CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-XXXX
ATTACHMENT B TO ORDER R5-2014-XXXX
MONITORING AND REPORTING PROGRAM

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE WESTERN SAN JOAQUIN RIVER WATERSHED
THAT ARE MEMBERS OF A THIRD-PARTY GROUP

TABLE OF CONTENTS

I. Introduction 2
II. General Provisions 2
III. Surface Water Quality Monitoring Requirements 3
A. Surface Water Monitoring Sites 3
1. Discharge Monitoring Sites 3
2. Source Water Monitoring Sites 4
3. Special Project Sites 4
B. Monitoring Locations 4
C. Monitoring Requirements and Schedule 5
1. Surface Water Monitoring 5
2. Monitoring Schedule and Frequency 6
3. Monitoring Parameters 6
4. Toxicity Testing 9
5. Special Project Monitoring 10
D. Surface Water Data Management Requirements 11
IV. Groundwater Quality Monitoring and Management Practice Assessment, and Evaluation Requirements 13
A. Groundwater Quality Assessment Report 13
B. Management Practice Evaluation Program 16
C. Groundwater Quality Trend Monitoring 17
D. Management Practices Evaluation Workplan 18
E. Trend Monitoring Workplan 20
V. Third-Party Reporting Requirements 21
A. Annual Groundwater Monitoring Results 21
B. Monitoring Report 21
C. Surface Water Exceedance Reports 24
D. Basin Plan Amendment Workplan 25
VI. Sediment Discharge and Erosion Assessment Report 26
VII. Water Quality Triggers for Development of Management Plans 26
VIII. Quality Assurance Project Plan (QAPP) 27

Appendix MRP-1: Third-Party Management Plan Requirements
Appendix MRP-2: Monitoring Well Installation and Sampling Plan and Completion Report

TENTATIVE

I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (Water Code) section 13267 which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board or "board"), to require preparation and submittal of technical and monitoring reports. This MRP includes requirements for a third-party representative entity assisting individual irrigated lands operators or owners that are members of the third-party (Members), as well as requirements for individual Members subject to and enrolled under Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of the Third-Party Group, Order R5-2014-xxxx (hereafter referred to as the "Order"). This MRP applies to each third-party issued an NOA by the Executive Officer. The requirements of this MRP are necessary to monitor Member compliance with the provisions of the Order and determine whether state waters receiving discharges from Member parcels are meeting water quality objectives. Additional discussion and rationale for this MRP's requirements are provided in Attachment A of the Order.

This MRP establishes specific surface and groundwater monitoring, reporting, and electronic data deliverable requirements for the third-party. Due to the nature of irrigated agricultural operations, monitoring requirements for surface waters and groundwater will be periodically reassessed to determine if changes should be made to better represent irrigated agriculture discharges to state waters. The monitoring schedule will also be reassessed so that constituents are monitored during application and/or release timeframes when constituents of concern are most likely to affect water quality. The third-party shall not implement any changes to this MRP unless the Central Valley Water Board or the Executive Officer issues a revised MRP. The Central Valley Water Board or Executive Officer may revise this MRP as it applies to a third-party or all third-parties governed by the Order. The Central Valley Water Board or Executive Officer may rescind this MRP and issue a new MRP as it applies to a third-party or all third-parties governed by the Order.

II. General Provisions

This Monitoring and Reporting Program (MRP) conforms to the goals of the Non-point Source (NPS) Program as outlined in *The Plan for California's Nonpoint Source Pollution (NSP) Program* by:

- tracking, monitoring, assessing and reporting program activities,
- ensuring consistent and accurate reporting of monitoring activities,
- targeting NPS Program activities at the watershed level,
- coordinating with public and private partners, and
- tracking implementation of management practices to improve water quality and protect existing beneficial uses.

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data. The third-party must follow sampling and analytical procedures as specified in Attachment C, Order No. R5-2008-0005, Coalition Group Monitoring Program Quality Assurance Project Plan Guidelines (QAPP Guidelines) and any revisions thereto approved by the Executive Officer.[1]

To the extent feasible, all technical reports required by this MRP must be submitted electronically in a format specified by the Central Valley Water Board that is reasonably available to the third-party.

This MRP requires the third-party to collect information from its Members and allows the third-party to report the information to the board in a summary format. The third-party must submit specific

[1] Central Valley Water Board staff will circulate proposed revisions of the QAPP Guidelines for public review and comment prior to Executive Officer consideration for approval.

TENTATIVE

Member information collected as part of the Order and this MRP when requested by the Executive Officer or as specified in the Order.

This MRP Order becomes effective on xx Month 2014. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the Executive Officer issuing the Notice of Applicability to the third-party, the third-party, on behalf of the individual Members, shall implement the following monitoring and reporting.

III. Surface Water Quality Monitoring Requirements

The surface water quality monitoring and reporting requirements in the MRP have been developed in consideration of the critical questions identified in the Information Sheet (Attachment A, section VI.A.1). The third-party must collect sufficient data to describe irrigated agriculture's impacts on surface water quality and to determine whether existing or newly implemented management practices comply with the surface water receiving water limitations of the Order.

A. Surface Water Monitoring Sites

The third-party shall ensure that discharge monitoring sites are representative of all areas and all types of irrigated agricultural waste discharge within the entire third-party area. Surface water monitoring sites shall be located to characterize water flow, quality, and irrigated agricultural waste discharges within the entire third-party area. Select monitoring sites are also designated as representative of water quality conditions and irrigated agricultural waste discharges (e.g., in adjacent smaller subwatersheds with similar waste discharges and receiving water conditions). Monitoring sites shall be designated either (a) Discharge sites (water conveyed through the site is primarily drainage discharge), or (b) Source Water sites (water is primarily used as irrigation source). A Discharge site or Source Water site may also serve as a Special Project site. Table 1 shows the list of monitoring sites and indicates the site type.

Any area with irrigated agricultural waste discharge that does not contain a monitoring site due to issues of access or location downstream of urban influence must be represented by another monitoring site within the region with similar land use and cultural practices. Any applicable surface water quality management plan (SQMP) actions associated with the representative monitoring site must take place in represented drainages without monitoring sites.

1. Discharge Monitoring Sites

The monitoring design at Discharge sites shall be adaptive in nature. Discharge sites shall be monitored comprehensively on a periodic basis to track trends in water quality and to identify water quality problems. Surface water monitoring (as described in section III.C.1) will be based on a three-year cycle consisting of Assessment monitoring during one year, and site-specific monitoring during years two and three based on the monitoring history and in-depth knowledge of agricultural practices. Newly established Discharge monitoring sites shall undergo Assessment monitoring for two consecutive years. When a water quality objective or trigger limit is exceeded at any Discharge site, the parameter associated with the exceedance must be included in the site-specific monitoring schedule for two[2] additional years.

The purpose of periodically repeating the Assessment Monitoring regime is to evaluate the effects of changes in land-use and management practices, provide information about long-term trends and

[2] If two exceedances occur within any three-year period, this requirement will be superseded upon Executive Officer approval of the Management Plan and associated monitoring for the parameter and site.

TENTATIVE

effectiveness of the management practices, and to confirm or adjust the monitored constituents and monitoring frequency.

Site-specific monitoring at Discharge sites shall be scheduled when the parameters of interest are expected to be present, and includes specific targeted monitoring or studies due to implementation of a TMDL, or for the implementation of a Management Plan that results from exceedances, and typically includes pesticide and toxicity analyses. Site-specific targeted monitoring shall also include parameters not under a Management Plan which had a single water quality objective or trigger limit exceedance during the most recent Assessment Monitoring period. Because the majority of pesticide applications and surface drainage discharges occur during the irrigation season, site-specific monitoring may occur at most sites during the irrigation season[3]. Site-specific constituents and frequency of monitoring shall be reviewed with the Central Valley Water Board staff at least annually and may be revised over time. Revisions to Management Plans which are approved by the Executive Officer will be reflected in the Discharge site monitoring schedule.

2. Source Water Monitoring Sites

Source Water sites shall be monitored regularly to characterize the condition of irrigation source waters. Sites designated as "Source Water Sites" shall be monitored for the constituents specified in Table 2 to evaluate potential contributions of measured parameters in the source irrigation water. The results of source water monitoring may be used to interpret the monitoring results of runoff from areas that use these sources for irrigation.

3. Special Project Sites

The third-party may designate Special Project sites as needed in a surface water quality management plan (SQMP) to evaluate commodity or management practice-specific effects on identified water quality problems,[4] or to evaluate sources of identified water quality problems.

In accordance with Water Code section 13267, the Executive Officer may require the third-party to conduct local or site-specific monitoring to address a parameter associated with a management plan or TMDL (see section III.C.5. below). Discharge sites located in areas where management plans are required will also be considered Special Project sites for the parameter(s) subject to the management plan(s).

B. Monitoring Locations

The location and SWAMP code of monitoring sites are identified in Table 1.

TENTATIVE

[3] For the purpose of this Order, the irrigation season is defined as March through August. Non-irrigation season is defined as September through February. The third-party, in collaboration with the Central Valley Water Board, may shift the seasons up or back one month to account for actual irrigation practices.
[4] "Water quality problem" is defined in Attachment E.

Table 1. Third-party Monitoring Sites, site code, and geographic location.

