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Central Valley Region
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3 June 2008

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EAST SAN JOAQUIN WATER QUALITY COALITION SEMI-ANNUAL MONITORING REPORT REVIEW

This letter serves to acknowledge receipt of the East San Joaquin Water Quality Coalition (Coalition) Semi-Annual Monitoring Report (SAMR), on 14 January 2008. The Central Valley Regional Water Quality Control Board staff (Staff) evaluated the SAMR for compliance with Board Order No. R5-2003-0833 (Board Order) and provided the attached review memorandum.

The memorandum notes that the Coalition is consistent with the Board Order in providing the following:

- Documentation for management practices survey results by subwatershed.
- Current pesticide use information that is coordinated with the timing and location of exceedances.
- Completeness reporting for quality control samples in accordance with acceptance limits.
- Correct application of follow-up to toxicity exceedances through toxicity identification evaluations.

Staff did identify some areas that require more attention, which include the need to assess the management practice survey results and management practice effectiveness. Our recommendation is that these matters be resolved through the development of the Coalition's MRP Plan revision and development of Management Plans.

Overall, the consistency and the quality with which the Coalition's SAMRs are developed and submitted are worth recognizing at this time. In particular, the submittal of monitoring data in SWAMP comparable database format and the Coalition's participation in the Technical Issues Committee through Mike Johnson and Melissa Turner are very much appreciated. It is anticipated that through this continued cooperation, an exemplary and very effective MRP Plan for the Coalition can be generated and implemented.

If you have any questions or comments regarding the review, or need any further information, please contact Dania Huggins at (916) 464-4843.

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JOE KARKOSKI, Chief
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Enclosure: Staff Review of ESJWQC SAMR

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Ken Landau
Dania Huggins

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TO: Margie Read
Senior Environmental Scientist
Irrigated Lands Regulatory Program

FROM: Dania Huggins
Water Resources Control Engineer
Irrigated Lands Regulatory Program

DATE: 12 May 2008

SIGNATURE: *Original Signed By Dania Huggins*

REVIEW OF 31 DECEMBER 2007 SEMI-ANNUAL MONITORING REPORT – EAST SAN JOAQUIN WATER QUALITY COALITION

On 14 January 2008, the Central Valley Regional Water Quality Control Board (Regional Water Board) staff received the East San Joaquin Water Quality Coalition (Coalition) Semi-Annual Monitoring Report (SAMR). An extension for SAMR submittal was requested to the Executive Officer on 19 December 2007.

Regional Water Board staff reviewed the SAMR to evaluate it for the reporting required in Order No. R5-2008-0005 (Order) and in the Coalition's Monitoring and Reporting Program (MRP) Plan. This memorandum summarizes the review findings.

In this memorandum, staff presents their comments and recommendations pursuant to the Order, and MRP Plan. The review is divided into two parts: (A) a discussion of administrative and compliance aspects and (B) a discussion of analytical aspects.

A. ADMINISTRATIVE AND COMPLIANCE

1. Executive Summary

The Executive Summary describes the number of exceedances that occurred during the reporting period. In addition, the Executive Summary briefly summarized the Coalition's activities and monitoring results. Although there is a specific component in the SAMR for conclusions and recommendations, this section could benefit from briefly including some of it here, particularly the Management Plan monitoring strategy and results.

2. Monitoring Objectives

The report did not include information or a discussion determining the effectiveness of management practices to reduce discharges of waste that impact water quality. Staff notes that as of November 2007, the Coalition is preparing management plans that will include discussions of management practice effectiveness. However, as part of the the SAMR the Coalition needs to include and document the process (Figure 1), in terms of management practices implementation, when follow up is done by Coalition representatives on exceedances (see example on Table 1).

3. **Watershed Description.** (Valuable Aquatic Resources' Section)
The Coalition indicates in Table 3 (page 21) that the immediate downstream water body for the Highline Canal is the San Joaquin River. However, during the first MRP Plan meeting (9 April 2008) it was clarified that the Highline Canal has a direct operational spill to the Merced River as well as a more indirect spill to the San Joaquin River. Thus, this information needs to be modified in future SAMRs.

4. **Pesticide Use Information**
The Coalition submitted Pesticide Use Reports (PURs) up to six months (in some instances) before the sample collection date in which a relevant exceedance occurred. These PUR data are mapped relative to the sample location indicating possible sources of exceedances. This information is very helpful to the reader. However, the follow up steps are not described after chemistry results, and PUR information were received. For example, did the coalition: (1) coordinate subwatershed meetings, (2) contact (upstream, near, adjacent) individual grower (s), (3) provide a number of alternatives for management practices (given the specific crop or hydrological conditions of the area), (4) determine a schedule to verify changes or new management practices in the area?

