		N/A	2,183
VRT_SANTO	10/30/2007	Lemon	2.69	2.69	none		N/A	7,220
VRT_THACH	10/29/2007	Lemon	12.12	12.12	none		N/A	6,003

[1] There are two exceedance concentrations for LAVD on 6/5/07 because the site was sampled twice in the same day.
[2] Site listed on this page did not have any chlorpyrifos applications weighted in pounds.

Table 18. Chlorpyrifos Applications and Exceedances by Monitoring Site for 2008

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2008 (gal)	Total Amount of Active Ingredient Applied per Site in 2008 (lbs)	2008 Date Benchmark Exceeded	Dry or Wet Event ?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
01T_ODD2_DCH	3/19/2008	Cabbage		89.78	7.97	179.04	1/5/2008	Wet	1.2828	1,564
	5/14/2008	Cabbage		10.13			1/24/2008	Wet	0.9837	
	9/16/2008	Broccoli		79.14						
	11/22/2008	Strawberry	7.97							
01T_ODD3_ARN	2/17/2008	Broccoli		75.81		75.81	none		N/A	800
02D_BROOM	6/25/2008	Lemon	100.58		102.48	1.50	none		N/A	8,236
	7/24/2008	Cabbage		1.50						
	11/1/2008	Strawberry	1.91							
04D_ETTG	1/7/2008	Broccoli		34.91	41.31	295.90	1/5/2008	Wet	0.5481	3,779
	1/15/2008	Broccoli		69.00			1/24/2008	Wet	0.8757	
	2/6/2008	Broccoli		9.98			9/16/2008	Dry	0.0561	
	2/27/2008	Broccoli		21.28						
	6/24/2008	Cabbage		99.00						
	7/2/2008	Cabbage		7.98						
	7/9/2008	Cabbage		14.25						
	8/22/2008	Cabbage		24.00						
	8/24/2008	Strawberry	2.25							
	9/2/2008	Kale		1.38						
	9/17/2008	Lemon	16.16							
	10/2/2008	Cabbage		14.12						
	10/10/2008	Lemon	17.96							
	11/11/2008	Strawberry	0.22							
	11/19/2008	Strawberry	4.71							

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2008 (gal)	Total Amount of Active Ingredient Applied per Site in 2008 (lbs)	2008 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
	4/11/2008	Onion		49.88			1/5/2008	Wet	0.0654	
04D_LAS	10/8/2008	Cabbage		3.00	0.00	88.88	1/24/2008	Wet	0.0586	1,339
	11/10/2008	Cabbage		36.00			9/16/2008	Dry	0.1307	
	9/12/2008	Lemon	91.06				1/24/2008	Wet	0.3984	
	10/30/2008	Lemon	38.17							
05D_LAVD	11/17/2008	Strawberry	0.70		398.73	0.00				877
	11/25/2008	Lemon	268.80							
	4/26/2008	Cabbage		13.50			1/5/2008	Wet	0.2254	
	9/2/2008	Lemon	28.29				1/24/2008	Wet	0.2442	
	9/24/2008	Lemon	302.40				9/16/2008	Dry	0.2695	
05D_SANT_VCWPD	11/20/2008	Strawberry	1.12		405.15	13.50				1,154
	11/20/2008	Strawberry	4.94							
	11/24/2008	Strawberry	1.21							
	11/25/2008	Lemon	67.20							
	7/21/2008	Lemon	3.04				1/24/2008	Wet	0.2482	
	8/28/2008	Lemon	46.47							
	9/2/2008	Lemon	30.53							
	9/4/2008	Lemon	3.82							
05T_HONDO	10/1/2008	Lemon	25.54		469.51	0.00				3,267
	10/6/2008	Lemon	344.16							
	10/6/2008	Lemon	12.60							
	11/22/2008	Lemon	3.36							

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2008 (gal)	Total Amount of Active Ingredient Applied per Site in 2008 (lbs)	2008 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
	7/23/2008	Lemon	2.69				none		N/A	
	8/11/2008	Lemon	0.76							
	8/27/2008	Lemon	18.51							
	8/29/2008	Lemon	3.23							
06T_FC_BR	9/29/2008	Orange	0.45		70.86	0.00				3,121
	10/31/2008	Lemon	15.15							
	11/12/2008	Lemon	26.94							
	11/19/2008	Lemon	0.60							
	11/19/2008	Lemon	2.53							
	6/24/2008	Lemon	2.81				none		N/A	
	8/5/2008	Lemon	47.77							
	9/17/2008	Lemon	50.29							
	9/18/2008	Lemon	2.92							
	9/30/2008	Lemon	28.35							
	10/8/2008	Lemon	37.80							
06T_LONG	10/10/2008	Lemon	123.48		582.53	0.00				2,935
	10/25/2008	Lemon	4.20							
	10/28/2008	Lemon	245.70							
	11/8/2008	Lemon	17.60							
	11/12/2008	Lemon	10.51							
	11/30/2008	Lemon	11.11							

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2008 (gal)	Total Amount of Active Ingredient Applied per Site in 2008 (lbs)	2008 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
9BD_GERRY	7/18/2008	Lemon	23.12		89.35	0.00	none		N/A	447
	9/12/2008	Lemon	35.92							
	10/11/2008	Lemon	30.24							
	11/2/2008	Lemon	0.07							
OXD_CENTR	7/8/2008	Cabbage		252.00	157.15	252.00	1/5/2008	Wet	0.6766	1,243
	8/9/2008	Strawberry	157.15				1/25/2008	Wet	4.9679	
S02T_ELLS	4/28/2008	Cabbage	1.57		279.83	0.00	9/16/2008	Dry	0.225	9,015
	8/28/2008	Lemon	64.26							
	9/3/2008	Lemon	52.92							
	9/15/2008	Lemon	12.60							
	9/15/2008	Lemon	67.20							
	10/28/2008	Lemon	22.30							
	10/31/2008	Lemon	58.98							
S02T_TODD	4/28/2008	Cabbage	1.57		102.52	0.00	none		N/A	5,748
	8/11/2008	Lemon	23.94							
	9/4/2008	Lemon	12.52							
	10/11/2008	Lemon	31.88							
	10/26/2008	Lemon	32.61							
S03D_BARDS	10/27/2008	Orange	0.56		1.68	0.00	1/24/2008	Wet	2.6776	2,214
	11/6/2008	Orange	1.12							

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2008 (gal)	Total Amount of Active Ingredient Applied per Site in 2008 (lbs)	2008 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
S03T_BOULD	9/10/2008	Lemon	147.51		290.35	0.00	none		N/A	3,764
	9/30/2008	Lemon	111.53							
	10/14/2008	Lemon	0.34							
	11/10/2008	Lemon	30.98							
S03T_TIMB	8/27/2008	Lemon	152.66		189.62	0.00	1/5/2008	Wet	0.1123	2,183
	10/21/2008	Lemon	36.96							
VRT_SANTO	2/8/2008	Orange		1.50	15.12	4.50	none		N/A	7,220
	2/27/2008	Orange		3.00						
	11/8/2008	Lemon	15.12							
VRT_THACH	2/7/2008	Orange		0.75	45.36	7.35	none		N/A	6,003
	2/11/2008	Orange		0.30						
	6/2/2008	Orange		4.50						
	9/19/2008	Orange		1.80						
	11/7/2008	Lemon	45.36							

Diazinon

Diazinon usage by weight was much less than chlorpyrifos in 2007, with 3,183 pounds applied as compared to 27,242 pounds of chlorpyrifos.[1] The commodity receiving the most diazinon was raspberries with 1,780 pounds applied to 676 acres. Applications of diazinon occurred within 9 VCAILG monitoring site drainage areas in 2007 and only 7 drainages in 2008. There was one exceedance of the 0.10 µg/L benchmark during the December 19, 2007 storm event. Two diazinon exceedances occurred during 2008, one during the January 24th storm event and the second during the dry season on May 20th. In 2007 most applications of diazinon were completed in the early months of the year, January through March, with a few applications in early summer. Diazinon applications during 2008, were during the dry months of April through September. As compared to chlorpyrifos, most of the 2007 applications of diazinon were small, with less than 10 gallons of active ingredient broadcast. In 2008 there was a wider range of application amounts (0.30 to 57.60 gallons of active ingredient). Table 19 and Table 20 include diazinon application information for the VCAILG monitoring site drainages and the water quality benchmark exceedances.

[1] California Department of Pesticide Regulation. "2007 Annual Pesticide Use Report Indexed by Chemical, Ventura County."

Table 19. Diazinon Applications and Exceedances by Monitoring Site for 2007

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2007 (gal)	Total Amount of Active Ingredient Applied per Site in 2007 (lbs)	2007 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
01T_ODD2_DCH	3/19/2007	Lettuce Head	0	84	0	84	none		N/A	1,564
02D_BROOM	2/21/2007	Raspberry	2.28	0	46.79	34	none		N/A	8,236
	2/21/2007	Raspberry	11.32	0						
	3/5/2007	Cabbage	3.24	0						
	3/20/2007	Beet/Bok Choy	6.85	4						
	4/4/2007	Cabbage/Bok Choy/Soil Fumigation Prep	23.1	0						
	7/10/2007	Corn, Human Consumption	0	30						
04D_ETTG	5/4/2007	Cabbage	0.48	0.5	1.01	0.5	none		N/A	3,779
	9/7/2007	Mustard	0.53	0						
04D_LAS	1/11/2007	Cabbage	0.84	0	0.99	0	none		N/A	1,339
	5/11/2007	Cabbage	0.15	0						
05D_SANT_VCWPD	7/3/2007	Collard	0.955	0	0.955	0	none		N/A	1,154
05T_HONDO	6/5/2007	Nursery-Outdoor Plant	0.228	0	0.228	0	12/19/2007	Wet	0.125	3,267
06T_LONG	3/20/2007	Raspberry	2.04	0	2.04	0	none		N/A	2,935
OXD_CENTR	7/29/2007	Nursery-Outdoor Flower	0	1	0	1	none		N/A	1,243
S03D_BARDS	3/6/2007	Radish/Beet	0.375	0	0.375	0	none		N/A	2,214

Table 20. Diazinon Applications and Exceedances by Monitoring Site for 2008

Site	Date	Commodity	Amount of Active Ingredient Applied (gal)	Amount of Active Ingredient Applied (lbs)	Total Amount of Active Ingredient Applied per Site in 2008 (gal)	Total Amount of Active Ingredient Applied per Site in 2008 (lbs)	2008 Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Date Concentration (ug/L)	Total Drainage Area (ac.)
02D_BROOM	7/8/2008	Corn	NA	16.50	NA	30.50	none		N/A	8,236
	4/10/2008	Cabbage	NA	14.00						
04D_ETTG	7/12/2008	Tomato	57.60	NA	64.32	NA	none		N/A	3,779
	4/22/2008	Tomato	6.72	NA						
04D_LAS	4/10/2008	Cabbage	NA	10.50	NA	10.50	5/20/2008	Dry	0.1933	1,339
05D_SANT_VCWPD	9/24/2008	Collard	2.88	NA	2.88	NA	none		N/A	1,154
05T_HONDO	8/21/2008	Raspberry	0.73	NA	0.73	NA	none		N/A	3,267
S03T_TIMB	5/24/2008	Parsley	0.30	NA	0.30	NA	none		N/A	2,183
S03D_BARDS	5/1/2008	Parsley	0.42	NA	0.42	NA	1/24/2008	Wet	0.1231	2,214

Pesticide Use Summary

Within the VCAILG monitoring drainages, chlorpyrifos and diazinon are applied at opposite times of the year. Application timing, but also amount, may sufficiently explain the discrepancy between these two pesticides in terms of rate of exceedance. Chlorpyrifos, while being applied at greater volumes, is typically used in the fall and winter when there is greater potential for pesticide transport offsite as stormwater runoff. Diazinon is applied during the spring and summer, which minimizes the likelihood of transport to drainage channels, or adjacent streams. It is also applied in smaller volumes. There are additional differences in soil sorption and half-life. Chlorpyrifos attaches more strongly to sediment surfaces and is not readily soluble in water. It's half-life in soil is between 60 and 120 days[2]. The half-life of diazinon in soil ranges from 2 to 4 weeks[3]. Evaluation of diazinon and chlorpyrifos reports for subsequent years will provide insight into the continued usage or replacement of these pesticides with other alternatives. A synthesis of the information from pesticide use reports and BMP surveys can be found in the section following the BMP Survey Evaluation.

BMP SURVEY EVALUATION

Background

As part of the VCAILG 2007 WQMP, a Survey of Management Practices was developed for distribution to VCAILG enrollees. The survey was modified and submitted in the December 15, 2008 revised version of the 2007 WQMP. It was then approved by the Regional Board Executive officer February, 3, 2009. Once approved, the finalized survey and drainage specific exceedance information (Appendix E, 2007) were mailed to all landowners and growers within the first tier priority drainage on March 6, 2009 (Figure 9). Completed surveys were provided by the first tier landowners and growers between March and June 2009.

The VCAILG Survey of Management Practices was designed, in part, to gather information about the extent of use of 100 BMPs, each of which was assigned to one of the following management practices categories[4]:

- Sediment and Erosion Management
- Irrigation Management
- Pest Management
- Nutrient Management
- Salinity Management and Leaching
- Property Management

[2] EXTOXNET. "Chlorpyrifos." June 1996. < http://extoxnet.orst.edu/pips/chlorpyr.htm>

[3] EXTOXNET. "Diazinon." June 1996. < http://extoxnet.orst.edu/pips/diazinon.htm>

[4] The list of BMPs, and the contaminants potentially mitigated by each BMP, is provided in Appendix D as approved in the 2007 WQMP, revised December 15, 2008.

As part of the survey, respondents were asked to assign one of the following five descriptors (scores) to each of the BMPs:

- Yes, used prior to Jan. 2008
- Yes, new since Jan. 2008
- Planned for Future
- No, not currently used
- Not Applicable

The design of the survey resulted in associations between Ventura County Assessor's Parcel Numbers (APNs) and the scores for each of the 100 BMPs.

As previously described, the areas draining to the following five monitoring sites were designated as first tier priority drainages:

1. 05D_SANT_VCWPD
2. 05D_LAVD
3. OXD_CENTR
4. S02T_TODD
5. S04T_TAPO

First tier priority drainage survey responses are evaluated below.

Level of Response

As of August 2008, 40 surveys had been returned which described management practices on the irrigated land within 92 parcels. The geographic distribution of the surveyed parcels is presented in Table 21.

Table 21. Geographic Distribution of Irrigated Parcels for Which Surveys Were Returned

VCAILG Monitoring Site Associated with Irrigated Parcel	Number of Parcels Surveyed
05D_LAVD	7
05D_SANT_BKGD	1
05D_SANT_VCWPD	7
OXD_CENTR	19
S02T_ELLS	8
S02_TODD	17
S03D_BARDS	1
S04T_TAPO	4
S04T_TAPO_BKGD	1
Outside a VCAILG monitoring site drainage	27

Detail about the response rate (pegged to acreage, not grower) for the surveys from the priority drainages is provided in Table 22.

Table 22. Details about the Surveyed Acreage in the Priority Drainages

Priority Drainage	Irrigated Acres for Which Surveys Were Received	Irrigated Acres in Drainage Area Enrolled in VCAILG	Percent of Enrolled Acres for which Surveys were Received	Total Assessed Agricultural Parcel Acres in Drainage Area
S02T_TODD	1231.12	1345.03	92%	2111.55
S04T_TAPO	751.76	751.76	100%	2091.67
OXD_CENTR	946.07	945.57	100%	1266.83
05D_SANT_VCWPD	478	798	60%	1114.13
05D_LAVD	546.4	738.7	74%	1086.25

Evaluation of Survey Results

BMPs were evaluated separately for specific constituents of concern. In order to focus the analysis, BMPs were evaluated only for constituents that produced water quality benchmark exceedances during VCAILG monitoring in both 2007 and 2008. Table 23 shows the combinations of drainages and constituents that resulted from this prioritization. Exceedances in dissolved oxygen, pH, temperature, and chronic toxicity benchmarks were not evaluated using survey results, since these are not specific pollutants targeted by implementing survey management practices; though some management practices may have a positive impact in addressing these exceedances.

Table 23. Cases for which Survey Results were Evaluated

Priority Drainage	Salts	Nitrogen	OC Pesticides	OP Pesticides
S02T_TODD	X	X		
S04T_TAPO	X	X	X	
OXD_CENTR		X	X	X
05D_SANT_VCWPD	X	X	X	X
05D_LAVD			X	X

Survey results were entered into an Access database. For the analyses contained herein, the database was queried on the basis of drainage area and APN. In the majority of cases, a single set of management practices (scores for the 100 BMPs) applied to an entire parcel. In these cases, the irrigated acreage assigned to a set of BMP scores was that reported for the parcel during the original VCAILG enrollment process. In a few cases where more than one survey was returned that applied to a single parcel (e.g., when an owner and a tenant reported management practices for subsets of the same parcel), the irrigated acreage within the parcel was

subdivided after consultation with owners and tenants, and assigned to the pertinent sets of BMP scores.

The BMP scores and associated parcel acreage were used to derive the following parameters for each BMP, for each priority drainage:

A_{Unused}	Surveyed acres in the priority drainage applicable to a BMP that are currently not managed using the BMP
A_{2007}	Surveyed acres in the priority drainage already managed using a BMP prior to Jan. 2008
A_{2008}	Surveyed acres in the priority drainage managed using a BMP only after Jan. 2008
A_{Future}	Surveyed acres in the priority drainage planned for future management using a BMP
A_{Total}	Surveyed acres in the priority drainage in which the BMP is potentially applicable: $(A_{Unused} + A_{2007} + A_{2008} + A_{Future})$

Next, these parameters were used to calculate two types of percentages (P) for each BMP:

1. Percent of total applicable acres in the drainage on which a BMP was employed *by the time of the Survey*:

   $$P_{current} = (A_{2007} + A_{2008})/A_{Total}$$

2. Percent of applicable acres unmanaged prior to Jan. 2008 that *became* managed after Jan. 2008 using the BMP:

   $$P_{new} = A_{2008} /(A_{Total} - A_{2007})$$

The first parameter ($P_{current}$) serves as an index of the current prevalence of BMP use, regardless of when the BMP was instituted by the grower. The second parameter (P_{new}) serves as an indicator of improvement in BMP use during 2008. Values for $P_{current}$ and P_{new} for each BMP, stratified by constituent and drainage area, are presented in Appendix E.

In order to simplify results, $P_{current}$ and P_{new} were averaged for the BMPs within management categories to provide single percentages for each priority drainage and management category. These results are provided in Table 24 and Table 25.

In order to identify which individual BMPs are under-used that apply to specific constituents, $P_{current}$ for BMPs were averaged across the priority drainages applicable to each of the four constituents of concern (salts, nutrients, OC pesticides, and OP pesticides). This procedure resulted in a new parameter, *mean* $P_{current}$, for each combination of BMP and constituent. BMPs for each constituent were then ranked according to *mean* $P_{current}$. In Table 26 cases are presented for which *mean* $P_{current}$ was less than 50% -- in other words, cases in which a BMP is currently being utilized, on average, on less than 50% of the applicable acreage in the priority drainages.