Site Name	SWAMP Code	Station Code	Latitude	Longitude
Discharge Sites				
Hospital Creek at River Road	541XHCARR	HCARR	37.61047	-121.23078
Ingram Creek at River Road	541STC040	ICARR	37.60022	-121.22506
Westley Wasteway near Cox Road	541XWWNCR	WWNCR	37.55822	-121.16372
Del Puerto Creek near Cox Road	541XDPCCR	DPCCR	37.53936	-121.12206
Del Puerto Creek at Hwy 33	541XDPCHW	DPCHW	37.51406	-121.15956
Ramona Lake near Fig Avenue	541XROLFA	ROLFA	37.47875	-121.06839
Marshall Road Drain near River Road	541XMRDRR	MRDRR	37.43631	-121.03617
Orestimba Creek at River Road	541STC019	OCARR	37.41386	-121.01489
Orestimba Creek at Hwy 33	541STC519	OCAHW	37.37717	-121.05856
Blewett Drain near Highway 132	541XVH132	VH132	37.64053	-121.22942
Newman Wasteway near Hills Ferry Road	541XNWHFR	NWHFR	37.32036	-120.98336
San Joaquin River at Lander Avenue**	541MER522	SJRLA	37.29506	-120.85139
Mud Slough u/s San Luis Drain**	541XMSUSL	MSUSL	37.26164	-120.90614
Salt Slough at Lander Avenue**	541MER531	SSALA	37.24797	-120.85225
Salt Slough at Sand Dam	541XSSASD	SSASD	37.13664	-120.76194
Los Banos Creek at Highway 140**	541MER554	LBCHW	37.27619	-120.95547
Los Banos Creek at China Camp Road	541XLBCCC	LBCCC	37.11447	-120.88953
Turner Slough near Edminster Road	541XTSAER	TSAER	37.30411	-120.90083
Poso Slough at Indiana Avenue	541XPSAIA	PSAIA	37.00622	-120.59033
Source Water Sites				
San Joaquin River at Sack Dam	541MAD0007	SJRSD	36.98353	-120.50050
San Joaquin River at PID Pumps	541STC507	SJRPP	37.49739	-121.08267
Delta Mendota Canal at DPWD Turnout	541XDMCDP	DMCDP	37.43678	-121.13347

**Discharge sites that are monitored year-round (both irrigation and non-irrigation season, and two rain events).

TENTATIVE

C. Monitoring Requirements and Schedule

1. Surface Water Monitoring

Surface water monitoring must provide sufficient data to describe irrigated agriculture's impacts on surface water quality, determine effectiveness of existing or newly implemented management practices, determine whether waste discharges from all represented types of irrigated agricultural operations comply with the receiving water limitations of the Order, and track any trends in degradation. Surface water assessment monitoring shall include a comprehensive suite of constituents (also referred to as "parameters") monitored periodically in a manner that allows for an evaluation of the condition of a water body and determination of whether irrigated agriculture operations in the Western San Joaquin River Watershed are causing or contributing to any surface water quality problems.

Surface water monitoring shall be conducted at all Discharge monitoring sites according to a continuous three-year cycle (one year of assessment, two years of site-specific monitoring), and

shall consist of the general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals identified in section III.C.3.

Follow-up sampling: The Central Valley Water Board Executive Officer may request that a parameter(s) of concern continue to be monitored at a specific site during non-scheduled periods. Parameters of concern may include, but are not limited to, parameters that exceed an applicable water quality objective or water quality trigger (see section VII).

Storm runoff monitoring. Sampling events shall be scheduled to capture at least two storm runoff events per year at all monitoring sites, except where a different frequency has been required or approved by the Executive Officer. The third-party shall identify storm runoff monitoring criteria in the initial Monitoring Plan Update (see section III.C.2). The criteria may include, but are not limited to, precipitation amounts or intensity, visually observed or measured increases in flow at the monitoring site(s) following a rainfall event, knowledge of soils or other factors affecting when storm runoff is expected to occur at monitoring sites, or consultation with Central Valley Water Board staff. Storm runoff monitoring may be coordinated with Assessment monitoring such that no additional sampling is required that month. However, the collection of storm runoff samples shall not be contingent upon the timing of other sampling events and could result in monitoring more than once during a month.

2. Monitoring Schedule and Frequency

By 15 January of the calendar year in which irrigation monitoring begins (irrigation season monitoring period begins 1 March) the third-party shall prepare a Monitoring Plan Update. The Monitoring Plan Update shall identify the appropriate monitoring periods (e.g., months, seasons) and frequency for all parameters that require testing (Table 2) at each site that is scheduled to be monitored (see section III.C.3 below). The Monitoring Plan Update shall include a discussion of the rationale to support the proposed schedule, and shall be subject to Executive Officer review and approval prior to the initiation of changes in monitoring. The third-party shall continue monitoring as described in the Westside San Joaquin River Watershed Coalition's 15 September 2008 Monitoring and Reporting Program Order (2008 MRP) and approved modifications thereto until the Executive Officer has approved the initial Monitoring Plan Update.

For metals, pesticides, and aquatic toxicity, the monitoring periods shall be determined utilizing previous monitoring results, knowledge of agricultural use patterns (if applicable), pesticide use trends, chemical characteristics, and other applicable criteria. Parameters not previously monitored under Monitoring and Reporting Program Order R5-2008-0831 at a site shall be monitored for two consecutive years during periods when most likely to be present. All other required parameters shall be monitored according to an approved schedule and frequency during the periods when monitoring is conducted at the Discharge and Source Water sites.

Monitoring must be conducted when the pollutant is most likely to be present. If there is a temporal or seasonal component to the beneficial use, monitoring must also be conducted when beneficial use impacts could occur. The frequency of data collection must be sufficient to allow determination of compliance with the relevant numeric water quality objective(s) or water quality triggers. Adequate characterization of the presence of some pollutants may require monitoring more than once per month. The third-party may submit written requests for the removal or addition of monitoring sites or parameters, or to modify the monitoring schedule and frequency, for approval by the Executive Officer.

3. Monitoring Parameters

Water quality and flow monitoring shall be used to assess the wastes in discharges from irrigated lands to surface waters and to evaluate the effectiveness of implemented management practices. Water quality is evaluated with both field-measured parameters and laboratory analytical data as

TENTATIVE

listed in Table 2 of this MRP, according to time of year and monitoring regime. The pesticides marked as "to be determined" (TBD) in Table 2 shall be identified as part of a process that includes input from qualified scientists and coordination with the Department of Pesticide Regulation. Based on the evaluation factors identified in this process, the Executive Officer will provide the third-party with a list of pesticides that must be considered by the third-party for inclusion in the Monitoring Plan Update. The third-party shall apply the evaluation factors to the relevant conditions in each site sub-watershed and propose the pesticides to be monitored in its Monitoring Plan Update.

Parameters that are part of an adopted TMDL that is in effect and for which irrigated agriculture is a source within the Western San Joaquin River Watershed shall be monitored in accordance with the adopted Basin Plan provisions or as directed by the Executive Officer. Current adopted TMDLs within the Western San Joaquin River Watershed for which irrigated agriculture is a source include the San Joaquin River Deep Water Ship Channel dissolved oxygen; San Joaquin River salt, boron, selenium, diazinon, and chlorpyrifos.

The metals to be monitored at sites within each site subwatershed shall be determined through an evaluation of several factors. The evaluation will provide the basis for including or excluding each metal. Evaluation factors shall include, but not be limited to: documented use of the metal applied to lands for irrigated agricultural purposes in the last three years, prior monitoring results, geological or hydrological conditions, and mobilization or concentration by irrigated agricultural operations. The third-party may also consider other factors such as acute and chronic toxicity thresholds and chemical characteristics of the metals. The third-party shall evaluate the monitoring parameters listed in Table 2 to determine which metals and metal fractions warrant monitoring for each subwatershed. Documentation of the evaluations must be provided to the Central Valley Water Board as part of the Monitoring Plan Update.

Table 2. Monitored Parameters at Discharge and Source Water sites

	Measured Parameter	Matrix	Assessment/ Rain Event	Source Water
Field Measurements	Estimated Flow (cfs)	Water	X	X
	Photo Documentation	Site	X	X
	Conductivity (at 25 ºC) (µs/cm)	Water	X	X
	Temperature (ºC)	Water	X	X
	pH	Water	X	X
	Dissolved Oxygen (mg/L)	Water	X	X
Drinking Water	*E. coli*	Water	X	X
	Total Organic Carbon (TOC)	Water	X	
General Physical	Hardness (as $CaCO_3$)	Water	**	X
	Total Suspended Solids (TSS)	Water	X	X
	Turbidity	Water	X	X
Metals	Arsenic (total)	Water	TBD	
	Boron (total)	Water	TBD	X
	Cadmium (dissolved)**	Water	TBD	
	Copper (dissolved)**	Water	TBD	X
	Lead (dissolved)**	Water	TBD	
	Molybdenum (total)	Water	TBD	

TENTATIVE

Table 2. Monitored Parameters at Discharge and Source Water sites

	Measured Parameter	Matrix	Assessment/ Rain Event	Source Water
	Nickel (dissolved)**	Water	TBD	X
	Selenium (total)	Water	TBD	
	Zinc (dissolved)**	Water	TBD	X
Nutrients	Total Ammonia (as N)	Water	X	
	Unionized Ammonia (calculated value)	Water	X	
	Nitrogen, Nitrate+Nitrite	Water	X	
	Soluble Orthophosphate	Water	X	
Pesticides	Registered pesticides determined according to the process identified in section III.C.3.	Water	TBD	Optional
303(d)	TMDL constituents required by the Basin Plan 303(d) listed constituents to be monitored if irrigated agriculture is identified as a contributing source within the Western San Joaquin River Watershed and requested by the Executive Officer.	Water or Sediment	TBD	TBD
Water Toxicity	*Ceriodaphnia dubia*	Water	X	
	Pimephales promelas	Water	X	
	Selenastrum capricornutum	Water	X	
	Toxicity Identification Evaluation	Water	see section III.C.4	
Sediment Toxicity	*Hyalella azteca*	Sediment	once during irrigation season, and once at the beginning of the non-irrigation season (see section III.C.4.b)	
Pesticides and Sediment Parameters	Bifenthrin	Sediment	see section III.C.4.b*	
	Cyfluthrin	Sediment	*	
	Cypermethrin	Sediment	*	
	Deltamethrin	Sediment	*	
	Esfenvalerate/Fenvalerate	Sediment	*	
	Fenpropathrin	Sediment	*	
	Lambda cyhalothrin	Sediment	*	
	Permethrin	Sediment	*	
	Piperonyl butoxide (PBO)	Sediment	*	
	Chlorpyrifos	Sediment	*	
	Percent Solids	Sediment	*	
	Total Organic Carbon	Sediment	X	
	Grain Size	Sediment	X	

* For sediment samples exhibiting significant toxicity and < 80% organism survival compared to the control, the sediment pesticide analysis will be performed. Sediment pesticide analyses may be identified according to an evaluation of PUR data (see sediment toxicity testing requirements in section III.C.4 below).
** Hardness samples shall be collected when sampling for these metals.

