



Mary-Ann Warmerdam  
Director

Arnold Schwarzenegger  
Governor

California Notice 2008-07

## SEMIANNUAL REPORT SUMMARIZING THE REEVALUATION STATUS OF PESTICIDE PRODUCTS DURING THE PERIOD OF January 1, 2008 THROUGH June 30, 2008

California regulations require the Department of Pesticide Regulation (DPR) to investigate reports of possible adverse effects to people or the environment resulting from the use of pesticides. If a significant adverse impact occurred or is likely to occur, the regulations require DPR to reevaluate the registration of the pesticide.

Title 3, California Code of Regulations (3CCR), section 6221, specifies a number of factors under which DPR may initiate a reevaluation: (a) public or worker health hazard, (b) environmental contamination, (c) residue over tolerance, (d) fish or wildlife hazard, (e) lack of efficacy, (f) undesirable phytotoxicity, (g) hazardous packaging, (h) inadequate labeling, (i) disruption of the implementation or conduct of pest management, (j) other information suggesting a significant adverse effect, (k) availability of an effective and feasible alternative material or procedure that is demonstrably less destructive to the environment, and (l) discovery that data upon which a registration was issued is false, misleading, or incomplete. Often, ongoing DPR reviews trigger a reevaluation. Reevaluation triggers also include State and county pesticide use surveillance and illness investigations, pesticide residue sample analyses, environmental monitoring activities, and information from other state or federal agencies.

When a pesticide enters the reevaluation process, DPR reviews existing data. DPR requires registrants to provide additional data to determine the nature or the extent of the potential hazard or identify appropriate mitigation measures, if needed.

DPR concludes reevaluations in a number of different ways. If the data demonstrates that use of the pesticide presents no significant adverse effects, DPR concludes the reevaluation without additional mitigation measures. If additional mitigation measures are necessary, DPR places appropriate restrictions on the use of the pesticide to mitigate the potential adverse effect. If the adverse impact cannot be mitigated, DPR cancels or suspends the registration of the pesticide product(s).

This report complies with the requirements of 3CCR section 6225. Title 3, CCR section 6225 requires DPR to prepare a semiannual report describing pesticides evaluated, under reevaluation, or for which factual or scientific information was received, but no reevaluation was initiated. The report contains two sections:

- I. Formal Reevaluation - initiated when an investigation indicates a significant adverse impact has occurred or is likely to occur (see page 2); and



- II. Preliminary Investigations (Evaluations) - products or active ingredients for which DPR receives possible adverse factual or scientific information, but no reevaluation has been initiated (see page 14).

## **I. FORMAL REEVALUATION**

Undertaken when investigations indicate that a significant adverse impact has occurred or is likely to occur.

### **BRODIFACOUM – 22 Products**

Pesticide products containing brodifacoum are registered in California for the control of rats and mice in residential, industrial, commercial, agricultural, and public buildings. Registrants formulate the product with a grain-based bait in pellets, mini-pellets, and wax blocks. On December 30, 1999, at the request of the Department of Fish and Game (DFG), DPR placed pesticide products containing brodifacoum into reevaluation. DFG expressed concern that California's wildlife are exposed and may be adversely affected by currently registered uses of the anticoagulant rodenticide brodifacoum. This second generation rodenticide is hydrophobic, lipophilic, and the target rodent receives a delayed lethal dose with its first feeding. After multiple feedings, a rodent may have a significant "body burden" of this persistent pesticide at death.

DPR and DFG staff met with representatives of the Rodenticide Registrant Task Force (RRTF) in April 2001. At that meeting, DPR agreed to review additional information submitted by the registrants. DPR's biologist reviewed all data, slides, scientific journal articles, and correspondence submitted by the RRTF and other brodifacoum registrants. In October 2001, the U.S. Environmental Protection Agency (U.S. EPA) completed its final draft of an ecological assessment of brodifacoum and several other rodenticides. Since it appeared that U.S. EPA had the same concerns as DPR and would initiate mitigation measures at a national level, DPR decided to wait for the completion of U.S. EPA's assessment. In January of 2003, U.S. EPA released its preliminary comparative ecological assessment for nine rodenticides, including brodifacoum. U.S. EPA's preliminary assessment indicated that of the nine rodenticides studied, brodifacoum appears to pose the greatest potential overall risk to birds and nontarget mammals. Based on comments received, U.S. EPA revised its Comparative Ecological Risk Assessment on Rodenticides in July 2004.

