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SACRAMENTO VALLEY
WATER QUALITY COALITION

Water Quality Management Plan Progress Report

Prepared by

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Executive Summary

The purpose of this document is to provide an update on the status of the Sacramento Valley Water Quality Coalition's (Coalition) Water Quality Management Plan (2009 Management Plan), which was reorganized into the Comprehensive Surface Water Quality Management Plan (CSQMP) in 2015. Annual updates to the Coalition's Water Quality Management Plan are called Water Quality Management Plan Progress Reports or simply Management Plan Progress Report (MPPR). The Coalition's Waste Discharge Requirements (WDR), Order No. R5-2014-0030-R1, specify the requirements for separate surface water Management Plans, and allows the Coalition to satisfy these requirements by updating the Surface Water Quality Management Plan previously approved under the Coalition Group Conditional Waiver to conform to the Order and the Monitoring and Reporting Program (MRP). The updated CSQMP must conform to the requirements specified for separate Management Plans, but the WDR allows existing individual Management Plans developed under the Coalition's Conditional Waiver (Conditional Waiver Order R5-2006-0053) to continue to apply under this Order. The approved CSQMP was most recently updated in November 2016.

In general terms, the processes to meet the requirements of the CSQMP can be distilled to these elements – source evaluation, identification of management practices needed to address exceedances, implementation of management practices, evaluation of effectiveness, and regular assessment of progress toward completion of the individual Management Plan. The Coalition has successfully developed and implemented processes for source evaluation and identification of management practices needed. Source evaluations have been completed and provided to the Central Valley Regional Water Quality Control Board (Regional Water Board) for a large number of management plan requirements for pesticides, toxicity, pathogen indicators, and legacy organochlorine pesticide exceedances.

Management Plan Monitoring

The need for Management Plan monitoring is determined primarily based on the potential to provide useful information for source identification, in establishing causes of toxicity, and to evaluate management practice effectiveness. This monitoring may consist of water column or sediment sampling, field evaluations, or surveys of agricultural practices. Except for legacy pesticide monitoring and monitoring at non-representative sites for pathogen indicators, and field measurements, all Management Plans had monitoring scheduled for source evaluation and/or compliance in 2017.

Based on the evaluations of Management Plan monitoring results through September 2017 and earlier source evaluations presented in this document, the Coalition has submitted or is preparing requests to deem complete the monitoring and other requirements for seven Management Plans.

New Management Plans

As part of this MPPR, data collected by the Coalition through September 2016 were evaluated to assess the necessity of any new Management Plan requirements. Requirements for new Management Plan elements were based on observations of more than one exceedance in a three-year period, as required by the ILRP. Proposed tasks and schedules to implement the new Management Plan elements were developed, if necessary. If modifications to the existing scope or schedule for implementation of an approved Management Plan were proposed, then these

changes are also described herein, if necessary. There was a single new Management Plan triggered for toxicity to *Selenastrum capricornutum* in Ulatis Creek caused by two exceedances (September 2015 and February 2016) in Coalition monitoring conducted by the Delta Regional Monitoring Program (Delta RMP) from July 2015 through June 2017. The Coalition's Ulatis Creek at Brown Road monitoring location was monitored by the Delta RMP during this time period and the Coalition was not informed by the Delta RMP of the two observed toxicities to *Selenastrum* that triggered the need for a Management Plan; hence, this new Management Plan is documented for the first time in this MPPR.

Evaluation of Progress

Meeting water quality objectives is the ultimate goal and measure of effectiveness of the implemented management practices and progress for the Management Plan. Water quality monitoring to measure this progress is ongoing and assessed annually, and has resulted in the completion of 35 Management Plans to date. As measured by the completion and ongoing work on specific Management Plan tasks and deliverables summarized above and documented throughout this MPPR, the Coalition continues to make good progress toward meeting these requirements and expects to achieve the goals of the current approved Management Plan and CSQMP.

Management Plan Progress Report

The purpose of this document is to provide an update on the status of the Sacramento Valley Water Quality Coalition's (Coalition) Water Quality Management Plan (2009 Management Plan[1]), which was reorganized into the Comprehensive Surface Water Quality Management Plan (CSQMP[2]) in 2015. The Coalition's Waste Discharge Requirements (WDR), Order No. R5-2014-0030-R1, specify the requirements for separate surface water Management Plans, and also allows the Coalition to satisfy these requirements by updating the Surface Water Quality Management Plan previously approved under the Coalition Group Conditional Waiver to conform to the Order and the Monitoring and Reporting Program (MRP). The updated CSQMP must conform to the requirements specified for separate Management Plans, but the WDR allows existing individual Management Plans developed under the Coalition's Conditional Waiver (Conditional Waiver Order R5-2006-0053[3]) to continue to apply under this Order. The approved CSQMP was most recently updated in November 2016.

Reporting for the CSQMP is intended to provide an overview of the Coalition's approach to meeting the requirements of the WDR, a list of all currently required Management Plans and their status, the Management Plans currently being implemented, and a schedule and process for development of newly required Management Plans. Data reports for monitoring conducted for the CSQMP are submitted on the same quarterly schedule and in the same formats as required by the Monitoring and Reporting Program (MRP) for regular Coalition monitoring.

This MPPR provides summaries of the progress made toward completion of specific Management Plan elements, updates to the list of required Management Plan elements, and recommendations for continuation or modification of individual Management Plans. This MPPR also summarizes the results of initial source identification evaluations, where performed, and results of selected Management Plan monitoring for the previous year, provides documentation of outreach efforts, and provides a summary of completed baseline management practice inventories in priority drainages. Future MPPRs will also document goals established for management practice implementation and assess progress toward these implementation goals for those recent Management Plans written to conform to WDR requirements, as opposed to those earlier Management Practices Implementation and Performance Goals (MPIPG) and Management Plans written to conform to the Coalition's Conditional Waiver.

[1] SVWQC 2009. Water Quality Management Plan. Prepared by Larry Walker Associates for the Sacramento Valley Water Quality Coalition (SVWQC). Sacramento, California. January 2009.

[2] SVWQC 2016, Comprehensive Surface Water Quality Management Plan. Prepared by Larry Walker Associates for the Sacramento Valley Water Quality Coalition (SVWQC). Sacramento, California. June 2015

[3] Prior to adoption of the WDR, the Coalition was subject to a Conditional Waiver of Waste Discharge Requirements for the Irrigated Lands Regulatory Program (ILRP) and subsequent amendments to the ILRP requirements (WQO-2004-0003, SWRCB 2004, R5-2005-0833, R5-2008-0005, R5-2009-0875).

The MPPR includes the following components, as specified in the MRP:

Table 1. Management Plan Progress Report Requirements[4]

MRP-1 Section	MPPR Requirement	Report Section Headings	Page
	Signed Transmittal Letter	NA	-
I.F.(1)	Title page	Title page	-
I.F.(2)	Table of contents	Table of Contents	*i*
I.F.(3)	Executive Summary	Executive Summary	*iii*
I.F.(4)	Location map(s) and a brief summary of management plans covered by the report	Results of Monitoring	4-8,13
I.F.(5)	Updated table that tallies all exceedances for the management plans	Results of Monitoring	14-16
I.F.(6)	A list of new management plans triggered since the previous report	New Management Plans	19
I.F.(7)	Status update on preparation of new management plans	Management Plan Status Update	19-21
I.F.(8)	A summary and assessment of management plan monitoring data collected during the reporting period	Results of Monitoring	9-12
I.F.(9)	A summary of management plan grower outreach conducted	Outreach Documentation	17
I.F.(10)	A summary of the degree of implementation of management practices	Summary: Evaluation of Progress	31-32
I.F.(11)	Results from evaluation of management practice effectiveness	Summary: Evaluation of Progress	31-32
I.F.(12)	An evaluation of progress in meeting performance goals and schedules	Summary: Evaluation of Progress	31-32
I.F.(13)	Any recommendations for changes to the management plan	Proposed Changes to the Management Plan	32

The activities conducted in 2017 to implement the Coalition's CSQMP continued to focus primarily on addressing the higher priority Management Plan elements triggered by exceedances of water quality objectives or trigger limits for registered pesticides and toxicity. Deliverables completed for registered pesticides included review and evaluation of pesticide application data, identification of potential sources, and determination of likely agricultural sources. Implementation completed to address toxicity exceedances included review and evaluation of pesticide application data, evaluation of monitoring results to identify potential causes of toxicity, and determination of likely agricultural sources of identified causes of toxicity. Source evaluations have been documented in the Source Evaluation Reports submitted for each

[4] Monitoring and Reporting Program (Attachment B to R5-2014-0030), Appendix MRP-1: Third-Party Management Plan Requirements, Section I.F.

Management Plan element, where necessary.[5] For registered pesticides and identified causes of toxicity, surveys of Coalition Members operating on high priority parcels were also conducted to determine the degree of implementation of relevant management practices. These survey results form the basis for establishing goals for additional management practice implementation needed to address exceedances of Basin Plan water quality objectives and *ILRP* Trigger Limits.

Management Plan elements with tasks completed in 2017 are listed in **Table 2**. This table provides the water body and analyte or monitoring category of concern and a summary of the major Management Plan task activity.

[5] A Management Plan element is the specific individual combination of the water body and analyte or monitoring category requiring management, e.g., diazinon in Gilsizer Slough, or invertebrate toxicity in Coon Hollow Creek.

