DWR-1272

Delta Regional Monitoring Program Annual Monitoring Report for Fiscal Year 2015–16: Pesticides and Toxicity

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Executive Summary

The primary purpose of this report is to document the first year (FY15/16) of pesticide monitoring by the Delta Regional Monitoring Program (Delta RMP). This document reports the results from samples collected monthly from July 2015 through June 2016. We have not provided analysis or interpretation of this data in this report; more in-depth data synthesis will be conducted in 2017–2018 after the second year of monitoring data is available and these data are evaluated by the Delta RMP's Technical Advisory Committee. The data described in this report are available for download via the California Environmental Data Exchange Network (CEDEN) website.[1]

Pesticide monitoring of the Delta RMP includes chemical analysis and toxicity testing of surface water samples. The parameters analyzed include 154 current use pesticides, dissolved copper, field parameters, and "conventional" parameters (ancillary parameters measured in the laboratory, such as dissolved/particulate organic carbon and hardness). Toxicity tests included an algal species (*Selenastrum capricornutum*, also known as *Raphidocelis subcapitata*), an invertebrate (*Ceriodaphnia dubia*, a daphnid or water flea), and a fish species (*Pimephales promelas*, fathead minnow). Toxicity testing included the evaluation of acute (survival) and chronic (growth, reproduction, biomass) toxicity endpoints. The surface water samples were collected from 5 fixed sites representing key inflows to the Delta that were visited monthly: Mokelumne River at New Hope Road, Sacramento River at Hood, San Joaquin River at Buckley Cove, San Joaquin River at Vernalis, and Ulatis Creek at Brown Road.

A total of 52 pesticides were detected above method detection limits (MDLs) in water samples (19 fungicides, 17 herbicides, 9 insecticides, 6 degradates, and 1 synergist). A total of 9 pesticides (5 herbicides, 3 insecticides, and 1 degradate) were detected in suspended sediments in 10 of a total of 60 samples collected during the study period (Table 4). All collected samples contained mixtures of pesticides ranging from 2 to 26 pesticides per sample. From a total of 154 target parameters, 100 compounds were never detected in any of the samples. In this report, concentrations for pesticides are reported in ng/L, equivalent to parts per trillion.

During this reporting period, there were a total of 18 samples with significant toxicity out of 180 tests performed. These results include reductions in the following endpoints: 12 reductions in *C. dubia* reproduction; 8 reductions in algal growth, 1 reduction in *P. promelas* survival; and 1 reduction in *C. dubia* survival. One sample from Buckley Cove had reductions in 3 endpoints

[1] http://ceden.waterboards.ca.gov/AdvancedQueryTool
You can download these data via the CEDEN Advanced Query Tool. At the top, under RESULTS CATEGORY, choose either "Water Quality" or "Toxicity." Then click "Select Projects" and choose "Delta RMP - Current Use Pesticides."

(0% survival and 0% reproduction in *C. dubia*, and 30% reduction in algal growth). Three additional instances of *P. promelas* toxicity were diagnosed as pathogen-related toxicity (PRT); PRT is an artifact of the test procedure and toxicity from the ambient sample cannot be determined when PRT occurs. The site with the highest number of samples with observed toxicity was the San Joaquin River at Buckley Cove, where chronic toxicity was observed to at least one species in 9 out of 12 monthly samples, and acute toxicity was observed in one instance.

Currently reported results of the initial tests of reproduction of *C. dubia* indicated statistically significant reductions in reproduction compared to culture water controls in surface water collected at several monitoring sites. Some of these samples had low electrical conductivity (EC) and *C. dubia* reproduction is known to be sensitive to low conductivity. Following the Surface Water Ambient Monitoring Program (SWAMP) guidance recommending a low EC control for short-term chronic *C. dubia* toxicity testing when EC is <100 μS/cm, these additional controls were included in monthly toxicity testing beginning in October 2015. *C. dubia* reproduction in many of the low EC controls was significantly lower than culture water controls. The Delta RMP Technical Advisory Committee (TAC) is considering how to assess effects with the intent of identifying toxicity that is caused by surface water contaminants and not due to natural differences in water quality given that some surface water samples also had relatively low EC but have not been compared with their paired low EC controls. Additional description is provided in Appendix 5. One sample collected in the San Joaquin River at Buckley Cove collected on January 19, 2016, induced 100% mortality in the *C. dubia* toxicity test. A Toxicity Identification Evaluation (TIE) was initiated but was inconclusive.

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Acronyms and Abbreviations

°C	degrees Celsius
$^{13}C_3$-atrazine	atrazine labelled with three Carbon-13 isotopes
$^{13}C_3$-caffeine	caffeine labelled with three Carbon-13 isotopes
3,5-DCA	3,5-dichloroaniline
acenaphthene-d_{10}	deuterated acenaphthene
ACN	acetonitrile
AHPL	Aquatic Health Program Laboratory
ASC	Aquatic Science Center
C. dubia	*Ceriodaphnia dubia*, a daphnid or water flea
C18	octadecyl carbon chain
CA	California
CO	Colorado
COC	chain of custody
CT	Connecticut
d	days
DCM	dichloromethane
DCPMU	1-(3,4-dichlorophenyl)-3-methylurea
DCPU	(3,4-dichlorophenyl)urea
DOC	dissolved organic carbon
EC	electric conductivity
EDTA	ethylenediaminetetraacetic acid
EI	electron ionization
EPA	Environmental Protection Agency
EPTC	S-Ethyl dipropylthiocarbamate
EtOAc	ethyl acetate
FY	fiscal year
FY15/16	fiscal year 2015/2016
FY16/17	fiscal year 2016/2017
GC	gas chromatography
GC/MS	gas chromatography mass spectrometry
GF/F	glass-fiber filters
h	hour
HLB	hydrophilic-lipophilic balanced
HPLC	high-performance liquid chromatography

L	liter
L1650	synthetic control water amended with inorganic salts to moderately hard specifications (see also ROEPAMH)
LC/MSMS	liquid chromatography tandem mass spectrometry
m	meter
MD	Maryland
MDL	method detection limit
MeOH	methanol
mg/L	milligram/Liter
mL	milliliter
mm	millimeter
MRM	multiple-reaction-monitoring
MS	mass spectrometry OR matrix spike
MSD	mass-selective detector
ng/L	nanogram/liter
NWQL	National Water Quality Laboratory, USGS
OCRL	Organic Chemistry Research Laboratory
OFR	Open-file report
OPP	Office of Pesticide Program
p,p'-DDE	1,1-bis-(4-chlorophenyl)-2,2-dichloroethene
P. promelas	*Pimephales promelas*, fathead minnow
PBO	piperonyl butoxide
pH	potential of hydrogen
POC	particulate organic carbon
PRT	pathogen-related toxicity
pyrene-d_{10}	deuterated pyrene
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
R	River
Rd	Road
RMP	Regional Monitoring Program
ROEPAMH	synthetic control water amended with inorganic salts to moderately hard specifications (see also L1650)
RPD	relative percent difference
RSD	relative standard deviation

S	sulphur
S. capricornutum	*Selenastrum capricornutum*, a single-celled algae
SFEI	San Francisco Estuary Institute
SJR	San Joaquin River
SPE	solid-phase extraction
SWAMP	Surface Water Ambient Monitoring Program
TIE	toxicity identification evaluation
TMDL	total maximum daily loads
TSS	total suspended solids
TX	Texas
UC	University of California
UCD	University of California at Davis
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UV	Ultraviolet light
XDB	extra-dense bonding
XL	extra-large
YCT	yeast, cerophyll, and trout chow
μL	microliter
μm	micrometer
μS	microsiemens

Introduction

The primary purpose of this report is to document the monitoring efforts and results of the Delta Regional Monitoring Program (Delta RMP) pesticide monitoring element. We have not provided analysis or interpretation of this data in this report. A more detailed analysis of the dataset, relative to the Delta RMP management and assessment questions (Appendix 1), will be completed in 2018. The analysis will consider all the data from the first two years of monitoring. Monitoring was performed according to the Delta RMP Quality Assurance Program Plan (Delta RMP 2016) and the Delta RMP FY15/16 Workplan (Delta RMP 2015).

Methods

Pesticide monitoring of the Delta RMP includes chemical analyses and toxicity testing. The parameters analyzed include several pesticide reporting groups, dissolved copper, field parameters, and "conventional" parameters (ancillary parameters measured in the laboratory, such as dissolved/particulate organic carbon and hardness).

The surface water samples for pesticide analyses were collected from fixed sites representing key inflows to the Delta that were visited monthly. The Delta region receives water from the Central Valley watershed, which comprises 60,000 square miles (160,000 km^2). Pesticides that occur in the Delta and its tributaries originate from both agricultural and urban sources.

The Delta RMP Quality Assurance Program Plan (QAPP, Delta RMP 2016) specifies the methods for sample collection, chemical analysis, and toxicity testing. See Appendix 2 (Field Sampling Report) for detailed information on the sample collection methods, and Appendix 3 (UC Davis aquatic toxicity laboratory report) for toxicity test methods. Detailed information on chemical-analytical methods can be found in a report from the U.S. Geological Survey (De Parsia et al. 2018). The following subsections provide short summaries of these methods.

Sample Collection

Samples for pesticide and toxicity monitoring were collected monthly by a USGS field sampling team as grab samples approximately 0.5 meters below the water surface. The samples were collected from bridges or by wading. Water was collected by submerging pre-cleaned 4 liter amber glass bottles (toxicity), 1 liter combusted amber glass bottles (pesticides), and an acid rinsed 3 liter Teflon bottle (copper, DOC and POC). Sample bottles for dissolved copper, DOC, and POC were rinsed three times with site water prior to filling, and containers were filled completely, leaving no headspace to minimize volatilization. Following sample collection at each site, subsamples to be analyzed for hardness and alkalinity were drawn by pouring sample water from the 3 L Teflon bottle into pre-cleaned 500 mL plastic bottles.

A total of 60 samples were collected. Sampling included 12 monthly sampling events at 5 sites. In January and March, sampling was timed to capture significant storm events. To plan the timing of sampling events, we referred to river flow forecasts,[2] and planned sampling events when river flows were predicted to rise by more than 25% at each of four sites where forecasts are available: lower Sacramento River, lower American River, San Joaquin River at Vernalis, and Mokelumne River.

Toxicity Testing

Toxicity tests for *S. capricornutum* (green algae), *C. dubia* (a daphnid or water flea), and *P. promelas* (fathead minnow) were based on chronic toxicity testing protocols outlined in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms* (EPA 2002). In addition, guidance from SWAMP (e.g., the use of low EC controls in addition to a standard control, Phillips 2013) was also followed. Toxicity tests include conductivity controls when one or more ambient samples have a lower or higher specific conductance than SWAMP's species specific thresholds. A low conductivity control is first statistically compared to the standard test acceptability control, to determine whether low conductivity has a negative impact on the test organism. In instances where the low conductivity control impairs a particular endpoint (e.g., *C. dubia* reproduction), the ambient sample with the lower conductivity is compared to the low conductivity control, rather than the standard control, to determine whether the ambient sample is toxic.

Table 1 on page 31 provides information on the toxicity test and the organisms used for toxicity testing. All tables are presented in a separate section at the end of the report.

S. capricornutum

S. capricornutum were cultured and maintained in-house at UCD AHPL from cultures originally obtained from Star Culturing, University of Texas (Austin, TX). Axenic algal cells (meaning only a single species was present in the culture) were placed in media for 4–7 days prior to test initiation to ensure cells were in exponential growth.

The *S. capricornutum* 96-hr chronic tests consisted of four replicate 250 mL glass flasks with 100 mL of sample and 1 mL of 1.0×10^6 cells/mL of *S. capricornutum*. A fifth replicate flask was inoculated and used for daily chemistry measurements. Tests were conducted without the addition of EDTA in order to minimize the chelation of metals, which could potentially be

[2] River Guidance Plots. California Department of Water Resources, issued jointly with the National Weather Service's California-Nevada River Forecast Center. Online at https://cdec.water.ca.gov/guidance_plots/

present in ambient samples. Test chambers were incubated in a temperature-controlled environmental chamber maintained at 25 ± 2°C under constant cool white fluorescent light. Flasks were kept in random placement in a mechanical shaker in constant orbital motion at 100 cycles per minute and were randomized twice daily. Cell growth was measured at test termination. Distilled water amended with nutrients (Hardness: 0 mg/L, Alkalinity: 0–4 mg/L, EC: 95-105 µS/cm, pH 7.8–8.2; USEPA, 2002) was used as the control. As this test acceptability control conductivity ranges from 95–105 µS/cm, additional low conductivity controls were not included with this species.

C. dubia

The *C. dubia* chronic tests consisted of ten replicate 20 mL glass vials each containing 15 mL of sample and one organism each. Tests were initiated with less than 24-hour-old *C. dubia*, born within an 8-hour period, using blocking by known parentage. *C. dubia* were transferred into a vial of fresh solution with *S. capricornutum* and YCT (a mixture of yeast, organic alfalfa and trout chow) daily. Tests were conducted at 25 ± 2 °C with a 16-hour light/8-hour dark photoperiod under fluorescent light. Mortality and reproduction were assessed daily and at test termination. L1650 (synthetic control water amended with inorganic salts and nutrients to moderately hard specifications; Hardness 80–100 mg/L, Alkalinity 56–64 mg/L, EC 295-320 µS/cm, pH 7.8–8.2; USEPA, 2002) was used as the control. Following QA guidelines established by the statewide SWAMP program, low conductivity controls were included, when ambient sample conductivities were at or below 100 µS/cm (Philips, 2013). These low conductivity controls were made with L1650 diluted with distilled water to match the conductivity of the low conductivity ambient sample.

Currently reported results of the initial tests of reproduction of *C. dubia* indicated statistically significant reductions in reproduction compared to culture water controls in surface water collected at several monitoring sites. Some of these samples had low electrical conductivity (EC) and *C. dubia* reproduction is known to be sensitive to low conductivity. Following Surface Water Ambient Monitoring Program (SWAMP) guidance, which recommends a low EC control for short-term chronic *C. dubia* toxicity testing when EC is <100 µS/cm, these additional controls were included in monthly toxicity testing beginning in October 2015. *C. dubia* reproduction in many of the low EC controls was significantly lower than culture water controls. The Delta RMP Technical Advisory Committee (TAC) is considering how to assess effects with the intent of identifying toxicity that is caused by surface water contaminants and not due to natural differences in water quality given that some surface water samples also had relatively low EC but have not been compared with their paired low EC controls. Additional description is provided in Appendix 5.

P. promelas

The *P. promelas* 7-day chronic toxicity tests consisted of four replicate 600 mL glass beakers each containing 250 mL of sample and ten organisms each. Tests were initiated with up to less than 48-hour-old *P. promelas*. Eighty percent of the test solution was renewed daily, at which time debris and dead fish were removed from the test chamber. Organisms were fed brine shrimp, *Artemia nauplii* three times daily. Tests were conducted at 25 ± 2 °C under fluorescent and ambient light with a 16-h light: 8-h dark photoperiod in a temperature-controlled water bath. Mortality was assessed daily. At test termination, the surviving *P. promelas* were dried and weighed in order to determine biomass. ROEPAMH (synthetic control water amended with inorganic salts to moderately hard specifications; Hardness 80-100 mg/L, Alkalinity 56-64 mg/L, EC 270-340 µS/cm, pH 7.8-8.2; USEPA, 2002) was used as the control. Following QA guidelines established by the statewide SWAMP program, low conductivity controls were included when ambient sample conductivities were at or below 100 µS/cm (Philips, 2013). These low conductivity controls were made with ROEPAMH diluted with distilled water to match the conductivity of the low conductivity ambient sample.

Pesticide Extraction and Analysis

Samples for pesticide analysis were analyzed at the USGS Organic Chemistry Research Laboratory (OCRL) in Sacramento, California. All water samples for pesticide analysis were filtered through pre-weighed, baked, 0.7-micrometer (µm) glass-fiber filters (Grade GF/F, Whatman, Piscataway, New Jersey) to remove suspended material. The filter paper containing the suspended sediments was dried at room temperature overnight (in the dark) then stored in a freezer at –20° Celsius (C) until extraction.

Sample Extraction

The extraction procedure and instrumental analysis by liquid chromatography tandem mass spectrometry (LC/MSMS) have been previously described in Hladik and Calhoun (2012). Briefly, filtered water samples were spiked with the recovery surrogate standards, monuron (Chem Service, West Chester, Pennsylvania) and imidacloprid-d4 (Cambridge Isotope Laboratories, Andover, Massachusetts). Each sample was then passed through an Oasis HLB solid phase extraction (SPE) (6 mL, 500 mg; Waters, Milford, Massachusetts) cartridge that had been cleaned with one column volume of dichloromethane (DCM) followed by one column-volume of acetone and two column-volumes of deionized water prior to use. During this process the water samples were pumped through the SPE cartridge at a flow rate of 10 milliliters per minute (mL/min); the SPE cartridge was then dried under nitrogen until the SPE sorbent was dry. The analytes were then eluted with 10 mL of 50:50 DCM:acetone. The eluent was then evaporated to less than 0.5 mL using a gentle stream of dry nitrogen, solvent-exchanged into acetonitrile (ACN), and further evaporated to 0.2 mL. The internal standard ($^{13}C_3$-caffeine, Cambridge Isotope Laboratories) was then added (20 µL of a 5-ng/µL solution). The sample extracts were stored in a freezer at –20°C until analysis (up to 30 days).

The extraction procedure (Hladik et al. 2008, 2009) and instrumental analysis by gas chromatography mass spectrometry (GC/MS) (Hladik and McWayne, 2012) have been previously described. Filtered water samples were spiked with the recovery surrogate standard $^{13}C_3$-atrazine (Cambridge Isotopes, Andover, Massachusetts). Each sample was passed through an Oasis HLB SPE (6 mL, 500 mg; Waters, Milford, Massachusetts) cartridge that had been cleaned with two column volume of ethyl acetate (EtOAc) followed by two column-volume of methanol (MeOH) and two column-volumes of deionized water prior to use. During this process the water samples were then pumped through the SPE cartridge at a flow rate of 10 mL/min; the SPE cartridges was dried under nitrogen until the SPE sorbent was dry. After extraction, sodium sulfate was added to the sample bottle to remove any residual water, and the bottle was rinsed three times with approximately 2 mL of DCM into a collection tube. The bottle rinse was concentrated to 1 mL under a gentle stream of nitrogen gas. The SPE cartridges were dried under nitrogen until the SPE sorbent was dry, then analytes were eluted with 12 mL of EtOAc into the concentrator tube containing its bottle rinse. The combined bottle rinse and eluent mixture was evaporated to less than 0.2 mL using a gentle stream of dry nitrogen. The internal standard, deuterated polycyclic aromatic hydrocarbon compounds acenaphthene-d_{10} and pyrene-d_{10} was then added (20 µL of a 10-ng/µL solution). The sample extracts were stored in a freezer at –20°C until analysis (up to 30 days).

Filter papers containing suspended sediment were cut up and placed in an Erlenmeyer flask and extracted twice with 50 mL of dichloromethane in a sonicator (Branson 5200; Danbury, CT) for 15 min. The extract was filtered through sodium sulfate, reduced using a Zymark Turbovap II (Hopinkton, MD) to 0.5 mL, then solvent exchanged into EtOAc, and further evaporated to less than 0.2 mL using a gentle stream of dry nitrogen. The internal standard, deuterated polycyclic aromatic hydrocarbon compounds acenaphthene-d10 and pyrene-d10 were then added (20 µL of a 10-ng/µL solution). The sample extracts were stored in a freezer at –20°C until analysis (up to 30 days).

Analytical Methods

Water extracts for analysis by LC/MSMS were analyzed on an Agilent (Palo Alto, California) 1100 HPLC coupled to a 6430 tandem MS system with a Zorbax Eclipse XDB-C18 column (2.1 mm × 150 mm × 3.5 mm; Agilent). The column flow rate was 0.6 mL/min, and the column temperature was 30°C. Data were collected in the multiple-reaction-monitoring (MRM) mode. Additional details about the instrument method can be found in Hladik and Calhoun (2012). Water and filter extracts for analysis by GC/MS were analyzed on an Agilent 7890A GC chromatograph with an Agilent 5975C Inert XL EI mass-selective detector (MSD) system using a DB-5MS analytical column (30 meter [m] by 0.25 millimeter [mm] by 0.25 micrometer [µm], Agilent, Palo Alto, Calif.) for separation with helium as the carrier gas. Data were collected in the selected-ion-monitoring mode. Additional details of the GC/MS method can be found in Hladik and others (2008, 2009).

Extraction and Analysis of Organic Carbon, Inorganic Carbon, Nitrogen, and Copper

All samples collected for analysis at the USGS National Water Quality Laboratory (NWQL) were filtered and preserved within 24 hours of collection at the USGS Organic Chemistry

Research Laboratory (OCRL) in Sacramento, CA, prior to shipment on ice to the NWQL in Denver, CO.

Sample Processing

Water samples for copper analysis were pumped through a 0.45-µm capsule filter (Pall Versapor High Capacity) using a peristaltic pump and collected in an acid rinsed 250 mL (milliliter) high-density polyethylene bottle. Prior to sample preparation, the capsule filter was rinsed with 2 L of deionized water (Barnstead E-Pure) followed by 25 mL of native water; the sample collection bottle was rinsed three times with deionized water (Barnstead E-Pure) and once with filtered native water. The sample was then preserved with certified, traceable nitric acid obtained from the NWQL.

Teflon filter towers with 25 mm filters were used for all other analytes. Sample water was passed through filters using gravity or compressed air. Water samples for dissolved organic carbon analysis were filtered through baked 0.3-µm glass-fiber filters (Advantec, Japan) into baked 125 mL amber glass bottles then preserved with certified, traceable sulfuric acid obtained from the NWQL. Particulate analytes (particulate organic carbon, inorganic carbon, and nitrogen) were collected on three baked 0.3-µm glass-fiber filters (Advantec, Japan) and stored wrapped in aluminum foil. Native water was passed through each filter until the filter appeared to be sufficiently loaded and the total volume of water passed through each filter was recorded.

Analytical Methods

Copper was analyzed at the NWQL using the method described in Techniques and Methods Book 5-B1 (Garbarino et al. 2006). Dissolved organic carbon was analyzed at the NWQL using the method described in OFR 92-480 (Brenton and Arnett 1993). Particulate organic carbon, total particulate inorganic carbon, total particulate nitrogen, and total particulate carbon were analyzed at the NWQL using EPA method 440.0 (Zimmerman et al.1997).