Since the initiation of this reevaluation, DFG has identified several more incidents of non-target wildlife exposures to brodifacoum. Given the increased public interest in wildlife issues associated with brodifacoum and the length of time U.S. EPA had taken to complete its assessment, DPR began taking steps to address the problems associated with the use of brodifacoum, and two other second-generation anticoagulants, difethialone and

bromadiolone. At a November 18, 2005 meeting of the Pesticide Registration and Evaluation Committee, DPR presented an issue paper recommending a number of mitigation measures.

In January 2006, DPR mailed letters to all current anticoagulant rodenticides registrants proposing that rodenticides baits containing brodifacoum, bromadiolone, and difethialone be restricted to indoor structural use only. DPR requested comments or alternate mitigation measures. In response to that letter, DPR received numerous responses, not only from registrants, but also from representatives of the pest control industry expressing concern over DPR's proposal. One consistent comment was that food-processing plants must place rodenticides outdoors in order to comply with federal law, which requires them to prevent entry by rodents into the premises. They felt that the placement of rodenticides baits indoors may encourage rodents to enter food-processing premises. A second consistent comment was that DPR should work with the U.S. EPA to develop mitigation measures.

In the spring of 2006, DPR staff met with representatives of the RRTF, and in a separate meeting, DPR staff met with representatives from the Pest Control Operators of California. In addition to numerous telephone conversations, U.S. EPA staff traveled to California in August 2006 to discuss rodenticides mitigation measures with DPR staff. At that meeting, U.S. EPA indicated that it would issue an amended Rodenticides Cluster Reregistration Eligibility Document (RED), including proposed mitigation measures, in mid-January 2007. U.S. EPA's RED will address both ecological risks and risks to children from rodenticides.

In January 2007, U.S. EPA provided its proposed *Risk Mitigation Decision for Nine Rodenticides* and opened a 60-day public comment period, which was extended to May 18, 2007. DPR provided comments supporting U.S. EPA's proposed risk mitigation decision (RMD).

In May 2008, U.S. EPA announced their final *Risk Mitigation Decision for Ten Rodenticides*. The ten rodenticides can be grouped into first and second-generation anticoagulants and non-anticoagulants. The first-generation anticoagulant active ingredients include chlorophacinone, diphacinone, and warfarin. The second-generation anticoagulant active ingredients include brodifacoum, bromadiolone, difethialone, and difenacoum. The non-anticoagulants include zinc phosphide, bromethalin, and cholecalciferol. To minimize children's exposure to rodenticide products used in homes, U.S. EPA is requiring that all first-generation and non-anticoagulants rodenticide bait products marketed to residential consumers be sold as solid formulations preloaded in bait stations. To reduce wildlife exposures and ecological risks, U.S. EPA is requiring sale and distribution limits intended to minimize availability of second-generation anticoagulant products to residential consumers and require use of bait stations for all outdoor, above-ground uses. U.S. EPA's RMD is

consistent with DPR's proposed mitigation measures. DPR will defer finalizing the reevaluation pending the outcome of U.S. EPA's efforts.

#### CHLOROPICRIN – 44 Products

Chloropicrin is a colorless liquid that volatilizes readily when released into the atmosphere. Chloropicrin has been used as an insecticide since 1917 and a soil fumigant since 1920. As a space and soil fumigant, chloropicrin controls nematodes, bacteria, fungi, insects, and weeds. Chloropicrin can be used alone or in combination with other fumigants such as 1,3-dichloropropene or methyl bromide. Small amounts of chloropicrin are added to methyl bromide and other fumigant applications as a warning agent.

Data submitted to DPR under the Birth Defect Prevention Act indicate that chloropicrin has the potential to cause adverse health effects at low doses. The National Institute for Occupational Safety and Health (NIOSH) set an 8-hour time-weighted average of 0.1 parts per million (ppm) as the reference exposure limit for workers exposed to chloropicrin. The NIOSH standard of 0.1 ppm was recommended primarily for the prevention of eye irritation in humans.

Air monitoring data submitted in 1999 by the Chloropicrin Manufacturers Task Force (CMTF) indicate that the air levels of chloropicrin at some distances from treated greenhouses or fields could exceed the NIOSH standard. In the CMTF studies, off-site movement of chloropicrin was monitored during and after soil fumigation using four application methods in three states. At the Arizona applications, considered to have meteorological conditions most comparable to California, 4 of the 16 monitoring stations located 180 feet from the treated fields had chloropicrin levels at or exceeding the NIOSH standard. The highest level monitored was around 1,700 micrograms per meter cubed ( $\mu\text{g}/\text{m}^3$ ) (i.e., 0.25 ppm). The flux or emissions of chloropicrin was also measured<sub>2</sub> using the aerodynamic method. At the Arizona sites, the flux ranged from 114 to 222  $\mu\text{g}/\text{m}^2/\text{sec}$ , or 12 to 25 percent of the chloropicrin applied during the highest 6-hour period. In addition, depending upon the aeration system used, the ambient air concentrations of chloropicrin near treated greenhouses could increase significantly as a result of the required ventilation operation. A typical aeration would involve venting the air in the greenhouse directly out to the exterior environment.