TENTATIVE

4. Toxicity Testing

The purpose of toxicity testing is to: 1) evaluate compliance with the Basin Plan narrative toxicity water quality objective; 2) identify the causes of toxicity when and where it is observed (e.g. metals, pesticides, ammonia, etc.); and 3) evaluate any additive toxicity or synergistic effects due to the presence of multiple constituents.

a. Aquatic Toxicity

Aquatic toxicity testing shall include *Ceriodaphnia dubia* (water flea), *Pimephales promelas* (fathead minnow), and *Selenastrum capricornutum* (green alga) in the water column (see Table 2). Testing for *C. dubia* and *P. promelas* shall follow the USEPA acute toxicity testing methods.[5] Testing for *S. capricornutum* shall follow the USEPA short-term chronic toxicity testing methods.[6] Toxicity test endpoints are survival for *C. dubia* and *P. promelas*, and growth for *S. capricornutum*.

Water column toxicity analyses shall be conducted on 100% (undiluted) sample for the initial screening. A sufficient sample volume shall be collected in order to allow the laboratory to conduct a Phase I Toxicity Identification Evaluation (TIE) on the same sample, should toxicity be detected, in an effort to identify the cause of the toxicity.

If a 50% or greater difference in *Ceriodaphnia dubia* or *Pimephales promelas* mortality in an ambient sample, as compared to the laboratory control, is detected at any time in an acceptable test, a TIE shall be initiated within 48 hours of such detection. If a 50% or greater reduction in *Selenastrum capricornutum* growth in an ambient sample, as compared to the laboratory control, is detected at the end of an acceptable test, a TIE shall be initiated within 48 hours of such detection.

At a minimum, Phase I TIE[7] manipulations shall be conducted to determine the general class(es) (e.g., metals, non-polar organics, and polar organics) of the chemical(s) causing toxicity. The laboratory report of TIE results submitted to the Central Valley Water Board must include a detailed description of the specific TIE manipulations that were utilized.

If within the first 96 hours of the initial toxicity screening, the mortality reaches 100%, a multiple dilution test shall be initiated. The dilution series must be initiated within 24 hours of the sample reaching 100% mortality, and must include a minimum of five (5) sample dilutions in order to quantify the magnitude of the toxic response. For the fathead minnow test, the laboratory must take the steps to procure test species within one working day, and the multiple dilution tests must be initiated the day fish are available.

Ceriodaphnia dubia and Pimephales promelas Media Renewal

Daily sample water renewals shall occur during all acute toxicity tests to minimize the effects of rapid pesticide losses from test waters. A feeding regime of 2 hours prior to test initiation and 2 hours prior to test renewal shall be applied. Test solution renewal must be 100% renewal for *Ceriodaphnia dubia* by transferring organisms by pipet into fresh aliquot of the original ambient sample, as defined in the freshwater toxicity testing manual.

[5] USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. Office of Water, Washington, D.C. USEPA-821-R-02-012.
[6] USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. USEPA-821-R-02-013.
[7] USEPA. 1991. Methods for Aquatic Toxicity Identification Evaluations. Phase I Toxicity Characterization Procedures. Office of Research and Development, Washington DC. 20460. EPA-600-6-91-003.

TENTATIVE

Selanastrum capricornutum Pre-Test Treatment

Algae toxicity testing shall not be preceded with treatment of the chelating agent EDTA. The purpose of omitting EDTA is to ensure that metals used to control vegetation in the field are not removed from sample aliquots prior to analysis or during the initial screening.

b. Sediment Toxicity

Sediment toxicity analyses shall be conducted according to EPA Method 600/R-99/064. Sampling and analysis for sediment toxicity testing utilizing *Hyalella azteca* (freshwater amphipod also known as Mexican scud) shall be conducted at each monitoring location established by the third-party for water quality monitoring, if appropriate sediment (i.e. silt, clay) is present at the site. If appropriate sediment is not present at the designated water quality monitoring site, an alternative site with appropriate sediment shall be designated for all sediment collection and toxicity testing events. Piped drains are not tested for sediment toxicity due to inaccessibility for sample collection and absence of relevant sediment habitat. Sediment samples shall be collected and analyzed for toxicity twice per year when water is present. Attempts should be made to collect one sample between 15 August and 15 October, and one sample between 1 March and 30 April, during each year of monitoring. The *H. azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a SQMP.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. Note that sediment collected for grain size analysis shall not be frozen. If the sample is not toxic to the test species, the additional sample volume can be discarded.

Sediment samples that show significant toxicity to *Hyalella azteca* at the end of an acceptable test and that exhibit < 80% organism survival compared to the control will require pesticide analysis of the same sample in an effort to determine the potential cause of toxicity. The third-party may use the previous three years of available pesticide use information to determine which of the parameters listed in Table 2 require testing in the sediment sample. Analysis at practical reporting limits of 1 ng/g on a dry weight basis for each pesticide is required to allow comparison to established lethal concentrations of these chemicals to the test species. This follow-up analysis must begin within five business days of when the toxicity criterion described above is exceeded. The third-party may also follow up with a sediment TIE when there is ≥ 50% reduction in test organism survival as compared to the laboratory control. Sediment TIEs are an optional tool.

5. Special Project Monitoring

The Central Valley Water Board or Executive Officer may require the third-party to conduct local or site-specific monitoring where monitoring identifies a water quality problem (Special Project Monitoring). The studies shall be representative of the effects of changes in management practices for the parameters of concern. Once Special Project Monitoring is required, the third-party must submit a Special Project Monitoring proposal. The proposal must provide the justification for the proposed study design, specifically identifying how the study design will quantify irrigated agriculture's contribution to the water quality problem, identify sources, and evaluate management practice effectiveness. When such a study is required, the proposed study must include an evaluation of the feasibility of conducting commodity and management practice specific field studies for those commodities and irrigated agricultural practices that could be associated with the constituents of concern. Special Project Monitoring studies will be designed to evaluate the effectiveness of practices used by multiple Members and will not be required of the third-party to evaluate compliance of an individual Member.

TENTATIVE

D. Surface Water Data Management Requirements

All surface water field and laboratory data (including sediment) must be submitted electronically to the ILRP in the required templates. The third-party shall ensure that the most current version of the templates are being utilized and that updates to database lookup lists are communicated to the ILRP on a routine basis. Required formatting and business rules for field, chemistry and toxicity data are detailed within the respective template instruction manuals (see below). These manuals are maintained in collaboration with the Central Valley Regional Data Center (CV RDC) to ensure comparability with the California Environmental Data Exchange Network (CEDEN). In addition to the use of required templates for field, chemistry, and toxicity data, the third-party shall maintain an electronic version of its approved Quality Assurance Project Plan (eQAPP). Detailed electronic water quality data submittal requirements are provided in section V.B of this MRP Order. Note that electronic copies (e.g. PDF) of all original field sheets, field measurement instrumentation calibration logs, chain of custody forms and laboratory reports must be included in the electronic data submittal.

Once data have been submitted to the ILRP, the data will undergo a series of reviews for adherence to the required formatting and business rules. The data will also be reviewed for the required quality control elements as detailed within the third-party's eQAPP. The third-party will be notified of any changes made to the dataset in order to successfully load the data. If significant changes are found to be needed, the dataset will be returned to the third-party for revision. Once the data sets have been reviewed and corrected, if needed, the data will be uploaded by the ILRP into a CV RDC CEDEN-comparable database. The dataset will then undergo a final set of reviews to ensure completeness and then be transferred to CEDEN for public access.

A narrative describing each required template is provided below. Links to the required templates, instruction manuals and optional tools are available on the ILRP Electronic Water Quality Monitoring Data Submission Resources webpage:

http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/electronic_data_submission/

<u>Field Data Template (Required)</u>

The third-party shall input all site visit information and field measurement results into the field data template, which is an Excel workbook. Site visit information (Location and Habitat) must be recorded for any site visit conducted to comply with the requirements in this Order, including events when a site is dry. The field data template contains three required worksheets (Locations, FieldResults, HabitatResults) and four optional worksheets (Stations, FundingCode, GroupCode and Personnel). An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

<u>Chemistry Data Template (Required)</u>

The third-party shall input all chemistry analysis and associated quality control information into the chemistry data template, which is an Excel workbook. The chemistry data template contains two required worksheets: Results and LabBatch. An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

<u>Toxicity Data Template (Required)</u>

The third-party shall input all toxicity analysis and associated quality control information, with the exception of reference toxicity analyses, into the toxicity data template, which is an Excel workbook. The toxicity data template contains three required worksheets: Results, Summary, and ToxBatch. An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

TENTATIVE

Electronic Quality Assurance Program Plan (eQAPP) (Required)

The eQAPP is an Excel workbook containing a worksheet of the quality control requirements for each analyte and method as detailed in the most current version of the third-party's approved QAPP. The eQAPP workbook will also include additional worksheets containing references for applicable codes, CEDEN retrieval information, and other project specific information. The ILRP has already provided each third-party with an eQAPP associated with their previously approved QAPP. The third-party shall be responsible for updating the Quality Control worksheet to the most current approved QAPP. Each analyte, method, extraction, units, recovery limits, QA sample requirement, etc. are included in this document using the appropriate codes required for the CEDEN-comparable database. This information should be used to conduct a quality control review prior to submission. Data that do not meet the project quality assurance acceptance requirements must be flagged accordingly and include applicable comments.