Staff recognizes that detailed information with regards to items 1 through 4 will be provided on an annual basis once Management Plans are implemented. However, a general description of this process should be included in the SAMR, especially for exceedances that are not yet incorporated into Management Plans.

The Coalition indicated on the Pesticide Used Information Section (page 197) of the SAMR, that "PUR data for Madera County were available only up to the end of May for the irrigation season ending on 29 October 2007. The additional PUR data will be included as an amendment to this report as soon as the Coalition can obtain and process them." Thus, the Coalition should submit this information with the next SAMR, **30 June 2008**.

5. **Location map(s) of sampling sites, crops and land uses**
The land use maps are very complete. However, one small suggestion would be, if it is possible to identify the sites with site ID numbers (see monitoring workshop maps for Zone 3 as an example). In some counties such as Merced the Site Name used as a label or Site ID in the map does not allow the reviewer to identify all the sites or see other important map features such as the land use, cities, and other land marks.

6. **Special project monitoring vs regular monitoring**
The Coalition has been including the special project monitoring as one of the strategies to address common exceedances. However, clarification is needed in the following items:
   (a) Sites under Management Plan monitoring.
   (b) Parameters that are part of the Management Plan monitoring.
   (c) Monitoring strategy for these constituents (e.g. frequency, location, rationale for the design strategy).
   (d) Describe the differences (if any) for Management Plan and Special Study (TDS, metals, and BOD) monitoring.

The rationale for choosing the special projects (based on sites or constituents) needs to be described in the Management Plan document and summarized in the revised MRP Plan. However, a general summary would be helpful to staff to better understand the results presented in the SAMR and the Coalition approach towards addressing water quality impacts. An example summary table that could be presented in the future is attached (Table 2).

7. **Summary of management practices** (page 136)
The Coalition provided a detailed listing of some of the strategies to keep growers up to date with management practices such as: listing of outreach grower meetings, notifications of exceedances through Coalition website, local newspapers, and mailings. In addition, the Coalition distributed 5,052 management practice surveys to selected growers in the Coalition region (both Coalition members and non members). The surveys were sent to landowners who the Coalition identified as having fields directly adjacent or near a waterway where exceedances occurred in 2006. The Coalition also provided a brief analysis of number of surveys completed and returned (23%), landowners indicating that there was no discharge from their property during either the storm or irrigation season (86%), most commonly used management practices, and other important information that was not quantified before. However, staff would recommend tabulating this information for the next report. Also, the management practices summary could be improved by including:
   (a) Purpose of the survey (e.g. to establish a baseline and expected follow up).
   (b) More detail on the "specific exceedances that demanded or allowed, the personal contact with individual landowners to review monitoring results and discuss management practices that may help prevent discharges" (Table 1 is an example of what could be done). In addition, it is indicated that "Coalition board members communicate with growers regularly and are effective agents for providing information to growers on a personal basis." The Coalition needs to provide or document these communications especially when they are part of the follow up process for exceedances. Thus, information on the type of the exceedance, sample date, steps to follow up with growers (see Table 1 for example) needs to be included.
   (c) Approach to obtain information from the 67%that did not respond, particularly with Management Plan implementation.

8. **Outreach and Education**
The Coalition provided information on the number of meetings and personal contacts made since the last SAMR. The Coalition held grower meetings on February 5, 20 and 22 of 2007 in Crows Landing, Modesto, and Denair (respectively). Outreach meetings also occurred after the irrigation season on December 11, 12 and 18 of 2007 in Madera, Merced, and Stanislaus counties (respectively). The Coalition significantly increased its outreach and education documentation from the previous SAMRs. However, clarification is needed on the process that the coalition is using or going to use to evaluate effectiveness on outreach and education, particularly with Management Plan reporting. "Coalition presentations over the past irrigation season provided general information on: site subwatershed, specific monitoring results, and management practices that <u>have proven to be effective to reduce the discharge of pesticides to water bodies</u>" (page 138). How the reduction of these pesticides discharges is evaluated is

not described. The Coalition will need to consider how the newly implemented changes, in Management Practices, are going to be quantified and evaluated.