Monitoring Results

Monitoring results are summarized in Tables 2, 3, 4, 5, and 9 beginning on page 32. Delta RMP pesticide monitoring detected a total of 54 pesticides in 60 water samples collected during the study period (22 herbicides, 19 fungicides, 12 insecticides, and 1 synergist). All analyzed samples contained mixtures of pesticides ranging from 2 to 26 pesticides per sample (Table 4 and Figure 6–10). On the other hand, 100 of the 154 analyzed compounds were never detected in any of the samples. There were 8 instances of observed toxicity with *S. capricornutum*, 12 instances of toxicity with *C. dubia*, and 4 instances of toxicity with *P. promelas* (Table 2). However, 3 of the instances of toxicity observed among P. promelas were induced by pathogens, and no conclusion can be made about the toxicity of the sample water.

A review of the quality control (QC) data for the first year of sampling and analysis concluded that all data submitted by the 3 contracted laboratories were considered usable for the intended purpose (see short summaries, by dataset, below). However, 7% of pesticide samples were flagged and 66% of toxicity samples were flagged. For the flagged pesticide results, <2% were flagged due to recovery or precision outside of the QAPP targets, but still reported. The remaining 5% were flagged but still reported for analysis past the QAPP listed holding time of 1 month. The lab has indicated that internal studies have shown consistent results for samples stored up to 6 months, and future versions of the QAPP may be updated to reflect that. The results of the QC review are summarized in Table 6 (chemical-analytical results) and Table 7 (toxicity testing results). See Appendix 4 (Quality Assurance Review Summary) for additional detail. Deviations from the QAPP for field parameters, also minor, are discussed in Appendix 2 (Field Sampling Report). Poor organism performance led to the rejection of *C. dubia* toxicity data for tests conducted in August 2015. Pathogen-Related Toxicity (PRT) was also observed with *P. promelas* in 2 samples from Mokelumne River at New Hope Road and one sample from San Joaquin River at Vernalis. This is an artifact of the test procedure and toxicity from the ambient sample cannot be determined when PRT occurs.

Pesticides

Results were reported for 154 current use pesticides, with 63 or more sample results (12 months × 5 stations plus field replicates) per pesticide for FY15/16. Of these, around 70% of reported analytical results were non-detect. All the data were of sufficient quality to be reportable.

DOC/POC, TSS, and Copper

All the data for dissolved organic carbon (DOC)/ particulate organic carbon (POC), and total suspended solids (TSS) were reportable, despite some minor deviations from the QAPP, including:

- Recovery in 8 of 22 DOC lab control samples was unusually low and very constant across replicates (exactly 5% and likely a transcription error)
- Exceedances of hold times for analysis of 5 DOC samples
- DOC detected in one filter blank at a concentration less than 30% of the lowest sample concentration
- Variation among TSS field replicates was greater than required in the QAPP, averaging replicate percent deviation (RPD) ~32%, over the 25% target
- No QAPP deviations for copper

Toxicity Testing

QAPP deviations found with the toxicity data submitted included water quality parameters (e.g. temperature and pH) that were less than one full unit outside the recommended test range. There were also samples analyzed beyond hold time (i.e., for 7/28/15 *C. dubia* tests performed on 8/8/15 and on follow-up TIEs), failures of test acceptability criteria for some controls (with alternative controls used for those tests), and significant effects for some blanks, which were already flagged by the lab. These issues are summarized in Table 7 and described in more detail in Appendix 3 (UC Davis AHPL lab report).

Data Presentation

Toxicity Results

During this reporting period, there were a total of 18 samples with significant toxicity. Results of toxicity tests are shown in Tables 2 and 3 and Figures 1 through 5. The highest number of samples with significantly reduced endpoints (7 of 12 samples) occurred at San Joaquin River at Buckley Cove. These results include 1 sample with reduced *S. capricornutum* growth, *C. dubia* survival, and *C. dubia* reproduction; 1 sample with reduced *C. dubia* reproduction and reduced algal growth; 3 samples with reduced algal growth, and 2 samples with reduced *C. dubia* reproduction (Figure 1). Four samples from Sacramento River at Hood caused significant reductions in *C. dubia* reproduction relative to controls (Figure 2). All 4 instances of observed toxicity at Hood were due to reductions in *C. dubia* reproduction. Significantly reduced endpoints occurred in 3 samples at Ulatis Creek at Brown Road, including 3 of reduced *C. dubia* reproduction and 1 reduction of algal growth (Figure 3). Three instances of significantly reduced endpoints occurred at San Joaquin River at Vernalis, including 1 reduced *P. promelas* biomass endpoint and 2 instances of reduced algal growth (Figure 4). One instance of toxicity was observed at Mokelumne River at New Hope Road (Figure 5), where there was reduced *C. dubia* reproduction.

Pathogen-related toxicity (PRT) was observed with *P. promelas* in 2 samples from Mokelumne River at New Hope Road and 1 sample from San Joaquin River at Vernalis. This is an artifact of the test procedure and toxicity from the ambient sample cannot be determined when PRT occurs. The PRT was alleviated when tests were initiated following the PRT follow-up protocol (which led to using the PRT follow-up protocol in initial screening tests for the remainder of the project period).

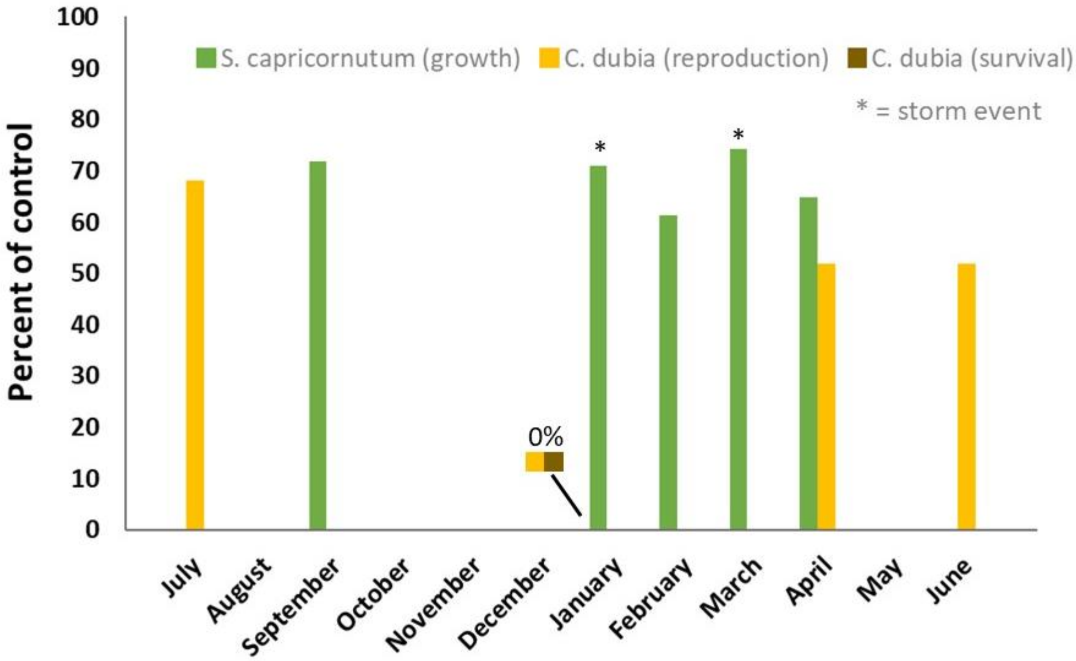

Figure 1. Toxic samples (significantly different from the L1615 control) collected from San Joaquin River at Buckley Cove, July 2015 to June 2016.

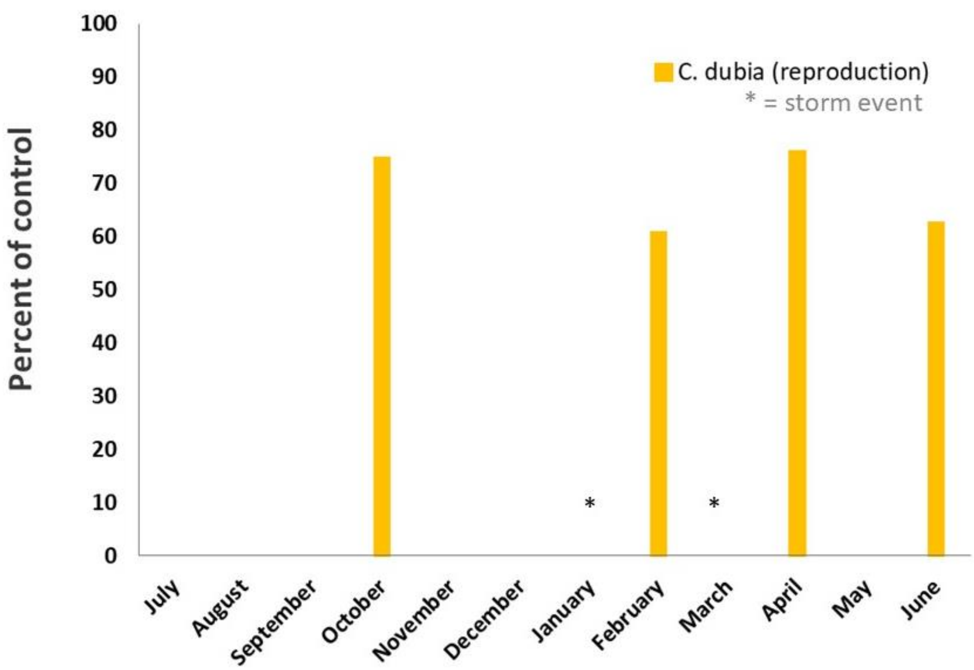

Figure 2. Toxic samples (significantly different from the control) collected from Sacramento River at Hood, July 2015 to June 2016.

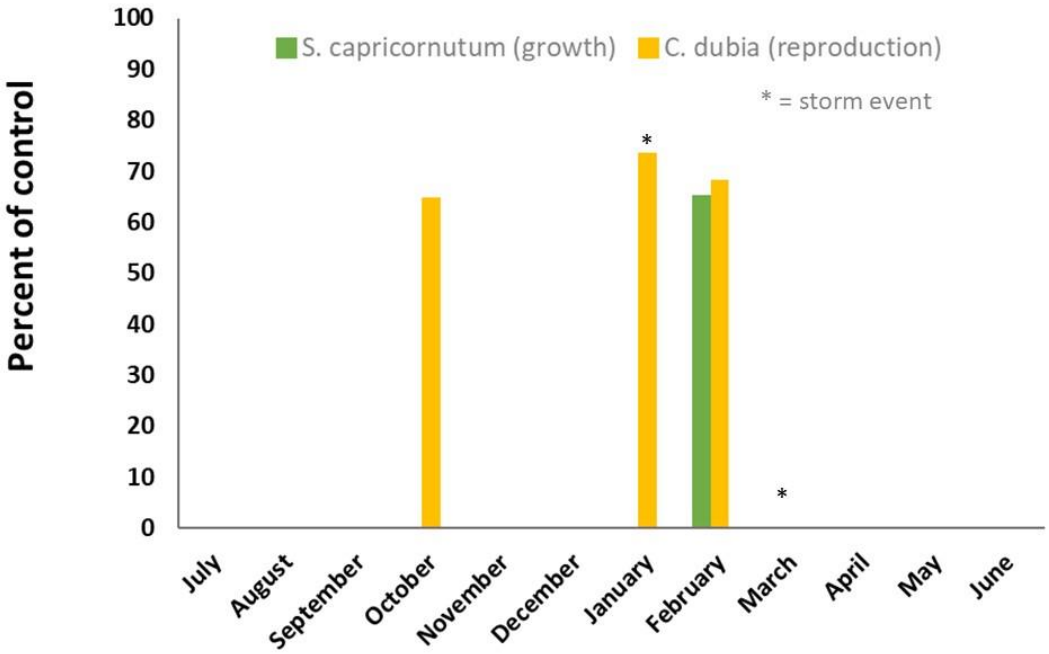

Figure 3 Toxic samples (significantly different from the control) collected from Ulatis Creek at Brown Road, July 2015 to June 2016.
* =storm event.

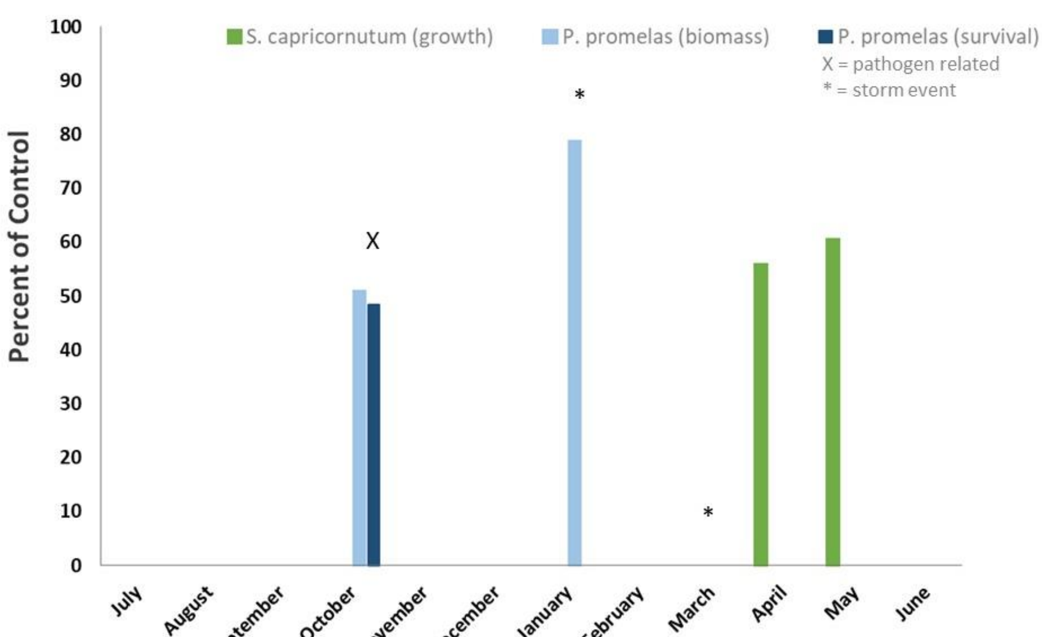

Figure 4. Toxic samples (significantly different from the control) collected from San Joaquin River near Vernalis, July 2015 to June 2016.

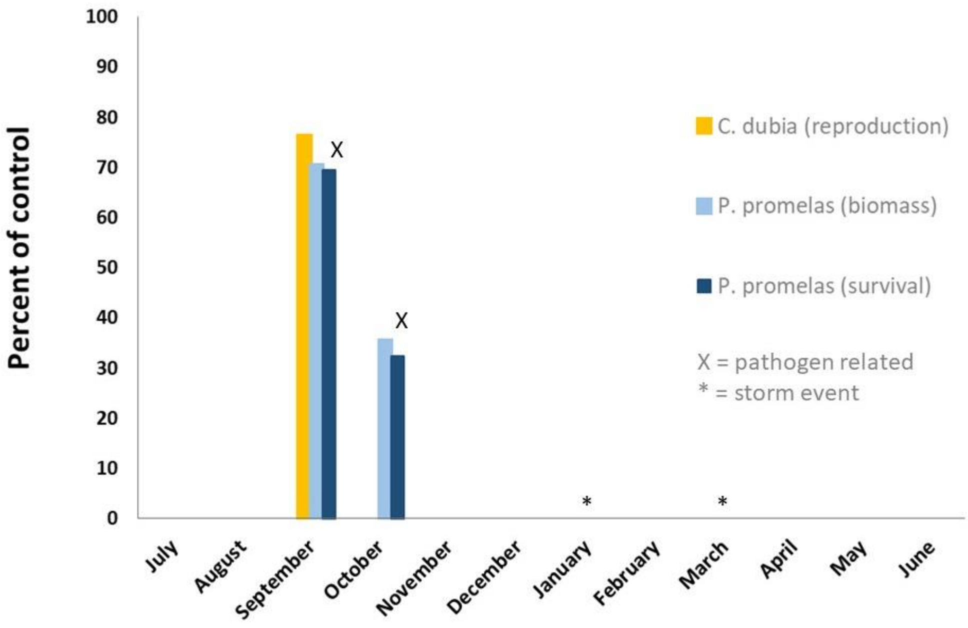

Figure 5. Toxic samples (significantly different from the control) collected from Mokelumne River at New Hope Road, July 2015 to June 2016.

Toxicity Results by Event

July 2015 – Statistically significant reduction (see Delta RMP 2016 QAPP) in *C. dubia* reproduction was observed for samples collected from San Joaquin River at Buckley Cove. This result was obtained in a repeat test initiated on August 8, 2015. The 36-hour holding time was missed for this retest. The original *C. dubia* toxicity test was terminated, because it did not meet test acceptability criteria due to poor animal health.

August 2015 – No toxicity was observed in the *S. capricornutum* or the *P. promelas* tests. The *C. dubia* toxicity test did not meet the test acceptability criteria, therefore no results are published from this test.

September 2015 – Statistically significant reduction in cell growth in *S. capricornutum* test for San Joaquin River at Buckley Cove and statistically significant reduction in the reproduction endpoint for *C. dubia* at the Mokelumne River at New Hope Road.

October 2015 – Statistically significant reduction in the reproduction endpoint for *C. dubia* at the Sacramento River at Hood and Ulatis Creek at Brown Road sites. However, discussions are pending on the interpretation of *C. dubia* toxicity at locations with low EC that were not compared to the low EC control (see footnotes 3-8).

November 2015 – No toxicity was observed in any tests.

December 2015 – No toxicity was observed in any tests.

January 2016 – Statistically significant reduction in cell growth in the *S. capricornutum* test at San Joaquin River @ Buckley Cove. Statistically significant reduction in biomass in *P. promelas* test at San Joaquin River at Vernalis. Statistically significant reduction in *C. dubia* reproduction endpoint at Ulatis Creek at Brown Road, as well as at San Joaquin River at Buckley Cove. San Joaquin River at Buckley Cove met the TIE Trigger with 100% *C. dubia* mortality. However, toxicity had attenuated in subsequent dilution series and TIE follow-up tests, and the TIE was therefore inconclusive.

February 2016 – Statistically significant reduction in cell growth in the *S. capricornutum* test observed at San Joaquin River at Buckley Cove and Ulatis Creek at Brown Road sites. Statistically significant reduction in *C. dubia* reproduction endpoint at Sacramento River at Hood and Ulatis Creek at Brown Road sites. However, discussions are pending on the interpretation of *C. dubia* toxicity at locations with low EC that were not compared to the low EC control (see footnotes 3-8).

March 2016 – Statistically significant reduction in cell growth in *S. capricornutum* at San Joaquin River at Buckley Cove.

April 2016 – Statistically significant reduction in cell growth in *S. capricornutum* at the San Joaquin River at Buckley Cove and San Joaquin River at Vernalis sites. Statistically significant reduction in *C. dubia* reproduction at the Sacramento River at Hood and San Joaquin River at Buckley Cove sites. However, discussions are pending on the interpretation of *C. dubia* toxicity at locations with low EC that were not compared to the low EC control (see footnotes 3-8).

May 2016 – Statistically significant reduction in cell growth in *S. capricornutum* at the San Joaquin River at Vernalis site.

June 2016 – Statistically significant reduction in *C. dubia* reproduction endpoint at Sacramento River at Hood and San Joaquin River at Buckley Cove. However, discussions are pending on the interpretation of *C. dubia* toxicity at locations with low EC that were not compared to the low EC control (see footnotes 3-8).

Toxicity Identification Evaluations

One sample collected in the San Joaquin River at Buckley Cove collected on January 19, 2016, induced 100% mortality in the *C. dubia* toxicity test. A Toxicity Identification Evaluation (TIE) was initiated but was inconclusive.

In addition, two samples collected on October 21, 2016, met the TIE threshold of $\geq$ 50% reduction in *the P. promelas* survival endpoint. The sample from the Mokelumne River had 30% survival and the sample from the San Joaquin River at Vernalis had 45% survival. However, the toxicity in both samples was pathogen-related, and no TIE was pursued.

Pesticide Results

A total of 52 pesticides were detected above MDLs in water samples collected during the study period (19 fungicides, 17 herbicides, 9 insecticides, 6 degradates, and 1 synergist) (Table 8). Table 8 provides a list of all detected pesticides and their overall detection frequencies in water samples. Overall, 8 pesticides were detected above MDLs in at least half of all samples. All samples contained mixtures of pesticides ranging from 2 to 26 pesticides per sample (Table 4). Pesticide concentrations ranged from non-detect to 2,627 nanograms per liter (ng/L); the herbicide metolachlor had the highest concentration (Table 4).

A total of 9 pesticides (5 herbicides, 3 insecticides, and 1 degradate) were detected in suspended sediments in 10 of a total of 60 samples collected during the study period (Table 4). Overall, the most frequently detected pesticides in suspended sediments were permethrin (7%), pendimethalin (5%), and bifenthrin (5%). Pesticide concentrations in the suspended sediments ranged from non-detect to 265 ng/L; the highest concentration was for pendimethalin (Table 4).

Pesticide Results by Station

Mokelumne River at New Hope Road

A total of 29 pesticides (14 fungicides, 9 herbicides, 3 insecticides, 2 degradates, and 1 synergist) were detected above MDLs in 12 water samples collected at this site with the most frequently detected compounds being boscalid (100%) and hexazinone (92%) (Table 4, Figure 6). The maximum pesticide concentration measured at this site was 247.3 ng/L (simazine) in the sample collected on March 7, 2016 (

Table 5). A minimum of 2 (October 21. 2015, February 17, 2016, May 18, 2016, and June 15, 2016) and a maximum of 11 (August 18, 2015, and March 7, 2016) pesticides or pesticide degradates were detected in each water sample (Figure 6). No pesticides or pesticide degradates were detected in the suspended sediments collected at this site. See Table 4 for a complete list of values for TSS, DOC, and POC, summarized briefly here:

- TSS values ranged from 0.1 mg/L (Nov. and Dec. 2015) to 15.9 mg/L (May 2016).
- POC values ranged from 0.2 mg/L (Oct. and Dec. 2015) to 1.0 mg/L (April 2016).
- DOC values ranged from 2.1 mg/L (Aug. and Oct.2015, April 2016) to 3.1 mg/L (July 28, 2015).

