October 4, 2005

MEMORANDUM

TO: David Weinberg and Ephi Gur

FROM: Lenwood Hall

SUBJECT: Additional co-occurrence analysis for diazinon and chlorpyrifos using data from the December 22, 2004 and the October 3, 2005 memoranda (San Joaquin Data only)

A summary of the diazinon and chlorpyrifos co-occurrence analysis, including target exceedences, for the above two memoranda is described below.

December 22, 2004 Analysis (Department of Pesticide Regulation Data)
A total of 311 samples were collected for both diazinon and chlorpyrifos measurements in the San Joaquin Watershed from 2002-2003. Detected concentrations of both OPs were reported from a total of 13 samples (4.1% of the samples). The % of these 13 samples that were concurrently below both the old and new acute/chronic diazinon and chlorpyrifos targets are summarized below:

Old acute diazinon target (80 ng/L) and old acute chlorpyrifos target (20 ng/L) – 46%
Old chronic diazinon target (50 ng/L) and old chronic chlorpyrifos target (14 ng/L) – 15%
New acute diazinon target (160 ng/L) and new acute chlorpyrifos target (25 ng/L) – 62%
New chronic diazinon target (100 ng/L) and new chronic chlorpyrifos target (15 ng/L) – 38%

October 3, 2005 Analysis (Regional Board data from UC-Davis)
A total of 473 samples were collected for both diazinon and chlorpyrifos measurements in the San Joaquin Watershed from 2003-2005. Detected concentrations of both OPs were reported from 32 samples (6.8% of the samples). The % of these 32 samples that were concurrently below both the old and new acute/chronic diazinon and chlorpyrifos targets are summarized below:

Old acute diazinon target (80 ng/L) and old acute chlorpyrifos target (20 ng/L) – 38%
Old chronic diazinon target (50 ng/L) and old chronic chlorpyrifos target (14 ng/L) – 31%
New acute diazinon target (160 ng/L) and new acute chlorpyrifos target (25 ng/L) – 59%
New chronic diazinon target (100 ng/L) and new chronic chlorpyrifos target (15 ng/L) – 44%

Summary
It is clear from this additional co-occurrence analysis that the results from both the December 2004 and the October 2005 OP analysis are generally similar with the exception of the two fold difference for the old chronic diazinon and chlorpyrifos comparisons (i.e., 15% for the December 2004 analysis and 31% for the October 2005 analysis). As expected, higher targets increase the % of samples that co-occur below thresholds (i.e., targets). It should also be noted that targets – which are very conservative values that contain safely factors – were used to represent thresholds in the above

analysis. Dr. Felscot in his review of the Regional Board diazinon and chlorpyrifos TMDL report states that the denominator in the additivity equation should include a definitive toxicity endpoint (i.e., an LC50) rather than a target that contains a safety factor. If we assume that an LC50 for an OP sensitive species such as *Ceriodaphnia* could be used to represent a threshold or better yet a genus mean acute value (i.e., 440 ng/L for diazinon and 60 ng/L for chlorpyrifos as used in the 2000 CDFG diazinon and chlorpyrifos water quality criteria document) then a much higher % of samples with co-occurring detected concentrations of diazinon and chlorpyrifos will be below these thresholds as presented below.

If the diazinon genus mean acute value of 440 ng/L and the chlorpyrifos genus mean acute value of 60 ng/L for *Ceriodaphnia* are used as thresholds, then 92% of the co-occurring detected diazinon and chlorpyrifos concentrations from the December 22, 2004 analysis are below these thresholds. If these same diazinon and chlorpyrifos genus mean acute values for *Ceriodaphnia* are used with the October 3, 2005 analysis, then 91% of the co-occurring detected diazinon and chlorpyrifos are below these thresholds.