The ILRP and CV RDC have also developed several optional tools to assist the third-party. Links to these tools, unless otherwise noted, are available on the ILRP Electronic Data Submission webpage.

Field Sheet Template (Optional)

An example of a CEDEN-comparable field sheet can be found on the ILRP webpage. This field sheet was designed to match the entry user interface within the CEDEN-comparable database to allow for easier data entry of all sample collection information.

CV RDC Field Entry Shell Database (Optional)

The CV RDC Field Entry Shell Database is a copy of the CV RDC database infrastructure that provides a user interface for site visit and field measurements data entry only. The shell database may be used by those who prefer to enter field data through a user interface rather than directly into the required Excel template. The database provides an export function that can populate the required CV RDC field data template with the data entered. The populated template is then required to be submitted to the ILRP. The shell database may not be used for entry of chemistry or toxicity data. A custom field entry shell database may be obtained by contacting the CV RDC: http://mlj-llc.com/contact.html.

Format Quick Guide (Optional Tool)

The Format Quick Guide is a guidance document developed to aid the third-party with data entry and can be used as a reference tool for commonly used codes necessary for populating the required data entry templates. The ILRP will provide this document, and updates to it, upon request.

EDD Checklist with example Pivots (Optional Tool)

The electronic data deliverable (EDD) checklist provides for a structured method for reviewing data deliverables from data entry staff or laboratories prior to loading. Example pivot tables are provided to assist with the review of the data. Documentation on how to use the checklist and associated pivot tables are available on the ILRP Electronic Data Submission webpage.

Online Data Checker (Optional Tool)

An online data checker was developed to automate the checking of the datasets against many of the format requirements and business rules associated with CEDEN-comparable data. The data checker can be accessed through the ILRP Electronic Data Submission webpage. Please note that data submission will not be accepted through this tool; however, the checker can still be used to check data for formatting and business rule compliance.

TENTATIVE

IV. Groundwater Quality Monitoring and Management Practice Assessment, and Evaluation Requirements

The groundwater quality monitoring, assessment, and evaluation requirements in this MRP have been developed in consideration of the critical questions developed by the Groundwater Monitoring Advisory Workgroup (questions are presented in the Information Sheet, Attachment A). The third-party must collect and analyze sufficient data to describe irrigated agricultural impacts on groundwater quality and to determine whether existing or newly implemented management practices comply with the groundwater receiving water limitations of the Order.

The strategy for evaluating groundwater quality and protection consists of 1) Groundwater Quality Assessment Report, 2) Management Practices Evaluation Program, and 3) Groundwater Quality Trend Monitoring Program.

1. The Groundwater Quality Assessment Report (GAR) provides the foundational information necessary for design of the Management Practices Evaluation Program and the Groundwater Quality Trend Monitoring Program. The GAR also identifies the high vulnerability groundwater areas where a Groundwater Quality Management Plan must be developed and implemented, as well as data gap areas for further evaluation.
2. The overall goal of the Management Practice Evaluation Program (MPEP) is to determine the effects, if any, irrigated agricultural practices have on first encountered groundwater under different conditions that could affect the discharge of waste from irrigated lands to groundwater (e.g., soil type, depth to groundwater, irrigation practice, crop type, nutrient management practice).
3. The overall objectives of the Groundwater Quality Trend Monitoring Program are to determine current water quality conditions of groundwater relevant to irrigated agriculture and develop long-term groundwater quality information that can be used to evaluate the regional effects of irrigated agricultural practices.

Each of these elements has its own specific objectives (provided below), and the design of each will differ in accordance with the specific objectives to be reached. While it is anticipated that these programs will provide sufficient groundwater quality and management practice effectiveness data to evaluate whether management practices of irrigated agriculture are protective of groundwater quality, the Executive Officer may also, pursuant to Water Code section 13267, order Members to perform additional monitoring or evaluations, where violations of this Order are documented or the irrigated agricultural operation is found to be a significant threat to groundwater quality.

A. Groundwater Quality Assessment Report

The purpose of the Groundwater Quality Assessment Report (GAR) is to provide the technical basis informing the scope and level of effort for implementation of the Order's groundwater monitoring and implementation provisions. Three (3) months after receiving an NOA from the Central Valley Water Board, the third-party will provide a proposed outline of the GAR to the Executive Officer that describes data sources and references that will be considered in developing the GAR. The third-party must review and update the GAR to incorporate new information every five (5) years after Executive Officer approval of the GAR.

1. *Objectives.* The main objectives of the GAR are to:
   - Provide an assessment of all readily available, applicable and relevant data and information to determine the high and low vulnerability areas where discharges from irrigated lands may result in groundwater quality degradation.
   - Establish priorities for implementation of monitoring and studies within high vulnerability or data gap areas.

TENTATIVE

- Provide a basis for establishing monitoring workplans developed to assess groundwater quality trends.
- Provide a basis for establishing management practices evaluation program workplans and priorities developed to evaluate the effectiveness of agricultural management practices to protect groundwater quality.
- Provide a basis for establishing groundwater quality management plans in high vulnerability areas and priorities for implementation of those plans.

2. *GAR components.* The GAR shall include, at a minimum, the following data components:
   - Detailed land use information with emphasis on land uses associated with irrigated agricultural operations. The information shall identify the largest acreage commodity types in the third-party area, including the most prevalent commodities comprising up to at least 80% of the irrigated agricultural acreage in the third-party area.
   - Information regarding depth to groundwater, provided as a contour map(s), if readily available. Tabulated and/or graphical data from discrete sampling events may be submitted if limited data precludes producing a contour map.
   - Groundwater recharge information, if readily available, including identification of areas contributing recharge to urban and rural communities where groundwater serves as a significant source of supply.
   - Soil survey information, including significant areas of high salinity, alkalinity and acidity.
   - Shallow groundwater constituent concentrations from existing monitoring networks (potential constituents of concern include any material applied as part of the agricultural operation, including constituents in irrigation supply water [e.g., pesticides, fertilizers, soil amendments, etc.] that could impact beneficial uses or cause degradation).
   - Information on existing groundwater data collection and analysis efforts relevant to this Order (e.g., Department of Pesticide Regulation [DPR] United States Geological Survey [USGS] State Water Board Groundwater Ambient Monitoring and Assessment [GAMA], California Department of Public Health, local groundwater management plans, etc.). This groundwater data compilation and review shall include readily accessible information relative to the Order on existing monitoring well networks, individual well details, and monitored parameters. For existing monitoring networks (or portions thereof) and/or relevant data sets, the third-party should assess the possibility of data sharing between the data-collecting entity, the third-party, and the Central Valley Water Board.

3. *GAR data review and analysis.* To develop the above data components, the GAR shall include review and use, where applicable, of relevant existing federal, state, county, and local databases and documents. The GAR shall include an evaluation of the above data components to:
   - Determine where known groundwater quality impacts exist for which irrigated agricultural operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from irrigated agricultural activities.
   - Determine the merit and feasibility of incorporating existing groundwater data collection efforts, and their corresponding monitoring well systems for obtaining appropriate groundwater quality information to achieve the objectives of and support groundwater monitoring activities under this Order. This shall include specific findings and conclusions and provide the rationale for conclusions.
   - Prepare a ranking of high vulnerability areas to provide a basis for prioritization of workplan activities.

TENTATIVE

- Describe pertinent geologic and hydrogeologic information for the third-party area(s) and utilize GIS mapping applications, graphics, and tables, as appropriate, in order to clearly convey pertinent data, support data analysis, and show results.

4. *Groundwater vulnerability designations.* The GAR shall designate high/low vulnerability areas for groundwater in consideration of high and low vulnerability definitions provided in Attachment E of the Order. Vulnerability designations may be refined/ updated periodically during the Monitoring Report process. The third-party must review and confirm or modify vulnerability designations every five (5) years after Executive Officer approval of the GAR. The vulnerability designations will be made by the third-party using a combination of physical properties (soil type, depth to groundwater, known agricultural impacts to beneficial uses, etc.) and management practices (e.g. irrigation method, crop type, nitrogen application and removal rates, extent of implementation, etc.). If the third-party intends to develop a Basin Plan Amendment Workplan (as described in section VIII.L of the Order), the third-party must identify the areas where a high vulnerability designation results from exceedances due to naturally elevated levels of a constituent. The third-party shall provide the rationale for proposed vulnerability determinations. The Executive Officer will make the final determination regarding vulnerability designations.

   If the GAR is not submitted to the board by the required deadline, the Executive Officer will designate default high/low vulnerability groundwater areas using such information as 1) those areas that have been identified by the State Water Board as Hydrogeologically Vulnerable Areas, 2) California Department of Pesticide Regulation groundwater protection areas, and 3) areas with exceedances of water quality objectives for which irrigated agriculture waste discharges may cause or contribute to the exceedance.