Table 2. Summary of Management Plan Task Activity

Management Plan Category	Subwatershed	Waterbody (Site ID)	Analyte(s)	Summary of Major Management Plan Activity and Status
DO and pH	Butte-Yuba-Sutter	Butte Slough (BTTSL)	DO	Unless otherwise noted, all sites sampled in 2017; Other tasks suspended on direction from Executive Officer (EO); Source Evaluations deferred; statistical analyses for the influence of agricultural activities on DO and pH exceedances initiated in 2017.
		Gilsizer Slough (GILSL)	DO, pH	
		Lower Honcut Creek (LNHCT)	DO	
		Lower Snake River (LSNKR)	DO, pH	
		Pine Creek (PNCHY)	DO	
		Sacramento Slough (SSKNK)	DO	
	Colusa Glenn	Colusa Basin Drain (COLDR)	DO	
		Freshwater Creek (FRSHC)	pH	
		Stony Creek (STYHY)	pH	
		Sycamore Slough (RARPP)[1]	DO, pH	
		Walker Creek (WLKCH)	DO, pH	
	Lake	McGaugh Slough (MGSLU)	DO	
		Middle Creek (MDLCR)	DO	
	Pit River	Fall River (FRRRB)	pH	
		Pit River at Canby (PRCAN)	DO	
		Pit River at Pittville (PRPIT)	DO, pH	
	PNSSNS	Coon Creek at Brewer (CCBRW)	DO	
		Coon Creek at Striplin (CCSTR)	DO	
	Sacramento/ Amador	Cosumnes River (CRTWN)[2]	DO, pH	
		Dry Creek (DCGLT)	pH	
		Grand Island Drain (GIDLR)	DO, pH	
		Laguna Creek (LAGAM)[1]	DO, pH	
	Shasta/Tehama	Anderson Creek (ACACR)	DO	
		Coyote Creek (COYTR)[1]	DO	
	Solano	Ulatis Creek (UCBRD)	DO, pH	
		Z-Drain (ZDDIX)	DO, pH	

Management Plan Category	Subwatershed	Waterbody (Site ID)	Analyte(s)	Summary of Major Management Plan Activity and Status
DO and pH *(continued)*	Upper Feather River	Indian Creek (INDAB)	DO	
	Yolo	Cache Creek (CCCPY)[1] Tule Canal (TCHWY)[2] Willow Slough (WLSPL)	DO, pH DO, pH DO, pH	
Legacy Pesticides	Butte-Yuba-Sutter	Gilsizer Slough (GILSL)	DDD and/or DDE (DDT degradation products)	Sampled at all sites during 2015 Assessment Monitoring period; Other Tasks suspended on direction from EO; Revised draft completion requests for El Dorado Subwatershed water bodies prepared and submitted for review; Regional Water Board approved request to complete DDE Management Plan in North Canyon Creek (January 5, 2018).
	Colusa Glenn	Lurline Creek (LRLNC) Sycamore Slough (RARPP)		
	El Dorado	Coon Hollow Creek (COONH)		
	Sacramento/ Amador	Grand Island Drain (GIDLR)		
	Yolo	Willow Slough (WLSPL)		
Pathogen Indicators	Butte-Yuba-Sutter	Gilsizer Slough[1] (GILSL) Lower Honcut Creek (LHNCT Lower Snake River (LSNKR) Pine Creek (PNCHY) Sacramento Slough (SSKNK) Wadsworth Canal (WADCN)	*E. coli*	Unless otherwise noted, sampled at all sites in 2017; Other tasks suspended pending May 1, 2018, submittal of a detailed management plan strategy or source identification study work plan to the Regional Water Board [June 13, 2017, comm. from EO]. A Bacterial Source Identification Study based on bacteroidales DNA was conducted and completed for the Coalition in 2007. The results of this preliminary study indicated that the overwhelming majority of bacteria in surface waters sampled were from human sources, and that agricultural contributions from agricultural bovine sources were rare or absent. A Source Evaluation Report for pathogen indicators (*E. coli*) was also prepared and submitted in 2011. This evaluation integrated SVWQC monitoring data, grower survey reports of implemented practices, and information about agricultural and non-agricultural sources, and concluded that agricultural was unlikely to be a significant contributing source in most monitored drainages.
	Colusa Glenn	Butte Creek (BUCGR) Colusa Basin Drain (COLDR) Freshwater Creek (FRSHC) Logan Creek[1] (LGNCR) Lurline Creek[1] (LRLNC) Stone Corral Creek[1] (SCCMR) Stony Creek[1] (STYHY) Sycamore Slough[1] (RARPP) Walker Creek (WLKCH)		
	Lake	McGaugh Slough (MGLSU) Middle Creek (MDLCR)		
	Napa	Pope Creek (PCULB)		

Management Plan Category	Subwatershed	Waterbody (Site ID)	Analyte(s)	Summary of Major Management Plan Activity and Status
Pathogen Indicators *(continued)*	Sacramento/ Amador	Cosumnes River [1] (CRWTN) Dry Creek[1] (DCGLT) Grand Island (GIDLR) Laguna Creek[1] (LAGAM)	*E. coli (continued)*	
	Shasta Tehama	Anderson Creek (ACACR) Coyote Creek[1] (COYTR)		
	Solano	Ulatis Creek[2] (UCBRD) Shag Slough[2] (SSLIB) Z-Drain[1] (ZDDIX)		
	Upper Feather River	Indian Creek (INDAB) Spanish Creek (SPGRN)		
	Yolo	Tule Canal[2] (TCHWY) Willow Slough (WLSPL)		
Registered Pesticides	Butte-Yuba-Sutter	Gilsizer Slough (GILSL)	Chlorpyrifos	Management Plan submitted to the Regional Water Board on November 30, 2016, and approved on December 16, 2016; implementation in progress.
		Pine Creek (PNCHY)	Chlorpyrifos	Management Plan submitted to the Regional Water Board on November 14, 2016, and approved on December 6, 2016; implementation in progress
	Colusa Glenn	Colusa Drain (COLDR)	Malathion	MPIPG submitted 2013; Request for completion submitted to Regional Water Board on June 7, 2017, and approved on August 15, 2017.
	Solano	Ulatis Creek (UCBRD)	Chlorpyrifos	MPIPG Addendum submitted in 2013; Outreach and implementation in progress; Management Plan that conforms to WDR requirements was submitted to Regional Water Board on May 2, 2017, and approved on June 19, 2017.
	Yolo	Willow Slough (WLSPL)	Diuron	Outreach and implementation continued in 2015; Request for completion submitted on December 10, 2015; Regional Water Board determined that additional monitoring is needed; continued implementation in progress.
		Willow Slough (WLSPL)	Malathion	MPIPG submitted in 2013; Request for completion submitted to Regional Water Board on June 30, 2017, and approved on August 15, 2017.

Management Plan Category	Subwatershed	Waterbody (Site ID)	Analyte(s)	Summary of Major Management Plan Activity and Status
Salinity	Butte-Yuba-Sutter	Gilsizer Slough (GILSL)	EC	Unless otherwise noted, sampled at all sites in 2017; Continued active participation in CV-SALTS; SVWQC joined CV Salinity Coalition as funding partner.
		Lower Snake River (LSNKR)	EC	
	Colusa Glenn	Colusa Basin Drain (COLDR)	EC	
		Freshwater Creek (FRSHC)	EC	
		Logan Creek[1] (LGNCR)	TDS	
		Lurline Creek[1] (LRLNC)	EC	
		Stone Corral Creek[1] (SCCMR)	EC	
		Sycamore Slough[1] (RARPP)	EC	
		Walker Creek (WLKCH)	EC	
	Lake	McGaugh Slough (MGSLU)	EC	
	Sacramento/ Amador	Dry Creek[1] (DCGLT)	TDS	
		Grand Island Drain (GIDLR)	EC	
	Solano	Ulatis Creek (UCBRD)	EC	
		Shag Slough[2] (SSLIB)	EC	
		Z-Drain (ZDDIX)	EC	
	Upper Feather River	Middle Fork of the Feather River (MFFGR)	EC	
	Yolo	Cache Creek[1] (CCCPY)	EC	
		Tule Canal[2] (TCHWY)	Boron, EC	
		Willow Slough (WLSPL)	Boron, EC	
Toxicity	Solano	Z-Drain (ZDDIX)	*Hyalell*a (pyrethroids)	Monitoring of toxicity continued in 2017; No toxicity exceedances in 2017; Request for completion submitted to Regional Water Board on June 26, 2017, and approved on August 3, 2017.
	Yolo	Willow Slough (WLSPL)	*Ceriodaphnia* (chlorpyrifos)	Chlorpyrifos MPIPG submitted in 2013; Implementation is in progress; Monitoring continued in 2016 with no toxicity exceedances observed in last 32 samples; Request for completion submitted on December 15, 2015; Regional Water Board determined that additional monitoring is needed.

Management Plan Category	Subwatershed	Waterbody (Site ID)	Analyte(s)	Summary of Major Management Plan Activity and Status
Trace Metals	Butte-Yuba-Sutter	Lower Honcut Creek (LHNCT)	Copper	Management plan submitted to Regional Board on January 20, 2017, and approved on March 7, 2017; implementation in progress.
		Pine Creek (PNCHY)	Copper	Management Plan monitoring initiated in 2016; Management Plan submitted to Regional Water Board on March 24, 2017, and approved on May 4, 2017; implementation in progress.
	Butte-Yuba-Sutter	Lower Snake River (LSNKR)	Arsenic	Monitoring continued in 2017; Source Evaluation submitted August 2013.
	Sacramento/ Amador	Grand Island Drain (GIDLR)	Arsenic	Monitoring continued in 2017.

Notes:
DO = Dissolved Oxygen
EC = Electrical Conductivity
[1] Non-representative site. Addressed with representative monitoring.
[2] Addressed by Delta Regional Monitoring Program (RMP) monitoring.

RESULTS OF MONITORING

Management Plan monitoring was conducted as scheduled in the Coalition's 2017 Monitoring Plan Update, as approved by the Regional Water Board. The results of monitoring conducted in the 2017 monitoring year (October 1, 2016, through September 30, 2017) for all Management Plan analytes through September 2017 have been reported in the Coalition's 2017 Annual Monitoring Report (AMR) and submitted to the Regional Water Board. Additionally, exceedances for all Management Plan sampling conducted from October 1, 2016, through September 30, 2017, have been reported in Exceedance Reports as required by the ILRP MRP.

The 2017 monitoring year was a "Non-Assessment" or "Core" Monitoring year for all representative Coalition sites, and most Management Plan monitoring was coordinated with scheduled monitoring or conducted independently as needed for the specific locations and parameters. Management Plan monitoring for the 2017 monitoring year was conducted at the sites shown in **Figure 1** and the results are summarized below. The results of Management Plan compliance monitoring are summarized in **Table 3**.

DO and pH

There are 26 sites with active Management Plan requirements for DO and 17 sites with active Management Plan requirements for pH.

- There were 74 samples collected for 17 sites with active Management Plan requirements for DO. There were 11 exceedances (15%) of the *ILRP* Trigger Limit for DO observed at nine sites.
- There were 46 samples collected from 11 sites with active Management Plan requirements for pH. There were seven exceedances observed (15%) of the *ILRP* Trigger Limit for pH at four different sites.

Legacy Pesticides

Management Plan monitoring for legacy organochlorine pesticides was last conducted during the Coalition's most recent Assessment Monitoring period (2015) and there was no planned monitoring of these pesticides during the 2017 monitoring year. All uses of DDT have been banned in the United States since 1972, except for control of emergency public health problems.[6]

Pathogen indicators

There are 31 sites with Management Plan requirements for pathogen indicator bacteria. Management Plan tasks for pathogen indicators have been suspended at the direction of the Executive Officer of the Regional Water Board pending the May 1, 2018, submittal of a detailed management plan strategy or source identification study work plan to the Regional Water Board [June 13, 2017, comm. from EO]. Management Plan monitoring for *E. coli* consisted of sampling at representative and integration monitoring sites, which resulted in the collection of 38 samples (including 10 field duplicates) from 12 sites with active Management Plan requirements for

[6] Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for DDT. U.S. Department of Health and Human Services. September 2002.

pathogen indicators. There were 16 exceedances (including five field duplicates; 42% of total samples) of the *ILRP* Trigger Limit for *E. coli* observed at these sites during 2017 monitoring.