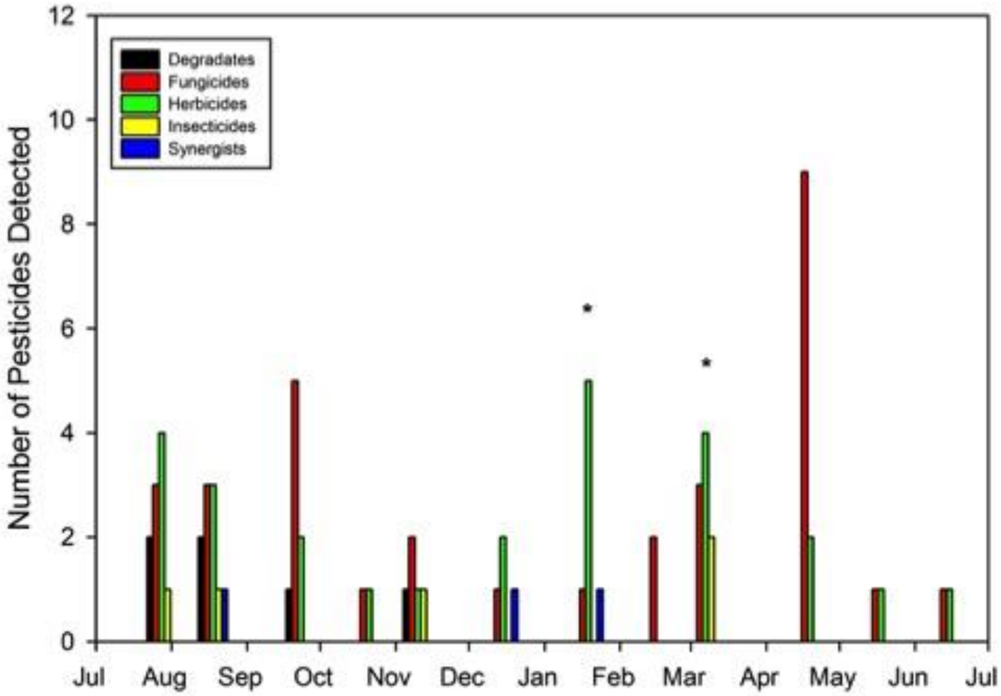

Figure 6. Numbers of pesticides detected at Mokelumne River at New Hope Road, July 2015 to June 2016.
* = storm samples.

Sacramento River at Hood

A total of 29 pesticides (11 herbicides, 9 fungicides, 6 insecticides, 2 degradates, and 1 synergist) were detected above MDLs in the 12 water samples collected at this site (Table 4, Figure 7). The fungicide azoxystrobin was detected in every sample, and an additional 7 pesticides (hexazinone, 3,4-dichloroaniline, boscalid, diuron, piperonyl butoxide (a synergist), carbendazim, and fipronil) were detected in at least half of the samples collected at this site (

Table 5). A minimum of 3 (February 17, 2016) and a maximum of 14 (March 7, 2016) pesticides or pesticide degradates were detected above MDLs in each water sample (Figure 7). Permethrin was the only pesticide detected on suspended sediments at this site. See Table 5 for a complete list of values for TSS, DOC, and POC, summarized here:

- TSS ranged from 0.1 mg/L (Nov. 2015) to 152.4 mg/L (Mar. 2016, storm event).
- POC ranged from 0.1 mg/L (Aug. and Sept. 2015) to 2.6 mg/L (Mar. 2016, storm event).
- DOC ranged from <0.5 mg/L (June 2016) to 4.4 mg/L (Jan. [storm event], Feb., and Apr. 2016).

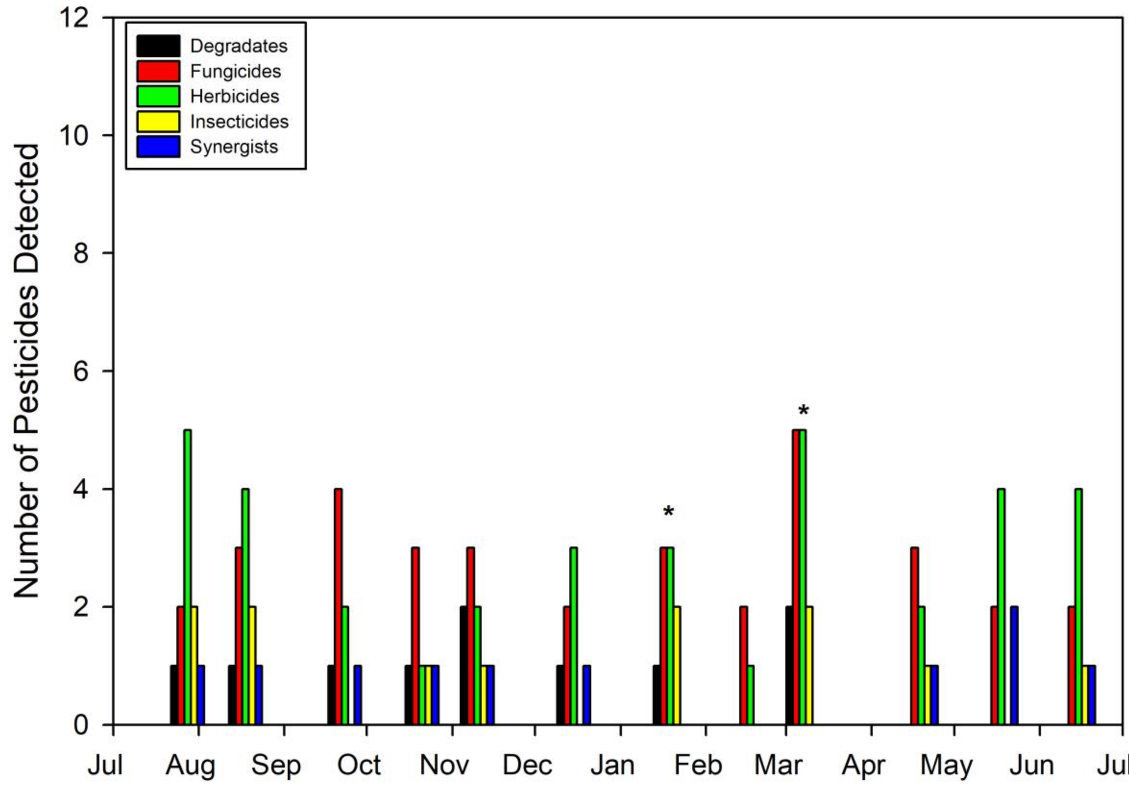

Figure 7. Numbers of pesticides detected at Sacramento River at Hood, July 2015 to June 2016.
* = storm samples.

San Joaquin River at Buckley Cove

A total of 36 pesticides (13 herbicides, 10 fungicides, 6 insecticides, 6 degradates, and 1 synergist) were detected above the MDL in the 12 water samples from this site. Eight pesticides were detected in every sample from this site (azoxystrobin, boscalid, DCPMU, diuron, fluridone, methoxyfenozide, and metolachlor), while an additional 11 pesticides (fluxapyroxad, carbendazim, chlorantraniliprole, DCPU, hexazinone, imidacloprid, 3,4-dichloroaniline, dithiopyr, piperonyl butoxide, simazine, and desulfinyl fipronil) were also detected in at least half of the samples (Table 4, Figure 8). The maximum pesticide concentration measured at the site was 450.8 ng/L for diuron in the sample collected on January 19, 2016 (

Table 5). A minimum of 13 (November 10 and December 15, 2015) and a maximum of 25 (January 19, 2016) pesticides or pesticide degradates were detected above MDLs in each water sample (Figure 8). Pendimethalin was detected in the suspended sediments of the sample collected on January 19, 2016 (51.1 ng/L) and permethrin was detected in the suspended sediments collected on August 18, 2015 (2.7 ng/L, Table 3).

TSS values at San Joaquin River at Buckley Cove ranged from 1.2 mg/L (October 2015) to 84.3 mg/L (January 2016, storm event). POC values ranged from 0.2 mg/L (August and September 2015) to 2.4 mg/L (March 2016, storm event). DOC values ranged from 2.7 mg/L (November 2015) to 8.4 mg/L (January, storm event). See Table 4 for a complete list of values for TSS, DOC, and POC.

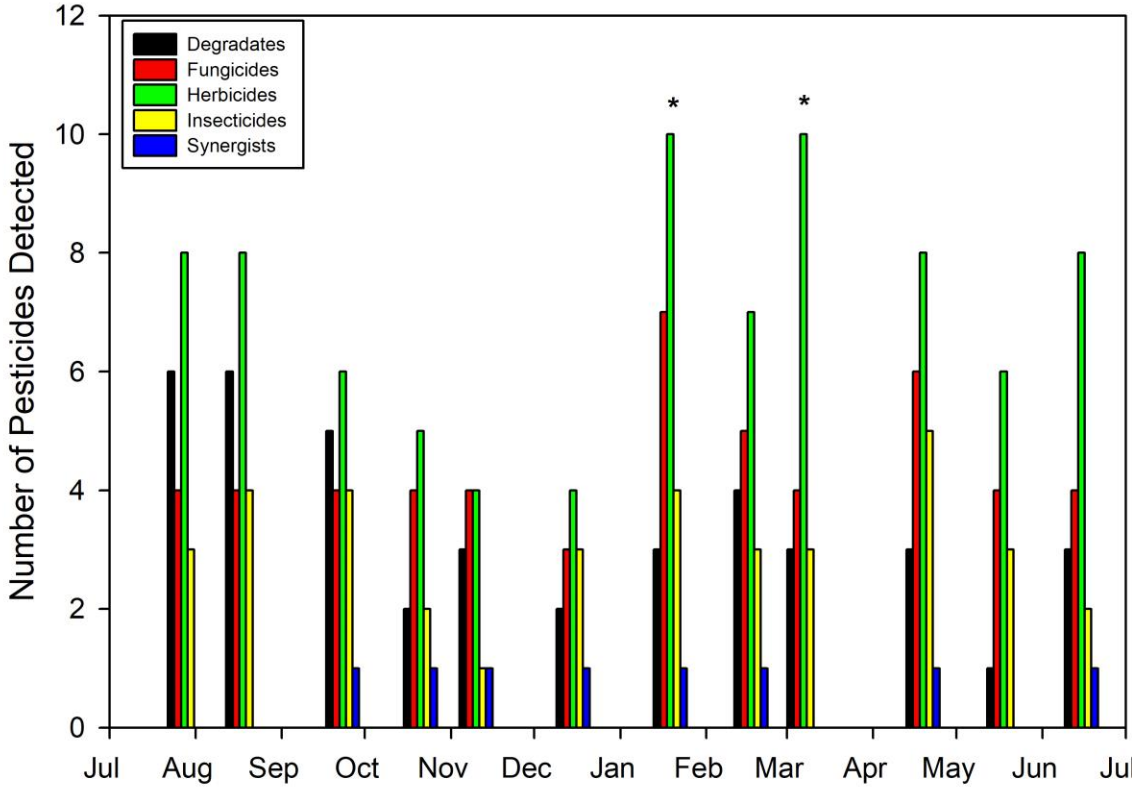

Figure 8. Numbers of pesticides detected at San Joaquin River at Buckley Cove, July 2015 to June 2016. * = storm samples.

San Joaquin River near Vernalis

A total of 29 pesticides (12 herbicides, 11 fungicides, 3 insecticides, and 3 degradates) were detected above MDLs in the 12 water samples collected from San Joaquin River near Vernalis. Two pesticides (methoxyfenozide and boscalid) were detected in every sample from this site, while an additional 8 pesticides (azoxystrobin, hexazinone, metolachlor, simazine, chlorantraniliprole, dithiopyr, diuron, and fluxapyroxad) were detected above MDLs in at least half of the samples (Table 4, Figure 9). A minimum of 6 (October 21, 2015) and a maximum of 19 (January 19, 2016) pesticides or pesticide degradates were detected above MDLs in each water sample (Figure 9).

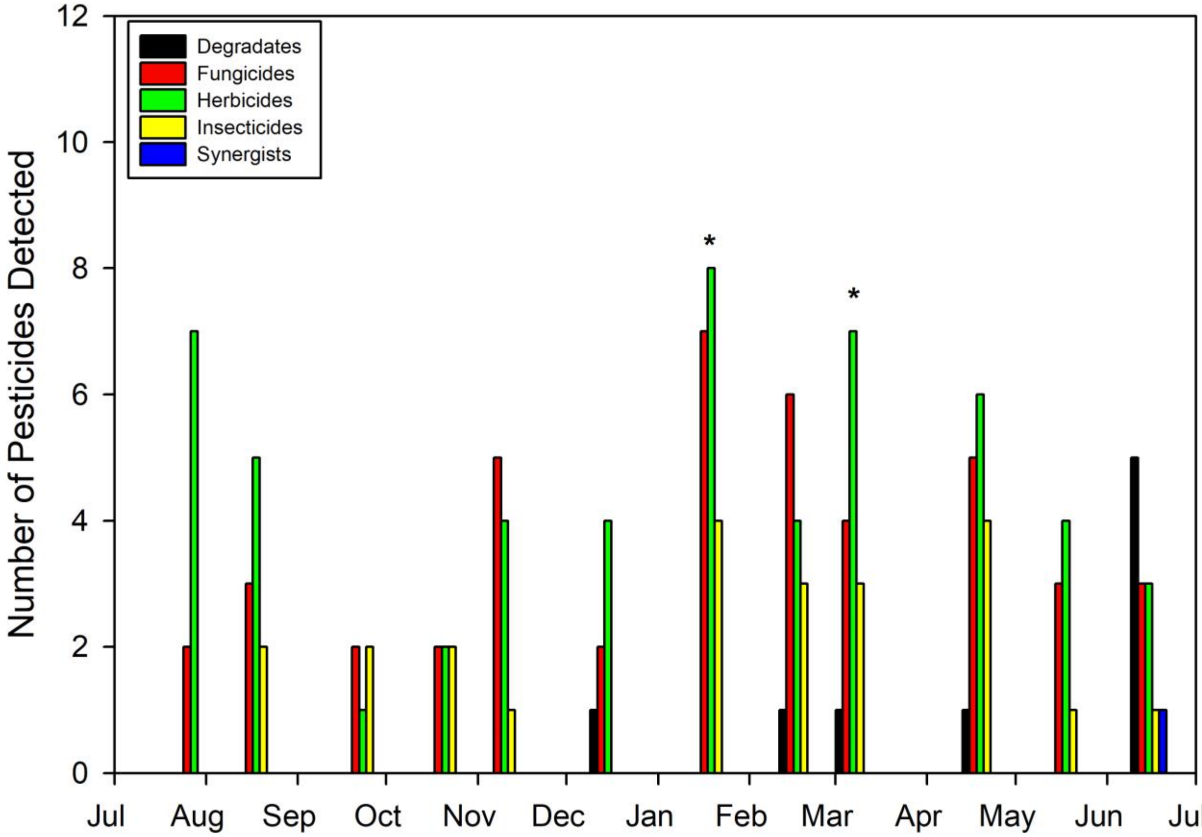

Figure 9. Numbers of pesticides detected at San Joaquin River near Vernalis, July 2015 to June 2016.
* = storm samples.

Two pesticides were detected above MDLS in the suspended sediments of water samples collected at San Joaquin River near Vernalis. The herbicide pendimethalin was detected in the sample collected on January 19, 2016 at a concentration of 27.5 ng/L and bifenthrin was detected at 4.3 ng/L on 4/19/2016 (Table 3).

TSS values at San Joaquin River at Vernalis ranged from 2.0 mg/L (November 2015) to 461.1 mg/L (January 2016, storm event). POC values ranged from 0.15 mg/L (August and September 2015) to 4.8 mg/L (June 2016). DOC values ranged from 2.2 mg/L (October 2015) to 5.1 mg/L (March, storm event). See Table 4 for a complete list of values for TSS, DOC, and POC.

Ulatis Creek at Brown Road

A total of 37 pesticides (13 herbicides, 10 fungicides, 9 insecticides, and 5 degradates) were detected above MDLs in the 12 water samples collected from Ulatis Creek at Brown Road. Two pesticides were detected above MDLs in every sample (boscalid and imidacloprid), while 10 additional pesticides were detected in at least half of the samples (Table 4, Figure 10). The maximum concentration measured at Ulatis Creek was 2627.4 ng/L for the herbicide metolachlor in the sample collected on May 18, 2016. A minimum of 8 (September 23, 2015) and a maximum of 27 (March 7, 2016) pesticides or pesticide degradates were detected in each water sample (Figure 10).

Pesticides were detected in the suspended sediments of 6 samples collected at Ulatis Creek (Table 4). A total of 8 pesticides were detected above MDLs (bifenthrin, cyhalothrin, dithiopyr, metolachlor, oxyfluorfen, p,p'-DDE, pendimethalin, permethrin, and prodiamine), with the most frequently detected compounds being the herbicides metolachlor (17 percent) and oxyfluorfen (15 percent) and the insecticides bifenthrin and permethrin (17 percent each). The storm sample collected on January 19, 2016, contained the most pesticides (6) and generally had the highest concentrations. The highest concentrations measured in the suspended sediment were 265 ng/L for pendimethalin, 26.4 ng/L for permethrin, and 23.2 ng/L for oxyfluorfen (Table 4).

TSS values at Ulatis Creek at Brown Road ranged from 16.4 mg/L (July 2015) to 580 mg/L (January 2016, storm event). POC values ranged from 1.0 mg/L (February 2016) to 38.5 mg/L (January 2016, storm event). DOC values ranged from 4.3 mg/L (November 2015) to 11.6 mg/L (June 2016). See Table 4 for a complete list of values for TSS, DOC, and POC.

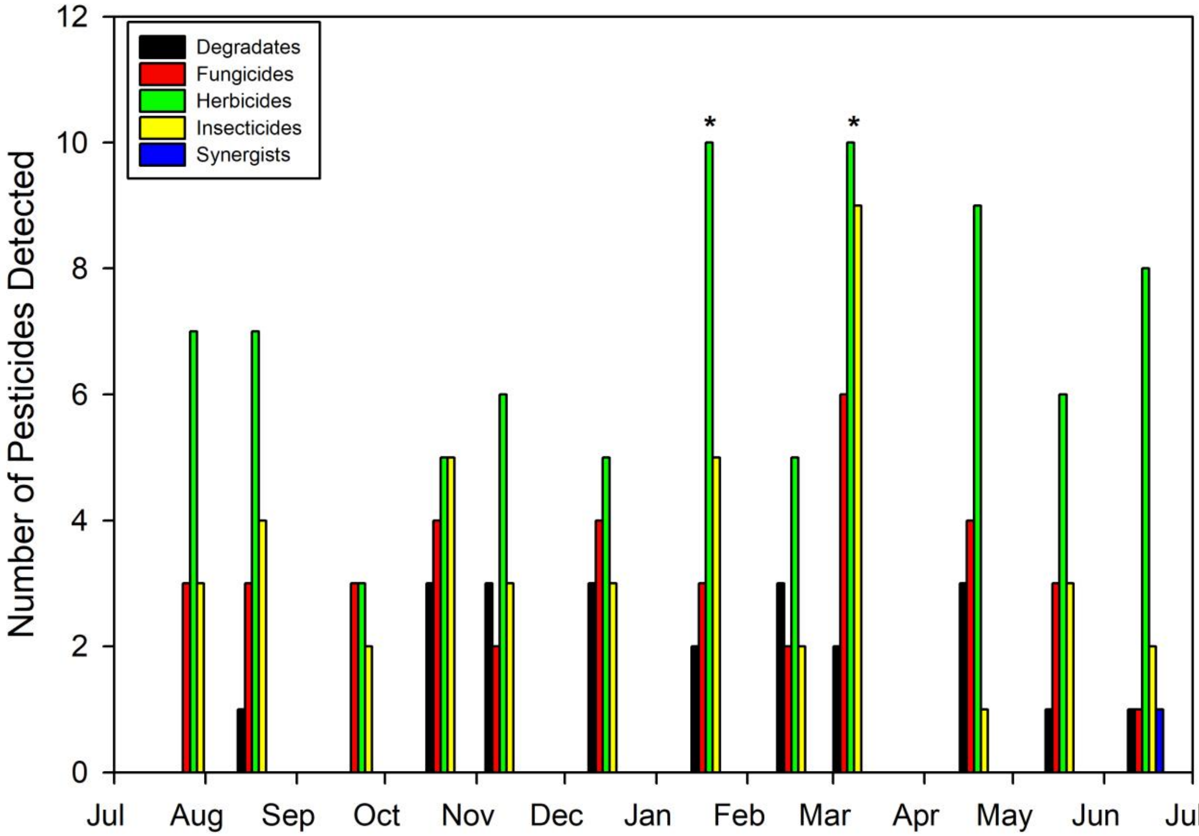

Figure 10. Numbers of pesticides detected at Ulatis Creek at Brown Road, July 2015 to June 2016.
* = storm samples.

Summary

A total of 52 pesticides were detected above MDLs in water samples (19 fungicides, 17 herbicides, 9 insecticides, 6 degradates, and 1 synergist), and a total of 9 pesticides (5 herbicides, 3 insecticides, and 1 degradate) were detected in suspended sediments in 10 of a total of 60 samples collected during the study period (Table 4). From a total of 154 target parameters, 100 compounds were never detected in any of the samples.

During this reporting period, there were a total of 18 samples with significant toxicity out of 180 tests performed. These results include reductions in the following endpoints: 12 reductions in *C. dubia* reproduction; 8 reductions in algal growth, 1 reduction in *P. promelas* survival; and 1 reduction in *C. dubia* survival. One sample from Buckley Cove had reductions in 3 endpoints

(0% survival and 0% reproduction in *C. dubia*, and 30% reduction in algal growth). Additional instances of *P. promelas* toxicity were diagnosed as pathogen-related toxicity (PRT).

This report contains limited analysis and interpretation of the data. More in-depth data synthesis will be conducted in 2018 when a second year of monitoring data becomes available and after these data are evaluated by the Delta RMP's Technical Advisory Committee.

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Tables

Table 1. Scientific and common names of organisms used for toxicity testing, their life stage, age, and source.

Test	**Endpoints**	**Test Organism - Scientific name**	**Test Organism - Common name**	**Life stage**	**Age**	**Source**
Pimephales (Fathead) 7-d Test	Biomass Survival	*Pimephales promelas*	Fathead Minnow	Larval	24-48 h	AquaTox Inc.
Ceriodaphnia 96-hr Water Test	Reproduction Survival	*Ceriodaphnia dubia*	Water flea	Neonate	<24 h, 8h window	Aquatic Research Organisms
Selenastrum (algae) 96-hr Water Test	Growth	*Selenastrum capricornutum*	Green algae	Log-phase	4-7 d	University of Texas

Table 2. Samples with toxicity for one or more endpoints (significantly different from control). Results are as percent (%) of control. † = Pathogen-related toxicity. * = Met TIE Trigger.

