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Introduction and Background

The primary purpose of this Comprehensive Surface Water Quality Management Plan (CSQMP) is to document the methods and efforts that will be made by the Sacramento Valley Water Quality Coalition (Coalition) to strategically target exceedances of water quality objectives identified in the Sacramento Valley watershed. The Coalition’s Waste Discharge Requirements (WDR), Order No. R5-2014-0030-R1, specifies the requirements for separate surface water Management Plans, and also allows the Coalition to satisfy these requirements by updating the Surface Water Quality Management Plan previously approved under the Coalition Group Conditional Waiver to conform to the Order and the Monitoring and Reporting Program (MRP). The updated CSQMP must conform to the requirements specified for separate Management Plans, but the WDR allows existing Management Plans developed under the Coalition’s Conditional Waiver (Conditional Waiver Order R5-2006-0053) to continue to apply under this Order. This approach is used for the Coalition’s CSQMP.

This document is an update and reorganization of the Coalition’s previously approved Water Quality Management Plan. It provides an overview of the Coalition’s approach to meeting the requirements of the WDR, a list of all currently required Management Plans and their status, the Management Plans currently being implemented, and a schedule and process for development of newly required Management Plans.

Overall Approach

The Coalition’s CSQMP addresses the elements required for each separate Management Plan by the Coalition’s Waste Discharge Requirements (WDR), Order No. R5-2014-0030-R1, under the Irrigated Lands Regulatory Program (ILRP), as described in Table 1.

The Coalition’s previously approved Management Plan approach included many elements that are consistent with guidance proposed in the Monitoring and Reporting Program (MRP) adopted by the Regional Water Board in January 2008 (Order No. R5-2008-0005) and the new WDR adopted in 2014 (Order No. R5-2014-0030). These primary Management Plan elements of the original Management Plan are now incorporated directly into the appropriate sections of the CSQMP as listed in Table 2, and are identified in the CSQMP as offset and highlighted text blocks.
Table 1. Required Elements of Management Plans

<table>
<thead>
<tr>
<th>CSQMP Sections</th>
<th>Summary of Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction and Background</strong></td>
<td>Constituents, water quality triggers, and geographic scope of the Management Plan</td>
</tr>
<tr>
<td><strong>Physical Setting and Information</strong></td>
<td>Relevant physical conditions and represented area for the Management Plan</td>
</tr>
<tr>
<td><strong>Management Plan Strategy</strong></td>
<td>Approach and strategy for implementation; Actions and tasks to achieve compliance (performance goals, member education, and management practices identification, validation and implementation); Duties and responsibilities for individuals and groups</td>
</tr>
<tr>
<td><strong>Monitoring Design</strong></td>
<td>Monitoring to measure effectiveness in achieving the goals of the Management Plan</td>
</tr>
<tr>
<td><strong>Data Evaluation</strong></td>
<td>Methods to evaluate monitoring data and to evaluate the effectiveness of the implemented management practices</td>
</tr>
<tr>
<td><strong>Records and Reporting</strong></td>
<td>Schedule for Management Plan Status Reports that summarize progress in implementing management plans</td>
</tr>
<tr>
<td><strong>Source Identification Study Requirements</strong></td>
<td>Optional: If a Source Identification Study is proposed, describes the components of the study, and the approach to estimating the contribution and impact of irrigated agriculture. Requires additional Executive Officer approval for proposed study.</td>
</tr>
<tr>
<td><strong>Specific Management Plans</strong></td>
<td>List and Compilation of Specific Management Plan Documents, including those previously approved under <em>Conditional Waiver Order R5-2006-0053</em>. Documents should include final versions of: Source Evaluation/Identification Study Reports; Management Practice Implementation and Performance Goals (MPIPGs) and Addenda; Requests for Completion (and any supplemental information); Letters of Approval from Regional Water Board Staff or Executive Officer;</td>
</tr>
</tbody>
</table>
Table 2. Use of previously approved Management Plan elements in the updated CSQMP

<table>
<thead>
<tr>
<th>Elements of 2009 Approved Management Plan</th>
<th>CSQMP Section Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy for identification of potential sources of the observed exceedances</td>
<td>Source Identification Study Requirements</td>
</tr>
<tr>
<td>Process to identify potential additional Management Practices to be implemented to address the exceedances</td>
<td>Management Plan Strategy (Actions and Tasks)</td>
</tr>
<tr>
<td>Management Practices implementation schedule</td>
<td>Management Plan Strategy (Actions and Tasks); Replaced with revised schedule required for WDR</td>
</tr>
<tr>
<td>Management Plan completion criteria and performance goals</td>
<td>Management Plan Strategy (Actions and Tasks)</td>
</tr>
<tr>
<td>Process and schedule for evaluating management plan effectiveness</td>
<td>Data Evaluation</td>
</tr>
<tr>
<td>Monitoring strategy and schedule</td>
<td>Monitoring Design</td>
</tr>
<tr>
<td>Identification of the participants that will implement the Management Plan</td>
<td>Management Plan Strategy (Duties and Responsibilities)</td>
</tr>
<tr>
<td>Schedule and process for reporting the results of Management Plan actions</td>
<td>Records and Reporting</td>
</tr>
</tbody>
</table>
A. INTRODUCTION AND BACKGROUND

Each separate Management Plan is required to discuss the constituents of concern (COCs), water quality triggers, and the geographic scope of the Management Plan.

Constituents of Concern (COCs)

The COCs potentially addressed by Management Plans fall into eight different categories. These are listed in Table 3 with the Coalition’s rationale for prioritization.

Although collaborating on ideas and approach, the Coalition’s Subwatershed Groups will be working independently on specific elements of the Management Plan. Within each subwatershed, site-specific management plans for registered pesticides and toxicity will continue to receive the highest priority for implementation, and legacy pesticides and trace metals will receive medium priority for implementation. Because salinity (including conductivity and TDS), DO, pathogens, and pH have much greater involvement of non-agricultural potential sources and causes, and consequently an expected longer time frame to identify appropriate coordinated solutions, these parameters are lower in priority. Within subwatersheds, sites with multiple management plan requirements will also generally receive a higher priority for implementation of management plans. Priorities for sites and parameters may also be influenced by the magnitude and frequency of exceedances, and the ability of agricultural management practices to affect changes in water quality. Generally, the priority for sites or parameters will be reflected as an extended schedule and lesser immediate commitment of resources for lower priorities. Levels of effort and schedules are detailed in the separate Management Plans. The priorities for management plan categories were based on a subjective assessment of the potential for affecting beneficial uses, the probability of significant agricultural sources or contributions, the probability and magnitude of non-agricultural sources, and the requirements and potential for successful management (Table 3). Additional details are provided in the specific approaches to Management Plan constituent categories (APPENDIX E).
<table>
<thead>
<tr>
<th>Management Plan Category</th>
<th>Priority</th>
<th>Rationale for Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered pesticides (including copper)</td>
<td>HIGH</td>
<td>High potential for affecting aquatic life beneficial uses; High probability of direct agricultural sources in many cases; High probability of successful management of agricultural sources with modified practices and other controls;</td>
</tr>
<tr>
<td>Toxicity in water and sediment</td>
<td>HIGH</td>
<td>High potential for affecting aquatic life beneficial uses; Moderate probability of direct agricultural sources with potential contributions from other anthropogenic and natural background sources; High probability of successful management of agricultural sources with modified practices if specific sources of toxicity are identified;</td>
</tr>
<tr>
<td>Legacy Organochlorine Pesticides</td>
<td>MEDIUM</td>
<td>Low potential for affecting aquatic life beneficial uses, medium probability of affecting other uses; High probability of historical agricultural sources, no current sources; Long-term management of multiple sources likely required even with successful management of agricultural sources; Low probability of meeting WQOs by implementing management practices;</td>
</tr>
<tr>
<td>Trace Metals (excluding copper and boron)</td>
<td>MEDIUM</td>
<td>Moderate potential for affecting aquatic life and other beneficial uses (depends on trace metal); Moderate probability of historical or current agricultural sources; High probability of natural background contributions; Long-term management of multiple sources likely required even with successful management of agricultural sources; Low probability of meeting WQOs by implementing management practices for most metals;</td>
</tr>
<tr>
<td>Nutrients</td>
<td>MEDIUM</td>
<td>Moderate potential for affecting aquatic life and other beneficial uses (depends on nutrient compound); Moderate to low probability of direct agricultural sources (based on low exceedance rates); Moderate probability of natural background or “legacy” contributions; High probability of successful management of agricultural sources with modified practices and other controls;</td>
</tr>
<tr>
<td>Salinity (including conductivity, TDS, and boron)</td>
<td>LOW</td>
<td>Low potential for affecting aquatic life, medium probability of affecting other uses, including agriculture; No direct agricultural sources, but high probability of agricultural contributions through consumptive uses, and high probability of contributions from other anthropogenic and uncontrollable background sources; Long-term integrated management of multiple sources required for solution;</td>
</tr>
<tr>
<td>DO and pH</td>
<td>LOW</td>
<td>Moderate potential for affecting aquatic life, low probability of affecting other uses; Low probability of significant direct agricultural sources, with high probability of natural causes; Long-term management of multiple sources likely required even with successful management of agricultural sources; Lower probability of meeting WQOs by implementing management practices;</td>
</tr>
<tr>
<td>Pathogen indicators</td>
<td>LOW</td>
<td>Low potential for affecting aquatic life, moderate probability of affecting other uses; Low to Moderate probability of significant agricultural sources, with high probability of contributions from other anthropogenic and uncontrollable natural sources; Long-term management of multiple sources likely required even with successful management of agricultural sources; Lower probability of meeting WQOs by implementing management practices;</td>
</tr>
</tbody>
</table>
Trigger Limits

The Coalition’s Order requires that Members comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges. The Order specifies the applicable numeric and narrative water quality objectives in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan), and the criteria in USEPA’s 1993 National Toxics Rule (NTR) and 2000 California Toxics Rule (CTR) which constitute numeric water quality standards when combined with the Basin Plan beneficial use designations. The numeric objectives from these sources compiled in Table 5 of the MRP of the Coalition’s WDR are provided in APPENDIX C. Table 5 of the MRP does not include a variety of water quality numeric thresholds that may be used to interpret narrative water quality objectives by the Regional Water Board for the ILRP and are considered “Trigger Limits”. Trigger Limits are discussed but not explicitly included in the WDR, which states that “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.” Trigger Limits are intended to implement narrative Basin Plan objectives and to protect applicable beneficial uses, and require approval by the Executive Officer.

The specific numeric objectives or Trigger Limits that were exceeded to trigger implementation will be documented in the narrative for each separate Management Plan.

Management Plan Boundaries

The applicable boundaries of the CSQMP are the watershed boundaries for the SVWQC. Boundaries for implementation for each separate Management Plan are generally determined based on the representative monitoring site and drainage and the represented drainages. The specific geographic boundaries for each Management Plan are specified in the introductory narrative summarizing the scope of each Management Plan. The drainages and representation currently used by the Coalition for monitoring and assessment are provided in APPENDIX D. This information is included in the Annual Monitoring Updates that must be approved by the Regional Water Board’s Executive Officer and are required by the WDR.

B. PHYSICAL SETTING AND INFORMATION

The purpose of this element of each separate Management Plan is to discuss the physical conditions that affect surface water, and existing applicable data.

This section includes land use maps to identify crops or crop categories relevant to the drainages in each Management Plan. The land use maps for drainages with management plans triggered under the previous Condition Waiver (Order R5-2009-030) are provided in Appendix D. Land use maps for new Management Plans triggered under the WDR will be added as these Management Plans are developed. The Coalition’s Groundwater Quality Assessment Report (GAR) maps are initially provided (by reference, in electronic formats compatible with standard GIS software) to satisfy this requirement. If other sources of data are used (e.g., Farm Evaluation data) these will also be provided in appropriate electronic formats for GIS. Management Plans will describe the watershed areas and associated COC(s) addressed by the plan (as described above.) If a water body is representative of other water bodies, the represented areas will be
identified. The applicable beneficial uses specified in the Basin Plan will be provided for the represented area water bodies.

Potential irrigated agriculture sources and other known sources of the COCs will be identified. If the sources are unknown, an optional Source Identification Study to determine the source(s) or to eliminate irrigated lands as a potential source may be proposed (see Section G). If an optional Source Identification Study is conducted, the results of the study will be referenced and summarized in the Management Plan.

The physical factors and processes affecting fate and transport of the COCs will be discussed, with a focus on the ability of agricultural management practices to influence these processes. A baseline inventory of relevant management practices affecting the COCs will be summarized. This baseline inventory of practices for each Management Plan will consist of the practices documented in the most recent Farm Evaluation data submitted by the Coalition to the Regional Water Board. The practices described in the Farm Evaluation data are summarized and localized to the Township level for the Annual Monitoring Report (AMR) as required by the WDR. Summaries for relevant individual practices in representative drainages and represented areas will be developed as needed for separate management plans.

Water quality data relevant and applicable to the COCs will be summarized and discussed as needed to develop and inform each of the Management Plans. Available data from existing water quality programs may be used, including but not limited to: Surface Water Ambient Monitoring Program (SWAMP); California State Water Resources Control Board (State Water Board) Groundwater Ambient Monitoring Assessment (GAMA) Program; United States Geological Survey (USGS); California Department of Public Health (DPH); California Department of Pesticide Regulation (DPR); California Department of Water Resources (DWR); and local groundwater management programs.

C. MANAGEMENT PLAN STRATEGY

The purpose of this section is to describe the Management Plan’s approach and strategy for implementation, the actions and tasks to achieve compliance, and the duties and responsibilities for individuals and groups to implement the plan.