Registered Pesticides

- Four samples (including one field duplicate) were analyzed for chlorpyrifos in Gilsizer Slough. The pesticides were not detected in any of the samples.
- Ten samples (including four field duplicates) were conducted for chlorpyrifos in Pine Creek. Chlorpyrifos was not detected in any of the samples.
- Eleven (11) events were conducted for chlorpyrifos in Ulatis Creek. Chlorpyrifos was not detected in any of the samples.
- Two samples (including one field duplicate) were conducted for diuron at Willow Slough, which has a Management Plan requirement for diuron. Diuron was not detected in the sample.
- Two samples were conducted for malathion in Willow Slough. There were no detections nor exceedances in either sample.
- Eight samples (including four field duplicates) were collected for malathion in Colusa Basin Drain. There were no detections nor exceedances in any of these samples.

Salinity

There are 17 sites with active Management Plan requirements for parameters related to salinity (EC, boron, and TDS). There were 47 sample events for EC at 11 sites, with 13 observed exceedances (28%) of the *ILRP* Trigger Limit for EC. Willow Slough also has a Management Plan requirement for boron. Six samples (including three field duplicates) were analyzed for boron from Willow Slough and four of those samples (including two field duplicates) exceeded the *ILRP* Trigger Limit for boron.

Toxicity

- Willow Slough has a Management Plan requirement for *Ceriodaphnia* toxicity and one sample was analyzed for toxicity to this test organism. The sample was not observed to be toxic to *Ceriodaphnia*.
- Z-Drain has a Management Plan requirement for sediment toxicity, and sediment samples were analyzed for one event for *Hyalella* toxicity. Toxicity was not observed in the sample.

Trace Metals

There were four active Management Plans for trace metals in 2017 for which monitoring was conducted: copper in Pine Creek and Lower Honcut Creek, and arsenic in Grand Island Drain and Lower Snake River.

Four samples were analyzed for copper (total and dissolved; 13 analyses in total, including five field duplicates) in Pine Creek and none exceeded either the 1,300 µg/L Basin Plan objective (Primary MCL) for total copper or the hardness-dependent CTR criterion that serves as the *ILRP* Trigger Limit for dissolved copper.

Two samples were analyzed for copper (total and dissolved; four analyses in total) in Lower Honcut Creek and none exceeded either the 1,300 µg/L Basin Plan objective (Primary MCL) for total copper or the hardness-dependent CTR criterion that serves as the *ILRP* Trigger Limit for dissolved copper.

Six samples were conducted for arsenic in Grand Island Drain (including three field duplicates), and all six of the samples analyzed resulted in exceedances of the *ILRP* Trigger Limit for arsenic (10 µg/L). There are both legacy and a few potential current sources of arsenic. There is very little remaining agricultural use of arsenic-based pesticide products (based on review of DPR's PUR data), and arsenic has only a few potentially significant sources: (1) natural background from arsenic in the soils, (2) arsenic remaining from legacy lead arsenate use in orchards, (3) arsenic used in various landscape maintenance and structural pest control applications (non-agriculture), and (4) arsenic used in wood preservatives. One possible source is the wooden bridge structure just upstream of the GIDLR sampling site, if arsenic-based preservatives were used in the wood. A final, but somewhat unlikely source is an arsenic-based additive that may still be used for chicken feed and which can potentially make its way into agricultural fields and runoff if the poultry litter is used on the field.

Seven samples were analyzed for total arsenic in Lower Snake River (including three field duplicates) and none exceeded the 10 µg/L Basin Plan objective (Primary MCL).

Nutrients

There were no active Management Plans for nutrients in 2017 for which monitoring was conducted.

However, a nutrient-related Management Plan requirement exists for the Clear Lake Nutrient TMDL. Monitoring for this Management Plan requirement consisted phosphorus analyses for three sample events at the McGaugh Slough site and four sample events at the Middle Creek site in the Lake County Subwatershed. No water quality objective currently exists for phosphorus in the Sacramento Valley Watershed.

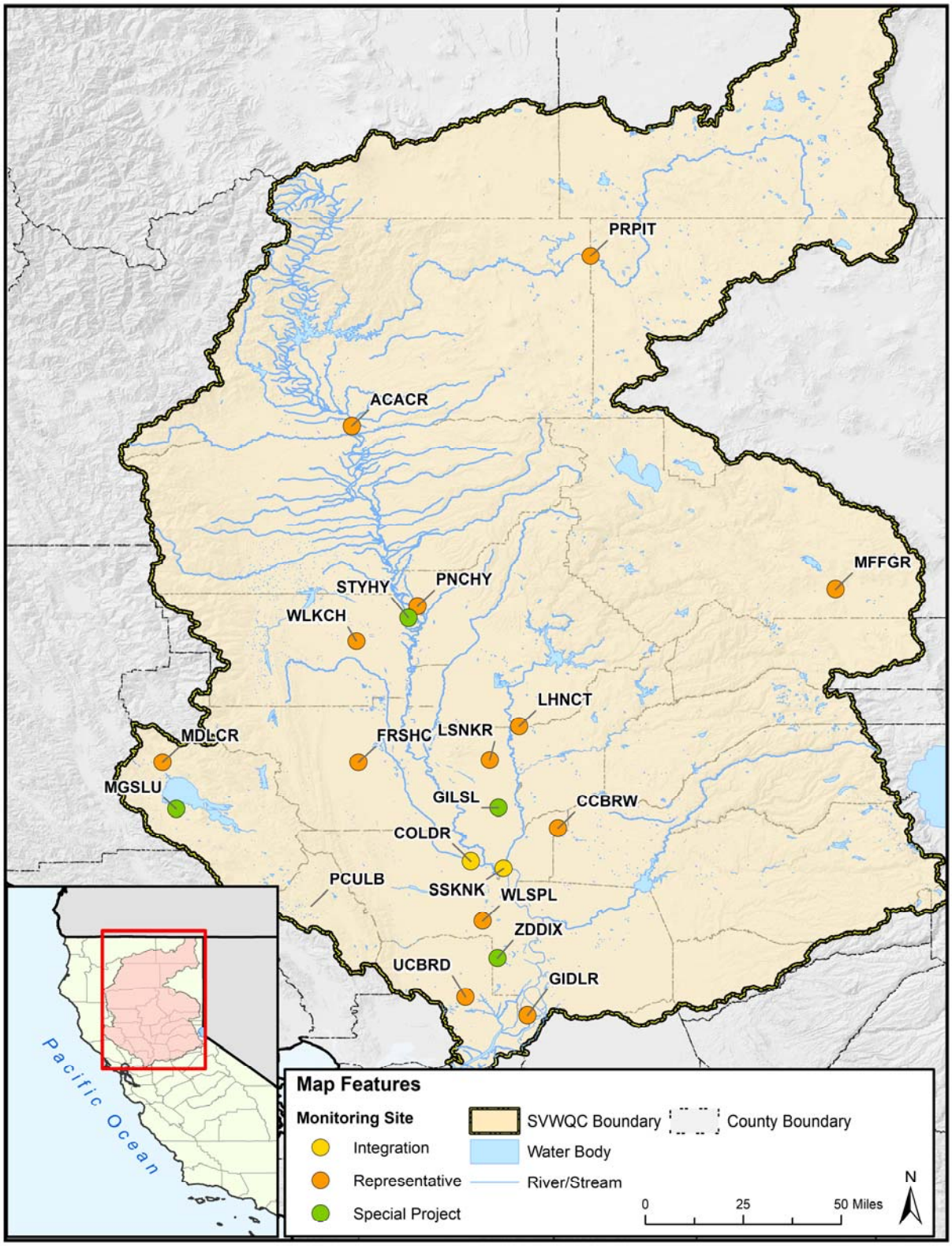

Figure 1. Coalition Monitoring Sites with 2017 Monitoring and Active Management Plans

Table 3. Summary of Management Plan Compliance Monitoring Outcomes

Management Plan Category	Analyte	Subwatershed	Site Name (Site ID)	Analyses	Pesticide Detections	Exceedances
DO and pH	Dissolved Oxygen		Gilsizer Slough at George Washington Road	3	NA	0
			Lower Honcut Creek at Hwy 70	3	NA	1
			Lower Snake River at Nuestro Road	7	NA	0
			Pine Creek at Highway 32	8	NA	2
			Sacramento Slough bridge near Karnak	4	NA	1
		Colusa Glenn	Colusa Basin Drain above KL	4	NA	2
			Freshwater Creek at Gibson Rd	3	NA	0
			Walker Creek near 99W and CR33	4	NA	0
		Lake	McGaugh Slough at Finley Road East	3	NA	1
			Middle Creek u/s from Highway 20	4	NA	1
		Pit River	Pit River at Pittville	3	NA	1
		PNSSNS	Coon Creek at Brewer Road	4	NA	0
		Sacramento/Amador	Grand Island Drain near Leary Road	4	NA	1
		Shasta/Tehama	Anderson Creek at Ash Creek Road	3	NA	0
		Solano	Ulatis Creek at Brown Road	11	NA	0
			Z Drain	1	NA	0
		Yolo	Willow Slough Bypass at Pole Line	5	NA	1
	pH	Butte-Yuba-Sutter	Gilsizer Slough at George Washington Road	3	NA	0
		Butte-Yuba-Sutter	Lower Snake River at Nuestro Road	7	NA	0
		Colusa Glenn	Stony Creek on Hwy 45 near Rd 24	2	NA	0
			Freshwater Creek	3	NA	0
			Walker Creek	4	NA	1
		Pit River	Fall River at Fall River Ranch Bridge	3	NA	1
			Pit River at Pittville	3	NA	0
		Sacramento/Amador	Grand Island Drain	4	NA	0
		Solano	Ulatis Creek at Brown Road	11	NA	4
			Z Drain	1	NA	0
		Yolo	Willow Slough Bypass at Pole Line	5	NA	1