5. *Prioritization of high vulnerability groundwater areas.* The third-party may prioritize the areas designated as high vulnerability areas to comply with the requirements of this Order, including conducting monitoring programs and carrying out required studies. When establishing relative priorities for high vulnerability areas, the third-party may consider, but not be limited to, the following:
   - Identified exceedances of water quality objectives for which irrigated agriculture waste discharges are the cause, or a contributing source.
   - The proximity of the high vulnerability area to areas contributing recharge to municipal and domestic supplies where groundwater serves as a significant source of supply.
   - Existing field or operational practices identified to be associated with irrigated agriculture waste discharges that are the cause, or a contributing source.
   - The largest acreage commodity types comprising up to at least 80% of the irrigated agricultural acreage in the high vulnerability areas and the irrigation and fertilization practices employed by these commodities.
   - Legacy or ambient conditions of the groundwater.
   - Groundwater basins currently or proposed to be under review by CV-SALTS.
   - Identified constituents of concern, e.g., relative toxicity, mobility.

   Additional information such as models, studies, and information collected as part of this Order may also be considered in designating and prioritizing vulnerability areas for groundwater. Such data include, but are not limited to, 1) published scientific studies, 2) hydrogeologic models, 3) data from areas with exceedances of water quality objectives for which irrigated agriculture waste discharges may cause or contribute to the exceedance, 4) those areas that have been identified by the State Water Board as Hydrogeologically Vulnerable Areas, and 5) California Department of Pesticide Regulation groundwater protection areas.

TENTATIVE

The Executive Officer will review and may approve or require changes to any third-party proposed high/low vulnerability areas and the proposed priority ranking. The vulnerability areas, or any changes thereto, shall not be effective until third-party receipt of written approval by the Executive Officer. An interested person may seek review by the Central Valley Water Board of the Executive Officer's decision on the designation of high and low vulnerability areas associated with approval of the Groundwater Quality Assessment Report.

B. Management Practice Evaluation Program

The goal of the Management Practice Evaluation Program (MPEP) is to determine the effects, if any, irrigated agricultural practices[8] have on groundwater quality. A MPEP is required in high vulnerability groundwater areas and must address the constituents of concern described in the GAR. This section provides the goals, objectives, and minimum reporting requirements for the MPEP. As specified in section IV.D of this MRP, the third-party is required to develop a workplan that will describe the methods that will be utilized to achieve the MPEP requirements.

1. *Objectives*. The objectives of the MPEP are to:
   - Identify whether existing site-specific and/or commodity-specific management practices are protective of groundwater quality within high vulnerability groundwater areas,
   - Determine if newly implemented management practices are improving or may result in improving groundwater quality.
   - Develop a quantitative estimate of the effect of Members' discharges of constituents of concern on groundwater quality in high vulnerability areas.
   - Utilize the results of evaluated management practices to determine whether practices implemented at represented Member farms (i.e., those not specifically evaluated, but having similar site conditions), need to be improved.

   Given the wide range of management practices/commodities that are used within the third-party's boundaries, it is anticipated that the third-party will rank or prioritize its high vulnerability areas and commodities, and present a phased approach to implement the MPEP.

2. *Implementation*. Since management practices evaluation may transcend watershed or third-party boundaries, this Order allows developing a MPEP on a watershed or regional basis that involves participants in other areas or third-party groups, provided the evaluation studies are conducted in a manner representative of areas to which it will be applied. The MPEP may be conducted in one of the following ways:

   - By the third-party,
   - By watershed or commodity groups within an area with known groundwater impacts or vulnerability, or
   - By watershed or commodity groups that wish to determine the effects of regional or commodity driven management practices.

   A master schedule describing the rank or priority for the investigation(s) of the high vulnerability areas (or commodities within these areas) to be examined under the MPEP shall be prepared and submitted to the Executive Officer as detailed in the Management Practices Evaluation Program Workplan section IV.D below.

[8] In evaluating management practices, the third-party is expected to focus on those practices that are most relevant to the Members' groundwater quality protection efforts.

TENTATIVE

3. *Report.* Reports of the MPEP must be submitted to the Executive Officer as part of the third-party's Monitoring Report or in a separate report due on the same date as the 15 June Semi-Annual Monitoring Report. The report shall include all data[9] (including analytical reports) collected by each phase of the MPEP since the previous report was submitted. The report shall also contain a tabulated summary of data collected to date by the MPEP. The report shall summarize the activities conducted under the MPEP, and identify the number and location of installed monitoring wells relative to each other and other types of monitoring devices. Within each report, the third-party shall evaluate the data and make a determination whether groundwater is being impacted by activities at farms being monitored by the MPEP.

   Each report shall also include an evaluation of whether the specific phase(s) of the Management Practices Evaluation Program is/are on schedule to provide the data needed to complete the Management Practices Evaluation Report (detailed below) by the required deadline. If the evaluation concludes that information needed to complete the Management Practices Evaluation Report may not be available by the required deadline, the report shall include measures that will be taken to bring the program back on schedule.

4. *Management Practices Evaluation Report*. No later than six (6) years after implementation of each phase of the MPEP, the third-party shall submit a Management Practices Evaluation Report (MPER) identifying management practices that are protective of groundwater quality for the range of conditions found at farms covered by that phase of the study. The identification of management practices for the range of conditions must be of sufficient specificity to allow Members of the third-party and staff of the Central Valley Water Board to identify which practices at monitored farms are appropriate for farms with the same or similar range of site conditions, and generally where such farms may be located within the third-party area (e.g., the summary report may need to include maps that identify the types of management practices that should be implemented in certain areas based on specified site conditions). The MPER must include an adequate technical justification for the conclusions that incorporates available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality.

   The report shall include an assessment of each management practice to determine which management practices are protective of groundwater quality. If monitoring concludes that management practices currently in use are not protective of groundwater quality based upon information contained in the MPER, and therefore are not confirmed to be sufficient to ensure compliance with the groundwater receiving water limitations of the Order, the third-party in conjunction with commodity groups and/or other experts (e.g., University of California Cooperative Extension, Natural Resources Conservation Service) shall propose and implement new/alternative management practices to be subsequently evaluated. Where applicable, existing GQMPs shall be updated by the third-party group to be consistent with the findings of the Management Practices Evaluation Report.

C. Groundwater Quality Trend Monitoring

This section provides the objectives and minimum sampling and reporting requirements for Groundwater Quality Trend Monitoring. As specified in section IV.E of this MRP, the third-party is required to develop a workplan that will describe the methods that will be utilized to meet the trend monitoring requirements.

[9] The data need not be associated with a specific parcel or Member.

TENTATIVE

1. *Objectives.* The objectives of Groundwater Quality Trend Monitoring are (1) to determine current water quality conditions of groundwater relevant to irrigated agriculture, and (2) to develop long-term groundwater quality information that can be used to evaluate the regional effects (i.e., not site-specific effects) of irrigated agriculture and its practices.

2. *Implementation.* To reach the stated objectives for the Groundwater Quality Trend Monitoring program, the third-party shall develop a groundwater monitoring network that will (1) be implemented over both high and low vulnerability areas in the third-party area, and (2) employ shallow wells, but not necessarily wells completed in the uppermost zone of first encountered groundwater. The use of existing wells is less costly than installing wells specifically designed for groundwater monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater trends. The third-party may also consider using existing monitoring networks such as those used by AB 3030 and SB 1938 plans.

   The third-party shall submit a proposed Trend Groundwater Monitoring Workplan described in section IV.E below to the Central Valley Water Board. The proposed network shall consist of a sufficient number of wells to provide coverage in the third-party geographic area so that current water quality conditions of groundwater and composite regional effects of irrigated agriculture can be assessed according to the trend monitoring objectives. The rationale for the distribution of trend monitoring wells shall be included in the workplan.

3. *Reporting.* The results of trend monitoring are to be included in the third-party's Monitoring Report and shall include a map of the sampled wells, tabulation of the analytical data, and time concentration charts. Groundwater monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board.

   Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the third-party) from each well, the third-party is to evaluate the data for trends. The methods to be used to evaluate trends shall be proposed by the third-party in the Trend Groundwater Monitoring Workplan described in section IV.E below.

D. Management Practices Evaluation Workplan

The third-party, either solely or in conjunction with a Management Practices Evaluation Group (watershed or commodity based), shall prepare a Management Practices Evaluation Workplan. The workplan shall be submitted to the Executive Officer for review and approval. The workplan must identify a reasonable number of locations situated throughout the high vulnerability groundwater area(s), and encompassing the range of management practices used, the major agricultural commodities, and site conditions under which these commodities are grown. The workplan shall be designed to meet the objectives and minimum requirements described in section IV.B of this MRP.

1. *Workplan approach.* The workplan must include a scientifically sound approach to evaluating the effect of management practices on groundwater quality. The workplan must include a mass balance and conceptual model of the transport, storage, and degradation/chemical transformation mechanisms for the constituents of concern, or equivalent method approved by the Executive Officer[10], must be provided. The proposed approach may include:

   - literature review of identified management practices,
   - root zone studies,

[10] For nitrate, the proposed "equivalent method" may be based on recommendations developed by the California Department of Food and Agriculture's Nitrogen Task Force or the State Water Resource Control Board's Expert Panel on nitrates (see Finding XX).

TENTATIVE

- groundwater monitoring,
- modeling,
- vadose zone sampling, and/or
- other scientifically sound and technically justifiable methods for meeting the objectives of the Management Practices Evaluation Program.