Management Plan Approach

If a separate Management Plan includes and prioritizes multiple areas or constituents, the prioritization process and any schedule based on the prioritization must be discussed in this section. Currently, the Coalition prioritizes Management Plans by constituent category, as described previously and summarized in Table 3. The Coalition’s prioritization by constituent category may be reflected in extended schedules for lower priority constituents, but the schedules for separate Management Plans must be consistent with the compliance schedules of the WDR, which is require to be “as short as practicable, but may not exceed 10 years from the date the SQMP is submitted for approval by the Executive Officer.” Any schedule proposed in a Management Plan must be supported with appropriate technical or economic justification as to why the proposed schedule is as short as practicable. Additionally, variances from the constituent
prioritization described in this CSQMP should be identified and supported in each of the Management Plans.

**Actions and Tasks**

Each Management Plan includes a description of the actions and tasks that will be implemented to achieve compliance with the WDR’s applicable receiving water limits (Water Quality Objectives and ILRP Trigger Limits). These actions and tasks include measurable performance goals, member education, and management practices identification, validation and implementation.

**Performance Goals**

Management Plans will establish measurable performance goals aligned with the management plan strategy. Specific targets for implementation of specific practices and milestones for expected progress will be identified. The goals for management practice implementation should be feasible, consider the baseline implementation, and reasonably expected to result in achieving compliance with the Order’s receiving water limitations (Water Quality Objectives and Trigger Limits).

**Performance Goals and Criteria for Completion of Management Plan**

The successful completion of specific Management Plan elements will be determined by the Executive Officer of the Regional Water Board. There are two pathways specified in the WDR for successful completion of a specific management plan element:

- An approved Source Identification Study confirms that agriculture is not a contributing source of the exceedances, and the issue is referred to Regional Water Board staff for other appropriate actions;
- Agriculture contributes or is assumed to be a potential source, the source(s) are eliminated or controlled with improved management practices, and compliance with water quality objectives is demonstrated;

The criteria for completion of each of these pathways are illustrated in Figure 1. The specific criteria for each of these pathways will be clearly identified and documented for each Management Plan element.

Interim goals will also be set to track the progress of Management Plan implementation. These will include measures of outreach efforts (e.g., numbers of meetings with individual owners and growers, numbers of targeted workshops, numbers of mailings, advisory assistance to identify appropriate management practices), measures of management practice implementation, and measures of changes in water quality. The specific goals will be developed as appropriate for each element, and progress toward these goals will be tracked and reported in the annual Management Plan Progress Reports.

In addition to the WDR-specified pathways for completion, there are additional outcomes possible for triggered Management Plans (also illustrated in Figure 1):

- Agriculture is (or is assumed to be) a potential source, but compliance with water quality objectives is not achievable by reasonable and economically feasible agricultural management practices; or...
No conclusion can be reached regarding the probable source(s) of exceedances, and reasonable efforts to identify the source(s) have been exhausted.

In these cases, Management Plans are not considered to have been successfully completed based on WDR criteria, but the Coalition may request that the Executive Officer of the Regional Water Board determine that a Management Plan is complete or not required for these reasons on a case-by-case basis. All determinations that Management Plans are complete or not required for any reason must be approved by the Executive Officer.

**Member Education**

Management Plans will include outreach and education to inform members about the water quality exceedances, sources and factors affecting the transport of the COCs, and management practices for prevention and control of discharges of the COCs, and other applicable methods of maintaining or improving water quality. The Management Plan will discuss the methods of outreach and distributing information on relevant management practices to be implemented, and how the effectiveness of outreach efforts will be tracked and evaluated.

**Management Practices**

Management Plans will identify relevant and effective management practices to be implemented, and the goals for implementation. (The specific practices to be implemented by separate growers can’t be dictated by SVWQC or the Regional Water Board.) Goals for implementation of effective practices will include the timeline for implementation and interim milestones, if needed. Management practices to be implemented must be validated to be effective, technically and economically feasible, and expected to result in meeting receiving water limitation. If identification of appropriate practices is not possible within the required schedule to develop and submit the Management Plan, an estimated timeline to evaluate and identify new and/or appropriate practices should be included.

**Management Practice Implementation**

The need for increased implementation of management practices by irrigated agriculture is dependent on the outcome of the Source Identification Studies (if proposed and approved), and on the “baseline” management practices that are already implemented. In addition to any specific source identification efforts for each Management Plan, the process to identify expansion of management practices will consider the following elements:

- Meetings with individual landowners and/or growers to discuss water quality exceedances, possible sources, and management plan requirements and goals.
- Information for management practices already in place will be based on the most recently conducted Farm Evaluation surveys for the represented and representative management plan areas. Additional surveys may be conducted if needed, but are not required.
- Additional outreach may be conducted dependent on the results of source identification efforts and will provide growers options for additional appropriate management practices.

The results of these outreach efforts to assist in identifying effective and feasible practices for implementation will be documented and included in the required annual Management Plan Progress Reports.
Management Plan Implementation Schedule

The schedule for implementing Management Plans and management practices should generally be as short as reasonably practicable to achieve compliance, but must not exceed ten years from the date the separate Management Plan is submitted for approval. The schedules for Management Plans developed previously under the Coalition’s Conditional Waiver (Conditional Waiver Order R5-2006-0053) already comply with this criterion. Key milestones and a typical schedule for a high priority Management Plan are provided in Table 4. Schedules for each Management Plan may vary based on the priority of the Management Plan or due to resources available to the implementing subwatershed group, but should conform to the WDR schedule requirements (as short as practicable and achieving compliance in less than 10 years.) The minimum feasible schedule to complete a Management Plan is approximately 4 years if agriculture is a known or assumed source and implementation is effective in controlling the problem:

- During the 1\textsuperscript{st} year after a Management Plan is triggered: development and approval of Management Plan, initial outreach and education, beginning of management practice implementation
- 2\textsuperscript{nd} through 4\textsuperscript{th} year after trigger of Management Plan: Management Plan monitoring, continued outreach and education, continued implementation;
- 4\textsuperscript{th} year after trigger of Management Plan: If no additional exceedances are observed during 3 years of Management Plan monitoring, document water quality and management practice implementation and effectiveness, and submit request for EO approval of completion of management plan.

If agriculture is not initially a known or assumed source, and a Source Identification Study is approved and conducted, the schedule above could be extended by the time needed to conduct the study and confirm agricultural sources.
Table 4. Typical Management Practice Implementation Schedule and Milestones

<table>
<thead>
<tr>
<th>Implementation Element</th>
<th>Schedule or Frequency for High Priority Management Plans&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate data for new Management Plan requirements</td>
<td>Monthly, with Final Exceedance Reports for each sampling event</td>
</tr>
<tr>
<td>Submit Source Identification Study Workplan/Proposal (Optional)</td>
<td>Within 90 days after trigger of Management Plan</td>
</tr>
<tr>
<td>Submit Management Plan with Implementation Goals and Schedule, (NO optional Source Identification Study)</td>
<td>Within 90 days after trigger of Management Plan</td>
</tr>
<tr>
<td>Begin Outreach and Education</td>
<td>Within the 1&lt;sup&gt;st&lt;/sup&gt; year after Management Plan triggered</td>
</tr>
<tr>
<td>Begin Implementation of Management Practices</td>
<td>Within the 1&lt;sup&gt;st&lt;/sup&gt; year after Management Plan triggered</td>
</tr>
<tr>
<td>Continue Outreach and Implementation of Management Practices</td>
<td>Years 2 – 4 after Management Plan triggered</td>
</tr>
<tr>
<td>Monitor Water Quality</td>
<td>Years 2 – 4 after Management Plan triggered</td>
</tr>
<tr>
<td>Evaluate and document water quality and management practice implementation and effectiveness, and submit request for EO approval of completion</td>
<td>Year 4 after Management Plan triggered (if no additional agricultural exceedances)</td>
</tr>
<tr>
<td>Management Plan with Implementation Goals and Schedule (WITH optional Source Identification Study)</td>
<td>90 days after approval of Completed Source Identification Study, or Per Approved Source Identification Study Schedule</td>
</tr>
<tr>
<td>Source Identification Study and Report (Optional)</td>
<td>Per Approved Source Identification Study Schedule</td>
</tr>
<tr>
<td>Document Baseline Management Practice Implementation (Farm Evaluations)</td>
<td>Annually on May 1 before Management Plan development</td>
</tr>
<tr>
<td>Evaluate Implementation Progress</td>
<td>Documented Annually on May 1 in Management Plan Progress Reports</td>
</tr>
<tr>
<td>Update Management Plan Requirements List</td>
<td>Documented Annually on May 1 in Management Plan Progress Reports</td>
</tr>
<tr>
<td>Assessment of Management Plan effectiveness</td>
<td>Documented Annually on May 1 in Management Plan Progress Reports</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> Schedule may be extended for LOW and MEDIUM priority management categories (legacy pesticides, trace metals, DO, pH, pathogen indicators, and salinity).
Figure 1. Management Plan Completion Pathways

Management Plan Triggered

- Conduct Source Evaluation (Optional)

- Is Ag a contributor to the problem?
  - NO or INCONCLUSIVE
    - Evaluate and Document Management Practices
      - Are additional mgt practices effective, appropriate, and feasible?
        - NO
          - Document and request EO determination that additional implementation is not required based on infeasibility
        - YES
          - Implement Additional Appropriate Practices
            - Track and Document Implementation
            - Monitor Quality
  - YES
    - Revisit evaluations?

- Are WQQ targets met?
  - NO
    - Document Implementation and Effectiveness
      - Request Determination that Management Plan is Complete or Not Required
        - EO Approval?
          - NO
          - Management Plan Complete
        - YES
          - Revisit evaluations?
Duties and responsibilities

The general structure of responsibilities for actions and implementation for Management Plans are provided in this CSQMP. The overall roles and responsibilities of the entities that make up the Coalition (NCWA, Subwatershed Groups, Members) to implement the ILRP are provided in additional detail below and in the NCWA’s April 10, 2014 submittal to Regional Water Board to serve as the 3rd Party representing the Sacramento Valley watershed.

The duties and responsibilities of the individuals, groups, or specific entities implementing the Management Plan is briefly described in each of the Management Plans. Lead individuals involved in major aspects of the project (e.g., project lead, data manager, sample collection lead, lead for stakeholder involvement, quality assurance manager) are identified and their responsibilities described sufficiently for Management Plan implementation. Additionally, any outside individuals, entities, or agencies that will be contacted to obtain data or assistance with implementation should also be identified (e.g., County Agricultural Commissioners and Departments, Statewide Ambient Monitoring Program (SWAMP), California Department of Pesticide Regulation, etc.). A simple organization chart should be included to illustrate the relationships of entities and individuals with lead project responsibilities (see example in Figure 2). Roles and responsibilities for implementation are also summarized in Table 5.

Participants and Responsibilities for Implementation

The Sacramento Valley Water Quality Coalition (Coalition) was formed in 2002 to enhance and improve water quality in the Sacramento River Basin and to help growers and wetlands managers meet the requirements in the Irrigated Lands Regulatory Program (ILRP). The Coalition is comprised of farmers, wetlands managers, and affiliated state and local agricultural organizations, as well as local governments throughout the Sacramento River watershed, which is a twenty-one county region that spans from the Sacramento/San Joaquin Bay-Delta almost to the California-Oregon border.

On April 10, 2014, the Northern California Water Association (NCWA) on behalf of the Coalition’s Subwatershed Groups, submitted a request for the issuance of a Notice of Applicability (NOA) to continue to serve as a third-party entity to represent owners and operators of irrigated lands within the Sacramento River Watershed subject to General Order R5-2014-0030 (General Order). On May 7, 2015, NCWA received a NOA from the Regional Water Board Executive Officer approving NCWA to serve as the third-party group for the entire Sacramento River Watershed.

Nested within the Sacramento Valley Water Quality Coalition (Coalition) are a series of “subwatershed” groups coordinated by the Coalition. Each subwatershed has a lead (“Subwatershed Coordinator”) that can assist the Coalition and its members to successfully implement the ILRP in the Sacramento Valley: Northeastern California Water Association, Shasta-Tehama Water Education Coalition, Colusa-Glenn Subwatershed Program, Butte-Yuba-Sutter Water Quality Coalition, Dixon/Solano RCD Water Quality Coalition, Sacramento-Amador Water Quality Alliance, Upper Feather River Subwatershed Group, Placer-Nevada-South Sutter-North Sacramento Subwatershed Group, Napa County Putah Creek Watershed Group, Lake County Agricultural Watershed Group, the El Dorado County Agricultural Water Quality Management Corporation, Goose Lake Subwatershed and the Yolo County Farm Bureau Education Corporation Subwatershed Program (collectively, the “Subwatershed Groups”).

NCWA provides program management services on behalf of Coalition members to implement the Coalition’s Regional Plan for Action submitted to the Regional Water Board on June 30, 2003, the Monitoring and Reporting Program Plan (MRPP) submitted by the Coalition on August 25, 2008, and the existing Surface Water Quality Management Plan approved February 9, 2009. As the program evolves, NCWA’s role will expand to provide program management for groundwater quality elements of the
WDR and MRP, administrative oversight of contractors, financial services and support to implement new plans and any plan amendments.

NCWA, in consultation with the Coalition’s Management Advisory Committee (MAC), contracts for a variety of services to implement various elements of the WDR. These contractors conduct surface water quality sampling and analyses at the sites consistent with the Coalition’s WDR and MRP, develop surface and groundwater quality management plans, manage and implement the monitoring program, manage data, assist the Coalition with communication of water quality results to the Regional Water Board and growers, and prepare monitoring and various Management Plan reports and other program documents.

NCWA also communicates with the Regional Water Board and the State Water Resources Control Board on behalf of Coalition members regarding program implementation, and oversees management of data and Geographic Information System development for communications with growers and the Regional Water Board. NCWA coordinates any necessary legal services on behalf of the Coalition regarding the ILRP, and contracts with appropriate legal representation as necessary.

Each Subwatershed Group supplements the Coalition’s scientific and technical consultant team with additional local resources capable of reviewing technical reports prepared by contractors, and as appropriate, developing outreach strategies with growers to address water quality problems identified by monitoring. Each Subwatershed Group reviews drafts of the Annual Reports prepared by NCWA’s contractors and provides timely feedback. Each Subwatershed Group maintains a membership list of those agricultural irrigators and wetlands managers that participate and seek “coverage” under the ILRP and provide the list annually to NCWA.