Pursuant to this reevaluation, DPR required chloropicrin registrants to conduct, and submit the results of, various worker exposure and air quality monitoring studies from field and greenhouse applications. DPR completed its review of the required monitoring data in August 2005. In November 2005, the CMTF responded to DPR's comments and questions regarding the studies. All of the data and information will be used in the risk assessment of chloropicrin, which DPR anticipates submitting for external peer review in the fourth quarter of 2008.

### CHLORPYRIFOS – 40 Products

The pesticide active ingredient chlorpyrifos is an insecticide registered for use on a variety of agricultural crops and turf for control of various insects. Chlorpyrifos is formulated as dusts, wettable powders, emulsifiable concentrates, concentrates, and ready-to-use solutions.

In March of 2004, DPR placed all agricultural use (includes turf use) products containing chlorpyrifos into reevaluation. The basis for the reevaluation is monitoring data collected by the Central Valley Regional Water Quality Control Board (CVRWQCB). The monitoring data showed chlorpyrifos levels in the rivers and tributaries of the San Joaquin Valley, the Sacramento/San Joaquin Delta, and Monterey County tributaries that exceeded water quality objectives (WQO) for aquatic invertebrates.

Pursuant to this reevaluation, chlorpyrifos registrants are required to identify the processes by which chlorpyrifos pesticide products are contributing to detections of chlorpyrifos in surface water at levels that exceed WQOs and identify mitigation strategies that have been shown to reduce or eliminate chlorpyrifos residues in surface water. The basic manufacturer of chlorpyrifos responded to the reevaluation with the submission of data and information. DPR reviewed the submitted information and agreed with the basic manufacturer's assessment of the modes of transport of chlorpyrifos residues to surface water. DPR then asked the basic manufacturer to identify mitigation strategies that will reduce or eliminate chlorpyrifos residues in surface water when used under California conditions for all major agricultural uses. In August 2005, the basic manufacturer identified mitigation measures that are intended to reduce chlorpyrifos residues in surface water when the products are used under California conditions.

At the end of January 2006, DPR requested that the basic manufacturer provide monitoring data to demonstrate effectiveness of mitigation measures. In June 2006, the basic manufacturer submitted additional information, in lieu of the monitoring data requested. At a September 2006 meeting, the basic manufacturer presented DPR with a surface water monitoring strategy to assess the impact of the current mitigation measures. A total of seven monitoring sites were proposed for the San Joaquin Valley. In October 2006, DPR requested that the basic manufacturer also monitor coastal areas.

In February 2007, the basic manufacturer submitted a revised monitoring proposal, which included monitoring in the Delta, and East and West San Joaquin watersheds. The registrant will investigate: how chlorpyrifos from granules is getting into surface waters by investigating application methods and use patterns; and develop best management practices (BMPs) specific to granule applications.

In April 2008, the registrant submitted a final report entitled, “Surface Water Monitoring and Use Investigations for Determining Effectiveness of Chlorpyrifos Mitigation Measures – 2007 Final Report.” In June 2008, DPR scientists reviewed the report and determined that the monitoring data indicate that chlorpyrifos continues to be detected at levels that exceed WQOs at most sites considered in the report. In addition, exceedances occur throughout the year and appear to result from numerous crops and application methods. As a result of this final report, DPR is requesting that the registrant conduct an additional study to determine if concentrations of chlorpyrifos in surface water are decreasing. The study shall consist of an evaluation of all available monitoring data, including monitoring sites from the entire Central Valley and Central Coast. DPR anticipates receiving a final report of monitoring at the specified sampling locations by the second quarter of 2009.