Table 24. Percent of Surveyed Acres Employing BMPs by the Time of the Survey (averaged within BMP categories)

Targeted Constituent	Category of BMPs	Number of Applicable BMPs	Priority Drainage				
			05D_SANT_VCWPD	S02T_TODD	OXD_CENTR	S04T_TAPO	05D_LAVD
Nitrogen	Sediment and Erosion	12	44%	69%	74%	66%	
	Irrigation	23	86%	92%	85%	86%	
	Nutrient	13	78%	93%	94%	85%	
	Salinity/Leaching	2	76%	42%	97%	68%	
	Property Management	5	84%	96%	98%	100%	
Salts	Sediment and Erosion	12	44%	69%		66%	
	Irrigation	23	88%	95%		100%	
	Pest Management	1	88%	95%		100%	
	Nutrient	13	78%	93%		85%	
	Salinity/Leaching	4	55%	71%		84%	
	Property Management	5	84%	96%		100%	
OC Pesticides	Sediment and Erosion	19	57%		73%	58%	74%
	Irrigation	22	81%		84%	85%	85%
	Property Management	4	88%		100%	100%	95%
OP Pesticides	Sediment and Erosion	19	57%		73%		74%
	Irrigation	22	81%		84%		85%
	Pest Management	28	88%		95%		90%
	Property Management	5	84%		96%		93%

Table 25. Percent of Surveyed Acres with New BMPS, Implemented After Jan. 2008 (averaged within BMP categories for targeted constituents)

Targeted Constituent	Category of BMPs	Number of Applicable BMPs	Priority Drainage				
			05D_SANT_VCWPD	S02T_TODD	OXD_CENTR	S04T_TAPO	05D_LAVD
Nitrogen	Sediment and Erosion	12	2%	17%	24%	0%	
	Irrigation	23	39%	45%	11%	0%	
	Nutrient	13	39%	13%	46%	0%	
	Salinity/Leaching	2	34%	5%	0%	0%	
	Property Management	5	0%	75%	78%	NA	
Salts	Sediment and Erosion	12	2%	17%		0%	
	Irrigation	23	39%	45%		0%	
	Pest Management	1	0%	0%		NA	
	Nutrient	13	39%	13%		0%	
	Salinity/Leaching	4	17%	5%		0%	
	Property Management	5	0%	75%		NA	
OC Pesticides	Sediment and Erosion	19	0%		16%	0%	53%
	Irrigation	22	31%		11%	0%	64%
	Property Management	4	0%		100%	NA	84%
OP Pesticides	Sediment and Erosion	19	0%		16%		53%
	Irrigation	22	31%		11%		64%
	Pest Management	28	6%		60%		81%
	Property Management	5	0%		73%		77%

Table 26. Best Management Practices (BMPs) Used on Less Than 50% of the Surveyed Acreage, when Results for All Priority Drainages are Averaged

Constituent	BMP Code from Survey	BMP Description	Mean Percent Use
Nitrogen	17	Stormwater runoff is captured or kept on the property.	2%
	16	Irrigation runoff is captured or kept on the property.	11%
	35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	24%
	18	Sediment traps are used at the end of the field to retain sediments in runoff.	27%
	34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	36%
	19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	37%
	21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	46%
OC Pesticides	17	Stormwater runoff is captured or kept on the property.	2%
	16	Irrigation runoff is captured or kept on the property.	4%
	35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	11%
	1	Consult with local agencies (NRCS, RCD, UCCE, or county planning) to develop a soil conservation plan.	21%
	18	Sediment traps are used at the end of the field to retain sediments in runoff.	23%
	19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	24%
	21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	29%
	2	Know your soil series and its erosion hazard rating.	48%

Constituent	BMP Code from Survey	BMP Description	Mean Percent Use
OP Pesticides	17	Stormwater runoff is captured or kept on the property.	2%
	16	Irrigation runoff is captured or kept on the property.	3%
	35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	11%
	1	Consult with local agencies (NRCS, RCD, UCCE, or county planning) to develop a soil conservation plan.	28%
	18	Sediment traps are used at the end of the field to retain sediments in runoff.	29%
	19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	32%
	55	Personnel are familiar with the UC online databases for comparing the risks of different pesticides moving with water and sediment and affecting non-target organisms (WaterTox or Pesticide Wise).	37%
	21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	39%
	45	Use UC IPM guidelines as a resource (www.ipm.ucdavis.edu).	44%
Salts	17	Stormwater runoff is captured or kept on the property.	0%
	16	Irrigation runoff is captured or kept on the property.	12%
	18	Sediment traps are used at the end of the field to retain sediments in runoff.	23%
	19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	24%
	35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	32%
	21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	34%
	74	Chemical properties of the soil, including pH and electrical conductivity (EC), are routinely measured.	39%
	34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	41%

Of the five-first tier priority drainages, 05D_LAVD showed significant improvements between the two monitoring years within the constituent categories of salts and nitrogen. There were no exceedances in either salts or nitrogen in 2008 and therefore an additional analysis of BMP implementation within these two constituent categories is provided. Fifty-five of the 100-surveyed management practices may address nitrogen exceedances. Those same management practices with the addition of three more apply to salts (BMP codes from survey: 71, 88, and 89). The following table lists all the surveyed management practices that address nitrogen and salts, with the additional three practices specific to salts constituents. Percentages are provided regarding implementation of each practice within the 05D_LAVD drainage area. Within the newly implemented since January 2008 category, management practices which were recently utilized on greater than 25% of the acreage in the 05D_LAVD drainage area are highlighted in yellow. Five management practices fall into this category, they include:

- The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.
- Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.
- Most recent nutrient recommendations for your particular crops and growing practices are used.
- Soil fertility is routinely monitored through measurements of nitrogen, phosphorus, potassium, and micronutrients.
- Fertilization rates are adjusted based on the results of soil fertility measurements.

The newly implemented BMPs bring the total coverage of these practices up to 100% utilization for all except the first practice listed above. Twenty-four, which is almost half of the 58 potential salts or 55 potential nitrogen management practices, have 100% use within the surveyed acreage. There are also many BMPs noted as being newly implemented within an area of 18% or greater of the 546.4 surveyed-irrigated acres.

Table 27. Salts and Nitrogen BMP Implementation within the 05D_LAVD Drainage Area

BMP Code from Survey	BMP Description	Overall Percent Use	Percent Use New Since Jan. 2008
5	Riparian areas or other areas of natural vegetation were retained or expanded during site development.	65.6%	18.3%
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.	100.0%	18.3%
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.	100.0%	18.3%
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.	65.6%	18.3%
11	Berms, culverts, or flow channels are in place to divert water away from roads.	100.0%	18.3%
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.	55.9%	18.3%
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.	81.7%	0.0%
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.	100.0%	18.3%
16	Irrigation runoff is captured or kept on the property.	0.0%	0.0%
17	Stormwater runoff is captured or kept on the property.	0.0%	0.0%
18	Sediment traps are used at the end of the field to retain sediments in runoff.	13.7%	4.0%
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	19.3%	0.0%
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.	100.0%	18.3%
21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	32.0%	18.3%
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab or other appropriate irrigation professionals.	100.0%	18.3%
23	When drip irrigation is used, the distribution uniformity is 90% or better.	81.7%	0.0%
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.	100.0%	18.3%
25	Filters are inspected and cleaned regularly.	100.0%	18.3%
26	Lines are flushed or cleaned chemically to prevent clogging.	66.4%	0.0%

BMP Code from Survey	BMP Description	Overall Percent Use	Percent Use New Since Jan. 2008
27	Pressure regulators or pressure compensating emitters are used.	100.0%	18.3%
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.	84.7%	18.3%
29	Consistent riser heights are used.	66.4%	4.0%
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.	56.7%	0.0%
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.	38.4%	0.0%
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.	66.4%	18.3%
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.	65.6%	27.1%
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	66.4%	8.8%
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	32.0%	8.8%
36	If irrigation must be based on a set schedule due to water availability, the amount of irrigation is varied according to the weather and plant growth stage.	47.3%	0.0%
37	Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.	100.0%	52.7%
38	Irrigation is halted if significant runoff occurs.	90.5%	18.3%
39	Harvested or unplanted areas are not irrigated.	66.4%	18.3%
40	Irrigation water quality is tested for parameters of interest including: pH, electrical conductivity (EC), sodium (Na), chloride (Cl), bicarbonate (HCO3), and boron (B).	100.0%	18.3%
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).	65.6%	18.3%
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.	100.0%	18.3%
71	Copper sulfate is not applied prior to extensive irrigation or expected rainfall.	53.7%	0.0%
73	Most recent nutrient recommendations for your particular crops and growing practices are used.	100.0%	27.1%

BMP Code from Survey	BMP Description	Overall Percent Use	Percent Use New Since Jan. 2008
74	Chemical properties of the soil, including pH and electrical conductivity (EC), are routinely measured.	65.6%	18.3%
75	Soil fertility is routinely monitored through measurements of nitrogen, phosphorus, potassium, and micronutrients.	100.0%	27.1%
76	Fertilization rates are adjusted based on the results of soil fertility measurements.	100.0%	27.1%
77	Crop plants are visually assessed for signs of nutrient deficiency or toxicity.	100.0%	18.3%
78	Leaf or petiole analyses are used as a guide for fertilizer application.	100.0%	18.3%
79	Fertilizer applications are split into multiple smaller applications rather than applying all that is required for a crop in one large application.	100.0%	18.3%
80	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.	66.4%	18.3%
81	Fertilizer applications are timed to maximize plant uptake, taking into consideration the life stage of the crop, potential rain events, and irrigation timing.	100.0%	18.3%
82	Slow-release fertilizers are used.	37.6%	0.0%
83	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.	100.0%	18.3%
84	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.	100.0%	18.3%
85	Mixing and loading of fertilizers occurs in a covered area on an impermeable surface and more than 100 feet down slope from any wells.	55.9%	18.3%
86	Leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).	66.3%	18.3%
87	Leaching is done only when fertilizer injectors are turned off.	48.0%	0.0%
88	Fertilizers and amendments with a low salt index are used.	100.0%	18.3%
89	Saline or high selenium wells are decommissioned and other sources of water are used.	4.0%	0.0%
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry educational meetings concerning management practices that protect water resources.	81.7%	18.3%
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.	100.0%	18.3%

BMP Code from Survey	BMP Description	Overall Percent Use	Percent Use New Since Jan. 2008
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.	100.0%	18.3%
93	Training is provided in the employees' native language.	91.2%	18.3%
95	Spill cleanup materials are readily accessible and maintained for all potential types and sizes of spills.	81.7%	18.3%

Survey Conclusions

The surveys that were received reflect management practices on large percentages (90-100%) of the enrolled acreage in three of the five priority drainages (S02T_TODD, S04T_TAPO, OXD_CENTR; see Table 22). Survey coverage was lower in the 05D_SANT_VCWPD drainage (60%) and the 05D_LAVD drainage (74%). Because all four of the priority constituents (salts, nutrients, OC pesticides, OP pesticides) are of concern in 05D_SANT_VCWPD, this drainage area is a priority for further survey work.

Inspection of the results in Table 25 reveals that growers in the S04T_TAPO drainage employed no new BMPs on irrigated acreage since Jan. 2008. Respondents in the OXD_CENTR and 05D_LAVD drainages report recently increased use of BMPs in almost all of the management categories pertinent to the constituents of local concern. Respondents in the 05D_SANT_VCWPD drainage reported almost no new use of BMPs for sediment and erosion management and property management (the latter entailing training and education activities).

Although only one year of monitoring data is available for review, the implementation of a broad range of management practices in the 05D_LAVD drainage area appears to be assisting with reducing benchmark exceedances in this drainage area. In future years when more monitoring data are available, similar analyses will be able to be completed for priority one and priority two drainage areas to assess the effectiveness of BMP implementation.

Inspection of the results in Table 24 indicates BMPs designed for sediment/erosion management and salinity/leaching management are less widely used in the priority drainages than BMPs designed for management of irrigation, pests, nutrients, and property (such as training and education). Several of the least used BMPs play a role in the control of all four of the constituents of concern. This suggests that it might be useful to focus outreach on the lesser used BMPs in order to decrease exceedances of water quality benchmarks. However, without knowing how prevalent the under-used BMPs are in drainage areas where water quality exceedances are *not* as frequently observed, it is difficult to determine the extent to which these patterns in BMP use explain water quality problems in the priority drainages.

SYNTHESIS OF PESTICIDE USE AND SURVEY INFORMATION WITHIN APPLICABLE FIRST TIER PRIORITY DRAINAGES

The following is an initial attempt to integrate information regarding pesticide usage with Management Practice Survey results for the three-first tier priority drainages with OP pesticides exceedances: 05D_SANT_VCWPD, 05D_LAVD, and OXD_CENTR. With only two years of monitoring data and one initial round of surveys, only general assessments regarding the observed exceedances and implemented or potential BMPs, can be made at this time. Of the two OP pesticides with water quality benchmarks, diazinon did not cause any exceedances during either of the two monitoring years at the previously mentioned sites. However, the chlorpyrifos benchmark was exceeded on at least two occasions at all three monitoring sites.

Within 05D_LAVD, chlorpyrifos was applied to lemons and strawberries. Exceedances at this monitoring site occurred during a dry event in 2007 and a wet event in 2008. According to the survey results covering 7 parcels and 74% of acres enrolled in VCAILG, BMPs that may address OP pesticides are being well executed in the categories of irrigation management, pest management, and property management. All BMPs within those three categories are currently implemented within greater than 85% of the surveyed acreage. Sediment and erosion

management practices had the lowest rate of implementation with 74% of all potential BMPs in that category being utilized. However, as shown in Table 25, many of the BMPs applicable to OP pesticides were newly implemented (after January 2008). During the two dry weather monitoring events in 2008, 05D_LAVD was dry and therefore no additional exceedances occurred at this site. 2009 monitoring will provide results on whether the previously implemented and new BMPs sufficiently mitigate OP pesticide transport. Additionally, VCAILG will work to obtain completed surveys from the 26% of acreage within the 05D_LAVD drainage area that are currently not covered.

Chlorpyrifos was applied to the following crops within the 05D_SANT_VCWPD drainage area: lemons, strawberries, kale, and cabbage. Exceedances of the chlorpyrifos benchmark occurred during the 2007 storm event, and both storm events and a single dry event in 2008. A significantly greater amount of chlorpyrifos was applied during 2008 than in 2007 within this drainage area, 405.15 gallons as compared to 48.66 and 13.5 pounds as compared to 6.39 pounds, respectively. Seven out of twelve chlorpyrifos applications within the years of 2007 and 2008, occurred during the month of November. Within this drainage area, surveys were returned for 7 parcels covering 60% of the VCAILG enrolled acres. Obtaining surveys to cover the additional 40% of the VCAILG acres will be the first step in assessing whether appropriate BMPs are being utilized to address OP pesticides within the 05D_SANT_VCWPD drainage area. Based on the currently available results, over 80% of surveyed acreage have implemented appropriate BMPs in the categories of irrigation, pest management, and property management (Table 24). Sediment and erosion BMPs are currently utilized at a rate of 57%, which leaves room for recommendations and improvement. No new BMPs were implemented on the surveyed acreage to control sediment and erosion.

Within the OXD_CENTR drainage area, chlorpyrifos was applied on three occasions to strawberries and cabbage within the months of July and August. Though applications took place in the summer, exceedances were only found during the three storm events. This lag in application time and water quality benchmark exceedances could be attributed to the transport time between application locations and the monitoring site. Additionally, if effective irrigation timing and application measures are in place, runoff and/or sediment transport may only occur during storm events. Based on the survey information, which covers 19 parcels and 100% of the VCAILG enrolled acreage, BMPs for irrigation, pest, and property management have all been implemented on over 80% of the drainage area acreage. However, sediment and erosion control is the category with the lowest implementation rate within this drainage area. Adding new BMPs in this category may help address the pesticide exceedances during wet weather. New BMPs, implemented after January 2008, were noted in the categories of irrigation and pest management.

GROWER OUTREACH AND BMP IMPLEMENTATION

In order to inform VCAILG members of their obligations under the Conditional Waiver and this WQMP, continued grower outreach is imperative. Outreach will continue to target growers according to the priority tiers and timeline described in previous sections. Methods of outreach to be carried out by the VCAILG include the following:

- Provide 319h grant team with lists of growers in each of the priority drainages according to the WQMP timeline (Figure 8). This will allow the grant team to provide on-site consultations, workshops, and demonstration tours for those growers in the areas which need the most assistance in achieving water quality benchmarks.

- Mail management practice surveys to growers in priority drainages according to the WQMP timeline (Figure 8). This will provide them with an opportunity to report their existing management practices, management practices that are newly implemented, and planned practices to address exceedances in their drainage area.
- The management practice survey is available online in the Water Quality section of the Farm Bureau website to enable any VCAILG member to report their current, new, and planned management practices.
- Host additional meetings according to the WQMP timeline (Figure 8). These meetings will focus on filling out the management practice survey, informing growers of water quality exceedances in their area, and discussing the importance of new management practice implementation and reporting.
- Provide growers with Mobile Irrigation Testing Lab information.

Uncooperative growers who do not participate in outreach opportunities or provide requested information may be removed from VCAILG and reported to the Regional Board at the discretion of the VCAILG Steering Committee.

BMP IMPLEMENTATION TRACKING

As detailed in the 2007 WQMP, VCAILG has created a database of BMP survey information to track established, new, and planned BMPs. Additional information will be gathered from the following sources:

- Management Practice Surveys
- VCAILG direct communication with grower members through mailings, meetings, and phone calls.
- VCAILG indirect communication with members using crop commission mailings and education outreach as a tool to gather management practice information.
- 319h grant communications with growers, including surveys, on-site consultations, workshops, tours, phone calls, other mailings. To enable efficient follow-up of BMP implementation, the VCAILG will provide UCCE with a list of its members who previously filled out a survey and are located within the priority drainage areas.
- Growers participating in the RCD's Irrigation Audits will be contacted in regard to changes they have made to their wells, pumps, and/or irrigation system following the recommendations outlined in their audit report.

Evaluation of survey results to date, show exceptional VCAILG member participation in submitting the Management Practice Survey within three of the first tier priority drainage areas (Table 22). Follow-up with growers within 05D_SANT_VCWPD and 05D_LAVD will take place to ensure survey completion by the remaining VCAILG members. Additionally, the 319h grant team will be provided with the survey results, which will allow them to target their site visits and outreach within the priority drainages and recommend BMPs that are not implemented as widely and may assist with achieving water quality benchmarks, such as sediment management practices (Table 26).

MONITORING RESULTS EVALUATION AND NEXT STEPS

The WQMP implementation has been designed based on the existing Conditional Waiver monitoring location drainage areas. As a result, the existing monitoring program can be utilized to determine if BMP implementation is effective in reducing water quality benchmark exceedances. Utilizing the existing monitoring sites and their identified drainage areas to prioritize, track, and implement management practices to address water quality impairments enables the VCAILG to build the existing dataset utilizing consistent sites that have been determined to represent agricultural discharges.

The evaluation of BMP survey results as compared to monitoring results discussed above has provided preliminary information on the effectiveness of BMPs in addressing benchmark exceedances. Additional monitoring data under the existing monitoring program is needed to further this evaluation. At this time, changes to the monitoring program are not necessary to further evaluate BMP effectiveness. Rather, additional years of monitoring data following BMP implementation will provide sufficient information to assess BMP effectiveness and compare water quality results with current field conditions and future improvements.

In this section of the 2007 WQMP, a process was presented for addressing continued exceedances and determining implementation completion. The WQMP implementation is still in the early stages and evaluation under the scenarios above cannot be completed until outreach to the first priority tier has been completed and monitoring results are available to determine if benchmark exceedances are still occurring. In the 2009 WQMP, the priority one drainages will be evaluated based on the procedure above to determine if additional actions or monitoring is needed.

With the participation of its members in this WQMP, the VCAILG will be able to document the efforts and progress towards improving water quality in Ventura County.

SUBMITTAL OF VCAILG MEMBER INFORMATION

Information regarding existing and newly installed BMPs, as well as other operational information relevant to water quality obtained from VCAILG members will be compiled on a monitoring site drainage or subwatershed basis for submittal to the Regional Board. All member information will be maintained should an inspection of the records be requested by Regional Board staff as required by the Conditional Waiver.

Conclusions and Recommendations

This 2008 WQMP addresses the exceedances of all constituents observed during the 2008 VCAILG Conditional Waiver Monitoring Program and requirements to have WQMPs in place for effective TMDLs in Ventura County. The WQMP implementation process was developed and presented in the 2007 WQMP, this plan provides information on 2008 benchmark exceedances, information regarding WQMP implementation achievements, and a detailed evaluation of Management Practice Survey results from the first tier priority drainages.

One VCAILG monitoring site location has been changed as requested in the April 9, 2009 letter, approving the 2008 Annual Monitoring Report. 06T_LONG has been moved upstream due to a lack of flow for two subsequent monitoring years. For details regarding this change in the VCAILG Monitoring Program, please refer to the VCAILG MRP Amendment dated May 19, 2009. No additional modifications to the MRP are proposed at this time.

Appendix A

Photos of Sites When Exceedances Occurred During 2008

CALLEGUAS CREEK WATERSHED

01T_ODD2_DCH

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

01T_ODD2_DCH

Event 6

View upstream

Event 7

View upstream

View downstream

01T_ODD3_ARN

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

01T_ODD3_ARN

Event 6

View upstream

View downstream

02D_BROOM

Event 4

No photos available, though exceedances occurred.