For Coalition members to remain in good standing they must comply with the requirements of the WDR. Coalition members must annually submit current information on the number of irrigated acres. The WDR requires Members to provide the Coalition through each Subwatershed Group information including, but not limited to, completing and returning membership surveys, Farm Evaluations, Nutrient Management Plans, and Nutrient Management Summary Reports; preparing Sediment and Erosion Control Plans; attending grower meetings (where required by a high vulnerability designation); and implementing best management practices as needed to comply with the WDR.

A summary of organizational roles and responsibilities from NCWA’s application to serve as the representing third party for SVWQC is provided in Table 5.

**Accountability**

The Coalition supports a broad cross-section of interests throughout the Sacramento River Basin. Its members have a proven record of implementing programs for social, economic and environmental benefits. The Coalition is committed to a program focused on enhancing and improving water quality in the Sacramento River Basin while sustaining the economic viability of agriculture and the associated values of managed wetlands.

To ensure accountability, the Coalition is committed to providing written updates and status reports on implementation of its various programs to the Regional Water Board. The updates and reports are designed to identify progress made within the Sacramento River Basin and to provide the Regional Water Board an opportunity to review and comment on the progress of these efforts.

The Coalition, through NCWA and its consultant team maintains an institutional knowledge of the ILRP that assists local Subwatershed Groups in effectively responding to water quality exceedances identified by the monitoring program. With this capability in place, once an exceedance triggering a Management Plan is identified, the Coalition, along with its Subwatershed Groups, partners and members, make every effort to isolate and address the problem through improved management practices and/or other appropriate actions.
**Education and Outreach**

The Coalition’s and its member Subwatershed Groups’ education and outreach efforts will ensure that consistent plans and accurate messages regarding water quality issues will effectively reach dischargers in the region. The target audiences include, but are not limited to landowners, wetlands managers and farmers. The Coalition will act as a facilitator and central hub for the transfer of information among the Sacramento Valley subwatersheds and ultimately to the landowners, farmers and wetlands managers. Furthermore, the Coalition will facilitate the identification and distribution of relevant information from activities and projects developed in other areas of the Central Valley.

The outreach message has evolved over time, initiating with general water quality issues and management practice reviews, advancing to the communication of specific results by watershed monitoring programs and offering information on various management measures that could be adopted by farmers to improve water quality. The collaboration offered through the Coalition will ensure that useful and scientifically accurate information about management options that are appropriate for the crops and geographic conditions in the region is available in a timely fashion to farmers. The outreach message will continue to evolve, building upon both historic and new information, relying on a long-term collaborative effort among the people who live and work within the watershed.
Figure 2. Management Plan Project Organization

Typical Management Plan Project Organization and Responsibilities

SVWQC

Subwatershed Entity
Project Lead: NAME
Education and Outreach Lead: NAME

Subwatershed Members
Management Practice Implementation and Reporting

Contractors
Water Quality Data Lead: NAME
Quality Assurance Lead: NAME
Management Practice Data Lead: NAME
Reporting Lead: NAME
### Table 5. SVWQC Organizational Roles and Responsibilities

<table>
<thead>
<tr>
<th>Northern California Water Association</th>
<th>Surface and Ground Water Monitoring Contractors</th>
<th>Subwatershed Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage implementation of WDR and MRP Order in coordination with Subwatershed Groups</td>
<td>Prepare Annual Monitoring Plan for submittal to Regional Board. Summarize all water quality results for individual Subwatersheds.</td>
<td>Maintain knowledge of Waste Discharge Requirements (WDR) and Monitoring and Reporting Program (MRP) elements.</td>
<td>Respond to Coalition and Subwatershed Group requests for information</td>
</tr>
<tr>
<td>Communicate Water Quality results to subwatersheds and/or public</td>
<td>Implement Monitoring and Reporting Program (MRP) Elements for Surface Water and Groundwater</td>
<td>Conduct outreach to growers to communicate water quality results from exceedance reports, annual water quality summaries, etc.</td>
<td>Attend required Outreach meetings</td>
</tr>
<tr>
<td>Track, analyze and comment on Proposed and Adopted Basin Plan Amendments (e.g., Pyrethroids) related to ILRP requirements</td>
<td>Manage surface water quality monitoring program, including preparation of exceedance reports, Quality Assurance Quality Control, data submittals</td>
<td>Maintain membership participant list, submit annual list, coordinate outreach and enrollment of new members.</td>
<td>Implement Best Management Practices</td>
</tr>
<tr>
<td>Track State Budget and Legislation related to agricultural water quality, groundwater, or discharge permits that will impact Coalition members</td>
<td>Prepare Sediment and Erosion Control Assessment Report</td>
<td>Submit Annual Outreach materials for Annual Monitoring Report</td>
<td></td>
</tr>
<tr>
<td>Track proposed State Water Resources Control Board Policies on Nutrients, Biological Objectives, 303(d) Impaired Waterbodies List, etc.</td>
<td>Prepare Surface Water Quality Management Plans as required.</td>
<td>Review Annual Budget for Program and Monitoring prepared by NCWA. Maintain sound fiscal standing.</td>
<td></td>
</tr>
<tr>
<td>Represent SVWQC at CV-SALTS Meetings</td>
<td>Prepare Groundwater Quality Assessment Report</td>
<td>Distribute and collect Farm Evaluation, Nitrogen Management and Sediment Erosion Control template information</td>
<td></td>
</tr>
<tr>
<td>Manage Consultants (legal and technical) contracts and work product deliverables related to WDR/MRP</td>
<td>Prepare Groundwater Quality Management Plans as required.</td>
<td>Assist in development and implementation of Surface and Groundwater Management Plans</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide NCWA information required in WDR/MRP in format required</td>
<td></td>
</tr>
</tbody>
</table>
D. MONITORING DESIGN

The purpose of Management Plan monitoring is to measure and evaluate the effectiveness of the goals and objectives of the Management Plan. Each of the Management Plans must include monitoring designed to determine whether management practice changes made in response to the Management Plan are effective in controlling discharges of the COC and improving water quality. This is generally achieved by monitoring for the COC at the representative location during various stages of the agricultural use patterns (e.g., pre-planting, first bloom, vegetative growth, fruit set, pre-harvest) when agricultural constituents are most used or COC discharge is most likely. CDPR’s available PUR data are used to establish the schedule for monitoring of specific pesticides. The location(s) of the sites and the schedule for Management Plan monitoring are representative of the COC use in the watershed. This requirement of the WDR is determined by submittal and approval of the Coalition’s Annual Monitoring Plan Update, which includes all Management Plan monitoring. Management Plan monitoring generally occurs at the same locations as representative Assessment monitoring, but may include additional or alternative locations if needed for source identification or evaluation. Specific monitoring strategies will be described in each of the Management Plans. Monitoring methods are typically the same as used for the Coalition’s assessment monitoring, but any variations or new methods should also be adequately specified in each of the Management Plans.

**Monitoring**

The need for additional monitoring will be determined primarily based on the potential to provide useful information for source identification, in establishing causes of toxicity, and to evaluate management practice effectiveness. If additional monitoring is determined to be appropriate, the details of the monitoring required for each element will be documented, including the matrices and parameters to be analyzed, frequency of sampling, locations, and triggers for additional monitoring or follow-up. Integration of monitoring with regular Irrigated Lands Regulatory Program (ILRP) evaluation monitoring or coordination with other monitoring efforts will be considered and discussed, if appropriate. Management plan monitoring will be reviewed at least once per year, and revised as needed with the Annual Monitoring Update.

E. DATA EVALUATION

The methods to be used by the Coalition to evaluate the effectiveness of the implemented management practices and outreach will be documented in each of the Management Plans. Techniques used to analyze data may include graphical, statistical, modeling, or index calculation methods. The information used to quantify program effectiveness will most commonly consist of water quality data and/or management practice implementation data, but other sources of relevant information may also be used. The process for tracking implementation of management practices will generally rely on Farm Evaluation surveys, Nutrient Management Plans and Summary Reports, and Sediment and Erosion Control Plan data. These sources may be augmented with additional targeted surveys if needed for specific Management Plans.
Evaluation of Management Plan Effectiveness

The effectiveness of management plans will primarily be judged on improvements in water quality. However, interim performance goals are often necessary to evaluate progress toward these goals. Progress toward the implementation performance goals established for each subwatershed and management plan element will be evaluated and documented in the Annual Management Plan Progress Reports. Evaluation of effectiveness will generally be based on meeting the following types of performance goals:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members (and potential members, if appropriate)
- Return of surveys from 100% of Coalition members in the target drainages
- Documentation and reporting of baseline management practice inventory
- Implementation of numbers or percentages of specific additional management practices in target drainages (goals and schedule established in separate Management Plans).
- Specified decreases in number or frequency of exceedances, detections, or average concentrations (goals and schedule established in separate Management Plans).

F. RECORDS AND REPORTING

The Coalition submits a Management Plan Progress Report (MPPR) annually on May 1. The MPPR contains the reporting components required for each of the Management Plans. The Coalition also submits a Monitoring Plan Update report (annually on August 1) with the monitoring schedules and constituents for the upcoming monitoring year. These reports and schedules are consistent with the requirements in Appendix MRP-1 of the WDR. All required data and reports are submitted to the Regional Board electronically.

Documentation and Reporting

Reporting for the CSQMP will provide sufficient and timely information regarding achievement of the performance goals and interim milestones. The MPPR will document the results of Source Identification Studies and evaluations to determine the effectiveness of the management practice implementation. At a minimum, these evaluations will be conducted as scheduled in each of the Management Plans and reported annually in the MPPR. Data reports will be submitted on the same quarterly schedule and in the same formats as required by the MRP for all Coalition monitoring. The MPPR also includes the results of Management Plan monitoring for the previous year, documentation of outreach efforts, evaluation of progress toward management practice implementation goals, updates to the list of required Management Plans, and any recommendations for continuation or modification of the CSQMP.
G. SOURCE IDENTIFICATION STUDIES

Source Identification studies are not required, and the Coalition may develop a management plan for the COC(s) that meets the Management Plan requirements without conducting a Source Identification Study. If the Coalition chooses to conduct a Source Identification Study to determine the cause of a water quality problem, or to eliminate irrigated agriculture as a potential source, the proposed study must first be approved by the Executive Officer of the Regional Water Board, and must include at least the following elements:

- An evaluation of the types of practices, commodities, and locations that may be a source
- An assessment of the potential pathways through which waste discharges can occur
- Continued monitoring at the management plan site/area
- A schedule for conducting the study
- A description of the approach to estimate the contribution of agriculture through field studies or alternative means (field studies must at least be evaluated)

**Source Identification Strategies**

Source identification strategies proposed for the Management Plans will vary and will be specified for each pollutant category and drainage, and may include any of the following:

- Additional review of pesticide applications
- Evaluation of adequacy of analytical and sampling methods to identify sources
- Evaluation of Coalition and other monitoring data
- Identification of agricultural and non-agricultural sources (if information for non-agricultural sources is available)
- Evaluation of agricultural vs. non-agricultural source contributions
- Analysis and documentation of relevant site-specific information for irrigated parcels in the drainage (crops, pesticide use, irrigation practices, management practices in place, Coalition participants, etc.)
- Ground-level visual reconnaissance of the water body and potential agricultural discharges.
- Monitoring for relevant constituents of interest in addition to the COC

H. MANAGEMENT PLAN DOCUMENTS

Existing and newly required Management Plans are listed in Appendix A and relevant documents are compiled in Appendix B. All appendix materials are provided as electronic documents. Each Management Plan is identified by the representative water body and the COCs (e.g., “Willow Slough Diazinon Management Plan”). Titles for separate Management Plan documents should reference the representative water body, COCs, document type, draft/final status, and date for the document, (e.g., “Willow Slough_Diazinon_DRAFT MP_2015JUN17”, or “Willow Slough_Diuron_Selenastrum_Final SIR_2015JUN17”).
Existing Management Plans developed under the Coalition’s Conditional Waiver (Order R5-2006-0053) will continue to apply. (These are already largely consistent with the requirements of the WDR (Order No. R5-2014-0030)). Documentation for these previously developed Management Plans (including Source Evaluations, Management Plans and Addenda, Requests for Completion, Approvals) are provided in Appendix B.

New required HIGH priority Management Plans will be developed as described in this document as required by the WDR (Order No. R5-2014-0030-R1). Remaining HIGH priority Management Plans to be developed or updated will be submitted to the Regional Water Board for review per the schedules indicated in Appendix A. Generally, newly triggered HIGH priority Management Plans will be developed and submitted to the Regional Water Board by the due date for the Annual Report of the monitoring year in which each Management Plan was triggered, e.g., new HIGH priority Management Plans triggered during the 2016 monitoring year (OCT 2015-SEP 2016) will be submitted no later than May 1, 2017.

No workplans for Source Identification Studies are in preparation at this time. The need for a workplan for an initial Source Identification Study to eliminate irrigated agriculture as a source of arsenic exceedances in Lower Snake River (MEDIUM priority COC) will be determined based on preliminary information on non-ag sources for this drainage and the outcome of a request to determine that a Management Plan is not required.

The approach to develop remaining previously triggered Management Plans for legacy organochlorine pesticides (MEDIUM priority) will be to develop and submit requests for completion of the Management Plans or a determination that a Management Plan is not required, or workplans for Source Identification Studies focused on implementation of sediment and erosion control practices to address potential irrigated agricultural sources of COCs. The timeline to develop and submit the requests or workplans for these studies is by 1 May 2017.

The approach to develop previously triggered and new Management Plans for these LOW priority COCs (dissolved oxygen, pH, and *E. coli*) will be to develop and submit requests for completion of the Management Plans or a determination that a Management Plan is not required, or workplans for Source Identification Studies that address these COCs as a category. The Coalition initiated discussion of an alternative statistical approach to resolving DO and pH Management Plans in August 2016. The timeline to develop and submit the requests or workplans for Source Identification Studies is by 1 May 2017.

