

Comments on
**ASacramento/Feather River Organophosphate Pesticide Management Plan:
Water Quality Targets for Diazinon®**

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Comments submitted by

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The Central Valley Regional Water Quality Control Board (CVRWQCB) and the CA Department of Pesticide Regulation (DPR) are developing a management plan for organophosphate (OP) pesticides in the Sacramento and Feather Rivers associated with the use of diazinon as an orchard dormant spray. This effort is being conducted through a stakeholder-developed consensus approach through the Sacramento/Feather River OP Pesticide Focus Group (Focus Group). Presented herein are comments on the March 29,2000 revised draft of the Sacramento/Feather River Organophosphate Pesticide Management Plan: Water Quality Targets for Diazinon.®

These comments consider not only the situation that is believed to exist today, but also that which could exist in the future in the Sacramento and Feather Rivers, where there is concern about the water quality impacts of the pesticides that are used as orchard dormant sprays. Further, since this document could set a precedent for establishing OP, other pesticide, and other potential toxicants TMDL control programs, comments are included on issues that, while currently not considered to be important in the Sacramento/Feather River dormant spray aquatic life toxicity control issue, are likely important in other waterbodies today, and could become important in the Sacramento/Feather Rivers and their tributaries in the future.

Overall Major Problems with this Draft

The most significant problem with this draft statement of possible diazinon TMDL goals is the lack of a discussion of the US EPA Office of Pesticide Programs and CA Department of Pesticide Regulations regulatory requirements of controlling the use of pesticides that are significantly adverse to the beneficial uses of a waterbody. As I have discussed at previous Focus Group meetings and in comments on diazinon TMDL goals, this target should be evaluated, since it could readily become the goal that is adopted by the State Water Resources Control Board in an appeal of the CVRWQCB diazinon TMDL, or in the courts in litigation that could arise from opposition to imposition of another TMDL goal for the control of diazinon-caused aquatic life toxicity.

At this time there is a conflict between US CWA and US EPA OPP regulatory approaches for pesticides that almost certainly will be reviewed by SWRCB, DPR and the courts. According to C. Fox (1999) stormwater runoff impacts of pesticides will be regulated based on US OPP regulations requiring no significant adverse impacts on beneficial uses. There are important ecological/water quality questions about the water quality-beneficial use significance of OP pesticide toxicity in waterbodies. It is readily possible that the laboratory-measured toxicity to *Ceriodaphnia* is of limited water quality significance to the beneficial uses of waterbodies. While inadequate to address all of the important issues, the current Ecological risk assessment and the mesocosm studies support this position. Pesticide manufactures/users should be given the opportunity to reliably demonstrate that diazinon can be present in the Sacramento and Feather Rivers and the Delta without impairing the beneficial uses of these waterbodies.

Further, since restricting the use of diazinon will almost certainly lead to the use of another pesticide that could be significantly adverse to beneficial uses of the Sacramento/Feather Rivers and the Delta, it is essential that real, significant water quality beneficial use-impairment of these waters be found before substituting one pesticide for another. This is especially true in the situation that exists today, where pesticides can be changed without reliable/adequate evaluation of the potential environmental impacts.

Failing to provide guidance on how to evaluate the relationship between *Ceriodaphnia* toxicity as measured in laboratory-based toxicity tests, and significant impacts on the Sacramento/Feather Rivers and the Delta beneficial uses will cause the CVRWQCB efforts to develop an appropriate TMDL to control important aquatic life toxicity associated with OP pesticide use, to become suspect and be judged inadequate. By addressing this issue as part of TMDL goal development, the CVRWQCB and DPR will be addressing the current range of regulatory requirements for pesticides. Rather than mechanically implementing the current CWA-based TMDL requirements, providing guidance on how to properly assess significant water quality impairments is the most technically valid approach in which the current available science is used in regulating pesticide and likely other potentially toxic constituents. Adoption of this approach will also address the ambiguity in the CVRWQCB Basin Plan requirements for toxicity control.

This approach of no significant adverse impacts on beneficial uses for establishing the OP pesticide TMDL goal will possibly stimulate field studies devoted to assessing the impact of the toxic pulses of OP pesticide toxicity on the numbers, types, and characteristics of organisms that are needed to define the real, significant impacts of the OP pesticide-caused aquatic life toxicity. This approach will enable the development of a Best Professional Judgment Weight of Evidence water quality evaluation of the type that is needed for properly regulating potentially toxic constituents in aquatic systems. Including this approach in the range of TMDL goals could and should become precedent-setting for the CVRWQCB in establishing technically valid cost-effective regulatory approaches for managing the subtle impacts of chemicals on aquatic systems.

Another area of deficiency in the current draft TMDL goals statement is the failure to discuss some of the problems with each of the TMDL goals that is proposed for consideration by the Focus Group. It is

essential that discussion of these issues be part of a properly prepared discussion of the range of possible TMDL goals for the control of OP pesticide-caused aquatic life toxicity. This type of information is essential for the Focus Group to select the appropriate TMDL goal.

Specific Comments

Page 1, paragraph 4, line 4. Change the word “*reduced*” to “managed.”

Page 3, paragraph 3, item 1. After “*US EPA water quality criteria*,” add “not yet adopted.” Also, add in item 7. “No significant impact on beneficial uses.”