Event 5

View upstream

View downstream

Event 6

Pipe discharge at site

Event 7

Pipe Discharge at site

Pipe Discharge at site

04D_ETTG

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

04D_ETTG

Event 6

View upstream

View downstream

Event 7

View upstream

View downstream

04D_LAS

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

04D_LAS

Event 6

View upstream

View downstream

Event 7

View upstream

View downstream

05D_SANT_VCWPD

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

05D_SANT_VCWPD

Event 6

View upstream

View downstream

Event 7

View upstream

View downstream

05D_LAVD

Event 5

View upstream

05T_HONDO

Event 4

View upstream

Event 5

View upstream

View downstream

06T_FC_BR

Event 4

View downstream

Event 5

View upstream

View downstream

OXNARD COASTAL WATERSHED

OXD_CENTR

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

OXD_CENTR

Event 6

View upstream

View downstream

Event 7

View upstream

View downstream

SANTA CLARA RIVER WATERSHED

S02T_ELLS

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

S02T_ELLS

Event 7

View upstream

View downstream

S02T_TODD

Event 4

View upstream

View downstream

Event 5

View upstream

Event 6

View upstream

View downstream

S03T_TIMB

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

S03T_BOULD

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

S03T_BOULD

Event 6

View upstream (high flow)

View upstream (low flow)

View downstream

S03D_BARDS

Event 5

View upstream

View downstream

S04T_HOPP

Event 6

View upstream

View downstream

S04T_TAPO

Event 4

View upstream

View downstream

Event 5

View upstream

View downstream

S04T_TAPO

Event 6

View upstream

View downstream

Event 7

View upstream

View downstream

VENTURA RIVER WATERSHED

VRT_THACH

Event 5

View upstream

View downstream

Appendix B

Benchmark Exceedance Data by Constituent and Site–2008

ORGANOCHLORINE PESTICIDES EXCEEDANCES

Calleguas Creek Watershed

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).

Table 28. 01T_ODD2_DCH Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results		
			Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Total Chlordane	µg/L	0.00059	*0.0799*	ND	ND
4,4'-DDD	µg/L	0.00084	*0.2558*	ND	ND
4,4'-DDE	µg/L	0.00059	*0.7365*	*0.0052*	*0.006*
4,4'-DDT	µg/L	0.00059	*0.4435*	ND	ND
Toxaphene	µg/L	0.0002			*0.0292*

ND = Not Detected

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 our after low tide.

Table 29. 01T_ODD3_ARN Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results		
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008
Total Chlordane	µg/L	0.00059	ND	*0.025*	*0.0061*
4,4'-DDD	µg/L	0.00084	*0.0198*	*0.0646*	*0.0255*
4,4'-DDE	µg/L	0.00059	*0.0992*	*0.1772*	*0.0439*
4,4'-DDT	µg/L	0.00059	*0.0377*	*0.0917*	*ND*

ND = Not Detected

02D_BROOM

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

Table 30. 02D_BROOM Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/202008	Event 7 9/16/2008
Total Chlordane	µg/L	0.00059	ND	*0.0148*	ND	*0.0285*
4,4'-DDD	µg/L	0.00084	*0.0155*	*0.0113*	*0.0051*	*0.0134*
4,4'-DDE	µg/L	0.00059	*0.0511*	*0.0866*	*0.0168*	*0.0547*
4,4'-DDT	µg/L	0.00059	*0.0140*	*0.034*	ND	*0.0144*
Dieldrin	µg/L	0.00014	ND	*0.0108*	ND	ND
Toxaphene	µg/L	0.0002	ND	ND	ND	*0.178*

ND = Not Detected

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).

Table 31. 04D_ETTG Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Total Chlordane	µg/L	0.00059	*0.0071*	*0.0353*	ND	ND
4,4'-DDD	µg/L	0.00084	*0.0839*	*0.1679*	*0.007*	*0.0078*
4,4'-DDE	µg/L	0.00059	*0.599*	*0.9049*	*0.023*	*0.0342*
4,4'-DDT	µg/L	0.00059	*0.1388*	*0.5552*	*0.0078*	*0.0092*
Toxaphene	µg/L	0.0002	ND	ND	ND	*0.110*

ND = Not Detected

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).

Table 32. 04D_LAS Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Total Chlordane	µg/L	0.00059	*0.0169*	*0.0438*	ND	*0.0088*
4,4'-DDD	µg/L	0.00084	*0.0449*	*0.0928*	*0.0083*	*0.02*
4,4'-DDE	µg/L	0.00059	*0.4073*	*0.5177*	*0.0217*	*0.0583*
4,4'-DDT	µg/L	0.00059	*0.0701*	*0.1695*	*0.0073*	*0.0109*
Toxaphene	µg/L	0.0002	ND	ND	ND	*0.177*

ND = Not Detected

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).

Table 33. 05D_SANT_VCWPD Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Total Chlordane	µg/L	0.00059	*0.0081*	*0.0244*	ND	ND
4,4'-DDD	µg/L	0.00084	ND	*0.0427*	ND	ND
4,4'-DDE	µg/L	0.00059	*0.0509*	*0.1827*	*0.0175*	*0.0456*
4,4'-DDT	µg/L	0.00059	ND	*0.1078*	ND	*0.0164*
Toxaphene	µg/L	0.0002	ND	ND	ND	*0.142*

ND = Not Detected

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.

Table 34. 05D_LAVD Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Total Chlordane	µg/L	0.00059	*0.0069*
4,4'-DDD	µg/L	0.00084	*0.0136*
4,4'-DDE	µg/L	0.00059	*0.1011*
4,4'-DDT	µg/L	0.00059	*0.0429*

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).

Table 35. 05T_HONDO Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results	
			Event 4 1/5/2008	Event 5 1/24/2008
Total Chlordane	µg/L	0.00059	ND	*0.0257*
4,4'-DDD	µg/L	0.00084	ND	*0.2694*
4,4'-DDE	µg/L	0.00059	*0.0299*	*1.0013*
4,4'-DDT	µg/L	0.00059	*0.0116*	*0.494*

ND = Not Detected

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).

Table 36. 06T_FC_BR Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Total Chlordane	µg/L	0.00059	*0.0367*
4,4'-DDE	µg/L	0.00059	*0.3005*
4,4'-DDT	µg/L	0.00059	*0.1066*

Oxnard Coastal Watershed

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 Blvd 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 Blvd.

Table 37. OXD_CENTR Organochlorine Pesticides Exceedances for 2008

			Results			
			Event 4	Event 5	Event 6	Event 7
Constituent	Units	Benchmark	1/5/2008	1/24/2008	5/20/2008	9/16/2008
Total Chlordane	µg/L	0.00059	ND	*0.1802*	ND	ND
4,4'-DDD	µg/L	0.00084	*0.0128*	*1.0772*	ND	*0.0053*
4,4'-DDE	µg/L	0.00059	*0.1029*	*2.1452*	*0.0079*	*0.0093*
4,4'-DDT	µg/L	0.00059	*0.0439*	*1.0539*	ND	ND

ND = Not Detected

Santa Clara River Watershed

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.

Table 38. SO2T_TODD Organochlorine Pesticides Exceedances for 2008

			Results
			Event 5
Constituent	Units	Benchmark	1/24/2008
4,4'-DDT	µg/L	0.00059	*0.0186*

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.

Table 39. S03T_TIMB Organochlorine Pesticides Exceedances for 2008

			Results
			Event 5
Constituent	Units	Benchmark	1/24/2008
4,4'-DDT	µg/L	0.00059	*0.0081*

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.

Table 40. S03T_BOULD Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Total Chlordane	µg/L	0.00059	*0.0066*

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.

Table 41. S03D_BARDS Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Total Chlordane	µg/L	0.00059	*0.0186*
4,4'-DDD	µg/L	0.00084	*0.0141*
4,4'-DDE	µg/L	0.00059	*0.1001*
4,4'-DDT	µg/L	0.00059	*0.0553*

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.

Table 42. S04T_TAPO Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results	
			Event 4 1/5/2008	Event 5 1/24/2008
Total Chlordane	µg/L	0.00059	ND	*0.0353*
4,4'-DDD	µg/L	0.00084	ND	*0.079*
4,4'-DDE	µg/L	0.00059	*0.0777*	*0.2578*

ND = Not Detected

Ventura River Watershed

VRT_THACH

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

Table 43. VRT_THACH Organochlorine Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
4,4'-DDT	ng/L	0.00059	*0.0069*

ORGANOPHOSPHORUS PESTICIDES EXCEEDANCES

Calleguas Creek Watershed

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).

Table 44. 01T_ODD2_DCH Organophosphorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results	
			Event 4 1/5/2008	Event 5 1/24/2008
Chlorpyrifos	µg/L	0.025	*1.2828*	*0.9837*

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).

Table 45. 04D_ETTG Organophosphorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results	
			Event 4 1/5/2008	Event 5 1/24/2008
Chlorpyrifos	µg/L	0.025	*0.5481*	*0.8757*

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).

Table 46. 04D_LAS Organophosphorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Chlorpyrifos	µg/L	0.025	*0.0654*	*0.0586*	ND	*0.1307*
Diazinon	µg/L	0.10	No exceedance	No exceedance	*0.1933*	ND

ND = Not Detected

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).

Table 47. 05D_SANT_VCWPD Organophosphorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results		
			Event 4 1/5/2008	Event 5 1/24/2008	Event 7 9/16/2008
Chlorpyrifos	µg/L	0.025	*0.2254*	*0.2442*	*0.2695*

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.

Table 48. 05D_LAVD Organophospohorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Chlorpyrifos	µg/L	0.025	*0.3984*

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).

Table 49. 05T_HONDO Organophosphorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Chlorpyrifos	µg/L	0.025	*0.2482*

Oxnard Coastal Watershed

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 Blvd 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 Blvd.

Table 50. OXD_CENTR Organophosphorus Pesticides Exceedances for 2008

			Results	
			Event 4	Event 5
Constituent	Units	Benchmark	1/5/2008	1/24/2008
Chlorpyrifos	µg/L	0.025	*0.6766*	*4.9679*

Santa Clara River Watershed

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.

Table 51. S02T_ELLS Organophosphorus Pesticides Exceedances for 2008

			Results
Constituent	Units	Benchmark	Event 7 9/16/2008
Chlorpyrifos	µg/L	0.025	*0.225*

ND = Not Detected

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.

Table 52. S03T_TIMB Organophosphorus Pesticides Exceedances for 2008

			Results
Constituent	Units	Benchmark	Event 4 1/5/2008
Chlorpyrifos	µg/L	0.025	*0.1123*

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.

Table 53. S03D_BARDS Organophosphorus Pesticides Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Chlorpyrifos	µg/L	0.025	*2.6776*
Diazinon	µg/L	0.10	*0.1231*

SALTS EXCEEDANCES

Calleguas Creek Watershed

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).

Table 54. 05D_SANT_VCWPD Salts Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Total Dissolved Solids (TDS)	mg/L	850	*2960*	*2260*	*2650*	*2310*
Chloride	mg/L	150	*220*	*155*	*220*	*210*
Sulfate	mg/L	250	*1430*	*1150*	*1110*	*1040*

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).

Table 55. 05T_HONDO Salts Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 4 1/5/2008
Sulfate	mg/L	250	*335*

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).

Table 56. 06T_FC_BR Salts Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 4 1/5/2008
Total Dissolved Solids (TDS)	mg/L	850	*1600*
Sulfate	mg/L	250	*958*

Santa Clara River Watershed

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.

Table 57. S02T_ELLS Salts Exceedances for 2008

Constituent	Units	Benchmark	Results	
			Event 4 1/5/2008	Event 5 1/24/2008
Total Dissolved Solids (TDS)	mg/L	1200	*1510*	*1530*
Chloride	mg/L	150	*157*	No exceedance
Sulfate	mg/L	600	*740*	*776*

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.

Table 58. S02T_TODD Salts Exceedances for 2008

Constituent	Units	Benchmark	Results		
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008
Total Dissolved Solids (TDS)	mg/L	1200	*1770*	*1710*	*2120*
Sulfate	mg/L	600	*880*	*875*	*1050*

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.

Table 59. S03T_TIMB Salts Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 5 1/24/2008
Sulfate	mg/L	650	*677*

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.

Table 60. S03T_BOULD Salts Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 6 5/20/2008
Total Dissolved Solids (TDS)	mg/L	1300	*1940*
Chloride	mg/L	100	*105*
Sulfate	mg/L	650	*905*

S04T_HOPP

This monitoring site is located on Hopper Creek just upstream of Hwy 126 and the railroad bridge. Hopper Creek is a tributary to Santa Clara River Reach 4.

Table 61. S04T_HOPP Salts Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 6 5/20/2008
Total Dissolved Solids (TDS)	mg/L	1300	*1560*
Sulfate	mg/L	600	*805*

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.

Table 62. S04T_TAPO Salts Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Total Dissolved Solids (TDS)	mg/L	1300	*4080*	*3030*	*4200*	*3660*
Chloride	mg/L	100	*190*	*137*	*203*	*200*
Sulfate	mg/L	600	*2160*	*1530*	*1870*	*1810*

NITROGEN EXCEEDANCES

Calleguas Creek Watershed

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).

Table 63. 01T_ODD2_DCH Nitrogen Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Nitrate-N	mg/L	10 [1]	*45.05*	*40.44*	*60.37*	*59.6*

[1] 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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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.

Table 64. 01T_ODD3_ARN Nitrogen Exceedances for 2008

Constituent	Units	Benchmark	Results		
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008
Nitrate-N	mg/L	10 [1]	*28.47*	*10.69*	*46.78*

[1] 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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

02D_BROOM

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

Table 65. 02D_BROOM Nitrogen Exceedances for 2008

Constituent	Units	Benchmark	Results			
			Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/202008	Event 7 9/16/2008
Nitrate-N	mg/L	10 [1]	*43.95*	*49.22*	*36.82*	*48.23*

[1] 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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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).

Table 66. 04D_ETTG Nitrogen Exceedances for 2008

			Results			
			Event 4	Event 5	Event 6	Event 7
Constituent	Units	Benchmark	1/5/2008	1/24/2008	5/20/2008	9/16/2008
Total Ammonia-N	mg/L	3.77 / 4.73 / 1.56 / 1.74 [1]	No exceedance	No exceedance	No exceedance	*1.91*
Nitrate-N	mg/L	10 [2]	*75.65*	*56.85*	*74.66*	*114.92*

[1] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based 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 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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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).

Table 67. 04D_LAS Nitrogen Exceedances for 2008

			Results			
			Event 4	Event 5	Event 6	Event 7
Constituent	Units	Benchmark	1/5/2008	1/24/2008	5/20/2008	9/16/2008
Nitrate-N	mg/L	10	*27.49*	*45.23*	*26.36*	*22.09*

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).

Table 68. 05D_SANT_VCWPD Nitrogen Exceedances for 2008

			Results			
			Event 4	Event 5	Event 6	Event 7
Constituent	Units	Benchmark	1/5/2008	1/24/2008	5/20/2008	9/16/2008
Nitrate-N	mg/L	10 [1]	*40.88*	*55*	*40.08*	*39.62*

[1] 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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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).

Table 69. 06T_FC_BR Nitrogen Exceedances for 2008

			Results
Constituent	Units	Benchmark	Event 4 1/5/2008
Nitrate-N	mg/L	10	*17.19*

Oxnard Coastal Watershed

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 Blvd 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 Blvd.

Table 70. OXD_CENTR Nitrogen Exceedances for 2008

			Results			
Constituent	Units	Benchmark	Event 4 1/5/2008	Event 5 1/24/2008	Event 6 5/20/2008	Event 7 9/16/2008
Nitrate-N	mg/L	10 [2]	*19.7*	*19.35*	*14.68*	*14.88*

[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 + Nitrite-N was used for comparison with VCAILG data collected at the monitoring sites in this reach.

Santa Clara River Watershed

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.

Table 71. S02T_TODD Nitrogen Exceedances for 2008

			Results
Constituent	Units	Benchmark	Event 6 5/20/2008
Nitrate-N	mg/L	10	*10.25*

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.

Table 72. S03T_TIMB Nitrogen Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 4 1/5/2008
Nitrate-N	mg/L	5	*6.65*

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.

Table 73. S03T_BOULD Nitrogen Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 6 5/20/2008
Total Ammonia-N	mg/L	3.93 / 4.21 / 1.45 / --[1]	*6.42* [2]
Nitrate-N	mg/L	5	*54.42*

[1] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based 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.
[2] Ammonia was detected in the lab blank and one of the two field blanks below the RL but above the MDL. The second field blank was bottled Arrowhead water instead of lab water, this field blank came back as ND for ammonia.

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.

Table 74. S04T_TAPO Nitrogen Exceedances for 2008

Constituent	Units	Benchmark	Results	
			Event 6 5/20/2008	Event 7 9/16/2008
Nitrate-N	mg/L	5	*8.03*	*13.56*

DISSOLVED OXYGEN EXCEEDANCES

Calleguas Creek Watershed

02D_BROOM

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

Table 75. 02D_BROOM Dissolved Oxygen Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 7 9/16/2008
Dissolved oxygen	mg/L	≥ 5	*1.95*

TEMPERATURE EXCEEDANCES

Calleguas Creek Watershed

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).

Table 76. 04D_LAS Temperature Exceedances for 2008

Constituent	Units	Benchmark	Results Event 6 5/20/2008
Temperature	ºC	≤ 26.67˚C [1]	*29.95*

[1] The temperature limit for waterbodies designated as WARM is 80˚F (26.7˚C).

PH EXCEEDANCES

Santa Clara River Watershed

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.

Table 77. S02T_ELLS PH Exceedances for 2008

Constituent	Units	Benchmark	Results
			Event 7 9/16/2008
pH	NA	6.5 ≤ pH ≤ 8.5	*8.56*

CHRONIC TOXICITY EXCEEDANCES

Toxicity samples were collected during monitoring Events 4 and 7. During 2008 monitoring, some sites still required 3-species screen tests to determine the most sensitive species; these tests were performed at 05T_HONDO, 06T_FC_BR, S02T_ELLS, S03T_TIMB, S04T_HOPP, VRT_THACH, and VRT_SANTO. Chronic toxicity was detected at four of these sites and the exceedance results are shown in the table below.

Table 78. Chronic Toxicity Exceedances for 3-Species Screen for 2008

Site	Event	*Selenastrum*		*Ceriodaphnia*		
		Cell Growth Toxicity	% Growth Reduct.	Survival Toxicity	Reprod. Toxicity	Reprod. % Reduct.
05T_HONDO	4: Jan 2008	N	----	N	Y	**16.6**
06T_FC_BR	4: Jan 2008	Y	**39.5**	N	Y	**25.6**
S02T_ELLS	4: Jan 2008	N	----	N	Y	**32.4**
S02T_ELLS dup	4: Jan 2008	N	----	N	Y	**29.7**
S03T_TIMB	4: Jan 2008	Y	**14.7**	N	Y	**18.2**

[1] *Selenastrum capricornutum* (algae) is evaluated for the growth endpoint.
[2] *Ceriodaphnia dubia* (invertebrate – water flea) is evaluated for the survival and reproduction endpoints.
[3] *Pimephales promelas* (vertebrate – fathead minnow) is evaluated for survival and biomass endpoints.

Single-species tests were completed at five sites during the Event 4 sampling. Chronic toxicity exceedance results for single-species can be found in Table 79.

Table 79. Chronic Toxicity Exceedances for Single-Species Testing at Freshwater Sites for 2008

Site	Event	*Ceriodaphnia* [1]				TIE Triggered?
		Survival Toxicity	Survival % Reduction	Reproduction Toxicity	Reproduction % Reduction	
01T_ODD2_DCH	4: Jan 2008	Y	**100.0**	---	---	Y
S02T_TODD	4: Jan 2008	N		Y	**100.0**	N [2]
S03T_BOULD	4: Jan 2008	N		Y	**48.8**	N

[1] *Ceriodaphnia dubia* (invertebrate – water flea) is evaluated for the survival and reproduction endpoints.

[2] A TIE was not triggered for this sample since we are evaluating chronic toxicity and survival was not significantly different from the control.