9. Conclusions and recommendations

The Coalition's conclusions are based on the monitoring objectives that Coalition established in the SAMR. Thus, the content of the conclusion reflects this association and verification of objective completion. However, clarification on the following items will be appropriate in Management Plan reports:

(a) Evaluation of additional management practices necessary to improve and/or protect water quality (e.g. evaluation of trend monitoring for specific areas and constituents).
(b) Follow up approach for measuring and evaluating outreach and education effectiveness for exceedances (Item 2, bullet 2, page 150).
(c) If the information on Irrigation Districts or field discharge points within the Coalition area available (Item 3, page 150) the Coalition should provide this information on a table and a GIS map showing where these locations are. Also, the Coalition should indicate if this work was done cooperatively (to obtain the information) with the Irrigation Districts (if so which ones).
(d) It is stated (Item 3, bullet 3, page 151) that "beginning in February 2008, landowners on the waterways where creek-walking had been completed will be invited to Coalition workshops where their responsibilities for discharges will be outlined." The Coalition should provide a written description of landowners' responsibilities for un-authorized discharges.
(e) Provide details on the "walking the creeks" including a description of how these creeks are selected, and summarizing the findings (Item 3, bullet 4, page 151).
(f) Determine the degree of implementation of management practices (Item 6, page 151). Please provide a description of the process for evaluating implementation (time lines, details, use Table 1 and Figure 1 as an example).
(g) Determine the effectiveness of management practices and strategies to reduce discharges of wastes that impact water quality (Item 7, page 152). A different strategy can be proposed by the coalition to approach this task in a more feasible manner (e.g. site or subwatershed specific approach, more follow up documentation in the current cases where changes or future changes are expected (Table 1 and Figure 1).
(h) Implementation of draft management plan. The coalition needs to explain and evaluate how the management plan strategy (increased frequency) has helped with managing and/or addressing exceedances.

B. ANALYTICAL ASPECTS

1. Monitoring Results

Load Calculations

The Coalition calculated the instantaneous loads for all detections during the reporting period and tabulated the results. To inform the reader of the limitations of the calculated load, staff recommends inserting the following paragraph. "The load values calculated and presented for pesticides or other constituents in this report represent instantaneous loads only. These values should not be used to extrapolate loading over any period of time (e.g., weekly, monthly, seasonal or annual). The primary purpose for reporting instantaneous loads is to provide the Regional Water Board with a context for the concentrations of various constituents at the time that samples were collected."

Toxicity Results

The tabulated toxicity results indicate that the Coalition collected all toxicity resamples as required. From the 22 samples that experienced significant toxicity, Toxicity Identification Evaluations (TIEs) analyses were done in 6 samples (of the 22 where results indicated a 50% or greater difference in test organism mortality between the ambient and laboratory sample). The laboratory was able to identify the cause of toxicity in 50% of the TIEs (metals, OPs, and non-polar organic) in the other 50% of the tests the toxicicant was not persistent or could not be determined.

Metals

The Coalition first step for Management Plan is source analysis, to determine if agriculture is contributing to metal exceedances. The Coalition indicated that "only copper is currently used by agriculture within the Coalition region, among the four metals for which exceedances have been found (arsenic, cadmium, copper and lead)." (Executive Summary, page 2). However, Management Plans are required for all metals at the following sites:

Site Name	Management Plan is Required
Ash Slough @ Ave 21	Cu, Pb
Cottonwood Ck @ Rd 20	Cu
Deadman Ck @ Gurr Rd	As, Cu
Dry Ck @ Rd 18 Mad Co	Cu, Pb
Dry Ck @ Wellsford Rd, Sta Co	Cu
Duck Slough @ Gurr Rd	Cu, Pb
Duck Slough @ Hwy 99	Cu, Pb
Hatch Drain @ Tuolumne Ave	As
Highline Canal @ Hwy 99	Cu, Pb
Highline Canal @ Lombardy Rd	Cu, Pb
Hilmar Drain @ Central Ave	Cu
Livingston Drain @ Robin Ave	Cu
Miles Creek @ Reilly Rd	Cu

Copper exceedances were experienced from 35 samples at 11 of the Coalition monitoring sites during regular monitoring events. Copper is widely used in the Coalition region throughout the irrigation season. For the counties and months in which PUR data were available, exceedances of copper were preceded by copper fungicide applications. Two samples collected from Dry Creek @ Rd 18 (sampled May 29) and Miles Creek @ Reilly Rd (sampled 26 June 2007) were found to contain copper at concentrations above the water quality trigger and also experienced toxicity to *Selenastrum*.

The Coalition needs to describe follow up steps for these copper exceedances (see Section A, Item 5). In one of the ESJWQC monthly board meetings it was suggested that contacting a specialist (PCA or other technical expert) on copper applications might be able to provide the Coalition and growers with a better understanding on how to manage copper applications and avoid water quality problems.