#### CYFLUTHRIN – 43 Products

The pesticide active ingredient cyfluthrin is a nonsystemic pyrethroid insecticide registered for use on numerous field, vegetable, and fruit crops, including citrus. In addition, DPR registers pesticide products containing cyfluthrin for use on lawns and ornamental plants, animals, and around industrial, institutional, agricultural, and household structures. DPR initiated the reevaluation on May 8, 1998, based on its investigation of a May 1997 outbreak of respiratory irritation reported among orange harvesters exposed to residues of cyfluthrin in Tulare County and other pesticide illness reports related to cyfluthrin. As a part of the investigation of the Tulare County incident, DPR’s Worker Health and Safety Branch conducted two separate inhalation-monitoring studies in orange groves during orange harvest. DPR determined that as dust and pollen are a part of the normal working environment, something different in the work environment led to the workers’ respiratory irritation symptoms. DPR believes that the application of cyfluthrin to the citrus groves close to harvest led to the respiratory symptoms experienced. DPR compiled the results of its monitoring study in “Health and Safety Report, HS – 1765.”

In mid-September 1998, the basic manufacturer of cyfluthrin submitted the results of several studies and journal articles concerning the respiratory irritation of cyfluthrin. On October 29, 1998, and again on August 16, 2001, DPR met with the basic manufacturer to discuss the cyfluthrin reevaluation.

In October 2001, the basic manufacturer submitted: two worker exposure studies regarding hand harvesting of oranges and sweet corn; four indoor exposure studies; and a study entitled “Study on the RD<sub>50</sub> Determination in Rats.” Based on this data, DPR determined that no further structural monitoring data were required. However, DPR determined that it had insufficient data regarding worker exposure during the hand harvesting of sweet corn, so DPR required a sweet corn worker exposure study. The results of the study were submitted to DPR in October 2004. All of the data and information will be used in the risk assessment of cyfluthrin, which DPR anticipates submitting for external peer review by the fourth quarter of 2008.

### DIAZINON – 6 Products

The pesticide active ingredient diazinon is an insecticide registered for use on a variety of agricultural crops, livestock, and turf for control of various insects. Diazinon is formulated as dusts, granules, wettable powders, seed dressings, emulsifiable solutions, impregnated materials, encapsulated materials, and concentrates.

DPR initiated the reevaluation of diazinon products labeled for use as dormant sprays based on monitoring studies conducted between 1991 and 2001 by the U.S. Geological Survey, Dow Agrosciences, DPR, the CVRWQCB and the State Water Resources Control Board (SWRCB). These studies demonstrate the presence of diazinon in surface waters of the Sacramento and San Joaquin Valleys at levels that exceed water quality criteria (WQC), especially during the dormant spray season.

To mitigate off-site movement of diazinon residues, registrants developed supplemental labeling for dormant spray products. The supplemental labeling adds mitigation measures, such as restricting application to ground equipment only, prohibiting application within 100 feet upslope of “sensitive aquatic sites,” and prohibiting application to orchards when soil moisture is at field capacity, or when a storm event is likely. The supplemental labeling is approved for use in California for all currently registered diazinon products.

In May 2004, the registrant submitted an update on various proposed studies intended to indicate whether the new mitigation measures will be effective. In November 2004, DPR staff met with the registrant to discuss revisions to study protocols. Because of the inclement weather during January and February of 2005, the registrant was unable to initiate the planned studies. Subsequently, the registrant conducted two studies in 2006 and submitted final reports in October 2006. In February 2007, DPR received a report prepared by the University of California, Davis (UCD) entitled, “Results of the 2006 TMDL Monitoring of Pesticides in California’s Central Valley Waterways, January – March 2006.” This study indicated diazinon concentrations measured during the 2006 dormant spray season were still exceeding WQC. In March 2007, DPR forwarded the February 2007 UCD study to the registrant and requested development and implementation of further mitigation measures to reduce or eliminate diazinon residues in surface water.

In May 2007, the registrant responded to DPR’s request for additional mitigation measures by proposing a different approach. The registrant proposes to work with the Coalition for Urban/Rural Environmental Stewardship (CURES) to develop a current and historical diazinon-sampling database, searchable by chemical and sample location. From this database, the registrant proposes to identify “hot spot” areas where exceedances have occurred during dormant spray season in the Sacramento River and San Joaquin River watersheds. Next, the registrant proposes to develop a confidential questionnaire to determine what practices growers are using to mitigate surface runoff, with the focus on

those growers where the exceedances have occurred. In addition to the questionnaire, the registrant proposes to provide growers with educational materials prior to dormant spray applications (October/November) describing DPR's new dormant orchard spray regulations and management practices specific to diazinon use as a dormant spray. Finally, the registrant proposes to work with Orica Australia Pty, Ltd. to advance new enzyme-based technology under the name of Landguard OP-A for the treatment of water contaminated with organophosphate insecticides.