The Coalition is not required to provide a specific schedule for development of salinity Management Plans with this CSQMP because it is participating in the Central Valley Salinity Alternatives Long Term Solutions (CV-SALTS) process that will lead to the development of Salt and Nutrient Management Plans (SNMP) for subregions in the entire Central Valley. The CV-SALTS SNMPs will dictate how the Coalition manages salt in the Sacramento Valley watershed over the next decades, including compliance schedules for management. The Coalition is actively involved in the development of the Basin Plan Amendment.
Appendix A: List and Status of Required Management Plans

The status of triggered Management Plans is provided in the attached Microsoft Excel file “APPENDIX A Management Plan Status”. Information provided in this list includes the following:

- Subwatershed name
- Water Body
- Monitoring Site
- Management Plan constituent category
- Management Plan analyte (COC)
- Year the Management Plan was added
- Status of the Management Plan (Active, Completed, Suspended)
- Next Deliverable Required or Planned:
  - Implementation Progress Report (IPR)
  - Request to Complete Management Plan (RTC)
  - Workplans for Source Identification Study
  - Survey Data (reported with Management Plan Progress Reports)
  - Management Plan
  - Regional Strategy (CV-SALTS)

Management plans or management plan categories that are not yet addressed because it is unknown whether there is an irrigated agriculture cause or contribution (pathogens, DO, pH, etc.) are indicated by a deliverable of “Workplan”, e.g., for Source Identification Studies to eliminate irrigated agriculture.
Appendix B: Specific Management Plan
Implementation Documents

This Appendix provides the following materials and documents as separate attached files:

- List of separate Management Plans and documents developed to date
- Separate Management Plan documents with goals and schedule for outreach and implementation, including any source evaluation reports or addenda to initially developed Management Plans.
Appendix C: Water Quality Triggers
Table 5 Numeric water quality objectives from the Basin Plan, California Maximum Contaminant Levels (MCL) and the California Toxics Rule.

<table>
<thead>
<tr>
<th>Constituent / Parameter</th>
<th>Basin Plan Water Quality Objective</th>
<th>Numeric Water Quality Objectives</th>
<th>Source of Numeric Threshold</th>
<th>Numeric Threshold (a)</th>
<th>Units</th>
<th>MUN- MCL</th>
<th>MUN- Toxicity</th>
<th>AGR</th>
<th>MUN- MCL</th>
<th>MUN- Toxicity</th>
<th>Aquatic Life &amp; Consumption</th>
<th>AGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Abstracts Service (CAS) Registry Number (Synonym, if any)</td>
<td></td>
<td></td>
<td>(footnotes in parentheses are at bottom of table)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Arsenic</td>
<td>Baseline Plan. Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento; American River from Folsom Dam to the Sacramento River; Folsom Lake; and the Sacramento-San Joaquin Delta.</td>
<td>7440-38-2</td>
<td>Basin Plan. 1-hour average</td>
<td>0.025</td>
<td>µg/L</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chlorpyrifos</td>
<td>Pesticides</td>
<td>2921-88-2</td>
<td>Basin Plan. 1-hour average</td>
<td>0.025</td>
<td>µg/L</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coliform, fecal</td>
<td>Bacteria</td>
<td></td>
<td>Basin Plan (d) (e)</td>
<td>200/100</td>
<td>MPN/mL</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coliform, total</td>
<td>Bacteria</td>
<td></td>
<td>Basin Plan (d) (f)</td>
<td>400/100</td>
<td>MPN/mL</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Conductivity</td>
<td>Salinity</td>
<td>(at 25° C)</td>
<td>Basin Plan. North Fork of the Feather River; Middle Fork of the Feather River from Little Last Chance Creek to Lake Oroville; Feather River from the Fish Barrier Dam at Oroville to Sacramento River</td>
<td>150</td>
<td>µS/cm</td>
<td>IS</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(Electrical conductivity)</td>
<td></td>
<td>Basin Plan. Sacramento River</td>
<td>230 (50 percentile), µS/cm</td>
<td></td>
<td></td>
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<tr>
<td>Copper</td>
<td>Chemical Constituents</td>
<td></td>
<td>California Secondary MCL</td>
<td>900-1600</td>
<td>µS/cm</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Diazinon</td>
<td>Pesticides</td>
<td>50-29-3</td>
<td>Basin Plan. Delta Waterways, Sacramento River from Shasta Dam to Colusa Basin Drain, Sacramento River from the Colusa Basin Drain to I Street Bridge. Feather River from Fish Barrier Dam to Sacramento River; 1-hour average</td>
<td>0.16</td>
<td>µg/L</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Basin Plan. As above; 4-day average</td>
<td>0.10</td>
<td>µg/L</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
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March 2014 – Revised June 2015
<table>
<thead>
<tr>
<th>Constituent / Parameter</th>
<th>Basin Plan Water Quality Objective</th>
<th>Numeric Water Quality Objectives</th>
<th>Source of Numeric Quality Objective</th>
<th>Numeric Threshold (a)</th>
<th>Units</th>
<th>MUN- MCL</th>
<th>MUN- Toxicity</th>
<th>MUN- MCL</th>
<th>MUN- Toxicity</th>
<th>Aquatic Life &amp; Consumption</th>
<th>AGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved Oxygen, minimum</td>
<td>Basin Plan. Sacramento River from Keswick Dam to Hamilton City, 1 June – 31 August Basin Plan. Feather River from Fish Barrier Dam at Oroville to Honcut Creek Basin Plan. Waters designated WARM Basin Plan. Waters designated COLD and/or SPWN</td>
<td>Source of Numeric Quality Objective</td>
<td>9.0 mg/L</td>
<td>IS</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Lead</td>
<td>California Primary MCL (total lead) California Toxics Rule (USEPA) (dissolved lead)</td>
<td>Source of Numeric Quality Objective</td>
<td>15 µg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Nitrate (as nitrogen)</td>
<td>California Primary MCL</td>
<td>Source of Numeric Quality Objective</td>
<td>10 mg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrite (as nitrogen)</td>
<td>California Primary MCL</td>
<td>Source of Numeric Quality Objective</td>
<td>1 mg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>Nitrate-Nitrite (as nitrogen)</td>
<td>California Primary MCL</td>
<td>Source of Numeric Quality Objective</td>
<td>10 mg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>pH – minimum</td>
<td>Basin Plan</td>
<td>Source of Numeric Quality Objective</td>
<td>6.5 units</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>pH – maximum</td>
<td>Basin Plan</td>
<td>Source of Numeric Quality Objective</td>
<td>8.5 units</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Selenium, total</td>
<td>California Primary MCL</td>
<td>Source of Numeric Quality Objective</td>
<td>50 µg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Simazine</td>
<td>California Primary MCL</td>
<td>Source of Numeric Quality Objective</td>
<td>4 µg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Temperature</td>
<td>Baseline Plan (h)</td>
<td>Source of Numeric Quality Objective</td>
<td>variable</td>
<td>IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Total Dissolved Solids (TDS)</td>
<td>California Secondary MCL, recommended level</td>
<td>Source of Numeric Quality Objective</td>
<td>500 – 1,000 mg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Constituent / Parameter</td>
<td>Basin Plan Water Quality Objective</td>
<td>Numerical Water Quality Objectives</td>
<td>Source of Numeric Threshold</td>
<td>Numeric Threshold (a)</td>
<td>Units</td>
<td>MUN-MCL</td>
<td>MUN-Toxicity</td>
<td>AGR</td>
<td>MUN-MCL</td>
<td>MUN-Toxicity</td>
<td>Aquatic Life &amp; Consumption</td>
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<td>------------------------</td>
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<tr>
<td>Zinc</td>
<td>Chemical Constituents Toxicity</td>
<td>California Secondary MCL (total zinc)</td>
<td>variable 5,000 µg/L</td>
<td>µg/L</td>
<td>G &amp; IS</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
<td>7440-66-6</td>
<td>California Toxics Rule (USEPA) (g) (dissolved zinc)</td>
<td>variable</td>
<td>µg/L</td>
<td>IS</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Footnotes to Table 8:

- **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.
- **i** See Delta Waterways listed in Appendix 42 of the Basin Plan

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)

March 2014 – Revised June 2015
Appendix D: SVWQC Drainages and Representation

This Appendix provides the following materials and documents as separate attached files:

- APPENDIX D Drainages and Representation.XLSX
- Maps with Land Use for drainages with Management Plans
Appendix E: Approaches for Management Plan

Constituent Categories

The material in this Appendix presents additional details of the Coalition’s Management Plan approach for specific constituent categories identified in the CSQMP. This material is adapted and updated from the Coalition’s approved 2009 Management Plan to be consistent with the CSQMP required by the Coalition’s WDR (Order R5-2014-0030-R1.)
REGISTERED PESTICIDES

This element of the Management Plan addresses exceedances of numeric water quality objectives or numeric interpretations of narrative objectives for pesticides legally registered for use for agricultural purposes. The status of triggered Management Plans is provided in Appendix A. Implementation of this element of the management plan will be conducted on a drainage-specific basis for representative and represented drainages determined to require management of pesticide exceedances.

Review Data and Regulatory Basis for Exceedances

The need for developing management plans is determined by exceedances of “Water Quality trigger limits” established by the Regional Water Board ILRP. These trigger limits include adopted numeric Basin Plan water quality objectives, California Toxics Rule criteria, and unadopted numeric interpretations of Basin Plan narrative objectives. The first step in the implementation of this element of the management plan is a review of the Coalition’s monitoring data and the basis establishing the need for the management plan. The basis for these trigger limits will be reviewed and evaluated for regulatory and scientific validity. Generally, adopted numeric objectives and criteria will be determined valid without any substantial additional review. Trigger limits based on unadopted numeric interpretations may receive additional evaluation. Any substantial questions regarding validity or basis for the triggers used to determine exceedances will be summarized and provided to the Regional Water Board staff and the ILRP Technical Issues Committee for additional consideration, evaluation, and confirmation. Based on the results of these considerations, the exceedances and need for a pesticide-specific management plan may be reevaluated. However, development and implementation of management plans required by exceedances of these trigger limits will proceed according to the normal schedule while any additional considerations are completed.

Water bodies observed to have more than one exceedance within a three year period of numeric Basin Plan water quality objectives or numeric interpretations of Basin Plan narrative objectives for pesticides registered for agricultural uses are listed in Appendix A. Exceedances based on trigger limits requiring additional evaluation are discussed in the separate Management Plans in Appendix B.

Source Identification

The following source identification efforts will be conducted on a drainage-specific basis to identify sources of pesticides and to evaluate potential agricultural and non-agricultural contributions to pesticide exceedances:

- Review of pesticide application data: Pesticide application data from California Department of Pesticide Regulations (CDPR) will be compiled and reviewed to determine whether the registered pesticides are used or likely to be used by irrigated...
agriculture in the affected drainages. Data will be compiled for applications of the specific pesticides in the affected drainages. Application data will be evaluated for use patterns and timing, and will consider characteristics that affect fate and transport (e.g., solubility and half-life). For instance, a longer period of application data would be considered when evaluating insoluble, sediment-bound pesticides with longer half-lives. The results of these evaluations will be confirmed by consultation with County Agricultural Departments. If necessary, patterns of use of specific pesticides of concern may also be confirmed through the surveys designed to collect Management Practice implementation data from growers (described below in Management Practice Implementation).

- Identification of potential agricultural and non-agricultural sources: Agricultural and non-agricultural sources of the pesticides will be identified and relative contributions will be evaluated based on pesticide use and application data, as well as relevant information for non-reported uses such as consumer retail sales and use. The relative importance of contributions will consider the percentage of land use comprised by each potential source, and their proximity and connection to surface waters of the drainage. The primary purpose of this evaluation is to determine whether irrigated agriculture is a likely source of the pesticides of concern. The secondary purpose is to identify other potential substantial non-agricultural sources.

- The following drainage-specific information for potential pesticide sources will be integrated into the separate Management Plans: reported use of the specific pesticides of concern by crop or commodity; crops by percent of the total irrigated acreage and total acreage; relevant application and irrigation practices; an initial list of the types of relevant management practices thought to be currently in use; and percent of agricultural acreage represented by Coalition participants in the representative and represented drainages. Potential sources will be prioritized by reported use of specific pesticides of concern, drainage distance and connectivity to water bodies, percent of irrigated acreage and total acreage, pesticide application and irrigation practices, and relevant management practices. The purpose of this evaluation is to prioritize potential agricultural sources for outreach and management practice implementation. Schedules and goals for additional management plan elements (e.g., management practice implementation) will be developed and modified based on the results of the source evaluation.

Management Practice Implementation

As discussed in the “Overall Approach,” implementation of specific additional appropriate management practices will depend on the outcome of optional Source Identification Studies conducted and on “baseline” practices already in place. If irrigated agriculture is a potential source of the pesticide(s) of interest, the process to identify appropriate additional management practices will include the following elements:
If potential irrigated agricultural sources of pesticides are confirmed, the baseline for management practices already in place in the targeted drainages will be based on Farm Evaluation data collected and reported annually in May. This information will be used to determine whether implementation of additional management practices is appropriate and feasible, and to establish goals for additional management practice implementation. Identification of options for appropriate management practices may be coordinated with Coalition for Urban/Rural Environmental Stewardship (CURES), University of California Cooperative Extension (UCCE), County Agriculture Departments, Natural Resources Conservation Service (NRCS), Resource Conservation Districts (RCDs), farm input suppliers, and pest control advisors, depending on the available resources. The specific coordinating entities are expected to vary in the different Coalition subwatersheds. Farm Evaluation data will also be used to measure and track progress toward the goals established for BMP implementation, and will be augmented by additional survey questions as needed for specific Management Plans.

- Develop a list of prioritized BMPs specific to pesticides of concern, and establish goals and schedule for additional implementation

- Meetings with individual landowners and/or growers to discuss exceedances, sources of pesticides, and management plan requirements and goals.