Sufficient groundwater quality monitoring data should be collected or available to confirm or validate the conclusions regarding the effect of the evaluated practices on groundwater quality. Any groundwater quality monitoring that is part of the workplan must be of first encountered groundwater. Monitoring of first encountered groundwater more readily allows identification of the area from which water entering a well originates than deeper wells and allows identification of changes in groundwater quality from activities on the surface at the earliest possible time.

2. *Groundwater quality monitoring –constituent selection.* Where groundwater quality monitoring is proposed, the Management Practices Evaluation Workplan must identify:

   - the constituents to be assessed, and
   - the frequency of the data collection (e.g. root zone pore water, groundwater quality monitoring, vadose zone monitoring; soil sampling) for each constituent, and
   - sampling techniques/methodology.

   The proposed constituents shall be selected based upon the information collected from the GAR and must be sufficient to determine if the management practices being evaluated are protective of groundwater quality. At a minimum, the baseline constituents for any groundwater quality monitoring must include those parameters required under trend monitoring.

3. *Workplan implementation and analysis.* The proposed Management Practices Evaluation Workplan shall contain sufficient information/justification for the Executive Officer to evaluate the ability of the evaluation program to identify whether existing management practices in combination with site conditions, are protective of groundwater quality. The workplan must explain how data collected at evaluated farms will be used to assess potential impacts to groundwater at represented farms that are not part of the Management Practices Evaluation Program's network. This information is needed to demonstrate whether data collected will allow identification of management practices that are protective of water quality at Member farms, including represented farms (i.e., farms for which on-site evaluation of practices is not conducted).

4. *Master workplan –prioritization.* If the third-party chooses to rank or prioritize its high vulnerability areas in its GAR, a single Management Practices Evaluation Workplan may be prepared which includes a timeline describing the priority and schedule for each of the areas/commodities to be investigated and the submittal dates for addendums proposing the details of each area's investigation.

5. *Installation of monitoring wells.* Upon approval of the Management Practices Evaluation Workplan, the third-party shall prepare and submit a Monitoring Well Installation and Sampling Plan (MWISP), if applicable. A description of the MWISP and its required elements/submittals are presented as Appendix MRP-2. The MWISP must be approved by the Executive Officer prior to the installation of the MWISP's associated monitoring wells.

TENTATIVE

E. Trend Monitoring Workplan

The third-party shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in section IV.C of this MRP. The workplan shall be submitted to the Executive Officer for review and approval. The Trend Monitoring Workplan shall provide information/details regarding the following topics:

1. *Workplan approach.* A discussion of the rationale for the number of proposed wells to be monitored and their locations is required in the workplan. The rationale needs to consider: 1) the variety of agricultural commodities produced within the third-party's boundaries (particularly those commodities comprising the most irrigated agricultural acreage), 2) the conditions discussed/identified in the GAR related to the vulnerability or data gap prioritization within the third-party area, and 3) the areas identified in the GAR as contributing significant recharge to urban and rural communities where groundwater serves as a significant source of supply.

2. *Well details.* The Workplan will provide details for wells proposed for trend monitoring, including:
   i. GPS coordinates;
   ii. Physical address of the property on which the well is situated (if available);
   iii. California State well number (if known);
   iv. Well depth;
   v. Top and bottom perforation depths;
   vi. A copy of the water well drillers log, if available;
   vii. Depth of standing water (static water level), if available (this may be obtained after implementing the program); and
   viii. Well seal information (type of material, length of seal).

3. *Proposed sampling schedule*. Trend monitoring wells will be sampled, at a minimum, annually at the same time of the year for the indicator parameters identified in Table 3 below.

4. *Workplan implementation and analysis. The Workplan will describe p*roposed method(s) to be used to evaluate trends in the groundwater monitoring data over time.

Table 3. Monitored Parameters at groundwater Trend Monitoring wells

	Measured Parameter
Annual Monitoring	
	Conductivity (at 25 ºC)* (µS/cm)
	pH* in pH units
	Dissolved oxygen (DO)* (mg/L)
	Temperature* (ºC)
	Nitrate as nitrogen (mg/L)
Sampled initially and once every five years thereafter	
	Total dissolved solids (TDS) (mg/L)
	General minerals (mg/L) • Anions (carbonate, bicarbonate, chloride, and sulfate) • Cations (boron, calcium, sodium, magnesium, and potassium)

* field parameters

TENTATIVE

V. Third-Party Reporting Requirements

Reports and notices shall be submitted in accordance with section IX of the Order, Reporting Provisions.

A. Annual Groundwater Monitoring Results

Annually, in the 15 June SAMR, the third-party shall submit the prior year's groundwater monitoring results as an Excel workbook containing an export of all data records uploaded and/or entered into the State Water Board GeoTracker database. If any data are missing from the report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board. If data are not loaded into the GeoTracker database, this shall also be noted with the submittal.

B. Monitoring Report

Semi-Annual Monitoring Reports (SAMR) shall be submitted by 15 June every year, covering the non-irrigation season (1 September-28 February), including any rain events, and by 30 November, covering the irrigation season (1 March-31 August). The first SAMR shall be due 15 June 2015. The report shall include the following components:

1. Signed Transmittal Letter;
2. Title page;
3. Table of contents;
4. Executive Summary;
5. Description of the third-party geographical area;
6. Monitoring objectives and design;
7. Sampling site/monitoring well descriptions and rainfall records for the time period covered under the SAMR;
8. Location map(s) of sampling sites/monitoring wells, crops and land uses;
9. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
10. Discussion of data relative to water quality objectives/trigger limits, and water quality management plan milestones/Basin Plan Amendment Workplan (BPAW) updates*, where applicable;
11. Electronic data submittal.
12. Sampling and analytical methods used;
13. Associated laboratory and field quality control samples results;
14. Summary of Quality Assurance Evaluation results (as identified in the most recent version of the third-party's approved QAPP for Precision, Accuracy and Completeness);
15. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
16. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and surface water related pesticide use information;
17. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
18. Evaluation of monitoring data to identify spatial trends and patterns;
19. *Summary of Nitrogen Management Plan information submitted to the third-party;
20. *Summary of management practice information collected as part of Farm Evaluations;
21. *Summary of mitigation monitoring;
22. Summary of education and outreach activities;
23. Conclusions and recommendations.

TENTATIVE

*BPAW updates and components 19, 20, and 21 shall be reported once per year in the 15 June SAMR. Additional requirements and clarifications necessary for the above report components are described below.

Report Component (1) —Signed Transmittal Letter

A transmittal letter shall accompany each report. The transmittal letter shall be submitted and signed in accordance with the requirements of section IX of the Order, Reporting Provisions.

Report Component (8) — Location Maps

Location map(s) showing the sampling sites/monitoring wells, crops, and land uses within the third-party's geographic area must be updated (based on available sources of information) and included in the Semi-Annual Monitoring Report. An accompanying GIS shapefile or geodatabase of monitoring site and monitoring well information must include the CEDEN-comparable site code and name (surface water only) and Global Positioning System (GPS) coordinates (surface water sites and wells used for monitoring). The map(s) must contain a level of detail that ensures they are informative and useful. GPS coordinates must be provided as latitude and longitude in the decimal degree coordinate system (at a minimum of five decimal places). The datum must be either WGS 1984 or NAD83, and clearly identified on the map(s) or in an associated key or table included in the report. The source and date of all data layers must be identified on the map(s) or in an associated key or table included in the report. All data layers/shapefiles/geodatabases included in the map shall be submitted with the initial Semi-Annual Monitoring Report. If changes occur to any submitted data, the updated portion shall be submitted in the subsequent SAMR.

Report Component (9) – Tabulated Results

In reporting monitoring data, the third-party shall arrange the data in tabular form so that the required information is readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with the data collection requirements of the MRP.

Report Component (10) — Data Discussion to Illustrate Compliance

The report shall include a discussion of the third-party's compliance with the data collection requirements of the MRP. If a required component was not met, an explanation for the missing data must be included. Results must also be compared to water quality objectives and trigger limits. If a Basin Plan Amendment Workplan (BPAW) has been approved by the Executive Officer, updates on progress made toward BPAW goals and milestones, including any adjustments to the time schedule, must be included.

Report Component (11) – Electronic Data Submittal

The report shall include an electronic data submittal including the following items:

1. An Excel workbook containing an export of all data records uploaded and/or entered into the CEDEN-comparable database (surface water data). The workbook shall contain, at a minimum, those items detailed in the most recent version of the third-party's approved QAPP.
2. The most current version of the third-party's eQAPP.
3. Electronic copies of all field sheets.
4. Electronic copies of photos obtained from all surface water monitoring sites, clearly labeled with the CEDEN-comparable station code and date.
5. Electronic copies of all applicable laboratory analytical reports on a CD.
6. For toxicity reports, all laboratory raw data must be included in the analytical report (including data for failed tests), as well as copies of all original bench sheets showing the results of individual replicates, such that all calculations and statistics can be reconstructed. The toxicity analyses data submittals must include individual sample results, negative control summary results, and replicate results. The minimum in-test water quality measurements reported must include the minimum and maximum measured values for specific conductivity, pH, ammonia, temperature, and dissolved oxygen.

TENTATIVE

7. For chemistry data, analytical reports must include, at a minimum, the following:
    a. A lab narrative describing QC failures,
    b. Analytical problems and anomalous occurrences,
    c. Chain of custody and sample receipt documentation,
    d. All sample results for contract and subcontract laboratories with units, RLs and MDLs,
    e. Sample preparation, extraction and analysis dates, and
    f. Results for all QC samples including all field and laboratory blanks, lab control spikes, matrix spikes, field and laboratory duplicates, and surrogate recoveries.

