

Summary of Issues in the CVRWQCB Irrigated Lands Proposed Revised MRP

Prepared for the CVRWQCB TIC meeting August 14, 2007

G. Fred Lee, PhD, DEE and Anne Jones-Lee, PhD
G. Fred Lee & Associates
El Macero, CA
gfredlee@aol.com www.gfredlee.com

These comments are adapted from our April 13, 2007 report to the CVRWQCB on the Working Draft MRP dated March 29, 2007:

Lee, G. F., and Jones-Lee, A., "Comments on 'Working Draft - Draft Monitoring and Reporting Program -Order No. R5-2007-__for Coalition Groups under Amended Order No. R5-2006-0053 Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands' dated March 29, 2007," Report submitted to CVRWQCB, Sacramento, CA by G. Fred Lee & Associates, El Macero, CA, April 13 (2007). Available online at: <http://www.members.aol.com/LFandWQ/CommentsWorkingDraftMRP.pdf>

The issues of greatest concern are the following.

- The approach for siting monitoring locations does not ensure reliable examination of the potential water quality impacts of agricultural runoff/discharges.
- The Assessment Monitoring program - one grab sample per month over a three-year period - is not adequate to reliably detect and evaluate general, or especially worst-case, conditions that could cause significant water quality impacts of runoff/discharges from irrigated agricultural areas.
- A single grab sample during each of two stormwater runoff events per year cannot be relied upon to provide a meaningful glimpse into the character, behavior, or potential water quality impact of an event, much less provide a basis for extrapolation to the general case impact for a discharge.
- The listing of Long-Term Monitoring Strategy (LTMS) monitoring parameters has deficiencies that diminish the monitoring program's reliability for producing data that can be used to evaluate violations of the CVRWQCB Basin Plan numeric and narrative water quality objectives (WQOs).

Revised MRP lists the "Objectives" of the MRP as:

"QUESTION No.1: Are conditions in waters of the State that receive agricultural drainage or are affected by other irrigated agriculture activities within Coalition Group boundaries protective, or likely to be protective, of beneficial uses?"

QUESTION No.2: What is the magnitude and extent of current or potential water quality problems in waters of the State that receive agricultural drainage or are affected by other irrigated agriculture activities within Coalition Group boundaries, as determined using monitoring information?"

QUESTION No.3: *What are the contributing source(s) from irrigated agriculture to the water quality problems in waters of the State that receive agricultural drainage or are affected by other irrigated agriculture activities within Coalition Group boundaries?*

QUESTION No.4: *What are the management practices that are being implemented to reduce the impacts of irrigated agriculture on waters of the State within the Coalition Group boundaries and where are they being applied?*

QUESTION No.5: *Are conditions in waters of the State within Coalition Group boundaries getting better or worse through implementation of management practices?"*

Meeting Objectives

Those objectives are appropriate and need to be achieved in order to begin to control the discharge of pollutants from irrigated lands in the Central Valley. However, there are deficiencies in the MRP that preclude the achievement of those objectives in the foreseeable future.

- The MRP will ultimately need to be significantly expanded and upgraded in specific aspects in order to achieve the program objectives.
 - Initially, the ag waiver water quality monitoring program was designed to initiate a limited-scope water quality monitoring program through which coalitions of agricultural interests discharging in an area were to begin to undertake analysis of a limited number of samples on a limited number of streams receiving runoff/discharges from irrigated agricultural lands.
 - Basically, the current, and for that matter the proposed revised, MRP is a “**hit or miss**” approach to water quality monitoring.
 - In order to reliably evaluate the ag runoff/discharge-related water quality impacts that cause violations of Basin Plan numeric and narrative water quality objectives, it is necessary to significantly expand the downstream watershed monitoring as well as to conduct a focused water quality monitoring program that is grounded in event/situation monitoring.

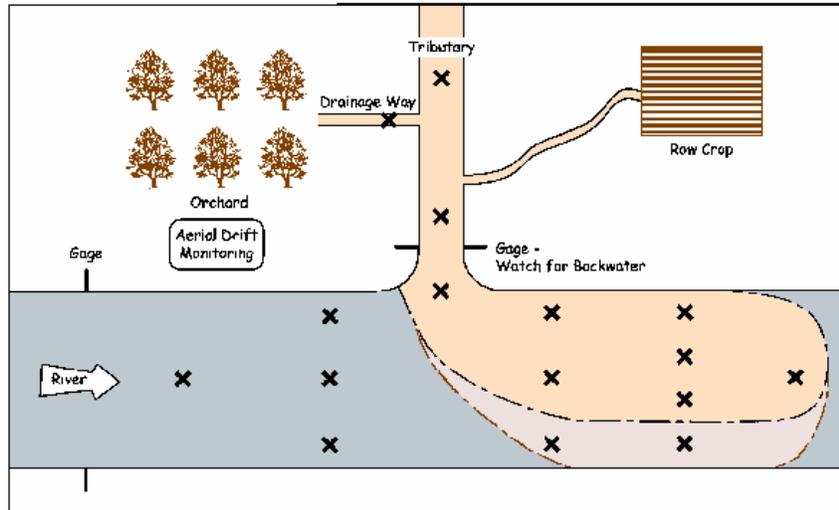
Recommendations for Improvement in MRP

In 2002 Lee and Jones-Lee discussed their recommendations for a water quality monitoring program for irrigated lands.