- Additional targeted outreach will be conducted dependent on the results of source identification efforts and will provide options for additional appropriate management practices. Outreach will be prioritized and directed to users and potential users of the pesticides of concern.

- Implementation actions will be coordinated with the Department of Pesticide Regulation and County Agriculture Departments when possible and appropriate. The need to coordinate with these entities will be determined on a case-by-case basis, based on the requirements or effectiveness of their authority to address specific pesticide related issues. In most cases, it is expected that this coordination would consist of keeping the Department of Pesticide Regulation informed of the issues, while working with the County Agriculture Departments to resolve issues.

### Implementation Schedule

The schedule for development and implementation of additional management practices will generally be conducted as described in the overall Management Plan approach. The schedule includes quarterly progress meetings with the Regional Water Board ILRP staff. The specific schedules for site-specific and parameter-specific Management Plans are documented in **Appendix B**. The results of source identification efforts will be used to prioritize drainages or commodities by greatest use potential for the specific pesticides of concern and lowest rates of
BMP implementation. These priorities will be reflected in the schedule and scope of Management Plan implementation.

**Completion Criteria and Performance Goals**

The successful completion of the Management Plan will be determined by the Executive Officer of the Regional Water Board. The possible pathways for successful completion of this element of the management plan are described in the Overall Approach. Because the relative contributions to specific pesticide exceedances will generally not be able to be quantified, these criteria are generally qualitative, with the exception of compliance with water quality objectives. Consequently, determination that a specific criterion has been met will be based on a “weight of evidence” approach in consultation with Regional Water Board staff and approved by the Executive Officer of the Regional Board. Determination of compliance with water quality objectives for pesticides will be determined to occur when no more than one exceedance of the appropriate trigger limit has been observed in three years of the specified management plan monitoring.

Progress toward the implementation goals established for each Management Plan will be evaluated and documented in annual Management Plan Progress Reports. Specific performance goals will include the following:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members (and potential members, if appropriate)
- Return of Farm Evaluation and other management practice surveys from Coalition members in the representative and represented drainages.
- Implementation of numbers or percentages of specific additional management practices in representative and represented drainages (goals and schedule established in separate Management Plans).
- Specified decreases in number or frequency of exceedances, detections, or average concentrations (goals and schedule established in separate Management Plans).

### Table 1. Pesticide Management Plan Completion Criteria

<table>
<thead>
<tr>
<th>Management Plan Pathway</th>
<th>Criteria for Successful Completion</th>
<th>Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture eliminated as source of exceedances</td>
<td>Pesticide confirmed not to have significant irrigated agricultural sources by an approved Source</td>
<td>Issue is referred to Regional Water Board staff for</td>
</tr>
<tr>
<td>Identification Study;</td>
<td>appropriate actions.</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
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<td></td>
</tr>
</tbody>
</table>
| 2. WQOs achieved by | • Irrigated agricultural sources likely; **AND**  
| control of probable | • Appropriate additional agricultural management  
| agricultural source(s) | practices have been identified, implemented, and  
| of exceedances       | documented; **AND**  
|                     | • Demonstrated achievement of water quality objectives | Periodically reevaluate compliance per MRP monitoring schedule. |
| 3. WQOs not achieveable by control of probable agricultural source(s) of exceedances | • Irrigated agricultural sources likely; **AND**  
|                     | • WQOs not achieved or expected to be achieved; **AND**  
|                     | • No additional appropriate management practices are possible or economically feasible; | Infeasibility is documented and issue is referred to Regional Water Board staff for appropriate actions. |
| 4. Probable sources not identified | • Sources of specific pesticides not identified by approved Source Identification Study; **AND**  
|                     | • All reasonable efforts at source ID exhausted | Documented and referred to Regional Water Board staff for appropriate actions. |

### Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water quality and meeting water quality objectives. In the interim, the effectiveness of the management plan will be evaluated based on meeting the interim performance goals described above and in separate Management Plans. Progress toward the implementation performance goals established for each subwatershed and management plan element will be evaluated and documented in annual Management Plan Progress Reports as established in approved Management Plans.

### Monitoring

Monitoring proposed to be performed is established in separate Management Plans and in the annual Monitoring Plan Updates. Some sites will continue to be monitored routinely as part of the Coalition’s ongoing monitoring effort. Other sites will be monitored during high use periods for the specific pesticide(s) of concern in that drainage. Sites will continue to be monitored for specific pesticides as needed to evaluate success of implemented management practices. Specific seasons and timing of the monitoring will be based on pesticide use patterns determined in the source identification evaluations and monitoring results. Any changes to the approved monitoring schedule must be approved by Regional Water Board staff prior to implementation.

### Participants Responsible for Implementation

The participants responsible for implementing specific elements of the Management Plans are documented in **Appendix B**.
Reporting

If a Source Identification Study is not proposed and conducted, the results of initial source identification efforts described above will be integrated into the Management Plans. The information will include the results of data reviews, any trigger limit evaluations, pesticide application reviews, source identification and evaluation, documentation of initial outreach meetings, and recommendations for the Management Plan monitoring. All other reporting for this category of Management Plans will be scheduled as proposed in the Overall Management Plan Approach and in separate Management Plans in Appendix B.
TOXICITY IN WATER AND SEDIMENT

This element of the Management Plan addresses exceedances of narrative objectives for toxicity in the Basin Plan. The status of triggered Management Plans is provided in Appendix A. Implementation of this element of the management plan will be conducted on a drainage-specific basis for the drainages determined to require management of toxicity exceedances.

Source Identification

The following source identification efforts will be conducted on a drainage-specific basis to identify causes and sources of toxicity, and to evaluate potential agricultural and non-agricultural contributions to toxicity. The primary distinction between source identification efforts for aquatic and sediment toxicity is a focus on soluble or more hydrophobic sediment-associated pesticides or other contaminants. If initial efforts do not provide sufficient information to determine the causes of toxicity, the potential role of irrigated agriculture, or to develop appropriate management practice implementation goals, any of the evaluations described may be deferred to a workplan proposal to conduct an optional Source Identification Study that meets the requirements of the WDR.

- Evaluation of Coalition Monitoring Data: Coalition data for toxicity, TIEs, chemistry, and follow-up analyses will be reviewed to identify potential causes and sources of the observed cases of toxicity. Data for all potentially toxic ILRP analytes will be evaluated to identify or eliminate potential causes of toxicity, including pesticides, trace metals, and ammonia. This evaluation will also consider known potentially additive or synergistic effects of detected analytes, based on interactions documented in literature and on similar modes of action.

- Additional review of pesticide applications: If toxicity cannot be reasonably attributed to constituents monitored for the ILRP, additional review of pesticide application data may be conducted to evaluate whether other unmonitored pesticides have potential to contribute to toxicity. Data will be compiled for pesticide applications in the specific parcels in the affected drainages. The period of application data reviewed will depend on the type of toxicity (aquatic or sediment) and likely causes of toxicity, but will include at least the month prior to and including the sample dates of each sample determined to be significantly toxic. Applied pesticides will be evaluated to identify or eliminate potential causes of toxicity based on the use pattern and timing, toxicity characteristics, and physical and chemical characteristics. TIE procedures used previously will be reviewed to determine whether these procedures were appropriate for the characteristics of specific unmonitored pesticides of concern, and recommendations will be made for modifications, if appropriate. Pesticides determined likely to cause or contribute to the observed toxicity may be added to the list of monitored constituents, if appropriate methods are available.
Identification of agricultural and non-agricultural sources: Agricultural and non-agricultural potential sources or causes of toxicity determined above will be identified and their relative contributions will be evaluated. Non-agricultural sources may include pesticide applications for mosquito abatement or weed control on rights-of-way, urban or rural residential runoff, treated wastewater, etcetera).

The results of initial source evaluations and any approved Source Identification Study will be integrated into the separate Management Plans: crops by percent of the total irrigated acreage and total acres, pesticide use by crop or commodity, irrigation practices, management practices currently in place, and Coalition participants. Potential sources will be prioritized by reported use of identified causes of toxicity, drainage distance and connectivity to water bodies, percent of total irrigated acreage and total acres, and use of relevant management practices. Schedules and goals for additional management plan elements (e.g., management practice implementation) will be developed and modified based on the results of the source evaluations.

Management Practice Implementation

As discussed in the “Overall Approach”, implementation of specific additional appropriate management practices will depend on the outcome of the source identification evaluations described above and on “baseline” practices already in place. In addition to the source identification efforts described above, the process to identify appropriate additional management practices will include the following elements:

- If irrigated agricultural sources of pesticides are not ruled out by initial source evaluations or an approved Source Identification Study, Farm Evaluation data for relevant management practices already in place in the targeted drainages will be evaluated. Evaluations related to sediment toxicity will include erosion and sediment management practices. This information will be used to determine whether implementation of additional management practices is appropriate and feasible, and to establish goals for additional management practice implementation. Identification of options for appropriate management practices may be coordinated with CURES, UCCE, County Agriculture Departments, NRCS, RCDs, farm input suppliers, and pest control advisors, depending on the available resources. The specific coordinating entities are expected to be different for the different Coalition subwatersheds. Farm Evaluation data will be used to measure and track progress toward the goals established for BMP implementation, and will be augmented by additional survey questions as needed for specific Management Plans.

- If the cause of toxicity is determined to be registered pesticides or other specific agricultural sources, meetings will be held with individual landowners and/or growers to discuss exceedances, possible sources, and management plan requirements and goals.
Additional outreach will be conducted dependent on the results of source identification efforts and will provide options for additional appropriate management practices.

**Implementation Schedule**

The schedule for development and implementation of additional management practices will generally be conducted as described in the overall Management Plan approach. The schedule includes quarterly progress meetings with the Regional Water Board ILRP staff. The schedules for site-specific and parameter-specific Management Plans are documented in Appendix B. The results of source identification efforts may be used to prioritize drainages or commodities by greatest use potential for the specific identified causes of toxicity or the lowest rates of BMP implementation. These priorities will be reflected in the schedule and scope of Management Plan implementation.

**Completion Criteria and Performance Goals**

The successful completion of the Management Plan will be determined by the Executive Officer of the Regional Water Board. The possible pathways for successful completion of this element of the management plan are described in the Overall Approach section.

The criteria for completion of each of these pathways are summarized in Table 2 and the pathways are illustrated in the Overall Management Plan Approach. Because the specific causes of toxicity exceedances may not be known and may not be determined in spite our best efforts, these criteria are generally qualitative, with the exception of compliance with water quality objectives. Consequently, determination that a specific criterion has been met will be based on a “weight of evidence” approach in consultation with Regional Water Board staff and approved by the Executive Officer of the Regional Board. Determination of compliance with water quality objectives for toxicity will be determined to occur when no more than one exceedance of the ILRP trigger has been observed in three years of the specified management plan monitoring.

Progress toward the implementation performance goals established for each subwatershed will be evaluated and documented in annual Management Plan Progress Reports. Specific performance goals will include the following:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members
- Return of Farm Evaluation and other management practice surveys from Coalition members in the representative and represented drainages.
- Implementation of numbers or percentages of specific additional management practices in target drainages (goals and schedule established in separate Management Plans).
Specified decreases in frequency of exceedances, detections, or average concentrations (goals and schedule established in separate Management Plans).

Table 2. Toxicity Management Plan Completion Criteria

<table>
<thead>
<tr>
<th>Management Plan Pathway</th>
<th>Criteria for Successful Completion</th>
<th>Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture eliminated as probable source of exceedances by an approved Source Identification Study</td>
<td>• Probable specific toxicant(s) are identified; <strong>AND</strong>&lt;br&gt;• Probable specific toxicant(s) confirmed not to have significant agricultural sources; <strong>OR</strong>…&lt;br&gt;• Probable specific toxicant(s) not identified; <strong>AND</strong>&lt;br&gt;• The weight of evidence of TIEs, monitoring data, and pesticide use evaluations all support a conclusion that agriculture is not a significant source;</td>
<td>Issue is referred to Regional Water Board staff for appropriate actions.</td>
</tr>
<tr>
<td>2. WQOs achieved by control of probable agricultural source(s) of exceedances</td>
<td>• Probable specific toxicant(s) identified; <strong>AND</strong>&lt;br&gt;• Potentially significant agricultural sources likely; <strong>AND</strong>&lt;br&gt;• Appropriate additional agricultural management practices have been identified, implemented, and documented; <strong>AND</strong>&lt;br&gt;• Demonstrated achievement of water quality objectives</td>
<td>Periodically reevaluate compliance per MRP monitoring schedule.</td>
</tr>
<tr>
<td>3. WQOs not achievable by control of probable agricultural source(s) of exceedances</td>
<td>• Specific toxicant(s) identified; <strong>AND</strong>&lt;br&gt;• Potentially significant agricultural sources are likely; <strong>AND</strong>&lt;br&gt;• WQOs not achieved or expected to be achieved; <strong>AND</strong>&lt;br&gt;• No additional appropriate management practices are possible or economically feasible;</td>
<td>Infeasibility is documented and issue is referred to Regional Water Board staff for appropriate actions.</td>
</tr>
<tr>
<td>4. Probable sources not identified</td>
<td>• Probable specific toxicant(s) not identified by an approved Source Identification Study; <strong>AND</strong>&lt;br&gt;• All reasonable efforts at source ID exhausted</td>
<td>Documented and referred to Regional Water Board staff for appropriate actions.</td>
</tr>
</tbody>
</table>

Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water quality and meeting water quality objectives. In the interim, the effectiveness of the management plan will be evaluated based on meeting the interim performance goals established for the Management Plan. Progress toward the implementation performance goals established for each
subwatershed and Management Plan will be evaluated and documented in annual Management Plan Progress Reports.

**Monitoring**

Monitoring proposed to be performed is established in separate Management Plans and in the annual Monitoring Plan Updates. Most sites will continue to be monitored routinely as part of the Coalition’s ongoing monitoring effort. TIEs and serial dilution testing required by the MRP will continue to be conducted at these sites. Additional sampling and analysis of water or sediment may be added if needed for an approved Source Identification Study. These analyses will include appropriate toxicity testing, and pesticides or other parameters as recommended by the results of the source identification element of the Management Plan. Specific seasons and timing of the monitoring will be determined based on the results of the source identification evaluations and monitoring results. Any changes to the approved monitoring schedule must be approved by Regional Water Board staff prior to implementation.