Laboratory raw data such as chromatograms, spectra, summaries of initial and continuing calibrations, sample injection or sequence logs, prep sheets, etc., are not required for submittal, but must by retained by the laboratory in accordance with the requirements of section X of the Order, Record-keeping Requirements.

If any data are missing from the semi-annual report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board. If data are not loaded into the CEDEN comparable database, this shall also be noted with the submittal.

Report Component (14) — Quality Assurance Evaluation (Precision, Accuracy and Completeness)

A summary of precision and accuracy results (both laboratory and field) is required in the report. The required data quality objectives are identified in the most recent version of the third-party's approved QAPP; acceptance criteria for all measurements of precision and accuracy must be identified. The third-party must review all QA/QC results to verify that protocols were followed and identify any results that did not meet acceptance criteria. A summary table or narrative description of all QA/QC results that did not meet objectives must be included. Additionally, the report must include a discussion of how the failed QA/QC results affect the validity of the reported data. The corrective actions to be implemented are described in the QAPP Guidelines.

In addition to precision and accuracy, the third-party must also calculate and report completeness. Completeness includes the percentage of all quality control results that meet acceptance criteria, as well as a determination of project completeness. For further explanation of this requirement, refer to the most recent version of the QAPP Guidelines. The third-party may ask the laboratory to provide assistance with evaluation of their QA/QC data, provided that the third-party prepares the summary table or narrative description of the results for the Monitoring Report.

Report Component (16) — Summary of Exceedances

A summary of the exceedances of water quality objectives or trigger limits that have occurred during the monitoring period is required in the Monitoring Report. In the event of exceedances for pesticides or toxicity in surface water, pesticide use data must be included in the Monitoring Report. Pesticide use information may be acquired from the agricultural commissioner. This requirement is described further in the following section on Exceedance Reports.

Report Component (18) — Evaluation of Monitoring Data

The third-party must evaluate its monitoring data in the Monitoring Report in order to identify potential trends and patterns in surface and groundwater quality that may be associated with waste discharge from irrigated lands. As part of this evaluation, the third-party must analyze all readily available monitoring data that meet program quality assurance requirements to determine deficiencies in monitoring for discharges from irrigated agricultural lands and whether additional sampling locations are needed. If deficiencies are identified, the third-party must propose a schedule for additional monitoring or source studies. Upon notification from the Executive Officer,

TENTATIVE

the third-party must monitor any parameter in an area that lacks sufficient monitoring data (i.e., a data gap should be filled to assess irrigated agriculture's effects on water quality).

The third-party should incorporate pesticide use information, as needed, to assist in its data evaluation. Wherever possible, the third-party should utilize tables or graphs that illustrate and summarize the data evaluation.

Report Component (19) – Summary of Reported Nitrogen Data
The third-party shall aggregate information from Members' Nitrogen Management Plan Summary Reports to characterize the input, uptake, and loss of nitrogen fertilizer applications by specific crops in the Western San Joaquin River Watershed. The third-party's assessment of Nitrogen Management Plan information must include, at a minimum, comparisons of farms with the same crops, similar soil conditions, and similar practices (e.g., irrigation management). At a minimum, the statistical summary of nitrogen consumption ratios by crop or other equivalent reporting units and the estimated nitrogen consumed for the different crop types and soil conditions will describe the range percentiles (10th, 25th, 50th, 75th, 90th) and any outliers. A box and whisker plot or equivalent tabular or graphical presentation of the data approved by the Executive Officer may be used. The nitrogen consumption ratio is the ratio of total nitrogen available for crop uptake (from sources including, but not limited to, fertilizers, manures, composts, nitrates in irrigation supply water and soil) to the estimated crop consumption of nitrogen. The summary of nitrogen management data must include a quality assessment of the collected information by township (e.g. missing data, potentially incorrect/inaccurate reporting), and a description of corrective actions to be taken regarding any deficiencies in the quality of data submitted, if such deficiencies were identified. The third-party will also provide an aggregate of the data submitted by its Members in an electronic format, compatible with ArcGIS, identified to at least the township level.[11]

Report Component (20) – Summary of Management Practice Information
The third-party will aggregate and summarize information collected from Farm Evaluations.[12] The summary of management practice data must include a quality assessment of the collected information by township (e.g. missing data, potentially incorrect/inaccurate reporting), and a description of corrective actions to be taken regarding any deficiencies in the quality of data submitted, if such deficiencies were identified. In addition to summarizing and aggregating the information collected, the third-party will provide the individual data records used to develop this summary in an electronic format, compatible with ArcGIS, identified to at least the township level.[11]

Report Component (21) – Mitigation Monitoring
As part of the Monitoring Report, the third-party shall report on the CEQA mitigation measures reported by Members to meet the provisions of the Order and any mitigation measures the third-party has implemented on behalf of Members. The third-party is not responsible for submitting information that Members do not send them directly by the 1 March deadline (see section VII.E of the Order for individual Discharger mitigation monitoring requirements). The Mitigation Monitoring Report shall include information on the implementation of CEQA mitigation measures (mitigation measures are described in Attachment C of the Order), including the measure implemented, identified potential impact the measure addressed, location of the mitigation measure (township, range, section), and any steps taken to monitor the ongoing success of the measure.

C. Surface Water Exceedance Reports

The third-party shall provide surface water exceedance reports if monitoring results show exceedances of adopted numeric water quality objectives or trigger limits, which are based on

[11] The Member and their associated parcel need not be identified.
[12] Note that the evaluation of the reported management practices information is discussed in Appendix MRP-1 and will be part of the annual Management Plan Status Report.

TENTATIVE

interpretations of narrative water quality objectives. For each surface water quality objective exceeded at a monitoring location, the third-party shall submit an Exceedance Report to the Central Valley Water Board. The estimated flow at the monitoring location and photographs of the site must be submitted in addition to the exceedance report but do not need to be submitted more than once. The third-party shall evaluate all of its monitoring data and determine exceedances no later than five (5) business days after receiving the laboratory analytical reports for an event. Upon determining an exceedance, the third-party shall send the Exceedance Report by email to the third-party's designated Central Valley Water Board staff contact by the next business day. The Exceedance Report shall describe the exceedance, the follow-up monitoring, and analysis or other actions the third-party may take to address the exceedance. Upon request, the third-party shall also notify the agricultural commissioner of the county in which the exceedance occurred and/or the director of the Department of Pesticide Regulation.

Surface water exceedances of pesticides or toxicity: When any pesticide or toxicity exceedance is identified at a location that is not under an approved management plan for toxicity or pesticides, follow-up actions must include an investigation of pesticide use within the location's watershed area. The investigation of toxicity exceedances must include all pesticides applied within the area that drains to the monitoring site during the four weeks immediately prior to the exceedance date. The pesticide use information may be acquired from the agricultural commissioner, or from information received from Members within the same drainage area. Results of the pesticide use investigation must be summarized and discussed in the Semi-Annual Monitoring Report.

D. Basin Plan Amendment Workplan

Should the third-party choose to pursue a Basin Plan Amendment as described in Section VIII.L. of the Order, the third-party must prepare a Basin Plan Amendment Workplan (BPAW) that includes the following elements:

1. A technical justification for initiating the basin plan amendment process including maps of the areas proposed for basin plan amendment. The justification must include an assessment of naturally occurring (background) concentrations of the constituent(s), evaluate the potential for irrigated agriculture to further degrade groundwater quality beyond background in the identified areas, and include a preliminary evaluation as to whether controllable water quality factors (as defined in the Basin Plan) are reasonably likely to result in attainment of the applicable use(s);
2. A use attainability study plan to determine whether the beneficial use(s) proposed for de-designation may be attained through the application of current or anticipated technologies, whether groundwater within the proposed basin plan amendment area is currently being used for the beneficial use proposed for de-designation, and whether the groundwater proposed for de-designation meets any of the criteria set forth in the Basin Plan that the board considers in making exceptions to beneficial use designations;
3. A description of how the third-party will coordinate the basin plan amendment process through CV-SALTS, if the amendment is based on elevated salt and/or nitrate concentrations;
4. A proposal for reduced reporting requirements for Members in the areas proposed for basin plan amendment. The third-party may propose that trend monitoring be reduced in those areas. The third-party may also propose that the requirement that the Management Practice Evaluation Program evaluate those areas be suspended. The reduced monitoring and reporting requirements shall be no less stringent than the requirements for low vulnerability areas;
5. A description of the monitoring and reporting required to complete the BPAW must be identified; and
6. A time schedule including workplan goals and milestones for completing BPAW items.

TENTATIVE

To the extent applicable, the above BPAW workplan elements may be met by existing efforts. However, the third-party must provide the information associated with the applicable element demonstrating that element's requirements are met.

The Executive Officer may approve the BPAW workplan if the Executive Officer determines that the BPAW workplan includes all of the required elements. To approve the workplan, the Executive Officer must conclude that the technical justification provides sufficient evidence indicating that waters within the identified high vulnerability areas would likely qualify for de-designation of a beneficial use or uses under the Basin Plan. Should the Executive Officer approve the BPAW workplan, the Executive Officer will also provide the applicable approved modifications to the monitoring and reporting program.

Annual updates on progress made toward BPAW goals and milestones, including any proposed adjustments to the time schedule, must be included in the 15 June Semi-Annual Monitoring Report.

The Executive Officer may reinstate high vulnerability monitoring and reporting requirements if any of the following occur: 1) information gathered during implementation of the BPAW indicates a basin plan amendment is unlikely to be adopted, 2) the basin plan amendment is not likely to be brought before the board within five years of the original proposal date due to insufficient progress in meeting workplan goals and milestones, or 3) the basin plan amendment is not approved by the regional board or state water board.