			Organism:	*S. capricornutum*	*C. dubia*		*P. promelas*	
Site Code	Site Name	Date	Endpoint:	Growth	Survival	Reproduction	Survival	biomass
544LSAC13	San Joaquin River at Buckley Cove	7/28/15				67.6		
544LSAC13	San Joaquin River at Buckley Cove	9/23/15		71.5				
544SAC002	Mokelumne River at New Hope Rd	9/23/15				76.3	69.4†	70.5†
510SACC3A	Sacramento River at Hood	10/21/15				74.7[3]		
511ULCABR	Ulatis Creek at Brown Rd	10/21/15				64.5		
544SAC002	Mokelumne River at New Hope Rd	10/21/15					32.3†	35.5†
541SJC501	San Joaquin River at Vernalis	10/21/15					48.4†	50.8†
544LSAC13	San Joaquin River at Buckley Cove	1/19/16		70.5	0.0*	0.0*		
511ULCABR	Ulatis Creek at Brown Rd	1/19/16				73.1		
541SJC501	San Joaquin River at Vernalis	1/19/16						78.6
544LSAC13	San Joaquin River at Buckley Cove	2/17/16		61.0				
511ULCABR	Ulatis Creek at Brown Rd	2/17/16		64.8				

[3] The Aquatic Health Program Laboratory's protocol is to compare samples with EC <100 µS/cm with the low EC control. Sample performance is otherwise compared with the L1650 control (EC 240-312 µS/cm). Comments provided by Regional San on April 6, 2017, suggest that a few samples with a relatively low EC (but not <100 µS/cm) differed significantly from the L1650 control but may or may not differ from the low EC control. They further suggest that comparison to the low EC control would be appropriate for samples with EC closer to the low EC threshold (<100 µS/cm) than the L1650 control (EC 240-312 µS/cm), before concluding that a sample is exhibiting toxicity (Appendix 5).

The initial EC in the *C. dubia* test initiated on October 22, 2015, was 183 µS/cm. The initial EC in the L1650 control was 312 µS/cm, and the initial EC in the low EC control was 64 µS/cm.

			Organism:	*S. capricornutum*	*C. dubia*		*P. promelas*	
Site Code	Site Name	Date	Endpoint:	Growth	Survival	Reproduction	Survival	biomass
510SACC3A	Sacramento River at Hood	2/17/16				60.7[4]		
511ULCABR	Ulatis Creek at Brown Rd	2/17/16				67.9		
544LSAC13	San Joaquin River at Buckley Cove	3/7/16		73.8				
544LSAC13	San Joaquin River at Buckley Cove	4/19/16		64.5				
541SJC501	San Joaquin River at Vernalis	4/19/16		55.8				
544LSAC13	Sacramento River at Hood	4/19/16				75.8[5]		
544LSAC13	San Joaquin River at Buckley Cove	4/19/16				51.5		
541SJC501	San Joaquin River at Vernalis	5/18/16		60.5				
510SACC3A	Sacramento River at Hood	6/15/16				62.5[6]		
544LSAC13	San Joaquin River at Buckley Cove	6/15/16				51.5		

[4] See footnote 3 on page 39. The initial EC in the *C. dubia* test initiated on February 18, 2016, was 200 µS/cm. The initial EC in the L1650 control was 311 µS/cm, and the initial EC in the low EC control was 75 µS/cm.

[5] See footnote 3 on page 39. The initial EC in the *C. dubia* test initiated on April 20, 2016, was 131 µS/cm. The initial EC in the L1650 control was 240 µS/cm, and the initial EC in the low EC control was 70 µS/cm.

[6] See footnote 3 on page 39. The initial EC in the *C. dubia* test initiated on June 16, 2016, was 118 µS/cm. The initial EC in the L1650 control was 272 µS/cm, and the initial EC in the low EC control was 82 µS/cm.

Table 3. Toxicity summary by site and by test organism.
o - no toxicity, X - significant difference from control, PRT - pathogen related toxicity, "-" test invalid.

Station Name	Test Organism	End Point	2015 Jul	2015 Aug	2015 Sep	2015 Oct	2015 Nov	2015 Dec	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June
San Joaquin River at Buckley Cove	*C. dubia*	Survival	o	-	o	o	o	o	**X**	o	o	o	o	o
		Reproduction	**X**	-	o	o	o	o	**X**	o	o	**X**	o	**X**
	P. promelas	Survival	o	o	o	o	o	o	o	o	o	o	o	o
		Growth	o	o	o	o	o	o	o	o	o	o	o	o
	S. capricornutum	Growth	o	o	**X**	o	o	o	**X**	**X**	**X**	**X**	o	o
Sacramento River at Hood	*C. dubia*	Survival	o	-	o	o	o	o	o	o	o	o	o	o
		Reproduction[7]	o	-	o	**X**	o	o	o	**X**	o	**X**	o	**X**
	P. promelas	Survival	o	o	o	o	o	o	o	o	o	o	o	o
		Growth	o	o	o	o	o	o	o	o	o[8]	o	o	o
	S. capricornutum	Growth	o	o	o	o	o	o	o	o	o	o	o	o
Ulatis Creek	*C. dubia*	Survival	o	-	o	o	o	o	o	o	o	o	o	o
		Reproduction	o	-	o	**X**	o	o	**X**	**X**	o	o	o	o
	P. promelas	Survival	o	o	o	o	o	o	o	o	o	o	o	o
		Growth	o	o	o	o	o	o	o	o	o	o	o	o
	S. capricornutum	Growth	o	o	o	o	o	o	o	**X**	o	o	o	o

[7] See footnotes3 to 6 on pages 39 and 40.

[8] Pathogen-related toxicity-associated retest. No toxicity in re-test.

Station Name	Test Organism	End Point	2015 Jul	2015 Aug	2015 Sep	2015 Oct	2015 Nov	2015 Dec	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June
San Joaquin River at Vernalis	*C. dubia*	Survival	o	-	o	o	o	o	o	o	o	o	o	o
		Reproduction	o	-	o	o	o	o	o	o	o	o	o	o
	P. promelas	Survival	o	o	o	PRT	o	o	o	o	o	o	o	o
		Growth	o	o	o	PRT	o	o	**X**	o	o	o	o	o
	S. capricornutum	Growth	o	o	o	o	o	o	o	o	o	**X**	**X**	o
Mokelumne River	*C. dubia*	Survival	o	-	o	o	o	o	o	o	o	o	o	o
		Reproduction	o	-	**X**	o	o	o	o	o	o	o	o	o
	P. promelas	Survival	o	o	PRT	PRT	o	o	o	o	o	o	o	o
		Growth	o	o	PRT	PRT	o	o	o	o	o	o	o	o
	S. capricornutum	Growth	o	o	o	o	o	o	o	o	o	o	o	o

Table 4. Pesticides detected above method detection limits (MDLs).
Concentrations in ng/L. * = storm sample. Whole sample = Water (concentration in filtrate) + Suspended Sediment (concentration on filter). ND = not detected.

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Mokelumne R @ New Hope Rd	07/28/2015	3,4-Dichloroaniline	4.7	ND	4.7
Mokelumne R @ New Hope Rd	08/18/2015	3,4-Dichloroaniline	4.2	ND	4.2
Mokelumne R @ New Hope Rd	09/23/2015	3,4-Dichloroaniline	7.6	ND	7.6
Mokelumne R @ New Hope Rd	07/28/2015	Azoxystrobin	54.4	ND	54.4
Mokelumne R @ New Hope Rd	08/18/2015	Azoxystrobin	115.3	ND	115.3
Mokelumne R @ New Hope Rd	09/23/2015	Azoxystrobin	90.1	ND	90.1
Mokelumne R @ New Hope Rd	04/19/2016	Azoxystrobin	14.1	ND	14.1
Mokelumne R @ New Hope Rd	07/28/2015	Boscalid	10.4	ND	10.4
Mokelumne R @ New Hope Rd	08/18/2015	Boscalid	21.2	ND	21.2
Mokelumne R @ New Hope Rd	09/23/2015	Boscalid	3.5	ND	3.5
Mokelumne R @ New Hope Rd	10/21/2015	Boscalid	11.1	ND	11.1
Mokelumne R @ New Hope Rd	11/10/2015	Boscalid	14.8	ND	14.8
Mokelumne R @ New Hope Rd	*01/19/2016	Boscalid	9.2	ND	9.2
Mokelumne R @ New Hope Rd	02/17/2016	Boscalid	4.8	ND	4.8
Mokelumne R @ New Hope Rd	*03/07/2016	Boscalid	4.7	ND	4.7
Mokelumne R @ New Hope Rd	04/19/2016	Boscalid	20.7	ND	20.7
Mokelumne R @ New Hope Rd	05/18/2016	Boscalid	7.3	ND	7.3
Mokelumne R @ New Hope Rd	06/15/2016	Boscalid	6.4	ND	6.4
Mokelumne R @ New Hope Rd	09/23/2015	Carbendazim	4.3	ND	4.3
Mokelumne R @ New Hope Rd	12/15/2015	Carbendazim	11.6	ND	11.6
Mokelumne R @ New Hope Rd	*03/07/2016	Carbendazim	5.6	ND	5.6
Mokelumne R @ New Hope Rd	04/19/2016	Chlorothalonil	6.7	ND	6.7
Mokelumne R @ New Hope Rd	07/28/2015	Clomazone	11.9	ND	11.9
Mokelumne R @ New Hope Rd	04/19/2016	Cyprodinil	9.1	ND	9.1
Mokelumne R @ New Hope Rd	*03/07/2016	Diazinon	89.1	ND	89.1
Mokelumne R @ New Hope Rd	11/10/2015	Dithiopyr	2.3	ND	2.3
Mokelumne R @ New Hope Rd	12/15/2015	Dithiopyr	7.0	ND	7.0
Mokelumne R @ New Hope Rd	*01/19/2016	Dithiopyr	14.8	ND	14.8
Mokelumne R @ New Hope Rd	*03/07/2016	Dithiopyr	17.4	ND	17.4
Mokelumne R @ New Hope Rd	04/19/2016	Dithiopyr	2.1	ND	2.1
Mokelumne R @ New Hope Rd	*01/19/2016	Diuron	7.0	ND	7.0
Mokelumne R @ New Hope Rd	*03/07/2016	Diuron	33.7	ND	33.7
Mokelumne R @ New Hope Rd	09/23/2015	Fenhexamide	17.3	ND	17.3
Mokelumne R @ New Hope Rd	11/10/2015	Fipronil	3.1	ND	3.1
Mokelumne R @ New Hope Rd	07/28/2015	Fipronil Desulfinyl	8.1	ND	8.1
Mokelumne R @ New Hope Rd	08/18/2015	Fipronil Desulfinyl	2.4	ND	2.4
Mokelumne R @ New Hope Rd	07/28/2015	Fluridone	4.0	ND	4.0
Mokelumne R @ New Hope Rd	08/18/2015	Fluridone	4.3	ND	4.3
Mokelumne R @ New Hope Rd	07/28/2015	Fluxapyroxad	4.8	ND	4.8
Mokelumne R @ New Hope Rd	08/18/2015	Fluxapyroxad	23.5	ND	23.5
Mokelumne R @ New Hope Rd	04/19/2016	Fluxapyroxad	6.8	ND	6.8
Mokelumne R @ New Hope Rd	07/28/2015	Hexazinone	40.7	ND	40.7
Mokelumne R @ New Hope Rd	08/18/2015	Hexazinone	20.3	ND	20.3

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Mokelumne R @ New Hope Rd	09/23/2015	Hexazinone	11.5	ND	11.5
Mokelumne R @ New Hope Rd	10/21/2015	Hexazinone	13.6	ND	13.6
Mokelumne R @ New Hope Rd	11/10/2015	Hexazinone	15.9	ND	15.9
Mokelumne R @ New Hope Rd	04/19/2016	Hexazinone	17.7	ND	17.7
Mokelumne R @ New Hope Rd	05/18/2016	Hexazinone	9.9	ND	9.9
Mokelumne R @ New Hope Rd	06/15/2016	Hexazinone	11.8	ND	11.8
Mokelumne R @ New Hope Rd	09/23/2015	Imazalil	118.9	ND	118.9
Mokelumne R @ New Hope Rd	02/17/2016	Iprodione	39.2	ND	39.2
Mokelumne R @ New Hope Rd	*03/07/2016	Iprodione	33.8	ND	33.8
Mokelumne R @ New Hope Rd	07/28/2015	Methoxyfenozide	3.2	ND	3.2
Mokelumne R @ New Hope Rd	08/18/2015	Methoxyfenozide	11.8	ND	11.8
Mokelumne R @ New Hope Rd	*03/07/2016	Methoxyfenozide	6.4	ND	6.4
Mokelumne R @ New Hope Rd	07/28/2015	Metolachlor	14.2	ND	14.2
Mokelumne R @ New Hope Rd	08/18/2015	Metolachlor	8.0	ND	8.0
Mokelumne R @ New Hope Rd	09/23/2015	Metolachlor	4.4	ND	4.4
Mokelumne R @ New Hope Rd	08/18/2015	Myclobutanil	15.2	ND	15.2
Mokelumne R @ New Hope Rd	12/15/2015	Oxyfluorfen	7.7	ND	7.7
Mokelumne R @ New Hope Rd	*01/19/2016	Oxyfluorfen	16.7	ND	16.7
Mokelumne R @ New Hope Rd	*03/07/2016	Oxyfluorfen	6.3	ND	6.3
Mokelumne R @ New Hope Rd	*01/19/2016	Pendimethalin	17.7	ND	17.7
Mokelumne R @ New Hope Rd	08/18/2015	Piperonyl butoxide	3.9	ND	3.9
Mokelumne R @ New Hope Rd	11/10/2015	Piperonyl butoxide	14.6	ND	14.6
Mokelumne R @ New Hope Rd	12/15/2015	Piperonyl butoxide	4.1	ND	4.1
Mokelumne R @ New Hope Rd	*01/19/2016	Piperonyl butoxide	6.9	ND	6.9
Mokelumne R @ New Hope Rd	04/19/2016	Pyrimethanil	4.9	ND	4.9
Mokelumne R @ New Hope Rd	04/19/2016	Quinoxyfen	4.2	ND	4.2
Mokelumne R @ New Hope Rd	*01/19/2016	Simazine	19.9	ND	19.9
Mokelumne R @ New Hope Rd	*03/07/2016	Simazine	247.3	ND	247.3
Mokelumne R @ New Hope Rd	04/19/2016	Tetraconazole	7.5	ND	7.5
Mokelumne R @ New Hope Rd	04/19/2016	Trifloxystrobin	7.4	ND	7.4
Mokelumne R @ New Hope Rd	07/28/2015	Copper, dissolved	1,320	n/a	1,320
Mokelumne R @ New Hope Rd	08/18/2015	Copper, dissolved	960	n/a	960
Mokelumne R @ New Hope Rd	09/23/2015	Copper, dissolved	1,360	n/a	1,360
Mokelumne R @ New Hope Rd	10/21/2015	Copper, dissolved	1,120	n/a	1,120
Mokelumne R @ New Hope Rd	11/10/2015	Copper, dissolved	1,220	n/a	1,220
Mokelumne R @ New Hope Rd	12/15/2015	Copper, dissolved	990	n/a	990
Mokelumne R @ New Hope Rd	*01/19/2016	Copper, dissolved	1,360	n/a	1,360
Mokelumne R @ New Hope Rd	02/17/2016	Copper, dissolved	1,470	n/a	1,470
Mokelumne R @ New Hope Rd	*03/07/2016	Copper, dissolved	2,030	n/a	2,030
Mokelumne R @ New Hope Rd	04/19/2016	Copper, dissolved	1,430	n/a	1,430
Mokelumne R @ New Hope Rd	05/18/2016	Copper, dissolved	1,230	n/a	1,230
Mokelumne R @ New Hope Rd	06/15/2016	Copper, dissolved	1,313	n/a	1,313
Sacramento R @ Hood	07/28/2015	3,4-Dichloroaniline	10.5	ND	10.5
Sacramento R @ Hood	08/18/2015	3,4-Dichloroaniline	15.3	ND	15.3
Sacramento R @ Hood	09/23/2015	3,4-Dichloroaniline	9.0	ND	9.0
Sacramento R @ Hood	10/21/2015	3,4-Dichloroaniline	3.2	ND	3.2

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Sacramento R @ Hood	11/10/2015	3,4-Dichloroaniline	7.8	ND	7.8
Sacramento R @ Hood	12/15/2015	3,4-Dichloroaniline	5.5	ND	5.5
Sacramento R @ Hood	*01/19/2016	3,4-Dichloroaniline	5.7	ND	5.7
Sacramento R @ Hood	*03/07/2016	3,4-Dichloroaniline	21.1	ND	21.1
Sacramento R @ Hood	06/15/2016	3,4-Dichloroaniline	144.9	ND	144.9
Sacramento R @ Hood	07/28/2015	Azoxystrobin	84.4	ND	84.4
Sacramento R @ Hood	08/18/2015	Azoxystrobin	347.8	ND	347.8
Sacramento R @ Hood	09/23/2015	Azoxystrobin	19.2	ND	19.2
Sacramento R @ Hood	10/21/2015	Azoxystrobin	35.9	ND	35.9
Sacramento R @ Hood	11/10/2015	Azoxystrobin	93.9	ND	93.9
Sacramento R @ Hood	12/15/2015	Azoxystrobin	30.3	ND	30.3
Sacramento R @ Hood	*01/19/2016	Azoxystrobin	32.6	ND	32.6
Sacramento R @ Hood	02/17/2016	Azoxystrobin	28.9	ND	28.9
Sacramento R @ Hood	*03/07/2016	Azoxystrobin	7.3	ND	7.3
Sacramento R @ Hood	04/19/2016	Azoxystrobin	15.3	ND	15.3
Sacramento R @ Hood	05/18/2016	Azoxystrobin	11.8	ND	11.8
Sacramento R @ Hood	06/15/2016	Azoxystrobin	24.5	ND	24.5
Sacramento R @ Hood	08/18/2015	Bifenthrin	2.9	ND[9]	2.9
Sacramento R @ Hood	07/28/2015	Boscalid	3.8	ND	3.8
Sacramento R @ Hood	08/18/2015	Boscalid	7.5	ND	7.5
Sacramento R @ Hood	10/21/2015	Boscalid	10.6	ND	10.6
Sacramento R @ Hood	11/10/2015	Boscalid	6.3	ND	6.3
Sacramento R @ Hood	*03/07/2016	Boscalid	3.0	ND	3.0
Sacramento R @ Hood	04/19/2016	Boscalid	13.4	ND	13.4
Sacramento R @ Hood	05/18/2016	Boscalid	7.2	ND	7.2
Sacramento R @ Hood	06/15/2016	Boscalid	8.9	ND	8.9
Sacramento R @ Hood	07/28/2015	Carbaryl	31.1	ND	31.1
Sacramento R @ Hood	08/18/2015	Carbendazim	20.6	ND	20.6
Sacramento R @ Hood	09/23/2015	Carbendazim	29.4	ND	29.4
Sacramento R @ Hood	10/21/2015	Carbendazim	21.1	ND	21.1
Sacramento R @ Hood	11/10/2015	Carbendazim	37.9	ND	37.9
Sacramento R @ Hood	12/15/2015	Carbendazim	18.5	ND	18.5
Sacramento R @ Hood	*01/19/2016	Carbendazim	4.2	ND	4.2
Sacramento R @ Hood	*03/07/2016	Carbendazim	4.4	ND	4.4
Sacramento R @ Hood	*01/19/2016	Chlorantraniliprole	4.4	ND	4.4
Sacramento R @ Hood	04/19/2016	Chlorothalonil	6.8	ND	6.8
Sacramento R @ Hood	07/28/2015	Clomazone	10.9	ND	10.9
Sacramento R @ Hood	08/18/2015	Clomazone	4.6	ND	4.6
Sacramento R @ Hood	05/18/2016	Clomazone	134.6	ND	134.6
Sacramento R @ Hood	06/15/2016	Clomazone	47.6	ND	47.6

[9] Low suspended solids concentration (see Table 5).