**Participants Responsible for Implementation**

The participants responsible for implementing specific elements of the Management Plans are documented in Appendix B.

**Reporting**

If a formal Source Identification Study is not proposed and conducted, the results of initial source identification efforts and the inventory of baseline management practices described above is integrated into the Management Plans for toxicity or specific identified COCs. The information typically includes the results of data reviews, pesticide application reviews, source identification and evaluation, documentation of initial outreach meetings, and recommendations for Management Plan monitoring. All other reporting for this category of Management Plans will be scheduled as proposed in the Overall Management Plan Approach and in separate Management Plans in Appendix B.
PATHOGEN INDICATORS

This element of the Management Plan addresses exceedances of *E. coli* bacteria that are used primarily as indicators of other human pathogenic organisms, including protozoans and viruses that are not be effectively monitored directly. Exceedances of pathogen indicators reflect a regional issue that affects the entire Central Valley. Consequently, pathogen indicator Management Plans will be developed and implemented on a regional basis in coordination with the Central Valley Regional Water Board and potentially in coordination with other ILRP Coalitions.

**Review Data and Regulatory Basis for Exceedances**

The need for developing management plans is determined by exceedances of “Water Quality trigger limits” established by the Regional Water Board ILRP. These trigger limits include adopted numeric Basin Plan water quality objectives, California Toxics Rule criteria, and unadopted numeric interpretations of Basin Plan narrative objectives. The first step in the implementation of this element of the management plan is a review of the data and the basis establishing the need for the management plan. The basis for these trigger limits will be reviewed and evaluated for regulatory and scientific validity. Generally, adopted numeric objectives and criteria will be determined valid without any substantial additional review. Trigger limits based on unadopted numeric interpretations may receive additional evaluation. For pathogen indicators, this may include an optional review of numeric Basin Plan water quality objectives or numeric interpretations of Basin Plan narrative objectives used to determine exceedances. A review may evaluate the regulatory and scientific basis for the objectives, the beneficial uses that these objectives are intended to protect and their applicability to the affected drainages, and allowable exceedance frequencies. Any substantial questions regarding validity or interpretation of the objectives used to determine exceedances will be summarized and provided to the Regional Water Board staff and the ILRP Technical Issues Committee for additional consideration and evaluation. Based on the results of these evaluations, the exceedances and need for a pathogen management plan may be reevaluated. However, development and implementation of management plans required by exceedances of the trigger limits will proceed while any additional considerations are completed.

Water bodies observed to have more than one exceedance of numeric Basin Plan water quality objectives or numeric interpretations of Basin Plan narrative objectives for pathogens are listed in **Appendix A**. Exceedances based on trigger limits requiring additional evaluation (if any) are discussed in the separate Management Plans in **Appendix B**.

**Source Identification**

The primary challenge in developing a management plan for pathogen indicators is determining the sources of the exceedances. Sources of the organisms used as pathogen indicators – *E. coli* in
this case – include all warm blooded animals (humans, domestic pets and livestock, waterfowl and other birds, and other assorted wildlife of all kinds). Consequently, *E. coli* is everywhere in the environment and there are typically multiple potential sources for virtually every water body, which presents significant challenges in source identification. The Coalition implemented and completed a preliminary source identification study that suggested that sources other than agriculture were primarily responsible for most exceedances of objectives for pathogen indicators. However, the results of these preliminary efforts were determined not to be adequately definitive for source identification or elimination of agriculture as a source. Going forward, the Coalition’s approach to address Management Plans required for *E. coli* will be to consult and collaborate with the Regional Water Board to develop and submit a workplan for a Source Identification Study that addresses this LOW priority COCs as a category. The specific objectives and time frame for conducting the study have not yet been established.

The workplan for the Source Identification Study for pathogens will focus on the following elements:

- The Coalition will survey Coalition members to inventory applications of animal wastes on agricultural fields and any related management practices.

- Irrigated acreage used for grazing operations will be catalogued and compared to other known sources and total contributing irrigated acreage in the drainages.

- Implementation of relevant management practices for grazing on irrigated pastures, sediment and erosion control, and irrigation and runoff management.

- A field survey (i.e. “creek walk”) may be considered for affected drainages. The primary purpose of these field surveys would be to identify and document potential non-agricultural and agricultural sources of pathogens and indicators, such as septic system discharges, wildlife activity, access by cattle, etc. The decision to conduct field surveys will be determined primarily based on completeness of access, cost of survey, and available resources to conduct the surveys.

- The information above will be compiled and evaluated to assess whether irrigated agriculture can be effectively eliminated as a source of exceedances. If irrigated agriculture is determined to be likely to be contributing to exceedances, the information will be evaluated to determine if additional implementation of management practices is economically feasible and likely to result in achieving compliance in receiving waters.

**Management Practice Implementation**

Implementation of specific additional appropriate management practices will depend on the results of the Coalition’s approved Source Identification Study (outlined above) and on the
baseline management practices already in place. To support source identification efforts, the Coalition’s efforts to identify appropriate additional management practices will initially include:

- Discussions with landowners and/or growers of possible sources of pathogens, Management Plan requirements and goals, and options for management practices. These discussions will be incorporated into scheduled public outreach meetings for the Subwatersheds or regions.

- Information for relevant cultural practices and management practices already in place will be based on Farm Evaluation data collected and reported annually in May, augmented as needed to provide information on management practices not included in the Farm Evaluations. This information will be used with source evaluation results to determine whether implementation of additional management practices is appropriate and feasible, and subsequently to establish goals for additional management practice implementation if needed. Identification of options for appropriate management practices may be coordinated with CURES, UCCE, County Agriculture Departments, NRCS, and RCDs, depending on the available resources. The specific coordinating entities are expected to vary in the different Coalition subwatersheds.

- Additional targeted outreach may be conducted dependent on the results of source identification efforts and will provide options for additional appropriate management practices. Outreach will be prioritized and directed to likely agricultural sources of pathogen indicator organisms.

Implementation Schedule

The schedule for development and implementation of additional management practices will be conducted as described in the overall Management Plan approach. The schedule will include quarterly progress meetings with the Regional Water Board ILRP staff. Schedules for site-specific and parameter-specific Management Plans are documented in Appendix B. The results of source identification efforts will be used to prioritize drainages or commodities by greatest potential for contributing to elevated pathogens and the lowest rates of management practice implementation. These priorities will be reflected in the schedule and scope of management plan implementation.

Completion Criteria and Performance Goals

The successful completion of the Management Plan will be determined by the Executive Officer of the Regional Water Board. The possible pathways for successful completion of this element of the management plan are described in the Overall Approach section.

The criteria for completion of each these pathways are summarized in Table 3. Because the relative contributions to pathogen indicator exceedances will generally not be able to be
quantified, these criteria are generally qualitative, with the exception of compliance with water quality objectives. Consequently, determination that a specific criterion has been met will be based on a “weight of evidence” approach in consultation with Regional Water Board staff and approved by the Executive Officer of the Regional Board. Determination of compliance with water quality objectives for pathogens will be determined to occur when no more than one exceedance of the water quality objective or trigger limit has been observed in three years of the specified management plan monitoring.

Progress toward the implementation performance goals established for each subwatershed will be evaluated and documented in annual Management Plan Progress Reports. Specific performance goals will include the following:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members (and potential members, if appropriate)
- Return of waste application and management practice surveys from 100% of Coalition members in the target drainages (in June of 2\textsuperscript{nd} year following trigger of management plan requirement).
- Documentation and reporting of baseline management practice inventory from surveys (in September of 2\textsuperscript{nd} year following trigger of management plan requirement)
- Implementation of numbers or percentages of specific additional management practices in target drainages (goals and schedule established in Management Plan Progress Report).
- Specified decreases in frequency of exceedances (goals and schedule established in Management Plan Progress Report).

<table>
<thead>
<tr>
<th>Management Plan Pathway</th>
<th>Criteria for Successful Completion</th>
<th>Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture eliminated as source of exceedances</td>
<td>E. coli bacteria confirmed not to have significant irrigated agricultural sources;</td>
<td>Issue is referred to Regional Water Board staff for appropriate actions.</td>
</tr>
<tr>
<td>2. WQOs achieved by control of probable agricultural source(s) of exceedances</td>
<td>Irrigated agricultural sources of E. coli bacteria confirmed; AND Appropriate additional agricultural management practices have been identified, implemented, and documented; AND</td>
<td>Periodically reevaluate compliance per MRP monitoring schedule.</td>
</tr>
</tbody>
</table>
• Demonstrated achievement of water quality objectives

3. WQOs not achievable by control of probable agricultural source(s) of exceedances
• Irrigated agricultural sources of E. coli bacteria confirmed; AND
• WQOs not achieved or expected to be achieved; AND
• No additional appropriate management practices are possible or economically feasible;

Infeasibility is documented and issue is referred to Regional Water Board staff for appropriate actions.

4. Probable sources not identified
• Probable specific toxicant(s) not identified by approved Source Identification Study; AND
• All reasonable efforts at source ID exhausted

Documented and referred to Regional Water Board staff for appropriate actions.

Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water quality and meeting water quality objectives. In the interim, the effectiveness of the management plan will be evaluated based on meeting the interim performance goals described above. Progress toward the implementation performance goals established for each subwatershed and management plan element will be evaluated and documented in annual Management Plan Progress Reports.

Monitoring

Monitoring proposed to be performed is established in separate Management Plans and in the annual Monitoring Plan Updates. Monitoring to be performed for pathogen indicator Management Plans will typically include two elements: (1) the Coalition’s ongoing Assessment monitoring effort continues to routinely monitor for pathogen indicators; (2) Additional monitoring may be conducted as part of an approved bacterial source identification study (currently under development). Any changes to approved monitoring schedules must be approved by Regional Water Board staff prior to implementation.

Participants Responsible for Implementation

All Coalition subwatersheds will contribute to implementation of this Management Plan through their participation in the Coalition. Other ILRP coalitions and the Central Valley Regional Water Board are also expected to participate in the source identification study under development.

The participants responsible for implementing specific elements of the Management Plan are specified in Appendix B.

Reporting

The schedule and scope for reporting for the bacterial Source Identification Studies will be as required by the approved studies. The reports are expected to include the results of data reviews,
source identification and evaluations, and documentation of the results of initial outreach meetings. All other reporting for this category of Management Plans will be scheduled as proposed in the Overall Management Plan Approach and in separate Management Plans in Appendix B.
LEGACY ORGANOCHLORINE PESTICIDES

This element of the Management Plan addresses exceedances of numeric water quality objectives for legacy organochlorine pesticides. The status of triggered Management Plans is provided in Appendix A. Implementation of this element of the management plan will be conducted on a drainage-specific basis for the drainages determined to require management of legacy organochlorine pesticides.

The approach to develop Management Plans for legacy organochlorine pesticides (MEDIUM priority) will be to consult and collaborate with the Regional Water Board to develop and submit workplans for Source Identification Studies focused on erosion potential and implementation of sediment and erosion control practices to address potential irrigated agricultural sources COCs.

Review Data and Regulatory Basis for Exceedances

Coalition monitoring data and the regulatory basis for determination of exceedances will be evaluated and summarized. Review of the monitoring data will include any seasonal patterns in exceedances that can be used to focus future monitoring efforts. Evaluation of the regulatory basis will focus on the beneficial uses that these objectives are intended to protect and to confirm their applicability to the affected drainages and appropriate averaging periods and allowable exceedance frequencies. Any substantial questions regarding implementation of the objectives used to determine exceedances will be summarized and provided to the Regional Water Board staff and the ILRP Technical Issues Committee for additional consideration and evaluation. Based on the results of these evaluations, the exceedances and need for a Management Plan may be reevaluated. However, development and implementation of Management Plans required by exceedances of the objectives will proceed while any additional regulatory considerations are completed.

Source Identification

Historical uses are considered the only significant sources of these legacy pesticides. Because no legitimate uses remain for agriculture or other sources, no formal source identification efforts will be undertaken to determine whether there are current sources of these pesticides. For the purpose of this management plan, it will be assumed that potential irrigated agricultural sources are limited to discharges of sediment and associated particulate-bound legacy pesticides from irrigated agricultural acreage. It is assumed that sources other than agricultural sediment discharges also contribute significantly to exceedances. The results of source evaluations and any approved Source Identification Studies will be integrated into the separate Management Plans. The information relevant to these Management Plans includes, but is not limited to crops by percent of the total irrigated acreage, irrigation practices, soil erosion potential, erosion and sediment management practices currently in place, and other results of the Coalition’s Sediment and Erosion Assessment. Irrigated agriculture sources and practices will be evaluated for their
potential contributions to erosion and transport of legacy pesticides. The primary purposes of this evaluation are to (1) document and evaluate the degree of implementation of relevant management practices, and (2) to prioritize potential irrigated agriculture sources for outreach and additional management practice implementation.

**Management Practice Implementation**

Implementation of specific additional appropriate management practices will depend on the results of an approved Source Identification Study and on the baseline management practices already in place. The process to identify appropriate additional management practices will include the following elements:

- Meetings with landowners and/or growers to discuss exceedances, possible sources and causes of sediment discharges, possible non-agricultural sources of legacy pesticides, options for relevant management practices, and management plan requirements and goals.

- The baseline for management practices already in place in the targeted drainages will be based on Farm Evaluation data collected and reported annually in May. As part of the results of the source evaluations, this information will be used to determine whether implementation of additional management practices is appropriate and feasible, and to establish goals for additional management practice implementation. (Although control of erosion is a goal of these management practices, it is not expected that soil movement from agricultural fields can be eliminated.) Identification of options for appropriate management practices may be coordinated with CURES, UCCE, County Agriculture Departments, NRCS, or RCDs, depending on the available resources. The specific coordinating entities are expected to vary in the different Coalition subwatersheds.