Management Plan Category	Analyte	Subwatershed	Site Name (Site ID)	Analyses	Pesticide Detections	Exceedances
Pathogen Indicators	*E. coli*	Butte-Yuba-Sutter	Lower Honcut Creek at Hwy 70	5	NA	1
			Lower Snake R. at Nuestro Rd	5	NA	2
			Pine Creek at Highway 32	4	NA	0
			Sacramento Slough bridge near Karnak	4	NA	1
		Colusa Glenn	Colusa Basin Drain above KL	5	NA	0
			Freshwater Creek at Gibson Rd	5	NA	5
			Walker Creek near 99W and CR33	5	NA	3
		Lake	Middle Creek u/s from Highway 20	3	NA	0
		Sacramento/Amador	Grand Island Drain near Leary Road	4	NA	3
		Shasta/Tehama	Anderson Creek at Ash Creek Road	3	NA	3
		Solano	Ulatis Creek at Brown Road	2	NA	1
		Yolo	Willow Slough Bypass at Pole Line	3	NA	2
Registered Pesticides	Chlorpyrifos	Butte-Yuba-Sutter	Gilsizer Slough at George Washington Road	4	0	0
			Pine Creek at Highway 32	10	0	0
		Solano	Ulatis Creek at Brown Road	11	0	0
	Diuron	Yolo	Willow Slough Bypass at Pole Line	2	0	0
	Malathion	Colusa Glenn	Colusa Basin Drain above KL	8	0	0
		Yolo	Willow Slough Bypass at Pole Line	2	0	0
Salinity	Boron	Yolo	Willow Slough Bypass at Pole Line	6	NA	4
	Conductivity	Butte-Yuba-Sutter	Gilsizer Slough at George Washington Road	3	NA	0
			Lower Snake R. at Nuestro Rd	7	NA	0
		Colusa Glenn	Colusa Basin Drain above KL	4	NA	1
			Freshwater Creek at Gibson Rd	3	NA	1
			Walker Creek near 99W and CR33	4	NA	0
		Lake	McGaugh Slough at Finley Road East	3	NA	1
		Sacramento/Amador	Grand Island Drain near Leary Road	4	NA	1
		Solano	Ulatis Creek at Brown Road	11	NA	7
			Z Drain	1	NA	1

Management Plan Category	Analyte	Subwatershed	Site Name (Site ID)	Analyses	Pesticide Detections	Exceedances
Salinity *(continued)*	Conductivity *(continued)*	Upper Feather River	Middle Fork Feather River above Grizzly Cr	2	NA	0
		Yolo	Willow Slough Bypass at Pole Line	5	NA	1
Toxicity	Ceriodaphnia survival	Butte-Yuba-Sutter	Lower Snake R. at Nuestro Rd	2	NA	0
		Colusa Glenn	Stony Creek on Hwy 45 near Rd 24	2	NA	0
		Yolo	Willow Slough Bypass at Pole Line	1	NA	0
	Hyalella survival	Solano	Z Drain	1	NA	0
Trace Metals	Arsenic	Sacramento/Amador	Grand Island Drain near Leary Road	6	NA	6
		Butte-Yuba-Sutter	Lower Snake R. at Nuestro Rd	7	NA	0
	Copper	Butte-Yuba-Sutter	Lower Honcut Creek at Hwy 70	4	NA	0
			Pine Creek at Highway 32	13	NA	0

NA = Not applicable

SOURCE EVALUATIONS

There were no new Source Evaluations conducted for Management Plan elements in 2017.

OUTREACH DOCUMENTATION

The Coalition and its subwatersheds continue to work with the Regional Water Board and its staff to implement the Coalition's *Landowner Outreach and Management Practices Communications Process* and the Coalition's approved CSQMP to address exceedances of water quality objectives identified in the Sacramento Valley. The primary strategic approach taken by the Coalition has been to notify and educate the subwatershed landowners, farm operators, and/or wetland managers about the cause(s) of toxicity and/or exceedance(s) of water quality objectives or *ILRP* Trigger Limits. Notifications have initially focused on, but not been limited to, growers who operate directly adjacent to or within proximity to a waterbody showing an exceedance of a water quality objective or *ILRP* Trigger Limit. The broader outreach program, which includes both grower meetings and the notifications distributed through direct mailings, encourages the adoption of BMPs and modification of the uses of specific farm and wetland inputs to prevent movement of constituents of concern into Sacramento Valley surface waters.

To identify landowners operating in high priority lands, the Coalition identifies the assessor parcels and subsequently, the owners of agricultural operations nearest the water bodies of interest. From the list of assessor parcel numbers, the Coalition identifies its members and mails to them an advisory notice along with information on options to address the specific exceedances using BMPs and/or requests for additional information regarding the management practices they implement. This same approach has been used to conduct management practice surveys in areas targeted by individual Management Plans.

Descriptions of the outreach and education activities conducted by the Coalition's subwatersheds in 2017 are provided in Appendix F (*SVWQC Outreach Materials*) of the Coalition's 2017 AMR.

MEMBER SURVEYS

Starting in 2014, the WDR required that the Coalition collect and aggregate summarized information from Farm Evaluations. The summary of the management practice data includes:

- A quality assessment of the information by township
- A description of corrective actions to be taken regarding any deficiencies in the quality of data submitted

This information is provided as a separate report (Farm Evaluation Summary Report) developed by Michael L. Johnson, LLC (MLJ) for the SVWQC. The 2017 Farm Evaluation Summary Report will be submitted to the Regional Water Board no later than May 1, 2018.

The Farm Evaluations and the annual Farm Evaluation Summary Report will be the primary source for management practices and member surveys, but additional surveys might be conducted on an as needed basis (see the Management Plan Status Updates section for a description of Focused Outreach Surveys).

RECOMMENDATIONS FOR MANAGEMENT PLAN MONITORING

Special project monitoring for the Management Plan elements includes specific targeted monitoring or studies to address implementation of a TMDL or implementation of an individual Management Plan that results from exceedances. Management Plan monitoring is generally conducted to support source identification or effectiveness assessment, and may include surveys of agricultural practices, as well as water column or sediment sampling. The monitoring sites, special study parameters, Management Plan strategy, implementation steps, and general schedule for Management Plans have been presented previously in the Sacramento Valley Coalition Group's approved *2009 Management Plan*, *Management Plan Progress Reports* (2010, 2011, 2012), the *Addendum to Sacramento Valley Water Quality Coalition Management Plan: Chlorpyrifos and Diazinon TMDLs*, and in the Coalition's monitoring plan updated annually for approval by the Executive Officer of the Regional Water Board.

The need for Management Plan monitoring is determined primarily based on the potential to provide useful information for source identification, in establishing causes of toxicity, and to evaluate management practice effectiveness. This monitoring may consist of water column or sediment sampling, field evaluations, or surveys of agricultural practices. Except for legacy pesticide monitoring, monitoring at non-representative sites for pathogen indicators, and field measurements, all Management Plans had monitoring scheduled for source evaluation and/or compliance in 2017. The monitoring proposed and conducted in 2017 was submitted to and approved by the Regional Water Board's Executive Officer on November 1, 2016. The Coalition's approved 2017 monitoring plan included the recommended monitoring schedule for the Management Plan, as well as monitoring required in 303(d)-listed water bodies and TMDLs for chlorpyrifos and diazinon.

Based on the evaluations of Management Plan monitoring results through September 2017 and source evaluations presented earlier in this document, the Coalition has submitted, is preparing requests to deem complete the requirements and monitoring, or is continuing the implementation of seven Management Plans. These Management Plans are summarized in **Table 4**. With respect to those Management Plans not yet completed, monitoring and implementation of these management plans will continue until completion is approved by the Executive Officer of the Regional Water Board, as required by the Coalition's MRP.

Table 4. Requests for Management Plan Completions

Subwatershed	Water Body	Category	Analyte	Status
Colusa Glenn	Colusa Drain	Registered Pesticides	*Malathion*	Approved for completion (August 15, 2017)
El Dorado	Coon Hollow Creek	Legacy Pesticides	DDE/DDT	Monitoring required; Other tasks suspended; Draft RTC submitted in 2013, revisions submitted May 2013 and April 2015; Regional Board responded to RTC on January 5, 2018, but did not comment on the request to complete this Management Plan.
	North Canyon Creek	Legacy Pesticides	DDE	Approved for completion (January 5, 2018)
Solano	Z Drain	Toxicity	*Hyalella*	Approved for completion (August 3, 2017)
Yolo	Willow Slough	Registered Pesticides	*Malathion*	Approved for completion (August 15, 2017)
	Willow Slough	Registered Pesticides	Diuron	Continue monitoring; RTC submitted on December 10, 2015; Regional Water Board requiring additional monitoring.
	Willow Slough	Toxicity	*Ceriodaphnia*	Continue monitoring; RTC submitted December 10, 2015; Regional Water Board requiring additional monitoring.

NEW MANAGEMENT PLANS

As part of this MPPR, data collected by the Coalition through September 2017 were evaluated to assess the necessity of any new Management Plan requirements. Requirements for new Management Plan elements were based on observations of more than one exceedance in a three-year period, as required by the ILRP. Proposed tasks and schedules to implement the new Management Plan elements were developed, if necessary. If modifications to the existing scope or schedule for implementation of an approved Management Plan were proposed, then these changes are also described herein, if necessary. There were no new Management Plans triggered by exceedances in Coalition monitoring conducted from October 2016 through September 2017. However, there was a single new Management Plan triggered for toxicity to *Selenastrum capricornutum* in Ulatis Creek caused by two exceedances (September 2015 and February 2016) in Coalition monitoring conducted by the Delta RMP from July 2015 through June 2017. A third *Selenastrum* toxicity event was observed in November 2016. The Coalition's Ulatis Creek at Brown Road monitoring location was monitored by the Delta RMP during this time period and the Coalition was not informed by the Delta RMP of the three observed toxicities to *Selenastrum* that triggered the need for a Management Plan; hence, this new Management Plan is documented for the first time in this MPPR.

MANAGEMENT PLAN STATUS UPDATES

Management Plans submitted to the Regional Water Board in 2016 and early 2017 (see **Table 2**) were crafted to conform to the requirements for separate Management Plans specified in the Coalition's WDR, Order No. R5-2014-0030-R1, under the ILRP. In some ways, these new requirements differ from those set forth in the previously approved 2009 Management Plan. Current Management Plan requirements emphasize a sound Management Plan approach that

includes performance goals, mechanisms for achieving goals, quantitative measures of progress, and a schedule for achieving goals. This approach requires more quantitative tracking of outreach and education efforts, as well as pesticide application practices and management practices implemented by growers that are targeted toward eliminating or reducing the concentrations of the constituent for which a particular Management Plan is developed.

In order to track changes in the implementation of specific categories of management practices by growers, the Butte-Yuba-Sutter Water Quality Coalition (BYSWQC) has developed a Focused Outreach Survey that is designed to document on an annual basis the management practices implemented by growers who apply the pesticide that is the subject of a particular Management Plan. Subwatersheds will target Focused Outreach Surveys to those growers who apply the target pesticide in the representative and represented drainages, as applicable. The initial Focused Outreach Survey sent to growers in 2017 are used to capture baseline management practice implementation information and subsequent annual surveys will be used to track changes in management practice implementation over the course of Management Plan implementation. Management Plans submitted to the Regional Water Board since 2016, those scheduled for near-term completion and submittal, and Coalition-wide Management Plan Approaches are discussed below.

Chlorpyrifos in Pine Creek

A Management Plan for Chlorpyrifos in Pine Creek was approved by the Regional Water Board on December 6, 2016. A Focused Outreach Survey (FOS) was sent to growers in the Pine Creek Drainage and represented drainages on February 1, 2017, to collect baseline information upon which to compare management practice implementation information provided by future surveys from those growers who apply chlorpyrifos. Baseline FOS information received from growers is currently being compiled.