Lee, G. F. and Jones-Lee, A., “Issues in Developing a Water Quality Monitoring Program for Evaluation of the Water Quality - Beneficial Use Impacts of Stormwater Runoff and Irrigation Water Discharges from Irrigated Agriculture in the Central Valley, CA,” California Water Institute Report TP 02-07 to the California Water Resources Control Board/ Central Valley Regional Water Quality Control Board, 157 pp, California State University Fresno, Fresno, CA, December (2002). Available online at: <http://www.gfredlee.com/Agwaivemonitoring-dec.pdf>

In that report, they pointed to the need for a highly focused, edge-of-the-field and nearby waterbody monitoring program that is designed to collect water samples during the times that the greatest concentrations of potential pollutants are being discharged or run off from the irrigated agricultural area. Such a program is illustrated in Figure 1 (below) from that report.

Figure 1
Recommended Monitoring Approach for Toxicity and its Impacts
in Agricultural Runoff/Discharges



X Water-Column & Benthic Sampling Locations

Use Caged Organisms at Selected Locations

Sample Water Column during Runoff Event
 Measure Toxicity & Pesticide Concentrations

Define Chemical & Toxicity Plumes

Use Specific Conductance &
 Temperature to Define Tributary
 Plume
 Use Oranges to Define Velocity

Determine Duration of Exposure for
 Toxic Conditions for Planktonic &
 Benthic Organisms

(from Lee and Jones-Lee, "Issues in Developing a Nonpoint Source Water Quality Monitoring Program for Evaluation of the Water Quality - Beneficial Use Impacts of Stormwater Runoff and Discharges from Irrigated Agriculture in the Central Valley, CA," 2002)

Key Elements for More Effective MRP

- The single grab sample of runoff for each of two stormwater runoff events as required under the current and proposed revised MRP is a “hit-or-miss” approach.
 - It is grossly inadequate to provide reliable monitoring of the potential occurrence of toxicity or other adverse impacts of ag runoff/discharges in a monitoring station watershed upstream of the monitoring location.
 - Such an approach could be followed for years without ever defining the adverse impacts of upstream ag runoff discharges. Further, by its inherent unreliability, it could lead to erroneous conclusions and expenditures for pollutant control that do not, in fact, remedy the problems.
 - It is important to understand that a short-term, “worst-case” runoff/discharge situation, such as a short-term pulse of pesticide-caused aquatic life toxicity, can go undetected under the current and proposed ag waiver water quality monitoring program yet have highly adverse impacts on aquatic life-related beneficial uses by killing larval fish or essential fish food organisms. This can

also adversely impact locally resident fish populations as well as anadromous fish populations (salmon).

- A reliable, focused water quality impact evaluation program requires an understanding of
 - how and when potential pollutants are transported from irrigated lands, and
 - how those pollutants adversely impact aquatic life and other beneficial uses of waterbodies receiving the ag runoff/discharge.
 - At this time, this understanding does not typically exist in the Central Valley.
- The result is that it will likely be necessary to conduct some preliminary studies to evaluate how best to monitor in specific locations.
 - The magnitude, duration, persistence and impacts of ag runoff-derived pollutants often depend on site-specific characteristics.
 - By focusing on edge-of-the-field, worst-case situations it will be possible to fairly quickly identify those agricultural practices and conditions that are most likely to be adverse to water quality due to aquatic life toxicity, turbidity, changes in aquatic life habitat such as spawning areas, etc.
 - Ultimately adopting this monitoring approach could prove to be less expensive for agricultural interests than the hit or miss monitoring set forth in the revised draft MRP.
- The MRP specifies that the monitoring for the initial round of focused monitoring be conducted at locations “representative” of the coalition’s area of responsibility.
 - An Expert Panel should be used to guide selection of sites in each watershed for initial study locations and to prioritize the allocation of funds available for monitoring.
 - In making the determination of focused monitoring locations consideration should be given to the range of factors that are expected to control or influence the water quality impact of the runoff/discharges.
 - The emphasis should be on gaining a technical understanding of key issues that are likely to influence the manifestation of aquatic life toxicity or other adverse impacts at a particular location.
- Key parts of the upstream monitoring program are
 - the upstream and downstream monitoring to determine if there are upstream sources of pollutant that are contributing to pollutant concentrations/loads, and the downstream extent of adverse impacts of ag discharges, and
 - evaluation of whether there are other downstream inputs of the pollutants of concern.
 - development of pollutant export coefficients that can be used to estimate potential pollutant loads from certain types and locations of irrigated agriculture.
- Experience with Nutrient Export Coefficients

- Protect agricultural interests from litigation that could result from initial upstream study locations.
- This approach rapidly leads to focused studies on developing management practices that can have general applicability for certain types of situations.
- **Focused upstream** monitoring
 - far more cost/effective for defining water quality impacts of stormwater runoff/discharges from irrigated agriculture than currently proposed, “hit or miss” MRP approach.