The results of outreach efforts will be documented and included in the Management Plan Progress Reports. These reports will also document progress toward the goals for management practice implementation, as required by the WDR. If it is determined that no additional appropriate management practices to control legacy pesticides are feasible, this will also be documented with the basis for the determination.

**Implementation Schedule**

The schedule for development and implementation of additional management practices will be conducted as described in the overall Management Plan approach. The schedule will include quarterly progress meetings with the Regional Water Board ILRP staff. Schedules for site-specific and parameter-specific Management Plans are documented in Appendix B.
Completion Criteria and Performance Goals

The successful completion of the Management Plan will be determined by the Executive Officer of the Regional Water Board. The possible pathways for successful completion of this element of the management plan are described in the Overall Approach section.

The criteria for completion of each these pathways are summarized in Table 4. Because the relative contributions to exceedances of legacy pesticides will generally not be able to be quantified, these criteria are generally qualitative, with the exception of compliance with water quality objectives. Consequently, determination that a specific criterion has been met will be based on a “weight of evidence” approach in consultation with Regional Water Board staff and approved by the Executive Officer of the Regional Board. Determination of compliance with water quality objectives for legacy pesticides will be determined to occur when no more than one exceedance of the appropriate trigger limit has been observed in three years of management plan monitoring.

Progress toward the implementation performance goals established for each subwatershed will be evaluated and documented in annual Management Plan Progress Reports. Specific performance goals will include the following:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members (and potential members, if appropriate)
- Return of erosion management practice surveys from 100% of Coalition members in the target drainages (in September of 2\textsuperscript{nd} year following trigger of management plan requirement).
- Documentation and reporting of baseline management practice inventory from surveys
- Implementation of numbers or percentages of specific additional management practices in target drainages (goals and schedule to be established in Management Plan Progress Report).
- Specified decreases in frequency of exceedances (goals and schedule established in Management Plan Progress Report).

<table>
<thead>
<tr>
<th>Management Plan Pathway</th>
<th>Criteria for Successful Completion</th>
<th>Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture</td>
<td>• Irrigated agricultural confirmed not to be a significant issue</td>
<td>Issue is referred to</td>
</tr>
<tr>
<td>Eliminated as source of exceedances</td>
<td>Source of sediment discharges or erosion in the drainage;</td>
<td>Regional Water Board staff for appropriate actions.</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
</tbody>
</table>
| 2. WQOs achieved by control of probable agricultural source(s) of exceedances | • Irrigated agricultural confirmed to be a source of sediment discharges or erosion; **AND**  
• Appropriate additional agricultural management practices have been identified, implemented, and documented; **AND**  
• Demonstrated achievement of water quality objectives | Periodically reevaluate compliance per MRP monitoring schedule. |
| 3. WQOs not achievable by control of probable agricultural source(s) of exceedances | • Irrigated agricultural sources of sediment discharges or erosion are likely; **AND**  
• WQOs not achieved or expected to be achieved; **AND**  
• No additional appropriate management practices are possible or economically feasible; | Infeasibility is documented and issue is referred to Regional Water Board staff for appropriate actions. |
| 4. Probable sources not identified | • Sources of legacy pesticides not identified by approved Source Identification Study; **AND**  
• All reasonable efforts at source ID exhausted | Documented and referred to Regional Water Board staff for appropriate actions. |

### Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water quality and meeting water quality objectives. In the interim, the effectiveness of the management plan will be evaluated based on meeting the interim performance goals described above. Progress toward the implementation performance goals established for each subwatershed and management plan element will be evaluated and documented in annual Management Plan Progress Reports.

### Monitoring

Monitoring proposed to be performed is described in separate Management Plans and in the annual Monitoring Plan Updates. Ongoing monitoring for legacy organochlorine pesticide Management Plans will be conducted twice during the first year of each Assessment monitoring period. Changes to the approved monitoring schedule must be approved by Regional Water Board staff prior to implementation.

### Participants Responsible for Implementation

The participants responsible for implementing specific elements of the Management Plan are identified in **Appendix B**.
Reporting

The schedule and scope for reporting for the legacy pesticide Source Identification Studies will be as required by the approved studies. The reports are expected to include the results of data reviews, source identification and evaluations, and documentation of the results of initial outreach meetings. All other reporting for this category of Management Plans will be scheduled as proposed in the **Overall Management Plan Approach** and in separate Management Plans in Appendix B.
NUTRIENTS

This element of the Management Plan addresses exceedances of numeric water quality objectives for nutrient compounds (nitrate and ammonia). The previously approved 2009 Management Plan did not include an approach for analytes in the nutrient category (nitrogen and phosphorus compounds). Due the addition of a Management Plan requirement for nitrate in the Cache Slough drainage for Ulatis Creek\(^1\), an approach for management of nutrient exceedances was proposed in the 2010 Management Plan Progress Report (MPPR). The proposed nutrient management approach follows the general model for the approved 2009 Management Plan. The elements of the proposed approach are as follows:

**Review Regulatory Basis**

Confirm regulatory basis establishing the need for the management plan. Discuss regulatory basis with ILRP Staff to confirm that MUN use applies in the affected water body.

**Source Identification**

Identify and evaluate potential sources, including irrigation supply water quality, natural background, non-agricultural discharges, and agricultural inputs.

Evaluate the timing and typical annual agricultural nutrient applications per acre for dominant crop types.

Evaluate relevant monitoring data for relationships between nutrient exceedances and the timing of source discharges or applications.

Prepare a Source Evaluation Report to identify and prioritize agricultural and non-agricultural sources of nutrients. Determine whether agriculture is a source of the observed exceedances.

**Management Practice Implementation**

*If agriculture is identified as a source* of the exceedances, the Coalition will conduct surveys of Coalition members to identify the current level of implementation of relevant management practices.

*If agriculture is identified as a source*, develop list of prioritized Management Practices specific to nutrients.

*If agriculture is identified as a source*, set goals and schedule for additional Management Practice implementation.

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\(^1\) The Management Plan for nitrate in Ulatis Creek was approved as completed in 2012 on the basis that agriculture was not contributing to the exceedances.
Implement additional Management Practices per established the Management Plan goals established above.

**Effectiveness Evaluation**

Conduct follow-up surveys for tracking the progress of implementation. This will generally be addressed by information collected for Farm Evaluations and Nutrient Management Planning required by the WDR, but may be supplemented with surveys specific to the Management Plan implementation goals, if necessary.

Conduct effectiveness monitoring for tracking the goals established for implementation.
TRACE METALS

This element of the Management Plan addresses exceedances of numeric water quality objectives for trace metals (arsenic, cadmium, copper, lead, nickel, selenium, and zinc). The trace metal boron is addressed in the salinity Management Plan section. The status of triggered Management Plans is provided in Appendix A. Implementation of this element of the management plan will be conducted on a drainage-specific basis for the drainages determined to require management of trace metals exceedances.

Review Data and Regulatory Basis for Exceedances

Coalition monitoring data and the regulatory basis for determination of exceedances will be evaluated and summarized. Review of the monitoring data will focus on any seasonal patterns in exceedances that can be used to focus future monitoring efforts. Evaluation of the regulatory basis will focus on the beneficial uses that these objectives or trigger limits are intended to protect and their applicability to the affected drainages, and appropriate averaging periods and allowable exceedance frequencies. Any substantial questions regarding implementation of the objectives used to determine exceedances will be summarized and provided to the Regional Water Board staff and the ILRP Technical Issues Committee for additional consideration and evaluation. Based on the results of these evaluations, the exceedances and need for a management plan may be reevaluated. However, development and implementation of management plans required by exceedances of the objectives will proceed while any additional regulatory considerations are completed.

Source Identification

The major sources of trace metals in the Central Valley have already been categorically identified, and include urban runoff, surface water and groundwater sources, and natural geological sources, as well as some direct agricultural uses of specific metals (e.g., copper). Sources of metals in agricultural runoff may also include direct importation from surface or groundwater supplies, dissolution of naturally occurring metals in soils, and intentional addition of some trace metals as micronutrients or pesticides. The following source identification efforts will be conducted on a drainage-specific basis to identify potential sources of trace metals and to evaluate potential agricultural and non-agricultural contributions to exceedances:

- **Review of agricultural uses**: Agricultural uses of the specific metals of concern will be reviewed to determine whether they are used or likely to be used by irrigated agriculture in the affected drainages. If available, data will be compiled for applications of the specific metals in the affected drainages, and the data will be evaluated for use patterns and timing.

- **Identification of agricultural and non-agricultural sources**: Agricultural uses of the specific metals of concern will be reviewed to determine whether they are used or likely
to be used by irrigated agriculture in the affected drainages. If available, data will be compiled for applications of the specific metals in the affected drainages, and the data will be evaluated for use patterns and timing. Non-agricultural sources of metals will also be identified and relative contributions will be evaluated based on available information on agricultural uses and non-agricultural sources (e.g., agricultural supply water or natural geological sources). The primary purpose of this evaluation is to determine whether irrigated agriculture is a direct source or contributor to exceedances of the metals of concern.

- **Source Evaluation Report:** A focused Source Evaluation Report will be prepared documenting the following information for the affected drainages: relevant information for non-agricultural sources, agricultural application information for the specific metals of concern, application and irrigation practices, relevant management practices currently in place, and Coalition participants in the drainage.

**Management Practice Implementation**

Implementation of specific additional appropriate management practices will depend on the outcome of the metals source identification studies. To support these source identification efforts, the process to identify appropriate additional management practices will initially include:

- **Meetings with landowners and/or growers:** Meetings with landowners and/or growers to discuss the exceedances, possible sources of metals, management plan requirements and goals, and options for management practices. These discussions will be incorporated into scheduled public outreach meetings for the Subwatersheds.

- **If an approved Source Identification Study determines that irrigated agriculture sources contribute to exceedances of trace metals objectives:** If an approved Source Identification Study determines that irrigated agriculture sources contribute to exceedances of trace metals objectives, detailed information for relevant cultural practices and management practices already in place will be developed through surveys and other mechanisms. This information will be used to determine whether implementation of additional management practices is appropriate and feasible, and to establish goals for additional management practice implementation. Identification of options for appropriate management practices may be coordinated with CURES, UCCE, County Agriculture Departments, NRCS, RCDs, farm input suppliers, and pest control advisors, depending on the available resources and the specific trace metals of concern. The specific coordinating entities are expected to vary in the different Coalition subwatersheds.

- **Additional targeted outreach:** Additional targeted outreach may be conducted dependent on the results of source identification efforts and will provide options for additional appropriate management practices. Outreach will be prioritized and directed to likely agricultural sources of elevated trace metal discharges.
The results of outreach efforts will be documented and included in the Management Plan Progress Reports. If it is determined that no additional appropriate management practices to control specific trace metals of concern are feasible, this will also be documented.

**Implementation Schedule**

The schedule for development and implementation of additional management practices will be conducted as described in the overall Management Plan approach. The schedule will include quarterly progress meetings with the Regional Water Board ILRP staff. Schedules for site-specific and parameter-specific Management Plans are documented in Appendix B.

**Completion Criteria and Performance Goals**

The successful completion of the Management Plan will be determined by the Executive Officer of the Regional Water Board. The possible pathways for successful completion of this element of the management plan are described in the Overall Approach section.

The criteria for completion of each of these pathways are summarized in Table 5. These criteria are generally qualitative, with the exception of compliance with water quality objectives. Consequently, determination that a specific criterion has been met will be based on a “weight of evidence” approach in consultation with Regional Water Board staff and approved by the Executive Officer of the Regional Board. Determination of compliance with water quality objectives for metals will be determined to occur when no more than one exceedance of the appropriate trigger limit has been observed in three years of the specified management plan monitoring.

Progress toward the implementation performance goals established for each subwatershed will be evaluated and documented in annual Management Plan Progress Reports. Specific performance goals will include the following:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members (and potential members, if appropriate)
- Return of management practice surveys from 100% of Coalition members in the target drainages
- Documentation and reporting of baseline management practice inventory from surveys
- Implementation of numbers or percentages of specific additional management practices in target drainages (goals and schedule to be established in Management Plan Progress Report)
- Specified decreases in frequency of exceedances (goals and schedule established in Management Plan Progress Report).

Table 5. Trace Metals Management Plan Completion Criteria

<table>
<thead>
<tr>
<th>Management Plan Pathway</th>
<th>Criteria for Successful Completion</th>
<th>Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture eliminated as source of exceedances</td>
<td>• Metal confirmed not to have significant irrigated agricultural sources;</td>
<td>Issue is referred to Regional Water Board staff for appropriate actions.</td>
</tr>
</tbody>
</table>
| 2. WQOs achieved by control of probable agricultural source(s) of exceedances | • Irrigated agricultural sources likely; **AND**  
• Appropriate additional agricultural management practices have been identified, implemented, and documented; **AND**  
• Demonstrated achievement of water quality objectives | Periodically reevaluate compliance per MRP monitoring schedule.                                |
| 3. WQOs not achievable by control of probable agricultural source(s) of exceedances | • Irrigated agricultural sources likely; **AND**  
• WQOs not achieved or expected to be achieved; **AND**  
• No additional appropriate management practices are possible or economically feasible; | Infeasibility is documented and issue is referred to Regional Water Board staff for appropriate actions. |
| 4. Probable sources not identified                           | • Sources of specific metals not identified by approved Source Identification Study; **AND**  
• All reasonable efforts at source ID exhausted                  | Documented and referred to Regional Water Board staff for appropriate actions.              |

Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water quality and meeting water quality objectives. In the interim, the effectiveness of the management plan will be evaluated based on meeting the interim performance goals described above. Progress toward the implementation performance goals established for each subwatershed and management plan element will be evaluated and documented in annual Management Plan Progress Reports.

Monitoring

Monitoring proposed to be performed is established in separate Management Plans compiled in Appendix B and in the annual Monitoring Plan Updates. The specific scope and timing of any continued monitoring may be modified based on results of source identification evaluations and
monitoring results. Any changes to the approved monitoring schedule must be approved by Regional Water Board staff prior to implementation.