In February 2008, DPR reviewed the information provided by the registrant. As an outcome, DPR determined that recent monitoring data needs to be evaluated to determine the relationship between diazinon use and exceedances of the WQC. Additionally, DPR is closely following studies on the effectiveness of Landguard OP-A to reduce off-site movement of diazinon and chlorpyrifos. However, unless the use of Landguard OP-A or a similar product is required by the pesticide label or DPR regulation, it is not an enforceable mitigation measure. DPR anticipates receiving the written evaluation of all relevant recent statewide surface water monitoring data in the third quarter of 2008.

#### METHYL BROMIDE – 38 Products

Methyl bromide is a colorless and odorless gas that has been widely used since the 1940s as a preplant soil fumigant for controlling nematodes, plant pathogens, weeds, and insects. After harvest, it is used to protect commodities from pest damage during storage, processing, and transportation.

Since the early 1990s, DPR has focused considerable attention on ensuring the safe use of methyl bromide. The Air Resources Board (ARB) monitored during the 2000 methyl bromide use season to measure ambient air concentrations and ascertain whether they posed a threat to public health. Data indicated that short-term levels of methyl bromide were well within acceptable limits. However, data also indicated that ambient air concentrations in a number of locations exceeded DPR's target exposure level for seasonal (six- to eight-weeks) exposures. As a result, DPR determined that in certain high-use areas, the use of methyl bromide may cause an adverse impact. On June 26, 2001, DPR placed all products containing methyl bromide labeled for field fumigation into reevaluation based on the results of the 2000 monitoring data.

To determine the extent of seasonal exposure to methyl bromide in 2001, DPR required registrants to conduct ambient air quality monitoring in the Camarillo/Oxnard area of Ventura County and the Santa Maria area of Santa Barbara County. The Alliance of the Methyl Bromide Industry (AMBI) completed its ambient air monitoring in October 2001 and submitted a final report in April 2002. In 2002, DPR required methyl bromide registrants to conduct and submit the results of ambient air quality monitoring in Monterey/Santa Cruz and Ventura counties. Monitoring in Ventura County was completed in August 2002. Monitoring



in Monterey and Santa Cruz counties was completed in October 2002. AMBI submitted the final results of the 2002 studies in April 2003, and DPR completed its review of the data in June 2003.

Effective January 14, 2001, DPR adopted permanent methyl bromide field fumigation regulations to mitigate possible acute exposures to methyl bromide, and then adopted amendments to these regulations April 8, 2002. However, the regulations were voided by a court decision (*Ventura County Agricultural Association vs. DPR*) on the grounds that DPR had not adequately consulted with the California Department of Food and Agriculture prior to noticing the regulations. To maintain continuity and to ensure continued protection of the health and safety of workers and the public when methyl bromide is used for field fumigation, DPR filed emergency regulations to repeal and readopt these regulations. During the process to permanently adopt these regulations, DPR determined that additional mitigation measures were necessary and proposed an additional regulatory level to protect the public and agricultural employees from possible methyl bromide exposure hazards. On November 3, 2004, the Office of Administrative Law approved the methyl bromide field fumigation regulations. At DPR's request, ARB conducted monitoring in Ventura during 2005 and 2006 to check the effectiveness of the regulations. ARB submitted the final monitoring report in September 2007, and DPR expects to complete its evaluation of the monitoring data by the third quarter of 2008. If the ARB monitoring data indicate the regulations are effective, the reevaluation will be concluded.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (DATA CALL-IN) – 535 Products

On February 16, 2005, DPR placed certain liquid formulation agricultural and commercial structural use pesticide products into reevaluation. The basis for the reevaluation is concern about release into the atmosphere of volatile organic compounds (VOCs) from agricultural and commercial structural use pesticide products. VOCs and nitrogen oxides react in the presence of sunlight to create ground-level ozone. Ozone is a major air pollutant, harmful to both human health and vegetation. Many pesticide active ingredients and inert ingredients are VOCs.

The federal Clean Air Act requires states to submit state implementation plans (SIPs) for implementing, maintaining, and enforcing national ambient air quality standards (NAAQS) for air pollutants, such as ozone, in each air quality control region of California. Any region that does not meet the NAAQS for a given pollutant is designated as a federal nonattainment area (NAA). Currently, eight California air districts do not meet the NAAQS for ozone. In 1994, ARB submitted a SIP to U.S. EPA. The SIP included a pesticide element. The pesticide element (also referred to as the Pesticide SIP) addresses VOCs that result from the use of agricultural and commercial structural use pesticides. (Consumer pesticide product sources of VOCs are regulated by ARB.) In the Pesticide SIP, DPR committed to reducing

VOC emissions from agricultural and commercial structural use pesticides by specified amounts within specified time periods for five NAAs. Three of the five NAAs do not meet the goals established in the 1994 SIP. These goals, relative to 1990 base year, were as follows: San Joaquin Valley, 12 percent reduction by 1999; Ventura, 20 percent reduction by 2005; and Southeast Desert, 20 percent reduction by 2007.