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Sacramento R @ Hood	*03/07/2016	Cyprodinil	9.2	ND	9.2
Sacramento R @ Hood	07/28/2015	Dithiopyr	7.9	ND	7.9
Sacramento R @ Hood	12/15/2015	Dithiopyr	3.5	ND	3.5
Sacramento R @ Hood	*03/07/2016	Dithiopyr	12.0	ND	12.0
Sacramento R @ Hood	09/23/2015	Diuron	4.3	ND	4.3
Sacramento R @ Hood	11/10/2015	Diuron	8.3	ND	8.3
Sacramento R @ Hood	12/15/2015	Diuron	17.5	ND	17.5
Sacramento R @ Hood	*01/19/2016	Diuron	43.0	ND	43.0
Sacramento R @ Hood	02/17/2016	Diuron	5.2	ND	5.2
Sacramento R @ Hood	*03/07/2016	Diuron	134.0	ND	134.0
Sacramento R @ Hood	04/19/2016	Diuron	4.1	ND	4.1
Sacramento R @ Hood	09/23/2015	Fenhexamide	8.5	ND	8.5
Sacramento R @ Hood	02/17/2016	Fenhexamide	28.1	ND	28.1
Sacramento R @ Hood	07/28/2015	Fipronil	25.0	ND	25.0
Sacramento R @ Hood	08/18/2015	Fipronil	6.9	ND	6.9
Sacramento R @ Hood	10/21/2015	Fipronil	4.4	ND	4.4
Sacramento R @ Hood	11/10/2015	Fipronil	12.2	ND	12.2
Sacramento R @ Hood	04/19/2016	Fipronil	4.6	ND	4.6
Sacramento R @ Hood	06/15/2016	Fipronil	3.1	ND	3.1
Sacramento R @ Hood	08/18/2015	Fluridone	4.5	ND	4.5
Sacramento R @ Hood	*01/19/2016	Flusilazole	7.5	ND	7.5
Sacramento R @ Hood	07/28/2015	Hexazinone	43.8	ND	43.8
Sacramento R @ Hood	08/18/2015	Hexazinone	22.9	ND	22.9
Sacramento R @ Hood	09/23/2015	Hexazinone	11.6	ND	11.6
Sacramento R @ Hood	10/21/2015	Hexazinone	20.0	ND	20.0
Sacramento R @ Hood	11/10/2015	Hexazinone	27.2	ND	27.2
Sacramento R @ Hood	*01/19/2016	Hexazinone	9.0	ND	9.0
Sacramento R @ Hood	*03/07/2016	Imidacloprid	9.3	ND	9.3
Sacramento R @ Hood	04/19/2016	Hexazinone	19.4	ND	19.4
Sacramento R @ Hood	05/18/2016	Hexazinone	14.8	ND	14.8
Sacramento R @ Hood	06/15/2016	Hexazinone	17.5	ND	17.5
Sacramento R @ Hood	09/23/2015	Imazalil	100.2	ND	100.2
Sacramento R @ Hood	*03/07/2016	Iprodione	6.0	ND	6.0
Sacramento R @ Hood	*01/19/2016	Methoxyfenozide	3.2	ND	3.2
Sacramento R @ Hood	07/28/2015	Metolachlor	13.2	ND	13.2
Sacramento R @ Hood	08/18/2015	Metolachlor	3.9	ND	3.9
Sacramento R @ Hood	05/18/2016	Metolachlor	5.9	ND	5.9
Sacramento R @ Hood	06/15/2016	Metolachlor	7.1	ND	7.1
Sacramento R @ Hood	*03/07/2016	Metolachlor	13.6	ND	13.6
Sacramento R @ Hood	11/10/2015	DCPMU	4.1	ND	4.1
Sacramento R @ Hood	*03/07/2016	DCPMU	9.4	ND	9.4
Sacramento R @ Hood	*03/07/2016	Oryzalin	25.0	ND	25.0
Sacramento R @ Hood	12/15/2015	Oxyfluorfen	3.8	ND	3.8
Sacramento R @ Hood	*03/07/2016	Permethrin	-	19 2	19.2
Sacramento R @ Hood	07/28/2015	Piperonyl butoxide	36.3	ND	36.3
Sacramento R @ Hood	08/18/2015	Piperonyl butoxide	17.8	ND	17.8

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Sacramento R @ Hood	09/23/2015	Piperonyl butoxide	10.2	ND	10.2
Sacramento R @ Hood	10/21/2015	Piperonyl butoxide	4.7	ND	4.7
Sacramento R @ Hood	11/10/2015	Piperonyl butoxide	45.0	ND	45.0
Sacramento R @ Hood	12/15/2015	Piperonyl butoxide	7.4	ND	7.4
Sacramento R @ Hood	04/19/2016	Piperonyl butoxide	10.4	ND	10.4
Sacramento R @ Hood	06/15/2016	Piperonyl butoxide	4.4	ND	4.4
Sacramento R @ Hood	07/28/2015	Propanil	38.8	ND	38.8
Sacramento R @ Hood	06/15/2016	Propanil	27.6	ND	27.6
Sacramento R @ Hood	*01/19/2016	Simazine	5.9	ND	5.9
Sacramento R @ Hood	*03/07/2016	Simazine	23.9	ND	23.9
Sacramento R @ Hood	05/18/2016	Thiobencarb	21.5	ND	21.5
Sacramento R @ Hood	07/28/2015	Copper, dissolved	1,230	n/a	1,230
Sacramento R @ Hood	08/18/2015	Copper, dissolved	1,680	n/a	1,680
Sacramento R @ Hood	09/23/2015	Copper, dissolved	1,870	n/a	1,870
Sacramento R @ Hood	10/21/2015	Copper, dissolved	1,320	n/a	1,320
Sacramento R @ Hood	11/10/2015	Copper, dissolved	1,280	n/a	1,280
Sacramento R @ Hood	12/15/2015	Copper, dissolved	1,030	n/a	1,030
Sacramento R @ Hood	*01/19/2016	Copper, dissolved	2,620	n/a	2,620
Sacramento R @ Hood	02/17/2016	Copper, dissolved	1,850	n/a	1,850
Sacramento R @ Hood	*03/07/2016	Copper, dissolved	2,600	n/a	2,600
Sacramento R @ Hood	04/19/2016	Copper, dissolved	1,300	n/a	1,300
Sacramento R @ Hood	05/18/2016	Copper, dissolved	1,030	n/a	1,030
Sacramento R @ Hood	06/15/2016	Copper, dissolved	1,090	n/a	1,090
SJR @ Buckley Cove	07/28/2015	3,4-Dichloroaniline	9.3	ND	9.3
SJR @ Buckley Cove	08/18/2015	3,4-Dichloroaniline	6.2	ND	6.2
SJR @ Buckley Cove	09/23/2015	3,4-Dichloroaniline	4.3	ND	4.3
SJR @ Buckley Cove	11/10/2015	3,4-Dichloroaniline	3.2	ND	3.2
SJR @ Buckley Cove	*01/19/2016	3,4-Dichloroaniline	5.0	ND	5.0
SJR @ Buckley Cove	02/17/2016	3,4-Dichloroaniline	3.9	ND	3.9
SJR @ Buckley Cove	*03/07/2016	3,4-Dichloroaniline	5.1	ND	5.1
SJR @ Buckley Cove	04/19/2016	3,4-Dichloroaniline	3.7	ND	3.7
SJR @ Buckley Cove	06/15/2016	3,4-Dichloroaniline	53.1	ND	53.1
SJR @ Buckley Cove	07/28/2015	DCPU	9.1	ND	9.1
SJR @ Buckley Cove	08/18/2015	DCPU	10.3	ND	10 3
SJR @ Buckley Cove	09/23/2015	DCPU	5.4	ND	5.4
SJR @ Buckley Cove	*01/19/2016	DCPU	11.8	ND	11 8
SJR @ Buckley Cove	02/17/2016	DCPU	9.7	ND	9.7
SJR @ Buckley Cove	*03/07/2016	DCPU	15.9	ND	15 9
SJR @ Buckley Cove	04/19/2016	DCPU	4.2	ND	4.2
SJR @ Buckley Cove	06/15/2016	DCPU	3.8	ND	3.8
SJR @ Buckley Cove	04/19/2016	Acibenzolar-S-methyl	88.4	ND	88.4
SJR @ Buckley Cove	07/28/2015	Atrazine	49.3	ND	49 3
SJR @ Buckley Cove	08/18/2015	Atrazine	21.4	ND	21.4
SJR @ Buckley Cove	09/23/2015	Atrazine	8.2	ND	8.2
SJR @ Buckley Cove	06/15/2016	Atrazine	40.0	ND	40 0
SJR @ Buckley Cove	07/28/2015	Azoxystrobin	58.1	ND	58.1

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
SJR @ Buckley Cove	08/18/2015	Azoxystrobin	117.8	ND	117.8
SJR @ Buckley Cove	09/23/2015	Azoxystrobin	38.0	ND	38 0
SJR @ Buckley Cove	10/21/2015	Azoxystrobin	128.6	ND	128.6
SJR @ Buckley Cove	11/10/2015	Azoxystrobin	66.7	ND	66.7
SJR @ Buckley Cove	12/15/2015	Azoxystrobin	14.1	ND	14.1
SJR @ Buckley Cove	*01/19/2016	Azoxystrobin	11.9	ND	11 9
SJR @ Buckley Cove	02/17/2016	Azoxystrobin	5.6	ND	5.6
SJR @ Buckley Cove	*03/07/2016	Azoxystrobin	3.7	ND	3.7
SJR @ Buckley Cove	04/19/2016	Azoxystrobin	48.4	ND	48.4
SJR @ Buckley Cove	05/18/2016	Azoxystrobin	14.7	ND	14.7
SJR @ Buckley Cove	06/15/2016	Azoxystrobin	33.2	ND	33 2
SJR @ Buckley Cove	07/28/2015	Boscalid	34.1	ND	34.1
SJR @ Buckley Cove	08/18/2015	Boscalid	46.0	ND	46 0
SJR @ Buckley Cove	09/23/2015	Boscalid	11.6	ND	11.6
SJR @ Buckley Cove	10/21/2015	Boscalid	37.6	ND	37.6
SJR @ Buckley Cove	11/10/2015	Boscalid	28.1	ND	28.1
SJR @ Buckley Cove	12/15/2015	Boscalid	6.9	ND	6.9
SJR @ Buckley Cove	*01/19/2016	Boscalid	118.0	ND	118.0
SJR @ Buckley Cove	02/17/2016	Boscalid	67.6	ND	67.6
SJR @ Buckley Cove	*03/07/2016	Boscalid	24.7	ND	24.7
SJR @ Buckley Cove	04/19/2016	Boscalid	93.7	ND	93.7
SJR @ Buckley Cove	05/18/2016	Boscalid	14.6	ND	14.6
SJR @ Buckley Cove	06/15/2016	Boscalid	28.6	ND	28.6
SJR @ Buckley Cove	07/28/2015	Carbendazim	61.0	ND	61 0
SJR @ Buckley Cove	08/18/2015	Carbendazim	58.6	ND	58.6
SJR @ Buckley Cove	09/23/2015	Carbendazim	70.7	ND	70.7
SJR @ Buckley Cove	10/21/2015	Carbendazim	107.1	ND	107.1
SJR @ Buckley Cove	11/10/2015	Carbendazim	33.4	ND	33.4
SJR @ Buckley Cove	12/15/2015	Carbendazim	20.3	ND	20 3
SJR @ Buckley Cove	*01/19/2016	Carbendazim	50.1	ND	50.1
SJR @ Buckley Cove	02/17/2016	Carbendazim	8.8	ND	8.8
SJR @ Buckley Cove	*03/07/2016	Carbendazim	35.0	ND	35 0
SJR @ Buckley Cove	06/15/2016	Carbendazim	7.1	ND	7.1
SJR @ Buckley Cove	07/28/2015	Chlorantraniliprole	5.0	ND	5.0
SJR @ Buckley Cove	08/18/2015	Chlorantraniliprole	9.3	ND	9.3
SJR @ Buckley Cove	09/23/2015	Chlorantraniliprole	10.3	ND	10 3
SJR @ Buckley Cove	10/21/2015	Chlorantraniliprole	11.0	ND	11 0
SJR @ Buckley Cove	12/15/2015	Chlorantraniliprole	4.7	ND	4.7
SJR @ Buckley Cove	*01/19/2016	Chlorantraniliprole	21.1	ND	21.1
SJR @ Buckley Cove	02/17/2016	Chlorantraniliprole	14.4	ND	14.4
SJR @ Buckley Cove	*03/07/2016	Chlorantraniliprole	10.6	ND	10.6
SJR @ Buckley Cove	04/19/2016	Chlorantraniliprole	8.9	ND	8.9
SJR @ Buckley Cove	07/28/2015	Clomazone	22.9	ND	22 9
SJR @ Buckley Cove	08/18/2015	Clomazone	10.7	ND	10.7
SJR @ Buckley Cove	04/19/2016	Diazinon	14.8	ND	14 8
SJR @ Buckley Cove	05/18/2016	Diazinon	5.3	ND	5.3

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
SJR @ Buckley Cove	07/28/2015	Dithiopyr	9.4	ND	9.4
SJR @ Buckley Cove	08/18/2015	Dithiopyr	2.5	ND	2.5
SJR @ Buckley Cove	12/15/2015	Dithiopyr	2.9	ND	2.9
SJR @ Buckley Cove	*01/19/2016	Dithiopyr	14.1	ND	14.1
SJR @ Buckley Cove	02/17/2016	Dithiopyr	22.1	ND	22.1
SJR @ Buckley Cove	*03/07/2016	Dithiopyr	57.5	ND	57 5
SJR @ Buckley Cove	04/19/2016	Dithiopyr	19.9	ND	19 9
SJR @ Buckley Cove	05/18/2016	Dithiopyr	4.0	ND	4.0
SJR @ Buckley Cove	07/28/2015	Diuron	86.5	ND	86 5
SJR @ Buckley Cove	08/18/2015	Diuron	63.6	ND	63.6
SJR @ Buckley Cove	09/23/2015	Diuron	36.5	ND	36 5
SJR @ Buckley Cove	10/21/2015	Diuron	13.8	ND	13 8
SJR @ Buckley Cove	11/10/2015	Diuron	6.7	ND	6.7
SJR @ Buckley Cove	12/15/2015	Diuron	27.5	ND	27 5
SJR @ Buckley Cove	*01/19/2016	Diuron	450.8	ND	450.8
SJR @ Buckley Cove	02/17/2016	Diuron	157.6	ND	157.6
SJR @ Buckley Cove	*03/07/2016	Diuron	312.8	ND	312.8
SJR @ Buckley Cove	04/19/2016	Diuron	60.5	ND	60 5
SJR @ Buckley Cove	05/18/2016	Diuron	10.2	ND	10 2
SJR @ Buckley Cove	06/15/2016	Diuron	21.3	ND	21 3
SJR @ Buckley Cove	04/19/2016	EPTC	7.3	ND	7.3
SJR @ Buckley Cove	06/15/2016	EPTC	33.7	ND	33.7
SJR @ Buckley Cove	07/28/2015	Fipronil	13.5	ND	13 5
SJR @ Buckley Cove	*01/19/2016	Fipronil	3.4	ND	3.4
SJR @ Buckley Cove	04/19/2016	Fipronil	4.4	ND	4.4
SJR @ Buckley Cove	07/28/2015	Fipronil Desulfinyl	13.1	ND	13.1
SJR @ Buckley Cove	08/18/2015	Fipronil Desulfinyl	4.9	ND	4.9
SJR @ Buckley Cove	09/23/2015	Fipronil Desulfinyl	3.1	ND	3.1
SJR @ Buckley Cove	10/21/2015	Fipronil Desulfinyl	4.7	ND	4.7
SJR @ Buckley Cove	11/10/2015	Fipronil Desulfinyl	2.1	ND	2.1
SJR @ Buckley Cove	12/15/2015	Fipronil Desulfinyl	2.7	ND	2.7
SJR @ Buckley Cove	02/17/2016	Fipronil Desulfinyl	2.8	ND	2.8
SJR @ Buckley Cove	07/28/2015	Fipronil sulfide	10.8	ND	10 8
SJR @ Buckley Cove	08/18/2015	Fipronil sulfide	4.6	ND	4.6
SJR @ Buckley Cove	09/23/2015	Fipronil sulfide	3.0	ND	3.0
SJR @ Buckley Cove	07/28/2015	Fipronil sulfone	12.2	ND	12 2
SJR @ Buckley Cove	08/18/2015	Fipronil sulfone	3.9	ND	3.9
SJR @ Buckley Cove	07/28/2015	Fluridone	382.7	ND	382.7
SJR @ Buckley Cove	08/18/2015	Fluridone	293.4	ND	293.4
SJR @ Buckley Cove	09/23/2015	Fluridone	165.2	ND	165.2
SJR @ Buckley Cove	10/21/2015	Fluridone	57.0	ND	57 0
SJR @ Buckley Cove	11/10/2015	Fluridone	9.6	ND	9.6
SJR @ Buckley Cove	12/15/2015	Fluridone	23.4	ND	23.4
SJR @ Buckley Cove	02/17/2016	Fluridone	16.3	ND	16 3
SJR @ Buckley Cove	04/19/2016	Fluridone	229.6	ND	229.6
SJR @ Buckley Cove	05/18/2016	Fluridone	207.5	ND	207.5

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
SJR @ Buckley Cove	06/15/2016	Fluridone	213.3	ND	213.3
SJR @ Buckley Cove	*01/19/2016	Fluridone	11.3	ND	11 3
SJR @ Buckley Cove	*03/07/2016	Fluridone	25.6	ND	25.6
SJR @ Buckley Cove	07/28/2015	Fluxapyroxad	15.4	ND	15.4
SJR @ Buckley Cove	08/18/2015	Fluxapyroxad	32.4	ND	32.4
SJR @ Buckley Cove	09/23/2015	Fluxapyroxad	22.6	ND	22.6
SJR @ Buckley Cove	10/21/2015	Fluxapyroxad	35.8	ND	35 8
SJR @ Buckley Cove	11/10/2015	Fluxapyroxad	21.7	ND	21.7
SJR @ Buckley Cove	*01/19/2016	Fluxapyroxad	10.0	ND	10 0
SJR @ Buckley Cove	02/17/2016	Fluxapyroxad	11.4	ND	11.4
SJR @ Buckley Cove	04/19/2016	Fluxapyroxad	57.7	ND	57.7
SJR @ Buckley Cove	05/18/2016	Fluxapyroxad	7.2	ND	7.2
SJR @ Buckley Cove	06/15/2016	Fluxapyroxad	11.1	ND	11.1
SJR @ Buckley Cove	07/28/2015	Hexazinone	132.2	ND	132.2
SJR @ Buckley Cove	08/18/2015	Hexazinone	94.8	ND	94 8
SJR @ Buckley Cove	09/23/2015	Hexazinone	39.0	ND	39 0
SJR @ Buckley Cove	10/21/2015	Hexazinone	33.0	ND	33 0
SJR @ Buckley Cove	11/10/2015	Hexazinone	19.2	ND	19 2
SJR @ Buckley Cove	*01/19/2016	Hexazinone	30.7	ND	30.7
SJR @ Buckley Cove	02/17/2016	Hexazinone	13.5	ND	13 5
SJR @ Buckley Cove	*03/07/2016	Hexazinone	16.6	ND	16.6
SJR @ Buckley Cove	04/19/2016	Hexazinone	54.5	ND	54 5
SJR @ Buckley Cove	05/18/2016	Hexazinone	10.3	ND	10 3
SJR @ Buckley Cove	06/15/2016	Hexazinone	21.2	ND	21 2
SJR @ Buckley Cove	08/18/2015	Imidacloprid	5.2	ND	5.2
SJR @ Buckley Cove	09/23/2015	Imidacloprid	9.7	ND	9.7
SJR @ Buckley Cove	12/15/2015	Imidacloprid	4.6	ND	4.6
SJR @ Buckley Cove	*01/19/2016	Imidacloprid	17.8	ND	17 8
SJR @ Buckley Cove	02/17/2016	Imidacloprid	8.9	ND	8.9
SJR @ Buckley Cove	*03/07/2016	Imidacloprid	7.2	ND	7.2
SJR @ Buckley Cove	04/19/2016	Imidacloprid	60.1	ND	60.1
SJR @ Buckley Cove	05/18/2016	Imidacloprid	13.7	ND	13.7
SJR @ Buckley Cove	06/15/2016	Imidacloprid	7.3	ND	7.3
SJR @ Buckley Cove	*01/19/2016	Iprodione	34.6	ND	34.6
SJR @ Buckley Cove	02/17/2016	Iprodione	51.1	ND	51.1
SJR @ Buckley Cove	*03/07/2016	Iprodione	42.1	ND	42.1
SJR @ Buckley Cove	*01/19/2016	Metalaxyl	36.9	ND	36 9
SJR @ Buckley Cove	07/28/2015	Methoxyfenozide	47.0	ND	47 0
SJR @ Buckley Cove	08/18/2015	Methoxyfenozide	48.8	ND	48 8
SJR @ Buckley Cove	09/23/2015	Methoxyfenozide	63.9	ND	63 9
SJR @ Buckley Cove	10/21/2015	Methoxyfenozide	55.8	ND	55 8
SJR @ Buckley Cove	11/10/2015	Methoxyfenozide	8.1	ND	8.1
SJR @ Buckley Cove	12/15/2015	Methoxyfenozide	15.7	ND	15.7
SJR @ Buckley Cove	*01/19/2016	Methoxyfenozide	253.5	ND	253.5
SJR @ Buckley Cove	02/17/2016	Methoxyfenozide	85.4	ND	85.4
SJR @ Buckley Cove	*03/07/2016	Methoxyfenozide	45.2	ND	45 2

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
SJR @ Buckley Cove	04/19/2016	Methoxyfenozide	74.3	ND	74 3
SJR @ Buckley Cove	05/18/2016	Methoxyfenozide	11.5	ND	11 5
SJR @ Buckley Cove	06/15/2016	Methoxyfenozide	21.7	ND	21.7
SJR @ Buckley Cove	07/28/2015	Metolachlor	142.8	ND	142.8
SJR @ Buckley Cove	08/18/2015	Metolachlor	94.5	ND	94 5
SJR @ Buckley Cove	09/23/2015	Metolachlor	43.3	ND	43 3
SJR @ Buckley Cove	10/21/2015	Metolachlor	16.5	ND	16 5
SJR @ Buckley Cove	11/10/2015	Metolachlor	12.2	ND	12 2
SJR @ Buckley Cove	12/15/2015	Metolachlor	7.0	ND	7.0
SJR @ Buckley Cove	*01/19/2016	Metolachlor	16.2	ND	16 2
SJR @ Buckley Cove	02/17/2016	Metolachlor	10.8	ND	10 8
SJR @ Buckley Cove	*03/07/2016	Metolachlor	42.8	ND	42 8
SJR @ Buckley Cove	04/19/2016	Metolachlor	55.6	ND	55.6
SJR @ Buckley Cove	05/18/2016	Metolachlor	42.6	ND	42.6
SJR @ Buckley Cove	06/15/2016	Metolachlor	83.5	ND	83 5
SJR @ Buckley Cove	*01/19/2016	Myclobutanil	15.9	ND	15 9
SJR @ Buckley Cove	07/28/2015	DCPMU	49.5	ND	49 5
SJR @ Buckley Cove	08/18/2015	DCPMU	39.4	ND	39.4
SJR @ Buckley Cove	09/23/2015	DCPMU	19.5	ND	19 5
SJR @ Buckley Cove	10/21/2015	DCPMU	8.4	ND	8.4
SJR @ Buckley Cove	11/10/2015	DCPMU	3.5	ND	3.5
SJR @ Buckley Cove	12/15/2015	DCPMU	4.7	ND	4.7
SJR @ Buckley Cove	*01/19/2016	DCPMU	54.6	ND	54.6
SJR @ Buckley Cove	02/17/2016	DCPMU	26.2	ND	26 2
SJR @ Buckley Cove	*03/07/2016	DCPMU	46.4	ND	46.4
SJR @ Buckley Cove	04/19/2016	DCPMU	27.7	ND	27.7
SJR @ Buckley Cove	05/18/2016	DCPMU	5.5	ND	5.5
SJR @ Buckley Cove	06/15/2016	DCPMU	11.7	ND	11.7
SJR @ Buckley Cove	*01/19/2016	Oryzalin	17.5	ND	17 5
SJR @ Buckley Cove	*03/07/2016	Oryzalin	16.7	ND	16.7
SJR @ Buckley Cove	04/19/2016	Oryzalin	15.1	ND	15.1
SJR @ Buckley Cove	*01/19/2016	Oxadiazon	7.7	ND	7.7
SJR @ Buckley Cove	02/17/2016	Oxadiazon	9.8	ND	9.8
SJR @ Buckley Cove	*03/07/2016	Oxadiazon	11.5	ND	11 5
SJR @ Buckley Cove	*01/19/2016	Oxyfluorfen	68.2	ND	68 2
SJR @ Buckley Cove	*03/07/2016	Oxyfluorfen	210.9	ND	210.9
SJR @ Buckley Cove	06/15/2016	Pendimethalin	14.4	ND	14.4
SJR @ Buckley Cove	*01/19/2016	Pendimethalin	53.8	51.1	104.9
SJR @ Buckley Cove	*03/07/2016	Pendimethalin	33.4	ND	33.4
SJR @ Buckley Cove	08/18/2015	Permethrin	-	2.7	2.7
SJR @ Buckley Cove	09/23/2015	Piperonyl butoxide	6.1	ND	6.1
SJR @ Buckley Cove	10/21/2015	Piperonyl butoxide	8.3	ND	8.3
SJR @ Buckley Cove	11/10/2015	Piperonyl butoxide	20.5	ND	20 5
SJR @ Buckley Cove	12/15/2015	Piperonyl butoxide	16.8	ND	16 8
SJR @ Buckley Cove	*01/19/2016	Piperonyl butoxide	32.1	ND	32.1
SJR @ Buckley Cove	02/17/2016	Piperonyl butoxide	6.0	ND	6.0