Activities and water quality measurements related to the satisfaction of this Management Plan's Performance Goals that occurred during the 2017 monitoring year are described below.

Performance Goal Status

PG 1: Chlorpyrifos applied by entity receiving pesticide use permit information from Butte County Agricultural Commissioner's office.

According to the Butte County Agricultural Commissioner's office, 195 restricted material permit holders approved to apply chlorpyrifos were provided with pesticide use permit conditions for chlorpyrifos.

PG 2, 3, & 4: Increased education and awareness of (a) end of row shutoff when spraying, (b) mechanisms to control drift, and (c) drift minimization.

Multiple grower meetings were held in Butte County to discuss the chlorpyrifos exceedances that triggered the Management Plan and establish good pesticide application practices. These meetings were held on November 1 and December 13, 2016, January 10, 19, and 26, 2017, and November 11, 2017. All five meetings collectively reached 1,232 growers/pesticide applicators; covering all applicators, not just those applying chlorpyrifos.

PG 5: The tracking of management practices implemented to reduce or prevent the discharge of chlorpyrifos to surface waters in the Pine Creek drainage and represented drainages is being

accomplished through a Focused Outreach Survey (FOS). FOS results are currently being compiled and will be submitted separately as an addendum to this report when they become available.

PG 6: Maintain chlorpyrifos concentrations in Pine Creek at Highway 32 (GILSL) to below the trigger limit for the organophosphate pesticide.

Monitoring performed at the PNCHY site has shown no exceedances of the chlorpyrifos trigger limit since July 2016, as shown in **Figure 2**.

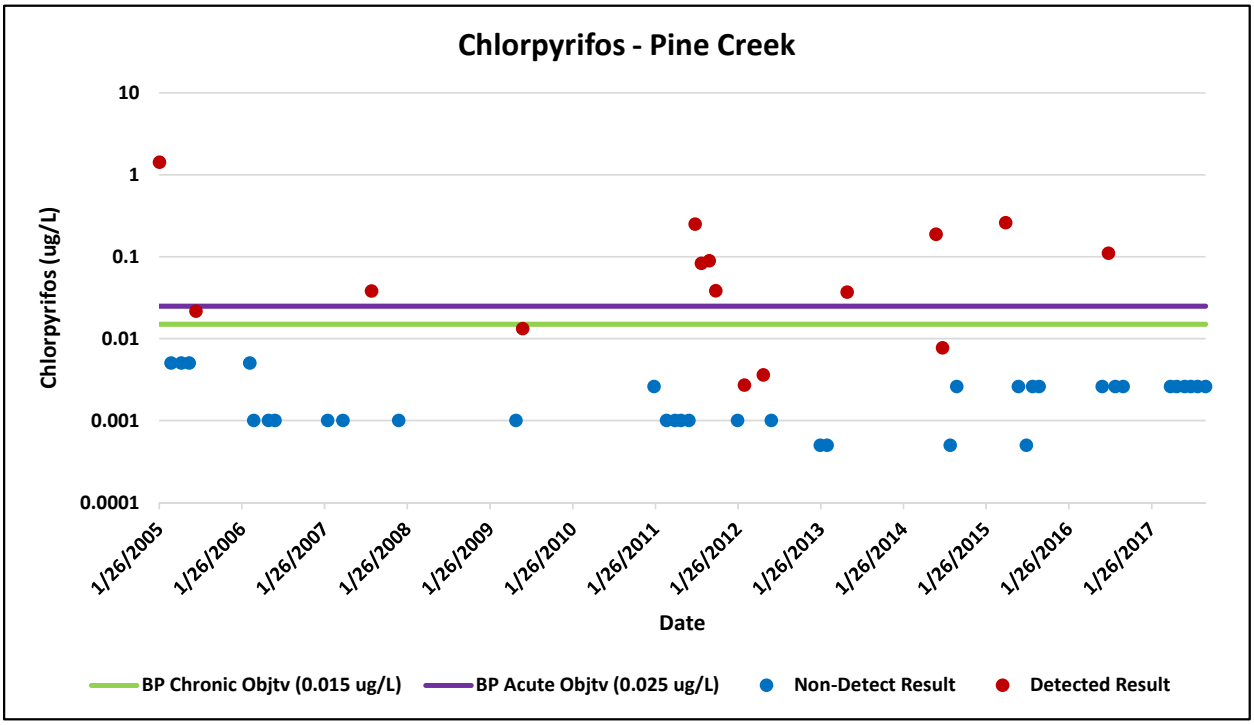

Figure 2. Chlorpyrifos Monitoring Results in Pine Creek at Highway 32: 2005 – 2017

Chlorpyrifos in Gilsizer Slough

A Management Plan for Chlorpyrifos in Gilsizer Slough was approved by the Regional Water Board on December 16, 2016. A FOS was sent to growers in the Gilsizer Slough Drainage on March 20, 2017, to collect baseline information upon which to compare management practice implementation information provided by future surveys from those growers who apply chlorpyrifos. Baseline FOS information received from growers is currently being compiled.

Activities and water quality measurements related to the satisfaction of this Management Plan's Performance Goals that occurred during the 2017 monitoring year are described below.

Performance Goal Status

PG 1: Chlorpyrifos applied by entity receiving pesticide use permit information from Sutter County Agricultural Commissioner's office.

According to the Sutter County Agricultural Commissioner's office, 434 restricted material permit holders approved to apply chlorpyrifos were provided with pesticide use permit conditions for chlorpyrifos.

PG 2, 3, & 4: Increased education and awareness of (a) end of row shutoff when spraying, (b) mechanisms to control drift, and (c) drift minimization.

Multiple grower meetings were held in Yuba-Sutter Counties to discuss the chlorpyrifos exceedances that triggered the Management Plan and establish good pesticide application practices. These meetings were held on November 1, 2016, January 18, 26, and 31, February 2, March 23, and November 2, 2017. All seven meetings collectively reached 785 growers/pesticide applicators; covering all applicators, not just those applying chlorpyrifos.

PG 5: Tracking of management practices implemented to reduce or prevent the discharge of chlorpyrifos to surface waters in the Gilsizer Slough drainage is being accomplished through a Focused Outreach Survey (FOS). FOS results are currently being compiled and will be submitted separately as an addendum to this report when they become available.

PG 6: Maintain chlorpyrifos concentrations in Gilsizer Slough at George Washington Blvd (GILSL) to below the trigger limit for the organophosphate pesticide.

Monitoring performed at the GILSL site has shown no exceedances of the chlorpyrifos trigger limit since August 2015, as shown in **Figure 3**.

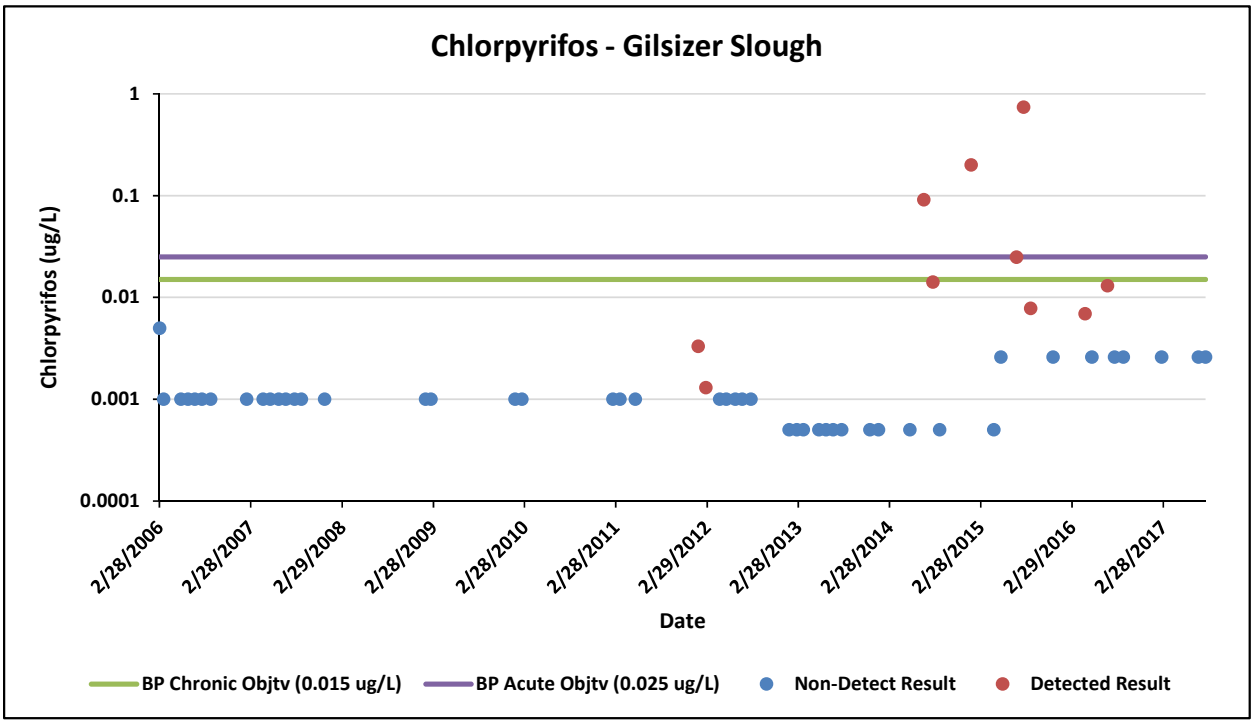

Figure 3. Chlorpyrifos Monitoring Results in Gilsizer Slough at George Washington Blvd: 2006 – 2017

Copper in Lower Honcut Creek

A Management Plan for Copper in Lower Honcut Creek was approved by the Regional Water Board on March 7, 2017. A FOS was sent to growers in the Lower Honcut Creek Drainage and represented drainages on March 20, 2017 to collect baseline information upon which to compare management practice implementation information provided by future surveys from those growers who apply copper. Baseline FOS information received from growers is currently being compiled.

Activities and water quality measurements related to the satisfaction of this Management Plan's Performance Goals that occurred during the 2017 monitoring year are described below.

Performance Goal Status

PG 1, 2, & 3: Increased education and awareness of (a) end of row shutoff when spraying, (b) mechanisms to control drift, and (c) drift minimization.

Multiple grower meetings were held in Yuba-Sutter Counties to discuss the copper exceedances that triggered the Management Plan and establish good pesticide application practices. These meetings were held on November 1, 2016, January 18, 26, and 31, February 2, March 23, and November 2, 2017. All seven meetings collectively reached 785 growers/pesticide applicators; covering all applicators, not just those applying pesticides containing copper.

PG 4: Tracking of management practices implemented to reduce or prevent the discharge of copper to surface waters in the Lower Honcut Creek drainage and represented drainages is being accomplished through a Focused Outreach Survey (FOS). FOS results are currently being compiled and will be submitted separately as an addendum to this report when they become available.