Appendix C

Drainage Areas for VCAILG Monitoring Sites

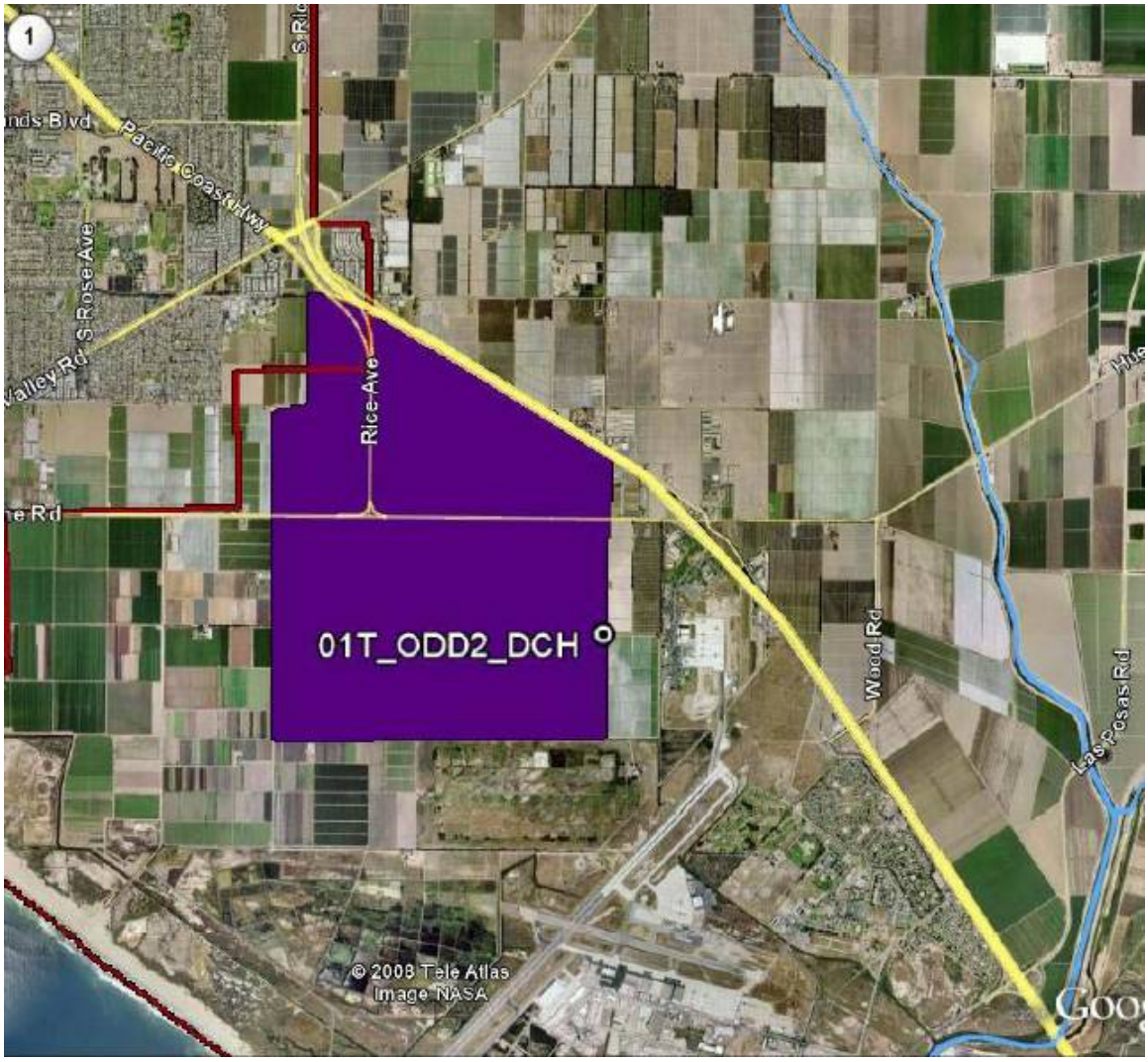


Figure 13. 01T_ODD2_DCH Drainage Area

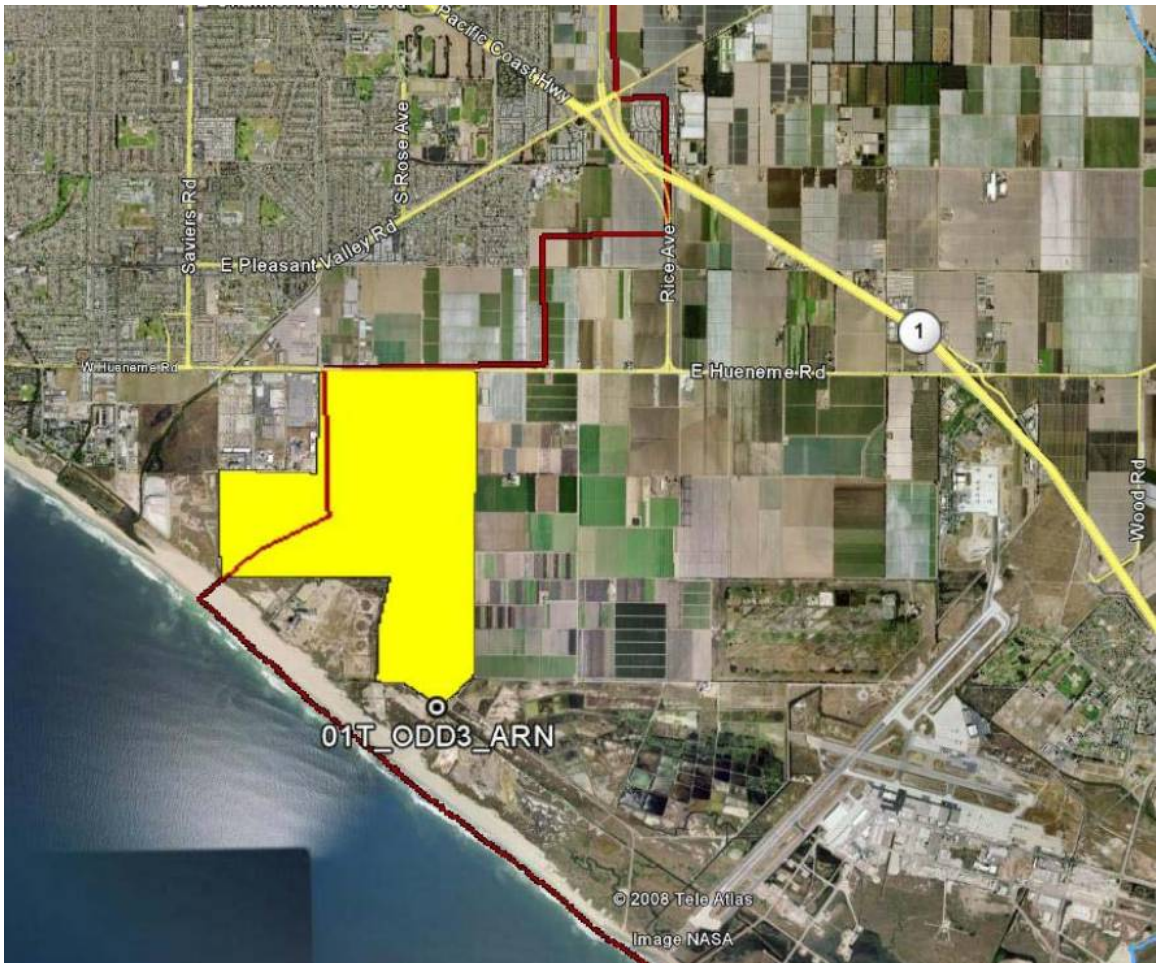


Figure 14. 01T_ODD3_ARN Drainage Area

Figure 15. 02D_BROOM and 02D_CSUCI Drainage Areas

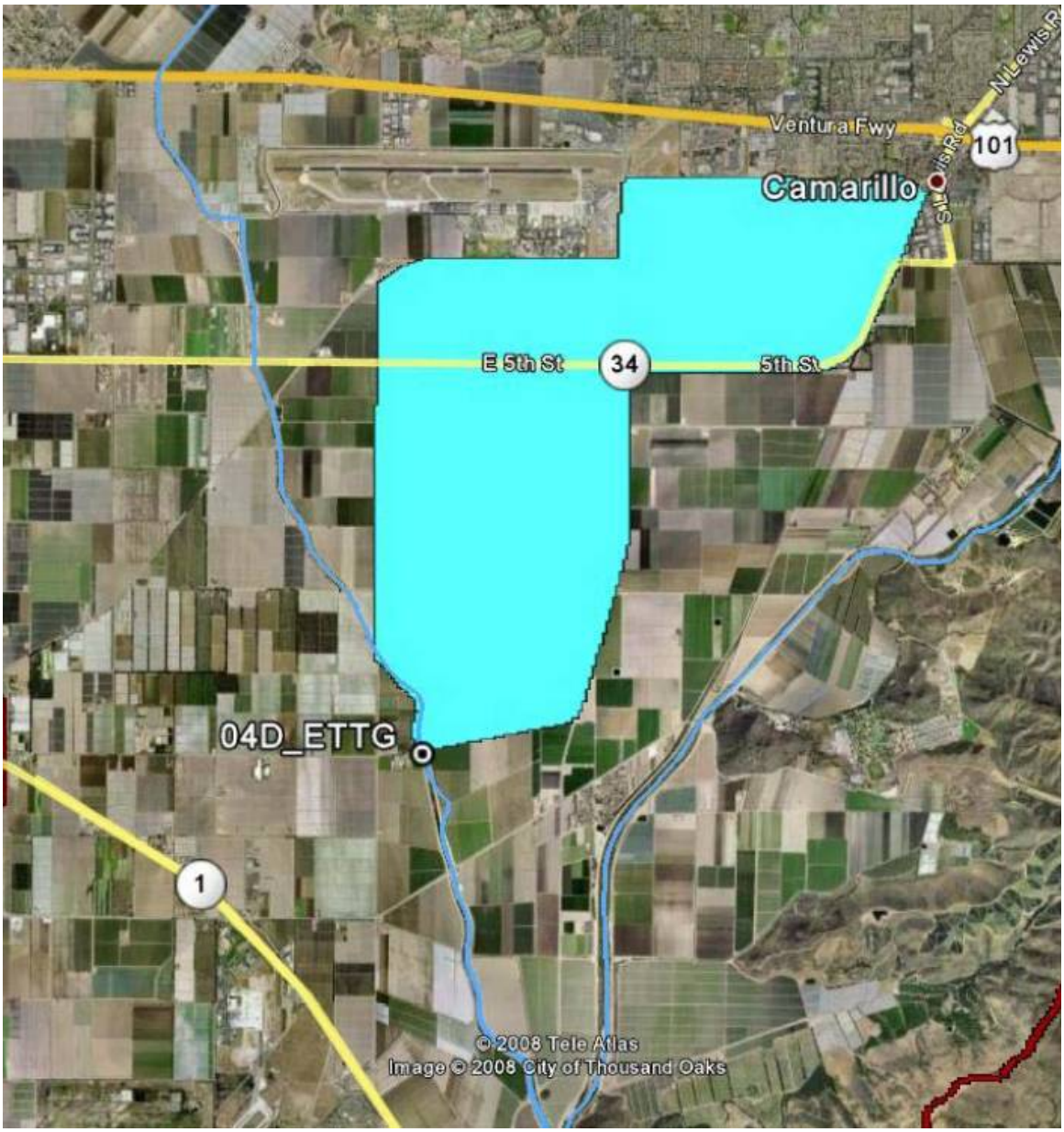


Figure 16. 04D_ETTG Drainage Area

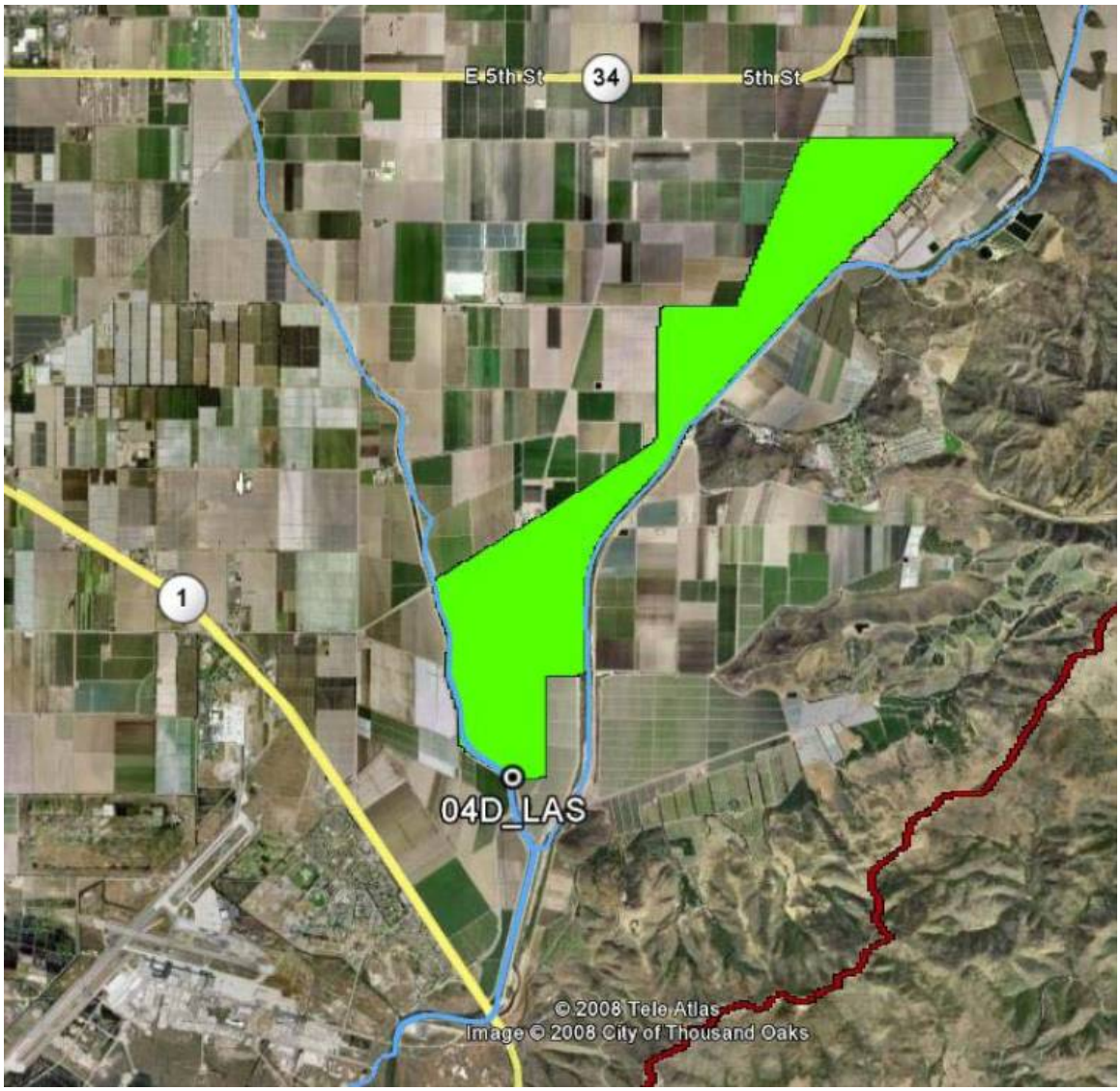


Figure 17. 04D_LAS Drainage Area

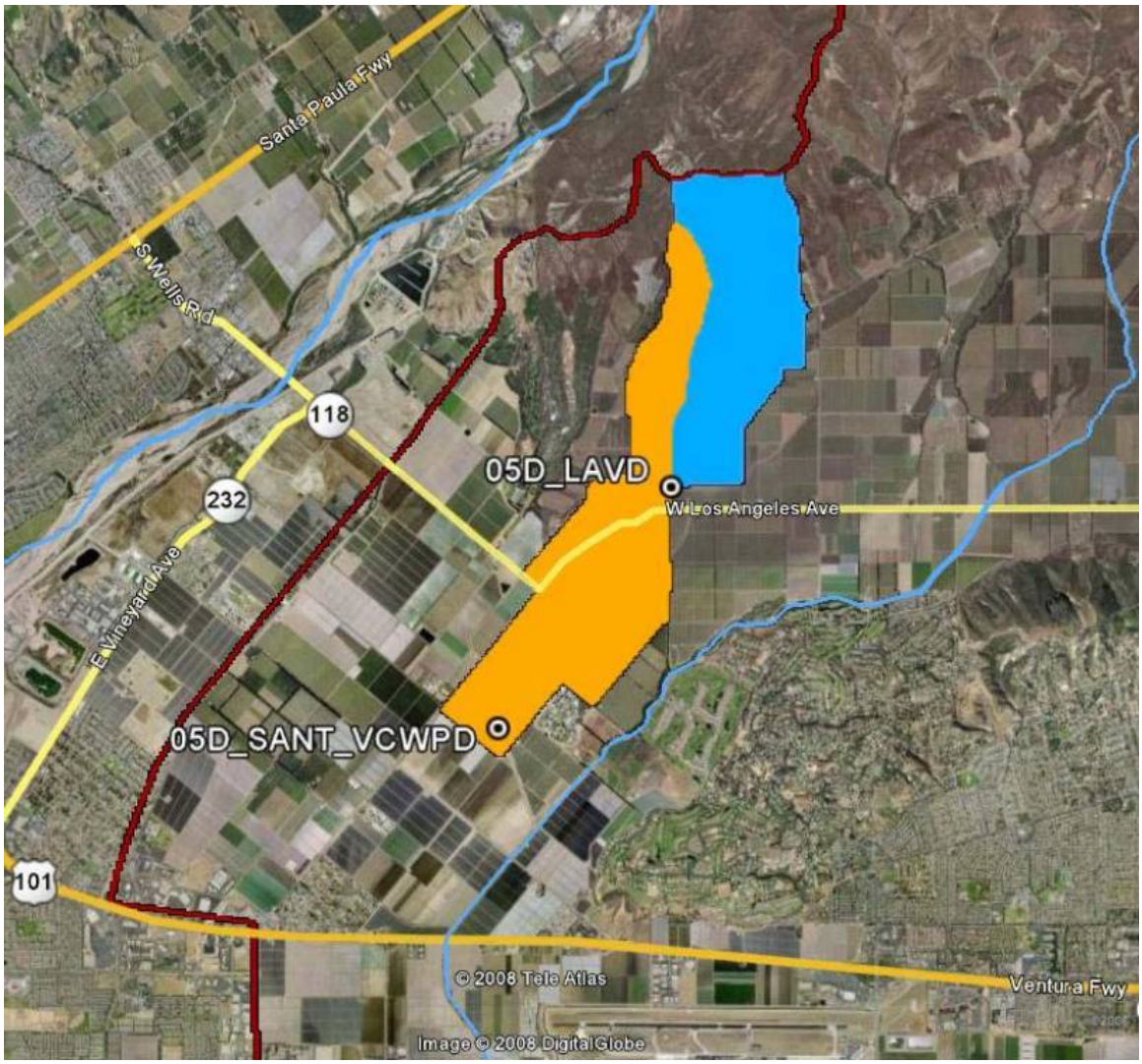


Figure 18. 05D_SANT_VCWPD and 05D_LAVD Drainage Areas

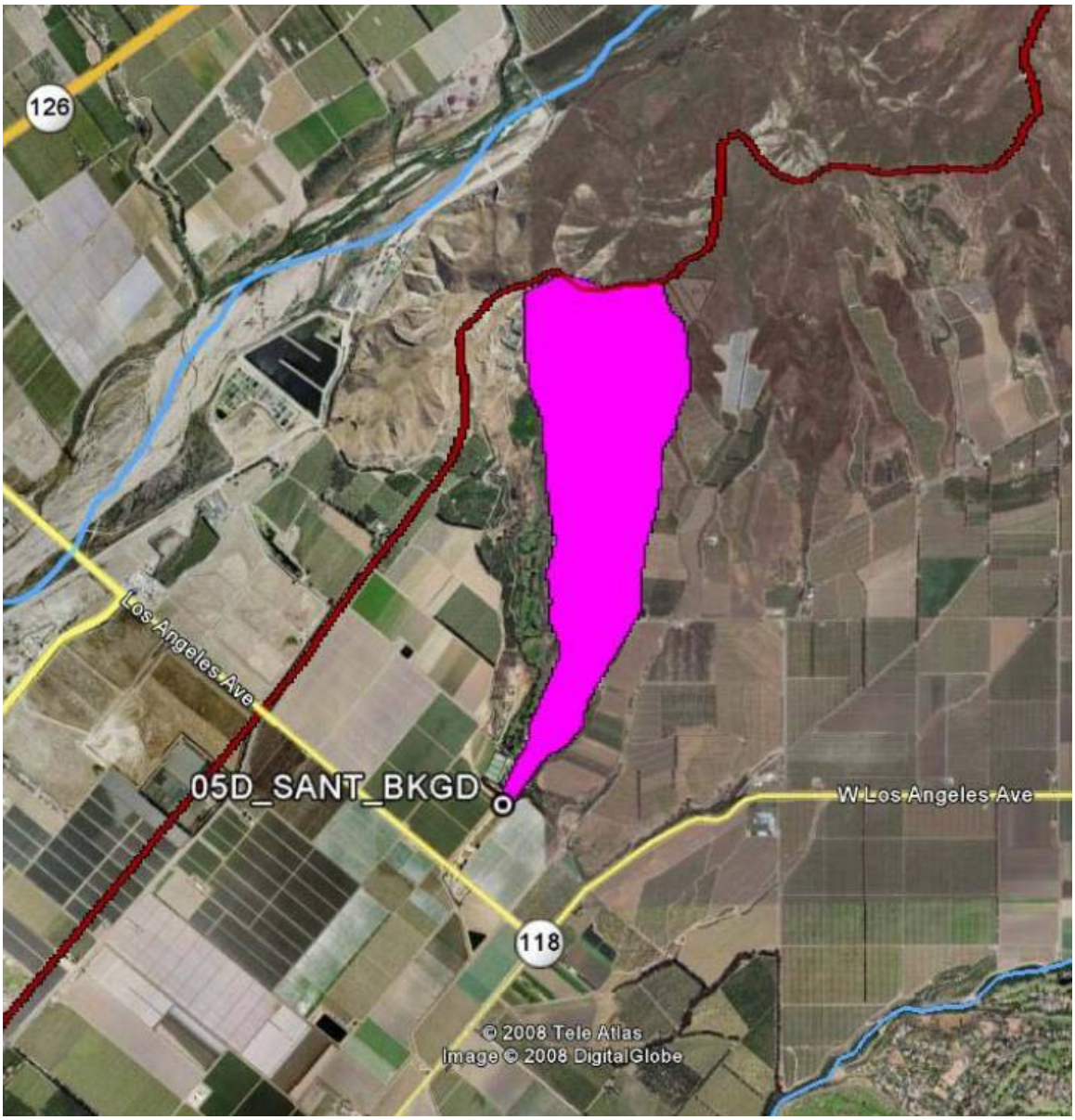


Figure 19. 05D_SANT_BKGD Drainage Area

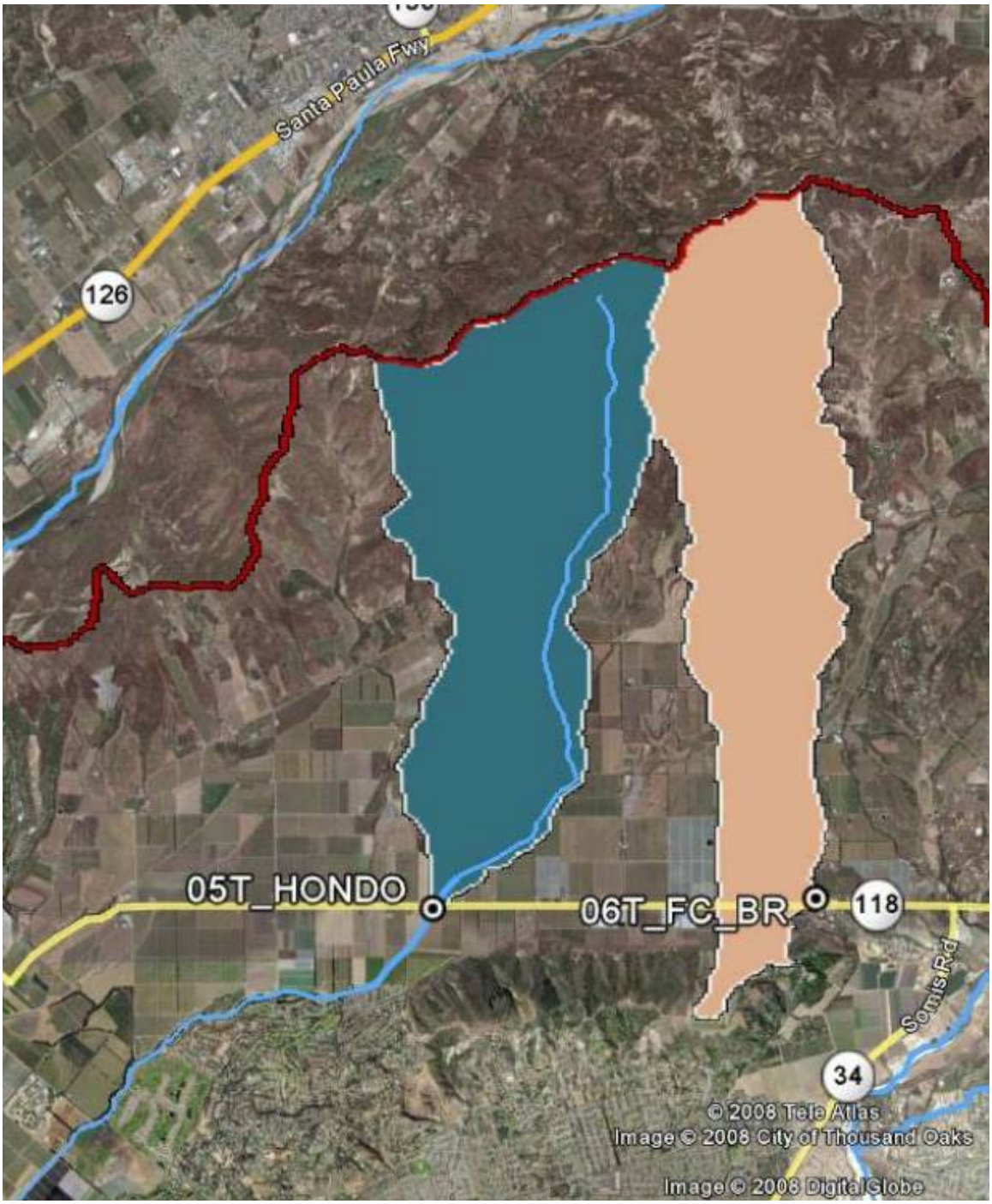


Figure 20. 05T_HONDO and 06T_FC_BR Drainage Areas

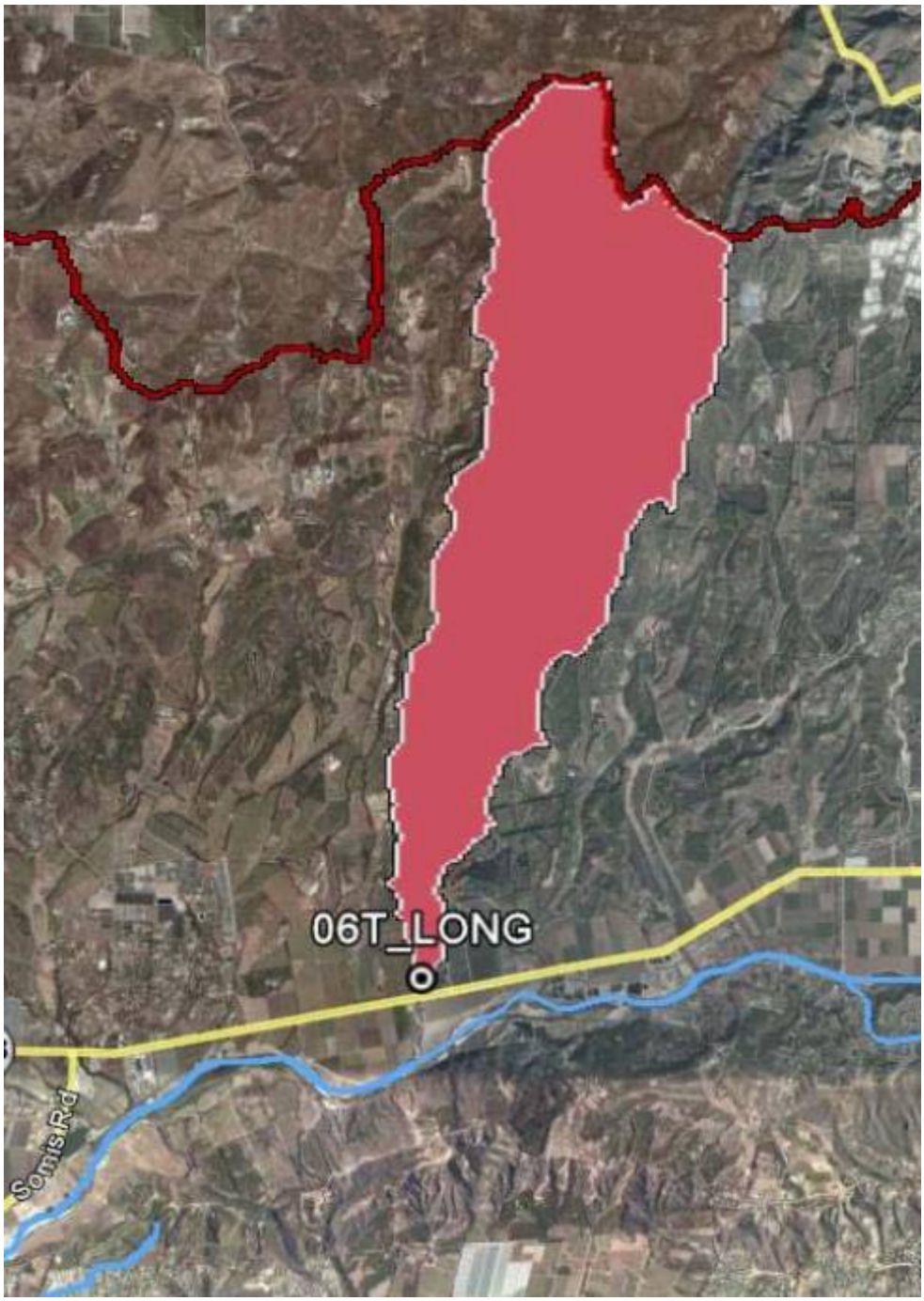


Figure 21. 06T_LONG Drainage Area

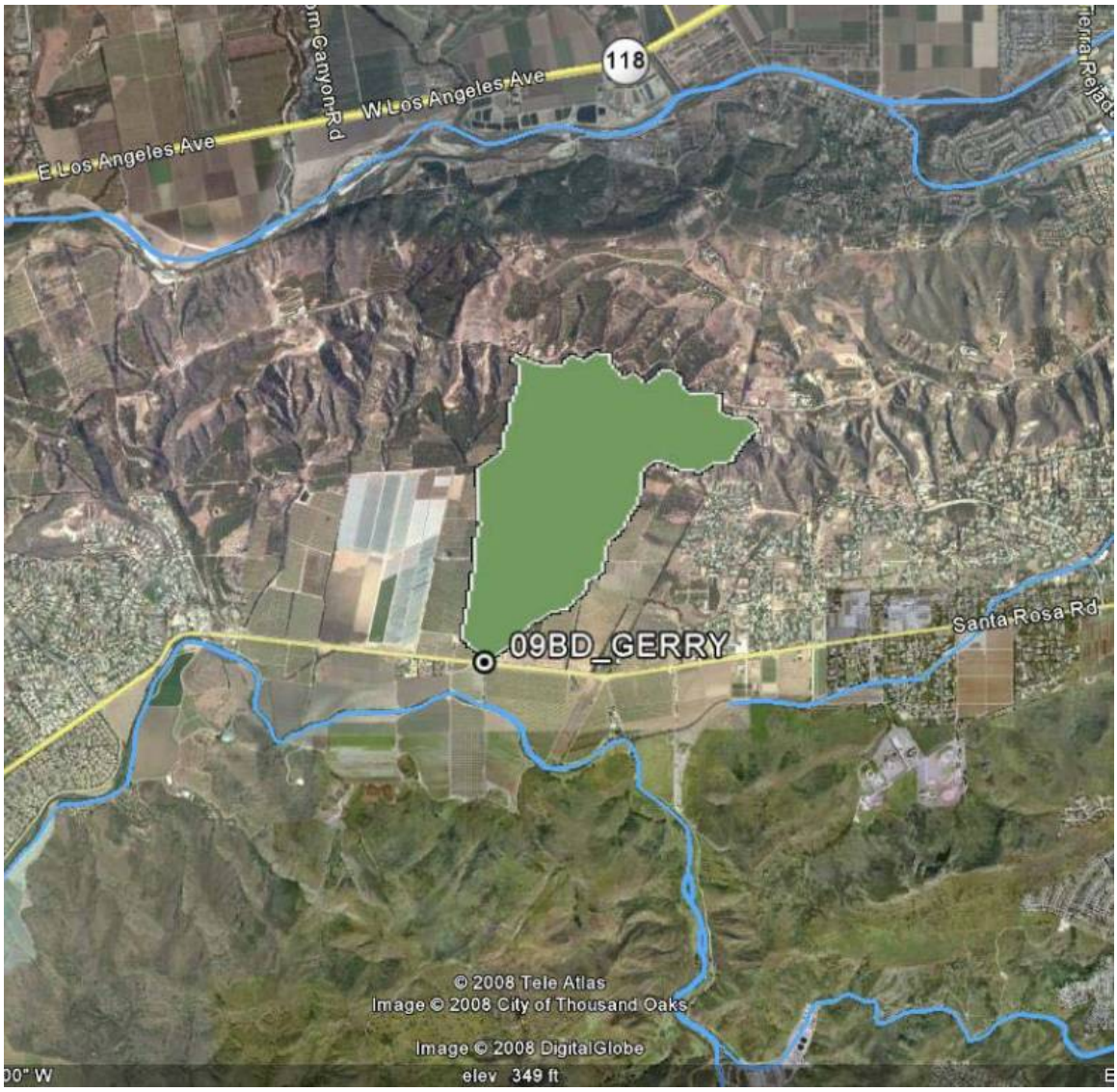


Figure 22. 09BD_GERRY Drainage Area

Figure 23. OXD_CENTR Drainage Area

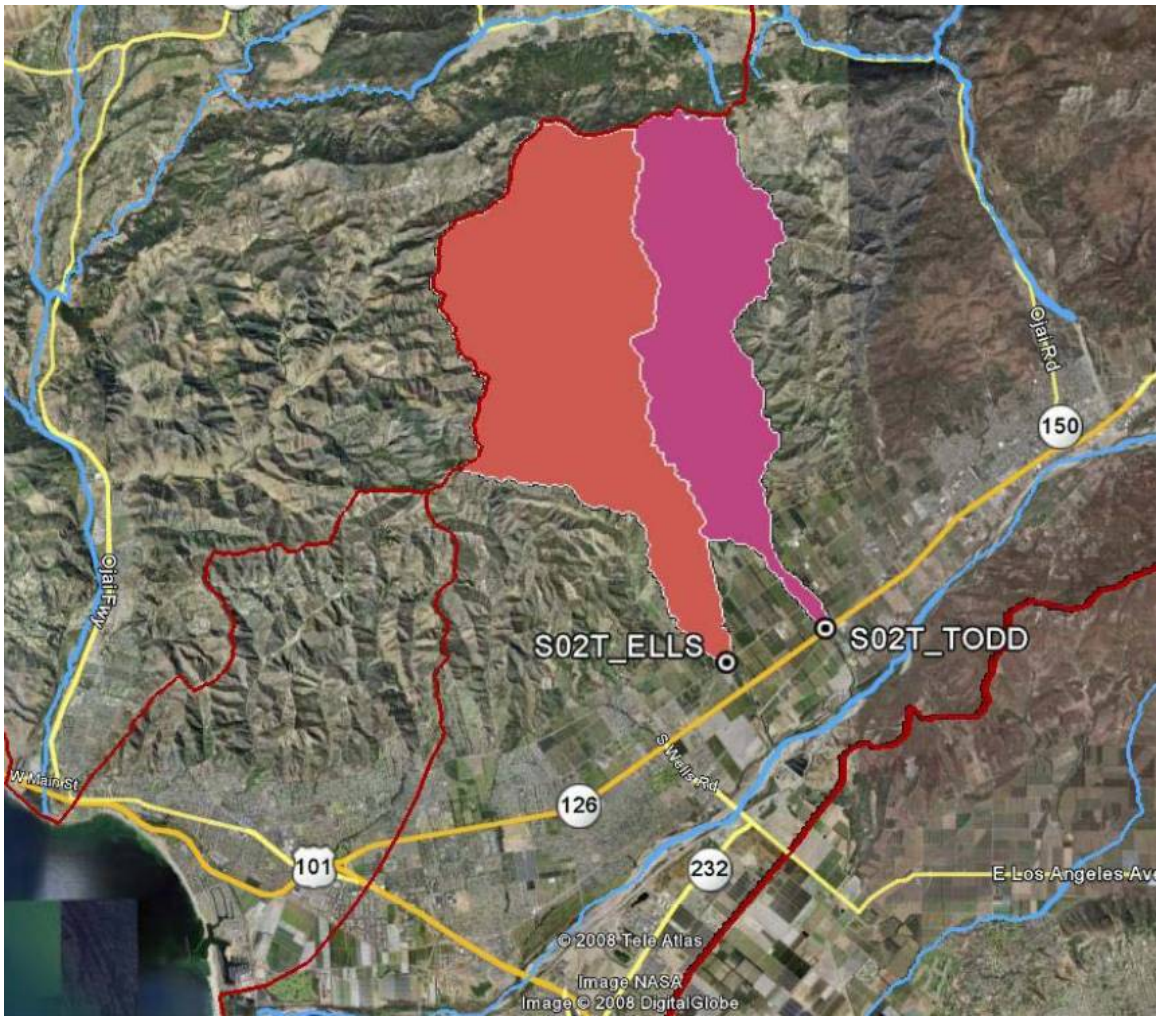


Figure 24. S02T_ELLS and S02T_TODD Drainage Areas

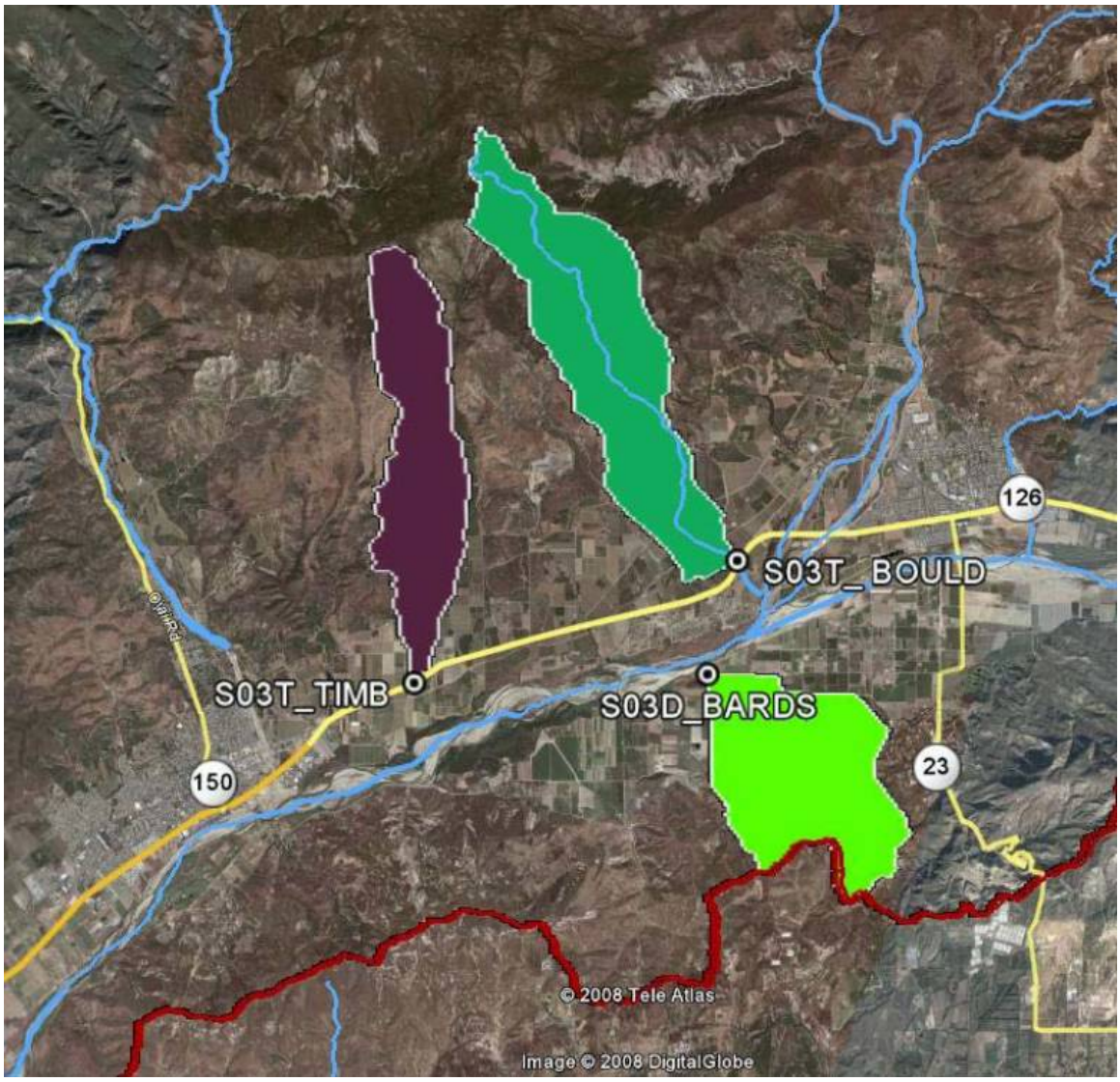


Figure 25. S03T_TIMB, S03T_BOULD, and S03D_BARDS Drainage Areas

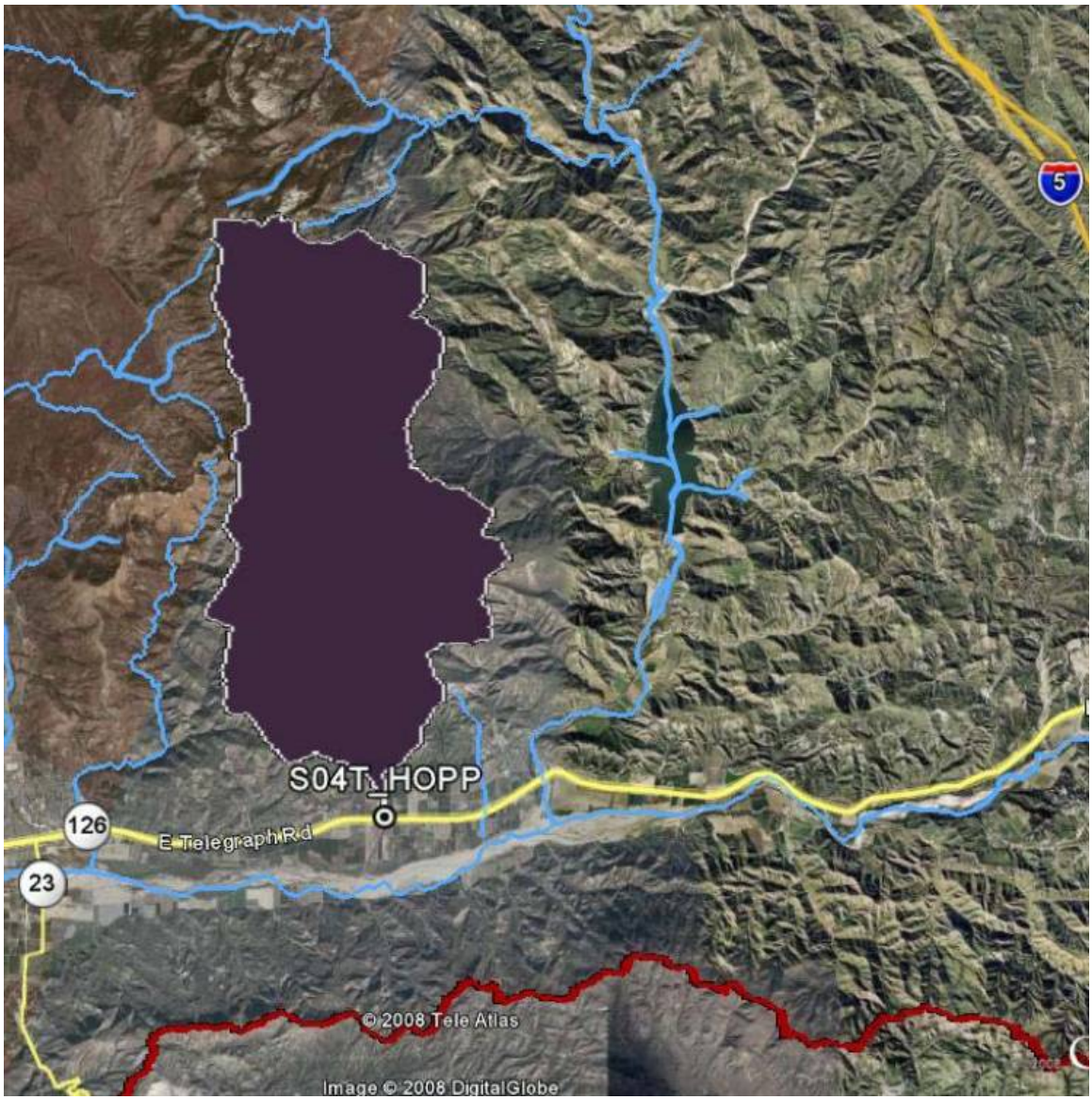


Figure 26. S04T_HOPP Drainage Area

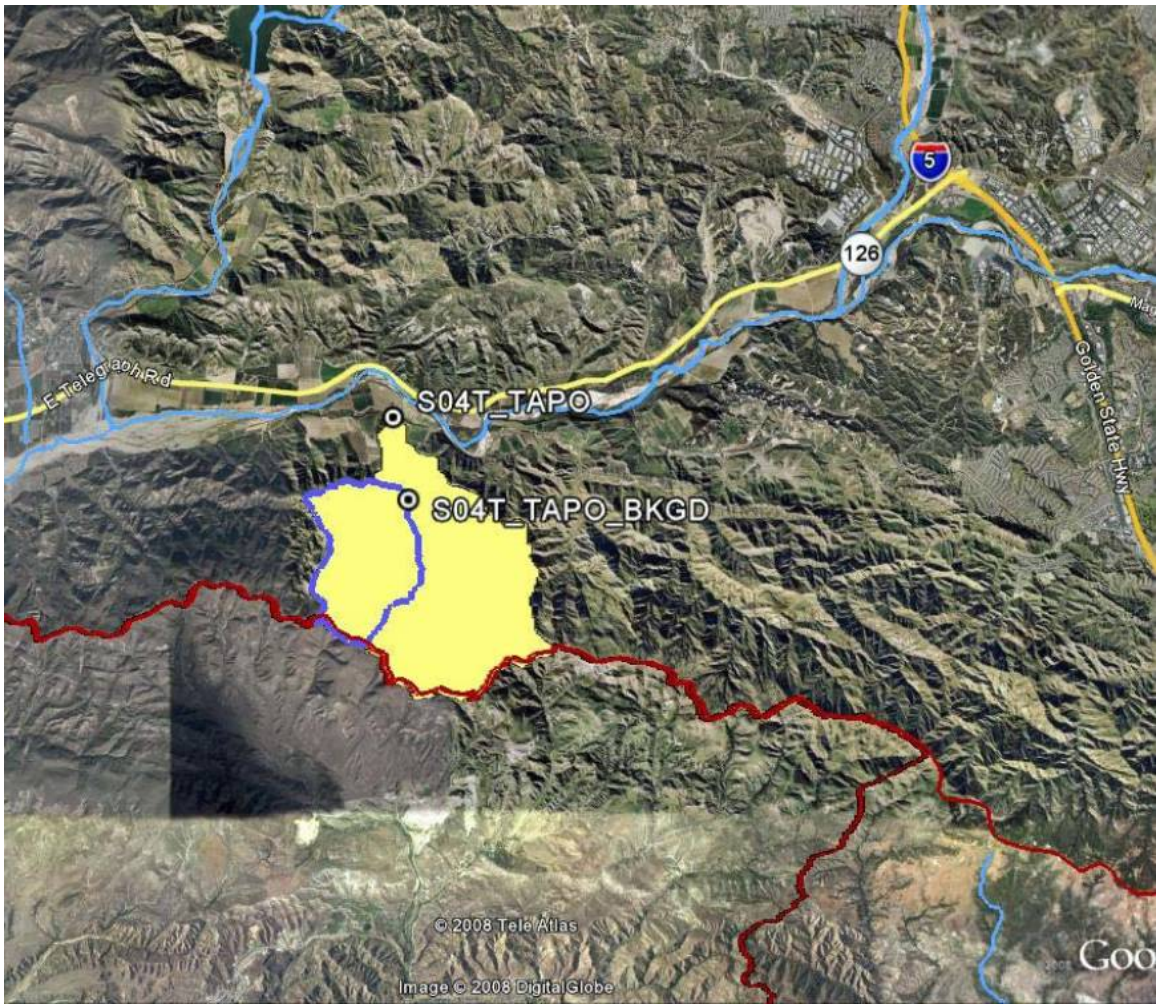


Figure 27. S04T_TAPO and S04T_TAPO_BKGD Drainage Areas

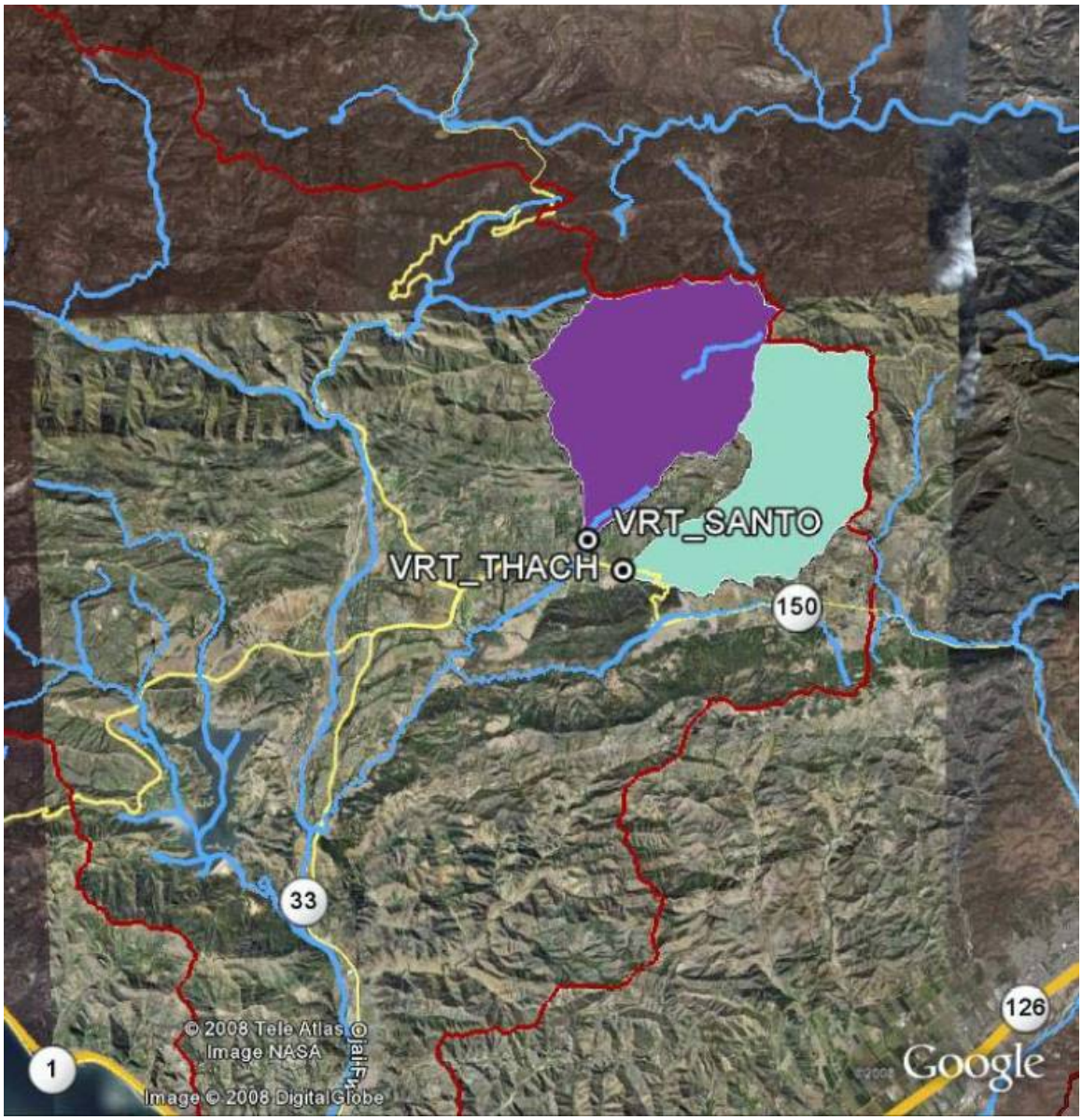


Figure 28. VRT_THACH and VRT_SANTO Drainage Areas

Appendix D

VCAILG Management Practice Survey

Management Practices		Practice Tracking					Pollutants Being Targeted/Controlled				
							Fertilization, Irrigation, & Runoff Control		Sediment Transport & Runoff Control [1]		
Sediment and Erosion Management		**Yes, Prior to Jan. 2008**	**Yes, New since Jan. 2008**	**Planned for future**	**No, Not currently used**	**N/A**	***Nitrogen***	***Salts***	***OC Pesticides***	***OP Pesticides***	***Metals***
1	Consult with local agencies (NRCS, RCD, UCCE, or county planning) to develop a soil conservation plan.								x	x	x
2	Know your soil series and its erosion hazard rating.								x	x	x
3	Consider erosion hazard rating and prevailing winds when choosing row orientation.								x	x	x
4	Long runs of production area are broken up by access roads or buffer strips.								x	x	x
5	Riparian areas or other areas of natural vegetation were retained or expanded during site development.						x	x	x	x	x
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.						x	x	x	x	x
7	Minimize compaction by using drive rows, reducing tractor passes, reducing cultivation, and avoiding driving on or tilling wet ground.								x	x	x
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.						x	x	x	x	x
9	Windbreaks or shelterbelts are used in areas prone to wind erosion.								x	x	x

	Sediment and Erosion Management continued	**Yes, Prior to Jan. 2008**	**Yes, New since Jan. 2008**	**Planned for future**	**No, Not currently used**	**N/A**	***Nitrogen***	***Salts***	***OC Pesticides***	***OP Pesticides***	***Metals***
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.						x	x	x	x	x
11	Berms, culverts, or flow channels are in place to divert water away from roads.						x	x	x	x	x
12	Road erosion is minimized by grading, using gravel or mulch on roads, or constructing water bars or drainways.								x	x	x
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.						x	x	x	x	x
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.						x	x	x	x	x
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.						x	x	x	x	x
16	Irrigation runoff is captured or kept on the property.						x	x	x	x	x
17	Stormwater runoff is captured or kept on the property.						x	x	x	x	x
18	Sediment traps are used at the end of the field to retain sediments in runoff.						x	x	x	x	x
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.						x	x	x	x	x

	Irrigation Management	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.						x	x	x	x	x
21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.						x	x	x	x	x
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab or other appropriate irrigation professionals.						x	x	x	x	x
23	When drip irrigation is used, the distribution uniformity is 90% or better.						x	x	x	x	x
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.						x	x	x	x	x
25	Filters are inspected and cleaned regularly.						x	x	x	x	x
26	Lines are flushed or cleaned chemically to prevent clogging.						x	x	x	x	x