To implement the 1994 SIP, DPR developed a method to estimate the VOC content (emission potential) of pesticide products and to calculate estimated pesticide VOC emissions. DPR used thermogravimetric analysis (TGA) data to determine the VOC content of pesticide products and, in conjunction with data from DPR's pesticide use report system, calculated estimated annual VOC emission totals for those pesticide products. To obtain TGA data on agricultural and commercial structural use pesticides, DPR placed all agricultural and commercial structural use pesticides formulated as liquids into reevaluation in 1994, and all solid formulations into reevaluation in 1995.

However, during these reevaluations, DPR gave registrants the option of calculating the VOC emission potential of a pesticide product using water and/or inorganic subtraction, instead of submitting TGA data. In addition, if no data (either TGA or subtraction) were submitted for a given pesticide product, DPR assigned the product a default emission potential value based on the highest TGA value for the product's formulation category (default values were later revised to the median TGA value for each formulation category). As a result, DPR only had TGA data for approximately 30-40 percent of currently registered agricultural and commercial structural use pesticides. This meant that DPR's calculations of total VOC emissions from pesticide products might have been inaccurate. Pesticide products formulated as liquids (i.e., emulsifiable concentrates, aqueous concentrates, flowable concentrates, oils) constituted the bulk of products with unknown (default) emission potentials. DPR again placed these types of products into reevaluation and required the submission of TGA data on each product by December 31, 2005.

At the end of June 2008, 535 of the original 787 products placed into reevaluation remained actively registered in California. Registrants submitted TGA data for 392 products. DPR identified 104 products as not intended for agricultural or commercial structural use, and, therefore, exempt from DPR's data call-in. Registrants requested exemptions from generating TGA data for 39 products. DPR anticipates completing TGA data reviews and evaluation of requests for exemptions by the fourth quarter of 2008.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (REFORMULATION) – 523 Products

On May 31, 2005, DPR placed certain liquid formulation agricultural and commercial structural use pesticide products into reevaluation. The basis for this reevaluation is the same as the basis for the reevaluation listed in the previous section. However, the purpose of the reevaluation is different, and it targets 748 products.

DPR initiated the second reevaluation to meet the 1999 goal to reduce pesticide VOC emissions to 21 tons/day for the San Joaquin Valley NAA. Total pesticide VOC emissions in the San Joaquin Valley NAA were 23.2 tons/day for May-October 2002, and 26.5 tons/day for May-October 2003, exceeding the 1999 goal by 2.2 and 5.5 tons/day respectively. Fumigants and pesticide products formulated as liquids make up most of the San Joaquin Valley pesticide VOC emission inventory. Fumigant products containing metam-sodium, 1,3-dichloropropene, and methyl bromide as primary active ingredients and chloropicrin as a secondary active ingredient comprise the largest portion of the San Joaquin Valley VOC emission inventory. However, fumigants are not amenable to reformulation. Liquid products, particularly those formulated as emulsifiable concentrates, are the next highest contributors to the pesticide VOC inventory. At that time, pesticide products formulated as liquids comprised approximately 40 percent of the pesticide VOC emission inventory in the San Joaquin Valley NAA area.

Staff analyses indicate that reformulation of the liquid pesticide products included in this reevaluation could result in significant VOC reductions in the San Joaquin NAA and throughout the State. Additionally, reformulation is one of the few regulatory options for which DPR can estimate VOC reductions using available data. Reformulation is likely a viable alternative only for liquid, non-fumigant pesticides. It is probably not possible or cost-effective to lower the VOC content of pesticides formulated as solids.

The list of pesticide products included in the reformulation reevaluation differs somewhat from the list of products included in the TGA data call-in. Pursuant to the reformulation reevaluation, registrants were required to choose one of the following three options for each product included in the reevaluation: submit a written commitment to reformulate the pesticide product to a VOC emission level of 20 percent or less, including information on how the product will be reformulated, a detailed timeline for accomplishing each task, and a schedule for progress reports; submit a request for exemption if the product does not meet the established reevaluation criteria; or submit a detailed explanation as to why the pesticide product cannot be reformulated. Registrant responses were due March 1, 2006.