PG 5: Maintain dissolved copper concentrations in Lower Honcut Creek at Highway 70 (LHNCT) to below the California Toxics Rule (CTR) hardness-dependent criterion for this trace metal.

Monitoring performed at the LHNCT site has shown no exceedances of the CTR hardness-dependent criterion for dissolved copper since May 2015, as shown in **Figure 4**.

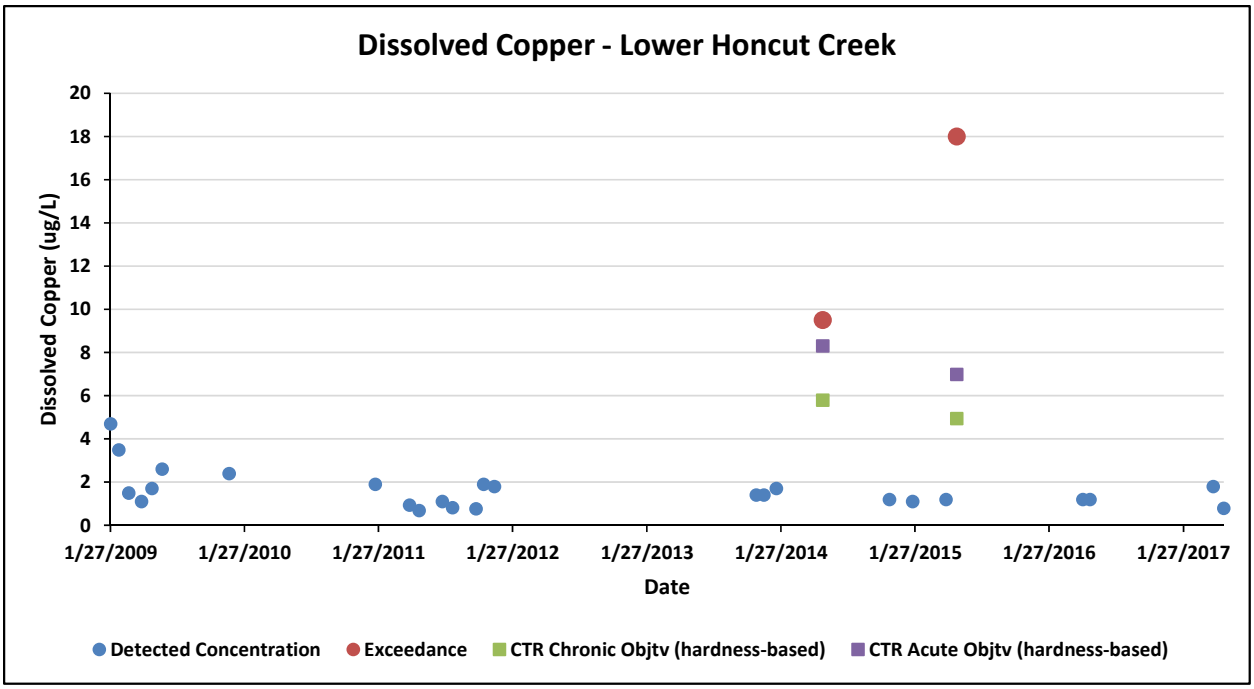

Figure 4. Dissolved Copper Monitoring Results in Lower Honcut Creek at Highway 70: 2009 – 2017

Copper in Pine Creek

A Management Plan for Copper in Pine Creek was approved by the Regional Water Board on May 4, 2017. A FOS was sent to growers in the Pine Creek Drainage and represented drainages on February 1, 2017, to collect baseline information upon which to compare management practice implementation information provided by future surveys from those growers who apply chlorpyrifos. Baseline FOS information received from growers is currently being compiled.

Activities and water quality measurements related to the satisfaction of this Management Plan's Performance Goals that occurred during the 2017 monitoring year are described below.

Performance Goal Status

PG 1, 2, & 3: Increased education and awareness of (a) end of row shutoff when spraying, (b) mechanisms to control drift, and (c) drift minimization.

Multiple grower meetings were held in Butte County to discuss the copper exceedances that triggered the Management Plan and establish good pesticide application practices. These meetings were held on November 1, 2016, January 18, 26, and 31, February 2, March 23, and November 2, 2017. All seven meetings collectively reached 785 growers/pesticide applicators; covering all applicators, not just those applying copper.

PG 4: Tracking of management practices implemented to reduce or prevent the discharge of copper to surface waters in the Pine Creek drainage and represented drainages is being accomplished through a Focused Outreach Survey (FOS). FOS results are currently being compiled and will be submitted separately as an addendum to this report when they become available.

PG 5: Maintain dissolved copper concentrations in Pine Creek at Highway 32 (PNCHY) to below the CTR hardness-dependent criterion for this trace metal.

Monitoring performed at the PNCHY site has shown no exceedances of the CTR hardness-dependent criterion for dissolved copper since December 2011, as shown in **Figure 5**.

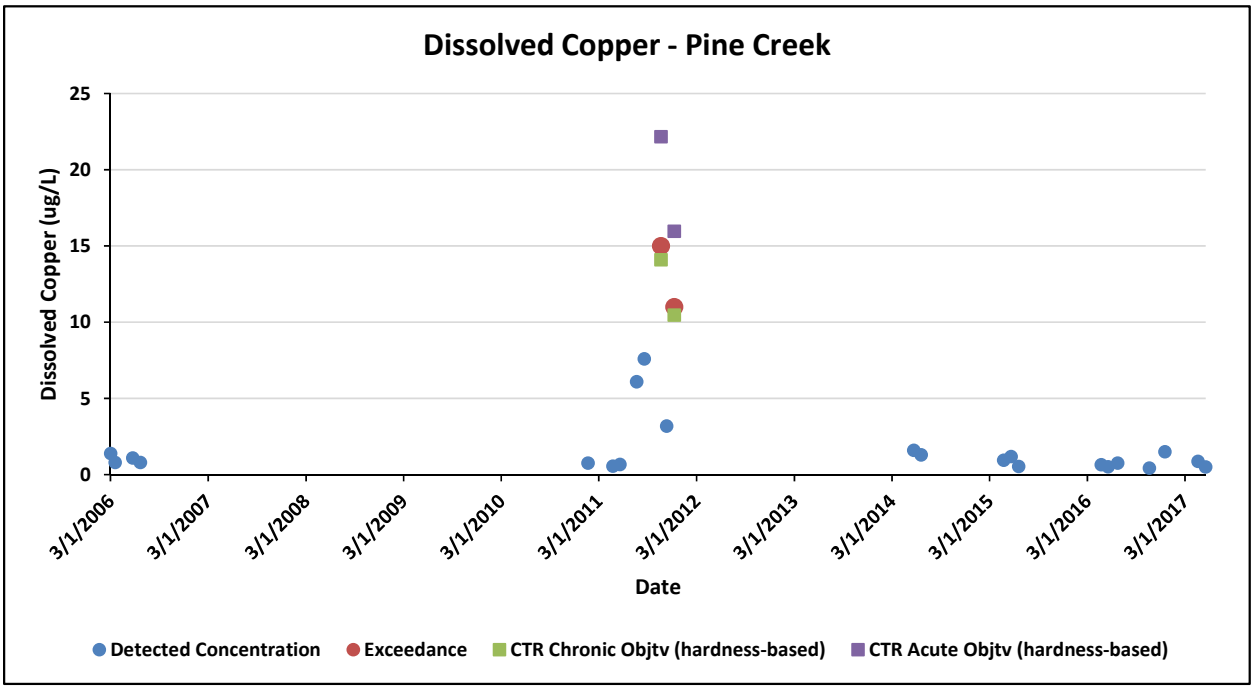

Figure 5. Dissolved Copper Monitoring Results in Pine Creek at Highway 32: 2006 – 2017

Chlorpyrifos in Ulatis Creek

The Dixon/Solano Resource Conservation District Agricultural Water Quality Coalition submitted to the Regional Water Board a Management Practices Implementation and Performance Goals (MPIPG) Report for Chlorpyrifos in Ulatis Creek in March 2013. In 2016, Regional Water Board staff requested that the Coalition review the MPIPG to determine if it conformed to the requirements for separate Management Plans specified in the Coalition's 2014 WDR because the Management Plan was not yet amenable to completion. The Coalition determined that the existing MPIPG needed to be updated to a Management Plan for Chlorpyrifos in Ulatis Creek to (1) conform to WDR requirements and (2) comply with chlorpyrifos use requirements related to the establishment of the pesticide as a state-restricted material on July 1, 2015. The Management Plan was submitted to the Regional Water Board on May 2, 2017, and approved on June 19, 2017.

Activities and water quality measurements related to the satisfaction of this Management Plan's Performance Goals that occurred during the 2017 monitoring year are described below.

Performance Goal Status

PG 1: Chlorpyrifos applied by entity receiving pesticide use permit information from Solano County Agricultural Commissioner's office.

According to the Solano County Agricultural Commissioner's office, 43 restricted material permit holders approved to apply chlorpyrifos were provided with pesticide use permit conditions for chlorpyrifos.

PG 2, 3, & 4: Increased education and awareness of (a) end of row shutoff when spraying, (b) mechanisms to control drift, and (c) drift minimization.

Three separate Solano Agricultural Commissioner Pesticide Applicator Training meetings were held on 17 November and 12 December 2016, and 19 January 2017. All three meetings collectively reached 110 pesticide applicators; covering all applicators, not just those applying chlorpyrifos. Additional information regarding these outreach events is provided in Appendix F (*SVWQC Outreach Materials*) of the Coalition's 2017 AMR.

PG 5: Tracking of management practices implemented to reduce or prevent the discharge of chlorpyrifos to surface waters in the Cache Slough drainage and represented drainages. Pesticide application practices and cultural practices to manage sediment and erosion taken from Coalition Farm Evaluations are presented in **Table 5** for the crop years 2015 and 2016. Because all Dixon/Solano Coalition members receive the same outreach and education information, regardless of the pesticides they apply, it is not necessary to track separately the management practice implementation of chlorpyrifos applicators.