27	Pressure regulators or pressure compensating emitters are used.						x	x	x	x	x
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.						x	x	x	x	x
29	Consistent riser heights are used.						x	x	x	x	x

	Irrigation Management continued	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.						x	x	x	x	x
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.						x	x	x	x	x
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.						x	x	x	x	x
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.						x	x	x	x	x
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.						x	x	x	x	x
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.						x	x	x	x	x
36	If irrigation must be based on a set schedule due to water availability, the amount of irrigation is varied according to the weather and plant growth stage.						x	x	x	x	x
37	Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.						x	x	x	x	x

	Irrigation Management continued	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
38	Irrigation is halted if significant runoff occurs.						x	x	x	x	x
39	Harvested or unplanted areas are not irrigated.						x	x	x	x	x
40	Irrigation water quality is tested for parameters of interest including: pH, electrical conductivity (EC), sodium (Na), chloride (Cl), bicarbonate (HCO3), and boron (B).						x	x			
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).						x	x	x	x	x
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.						x	x	x	x	x

	Pest Management	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
43	Proper scouting methods are used to determine the population densities of insect pests, snails, slugs, and weeds and the incidence of diseases. Methods include use of yellow sticky traps, use of pheromone traps, plant inspection, beating, or net sweeping or other appropriate scouting tools and methods .									x	x
44	Use weather data or degree days to determine when to control pests.									x	x
45	Use UC IPM guidelines as a resource (www.ipm.ucdavis.edu).									x	
46	Diagnostic lab services or other professional assistance is used to identify unknown pathogens, pests, or growth problems before implementing a control measure.									x	x
47	All transplants, plugs, or plant material is inspected for pests before planting or introduction in the growing area.									x	x
48	Natural enemy populations are considered when choosing pesticides, application rates, and timing.									x	x
49	Beneficial insects or mites are released in the field.									x	x
50	Personnel are aware of the causal agents of diseases in the field and their methods of spread.									x	x
51	Personnel are familiar with methods and timing of disease control.									x	x

	Pest Management continued	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
52	Disease resistance or disease tolerant crop varieties are used.									x	x
53	Classes of pesticides are rotated to avoid resistance.									x	
54	The grower or pesticide applicator considers selectivity and effectiveness against the target organism before choosing a pesticide.									x	
55	Personnel are familiar with the UC online databases for comparing the risks of different pesticides moving with water and sediment and affecting non-target organisms (WaterTox or Pesticide Wise).									x	
56	Spray timing is based on economic thresholds of pest incidence.									x	x
57	Hot spots are identified and sprayed rather than treating an entire field.									x	x
58	Sprayers are routinely calibrated to ensure accurate application rates.									x	x
59	Worn nozzles and screens are replaced to ensure the best coverage of pesticide applications.									x	x
60	Treatment rate, water volume, and driving speed are optimized to attain the coverage needed for specific pests.									x	x
61	Pesticides are applied only according to the label and environmental hazards are followed.									x	x
62	Pesticides are applied at the lowest effective labeled rate.									x	x

	Pest Management continued	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
63	Pesticide use records are submitted monthly to the county Agricultural Commissioner.									x	x
64	Pesticides are stored where they are protected from rain and contained on an impermeable pad with curb to contain spills or leaks.									x	x