On August 31, 2006, DPR proposed to cancel 15 products for failure to comply with the requirements of DPR's May 2005 reevaluation notice. Hearings on the proposed cancellations were scheduled for late September 2006, but before the hearings could be held, all registrants either complied with the reevaluation requirements or voluntarily cancelled

their product registrations. As a result, the 15 products are no longer subject to cancellation. DPR received six requests for an exemption and two were determined to be exempt from reformulation. Registrants voluntarily cancelled the registrations of the remaining seven products.

At the end of June 2008, 523 of the original 748 products remained actively registered in California. Written commitments to reformulate were received, and are pending review, for 60 products. DPR exempted 310 products from reformulation because the products' VOC emission potential is less than 20 percent. The registrants for the remaining 153 products submitted one of the following responses: provided DPR with a detailed reason why reformulation is not feasible or contrary to VOC reduction; explained that the product registrant is a supplemental distributor which relies on the basic registrant to make a reformulation decision; or requested an exemption from reformulation because the TGA estimate is below 20 percent VOC. DPR is currently evaluating the registrant responses and anticipates reaching a decision by the fourth quarter of 2008.

#### CERTAIN PESTICIDE PRODUCTS CONTAINING PYRETHROIDS – 585 Products

DPR placed certain pesticide products containing pyrethroids into reevaluation on August 31, 2006. The reevaluation is based on monitoring surveys and toxicity studies revealing the widespread presence of pyrethroid residues in the sediment of both agricultural and urban dominated California waterways at levels toxic to *Hyalella azteca* (*H. azteca*). Scientists conducted sediment bioassays using *H. azteca*, a resident species found in some Central Valley water bodies. Scientists commonly use *H. azteca*, an aquatic crustacean, as an indicator of environmental health and water quality in streams, lakes, and other bodies of water. Significant toxicity was observed at numerous sites. There was a high correlation between concentrations of pyrethroids and observed toxicity. Findings further indicate that the unique physical, chemical, and toxicological properties of the pyrethroid class of chemicals contribute to their propensity to accumulate in sediment at toxic levels.

Pyrethroids are synthetic insecticides. DPR did not include pesticide products containing pyrethrins in this reevaluation because pyrethrins are known to break down rapidly in the environment. Pyrethrins are naturally occurring insecticides found in *Chrysanthemum cinerariaefolium*, a perennial plant with a daisy-like appearance. Additionally, DPR excluded from this reevaluation the following product types: pressurized liquids, pressurized gasses, or pressurized dusts; chemicals impregnated into another material (e.g., ear tags, pet flea collars, ant disks/stakes, but not including fabric); and manufacturing use only products. DPR excluded these formulation categories because it is unlikely that the pyrethroids in these types of products will move into surface waters or sediments. Only formulations involving clothing (impregnated cloth and pressurized spray onto clothes) were included due to concerns that the pyrethroids may contribute to the contamination of surface water when the clothing is washed.

For purposes of data requirements, DPR divided pyrethroid chemicals into three groups. The first group (Group I) consists of the first generation or “Type I” photosensitive pyrethroids. Typically, these pyrethroids are used indoors and around residential areas. The active ingredients that fall into this group are bioallethrin, d-allethrin, imiprothrin, phenothrin, prallethrin, resmethrin, and tetramethrin. The second (Group II) and third groups (Group III) consist of the newer second-generation pyrethroids. The more toxic Group II and Group III pyrethroids, most of which are “Type II” pyrethroids, are less photosensitive, persist longer in the environment, and are widely used in both agricultural and urban settings. The two active ingredients in Group II, tau-fluvalinate and tralomethrin, have not been monitored or detected in California aquatic sediments. Group III pyrethroids have been detected on aquatic sediments, and include the following active ingredients: (s)-cypermethrin, beta-cyfluthrin, bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, fenpropathrin, gamma-cyhalothrin, lambda-cyhalothrin, and permethrin.

Pursuant to this reevaluation, registrants with products containing active ingredients in Group I are required to submit certain environmental fate data. Registrants with products containing active ingredients in Group II are required to submit: sediment persistence and ecotoxicology data; and monitoring in areas appropriate to use patterns. Registrants with products containing active ingredients in Group III are required to submit: certain environmental fate data; sediment persistence and ecotoxicology data; and transport mechanisms and mitigation data. Registrants with products containing permethrin are required to conduct monitoring in Publicly Owned Treatment Works (POTWs).