Table 5. Comparison of Practices Implemented in the Cache Slough Drainage and Represented Drainages in 2015 – 2016 to Prevent Chlorpyrifos from Entering Surface Waters

PRACTICE CATEGORY **Individual Practice**	**2015 % Total Acres (125,454 acres)**	**2016 % Total Acres (121,236 acres)**
PESTICIDE APPPLICATION PRACTICES		
Follow label restrictions	91.7	91.0
Avoid surface water when spraying	90.4	89.8
Monitor wind conditions	89.8	89.9
County permit followed	88.7	88.0
Use PCA recommendations	88.3	87.3
Attend trainings	85.7	85.9
Monitor rain forecasts	84.6	86.5
Use appropriate buffer zones	83.4	82.7
End of row shutoff when spraying	83.0	82.2
Use drift control agents	81.3	81.9
Sensitive areas mapped	60.4	59.8
Reapply rinsate to treated field	54.4	52.9
Use vegetated drain ditches	37.7	38.7
Target sensing sprayer used	14.9	16.0
No pesticides applied	8.6	9.5
Other1	5.1	4.2

PRACTICE CATEGORY Individual Practice	2015 % Total Acres (125,454 acres)	2016 % Total Acres (121,236 acres)
Chemigation	5.1	4.8
No Selection	0.1	0.1
CULTURAL PRACTICES TO MANAGE SEDIMENT AND EROSION		
Soil water penetration has been increased through the use of amendments, deep ripping and/or aeration.	69.5	69.4
Crop rows are graded, directed and at a length that will optimize the use of rain and irrigation water.	56.6	60.6
Minimum tillage incorporated to minimize erosion.	46.7	52.0
Vegetated ditches are used to remove sediment as well as water soluble pesticides, phosphate fertilizers and some forms of nitrogen.	38.1	40.4
Cover crops or native vegetation are used to reduce erosion.	33.6	35.8
Storm water is captured using field borders.	32.1	37.6
Berms are constructed at low ends of fields to capture runoff and trap sediment.	20.9	22.7
Sediment basins / holding ponds are used to settle out sediment and hydrophobic pesticides such as pyrethroids from irrigation and storm runoff	18.7	19.7
Subsurface pipelines are used to channel runoff water.	18.6	18.2
Creek banks and stream banks have been stabilized.	13.9	15.1
Vegetative filter strips and buffers are used to capture flows.	12.3	14.4
Hedgerows or trees are used to help stabilize soils and trap sediment movement.	9.9	13.9
No storm drainage due to field or soil conditions.	7.0	6.5
Other	6.8	5.6
Field is lower than surrounding terrain.	2.7	3.1
No Selection	1.3	1.5

PG 6: Maintain chlorpyrifos concentrations in Ulatis Creek at Brown Road (UCBRD) to below the trigger limit for the organophosphate pesticide.

Monitoring performed at the UCBRD site has shown no exceedances of the chlorpyrifos trigger limit since May 2015, as shown in **Figure 6**.

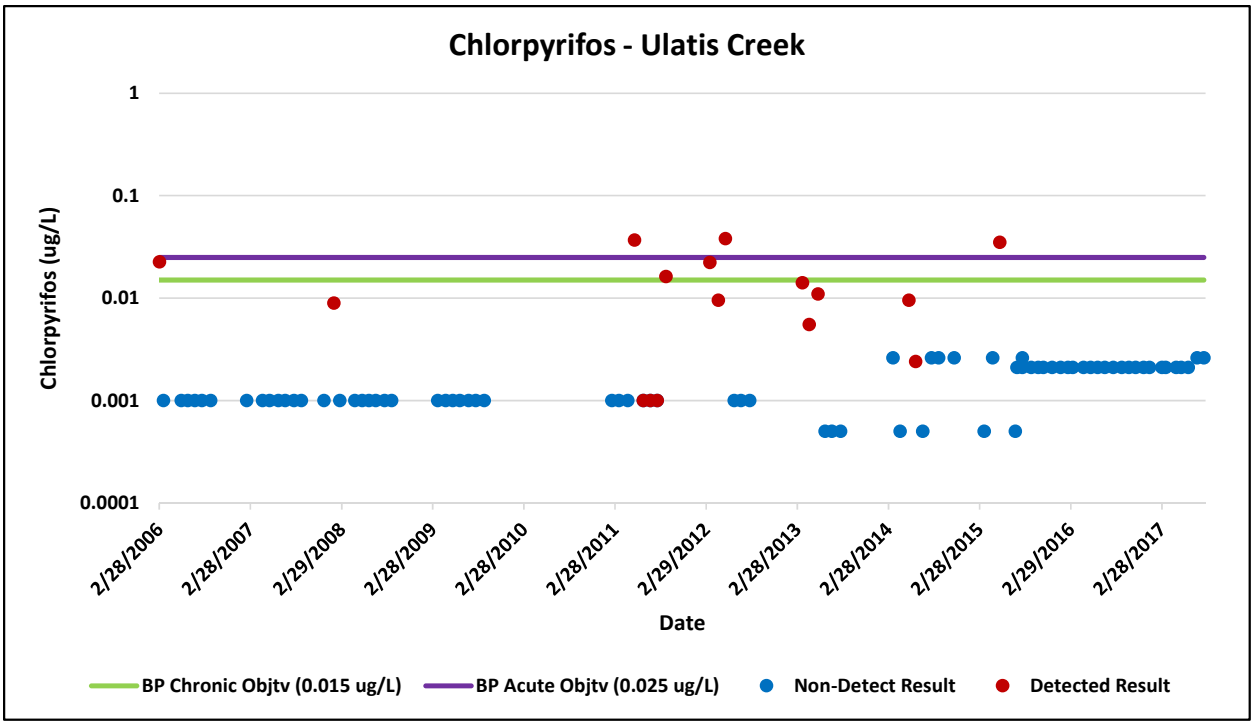

Figure 6. Chlorpyrifos Monitoring Results in Ulatis Creek at Brown Road: 2006 – 2017

Unknown Toxicity to *Selenastrum* in Ulatis Creek

As described above, three water column toxicity to algae (*Selenastrum capricornutum*) events were observed in Delta RMP monitoring in Ulatis Creek that was conducted to satisfy Coalition ILRP monitoring requirements, as well as those of other permitted dischargers. These toxicity events were observed in September 2015, February 2016, and November 2016. Based on Delta RMP water column pesticides data and inconclusive toxicity identification evaluation (TIE) results for the November 2016 sample, the potential cause of the three observed *Selenastrum* toxicities is unknown. A review of contemporaneous pesticide analyses associated with the three observed toxicity events showed no individual pesticide or collection of pesticides as the potential cause of the observed toxicity when comparing detected pesticide concentrations to relevant ecotoxicology benchmarks for algae. The Sacramento Valley Water Quality Coalition will submit to the Regional Water Board a draft Management Plan for Unknown Toxicity to *Selenastrum* in Ulatis Creek by May 1, 2018.

DO and pH Management Plan Approach

Management Plans for dissolved oxygen (DO) and pH were triggered at numerous Coalition monitoring sites during the earliest years of Coalition monitoring and these parameters continue to exceed their relevant water quality objectives (WQOs) at many monitoring sites. The development of DO and pH Management Plans has been given a low priority by the Regional Water Board and the Coalition, relative to other parameters, for the following reasons:

> DO and pH show (1) moderate potential for affecting aquatic life; (2) low probability of affecting other uses; (3) low probability of significant direct agricultural sources with high probability of natural causes; (4) long-term management of multiple sources likely

required even with successful management of agricultural sources; and (5) lower probability of meeting WQOs by implementing management practices.

Regional Water Board Management decided in 2016 to pursue the development of DO and pH Management Plans for all Central Valley Coalitions where such Management Plans have been triggered and asked the SVWQC to develop a Management Plan approach/methodology for these two parameters.

The Coalition has pursued a multistep analysis approach that used statistical methods (conventional parametric multiple regression/ANOVA and non-parametric methods (Spearman's rank-order correlation)) and typical graphical methods to first evaluate all Coalition DO and pH data for relationships with non-agricultural environmental event-based factors including: flow, water temperature, time of day, time of year (season), event type (wet/dry), and electrical conductivity (EC was included as a factor only in the pH regression analysis). Statistics were calculated for each site for frequency of exceedance and residuals of regression on non-agricultural environmental factors. These tasks constituted Step 1 of the analysis. The results of Step 1 provided the following information:

- The DO regression model explained 21% of observed variability in DO concentration; and
- The pH regression model explained 15% of observed variability in pH concentrations.

Step 2 of the analysis evaluated the relationships between relevant drainage (site) characteristics and DO or pH exceedance statistics for each site using the Spearman's rank-order correlation. Drainage characteristics were divided into the following two groups with a check for inter-relationship between agricultural and non-agricultural characteristics, as necessary:

Agricultural-related Characteristics: percent (%) irrigation method, average nutrient concentration, and percent (%) implementation of sediment and erosion control practices.

Non-Agricultural Characteristics: average gradient, drainage size, and elevation.

The correlation analysis was used to determine the strength of the relationships between both the agricultural-related characteristics and the non-agricultural characteristics and observed exceedances of WQOs. The results of Step 2 provided the following information:

- The agricultural practice of laser leveling fields was the only practice identified as statistically significant, with a negative relationship between (a) implementation and median DO and pH water column concentrations, and (b) exceedances of the WQO for pH;
- Nitrate showed a significant positive relationship between its median concentration and median DO concentrations in the water column;
- Phosphorus showed a significant negative relationship between (a) its median concentration and median DO and pH water column concentrations, (b) a positive relationship between its median concentration and exceedances of the WQO for DO, and (c) a negative relationship between its median concentration and exceedances of the WQO for pH.

- Total organic carbon showed a significant negative relationship between (a) its median concentration and median DO water column concentrations, and (b) a positive relationship between its median concentration and exceedances of the WQO for DO.

The above results were presented to Regional Water Board staff during two separate meetings held on September 22, 2017, and March 1, 2018. With respect to the absence of significant relationships between percent implementation of agricultural-related practices and exceedances of WQOs for DO and pH at the current levels of management practice implementation (with the noted exception of laser leveling), it bears noting that additional implementation of management practices would not be expected to influence observed rates of WQO exceedances for DO and pH. Additionally, it should be noted that because phosphorus naturally occurs in soils of the Sacramento Valley, the agricultural use of phosphorus has little effect on DO exceedances.

The Coalition has been informed that Regional Water Board staff will discuss the results of these two statistical analyses with its management and communicate any additional required actions on the Coalition's part at a future undetermined date.

Work Plan to Determine the Need for Pathogen Indicator Management Plans

Since the beginning of the Coalition's Monitoring Program, Management Plans for *E. coli* have been triggered at many Coalition monitoring sites. The indicator bacteria, *E. coli*, is used as a surrogate for waterborne pathogens when monitoring streams to assess potential impacts to human health. These Management Plans have been suspended by the Executive Officer of the Regional Water Board. Since the suspension by the Regional Water Board, the Coalition has produced reports outlining the various potential sources of pathogens measured at its monitoring sites. In 2007, the Coalition conducted a Pathogen Source Identification Study, which used Quantitative Polymerase Chain Reaction (qPCR) analysis targeting genetic markers to determine the source(s) of the *E. coli* measured in Coalition water quality samples. In 2011, LWA submitted a Pathogen Indicator Source Evaluation Report (2011 SER), which analyzed Coalition monitoring data, survey results, and information relating to other pathogen sources to classify a subset of drainages as not requiring a monitoring plan. The Coalition will submit a Work Plan on May 1, 2018, that follows the steps laid out in the 2011 SER, while building upon its conclusions through additional verification monitoring for monitoring sites that appear to necessitate a Management Plan.

