



# Department of Pesticide Regulation



Mary-Ann Warmerdam  
Director

## MEMORANDUM

Arnold Schwarzenegger  
Governor

TO: Christopher Reardon  
Chief Deputy Director

FROM: Mary-Ann Warmerdam  
Director  
(916) 445-4000

DATE: August 27, 2008

SUBJECT: DIRECTOR'S PROPOSED DECISION CONCERNING ENDOSULFAN AS A  
TOXIC AIR CONTAMINANT

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Attached is a public notice of the proposed decision concerning my response to the Scientific Review Panel's findings on endosulfan as a toxic air contaminant. My response has been made in accordance with all authorities and requirements stipulated in the Food and Agricultural Code and California Code of Regulations that mandate this determination. The Scientific Review Panel's findings were transmitted to me on August 18, 2008. Therefore, my response has been made within the ten-day statutory deadline.

I thank you, the staff, and all the members of the Scientific Review Panel for the excellent work.

Attachment

cc: Mary Nichols, ARB Chair (w/Attachment)  
Joan Denton, OEHHA Director (w/Attachment)  
Scientific Review Panel (w/Attachment)  
Jim Behrmann, Scientific Review Panel ARB Liaison (w/Attachment)  
Chuck Andrews, DPR Assistant Director (w/Attachment)  
John Sanders, Ph.D., DPR Acting Assistant Director (w/Attachment)  
Dave Duncan, DPR Branch Chief (w/Attachment)  
Sue Edmiston, DPR Branch Chief (w/Attachment)  
Nan Gorder, DPR Branch Chief (w/Attachment)  
Gary Patterson, DPR Branch Chief (w/Attachment)  
Ann Prichard, DPR Acting Branch Chief (w/Attachment)



August 27, 2008

Post Until October 3, 2008

NOTICE OF PROPOSED DECISION CONCERNING  
THE DIRECTOR'S DECLARATION OF  
ENDOSULFAN AS A TOXIC AIR CONTAMINANT

Section 14023 of the Food and Agricultural Code requires the Director of the Department of Pesticide Regulation (DPR) to determine if a pesticide is a toxic air contaminant (TAC) after receiving the findings of the Scientific Review Panel (SRP), a panel of experts representing a range of scientific disciplines. Based on the findings of the SRP's assessment of the report entitled "Final Draft Endosulfan Risk Characterization Document (RCD)" and the criteria given in Title 3, California Code of Regulations (3 CCR) section 6890(b), the Director proposes to declare endosulfan as a TAC.

Background

With the enactment of California's TAC Act (Assembly Bill 1807, Tanner, Chapter 1047, Statutes of 1983; amended by Tanner, Chapter 1380, Statutes of 1984), the Legislature created the statutory framework for the evaluation and control of chemicals as TACs. The statute defines TACs as air pollutants that may cause or contribute to increases in serious illness or death, or that may pose a present or potential hazard to human health. DPR is responsible for the evaluation of pesticides as TACs.

In general, the law focuses on the evaluation and control of pesticides in ambient community air. In implementing the law, DPR must: (1) conduct a review of the physical properties, environmental fate, and human health effects of the candidate pesticide; (2) determine the levels of human exposure in the environment; and (3) estimate the potential human health risk from those exposures. The law requires DPR to list in regulation those pesticides that meet the criteria to be TACs.

For each pesticide, the law requires the preparation of a report that includes the environmental fate and use of the pesticide, an assessment of exposure of the public to air concentrations of the pesticide, and a health assessment. The report is reviewed by the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board, and is made available for public review. Based on the results of these reviews, the draft report is revised as appropriate. The draft undergoes a rigorous peer review for scientific soundness by the SRP. Based on the results of this comprehensive evaluation, the DPR Director determines whether the candidate is a TAC. If the Director determines the pesticide meets the criteria to be a TAC, DPR declares the pesticide a TAC in regulation, and adds it to the TAC list.