65	Pesticide mixing and loading is done on an impermeable surface and more than 100 feet down slope from any wells.									x	x
66	Pesticide disposal methods are environmentally safe and in accordance to label instructions.									x	x
67	Reduced risk pesticides are used.									x	
68	Choose selective pesticides for the target pest species and avoid using broad-spectrum pesticides.									x	
69	Avoid applying pesticides when wind could move them off-target as drift.									x	x
70	Avoid applying pesticides when rain or scheduled irrigation will move the pesticides as runoff and ground percolation.									x	x
71	Copper sulfate is not applied prior to extensive irrigation or expected rainfall.							x			x
72	Copper containing pesticides are replaced with alternatives.										x

	Nutrient Management	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
73	Most recent nutrient recommendations for your particular crops and growing practices are used.						x	x			
74	Chemical properties of the soil, including pH and electrical conductivity (EC), are routinely measured.						x	x			
75	Soil fertility is routinely monitored through measurements of nitrogen, phosphorus, potassium, and micronutrients.						x	x			
76	Fertilization rates are adjusted based on the results of soil fertility measurements.						x	x			
77	Crop plants are visually assessed for signs of nutrient deficiency or toxicity.						x	x			
78	Leaf or petiole analyses are used as a guide for fertilizer application.						x	x			
79	Fertilizer applications are split into multiple smaller applications rather than applying all that is required for a crop in one large application.						x	x			
80	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.						x	x			
81	Fertilizer applications are timed to maximize plant uptake, taking into consideration the life stage of the crop, potential rain events, and irrigation timing.						x	x			
82	Slow-release fertilizers are used.						x	x			

	Nutrient Management continued	**Yes, Prior to Jan. 2008**	**Yes, New since Jan. 2008**	**Planned for future**	**No, Not currently used**	**N/A**	***Nitrogen***	***Salts***	***OC Pesticides***	***OP Pesticides***	***Metals***
83	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.						x	x			
84	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.						x	x			
85	Mixing and loading of fertilizers occurs in a covered area on an impermeable surface and more than 100 feet down slope from any wells.						x	x			
	Salinity Management and Leaching										
86	Leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).						x	x			
87	Leaching is done only when fertilizer injectors are turned off.						x	x			
88	Fertilizers and amendments with a low salt index are used.							x			
89	Saline or high selenium wells are decommissioned and other sources of water are used.							x			

	Property Management	Yes, Prior to Jan. 2008	Yes, New since Jan. 2008	Planned for future	No, Not currently used	N/A	*Nitrogen*	*Salts*	*OC Pesticides*	*OP Pesticides*	*Metals*
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry educational meetings concerning management practices that protect water resources.						x	x	x	x	x
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.						x	x	x	x	x
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.						x	x	x	x	x
93	Training is provided in the employees' native language.						x	x	x	x	x
94	Fuel tanks are checked and maintained to prevent leaks.										x
95	Spill cleanup materials are readily accessible and maintained for all potential types and sizes of spills.						x	x		x	x
96	All vehicles, trucks, and tractors are regularly maintained to detect and prevent fluid leaks.										x
97	Vehicles, machinery, and tanks no longer in use are drained of fluids, and those fluids properly disposed.										x

	Property Management continued	**Yes, Prior to Jan. 2008**	**Yes, New since Jan. 2008**	**Planned for future**	**No, Not currently used**	**N/A**	***Nitrogen***	***Salts***	***OC Pesticides***	***OP Pesticides***	***Metals***
98	The property is kept clean and free of debris.										
99	The property has an adequate number of waste containers that are regularly collected to prevent overflow and are kept covered to prevent scattering of trash.										
100	Restrooms or portable toilets are available where needed and regularly maintained.										