VI. Sediment Discharge and Erosion Assessment Report

The third-party shall prepare a Sediment Discharge and Erosion Assessment Report. The report shall be submitted to the Executive Officer for review. The goal of the report is to determine which irrigated agricultural areas within the Western San Joaquin River Watershed are subject to erosion and may discharge sediment that may degrade surface waters. The objective of the report is to determine which Member operations are within such areas, and need to develop a Sediment and Erosion Control Plan. The report must be developed to achieve the above goal and objective and must at a minimum, provide a description of the sediment and erosion areas as a series of ArcGIS shapefiles with a discussion of the methodologies utilized to develop the report.

VII. Water Quality Triggers for Development of Management Plans

This Order requires that Members comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* and *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans) contain numeric and narrative water quality objectives applicable to surface water and groundwater within the Order's watershed area. USEPA's 1993 National Toxics Rule (NTR) and 2000 California Toxics Rule (CTR) contain water quality criteria which, when combined with Basin Plan beneficial use designations constitute numeric water quality standards. Table 4 of this MRP lists Basin Plan numeric water quality objectives and NTR/CTR criteria for constituents of concern that may be discharged by Members.

Table 4 does not include water quality criteria that may be used to interpret narrative water quality objectives, which shall be considered trigger limits. Trigger limits will be developed by the Central Valley Water Board staff through a process involving coordination with the Department of Pesticide Regulation (for pesticides) and stakeholder input. The trigger limits will be designed to implement narrative Basin Plan objectives and to protect applicable beneficial uses. The Executive Officer will make a final determination as to the appropriate trigger limits.

TENTATIVE

VIII. Quality Assurance Project Plan (QAPP)

The third-party must develop and/or maintain a QAPP that includes watershed and site-specific information, project organization and responsibilities, and the quality assurance components in the QAPP Guidelines. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health (DPH), except where the DPH has not developed a certification program for the material to be analyzed.

The Westside San Joaquin River Watershed Coalition submitted the QAPP for review in 2008, and a revised draft in 2013. The draft QAPP is acceptable for use by the third-party pending approval by the Central Valley Water Board's Quality Assurance Officer and the Executive Officer. Any necessary modifications to the QAPP for groundwater monitoring shall be submitted with the MPEP and groundwater trend monitoring workplans (section IV, MRP). Any proposed modifications to the approved QAPP must receive Executive Officer approval prior to implementation.

The Central Valley Water Board may conduct an audit of the third-party's contracted laboratories at any time in order to evaluate compliance with the most current version of the QAPP Guidelines. Quality control requirements are applicable to all of the constituents listed in the QAPP Guidelines, as well as any additional constituents that are analyzed or measured, as described in the appropriate method. Acceptable methods for laboratory and field procedures as well as quantification limits are described in the QAPP Guidelines.

TENTATIVE

TENTATIVE

Table 4. Basin Plan Numeric Water Quality Objectives for the Western San Joaquin River Watershed. ** Where more than one objective is applicable, the most stringent shall be applied.*

Constituent / Parameter Chemical Abstracts Service (CAS) Registry Number (Synonym, if any)	Basin Plan Water Quality Objective	Numeric Water Quality Objectives			G = Groundwater IS = Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body						
						Groundwater			Inland Surface Waters			
		Source of Numeric Threshold *(footnotes in parentheses are at the bottom of table)*	Numeric Threshold (a)	Units		MUN-MCL	MUN-Toxicity	AGR	MUN-MCL	MUN-Toxicity	Aquatic Life & Consumption	AGR
Boron, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	2,000	µg/L	IS							X
7440-42-8		Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	800 (b)	µg/L	IS							X
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	2,600	µg/L	IS							X
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	1,000 (b)	µg/L	IS							X
		Basin Plan. SJR, mouth of Merced R to Vernalis (critical year) (c)	1,300 (b)	µg/L	IS							X
		Basin Plan. SJR from Sack Dam to mouth of Merced River	5,800	µg/L	IS							X
		Basin Plan. SJR from Sack Dam to mouth of Merced River	2,000 (b)	µg/L	IS							X
Chlorpyrifos	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.025	µg/L	IS						X	
2921-88-2		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.015	µg/L	IS						X	
Coliform, fecal	Bacteria	Basin Plan (d) (e)	200/100	MPN/mL	IS				X			
		Basin Plan (d) (f)	400/100	MPN/mL	IS				X			
Coliform, total	Bacteria	Basin Plan	2.2/100	MPN/mL	G	X						
Conductivity (at 25° C)	Salinity	Basin Plan. SJR, Friant Dam to Mendota Pool	150	µS/cm	IS							
(Electrical conductivity)		California Secondary MCL	900-1600	µS/cm	G & IS	X	X		X	X		
Copper	Chemical Constituents	California Secondary MCL (total copper)	1,000	µg/L	G & IS	X			X	X		
7440-50-8	Toxicity	California Toxics Rule (USEPA), (g) (dissolved copper)	variable	µg/L	IS						X	
Diazinon	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.16	µg/L	IS						X	
50-29-3		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.10	µg/L	IS						X	
Dissolved Oxygen, minimum	Dissolved Oxygen	Basin Plan. Merced R from Cressy to New Exchequer Dam, all year	8.0	mg/L	IS						X	
7782-44-7		Basin Plan. Tuolumne R, Waterford to La Grange, 15 Oct – 15 Jun	8.0	mg/L	IS						X	
		Basin Plan. Waters designated WARM	5.0	mg/L	IS						X	
		Basin Plan. Waters designated COLD and/or SPWN	7.0	mg/L	IS						X	
Lead	Chemical Constituents	California Primary MCL (total lead)	15	µg/L	G & IS	X			X			
7439-92-1	Toxicity	California Toxics Rule (USEPA) (g) (dissolved lead)	variable	µg/L	IS						X	
Molybdenum, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	15	µg/L	IS							X
7439-98-7		Basin Plan. SJR, mouth of Merced R to Vernalis (monthly mean)	10	µg/L	IS							X
		Basin Plan. SJR, Sack Dam to mouth of Merced R	50	µg/L	IS							X
		Basin Plan. SJR, Sack Dam to mouth of Merced R (monthly mean)	19	µg/L	IS							X

TENTATIVE

Constituent / Parameter Chemical Abstracts Service (CAS) Registry Number (Synonym, if any)	Basin Plan Water Quality Objective	Numeric Water Quality Objectives			G = Groundwater IS = Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body						
						Groundwater			Inland Surface Waters			
		Source of Numeric Threshold *(footnotes in parentheses are at the bottom of table)*	Numeric Threshold (a)	Units		MUN-MCL	MUN-Toxicity	AGR	MUN-MCL	MUN-Toxicity	Aquatic Life & Consumption	AGR
Nitrate (as nitrogen) 14797-55-8	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X		
Nitrite (as nitrogen) 14797-65-0	Chemical Constituents	California Primary MCL	1	mg/L	G & IS	X	X		X	X		
Nitrate+Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X		
pH – minimum	pH	Basin Plan	6.5	units	G & IS	X	X		X	X		
pH – maximum			8.5	units	G & IS	X	X		X	X		
Selenium, total 7782-49-2	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	12	µg/L								
		Basin Plan. SJR, mouth of Merced R to Vernalis (4-day mean)	5	µg/L								
		Basin Plan. SJR, Sack Dam to mouth of Merced R	20	µg/L								
		Basin Plan. SJR, Sack Dam to mouth of Merced R (4-day mean)	5	µg/L								
		California Primary MCL	50	µg/L	G & IS	X			X			
	Toxicity	National Toxics Rule (USEPA), 4-day mean	5	µg/L	IS						X	
Simazine 122-34-9	Chemical Constituents	California Primary MCL	4	µg/L	G & IS	X	X		X	X		
Temperature	Temperature	Basin Plan (h)	variable		IS							
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500 – 1,000	mg/L	G & IS	X	X		X	X		
Turbidity	Turbidity	Basin Plan. Where natural turbidity is <1 NTU	2	NTU	IS							
		Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.	variable; 2-6	NTU	IS							
		Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.	variable; 6 - 70	NTU	IS							
		Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.	variable; 60-110	NTU	IS							
		Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.	variable	NTU	IS							
Zinc	Chemical Constituents	California Secondary MCL (total zinc)	5,000	µg/L	G & IS	X			X			
7440-66-6	Toxicity	California Toxics Rule (USEPA) (g) (dissolved zinc)	variable	µg/L	IS						X	

Footnotes to Table 4:

a	Numeric thresholds are maximum levels unless noted otherwise.
b	Monthly mean.
c	See Basin Plan for definition of Critical Year.

d	Applies in waters designated for contact recreation (REC-1).
e	Geometric mean of the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed this number.
f	No more than ten percent of the total number of samples taken during any 30-day period shall exceed this number.
g	The numeric thresholds for dissolved metals are hardness dependent. As hardness increases, water quality objectives generally increase.
h	The natural receiving water temperature shall not be altered unless it can be demonstrated to the satisfaction of the Water Board that such alteration does not adversely affect beneficial uses. However, at no time shall the temperature of WARM and COLD waters be increased more than 5 degrees Fahrenheit (or 2.78°C) above natural receiving water temperature.

Beneficial Uses:

AGR – Agricultural water uses, including irrigation supply and stock watering

Aquatic Life & Consumption – Aquatic life and consumption of aquatic resources

MUN-MCL – Municipal or domestic supply (MUN) with default selection of drinking water maximum contaminant limit (MCL) when available

MUN-Toxicity – Municipal or domestic supply (MUN) with consideration of human toxicity thresholds that are more stringent than drinking water maximum contaminant limits (MCLs)