



## MEMORANDUM

TO: Tessa Fojut  
Central Valley Regional Water Quality Control Board  
11020 Sun Center Dr., Ste. 200  
Rancho Cordova, CA 95670

FROM: Xin Deng, Ph.D.  
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DATE: May 5, 2014

SUBJECT: REVIEW OF REPORT FOR THE DERIVATION OF ESFENVALERATE  
WATER AND SEDIMENT QUALITY CRITERIA

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The report described the procedures for derivation of esfenvalerate water and sediment quality criteria (WQC and SQC) by applying the water and sediment quality criteria derivation methodologies (UCDM and UCDSM) developed by the University of California, Davis. The report explicitly followed the data evaluation criteria of the methodologies and identified acceptable acute and chronic toxicity values for water and sediment. Based on the methodologies, the acute WQC was derived by using the log-logistic species sensitivity distribution procedure. The chronic WQC, and acute and chronic SQCs were derived by applying either an Assessment Factor or default acute-chronic ratios (ACRs).

The application of UCDM and UCDSM resulted in an acute WQC of 20 ng/L, chronic WQC of 3 ng/L, interim acute SQC of 12 ng/g OC and interim chronic SQC of 2.1 ng/g OC. Comparisons to the existing toxicity data from sensitive species, threatened and endangered species and ecosystem studies suggested that the derived acute and chronic criteria be protective of aquatic organisms under the current knowledge of esfenvalerate water and sediment toxicity.

The report appropriately discussed the limitations and uncertainties involving in the criteria derivation. For the acute WQC, the limitations were primarily attributed to the limited number of acute toxicity data that were based on flow-through tests and measured concentrations, and absence of the toxicity data for the known sensitive species *Hyaella azteca*. For the chronic WQC, the limitations were due to the lack of toxicity data on *H. azteca* and fewer than required number of chronic values for species sensitivity analysis. The report particularly noted that it was uncertain whether the acute and chronic WQCs were protective of amphipods as no water toxicity data was available for the sensitive species *Hyaella azteca*. We noted that the acute WQC of 20 ng/L was more protective than the lowest acute US EPA aquatic life benchmark of



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25 ng/L and could be potentially applied for data evaluations in DPR's surface water monitoring programs. The chronic WQC of 3 ng/L, however, is below the current reporting limit of 5 ng/L for esfenvalerate in the DPR's chemistry report, thus, it may not be feasible to be used as a criterion for evaluation of esfenvalerate contamination in surface water. For the acute and chronic SQC, lack of sediment toxicity data primarily contributed to the limitations and uncertainties. Other uncertainties were related to toxicity changes with lower temperatures and addition of PBO (piperonyl butoxide) in pyrethroid formulations that could not be quantified with limited data sources. We agree with the report to consider the SQC interim values until more data are available to better address the limitations and uncertainties in the future.

We appreciate the opportunity to review the "Water and Sediment Quality Criteria Report for Esfenvalerate". If you have further question, please contact Xin Deng at (916) 445-2506 or [xdeng@cdpr.ca.gov](mailto:xdeng@cdpr.ca.gov).