"Five arsenic exceedances were experienced in samples collected during the 2007 irrigation season. Arsenic is found in sodium cacodylate, which is applied by agriculture for broadleaf weed control and as a cotton defoliant. The registrations on many of the products with this active ingredient have been cancelled. However, there are four products currently registered for use on citrus, for weed control around ditches, for use on ornamental plants, for nonagricultural weed control, and for weed control around buildings, driveways, sidewalks, rights-of-way, and fencerows (page 132, first paragraph)." The Coalition states that "any arsenic found in water samples is a result of irrigation drainage through native soils and leaching to surface waters." Since there is a use for arsenic in agriculture, the Coalition needs to propose a strategy to determine or eliminate agriculture as the potential source.

2. Lab and Field QC Results

Field QC

The SAMR provided several tabulations of tests within acceptability criteria. Acceptance criteria of field duplicates and field blanks were met with a range of 92% to 100% for all constituents.

Lab QC

Lab control spikes, matrix spikes and matrix spike duplicates were within acceptance criteria for accuracy and precision except for paraquat dichloride. The percent of samples meeting acceptance criteria was 100% for all the samples with exception of paraquat dichloride with 88%. The overall laboratory precision for the LCS/LCSD samples was met in 100% of samples with the exception of paraquat dichloride for which 88% of the samples where within control limits (23 of the 26 samples). Method blank quality control sample was 100% for all samples with exception of zinc with 96%

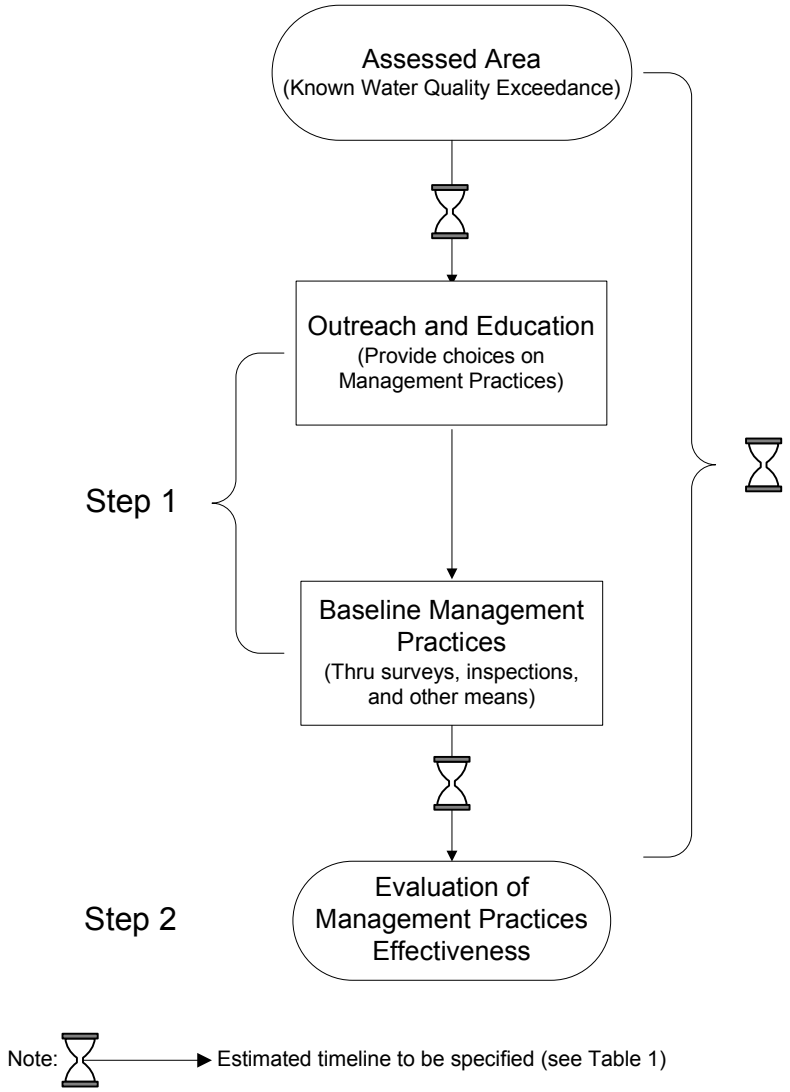
Hold times for all chemistry analysis were met except for one sample (21 August 2007) for each of the following constituents: paraquat dichloride, DDD, DDE, DDT, dieldrin, endrin and methoxychlor. Paraquat dichloride was re-extracted and re-analyzed outside of hold time due to 0% recoveries in both the matrix and lab control spikes in the original analysis. DDD, DDE, DDT, dieldrin, endrin and methoxychlor were re-extracted and reanalyzed due to possible laboratory contamination.