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
SJR @ Buckley Cove	04/19/2016	Piperonyl butoxide	7.2	ND	7.2
SJR @ Buckley Cove	04/19/2016	Propiconazole	38.7	ND	38.7
SJR @ Buckley Cove	07/28/2015	Simazine	53.5	ND	53 5
SJR @ Buckley Cove	08/18/2015	Simazine	26.0	ND	26 0
SJR @ Buckley Cove	09/23/2015	Simazine	6.9	ND	6.9
SJR @ Buckley Cove	10/21/2015	Simazine	6.5	ND	6.5
SJR @ Buckley Cove	*01/19/2016	Simazine	386.8	ND	386.8
SJR @ Buckley Cove	02/17/2016	Simazine	130.8	ND	130.8
SJR @ Buckley Cove	*03/07/2016	Simazine	191.6	ND	191.6
SJR @ Buckley Cove	04/19/2016	Simazine	39.4	ND	39.4
SJR @ Buckley Cove	05/18/2016	Simazine	5.9	ND	5.9
SJR @ Buckley Cove	06/15/2016	Simazine	16.5	ND	16 5
SJR @ Buckley Cove	04/19/2016	Thiabendazole	7.0	ND	7.0
SJR @ Buckley Cove	05/18/2016	Thiabendazole	5.5	ND	5.5
SJR @ Buckley Cove	09/23/2015	Thiamethoxam	3.4	ND	3.4
SJR @ Buckley Cove	07/28/2015	Copper, dissolved	2,000	n/a	2,000
SJR @ Buckley Cove	08/18/2015	Copper, dissolved	1,820	n/a	1,820
SJR @ Buckley Cove	09/23/2015	Copper, dissolved	1,890	n/a	1,890
SJR @ Buckley Cove	10/21/2015	Copper, dissolved	1,460	n/a	1,460
SJR @ Buckley Cove	11/10/2015	Copper, dissolved	1,120	n/a	1,120
SJR @ Buckley Cove	12/15/2015	Copper, dissolved	1,500	n/a	1,500
SJR @ Buckley Cove	*01/19/2016	Copper, dissolved	3,290	n/a	3,290
SJR @ Buckley Cove	02/17/2016	Copper, dissolved	3,670	n/a	3,670
SJR @ Buckley Cove	*03/07/2016	Copper, dissolved	4,370	n/a	4,370
SJR @ Buckley Cove	04/19/2016	Copper, dissolved	1,890	n/a	1,890
SJR @ Buckley Cove	05/18/2016	Copper, dissolved	1,230	n/a	1,230
SJR @ Buckley Cove	06/15/2016	Copper, dissolved	1,600	n/a	1,600
San Joaquin River nr Vernalis	*03/07/2016	3,4-Dichloroaniline	3.5	ND	3.5
San Joaquin River nr Vernalis	06/15/2016	3,4-Dichloroaniline	5.0	ND	5.0
San Joaquin River nr Vernalis	*01/19/2016	DCPU	9.2	ND	9.2
San Joaquin River nr Vernalis	*03/07/2016	DCPU	8.1	ND	8.1
San Joaquin River nr Vernalis	04/19/2016	Acibenzolar-S-methyl	23.7	ND	23.7
San Joaquin River nr Vernalis	07/28/2015	Atrazine	9.7	ND	9.7
San Joaquin River nr Vernalis	08/18/2015	Atrazine	3.9	ND	3.9
San Joaquin River nr Vernalis	07/28/2015	Azoxystrobin	5.1	ND	5.1
San Joaquin River nr Vernalis	08/18/2015	Azoxystrobin	16.0	ND	16.0
San Joaquin River nr Vernalis	09/23/2015	Azoxystrobin	24.5	ND	24.5
San Joaquin River nr Vernalis	10/21/2015	Azoxystrobin	37.7	ND	37.7
San Joaquin River nr Vernalis	11/10/2015	Azoxystrobin	22.2	ND	22.2
San Joaquin River nr Vernalis	*01/19/2016	Azoxystrobin	16.5	ND	16.5
San Joaquin River nr Vernalis	*03/07/2016	Azoxystrobin	4.2	ND	4.2
San Joaquin River nr Vernalis	04/19/2016	Azoxystrobin	27.9	ND	27.9
San Joaquin River nr Vernalis	05/18/2016	Azoxystrobin	12.9	ND	12.9
San Joaquin River nr Vernalis	06/15/2016	Azoxystrobin	14.6	ND	14.6
San Joaquin River nr Vernalis	04/19/2016	Bifenthrin	-	4 3	4.3
San Joaquin River nr Vernalis	07/28/2015	Boscalid	9.1	ND	9.1

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
San Joaquin River nr Vernalis	08/18/2015	Boscalid	17.1	ND	17.1
San Joaquin River nr Vernalis	09/23/2015	Boscalid	3.7	ND	3.7
San Joaquin River nr Vernalis	10/21/2015	Boscalid	13.4	ND	13.4
San Joaquin River nr Vernalis	11/10/2015	Boscalid	17.9	ND	17.9
San Joaquin River nr Vernalis	12/15/2015	Boscalid	3.8	ND	3.8
San Joaquin River nr Vernalis	*01/19/2016	Boscalid	39.4	ND	39.4
San Joaquin River nr Vernalis	02/17/2016	Boscalid	27.5	ND	27.5
San Joaquin River nr Vernalis	*03/07/2016	Boscalid	21.8	ND	21.8
San Joaquin River nr Vernalis	04/19/2016	Boscalid	49.7	ND	49.7
San Joaquin River nr Vernalis	05/18/2016	Boscalid	12.5	ND	12.5
San Joaquin River nr Vernalis	06/15/2016	Boscalid	15.5	ND	15.5
San Joaquin River nr Vernalis	11/10/2015	Carbendazim	9.2	ND	9.2
San Joaquin River nr Vernalis	*01/19/2016	Carbendazim	7.5	ND	7.5
San Joaquin River nr Vernalis	02/17/2016	Carbendazim	7.6	ND	7.6
San Joaquin River nr Vernalis	*03/07/2016	Carbendazim	40.7	ND	40.7
San Joaquin River nr Vernalis	08/18/2015	Chlorantraniliprole	4.0	ND	4.0
San Joaquin River nr Vernalis	09/23/2015	Chlorantraniliprole	4.9	ND	4.9
San Joaquin River nr Vernalis	10/21/2015	Chlorantraniliprole	5.1	ND	5.1
San Joaquin River nr Vernalis	*01/19/2016	Chlorantraniliprole	10.8	ND	10.8
San Joaquin River nr Vernalis	02/17/2016	Chlorantraniliprole	7.3	ND	7.3
San Joaquin River nr Vernalis	*03/07/2016	Chlorantraniliprole	6.5	ND	6.5
San Joaquin River nr Vernalis	04/19/2016	Chlorantraniliprole	4.1	ND	4.1
San Joaquin River nr Vernalis	02/17/2016	Cyprodinil	11.0	ND	11.0
San Joaquin River nr Vernalis	*01/19/2016	Diazinon	7.2	ND	7.2
San Joaquin River nr Vernalis	05/18/2016	Diazinon	6.0	ND	6.0
San Joaquin River nr Vernalis	07/28/2015	Dithiopyr	7.2	ND	7.2
San Joaquin River nr Vernalis	08/18/2015	Dithiopyr	1.9	ND	1.9
San Joaquin River nr Vernalis	11/10/2015	Dithiopyr	3.1	ND	3.1
San Joaquin River nr Vernalis	12/15/2015	Dithiopyr	14.1	ND	14.1
San Joaquin River nr Vernalis	*01/19/2016	Dithiopyr	50.4	ND	50.4
San Joaquin River nr Vernalis	02/17/2016	Dithiopyr	15.2	ND	15.2
San Joaquin River nr Vernalis	*03/07/2016	Dithiopyr	51.0	ND	51.0
San Joaquin River nr Vernalis	04/19/2016	Dithiopyr	6.3	ND	6.3
San Joaquin River nr Vernalis	05/18/2016	Dithiopyr	3.5	ND	3.5
San Joaquin River nr Vernalis	07/28/2015	Diuron	4.3	ND	4.3
San Joaquin River nr Vernalis	12/15/2015	Diuron	26.3	ND	26.3
San Joaquin River nr Vernalis	*01/19/2016	Diuron	180.6	ND	180.6
San Joaquin River nr Vernalis	02/17/2016	Diuron	58.3	ND	58.3
San Joaquin River nr Vernalis	*03/07/2016	Diuron	133.0	ND	133.0
San Joaquin River nr Vernalis	04/19/2016	Diuron	33.1	ND	33.1
San Joaquin River nr Vernalis	05/18/2016	Diuron	7.5	ND	7.5
San Joaquin River nr Vernalis	06/15/2016	Diuron	6.0	ND	6.0
San Joaquin River nr Vernalis	12/15/2015	Fenhexamide	12.1	ND	12.1
San Joaquin River nr Vernalis	07/28/2015	Fluridone	4.4	ND	4.4
San Joaquin River nr Vernalis	*01/19/2016	Flusilazole	12.7	ND	12.7
San Joaquin River nr Vernalis	08/18/2015	Fluxapyroxad	5.8	ND	5.8

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
San Joaquin River nr Vernalis	11/10/2015	Fluxapyroxad	6.6	ND	6.6
San Joaquin River nr Vernalis	02/17/2016	Fluxapyroxad	6.3	ND	6.3
San Joaquin River nr Vernalis	04/19/2016	Fluxapyroxad	24.7	ND	24.7
San Joaquin River nr Vernalis	05/18/2016	Fluxapyroxad	6.9	ND	6.9
San Joaquin River nr Vernalis	06/15/2016	Fluxapyroxad	7.9	ND	7.9
San Joaquin River nr Vernalis	07/28/2015	Hexazinone	38.8	ND	38.8
San Joaquin River nr Vernalis	08/18/2015	Hexazinone	22.9	ND	22.9
San Joaquin River nr Vernalis	09/23/2015	Hexazinone	11.4	ND	11.4
San Joaquin River nr Vernalis	10/21/2015	Hexazinone	12.9	ND	12.9
San Joaquin River nr Vernalis	11/10/2015	Hexazinone	10.9	ND	10.9
San Joaquin River nr Vernalis	12/15/2015	Hexazinone	8.9	ND	8.9
San Joaquin River nr Vernalis	*01/19/2016	Hexazinone	46.4	ND	46.4
San Joaquin River nr Vernalis	02/17/2016	Hexazinone	9.5	ND	9.5
San Joaquin River nr Vernalis	*03/07/2016	Hexazinone	17.9	ND	17.9
San Joaquin River nr Vernalis	04/19/2016	Hexazinone	33.5	ND	33.5
San Joaquin River nr Vernalis	05/18/2016	Hexazinone	8.7	ND	8.7
San Joaquin River nr Vernalis	06/15/2016	Hexazinone	11.7	ND	11.7
San Joaquin River nr Vernalis	*01/19/2016	Imidacloprid	12.4	ND	12.4
San Joaquin River nr Vernalis	02/17/2016	Imidacloprid	4.3	ND	4.3
San Joaquin River nr Vernalis	*03/07/2016	Imidacloprid	8.3	ND	8.3
San Joaquin River nr Vernalis	04/19/2016	Imidacloprid	11.1	ND	11.1
San Joaquin River nr Vernalis	*01/19/2016	Iprodione	124.2	ND	124.2
San Joaquin River nr Vernalis	02/17/2016	Iprodione	201.4	ND	201.4
San Joaquin River nr Vernalis	*03/07/2016	Iprodione	54.2	ND	54.2
San Joaquin River nr Vernalis	07/28/2015	Methoxyfenozide	18.9	ND	18.9
San Joaquin River nr Vernalis	08/18/2015	Methoxyfenozide	10.5	ND	10.5
San Joaquin River nr Vernalis	09/23/2015	Methoxyfenozide	16.6	ND	16.6
San Joaquin River nr Vernalis	10/21/2015	Methoxyfenozide	13.8	ND	13.8
San Joaquin River nr Vernalis	11/10/2015	Methoxyfenozide	5.2	ND	5.2
San Joaquin River nr Vernalis	12/15/2015	Methoxyfenozide	8.5	ND	8.5
San Joaquin River nr Vernalis	*01/19/2016	Methoxyfenozide	67.2	ND	67.2
San Joaquin River nr Vernalis	02/17/2016	Methoxyfenozide	28.2	ND	28.2
San Joaquin River nr Vernalis	*03/07/2016	Methoxyfenozide	36.0	ND	36.0
San Joaquin River nr Vernalis	04/19/2016	Methoxyfenozide	14.0	ND	14.0
San Joaquin River nr Vernalis	05/18/2016	Methoxyfenozide	7.6	ND	7.6
San Joaquin River nr Vernalis	06/15/2016	Methoxyfenozide	22.8	ND	22.8
San Joaquin River nr Vernalis	07/28/2015	Metolachlor	30.8	ND	30.8
San Joaquin River nr Vernalis	08/18/2015	Metolachlor	5.9	ND	5.9
San Joaquin River nr Vernalis	10/21/2015	Metolachlor	3.5	ND	3.5
San Joaquin River nr Vernalis	11/10/2015	Metolachlor	6.4	ND	6.4
San Joaquin River nr Vernalis	*01/19/2016	Metolachlor	28.3	ND	28.3
San Joaquin River nr Vernalis	*03/07/2016	Metolachlor	12.6	ND	12.6
San Joaquin River nr Vernalis	04/19/2016	Metolachlor	9.0	ND	9.0
San Joaquin River nr Vernalis	05/18/2016	Metolachlor	11.8	ND	11.8
San Joaquin River nr Vernalis	06/15/2016	Metolachlor	14.8	ND	14.8
San Joaquin River nr Vernalis	12/15/2015	DCPMU	8.2	ND	8.2

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
San Joaquin River nr Vernalis	02/17/2016	DCPMU	9.9	ND	9.9
San Joaquin River nr Vernalis	*03/07/2016	DCPMU	21.9	ND	21.9
San Joaquin River nr Vernalis	04/19/2016	DCPMU	10.8	ND	10.8
San Joaquin River nr Vernalis	*01/19/2016	Oryzalin	8.7	ND	8.7
San Joaquin River nr Vernalis	*03/07/2016	Oryzalin	10.1	ND	10.1
San Joaquin River nr Vernalis	*01/19/2016	Oxyfluorfen	22.6	ND	22.6
San Joaquin River nr Vernalis	*01/19/2016	Pendimethalin	46.0	27 5	73.5
San Joaquin River nr Vernalis	*03/07/2016	Pendimethalin	28.9	ND	28.9
San Joaquin River nr Vernalis	04/19/2016	Prometryn	10.2	ND	10.2
San Joaquin River nr Vernalis	11/10/2015	Propiconazole	23.5	ND	23.5
San Joaquin River nr Vernalis	*01/19/2016	Propiconazole	23.4	ND	23.4
San Joaquin River nr Vernalis	02/17/2016	Propiconazole	16.4	ND	16.4
San Joaquin River nr Vernalis	04/19/2016	Propiconazole	23.5	ND	23.5
San Joaquin River nr Vernalis	07/28/2015	Simazine	17.0	ND	17.0
San Joaquin River nr Vernalis	08/18/2015	Simazine	5.3	ND	5.3
San Joaquin River nr Vernalis	11/10/2015	Simazine	7.3	ND	7.3
San Joaquin River nr Vernalis	12/15/2015	Simazine	8.4	ND	8.4
San Joaquin River nr Vernalis	*01/19/2016	Simazine	30.6	ND	30.6
San Joaquin River nr Vernalis	02/17/2016	Simazine	23.8	ND	23.8
San Joaquin River nr Vernalis	*03/07/2016	Simazine	21.6	ND	21.6
San Joaquin River nr Vernalis	04/19/2016	Simazine	10.2	ND	10.2
San Joaquin River nr Vernalis	*01/19/2016	Tetraconazole	11.6	ND	11.6
San Joaquin River nr Vernalis	07/28/2015	Copper, dissolved	860	n/a	860
San Joaquin River nr Vernalis	09/23/2015	Copper, dissolved	920	n/a	920
San Joaquin River nr Vernalis	10/21/2015	Copper, dissolved	605	n/a	605
San Joaquin River nr Vernalis	11/10/2015	Copper, dissolved	880	n/a	880
San Joaquin River nr Vernalis	01/19/2016	Copper, dissolved	1,780	n/a	1,780
San Joaquin River nr Vernalis	02/17/2016	Copper, dissolved	1,200	n/a	1,200
San Joaquin River nr Vernalis	*03/07/2016	Copper, dissolved	1,620	n/a	1,620
San Joaquin River nr Vernalis	04/19/2016	Copper, dissolved	1,510	n/a	1,510
San Joaquin River nr Vernalis	05/18/2016	Copper, dissolved	830	n/a	830
San Joaquin River nr Vernalis	06/15/2016	Copper, dissolved	830	n/a	830
Ulatis Crk @ Brown Rd	11/10/2015	3,4-Dichloroaniline	4.0	ND	4.0
Ulatis Crk @ Brown Rd	02/17/2016	3,4-Dichloroaniline	3.6	ND	3.6
Ulatis Crk @ Brown Rd	04/19/2016	3,4-Dichloroaniline	4.2	ND	4.2
Ulatis Crk @ Brown Rd	06/15/2016	3,4-Dichloroaniline	6.1	ND	6.1
Ulatis Crk @ Brown Rd	10/21/2015	DCPU	3.6	ND	3.6
Ulatis Crk @ Brown Rd	02/17/2016	DCPU	5.3	ND	5.3
Ulatis Crk @ Brown Rd	04/19/2016	DCPU	3.4	ND	3.4
Ulatis Crk @ Brown Rd	07/28/2015	Atrazine	14.6	ND	14.6
Ulatis Crk @ Brown Rd	08/18/2015	Atrazine	5.9	ND	5.9
Ulatis Crk @ Brown Rd	09/23/2015	Atrazine	4.1	ND	4.1
Ulatis Crk @ Brown Rd	11/10/2015	Atrazine	14.1	ND	14.1
Ulatis Crk @ Brown Rd	12/15/2015	Atrazine	6.3	ND	6.3
Ulatis Crk @ Brown Rd	04/19/2016	Atrazine	10.4	ND	10.4
Ulatis Crk @ Brown Rd	07/28/2015	Azoxystrobin	34.7	ND	34.7

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Ulatis Crk @ Brown Rd	08/18/2015	Azoxystrobin	103.9	ND	103.9
Ulatis Crk @ Brown Rd	09/23/2015	Azoxystrobin	5.9	ND	5.9
Ulatis Crk @ Brown Rd	10/21/2015	Azoxystrobin	54.6	ND	54.6
Ulatis Crk @ Brown Rd	*03/07/2016	Azoxystrobin	6.5	ND	6.5
Ulatis Crk @ Brown Rd	04/19/2016	Azoxystrobin	29.1	ND	29.1
Ulatis Crk @ Brown Rd	05/18/2016	Azoxystrobin	14.5	ND	14.5
Ulatis Crk @ Brown Rd	11/10/2015	Bifenthrin	33.3	ND	33.3
Ulatis Crk @ Brown Rd	12/15/2015	Bifenthrin	13.2	ND	13.2
Ulatis Crk @ Brown Rd	*01/19/2016	Bifenthrin	-	19 0	19.0
Ulatis Crk @ Brown Rd	02/17/2016	Bifenthrin	11.5	ND	11.5
Ulatis Crk @ Brown Rd	*03/07/2016	Bifenthrin	-	3 5	3.5
Ulatis Crk @ Brown Rd	07/28/2015	Boscalid	32.6	ND	32.6
Ulatis Crk @ Brown Rd	08/18/2015	Boscalid	47.5	ND	47.5
Ulatis Crk @ Brown Rd	09/23/2015	Boscalid	10.0	ND	10.0
Ulatis Crk @ Brown Rd	10/21/2015	Boscalid	47.3	ND	47.3
Ulatis Crk @ Brown Rd	11/10/2015	Boscalid	66.8	ND	66.8
Ulatis Crk @ Brown Rd	12/15/2015	Boscalid	23.5	ND	23.5
Ulatis Crk @ Brown Rd	*01/19/2016	Boscalid	82.1	ND	82.1
Ulatis Crk @ Brown Rd	02/17/2016	Boscalid	46.2	ND	46.2
Ulatis Crk @ Brown Rd	*03/07/2016	Boscalid	64.9	ND	64.9
Ulatis Crk @ Brown Rd	04/19/2016	Boscalid	50.4	ND	50.4
Ulatis Crk @ Brown Rd	05/18/2016	Boscalid	20.3	ND	20.3
Ulatis Crk @ Brown Rd	06/15/2016	Boscalid	25.4	ND	25.4
Ulatis Crk @ Brown Rd	10/21/2015	Carbaryl	20.7	ND	20.7
Ulatis Crk @ Brown Rd	10/21/2015	Carbendazim	155.9	ND	155.9
Ulatis Crk @ Brown Rd	12/15/2015	Carbendazim	57.0	ND	57.0
Ulatis Crk @ Brown Rd	*03/07/2016	Carbendazim	8.0	ND	8.0
Ulatis Crk @ Brown Rd	07/28/2015	Chlorantraniliprole	150.5	ND	150.5
Ulatis Crk @ Brown Rd	08/18/2015	Chlorantraniliprole	36.1	ND	36.1
Ulatis Crk @ Brown Rd	09/23/2015	Chlorantraniliprole	49.5	ND	49.5
Ulatis Crk @ Brown Rd	10/21/2015	Chlorantraniliprole	12.3	ND	12.3
Ulatis Crk @ Brown Rd	*01/19/2016	Chlorantraniliprole	25.9	ND	25.9
Ulatis Crk @ Brown Rd	*03/07/2016	Chlorantraniliprole	26.9	ND	26.9
Ulatis Crk @ Brown Rd	05/18/2016	Chlorantraniliprole	14.4	ND	14.4
Ulatis Crk @ Brown Rd	06/15/2016	Chlorantraniliprole	260.0	ND	260.0
Ulatis Crk @ Brown Rd	*03/07/2016	Cyhalothrin	-	15 2	15.2
Ulatis Crk @ Brown Rd	*03/07/2016	Diazinon	44.2	ND	44.2
Ulatis Crk @ Brown Rd	07/28/2015	Dithiopyr	15.4	ND	15.4
Ulatis Crk @ Brown Rd	08/18/2015	Dithiopyr	5.1	ND	5.1
Ulatis Crk @ Brown Rd	10/21/2015	Dithiopyr	14.2	ND	14.2
Ulatis Crk @ Brown Rd	11/10/2015	Dithiopyr	7.6	ND	7.6
Ulatis Crk @ Brown Rd	12/15/2015	Dithiopyr	202.8	ND	202.8
Ulatis Crk @ Brown Rd	*01/19/2016	Dithiopyr	35.3	9.6	44.9
Ulatis Crk @ Brown Rd	02/17/2016	Dithiopyr	13.1	ND	13.1
Ulatis Crk @ Brown Rd	*03/07/2016	Dithiopyr	184.0	ND	184.0
Ulatis Crk @ Brown Rd	04/19/2016	Dithiopyr	13.0	ND	13.0