[1] Previous samplings have shown pesticides and metals to have caused toxicity. Therefore, BMPs that address these classes of constituents will also mitigate toxicity exceedances.

Appendix E

VCAILG Management Practice Survey Results

Salts Related Management Practices–Survey Results

		Current Status			Improvement		
		Percent of Applicable Acres Employing the BMP by the Time of the Survey			Percent of Applicable Acres Unmanaged Before Jan 2008 that Became Managed After Jan 2008		
	Sediment and Erosion Management	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO
5	Riparian areas or other areas of natural vegetation were retained or expanded during site development.	36%	88%	100%	0%	0%	NA
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.	100%	100%	100%	NA	100%	NA
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.	88%	77%	100%	0%	0%	NA
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.	0%	100%	100%	0%	NA	NA
11	Berms, culverts, or flow channels are in place to divert water away from roads.	0%	96%	100%	0%	0%	NA
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.	41%	100%	100%	0%	NA	NA
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.	100%	100%	87%	0%	NA	0%
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.	100%	68%	88%	0%	57%	0%
16	Irrigation runoff is captured or kept on the property.	17%	11%	7%	17%	0%	0%
17	Stormwater runoff is captured or kept on the property.	0%	0%	0%	0%	0%	0%
18	Sediment traps are used at the end of the field to retain sediments in runoff.	42%	20%	7%	0%	0%	0%
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	0%	71%	0%	0%	0%	0%

	Irrigation Management	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.	100%	75%	88%	100%	69%	0%
21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	12%	91%	0%	12%	87%	0%
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab or other appropriate irrigation professionals.	83%	96%	88%	41%	0%	0%
23	When drip irrigation is used, the distribution uniformity is 90% or better.	100%	90%	100%	100%	0%	NA
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.	100%	100%	100%	NA	NA	NA
25	Filters are inspected and cleaned regularly.	100%	100%	100%	NA	NA	NA
26	Lines are flushed or cleaned chemically to prevent clogging.	71%	95%	88%	0%	0%	0%
27	Pressure regulators or pressure compensating emitters are used.	100%	95%	88%	100%	0%	0%
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.	100%	100%	100%	NA	NA	NA
29	Consistent riser heights are used.	100%	100%	100%	NA	NA	NA
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.	100%	100%	100%	NA	NA	NA
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.	100%	100%	100%	NA	NA	NA
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.	83%	82%	100%	0%	0%	NA
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.	100%	96%	93%	0%	57%	0%
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	83%	21%	19%	0%	0%	0%

	Irrigation Management continued	05D_SANT _VCWPD	S02T_TODD	S04T_TAPO	05D_SANT _VCWPD	S02T_TODD	S04T_TAPO
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	12%	73%	12%	12%	0%	0%
36	If irrigation must be based on a set schedule due to water availability, the amount of irrigation is varied according to the weather and plant growth stage.	100%	100%	100%	NA	100%	NA
37	Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.	51%	100%	100%	45%	100%	NA
38	Irrigation is halted if significant runoff occurs.	100%	100%	100%	NA	100%	NA
39	Harvested or unplanted areas are not irrigated.	75%	100%	100%	0%	NA	NA
40	Irrigation water quality is tested for parameters of interest including: pH, electrical conductivity (EC), sodium (Na), chloride (Cl), bicarbonate (HCO3), and boron (B).	100%	95%	100%	99%	64%	NA
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).	100%	100%	100%	NA	NA	NA
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.	100%	100%	100%	NA	100%	NA
	Pest Management						
71	Copper sulfate is not applied prior to extensive irrigation or expected rainfall.	88%	95%	100%	0%	0%	NA

	Nutrient Management	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO
73	Most recent nutrient recommendations for your particular crops and growing practices are used.	83%	96%	100%	0%	0%	NA
74	Chemical properties of the soil, including pH and electrical conductivity (EC), are routinely measured.	12%	86%	19%	12%	0%	0%
75	Soil fertility is routinely monitored through measurements of nitrogen, phosphorus, potassium, and micronutrients.	83%	96%	100%	41%	0%	NA
76	Fertilization rates are adjusted based on the results of soil fertility measurements.	83%	100%	100%	41%	NA	NA
77	Crop plants are visually assessed for signs of nutrient deficiency or toxicity.	100%	100%	100%	NA	NA	NA
78	Leaf or petiole analyses are used as a guide for fertilizer application.	83%	100%	93%	0%	NA	0%
79	Fertilizer applications are split into multiple smaller applications rather than applying all that is required for a crop in one large application.	100%	100%	100%	100%	NA	NA
80	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.	100%	91%	7%	98%	86%	0%
81	Fertilizer applications are timed to maximize plant uptake, taking into consideration the life stage of the crop, potential rain events, and irrigation timing.	100%	100%	100%	NA	NA	NA
82	Slow-release fertilizers are used.	12%	69%	100%	0%	7%	NA
83	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.	100%	95%	100%	100%	0%	NA
84	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.	100%	74%	100%	NA	0%	NA
85	Mixing and loading of fertilizers occurs in a covered area on an impermeable surface and more than 100 feet down slope from any wells.	61%	100%	81%	0%	NA	0%

	Salinity Management and Leaching	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO	05D_SANT_VCWPD	S02T_TODD	S04T_TAPO
86	Leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).	83%	42%	36%	41%	11%	0%
87	Leaching is done only when fertilizer injectors are turned off.	69%	42%	100%	28%	0%	NA
88	Fertilizers and amendments with a low salt index are used.	69%	100%	100%	0%	NA	NA
89	Saline or high selenium wells are decommissioned and other sources of water are used.	0%	100%	100%	0%	NA	NA
	Property Management						
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry educational meetings concerning management practices that protect water resources.	51%	100%	100%	0%	100%	NA
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.	100%	100%	100%	0%	NA	NA
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.	100%	100%	100%	NA	100%	NA
93	Training is provided in the employees' native language.	100%	100%	100%	NA	100%	NA
95	Spill cleanup materials are readily accessible and maintained for all potential types and sizes of spills.	69%	78%	100%	0%	0%	NA

Nitrogen Related Management Practices–Survey Results

		Current Status				Improvement			
		Percent of Applicable Acres Employing the BMP by the Time of the Survey				Percent of Applicable Acres Unmanaged Before Jan 2008 that Became Managed After Jan 2008			
	Sediment and Erosion Management	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO
5	Riparian areas or other areas of natural vegetation were retained or expanded during site development.	36%	88%	100%	100%	0%	0%	100%	NA
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.	100%	100%	100%	100%	NA	100%	100%	NA
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.	88%	77%	93%	100%	0%	0%	38%	NA
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.	0%	100%	100%	100%	0%	NA	NA	NA
11	Berms, culverts, or flow channels are in place to divert water away from roads.	0%	96%	93%	100%	0%	0%	0%	NA
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.	41%	100%	100%	100%	0%	NA	NA	NA
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.	100%	100%	76%	87%	0%	NA	0%	0%
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.	100%	68%	93%	88%	0%	57%	0%	0%
16	Irrigation runoff is captured or kept on the property.	17%	11%	7%	7%	17%	0%	0%	0%
17	Stormwater runoff is captured or kept on the property.	0%	0%	7%	0%	0%	0%	0%	0%
18	Sediment traps are used at the end of the field to retain sediments in runoff.	42%	20%	39%	7%	0%	0%	0%	0%
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	0%	71%	76%	0%	0%	0%	0%	0%

	Irrigation Management	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.	100%	75%	90%	88%	100%	69%	0%	0%
21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	12%	91%	80%	0%	12%	87%	30%	0%
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab or other appropriate irrigation professionals.	83%	96%	93%	88%	41%	0%	38%	0%
23	When drip irrigation is used, the distribution uniformity is 90% or better.	100%	90%	93%	100%	100%	0%	0%	NA
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.	100%	100%	93%	100%	NA	NA	0%	NA
25	Filters are inspected and cleaned regularly.	100%	100%	93%	100%	NA	NA	0%	NA
26	Lines are flushed or cleaned chemically to prevent clogging.	71%	95%	89%	88%	0%	0%	0%	0%
27	Pressure regulators or pressure compensating emitters are used.	100%	95%	100%	88%	100%	0%	NA	0%
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.	100%	100%	100%	100%	NA	NA	NA	NA
29	Consistent riser heights are used.	100%	100%	100%	100%	NA	NA	NA	NA
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.	100%	100%	97%	100%	NA	NA	0%	NA
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.	100%	100%	100%	100%	NA	NA	NA	NA
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.	83%	82%	28%	100%	0%	0%	0%	NA

	Irrigation Management continued	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.	100%	96%	91%	93%	0%	57%	0%	0%
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	83%	21%	20%	19%	0%	0%	0%	0%
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	12%	73%	0%	12%	12%	0%	0%	0%
36	If irrigation must be based on a set schedule due to water availability, the amount of irrigation is varied according to the weather and plant growth stage.	100%	100%	100%	100%	NA	100%	NA	NA
37	Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.	51%	100%	97%	100%	45%	100%	58%	NA
38	Irrigation is halted if significant runoff occurs.	100%	100%	93%	100%	NA	100%	38%	NA
39	Harvested or unplanted areas are not irrigated.	75%	100%	97%	100%	0%	NA	0%	NA
40	Irrigation water quality is tested for parameters of interest including: pH, electrical conductivity (EC), sodium (Na), chloride (Cl), bicarbonate (HCO3), and boron (B).	100%	95%	100%	100%	99%	64%	NA	NA
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).	100%	100%	100%	100%	NA	NA	NA	NA

	Irrigation Management continued	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.	100%	100%	100%	100%	NA	100%	NA	NA
	Nutrient Management								
73	Most recent nutrient recommendations for your particular crops and growing practices are used.	83%	96%	100%	100%	0%	0%	100%	NA
74	Chemical properties of the soil, including pH and electrical conductivity (EC), are routinely measured.	12%	86%	100%	19%	12%	0%	NA	0%
75	Soil fertility is routinely monitored through measurements of nitrogen, phosphorus, potassium, and micronutrients.	83%	96%	100%	100%	41%	0%	100%	NA
76	Fertilization rates are adjusted based on the results of soil fertility measurements.	83%	100%	100%	100%	41%	NA	100%	NA
77	Crop plants are visually assessed for signs of nutrient deficiency or toxicity.	100%	100%	100%	100%	NA	NA	NA	NA
78	Leaf or petiole analyses are used as a guide for fertilizer application.	83%	100%	97%	93%	0%	NA	0%	0%
79	Fertilizer applications are split into multiple smaller applications rather than applying all that is required for a crop in one large application.	100%	100%	100%	100%	100%	NA	NA	NA
80	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.	100%	91%	100%	7%	98%	86%	100%	0%
81	Fertilizer applications are timed to maximize plant uptake, taking into consideration the life stage of the crop, potential rain events, and irrigation timing.	100%	100%	93%	100%	NA	NA	0%	NA
82	Slow-release fertilizers are used.	12%	69%	89%	100%	0%	7%	0%	NA
83	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.	100%	95%	89%	100%	100%	0%	0%	NA

	Nutrient Management continued	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO	05D_SANT _VCWPD	S02T_ TODD	OXD_ CENTR	S04T_ TAPO
84	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.	100%	74%	97%	100%	NA	0%	58%	NA
85	Mixing and loading of fertilizers occurs in a covered area on an impermeable surface and more than 100 feet down slope from any wells.	61%	100%	54%	81%	0%	NA	0%	0%
	Salinity Management and Leaching								
86	Leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).	83%	42%	100%	36%	41%	11%	NA	0%
87	Leaching is done only when fertilizer injectors are turned off.	69%	42%	93%	100%	28%	0%	0%	NA
	Property Management								
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry educational meetings concerning management practices that protect water resources.	51%	100%	100%	100%	0%	100%	100%	NA
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.	100%	100%	100%	100%	0%	NA	100%	NA
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.	100%	100%	100%	100%	NA	100%	NA	NA
93	Training is provided in the employees' native language.	100%	100%	100%	100%	NA	100%	NA	NA
95	Spill cleanup materials are readily accessible and maintained for all potential types and sizes of spills.	69%	78%	91%	100%	0%	0%	34%	NA

OC Pesticides Management Practices–Survey Results

		Current Status				Improvement			
		Percent of Applicable Acres Employing the BMP by the Time of the Survey				Percent of Applicable Acres Unmanaged Before Jan 2008 that Became Managed After Jan 2008			
	Sediment and Erosion Management	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO
1	Consult with local agencies (NRCS, RCD, UCCE, or county planning) to develop a soil conservation plan.	29%	12%	43%	0%	0%	0%	0%	0%
2	Know your soil series and its erosion hazard rating.	82%	51%	40%	18%	0%	0%	0%	0%
3	Consider erosion hazard rating and prevailing winds when choosing row orientation.	100%	100%	89%	0%	NA	0%	0%	0%
4	Long runs of production area are broken up by access roads or buffer strips.	100%	88%	100%	100%	NA	0%	NA	NA
5	Riparian areas or other areas of natural vegetation were retained or expanded during site development.	66%	36%	100%	100%	35%	0%	100%	NA
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.	100%	100%	100%	100%	100%	NA	100%	NA
7	Minimize compaction by using drive rows, reducing tractor passes, reducing cultivation, and avoiding driving on or tilling wet ground.	100%	100%	100%	100%	100%	NA	NA	NA
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.	100%	88%	93%	100%	100%	0%	38%	NA
9	Windbreaks or shelterbelts are used in areas prone to wind erosion.	100%	83%	40%	1%	NA	0%	0%	0%
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.	100%	0%	100%	100%	100%	0%	NA	NA
11	Berms, culverts, or flow channels are in place to divert water away from roads.	100%	100%	93%	100%	100%	NA	0%	NA
12	Road erosion is minimized by grading, using gravel or mulch on roads, or constructing water bars or drainways.	85%	100%	93%	99%	54%	NA	0%	0%

	Sediment and Erosion Management	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.	100%	1%	100%	100%	100%	0%	NA	NA
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.	100%	95%	76%	87%	NA	0%	0%	0%
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.	100%	92%	93%	88%	100%	0%	0%	0%
16	Irrigation runoff is captured or kept on the property.	0%	0%	7%	7%	0%	0%	0%	0%
17	Stormwater runoff is captured or kept on the property.	0%	0%	7%	0%	0%	0%	0%	0%
18	Sediment traps are used at the end of the field to retain sediments in runoff.	19%	28%	39%	7%	6%	0%	0%	0%
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	19%	0%	76%	0%	0%	0%	0%	0%
	Irrigation Management								
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.	100%	95%	90%	88%	100%	89%	0%	0%
21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	38%	0%	80%	0%	26%	0%	30%	0%
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab or other appropriate irrigation professionals.	100%	84%	93%	88%	100%	41%	38%	0%
23	When drip irrigation is used, the distribution uniformity is 90% or better.	100%	100%	93%	100%	NA	100%	0%	NA
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.	100%	100%	93%	100%	100%	NA	0%	NA
25	Filters are inspected and cleaned regularly.	100%	100%	93%	100%	100%	NA	0%	NA

	Irrigation Management continued	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO
26	Lines are flushed or cleaned chemically to prevent clogging.	81%	83%	89%	88%	0%	0%	0%	0%
27	Pressure regulators or pressure compensating emitters are used.	100%	100%	100%	88%	100%	100%	NA	0%
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.	85%	100%	100%	100%	54%	NA	NA	NA
29	Consistent riser heights are used.	100%	100%	100%	100%	100%	NA	NA	NA
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.	100%	100%	97%	100%	NA	NA	0%	NA
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.	53%	100%	100%	100%	0%	NA	NA	NA
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.	66%	82%	28%	100%	35%	0%	0%	NA
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.	66%	56%	91%	93%	44%	0%	0%	0%
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	81%	78%	20%	19%	36%	0%	0%	0%
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	32%	0%	0%	12%	11%	0%	0%	0%
36	If irrigation must be based on a set schedule due to water availability, the amount of irrigation is varied according to the weather and plant growth stage.	100%	100%	100%	100%	NA	NA	NA	NA
37	Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.	100%	40%	97%	100%	100%	39%	58%	NA
38	Irrigation is halted if significant runoff occurs.	90%	100%	93%	100%	66%	NA	38%	NA

	Irrigation Management continued	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO	05D_ LAVD	05D_SANT _VCWPD	OXD_ CENTR	S04T_ TAPO
39	Harvested or unplanted areas are not irrigated.	66%	72%	97%	100%	35%	0%	0%	NA
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).	100%	100%	100%	100%	100%	NA	NA	NA
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.	100%	100%	100%	100%	100%	NA	NA	NA
	Property Management								
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry educational meetings concerning management practices that protect water resources.	90%	51%	100%	100%	68%	0%	100%	NA
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.	100%	100%	100%	100%	100%	0%	100%	NA
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.	100%	100%	100%	100%	100%	NA	NA	NA
93	Training is provided in the employees' native language.	91%	100%	100%	100%	68%	NA	NA	NA

OP Pesticides Management Practices–Survey Results

		Current Status			Improvement		
		Percent of Applicable Acres Employing the BMP by the Time of the Survey			Percent of Applicable Acres Unmanaged Before Jan 2008 that Became Managed After Jan 2008		
	Sediment and Erosion Management	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR
1	Consult with local agencies (NRCS, RCD, UCCE, or county planning) to develop a soil conservation plan.	29%	12%	43%	0%	0%	0%
2	Know your soil series and its erosion hazard rating.	82%	51%	40%	0%	0%	0%
3	Consider erosion hazard rating and prevailing winds when choosing row orientation.	100%	100%	89%	NA	0%	0%
4	Long runs of production area are broken up by access roads or buffer strips.	100%	88%	100%	NA	0%	NA
5	Riparian areas or other areas of natural vegetation were retained or expanded during site development.	66%	36%	100%	35%	0%	100%
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.	100%	100%	100%	100%	NA	100%
7	Minimize compaction by using drive rows, reducing tractor passes, reducing cultivation, and avoiding driving on or tilling wet ground.	100%	100%	100%	100%	NA	NA
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.	100%	88%	93%	100%	0%	38%
9	Windbreaks or shelterbelts are used in areas prone to wind erosion.	100%	83%	40%	NA	0%	0%
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.	100%	0%	100%	100%	0%	NA
11	Berms, culverts, or flow channels are in place to divert water away from roads.	100%	100%	93%	100%	NA	0%
12	Road erosion is minimized by grading, using gravel or mulch on roads, or constructing water bars or drainways.	85%	100%	93%	54%	NA	0%
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.	100%	1%	100%	100%	0%	NA

	Sediment and Erosion Management	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.	100%	95%	76%	NA	0%	0%
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.	100%	92%	93%	100%	0%	0%
16	Irrigation runoff is captured or kept on the property.	0%	0%	7%	0%	0%	0%
17	Stormwater runoff is captured or kept on the property.	0%	0%	7%	0%	0%	0%
18	Sediment traps are used at the end of the field to retain sediments in runoff.	19%	28%	39%	6%	0%	0%
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.	19%	0%	76%	0%	0%	0%
	Irrigation Management						
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.	100%	95%	90%	100%	89%	0%
21	Utilize the services of the Irrigation Mobile Lab or a professional irrigation consultant for evaluating irrigation system performance.	38%	0%	80%	26%	0%	30%
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab or other appropriate irrigation professionals.	100%	84%	93%	100%	41%	38%
23	When drip irrigation is used, the distribution uniformity is 90% or better.	100%	100%	93%	NA	100%	0%
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.	100%	100%	93%	100%	NA	0%
25	Filters are inspected and cleaned regularly.	100%	100%	93%	100%	NA	0%
26	Lines are flushed or cleaned chemically to prevent clogging.	81%	83%	89%	0%	0%	0%
27	Pressure regulators or pressure compensating emitters are used.	100%	100%	100%	100%	100%	NA