The Work Plan outlines two separate evaluation phases that will be used to assess whether Management Plans will be required for Coalition drainages that have triggered an *E. coli* Management Plan. Phase 1 of the evaluation will categorize drainages with triggered Management Plans as either (1) not requiring an *E. coli* Management Plan, (2) requiring an *E. coli* Management Plan, or (3) requiring additional information to make a definitive determination regarding the need for a Management Plan. Phase 2 of the evaluation will focus on verification monitoring for the subset of drainages that required additional information. At the end of Phase 2, all evaluated drainages will be classified either as requiring or not requiring an *E. coli* Management Plan.

Goals for Implementation of Management Practices

Under the Conditional Waiver, the Coalition was required to develop performance goals and a schedule for implementation of management practices when it was determined that agriculture

was a contributor to exceedances of water quality objectives or *ILRP* Trigger Limits. These Management Practice Implementation Performance Goals (MPIPG) were developed as independent documents for specific Management Plan elements. The WDR incorporated these elements into the requirements for Management Plans. Following the adoption of the WDR, MPIPGs have either been completed, or were incorporated into an updated Management Plan that conforms to WDR requirements (e.g., chlorpyrifos in Ulatis Creek). **Table 6** contains the status of all previously prepared MPIPGs.

Table 6. Status: Submitted Management Practices Implementation and Performance Goals

Management Plan Analytes	Water Body	Status
Malathion	Colusa Drain	RTC approved for completion (August 2017)
Chlorpyrifos	Ulatis Creek	MP updated to meet WDR requirements and submitted in 2017
Malathion	Willow Slough	RTC approved for completion (August 2017)
Hyalella toxicity and pyrethroid pesticides	Z-Drain	RTC approved for completion (August 2017)

Deliverables and Schedule for Ongoing Management Plan Elements

Deliverables to be completed in 2017 for existing Management Plans are listed in **Table 7**. The specific detailed tasks for these existing Management Plans have been provided previously.

Table 7. 2017 Deliverables for Ongoing Management Plans

Analytes		Subwatershed	Water Body	Status	Next Deliverable
Registered Pesticides	Chlorpyrifos	Butte-Yuba-Sutter	Gilsizer Slough	Continue monitoring and implementation	Provide annual information on Performance Goal achievement
	Chlorpyrifos	Butte-Yuba-Sutter	Pine Creek	Continue monitoring and implementation	As above
	Chlorpyrifos	Solano	Ulatis Creek	Continue monitoring and implementation; MPIPG updated to a Management Plan in 2017	RTC summer 2018
	Diuron	Yolo	Willow Slough	Continue monitoring and implementation; RTC submitted; Regional Water Board required additional monitoring	None
Toxicity	Selenastrum (Unknown Toxicity)	Solano	Ulatis Creek	Draft Management Plan prepared	Draft Management Plan submitted on May 1, 2018
	Ceriodaphnia	Yolo	Willow Slough	Continue monitoring and implementation; RTC submitted; Regional Water Board required additional monitoring	None
Trace Metals	Arsenic	Sacramento Amador	Grand Island Drain	Continue monitoring; SER submitted in 2013	None established
	Arsenic	Butte-Yuba-Sutter	Lower Snake River	Continue monitoring	None established
	Copper	Butte-Yuba-Sutter	Lower Honcut Creek	Continue monitoring and implementation	Provide annual information on Performance Goal achievement
	Copper	Butte-Yuba-Sutter	Pine Creek	Continue monitoring and implementation	As above

Analytes		Subwatershed	Water Body	Status	Next Deliverable
Legacy Pesticides	DDE	Butte-Yuba-Sutter	Gilsizer Slough	Continue monitoring	None established
	DDE	Colusa Glenn	Lurline Creek		Prepare RTC, 2018
	DDE	Yolo	Willow Slough		Prepare RTC, 2018
	DDE/DDT	Colusa Glenn	Rough and Ready Pumping Plant		None established
	DDE/DDT	Sacramento Amador	Grand Island Drain		None established
	DDE/DDT	El Dorado	Coon Hollow Creek		None established
Pathogen Indicators	*E. coli*	Butte-Yuba-Sutter, Colusa Glenn, Lake, Napa, Sacramento-Amador, Shasta-Tehama, Solano, Upper Feather River, Yolo	31 water bodies	Draft Work Plan for Management Plan Approach prepared	Draft Work Plan for Management Plan Approach submitted on May 1, 2018
Salinity	Conductivity, TDS, Boron	Butte-Yuba-Sutter, Colusa Glenn, Lake, Sacramento-Amador, Solano, Yolo, Upper Feather River, Yolo	20 water bodies	Monitoring required; Other tasks suspended by Executive Officer of the CVRWQCB;	No deliverable requirements established
DO and pH	DO, pH	Butte-Yuba-Sutter, Colusa Glenn, Lake, Sacramento-Amador, Shasta Tehama, Pit River, PNSSNS, Solano, Upper Feather River, Yolo	30 water bodies	Monitoring required; Coalition presented results of two-step statistical analysis to Regional Water Board staff September 22, 2017, and March 1, 2018	None established

Notes:
MPIPG = Management Practices Implementation and Performance Plan; RTC = Request to Complete Management Plan

TMDL COMPLIANCE REPORTING

Currently, TMDL compliance monitoring and reporting by the Coalition is limited to the TMDLs for chlorpyrifos and diazinon discharges to the Sacramento and Feather Rivers and the Sacramento-San Joaquin Delta (Delta), and for the Clear Lake Nutrient TMDL. The Chlorpyrifos and Diazinon TMDL report will be submitted on a biennial basis beginning in 2019. This section will be updated with its conclusions only in the years of TMDL report submittal.

In 2006, the Regional Water Board adopted the Clear Lake Nutrient TMDL with the goal of achieving a 40% reduction in non-point source contributions. The Coalition provided information to assist in the 2012 update of the TMDL. In July 2016, the Coalition prepared a second memorandum[7] to support Regional Water Board staff in its 2016 update of the Clear Lake Nutrient TMDL. The 2016 memorandum provides follow-up responses to a set of questions originally asked by Regional Water Board staff in 2011. A summary of this memorandum was included in the 2017 MPPR.

SUMMARY: EVALUATION OF MANAGEMENT PLAN PROGRESS

The Coalition's Management Plan approach implements the processes and elements that are outlined in the Coalition's Water Quality Management Plan (2009 Management Plan), which was reorganized into the Comprehensive Surface Water Quality Management Plan (CSQMP) in 2015. The Coalition's approved CSQMP was most recently updated in November 2016. The CSQMP complies with the requirements set forth in the Coalition's Waste Discharge Requirements (WDR), Order No. R5-2014-0030-R1, and Monitoring and Reporting Program (MRP) adopted by the Regional Water Board in March 2014.

In general terms, the processes to meet the requirements of the Management Plan can be distilled to these elements – source evaluation, identification of management practices needed to address exceedances, implementation of management practices, evaluation of effectiveness, and regular assessment of progress toward completion of the Management Plan. The Coalition has successfully developed and implemented processes for source evaluation and identification of management practices needed. Source evaluations have been completed and provided to the Regional Water Board for a large number of Management Plan requirements for pesticides, toxicity, pathogen indicators, and legacy organochlorine pesticide exceedances.

Changes in practices and implementation of additional management practices to minimize discharges of waste contributing to exceedances have been ongoing since the ILRP was initiated, due to the outreach and education efforts of the Coalition and its members and partners. Specific trackable goals (Management Practice Implementation and Performance Goals MPIPGs) for a number of pesticide and toxicity Management Plans have been developed and submitted to the Regional Water Board beginning in 2011. Although most of these MPIPGs were never comprehensively reviewed by the Water Board, implementation to meet these goals was initiated in the subwatersheds in anticipation of Regional Water Board approval. Assessment of progress toward specific implementation goals will continue to be conducted regularly as documented in individual approved MPIPG documents and as required by the current WDR and approved CSQMP until these pre-2014 Management Plans are completed.

[7] *Memorandum: Clear Lake Nutrient TMDL Progress Information Update Request: July 15, 2016. Prepared for the Sacramento Valley Water Quality Coalition by Larry Walker Associates, Davis, CA.*

With regard to new Management Plans developed pursuant to the WDR and CSQMP and submitted to the Regional Water Board beginning in 2016, assessment of progress toward completion of the Management Plan will be based on the tracking of actions focused on reducing the risk of exceedances of the target constituent above its water quality objective (WQO) and thus, helping to improve surface water quality in the representative drainage and represented drainages, as applicable. Actions will be implemented by responsible parties (subwatershed leads and staff, along with their designees) according to a schedule that results in compliance with a specific WQO in a time frame that is as short as practicable, but may not exceed 10 years from the date the Management Plan is submitted for approval by the Regional Water Board's Executive Officer.

The approach to managing a target constituent will include the establishment of performance goals meant to reduce the discharge of the constituent to surface waters. Performance goals are typically represented as changes in behaviors of those applying a particular constituent. A typical mechanism for achieving changes in behaviors is through general outreach and education to growers and applicators, as well as targeted outreach and education to growers and applicators who apply a pesticide in the drainage where the Management Plan exists. A quantitative measure of progress is evaluated based on achievement of outreach and education goals, along with the tracking of changes in behaviors as measured by the frequency of implementation of specific management practices likely to reduce the discharge of a target constituent to surface waters. The frequency of management practices implementation is measured at the beginning of the Management Plan (baseline management practices assessment – using the Farm Evaluation or Focused Outreach Surveys) and over time as growers and applicators are exposed to continued outreach and education and subsequent water quality monitoring data. Management practices implementation will commonly be reassessed on an annual basis. Finally, the Coalition, subwatersheds, and Regional Water Board staff will assess the achievement of performance goals according to the schedule for their attainment included in an approved Management Plan and reported in annual MPPRs.

Meeting water quality objectives is the ultimate goal and measure of effectiveness of the implemented management practices and progress for the Management Plan. Water quality monitoring to measure this progress is ongoing and assessed annually, and has resulted in the completion of 35 Management Plans to date. As measured by the completion and ongoing work on specific Management Plan tasks and deliverables summarized above and documented throughout this MPPR, the Coalition continues to make good progress toward meeting these requirements and expects to achieve the goals of the current approved Management Plan and CSQMP.

PROPOSED CHANGES TO THE COMPREHENSIVE SURFACE WATER QUALITY MANAGEMENT PLAN

The Coalition's currently approved Management Plan and updates have been integrated into a Comprehensive Surface Water Quality Management Plan (CSQMP) to meet the requirements of the Coalition's WDR, Order No. R5-2014-0030, and Monitoring and Reporting Program (MRP) adopted by the Regional Water Board in March 2014. The Coalition's approved CSQMP was most recently updated in November 2016.