**Participants Responsible for Implementation**

The participants responsible for implementing specific elements of the Management Plan are specified in Appendix B.

**Reporting**

The schedule and scope for reporting for trace metals Management Plans will initially be as required by the approved Source Identification Studies. The reports are expected to include the results of data reviews, source identification and evaluations, and documentation of the results of outreach. All other reporting for this category of Management Plans will be scheduled as proposed in the **Overall Management Plan Approach** and in separate Management Plans in Appendix B.
SALINITY

This element of the Management Plan addresses exceedances of total dissolved solids (TDS), electrical conductivity (EC), and boron. Salinity is a regional issue that affects the entire Central Valley and Sacramento-San Joaquin Delta. Consequently, this element of the management plan will be developed and implemented on a regional basis in coordination with the Central Valley Regional Water Board and other ILRP Coalitions. The Central Valley Regional Water Board and State Regional Water Board have initiated a comprehensive effort to address salinity problems in California’s Central Valley and to adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is an effort to develop and implement a comprehensive salinity management program. The CV-SALTS program is an ongoing multi-year effort. In the context of the ILRP, the primary mechanism for developing and implementing a salinity management plan will be the Coalition’s continued participation in CV-SALTS. Specific management plan actions to be implemented by the Coalition in support of these efforts are documented in the following sections.

Source Identification

The major sources of salinity in the Central Valley have already been categorically identified, and include urban and rural water users, industrial users, surface water and groundwater sources, and natural geological sources, as well as agricultural users. Agricultural categories of salinity sources include direct importation from surface or groundwater supplies, evapoconcentration of supply water, addition of salts by dissolution of naturally occurring salts in soils, and intentional addition of salts as fertilizers or soil conditioners. The Coalition will support additional source characterization for the CV-SALTS program through the ongoing ILRP monitoring effort. Additionally, data will be compiled to characterize salinity characteristics of irrigation supply waters, if these data have not already been compiled by the CV-SALTS program.

In addition to participation in the CV-SALTS process, the Coalition may conduct additional independent efforts to support source identification for salinity management.

Management Practice Implementation

Integrated management and control of salinity in Central Valley waters is the objective of the CV-SALTS effort, and can only be achieved by coordinated efforts by all of the stakeholders. The scope of agriculture management practice implementation for salinity will be determined through the CV-SALTS process.

Implementation Schedule

The schedule for implementation of additional salinity management efforts is dependent on and will be developed through CV-SALTS, which is a many-year effort. Specific schedules and
goals for each subwatershed or for the Coalition as a whole will be based on outcomes of the
CV-SALTS process. The parties responsible for tracking implementation of management
practices cannot yet be identified, but will be documented later in the process. Implementation
will be evaluated and documented as required for the annual Management Plan Progress Report.

Completion Criteria and Performance Goals

Completion criteria and performance goals for this element of the management plan will be
developed through the CV-SALTS process and can not yet be specified for the Coalition or
Subwatersheds.

Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water
quality and meeting water quality objectives. In the interim, the effectiveness of the management
plan will be evaluated based on meeting the interim performance goals described above. Progress
toward implementation performance goals established for each subwatershed will eventually be
evaluated and documented in annual Management Plan Progress Reports.

Monitoring

Monitoring proposed to be performed is established in separate Management Plans and in the
annual Monitoring Plan Updates. Monitoring to be performed as part of this Management Plan
will generally consist of the Coalition’s ongoing monitoring efforts to routinely monitor EC and
boron during Assessment monitoring periods, and EC with surface water Management Plan
monitoring for any other Management Plans. Additional monitoring may be conducted for
drainages that are determined not to have sufficient available data to characterize EC or boron
for implementation through the CV-SALTS program.

Participants Responsible for Implementation

The participants responsible for implementing specific elements of the Management Plan are
specified in Appendix B. The Coalition’s initial responsibility for implementing this element of
the Management Plan is through participation and coordination with the CV-SALTS program.
Coalition Subwatersheds will be responsible for conducting the initial outreach for the
Management Plan. Parties responsible for specific additional elements of implementation will be
determined as these elements are developed.
DISSOLVED OXYGEN AND PH

This element of the management plan addresses exceedances of dissolved oxygen (DO) and pH.

Review Data and Regulatory Basis for Exceedances

The first step in the implementation of this element of the management plan is a review of the monitoring data and the regulatory basis establishing the need for the management plan. For DO and pH, this will include an evaluation of the current designated beneficial uses of the water bodies to determine whether the COLD or WARM designations should apply. The information used will include an evaluation of whether natural seasonal conditions (e.g., low flows, elevated temperatures, and low DO) support these designated uses in water bodies that would be completely dry in the absence of irrigation returns. An initial determination will be made in consultation with appropriate Regional Board staff of the ambient conditions (including flow, DO, temperature, resident species) required to define and support the designated WARM and COLD beneficial uses. This task will include an evaluation of the existing monitoring data for seasonal patterns of flow, temperature and DO in the monitored waterbodies. Recommendations for additional monitoring will be developed if available information is determined to be insufficient to establish appropriate beneficial uses for Coalition monitoring sites.

The review will evaluate the regulatory and scientific basis for the objectives, beneficial uses that these objectives are intended to protect and their applicability to the affected drainages, and allowable exceedance frequencies. Any substantial questions regarding validity or interpretation of the objectives used to determine exceedances will be summarized and provided to the Regional Water Board staff and the ILRP Technical Issues Committee for additional consideration and evaluation. Based on the results of these evaluations, the exceedances and need for a management plan may be reevaluated.

Source Identification

Dissolved oxygen (DO) concentrations are often low regionally during low flow and high water temperature conditions (i.e., there are significant natural seasonal causes). These same conditions can cause or contribute to high or low pH in ambient water. These parameters also exhibit significant natural diurnal variation with daily fluctuations controlled principally by algal photosynthesis and respiration, and the buffering capacity of the water. These processes are controlled by light and nutrient availability, concentrations of organic matter, and temperature. These factors combine to cause increasing DO and pH during daylight hours and decreasing DO and pH at night. Diurnal variations are typically greater in summer because there is more light and higher temperatures. Irrigation return flows may influence this variation primarily by increasing or decreasing in-stream temperatures, or by increasing available nutrients or organic matter. Therefore, low DO concentrations may be caused or exacerbated by algal growth and natural diurnal respiration and variation. Algal growth may be influenced by potentially elevated
nutrient runoff from irrigated agriculture (fertilizer application, irrigated pasture, dairy facilities),
or from irrigation supply water that contains high nutrient concentrations or phytoplankton from
upstream sources. To evaluate potential contributions of elevated nutrients from agriculture to
DO and pH exceedances, the Coalition will undertake the following:

- Nutrient applications and agricultural uses will be evaluated to better identify potential
  nutrient sources and to characterize use patterns in monitored drainages. The purpose of
  this element is to describe the types of nutrients applied, estimate how much is applied
  per acre of a specific crop type, when nutrients are typically applied, and how
  applications are linked with irrigation patterns. Because data for actual fertilizer
  applications are not available, this characterization will be made based on current land
  use data and available information on cultural practices (e.g., grazed pasture, manure
  applications, and crop types and the typical nitrogen and phosphorus applications
  required to support these crops).

- Available relevant monitoring data will be evaluated for nutrients and organic carbon in
  monitored drainages to determine whether excess nutrients may indirectly contribute to
  low dissolved oxygen or pH extremes through promotion of excessive algal growth. The
  evaluation will be made based on average ambient nutrient concentrations, observations
  of excessive algae, and their relationship with the frequency, and patterns and timing of
  low DO or extreme pH conditions from Coalition monitoring data. Evaluations of this
  relationship will utilize formal statistical methods if the available data support this, or
  will consist of a qualitative assessment if the data do not support more rigorous statistical
  methods.

- A focused Source Evaluation Report will be prepared documenting the following
  drainage-specific information for irrigated parcels in the affected drainages: crops by
  percent of total irrigated acreage, relative use of the additional nutrients by crop or
  commodity, nutrient application and irrigation practices, relevant management practices
  currently in place, and Coalition participants in the drainage. Based on a lower priority
  for this management plan element, source evaluations are estimated to be completed by
  June of 2011 and reported by September 2011.

**Management Practice Implementation**

Implementation of specific additional appropriate management practices will depend on the
outcome of the source identification efforts. To support these source identification efforts, the
process to identify appropriate additional management practices will include:

- Discussions with landowners and/or growers of the exceedances, sources of nutrients and
  organic carbon, management plan requirements and goals, and options for management
  practices. These discussions will be incorporated into scheduled public outreach meetings
If Source Identification Studies determine that elevated nutrients from irrigated agriculture contribute to exceedances of DO and pH objectives, detailed information for relevant cultural practices and management practices already in place will be developed through surveys of Coalition members. This information will be used with the results of source evaluations to determine whether implementation of additional management practices is appropriate and feasible, and to establish goals for additional management practice implementation. Identification of options for appropriate management practices will be coordinated with CURES, UCCE, County Agriculture Departments, and RCDs.

Depending on the results of source evaluations and baseline management practice implementation, targeted outreach may be conducted to provide options for additional appropriate management practices. Outreach will be prioritized and directed to growers of crops or commodities determined most likely to contribute to exceedances.

The results of the outreach efforts will be documented and included in the Management Plan Progress Reports, as required by the WDR. Documentation of outreach efforts will typically include numbers of participants, relevant options for management practices, any additional practices planned to be implemented, and the goals and schedule for additional management practice implementation. If it is determined that no additional appropriate management practices to control DO and pH are feasible, this will also be documented.

**Implementation Schedule**

The schedule for development and implementation of additional management practices will be conducted as described in the overall Management Plan approach. However, due to the lower priority and longer period expected for resolution for this management plan element, the schedule will be extended by one year. The schedule will include quarterly progress meetings with the Regional Water Board ILRP staff. Schedules for site-specific and parameter-specific Management Plans are documented in Appendix B. The results of source identification efforts and management practice inventories will be used to prioritize drainages or commodities by greatest potential for contributing to DO and pH exceedances and the lowest rates of management practice implementation. These priorities will be reflected in the schedule and scope of management plan implementation.

**Completion Criteria and Performance Goals**

The successful completion of the Management Plan will be determined by the Executive Officer of the Regional Water Board. The possible pathways for successful completion of this element of the management plan are described in the Overall Approach section. The criteria for completion of each these pathways are summarized in Table 6. These criteria are generally qualitative, with the exception of compliance with water quality objectives. Consequently, determination that a specific criterion has been met will be based on a “weight of evidence” approach in consultation.
with Regional Water Board staff and approved by the Executive Officer of the Regional Board. Determination of compliance with water quality objectives for DO and pH will be determined to occur when no more than one exceedance of the appropriate trigger limit has been observed in three years of the specified management plan monitoring.

Progress toward the implementation performance goals established for each subwatershed will be evaluated and documented in annual Management Plan Progress Reports. Specific performance goals will include the following:

- Completion of source identification and evaluation
- Completion and documentation of targeted outreach to Coalition members
- Return of management practice surveys from 100% of Coalition members in the target drainages
- Documentation and reporting of baseline management practice inventory from surveys
- Implementation of numbers or percentages of specific additional management practices in target drainages (goals and schedule to be established in Management Plan Progress Report).
- Specified decreases in frequency of exceedances (goals and schedule established in Management Plan Progress Report).

**Table 6. DO and pH Management Plan Completion Criteria**

<table>
<thead>
<tr>
<th>Management Plan Pathway</th>
<th>Criteria for Successful Completion</th>
<th>Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture eliminated as source of exceedances</td>
<td>• Exceedances determined not to have significant irrigated agricultural causes;</td>
<td>Issue is referred to Regional Water Board staff for appropriate actions.</td>
</tr>
<tr>
<td>2. WQOs achieved by control of probable agricultural contributions to exceedances</td>
<td>• Irrigated agricultural contribution likely; AND • Appropriate additional agricultural management practices have been identified, implemented, and documented; AND • Demonstrated achievement of water quality objectives</td>
<td>Periodically reevaluate compliance per MRP monitoring schedule.</td>
</tr>
<tr>
<td>3. WQOs not achievable by control of probable agricultural contributions to</td>
<td>• Irrigated agricultural contribution likely; AND • WQOs not achieved or expected to be achieved; AND • No additional appropriate management practices are possible or economically feasible;</td>
<td>Infeasibility is documented and issue is referred to Regional Water Board staff for</td>
</tr>
</tbody>
</table>
Evaluation of Management Plan Effectiveness

Ultimately, the effectiveness of management plans will be judged on improvements in water quality and meeting water quality objectives. In the interim, the effectiveness of the management plan will be evaluated based on meeting the interim performance goals described above. Progress toward the implementation performance goals established for each subwatershed and management plan element will be evaluated and documented in annual Management Plan Progress Reports.

Monitoring

Monitoring proposed to be performed is established in separate Management Plans and in the annual Monitoring Plan Updates. Monitoring to be performed for DO and pH Management Plans includes the Coalition’s ongoing monitoring effort to routinely monitor for field parameters. If indicated by the source identification efforts, additional monitoring of nutrients or other related constituents may be conducted in subsequent years. Any additional monitoring will be integrated with the Coalition’s Assessment monitoring, and will also incorporate any other recommendations resulting from source identification efforts. Any changes to approved monitoring schedules must be approved by Regional Water Board staff prior to implementation.

Participants Responsible for Implementation

The participants responsible for implementing specific elements of the Management Plan are specified in Appendix B.

Reporting

The schedule and scope for reporting for DO and pH Management Plans will initially be as required by the approved Source Identification Studies. The reports will include the results of reviews of data and regulatory basis for exceedances, evaluations of nutrient contributions, focused WER, documentation of initial outreach meetings, and recommendations for the Management Plan monitoring. All other reporting for this category of Management Plans will be scheduled as proposed in the Overall Management Plan Approach and in separate Management Plans in Appendix B.