Once a candidate pesticide has been declared a TAC, it enters phase two of the program--the mitigation, or control, phase. In the mitigation phase, DPR investigates the need for, and appropriate degree of, control for the TAC. If reductions in exposure are needed, DPR must develop control measures to reduce emissions to levels that adequately protect public health.

## Department Conclusions

Title 3, CCR section 6890 states, “A pesticide shall be identified as a toxic air contaminant if its concentrations in ambient air are greater than the following levels (for the purposes of this section, a threshold is defined as the dose of a chemical below which no adverse effect occurs):

- (a) For pesticides which have thresholds for adverse health effects, this level shall be ten-fold below the air concentration which has been determined by the Director to be adequately protective of human health.
- (b) For pesticides which do not have thresholds for adverse health effects, this level shall be equivalent to the air concentration which would result in a ten-fold lower risk than that which has been determined by the Director to be a negligible risk.”

The reference concentration is the estimate of daily human exposure that is not likely to result in health concerns. It is calculated from the No-Observed-Effect Levels from toxicity studies in experimental animals and applicable uncertainty factors. The reference concentrations for endosulfan included an uncertainty factor of 100 to account for the extrapolation of data from a laboratory animal study, and the variation in response between individuals. The No-Observed-Effect Levels for acute, 1-2 weeks, subchronic (13-weeks), and chronic exposures were 0.194, 0.194, and 0.0194 milligrams per kilogram per day (mg/kg/day), respectively. The reference concentrations (and exposure durations) for infants, the highest exposed group in the general population, are 0.0033 milligrams per cubic meter (mg/m<sup>3</sup>) for acute exposure, 0.0033 mg/m<sup>3</sup> for subchronic exposure, and 0.00033 mg/m<sup>3</sup> for chronic exposure. As described above, air concentrations exceeding one-tenth (10 percent) of the reference concentrations meet the criteria for listing as a TAC. Therefore, endosulfan air concentrations exceeding 0.00033 mg/m<sup>3</sup> for acute exposure, 0.00033 mg/m<sup>3</sup> for subchronic exposure, and 0.000033 mg/m<sup>3</sup> for chronic exposure would meet the criteria for listing as a TAC.

To estimate human bystander exposure to endosulfan in air, data were used from application site monitoring in a 1997 study in San Joaquin County. Concentrations are assumed to be directly proportional to application rate; and to adjust for concentrations associated with the maximum endosulfan application rate in estimating short-term exposures, the 24-hour time-weighted average was multiplied by 1.67 (2.5 divided by 1.5). Estimates were based on an assumed high-use period of one month, as repeated applications adjacent to any one individual are considered unlikely for longer intervals. The short-term absorbed daily dose for bystanders was 0.0016 mg/kg/day for infants and 0.00076 mg/kg/day for adults. Seasonal average daily dose estimates for bystander exposures to endosulfan were 0.00056 mg/kg/day for infants and 0.00027 mg/kg/day for adults. Annual average daily dose estimates for bystanders were 0.000047 mg/kg/day for infants and 0.000022 mg/kg/day for adults. Seasonal average daily does estimates for bystander exposures to endosulfan are 0.00056 mg/kg/day for infants and 0.00027 mg/kg/day for adults. Annual average daily dose estimates for bystanders are 0.000047 mg/kg/day for infants and 0.000022 mg/kg/day for adults. These were 82 percent, 29 percent, and 24 percent of the reference concentration

for infants acute, subchronic and chronic, respectively, thereby meeting the criteria for identifying endosulfan as a TAC.

Some of these conclusions differ from the findings of the SRP and OEHHA, in that they recommended lower reference concentrations in some instances. Both the SRP and OEHHA recommend designating endosulfan as a TAC. DPR will consider the differences in the reference concentrations during its risk management evaluation.

Department Actions

DPR proposes to adopt a regulation designating endosulfan as a TAC. DPR proposes to add endosulfan to the list of pesticides in 3 CCR section 6860(a).

DPR will conduct a public hearing concerning the proposed regulation.

APPROVED BY:  Date: 08/27/08  
Mary-Ann Warmerdam, Director