	Irrigation Management continued	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.	85%	100%	100%	54%	NA	NA
29	Consistent riser heights are used.	100%	100%	100%	100%	NA	NA
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.	100%	100%	97%	NA	NA	0%
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.	53%	100%	100%	0%	NA	NA
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.	66%	82%	28%	35%	0%	0%
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.	66%	56%	91%	44%	0%	0%
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.	81%	78%	20%	37%	0%	0%
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.	32%	0%	0%	11%	0%	0%
36	If irrigation must be based on a set schedule due to water availability, the amount of irrigation is varied according to the weather and plant growth stage.	100%	100%	100%	NA	NA	NA
37	Flow meters are used to measure actual water use and is coupled with known crop use values or other measurements to conserve water as appropriate.	100%	40%	97%	100%	39%	58%
38	Irrigation is halted if significant runoff occurs.	90%	100%	93%	66%	NA	38%
39	Harvested or unplanted areas are not irrigated.	66%	72%	97%	35%	0%	0%

	Irrigation Management continued	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).	100%	100%	100%	100%	NA	NA
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.	100%	100%	100%	100%	NA	NA
	Pest Management						
43	Proper scouting methods are used to determine the population densities of insect pests, snails, slugs, and weeds and the incidence of diseases. Methods include use of yellow sticky traps, use of pheromone traps, plant inspection, beating, or net sweeping or other appropriate scouting tools and methods .	100%	100%	100%	100%	NA	NA
44	Use weather data or degree days to determine when to control pests.	100%	69%	100%	100%	0%	100%
45	Use UC IPM guidelines as a resource (www.ipm.ucdavis.edu).	32%	61%	40%	0%	0%	0%
46	Diagnostic lab services or other professional assistance is used to identify unknown pathogens, pests, or growth problems before implementing a control measure.	100%	100%	90%	100%	NA	0%
47	All transplants, plugs, or plant material is inspected for pests before planting or introduction in the growing area.	100%	100%	100%	100%	NA	NA
48	Natural enemy populations are considered when choosing pesticides, application rates, and timing.	100%	100%	100%	100%	NA	100%
49	Beneficial insects or mites are released in the field.	82%	39%	93%	50%	0%	38%
50	Personnel are aware of the causal agents of diseases in the field and their methods of spread.	100%	100%	90%	100%	NA	0%
51	Personnel are familiar with methods and timing of disease control in the growing region.	100%	100%	90%	100%	NA	0%

	Pest Management continued	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR
52	Disease resistance or disease tolerant crop varieties are used.	100%	100%	96%	100%	NA	0%
53	Classes of pesticides are rotated to avoid resistance.	82%	100%	100%	0%	NA	100%
54	The grower or pesticide applicator considers selectivity and effectiveness against the target organism before choosing a pesticide.	100%	100%	100%	100%	NA	NA
55	Personnel are familiar with the UC online databases for comparing the risks of different pesticides moving with water and sediment and affecting non-target organisms (WaterTox or Pesticide Wise).	14%	12%	85%	5%	0%	0%
56	Spray timing is based on economic thresholds of pest incidence.	100%	100%	96%	100%	NA	62%
57	Hot spots are identified and sprayed rather than treating an entire field.	85%	39%	100%	80%	39%	100%
58	Sprayers are routinely calibrated to ensure accurate application rates.	91%	100%	100%	68%	NA	NA
59	Worn nozzles and screens are replaced to ensure the best coverage of pesticide applications.	100%	100%	100%	100%	NA	NA
60	Treatment rate, water volume, and driving speed are optimized to attain the coverage needed for specific pests.	100%	100%	100%	100%	NA	100%
61	Pesticides are applied only according to the label and environmental hazards are followed.	100%	100%	100%	100%	NA	NA
62	Pesticides are applied at the lowest effective labeled rate.	90%	83%	89%	66%	0%	22%
63	Pesticide use records are submitted monthly to the county Agricultural Commissioner.	91%	100%	100%	68%	NA	100%
64	Pesticides are stored where they are protected from rain and contained on an impermeable pad with curb to contain spills or leaks.	100%	100%	100%	100%	NA	NA
65	Pesticide mixing and loading is done on an impermeable surface and more than 100 feet down slope from any wells.	56%	61%	97%	29%	0%	69%

	Pest Management continued	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR	05D_LAVD	05D_SANT_ VCWPD	OXD_ CENTR
66	Pesticide disposal methods are environmentally safe and in accordance to label instructions.	100%	100%	100%	100%	NA	100%
67	Reduced risk pesticides are used.	100%	100%	100%	100%	NA	100%
68	Choose selective pesticides for the target pest species and avoid using broad-spectrum pesticides.	100%	100%	100%	100%	NA	100%
69	Avoid applying pesticides when wind could move them off-target as drift.	100%	100%	100%	100%	NA	NA
70	Avoid applying pesticides when rain or scheduled irrigation will move the pesticides as runoff and ground percolation.	100%	100%	100%	100%	NA	100%
	Property Management						
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry educational meetings concerning management practices that protect water resources.	90%	51%	100%	68%	0%	100%
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.	100%	100%	100%	100%	0%	100%
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.	100%	100%	100%	100%	NA	NA
93	Training is provided in the employees' native language.	91%	100%	100%	68%	NA	NA
95	Spill cleanup materials are readily accessible and maintained for all potential types and sizes of spills.	82%	69%	81%	50%	0%	19%

Appendix F

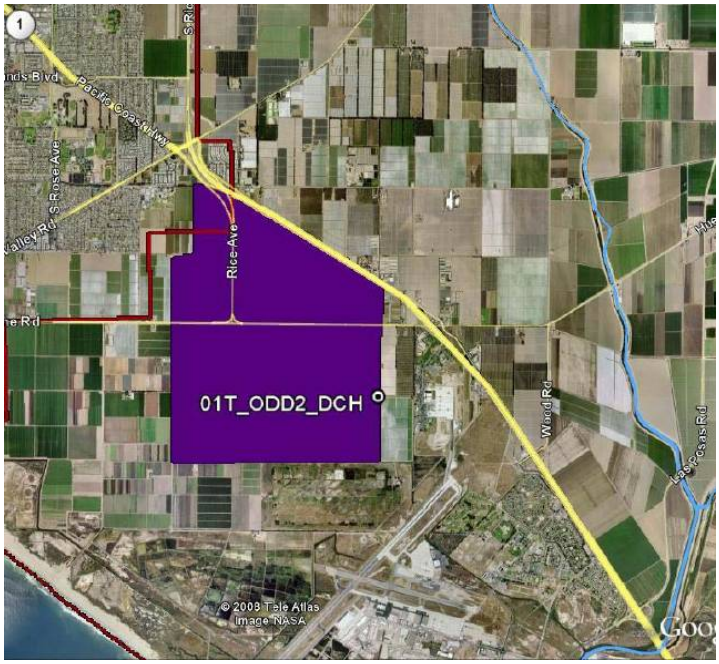
Management Practice Survey Cover Sheets

Management Practice Survey:
Supplemental Information for the Duck Pond (01T_ODD2_DCH)

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 and 2008 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the Duck Pond/Oxnard Drain #2 monitoring site



These are the water quality benchmark exceedances found at 01T_ODD2_DCH:

Dry Weather

- Nitrogen
- OC Pesticides (ie. DDT)

Wet Weather

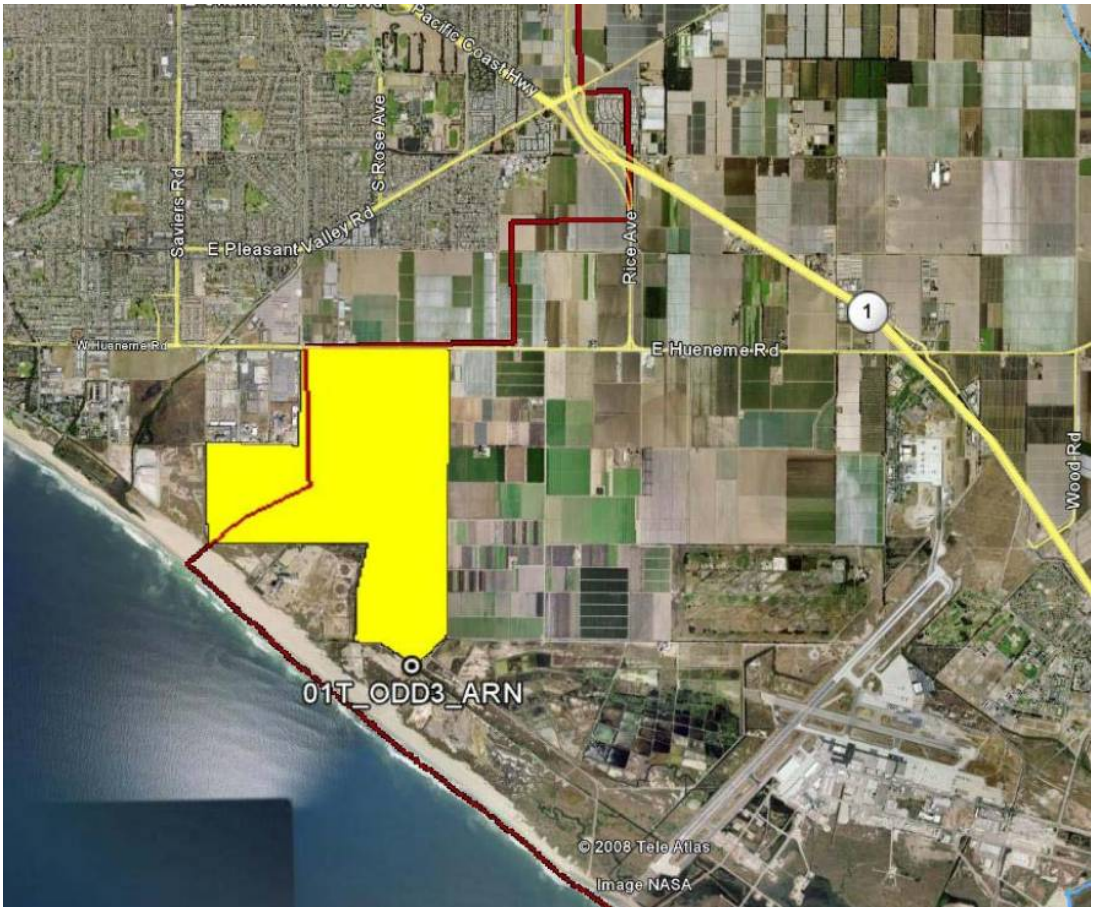
- Nitrogen
- OC Pesticides (ie. DDT)
- OP Pesticides (chlorpyrifos/lorsban)
- Chronic Toxicity

Management Practice Survey:
Supplemental Information for Oxnard Drain #3 at Arnold Road (01T_ODD3_ARN)

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 and 2008 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the Oxnard Drain #3 at Arnold Road monitoring site



These are the water quality benchmark exceedances found at 01T_ODD3_ARN:

Dry Weather

- Nitrogen
- OC Pesticides (ie. DDT, toxaphene)

Wet Weather

- Nitrogen
- OC Pesticides (ie. DDT)

Management Practice Survey:
Supplemental Information for the Central Ditch (02D_BROOM)

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 and 2008 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the Broome Ranch Road monitoring site

These are the water quality benchmark exceedances found at 02D_BROOM:

Dry Weather

- Nitrogen
- OC Pesticides (ie. DDT)
- Dissolved Oxygen

Wet Weather

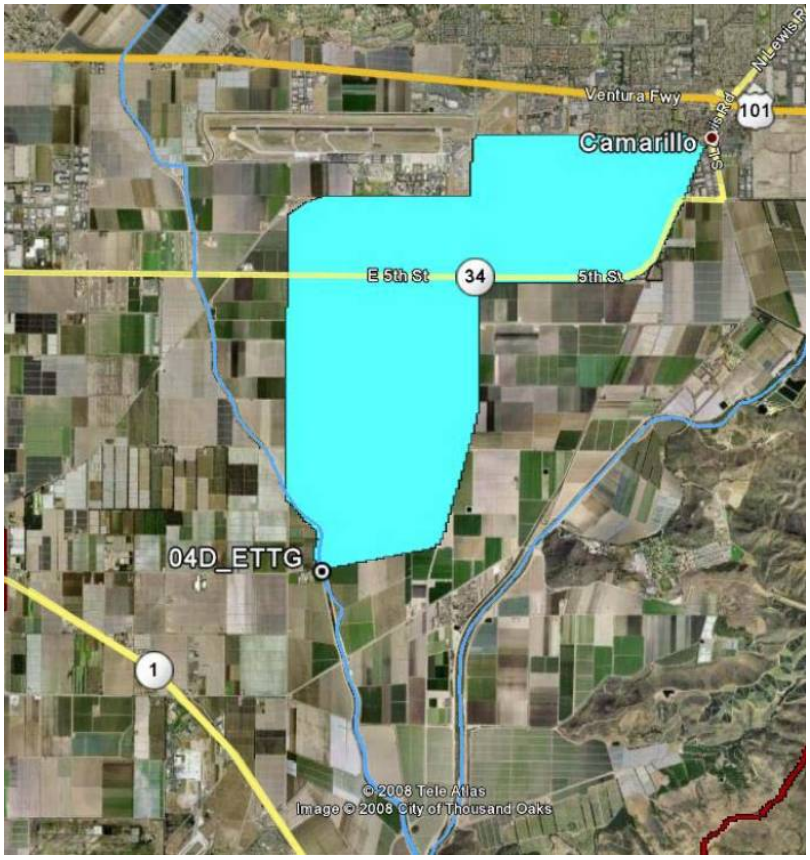
- Nitrogen
- OC Pesticides (ie. DDT)

Management Practice Survey:
Supplemental Information for Revolon Slough at Etting Road (04D_ETTG)

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 and 2008 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to ***Revolon Slough at Etting Road***



These are the water quality benchmark exceedances found at 04D_ETTG:

Dry Weather

- Nitrogen
- OC Pesticides (ie. DDT)
- OP Pesticides (chlorpyrifos/lorsban)

Wet Weather

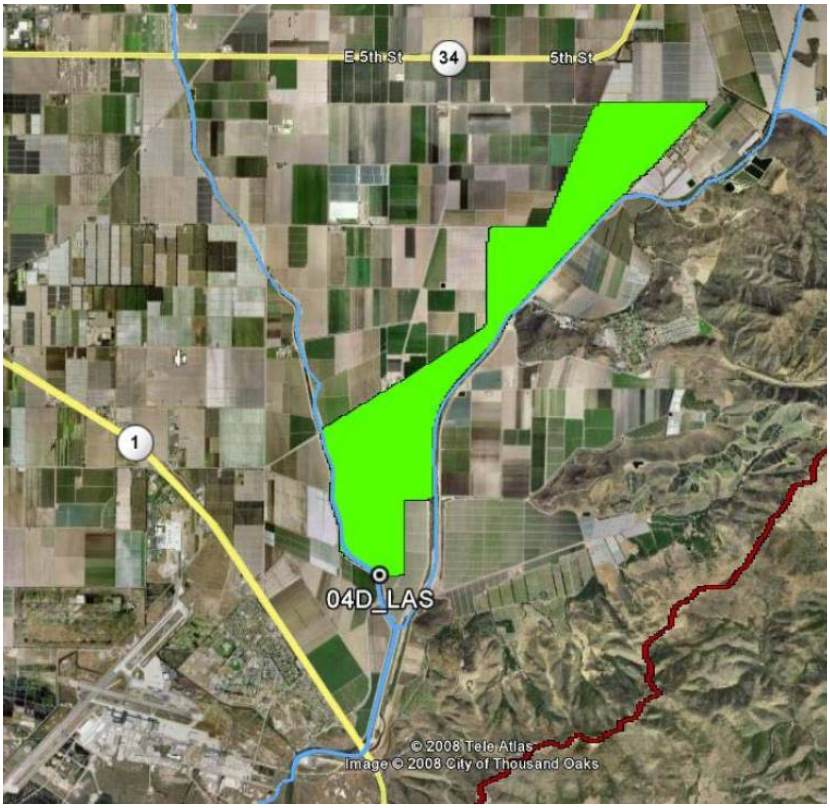
- Nitrogen
- OC Pesticides (ie. DDT)
- OP Pesticides (chlorpyrifos/lorsban)

Management Practice Survey:
Supplemental Information for Revolon Slough at S. Las Posas Road (04D_LAS)

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 and 2008 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to Revolon Slough at South Las Posas Road



These are the water quality benchmark exceedances found at 04D_LAS:

Dry Weather

- Nitrogen
- OC Pesticides (DDT, toxaphene)
- OP Pesticides (chlorpyrifos, diazinon)
- Temperature

Wet Weather

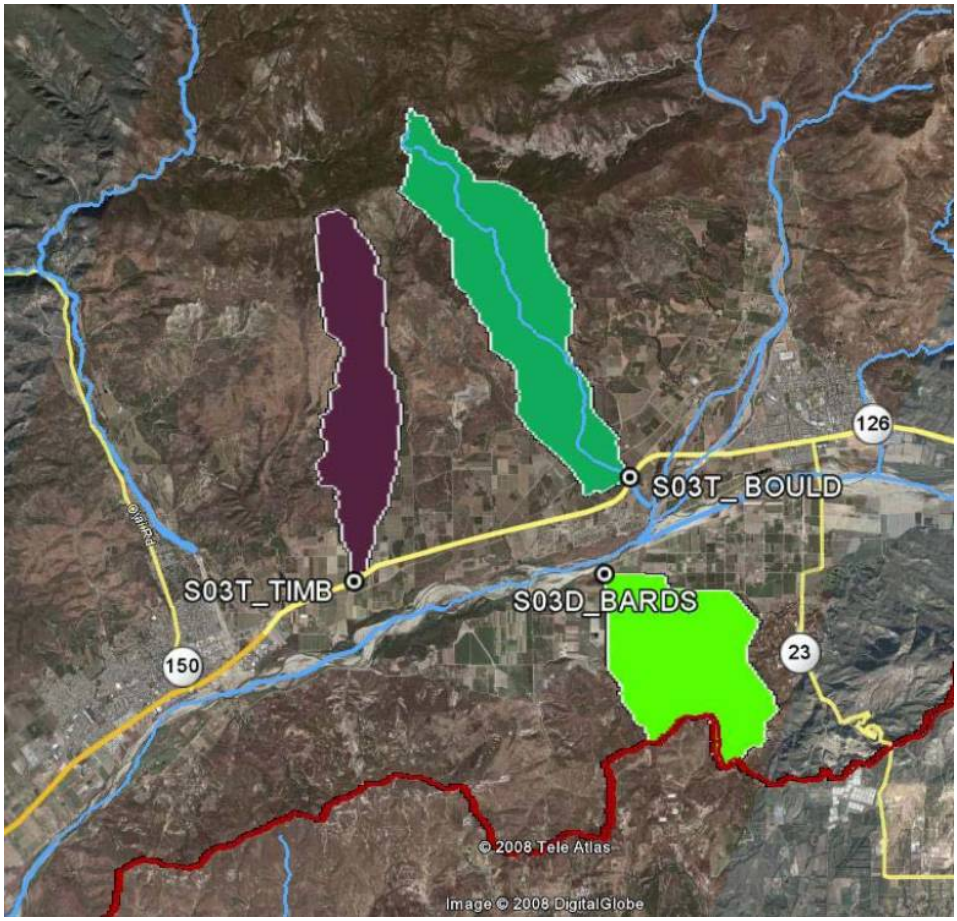
- Nitrogen
- OC Pesticides (DDT, chlordane)
- OP Pesticides (chlorpyrifos/lorsban)

Management Practice Survey:
Supplemental Information for Boulder Creek (S03T_BOULD)

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 and 2008 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the Boulder Creek monitoring site.



These are the water quality benchmark exceedances found at S03T_BOULD:

Dry Weather

- Nitrogen
- Salts

Wet Weather

- Chronic Toxicity
- OC Pesticides (chlordane)