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Ulatis Crk @ Brown Rd	05/18/2016	Dithiopyr	6.3	ND	6.3
Ulatis Crk @ Brown Rd	07/28/2015	Diuron	6.4	ND	6.4
Ulatis Crk @ Brown Rd	08/18/2015	Diuron	5.1	ND	5.1
Ulatis Crk @ Brown Rd	10/21/2015	Diuron	18.4	ND	18.4
Ulatis Crk @ Brown Rd	11/10/2015	Diuron	4.5	ND	4.5
Ulatis Crk @ Brown Rd	12/15/2015	Diuron	34.0	ND	34.0
Ulatis Crk @ Brown Rd	*01/19/2016	Diuron	44.8	ND	44.8
Ulatis Crk @ Brown Rd	02/17/2016	Diuron	6.4	ND	6.4
Ulatis Crk @ Brown Rd	*03/07/2016	Diuron	37.7	ND	37.7
Ulatis Crk @ Brown Rd	04/19/2016	Diuron	78.8	ND	78.8
Ulatis Crk @ Brown Rd	05/18/2016	Diuron	11.2	ND	11.2
Ulatis Crk @ Brown Rd	06/15/2016	Diuron	3.3	ND	3.3
Ulatis Crk @ Brown Rd	06/15/2016	EPTC	7.0	ND	7.0
Ulatis Crk @ Brown Rd	12/15/2015	Fenhexamide	73.1	ND	73.1
Ulatis Crk @ Brown Rd	10/21/2015	Fipronil	13.4	ND	13.4
Ulatis Crk @ Brown Rd	11/10/2015	Fipronil	3.8	ND	3.8
Ulatis Crk @ Brown Rd	12/15/2015	Fipronil	4.1	ND	4.1
Ulatis Crk @ Brown Rd	*01/19/2016	Fipronil	11.0	ND	11.0
Ulatis Crk @ Brown Rd	*03/07/2016	Fipronil	4.0	ND	4.0
Ulatis Crk @ Brown Rd	10/21/2015	Fipronil Desulfinyl	5.3	ND	5.3
Ulatis Crk @ Brown Rd	11/10/2015	Fipronil Desulfinyl	2.7	ND	2.7
Ulatis Crk @ Brown Rd	12/15/2015	Fipronil Desulfinyl	3.2	ND	3.2
Ulatis Crk @ Brown Rd	11/10/2015	Fipronil sulfone	4.7	ND	4.7
Ulatis Crk @ Brown Rd	12/15/2015	Fipronil sulfone	4.6	ND	4.6
Ulatis Crk @ Brown Rd	*03/07/2016	Fipronil sulfone	4.8	ND	4.8
Ulatis Crk @ Brown Rd	07/28/2015	Fluridone	11.6	ND	11.6
Ulatis Crk @ Brown Rd	08/18/2015	Fluridone	6.7	ND	6.7
Ulatis Crk @ Brown Rd	09/23/2015	Fluridone	4.5	ND	4.5
Ulatis Crk @ Brown Rd	10/21/2015	Fluridone	5.4	ND	5.4
Ulatis Crk @ Brown Rd	*03/07/2016	Fluridone	23.3	ND	23.3
Ulatis Crk @ Brown Rd	04/19/2016	Fluridone	95.8	ND	95.8
Ulatis Crk @ Brown Rd	05/18/2016	Fluridone	12.7	ND	12.7
Ulatis Crk @ Brown Rd	06/15/2016	Fluridone	3.8	ND	3.8
Ulatis Crk @ Brown Rd	07/28/2015	Fluxapyroxad	14.8	ND	14.8
Ulatis Crk @ Brown Rd	08/18/2015	Fluxapyroxad	32.6	ND	32.6
Ulatis Crk @ Brown Rd	10/21/2015	Fluxapyroxad	13.8	ND	13.8
Ulatis Crk @ Brown Rd	11/10/2015	Fluxapyroxad	13.3	ND	13.3
Ulatis Crk @ Brown Rd	*03/07/2016	Fluxapyroxad	71.4	ND	71.4
Ulatis Crk @ Brown Rd	04/19/2016	Fluxapyroxad	15.2	ND	15.2
Ulatis Crk @ Brown Rd	05/18/2016	Fluxapyroxad	7.6	ND	7.6
Ulatis Crk @ Brown Rd	07/28/2015	Hexazinone	67.8	ND	67.8
Ulatis Crk @ Brown Rd	08/18/2015	Hexazinone	72.2	ND	72.2
Ulatis Crk @ Brown Rd	10/21/2015	Hexazinone	32.9	ND	32.9
Ulatis Crk @ Brown Rd	11/10/2015	Hexazinone	41.4	ND	41.4
Ulatis Crk @ Brown Rd	12/15/2015	Hexazinone	14.1	ND	14.1
Ulatis Crk @ Brown Rd	*01/19/2016	Hexazinone	32.2	ND	32.2

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Ulatis Crk @ Brown Rd	02/17/2016	Hexazinone	13.2	ND	13.2
Ulatis Crk @ Brown Rd	*03/07/2016	Hexazinone	2273.5	ND	2273.5
Ulatis Crk @ Brown Rd	04/19/2016	Hexazinone	78.2	ND	78.2
Ulatis Crk @ Brown Rd	05/18/2016	Hexazinone	112.1	ND	112.1
Ulatis Crk @ Brown Rd	06/15/2016	Hexazinone	86.6	ND	86.6
Ulatis Crk @ Brown Rd	07/28/2015	Imidacloprid	12.6	ND	12.6
Ulatis Crk @ Brown Rd	08/18/2015	Imidacloprid	4.6	ND	4.6
Ulatis Crk @ Brown Rd	09/23/2015	Imidacloprid	3.9	ND	3.9
Ulatis Crk @ Brown Rd	10/21/2015	Imidacloprid	30.0	ND	30.0
Ulatis Crk @ Brown Rd	11/10/2015	Imidacloprid	16.0	ND	16.0
Ulatis Crk @ Brown Rd	12/15/2015	Imidacloprid	21.9	ND	21.9
Ulatis Crk @ Brown Rd	*01/19/2016	Imidacloprid	19.5	ND	19.5
Ulatis Crk @ Brown Rd	02/17/2016	Imidacloprid	17.8	ND	17.8
Ulatis Crk @ Brown Rd	*03/07/2016	Imidacloprid	19.5	ND	19.5
Ulatis Crk @ Brown Rd	04/19/2016	Imidacloprid	9.6	ND	9.6
Ulatis Crk @ Brown Rd	05/18/2016	Imidacloprid	7.8	ND	7.8
Ulatis Crk @ Brown Rd	06/15/2016	Imidacloprid	6.4	ND	6.4
Ulatis Crk @ Brown Rd	*03/07/2016	Indoxacarb	72.9	ND	72.9
Ulatis Crk @ Brown Rd	09/23/2015	Metalaxyl	17.0	ND	17.0
Ulatis Crk @ Brown Rd	07/28/2015	Methoxyfenozide	3.8	ND	3.8
Ulatis Crk @ Brown Rd	08/18/2015	Methoxyfenozide	5.3	ND	5.3
Ulatis Crk @ Brown Rd	10/21/2015	Methoxyfenozide	9.0	ND	9.0
Ulatis Crk @ Brown Rd	*01/19/2016	Methoxyfenozide	23.9	ND	23.9
Ulatis Crk @ Brown Rd	*03/07/2016	Methoxyfenozide	9.4	ND	9.4
Ulatis Crk @ Brown Rd	07/28/2015	Metolachlor	140.3	ND	140.3
Ulatis Crk @ Brown Rd	08/18/2015	Metolachlor	63.0	ND	63.0
Ulatis Crk @ Brown Rd	10/21/2015	Metolachlor	14.5	ND	14.5
Ulatis Crk @ Brown Rd	11/10/2015	Metolachlor	20.9	ND	20.9
Ulatis Crk @ Brown Rd	*01/19/2016	Metolachlor	114.0	ND	114.0
Ulatis Crk @ Brown Rd	*03/07/2016	Metolachlor	57.2	ND	57.2
Ulatis Crk @ Brown Rd	04/19/2016	Metolachlor	9.1	ND	9.1
Ulatis Crk @ Brown Rd	05/18/2016	Metolachlor	2627.4	17 8	2645.2
Ulatis Crk @ Brown Rd	06/15/2016	Metolachlor	177.9	4.1	182.0
Ulatis Crk @ Brown Rd	07/28/2015	DCPMU	4.4	ND	4.4
Ulatis Crk @ Brown Rd	08/18/2015	DCPMU	4.0	ND	4.0
Ulatis Crk @ Brown Rd	10/21/2015	DCPMU	6.6	ND	6.6
Ulatis Crk @ Brown Rd	12/15/2015	DCPMU	5.4	ND	5.4
Ulatis Crk @ Brown Rd	*01/19/2016	DCPMU	7.0	ND	7.0
Ulatis Crk @ Brown Rd	02/17/2016	DCPMU	3.8	ND	3.8
Ulatis Crk @ Brown Rd	*03/07/2016	DCPMU	5.4	ND	5.4
Ulatis Crk @ Brown Rd	04/19/2016	DCPMU	18.7	ND	18.7
Ulatis Crk @ Brown Rd	05/18/2016	DCPMU	3.5	ND	3.5
Ulatis Crk @ Brown Rd	*01/19/2016	Oryzalin	72.6	ND	72.6
Ulatis Crk @ Brown Rd	*03/07/2016	Oryzalin	18.7	ND	18.7
Ulatis Crk @ Brown Rd	06/15/2016	Oryzalin	10.9	ND	10.9
Ulatis Crk @ Brown Rd	*01/19/2016	Oxadiazon	11.0	ND	11.0

Site	Date	Analyte	Water (ng/L)	Suspended Sediment (ng/L)	Whole Sample (ng/L)
Ulatis Crk @ Brown Rd	*03/07/2016	Oxadiazon	50.4	ND	50.4
Ulatis Crk @ Brown Rd	12/15/2015	Oxyfluorfen	29.7	ND	29.7
Ulatis Crk @ Brown Rd	*01/19/2016	Oxyfluorfen		23 2	23.2
Ulatis Crk @ Brown Rd	02/17/2016	Oxyfluorfen	37.9	ND	37.9
Ulatis Crk @ Brown Rd	*03/07/2016	Oxyfluorfen	25.7	ND	25.7
Ulatis Crk @ Brown Rd	04/19/2016	Oxyfluorfen	6.3	ND	6.3
Ulatis Crk @ Brown Rd	06/15/2016	Oxyfluorfen	25.8	ND	25.8
Ulatis Crk @ Brown Rd	*01/19/2016	p,p'-DDE	-	5.6	5.6
Ulatis Crk @ Brown Rd	04/19/2016	Pendimethalin	33.6	ND	33.6
Ulatis Crk @ Brown Rd	*01/19/2016	Pendimethalin	99.6	265 0	364.6
Ulatis Crk @ Brown Rd	*03/07/2016	Pendimethalin	205.4	ND	205.4
Ulatis Crk @ Brown Rd	08/18/2015	Permethrin	-	3 2	3.2
Ulatis Crk @ Brown Rd	*03/07/2016	Permethrin	-	26.4	26.4
Ulatis Crk @ Brown Rd	*01/19/2016	Prodiamine	8.5	9.6	18.1
Ulatis Crk @ Brown Rd	*01/19/2016	Propiconazole	34.0	ND	34.0
Ulatis Crk @ Brown Rd	*03/07/2016	Propiconazole	24.8	ND	24.8
Ulatis Crk @ Brown Rd	04/19/2016	Propiconazole	35.1	ND	35.1
Ulatis Crk @ Brown Rd	07/28/2015	Simazine	54.5	ND	54.5
Ulatis Crk @ Brown Rd	08/18/2015	Simazine	29.5	ND	29.5
Ulatis Crk @ Brown Rd	09/23/2015	Simazine	13.5	ND	13.5
Ulatis Crk @ Brown Rd	11/10/2015	Simazine	9.5	ND	9.5
Ulatis Crk @ Brown Rd	*01/19/2016	Simazine	6.9	ND	6.9
Ulatis Crk @ Brown Rd	02/17/2016	Simazine	15.3	ND	15.3
Ulatis Crk @ Brown Rd	*03/07/2016	Simazine	209.1	ND	209.1
Ulatis Crk @ Brown Rd	04/19/2016	Simazine	12.6	ND	12.6
Ulatis Crk @ Brown Rd	05/18/2016	Simazine	159.0	ND	159.0
Ulatis Crk @ Brown Rd	06/15/2016	Simazine	16.2	ND	16.2
Ulatis Crk @ Brown Rd	*01/19/2016	Tetraconazole	10.3	ND	10.3
Ulatis Crk @ Brown Rd	12/15/2015	Thiabendazole	3.9	ND	3.9
Ulatis Crk @ Brown Rd	02/17/2016	Thiabendazole	4.0	ND	4.0
Ulatis Crk @ Brown Rd	05/18/2016	Thiamethoxam	25.7	ND	25.7
Ulatis Crk @ Brown Rd	*03/07/2016	Trifloxystrobin	7.7	ND	7.7
Ulatis Crk @ Brown Rd	07/28/2015	Copper, dissolved	3,030	n/a	3,030
Ulatis Crk @ Brown Rd	08/18/2015	Copper, dissolved	2,460	n/a	2,460
Ulatis Crk @ Brown Rd	09/23/2015	Copper, dissolved	2,260	n/a	2,260
Ulatis Crk @ Brown Rd	10/21/2015	Copper, dissolved	1,530	n/a	1,530
Ulatis Crk @ Brown Rd	11/10/2015	Copper, dissolved	1,240	n/a	1,240
Ulatis Crk @ Brown Rd	12/15/2015	Copper, dissolved	2,380	n/a	2,380
Ulatis Crk @ Brown Rd	*01/19/2016	Copper, dissolved	3,760	n/a	3,760
Ulatis Crk @ Brown Rd	02/17/2016	Copper, dissolved	2,260	n/a	2,260
Ulatis Crk @ Brown Rd	*03/07/2016	Copper, dissolved	3,960	n/a	3,960
Ulatis Crk @ Brown Rd	04/19/2016	Copper, dissolved	3,570	n/a	3,570
Ulatis Crk @ Brown Rd	05/18/2016	Copper, dissolved	2,970	n/a	2,970
Ulatis Crk @ Brown Rd	06/15/2016	Copper, dissolved	4,230	n/a	4,230

Table 5. Total Suspended Solids (TSS), Dissolved Organic Carbon (DOC), and Particulate Organic Carbon (POC) concentration in samples.

* = storm sample.

Site	Date	Analyte	Result	Unit
Mokelumne R @ New Hope Rd	07/28/2015	Total Suspended Solids	13.1	mg/L
Mokelumne R @ New Hope Rd	08/18/2015	Total Suspended Solids	11.3	mg/L
Mokelumne R @ New Hope Rd	09/23/2015	Total Suspended Solids	4.8	mg/L
Mokelumne R @ New Hope Rd	10/21/2015	Total Suspended Solids	0.3	mg/L
Mokelumne R @ New Hope Rd	11/10/2015	Total Suspended Solids	0.1	mg/L
Mokelumne R @ New Hope Rd	12/15/2015	Total Suspended Solids	2.7	mg/L
Mokelumne R @ New Hope Rd	*01/19/2016	Total Suspended Solids	5.2	mg/L
Mokelumne R @ New Hope Rd	02/17/2016	Total Suspended Solids	3.9	mg/L
Mokelumne R @ New Hope Rd	*03/07/2016	Total Suspended Solids	5.4	mg/L
Mokelumne R @ New Hope Rd	04/19/2016	Total Suspended Solids	15.9	mg/L
Mokelumne R @ New Hope Rd	05/18/2016	Total Suspended Solids	4.8	mg/L
Mokelumne R @ New Hope Rd	06/15/2016	Total Suspended Solids	12.0	mg/L
Mokelumne R @ New Hope Rd	07/28/2015	Dissolved Organic Carbon	3.06	mg/L
Mokelumne R @ New Hope Rd	08/18/2015	Dissolved Organic Carbon	2.12	mg/L
Mokelumne R @ New Hope Rd	09/23/2015	Dissolved Organic Carbon	2.83	mg/L
Mokelumne R @ New Hope Rd	10/21/2015	Dissolved Organic Carbon	2.13	mg/L
Mokelumne R @ New Hope Rd	11/10/2015	Dissolved Organic Carbon	2.2	mg/L
Mokelumne R @ New Hope Rd	12/15/2015	Dissolved Organic Carbon	2.65	mg/L
Mokelumne R @ New Hope Rd	*01/19/2016	Dissolved Organic Carbon	2.94	mg/L
Mokelumne R @ New Hope Rd	02/17/2016	Dissolved Organic Carbon	2.26	mg/L
Mokelumne R @ New Hope Rd	*03/07/2016	Dissolved Organic Carbon	2.89	mg/L
Mokelumne R @ New Hope Rd	04/19/2016	Dissolved Organic Carbon	2.14	mg/L
Mokelumne R @ New Hope Rd	05/18/2016	Dissolved Organic Carbon	-[10]	mg/L
Mokelumne R @ New Hope Rd	06/15/2016	Dissolved Organic Carbon	2.68	mg/L
Mokelumne R @ New Hope Rd	07/28/2015	Particulate Organic Carbon	1.41	mg/L
Mokelumne R @ New Hope Rd	08/18/2015	Particulate Organic Carbon	0.863	mg/L
Mokelumne R @ New Hope Rd	09/23/2015	Particulate Organic Carbon	0.614	mg/L
Mokelumne R @ New Hope Rd	10/21/2015	Particulate Organic Carbon	0.209	mg/L
Mokelumne R @ New Hope Rd	11/10/2015	Particulate Organic Carbon	0.2	mg/L
Mokelumne R @ New Hope Rd	12/15/2015	Particulate Organic Carbon	0.304	mg/L

[10] Sample was lost due to a processing error at the USGS National Water Quality Laboratory in Denver.

Site	Date	Analyte	Result	Unit
Mokelumne R @ New Hope Rd	*01/19/2016	Particulate Organic Carbon	0.619	mg/L
Mokelumne R @ New Hope Rd	02/17/2016	Particulate Organic Carbon	0.753	mg/L
Mokelumne R @ New Hope Rd	*03/07/2016	Particulate Organic Carbon	0.417	mg/L
Mokelumne R @ New Hope Rd	04/19/2016	Particulate Organic Carbon	0.951	mg/L
Mokelumne R @ New Hope Rd	05/18/2016	Particulate Organic Carbon	0.378	mg/L
Mokelumne R @ New Hope Rd	06/15/2016	Particulate Organic Carbon	0.499	mg/L
Sacramento R @ Hood	07/28/2015	Total Suspended Solids	5.4	mg/L
Sacramento R @ Hood	08/18/2015	Total Suspended Solids	2.8	mg/L
Sacramento R @ Hood	09/23/2015	Total Suspended Solids	51.5	mg/L
Sacramento R @ Hood	10/21/2015	Total Suspended Solids	5.6	mg/L
Sacramento R @ Hood	11/10/2015	Total Suspended Solids	0.1	mg/L
Sacramento R @ Hood	12/15/2015	Total Suspended Solids	15.5	mg/L
Sacramento R @ Hood	*01/19/2016	Total Suspended Solids	138.4	mg/L
Sacramento R @ Hood	02/17/2016	Total Suspended Solids	16.2	mg/L
Sacramento R @ Hood	*03/07/2016	Total Suspended Solids	152.4	mg/L
Sacramento R @ Hood	04/19/2016	Total Suspended Solids	13.7	mg/L
Sacramento R @ Hood	05/18/2016	Total Suspended Solids	9.5	mg/L
Sacramento R @ Hood	06/15/2016	Total Suspended Solids	15.2	mg/L
Sacramento R @ Hood	07/28/2015	Dissolved Organic Carbon	1.81	mg/L
Sacramento R @ Hood	08/18/2015	Dissolved Organic Carbon	1.81	mg/L
Sacramento R @ Hood	09/23/2015	Dissolved Organic Carbon	1.59	mg/L
Sacramento R @ Hood	10/21/2015	Dissolved Organic Carbon	1.64	mg/L
Sacramento R @ Hood	11/10/2015	Dissolved Organic Carbon	1.78	mg/L
Sacramento R @ Hood	12/15/2015	Dissolved Organic Carbon	2.04	mg/L
Sacramento R @ Hood	*01/19/2016	Dissolved Organic Carbon	4.44	mg/L
Sacramento R @ Hood	02/17/2016	Dissolved Organic Carbon	2.65	mg/L
Sacramento R @ Hood	*03/07/2016	Dissolved Organic Carbon	4.42	mg/L
Sacramento R @ Hood	04/19/2016	Dissolved Organic Carbon	1.64	mg/L
Sacramento R @ Hood	05/18/2016	Dissolved Organic Carbon	>0.46	mg/L
Sacramento R @ Hood	06/15/2016	Dissolved Organic Carbon	2.56	mg/L
Sacramento R @ Hood	07/28/2015	Particulate Organic Carbon	0.358	mg/L
Sacramento R @ Hood	08/18/2015	Particulate Organic Carbon	0.107	mg/L
Sacramento R @ Hood	09/23/2015	Particulate Organic Carbon	0.105	mg/L
Sacramento R @ Hood	10/21/2015	Particulate Organic Carbon	0.172	mg/L
Sacramento R @ Hood	11/10/2015	Particulate Organic Carbon	0.264	mg/L
Sacramento R @ Hood	12/15/2015	Particulate Organic Carbon	0.514	mg/L
Sacramento R @ Hood	*01/19/2016	Particulate Organic Carbon	2.11	mg/L
Sacramento R @ Hood	02/17/2016	Particulate Organic Carbon	0.443	mg/L
Sacramento R @ Hood	*03/07/2016	Particulate Organic Carbon	2.55	mg/L