Surrogates were run with water samples collected and analyzed during the irrigation season of 2007. Percent of samples meeting the acceptance surrogate recovery was 95%. However, the Coalition is using isoxaben as a surrogate for some analyses. Isoxaben is being used by Turlock and Modesto ID (as a pre-emergent herbicide for weed control). Since, these two IDs are located within the boundaries of the ESJWQC, staff will recommend that the Coalition instruct the laboratory to use a different surrogate that is not being used in the field.

DH: dh

Enclosure: **Figure 1.** Evaluation of Management Practices Effectiveness
Table 1. Example documentation and follow up
Table 2. Special Project Monitoring information

Figure 1. Evaluation of Management Practices Effectiveness



Evaluation of Management Practices effectiveness could be done by assessing the number of **Newly implemented or changes in Management Practices.** For a given Management Plan area the process might include the number of:

a. Individual contact with growers
b. Site visits and inspections
c. Surveys (as follow up after baseline Management Practices are known)
d. Others

Table 1. Example documentation and follow up.

Site	Exceedance Description	Sample Date	Potential Source (based on PUR or other information)	Coalition Follow Up	
				Step 1	Step 2
Black Rascal Creek @ Yosemite Rd	***Ceriodaphnia dubia*** [1] (0 % survival, 37.5 TU). Resample (0 % survival). Chlorpyrifos = 3.7 ug/L	24 July 07 (TIE➔OP) 31 July 07 (Resample)	Contacted grower upstream on XXXX and found out about the use of Chlorpyrifos (almonds) on XXXX.[2]	Coalition representatives contacted the grower on XXXX and discussed management practices (XXXX) to eliminate future exceedances. [3]	The coalition (1) contacted the grower and (2) conducted a site visit to verify implementation or changes made on the property based on the choices on management practices provided by the coalition representative.[4]
	Ceriodaphnia dubia [1] (0 % survival) Resample (0 % survival). Chlorpyrifos = 0.12 ug/L	21 August 07 (TIE➔OP) 28 August 07(Resample)	No applications of pesticides after July 22, 2007 and therefore toxicity in these samples could be from chlorpyrifos applications in July.		
Merced River @ Santa Fe Dr	***Ceriodaphnia dubia*** [1] (0 % survival, 11 TU). Resample (0 % survival). Chlorpyrifos = 0.59 ug/L	24 January 08 (TIE➔OP) 30 January 08 (Resample)	Based on PUR information, grower (500 acres) contacted upstream on XXXX and Coalition found out about the used of Chlorpyrifos (almonds) on Nov-Dec XXXX.[2]	Try to contact the grower by April 11 (XXXX) and discussed management practices (XXXX) to eliminate future exceedances. [3].	Describe follow up actions to ensure that management practices are implmeneted..

Notes:

1 This exceedance and the details included in this table are provided on the Interpretation of Results Section of the SAMR (page 121)

2 Missing the **date that the grower was contacted** and the **date that chlorpyrifos was applied** in the almond field.

3 Missing the **date that the grower was contacted** and **the type and number of management practices** that the Coalition provide to the grower as choices.

4 Step 2 an essential part of the process to determine the effectiveness of Coalition Outreach and Education.

5 On 21 February 08 Coalition mailed 339 postcard to landowners in the Merced River watershed, 50 of whom are coalition members. The postcard described the exceedances and a meeting following up on 29 February was held on Winton, Ca (Bettencourt Ranch).

Table 2. Special Project Monitoring information.

Site	Special Study	Management Plan	Frequency (if different from Normal Monitoring)[1]	Upstream Location
ALL Sites on Table 6 of SAMR	BOD E.coli		1st and 4th Irr season	
Ash Slough at Ave 21				
Berenda Slough along Ave 18 1/2		Chlorpyrifos	One extra sample during each irrigation and storm event??	Same as Normal Monitoring
Cottonwood Creek @ Rd 20		Copper		
Dry Creek @ Rd 18		Copper		
Dry Creek @ Wellsford Rd		Organophosphates *Ceriodaphnia*		
Duck Slough @ Gurr Rd		Copper, chlorpyrifos, thiobencarb, bifenthrin		
Duck Slough @ Gurr Rd				

Note:

1 Coalition needs to define Normal Monitoring.