Page 4, paragraph 1 states in the first line that “*A numeric target is a required element of a TMDL.*” I question the reliability of this statement. I know that TMDLs are being developed without numeric water quality objective goals. Further in the same paragraph, the statement, “*The numeric target is used to determine compliance with the TMDL and to gage the effectiveness of the control measures being implemented.*” While this is often done, it can be highly unreliable in terms of a cost-effective control program. In many situations, the numeric targets that are used as TMDL goals do not reliably relate to water quality-beneficial use issues. There is need to stop trying to short-cut proper water quality assessments by trying to use chemically-based numeric targets, rather than conducting proper assessments of real water quality impacts to the numbers, types, and characteristics of desirable forms of aquatic life.

Page 4, last paragraph, is a statement of the CVRWQCB Basin Plan toxicity control requirements. There are a number of aspects of this statement that need clarification, such as what is meant by “*produce detrimental physiological responses.*” Organisms show biological/physiological impacts to chemicals that are not necessarily significantly adverse to the organisms, or especially to higher trophic-level organisms of concern to the public. The CVRWQCB needs to develop guidance on how the Basin Plan requirements should be implemented.

Page 5, second paragraph, first line, uses the term “*water chemistry*” incorrectly. Water chemistry is concerned with the kinetics and thermodynamics of the reactions that control the chemical species present in a water. Chemical analyses results are not “chemistry.” The “*water chemistry*” term should be changed to “chemical.”

Further in the same paragraph, the statement that finding concentrations of diazinon above CDFG criteria “*...is sufficient evidence that the Basin Plan’s narrative objectives are being exceeded.*” This is a very dangerous approach that fails to properly consider the worst-case nature of how the CDFG criteria were developed, compared to the kinds of exposures that can occur associated with stormwater runoff-associated OP pesticides and other constituents.

Page 5, paragraph 1, under item II, U.S.EPA Aquatic Life Criteria, states “*These criteria are intended to be 95 percent protective of all aquatic species.*” Because of the worst-case nature of these

criteria, in which the aqueous environmental chemistry of the constituent is ignored in criteria implementation, they are often far more protective than 95 percent, dependent on the source of the constituents and the characteristics of the waterbody in which the constituent is located.

With respect to the last sentence in that paragraph about the one-hour average and four-day average for acute and chronic criteria, respectively, it should be understood that those values were arbitrarily developed, without proper peer review, to represent acute and chronic conditions. There is no question about the fact that concentrations well above the EPA criterion values for one hour or four days can occur without adverse impacts to aquatic organisms being regulated by the criterion value. The US EPA has understood this problem for many years and has, on several occasions, proposed to address this over-regulation. Thus far the politics of the situation are such that the Agency has failed to do so.

On page 7 and elsewhere, far too many significant figures are being used to express concentrations. The number of significant figures used in a concentration of a constituent should relate to the reliability of the measurements.

Page 8. I believe the CDFG update on the diazinon criterion has been completed and is now published.

Page 10. It should be understood that the US EPA's water effects ratio approach fails to adjust the criterion values for certain types of sources of constituents and for those constituents which equilibrate slowly in aquatic systems.

An issue that should be mentioned is that the US EPA's approach for developing the acute criterion value, which represents an extrapolation of the four most sensitive species' LC50 values, has serious technical difficulties. It has been found that including a more sensitive species within the four that are used causes the criterion value to increase, since the line of extrapolation is made steeper.

On page 11, mention is made of the US EPA AQUIRE Database. Mention should also be made of the US EPA OPP Ecotoxicity Database. There are over 13,000 entries in that database on toxicity to certain organisms, such as *Daphnia magna* and *Mysidopsis bahia*, associated with the registration of pesticides.

Page 12 should contain a discussion of some of the problems with the probabilistic ecological risk assessment approach as discussed in this write-up. Lee and Jones-Lee (1999) have discussed some of these issues. Further, de Vlaming has a discussion of these issues in press.

Page 13 presents the *Ceriodaphnia* no effect level approach proposed by Perrone. This is a very dangerous approach, since it is based, to a considerable extent, on co-occurrence of toxic effects with chemical concentrations. Such a co-occurrence approach can readily lead to erroneous cause-and-effect relationships.

As noted above, discussions on the no significant impact on beneficial use approach should be presented in this discussion of TMDL goals. Further, this report should contain a discussion of cumulative impacts of pesticides and other constituents.

A discussion of a ‘Best Professional Judgment’ ‘Weight of Evidence’ approach which includes obtaining information on organism assemblages as impacted by the toxic pulses of diazinon-caused toxicity should be included.

Another issue that needs to be discussed is that of pesticides leaving the areas of application and becoming Porter-Cologne “wastes.” Ultimately, this may be the way in which pesticides that cause adverse impacts in receiving waters for stormwater runoff and agricultural and other discharges may be regulated in California.

References

Fox, C., Assistant Administrator, US EPA, personal communication to G. Fred Lee (1999).

Lee, G.F. and Jones-Lee, A., “The Single Chemical Probabilistic Risk Assessment Approach is Inadequate For OP Pesticide Aquatic Life Toxicity,” *Learned Discourses, SETAC News*, 20-21 November (1999).