Site	Date	Analyte	Result	Unit
Sacramento R @ Hood	04/19/2016	Particulate Organic Carbon	0.501	mg/L
Sacramento R @ Hood	05/18/2016	Particulate Organic Carbon	0.15	mg/L
Sacramento R @ Hood	06/15/2016	Particulate Organic Carbon	0.485	mg/L
SJR @ Buckley Cove	07/28/2015	Total Suspended Solids	17.9	mg/L
SJR @ Buckley Cove	08/18/2015	Total Suspended Solids	16.8	mg/L
SJR @ Buckley Cove	09/23/2015	Total Suspended Solids	18.8	mg/L
SJR @ Buckley Cove	10/21/2015	Total Suspended Solids	1.2	mg/L
SJR @ Buckley Cove	11/10/2015	Total Suspended Solids	2.5	mg/L
SJR @ Buckley Cove	12/15/2015	Total Suspended Solids	45.0	mg/L
SJR @ Buckley Cove	*01/19/2016	Total Suspended Solids	84.3	mg/L
SJR @ Buckley Cove	02/17/2016	Total Suspended Solids	12.2	mg/L
SJR @ Buckley Cove	*03/07/2016	Total Suspended Solids	14.4	mg/L
SJR @ Buckley Cove	04/19/2016	Total Suspended Solids	15.2	mg/L
SJR @ Buckley Cove	05/18/2016	Total Suspended Solids	17.3	mg/L
SJR @ Buckley Cove	06/15/2016	Total Suspended Solids	9.3	mg/L
SJR @ Buckley Cove	07/28/2015	Dissolved Organic Carbon	5.04	mg/L
SJR @ Buckley Cove	08/18/2015	Dissolved Organic Carbon	4.82	mg/L
SJR @ Buckley Cove	09/23/2015	Dissolved Organic Carbon	4.28	mg/L
SJR @ Buckley Cove	10/21/2015	Dissolved Organic Carbon	3.54	mg/L
SJR @ Buckley Cove	11/10/2015	Dissolved Organic Carbon	2.72	mg/L
SJR @ Buckley Cove	12/15/2015	Dissolved Organic Carbon	3.35	mg/L
SJR @ Buckley Cove	*01/19/2016	Dissolved Organic Carbon	7.65	mg/L
SJR @ Buckley Cove	02/17/2016	Dissolved Organic Carbon	8.37	mg/L
SJR @ Buckley Cove	*03/07/2016	Dissolved Organic Carbon	7.37	mg/L
SJR @ Buckley Cove	04/19/2016	Dissolved Organic Carbon	4.8	mg/L
SJR @ Buckley Cove	05/18/2016	Dissolved Organic Carbon	3.23	mg/L
SJR @ Buckley Cove	06/15/2016	Dissolved Organic Carbon	3.85	mg/L
SJR @ Buckley Cove	07/28/2015	Particulate Organic Carbon	1.28	mg/L
SJR @ Buckley Cove	08/18/2015	Particulate Organic Carbon	0.441	mg/L
SJR @ Buckley Cove	09/23/2015	Particulate Organic Carbon	0.429	mg/L
SJR @ Buckley Cove	10/21/2015	Particulate Organic Carbon	0.352	mg/L
SJR @ Buckley Cove	11/10/2015	Particulate Organic Carbon	0.188	mg/L
SJR @ Buckley Cove	12/15/2015	Particulate Organic Carbon	1.12	mg/L
SJR @ Buckley Cove	*01/19/2016	Particulate Organic Carbon	2.35	mg/L
SJR @ Buckley Cove	02/17/2016	Particulate Organic Carbon	0.889	mg/L
SJR @ Buckley Cove	*03/07/2016	Particulate Organic Carbon	0.543	mg/L
SJR @ Buckley Cove	04/19/2016	Particulate Organic Carbon	1.3	mg/L
SJR @ Buckley Cove	05/18/2016	Particulate Organic Carbon	1.51	mg/L
SJR @ Buckley Cove	06/15/2016	Particulate Organic Carbon	2.17	mg/L

Site	Date	Analyte	Result	Unit
San Joaquin River nr Vernalis	07/28/2015	Total Suspended Solids	4.9	mg/L
San Joaquin River nr Vernalis	08/18/2015	Total Suspended Solids	6.5	mg/L
San Joaquin River nr Vernalis	09/23/2015	Total Suspended Solids	5.6	mg/L
San Joaquin River nr Vernalis	10/21/2015	Total Suspended Solids	3.6	mg/L
San Joaquin River nr Vernalis	11/10/2015	Total Suspended Solids	2	mg/L
San Joaquin River nr Vernalis	12/15/2015	Total Suspended Solids	3.7	mg/L
San Joaquin River nr Vernalis	*01/19/2016	Total Suspended Solids	461.1	mg/L
San Joaquin River nr Vernalis	02/17/2016	Total Suspended Solids	18.9	mg/L
San Joaquin River nr Vernalis	*03/07/2016	Total Suspended Solids	35.2	mg/L
San Joaquin River nr Vernalis	04/19/2016	Total Suspended Solids	47.2	mg/L
San Joaquin River nr Vernalis	05/18/2016	Total Suspended Solids	27	mg/L
San Joaquin River nr Vernalis	06/15/2016	Total Suspended Solids	19.8	mg/L
San Joaquin River nr Vernalis	07/28/2015	Dissolved Organic Carbon	2.6	mg/L
San Joaquin River nr Vernalis	08/18/2015	Dissolved Organic Carbon	2.27	mg/L
San Joaquin River nr Vernalis	09/23/2015	Dissolved Organic Carbon	2.55	mg/L
San Joaquin River nr Vernalis	10/21/2015	Dissolved Organic Carbon	2.23	mg/L
San Joaquin River nr Vernalis	11/10/2015	Dissolved Organic Carbon	2.38	mg/L
San Joaquin River nr Vernalis	12/15/2015	Dissolved Organic Carbon	2.54	mg/L
San Joaquin River nr Vernalis	*01/19/2016	Dissolved Organic Carbon	4.47	mg/L
San Joaquin River nr Vernalis	02/17/2016	Dissolved Organic Carbon	4.74	mg/L
San Joaquin River nr Vernalis	*03/07/2016	Dissolved Organic Carbon	5.08	mg/L
San Joaquin River nr Vernalis	04/19/2016	Dissolved Organic Carbon	3.06	mg/L
San Joaquin River nr Vernalis	05/18/2016	Dissolved Organic Carbon	2.89	mg/L
San Joaquin River nr Vernalis	06/15/2016	Dissolved Organic Carbon	2.77	mg/L
San Joaquin River nr Vernalis	07/28/2015	Particulate Organic Carbon	0.794	mg/L
San Joaquin River nr Vernalis	08/18/2015	Particulate Organic Carbon	0.147	mg/L
San Joaquin River nr Vernalis	09/23/2015	Particulate Organic Carbon	0.154	mg/L
San Joaquin River nr Vernalis	10/21/2015	Particulate Organic Carbon	0.175	mg/L
San Joaquin River nr Vernalis	11/10/2015	Particulate Organic Carbon	0.289	mg/L
San Joaquin River nr Vernalis	12/15/2015	Particulate Organic Carbon	0.293	mg/L
San Joaquin River nr Vernalis	*01/19/2016	Particulate Organic Carbon	1.39	mg/L
San Joaquin River nr Vernalis	02/17/2016	Particulate Organic Carbon	1.46	mg/L
San Joaquin River nr Vernalis	*03/07/2016	Particulate Organic Carbon	1.6	mg/L
San Joaquin River nr Vernalis	04/19/2016	Particulate Organic Carbon	2.96	mg/L
San Joaquin River nr Vernalis	05/18/2016	Particulate Organic Carbon	2.9	mg/L
San Joaquin River nr Vernalis	06/15/2016	Particulate Organic Carbon	4.79	mg/L
Ulatis Crk @ Brown Rd	07/28/2015	Total Suspended Solids	16.4	mg/L
Ulatis Crk @ Brown Rd	08/18/2015	Total Suspended Solids	18	mg/L
Ulatis Crk @ Brown Rd	09/23/2015	Total Suspended Solids	25.3	mg/L

Site	Date	Analyte	Result	Unit
Ulatis Crk @ Brown Rd	10/21/2015	Total Suspended Solids	26.5	mg/L
Ulatis Crk @ Brown Rd	11/10/2015	Total Suspended Solids	35.2	mg/L
Ulatis Crk @ Brown Rd	12/15/2015	Total Suspended Solids	31.7	mg/L
Ulatis Crk @ Brown Rd	*01/19/2016	Total Suspended Solids	580.0	mg/L
Ulatis Crk @ Brown Rd	02/17/2016	Total Suspended Solids	22.3	mg/L
Ulatis Crk @ Brown Rd	*03/07/2016	Total Suspended Solids	189.4	mg/L
Ulatis Crk @ Brown Rd	04/19/2016	Total Suspended Solids	27.2	mg/L
Ulatis Crk @ Brown Rd	05/18/2016	Total Suspended Solids	24	mg/L
Ulatis Crk @ Brown Rd	06/15/2016	Total Suspended Solids	29.3	mg/L
Ulatis Crk @ Brown Rd	07/28/2015	Dissolved Organic Carbon	8.01	mg/L
Ulatis Crk @ Brown Rd	08/18/2015	Dissolved Organic Carbon	7.22	mg/L
Ulatis Crk @ Brown Rd	09/23/2015	Dissolved Organic Carbon	9.97	mg/L
Ulatis Crk @ Brown Rd	10/21/2015	Dissolved Organic Carbon	8.93	mg/L
Ulatis Crk @ Brown Rd	11/10/2015	Dissolved Organic Carbon	4.25	mg/L
Ulatis Crk @ Brown Rd	12/15/2015	Dissolved Organic Carbon	6.32	mg/L
Ulatis Crk @ Brown Rd	*01/19/2016	Dissolved Organic Carbon	7.77	mg/L
Ulatis Crk @ Brown Rd	02/17/2016	Dissolved Organic Carbon	4.74	mg/L
Ulatis Crk @ Brown Rd	*03/07/2016	Dissolved Organic Carbon	9.24	mg/L
Ulatis Crk @ Brown Rd	04/19/2016	Dissolved Organic Carbon	6.06	mg/L
Ulatis Crk @ Brown Rd	05/18/2016	Dissolved Organic Carbon	6.85	mg/L
Ulatis Crk @ Brown Rd	06/15/2016	Dissolved Organic Carbon	11.6	mg/L
Ulatis Crk @ Brown Rd	07/28/2015	Particulate Organic Carbon	0.963	mg/L
Ulatis Crk @ Brown Rd	08/18/2015	Particulate Organic Carbon	1.65	mg/L
Ulatis Crk @ Brown Rd	09/23/2015	Particulate Organic Carbon	1.83	mg/L
Ulatis Crk @ Brown Rd	10/21/2015	Particulate Organic Carbon	1.15	mg/L
Ulatis Crk @ Brown Rd	11/10/2015	Particulate Organic Carbon	1.25	mg/L
Ulatis Crk @ Brown Rd	12/15/2015	Particulate Organic Carbon	1.54	mg/L
Ulatis Crk @ Brown Rd	*01/19/2016	Particulate Organic Carbon	38.5	mg/L
Ulatis Crk @ Brown Rd	02/17/2016	Particulate Organic Carbon	1.03	mg/L
Ulatis Crk @ Brown Rd	*03/07/2016	Particulate Organic Carbon	5.14	mg/L
Ulatis Crk @ Brown Rd	04/19/2016	Particulate Organic Carbon	4.41	mg/L
Ulatis Crk @ Brown Rd	05/18/2016	Particulate Organic Carbon	1.69	mg/L
Ulatis Crk @ Brown Rd	06/15/2016	Particulate Organic Carbon	1.79	mg/L

Table 6. Quality Assurance (QA) summary for chemical-analytical results.

RPD = Relative percent difference. RSD = Relative standard deviation.

	% Non-detects	% Results < 3x Blank	Avg % Recovery[11]	Avg % RPD or RSD
GC/MS pesticides				
avg[12]	93%	0%	98%	5%
min[13]	8%	0%	77%	2%
max[14]	100%	0%	109%	11%
LC/MS-MS pesticides				
avg	83%	0%	90%	7%
min	31%	0%	62%	3%
max	100%	0%	111%	18%
Dissolved Organic Carbon[15]	1%	0%	96%	4%
Particulate Organic Carbon[16]	0%	0%	92%	12%
Total Inorganic Carbon	92%	0%	NA	NA
Copper	5%	0%	97%	2%
Nitrogen, Total	13%	0%	99%	2%
Total Suspended Solids	0%	0%	NA	NA

[11] Average % recovery across all batches, calculated by averaging the average recoveries from all individual batches. Minimum and maximum % average recoveries represent the analytes with the lowest and highest average of averages.

[12] "Average" pesticide results for all analytes within the method considered collectively.

[13] "Min" and "Max" results for individual compounds, e.g., the fewest NDs for any one compound by GC/MS was 8%, while the most was 100%ND (this occurred for many individual compounds, given that the average is 93%ND).

[14] See footnote 12.

[15] DOC samples were used to represent lab recovery and precision for all dissolved carbon species.

[16] Total particulate carbon samples were used to represent lab recovery and precision for particulate carbon species.

Table 7. QA summary of toxicity results (counts and percentages of flagged results).

Test	Total number	Test Water Quality[17]	Alternative Control[18]	Hold Time[19]
Ceriodaphnia dubia	61	28 (46%)	7 (11%)	5 (8%)
Pimephales promelas	70	47 (67%)	7 (10%)	12 (17%)
Selenastrum capricornutum	68	40 (59%)	0 (0%)	3 (4%)

[17] Temperature and pH were the most common water quality deviations, usually by <1 degree C or <1 pH unit. Labs often note such small deviances seldom cause measurable significant effect, but may bias results (e.g., slower growth).

[18] Alternative control flags are applied when the primary control fails acceptance criteria but a similar QC sample type (e.g., a blank, or salinity control) passes, or is more equivalent to the field sample, and used instead for significance testing.

[19] Hold time exceedances most frequently occur on retests, as all samples are usually past hold time by the time problems are found with test organisms (low viability, control sample failure, etc.) The only options then are to retest and report hold time flags, or to not retest and not report any results.

Table 8. Overall detection frequencies for pesticides in water samples (n = 60) collected from Delta Regional Monitoring Program sites, July 2015 to June 2016, in order of overall detection frequency.

Pesticide	**Pesticide Type**	**Chemical Class**	**Overall Detection Frequency**	**Number of Samples with Detections above MDL**
Boscalid	Fungicide	Pyridine	92%	55
Hexazinone	Herbicide	Triazone	85%	51
Azoxystrobin	Fungicide	Strobilurin	75%	45
Diuron	Herbicide	Urea	67%	40
Metolachlor	Herbicide	Chloroacetanilide	63%	38
Dithiopyr	Herbicide	Pyridine	58%	35
Methoxyfenozide	Insecticide	Diacylhydrazine	55%	33
Simazine	Herbicide	Triazine	53%	32
N-(3,4-Dichlorophenyl)-N'-methylurea (DCPMU)	Degradate	Urea	47%	28
3,4-Dichloroaniline (3,4-DCA)	Degradate	Urea	45%	27
Carbendazim	Fungicide	Benzimidazole	45%	27
Fluxapyroxad	Fungicide	Anilide	43%	26
Imidacloprid	Insecticide	Neonicotinoid	43%	26
Chlorantraniliprole	Insecticide	Anthranilic diamide	42%	25
Fluridone	Herbicide	Unclassified	40%	24
Piperonyl butoxide	Synergist	Unclassified	32%	19
Fipronil	Insecticide	Phenylpyrazole	25%	15
3,4-Dichlorophenylurea (DCPU)	Degradate	Urea	22%	13
Atrazine	Herbicide	Triazine	20%	12
Desulfinylfipronil	Degradate	Phenylpyrazole	20%	12
Oxyfluorfen	Herbicide	Nitrophenyl ether	20%	12
Iprodione	Fungicide	Dicarboxamide	15%	9
Oryzalin	Herbicide	2,6-Dinitroaniline	15%	9
Pendimethalin	Herbicide	Aniline	15%	9
Propiconazole	Fungicide	Azole	13%	8
Bifenthrin	Insecticide	Pyrethroid	12%	7
Clomazone	Herbicide	Isoxazlidinone	12%	7
Diazinon	Insecticide	Organophosphate	10%	6
Fenhexamide	Fungicide	Anilide	8%	5
Fipronil Sulfone	Degradate	Phenylpyrazole	8%	5
Oxydiazon	Herbicide	Oxadiazolone	8%	5
Thiabendazole	Fungicide	Benzimidazole	7%	4
Cyprodinil	Fungicide	Pyrimidine	5%	3
EPTC	Herbicide	Thiocarbamate	5%	3

Pesticide	Pesticide Type	Chemical Class	Overall Detection Frequency	Number of Samples with Detections above MDL
Fipronil Sulfide	Degradate	Phenylpyrazole	5%	3
Tetraconazole	Fungicide	Azole	5%	3
Acibenzolar-methyl	Fungicide	Benzothiadiazole	3%	2
Carbaryl	Insecticide	Carbamate	3%	2
Chlorothalonil	Fungicide	Chloronitrile	3%	2
Flusilazole	Fungicide	Triazole	3%	2
Imazalil	Fungicide	Triazole	3%	2
Metalaxyl	Fungicide	Phenylamide	3%	2
Myclobutanil	Fungicide	Triazole	3%	2
Propanil	Herbicide	Anilide	3%	2
Thiamethoxam	Insecticide	Neonicotinoid	3%	2
Trifloxystrobin	Fungicide	Strobilurin	3%	2
Indoxacarb	Insecticide	Oxadiazine	2%	1
Prodiamine	Herbicide	Dinitroaniline	2%	1
Prometryn	Herbicide	Triazine	2%	1
Pyrimethanil	Fungicide	Pyrimidine	2%	1
Quinoxyfen	Fungicide	Quinoline	2%	1
Thiobencarb	Herbicide	Thiocarbamate	2%	1

Table 9. Summary of copper results.
Concentrations in ng/L. * = storm sample.

Site Name	Date	Hardness (mg/L)	Copper, dissolved (ng/L)	MDL (ng/L)
Mokelumne River at New Hope Rd	7/28/15	40	1,320	800
Mokelumne River at New Hope Rd	8/18/15	44	960	800
Mokelumne River at New Hope Rd	9/23/15	56	1,360	800
Mokelumne River at New Hope Rd	10/21/15	20	1,120	800
Mokelumne River at New Hope Rd	11/10/15	22	1,220	800
Mokelumne River at New Hope Rd	12/15/15	20	990	800
Mokelumne River at New Hope Rd	1/19/16	20	1,360	800
Mokelumne River at New Hope Rd	2/17/16	20	1,470	800
Mokelumne River at New Hope Rd	3/7/16	16	2,030	800
Mokelumne River at New Hope Rd	4/19/16	20	1,430	800
Mokelumne River at New Hope Rd	5/18/16	16	1,230	800
Mokelumne River at New Hope Rd	6/15/16	20	1,313	800
Sacramento River at Hood	7/28/15	44	1,230	800
Sacramento River at Hood	8/18/15	56	1,680	800
Sacramento River at Hood	9/23/15	56	1,870	800
Sacramento River at Hood	10/21/15	64	1,320	800
Sacramento River at Hood	11/10/15	60	1,280	800
Sacramento River at Hood	12/15/15	64	1,030	800
Sacramento River at Hood	1/19/16	60	2,620	800
Sacramento River at Hood	2/17/16	68	1,850	800

Site Name	Date	Hardness (mg/L)	Copper, dissolved (ng/L)	MDL (ng/L)
Sacramento River at Hood	3/7/16	52	2,600	800
Sacramento River at Hood	4/19/16	48	1,300	800
Sacramento River at Hood	5/18/16	44	1,030	800
Sacramento River at Hood	6/15/16	36	1,090	800
San Joaquin River at Buckley Cove	7/28/15	204	2,000	800
San Joaquin River at Buckley Cove	8/18/15	204	1,820	800
San Joaquin River at Buckley Cove	9/23/15	216	1,890	800
San Joaquin River at Buckley Cove	10/21/15	168	1,460	800
San Joaquin River at Buckley Cove	11/10/15	92	1,120	800
San Joaquin River at Buckley Cove	12/15/15	112	1,500	800
San Joaquin River at Buckley Cove	1/19/16	88	3,290	800
San Joaquin River at Buckley Cove	2/17/16	140	3,670	800
San Joaquin River at Buckley Cove	3/7/16	132	4,370	800
San Joaquin River at Buckley Cove	4/19/16	184	1,890	800
San Joaquin River at Buckley Cove	5/18/16	68	1,230	800
San Joaquin River at Buckley Cove	6/15/16	116	1,600	800
San Joaquin River at Vernalis	7/28/15	228	860	800
San Joaquin River at Vernalis	8/18/15	140	<MDL	800
San Joaquin River at Vernalis	9/23/15	80	920	800
San Joaquin River at Vernalis	10/21/15	116	<MDL	800
San Joaquin River at Vernalis	11/10/15	60	880	800
San Joaquin River at Vernalis	12/15/15	108	<MDL	800

Site Name	Date	Hardness (mg/L)	Copper, dissolved (ng/L)	MDL (ng/L)
San Joaquin River at Vernalis	1/19/16	108	1,780	800
San Joaquin River at Vernalis	2/17/16	216	1,200	800
San Joaquin River at Vernalis	3/7/16	156	1,620	800
San Joaquin River at Vernalis	4/19/16	44	1,510	800
San Joaquin River at Vernalis	5/18/16	88	830	800
San Joaquin River at Vernalis	6/15/16	104	1,040	800
Ulatis Creek at Brown Road	7/28/15	240	3,030	800
Ulatis Creek at Brown Road	8/18/15	254	2,460	800
Ulatis Creek at Brown Road	9/23/15	320	2,260	800
Ulatis Creek at Brown Road	10/21/15	304	1,530	800
Ulatis Creek at Brown Road	11/10/15	296	1,240	800
Ulatis Creek at Brown Road	12/15/15	200	2,380	800
Ulatis Creek at Brown Road	1/19/16	80	3,760	800
Ulatis Creek at Brown Road	2/17/16	320	2,260	800
Ulatis Creek at Brown Road	3/7/16	76	3,960	800
Ulatis Creek at Brown Road	4/19/16	284	3,570	800
Ulatis Creek at Brown Road	5/18/16	272	2,970	800
Ulatis Creek at Brown Road	6/15/16	352	4,230	800