#### **Group I Active Ingredients**

By December 2007, DPR received the required environmental fate studies for all Group I active ingredients.

##### Imiprothrin

In March 2008, DPR completed its review of submitted imiprothrin environmental fate studies. Adequate data were submitted for soil adsorption coefficient and aerobic/anaerobic soil half-life. The 12 actively registered products labeled for the control of ants and roaches consist of a formulation class that is exempted from the reevaluation. An acceptable water photolysis study must be submitted prior to DPR approval to add outdoor uses with non-pressurized formulations.

DPR anticipates completing its review of the environmental fate data for the remaining active ingredients and determining whether additional sediment toxicity studies will be required by the first quarter of 2009.

### **Group II Active Ingredients**

In January 2007, a registrant with products containing tau-fluvalinate requested a waiver from all of the data requirements for Group II active ingredients based on low use in California. In September 2007, DPR notified registrants of pesticide products containing tau-fluvalinate and tralomethrin that additional studies were not required at this time. DPR's determination was based on the registrant's commitment to implement mitigation measures developed for products containing the Group III active ingredients with similar uses. All registrants agreed to implement mitigation measures in lieu of generating the required studies.

### **Group III Active Ingredients**

#### **Part 1 – Environmental Fate Data**

##### Esfenvalerate

In January 2007, DPR completed its review of submitted soil adsorption coefficient data and determined the data requirement is satisfied.

##### Gamma-Cyhalothrin

In October 2006, the registrant for gamma-cyhalothrin submitted a request to bridge the required anaerobic soil half-live data to existing anaerobic metabolism data on file for lambda-cyhalothrin. In February 2007, DPR denied the bridging request and required the anaerobic metabolism study be conducted and data submitted by the first quarter of 2009.

#### **Part 2 – Sediment Persistence and Ecotoxicology Data**

##### Sediment Analytical Method

In February 2007, the Pyrethroid Working Group (PWG) submitted two studies entitled, "6-Month Response to Pyrethroid Reevaluation Notice – Submission of Analytical Method" and "Method Validation for Determination of Residues of Several Pyrethroid Insecticides in Sediment." In June 2007, DPR found the studies adequate to satisfy DPR's analytical method data requirement for all Group III pyrethroids in sediment.

##### Aerobic/Anaerobic California Sediment Half-Lives

In April 2007, the PWG submitted a study protocol entitled, "Aerobic Aquatic and Anaerobic Aquatic Degradation of Pyrethroid Insecticides in Three California Sediments." In December 2007, DPR found the study protocol to be acceptable. The final results of this study are anticipated in the last quarter of 2009.

##### Sediment Acute and Chronic Toxicity

In September 2007, DPR received study protocols for sediment toxicity. In December 2007, DPR received comments from U.S. EPA, SWRCB, CVRWQCB, UC Davis, UC Berkeley, TDC Environmental, and California Stormwater Quality

Association (CASQA). In January 2008, DPR solicited comments from PWG on the stakeholder reviews received. In February 2008, PWG submitted acute and chronic toxicity tests performed for U.S. EPA on the active ingredients bifenthrin, cyfluthrin, cypermethrin, and esfenvalerate. In May 2008, DPR determined that a revised study protocol is necessary to address the stakeholder comments and incorporate PWG feedback by the second quarter of 2008.

### **Part 3 – Transport Mechanisms and Mitigation**

In July 2007, PWG submitted an overall plan to address transport mechanisms and mitigation, and explained how the submitted study proposals address off-site movement of pyrethroid residues. The two proposals are entitled “Investigation of Sediment Toxicity in Kirker Creek and Pleasant Grove Creek Phase I: Ground Truthing Land Uses and Stormwater Input Points” and “The Use of Agricultural Sediment Basins as a Best Management Practice in Irrigated Tomatoes.”

In October 2007, DPR received comments from U.S. EPA Region 9, SWRCB, and CASQA. As a result of the comments received, DPR requested PWG provide feedback on a number of early mitigation measures addressing urban runoff. The proposed early mitigation measures included: prevent wash off of pre-construction termiticides; modify product labels to limit impervious surface applications; prohibit outdoor, above ground applications of pyrethroids prior to and during rain; and modify labels to include additional water quality protection directions. In April 2008, PWG provided their perspective on the stakeholder reviews of the PWG study proposals and proposed early mitigation measures. In May 2008, PWG met with U.S. EPA to discuss the possibility of adding the early mitigation measures to labeling of all pyrethroid containing products.

In February 2008, PWG submitted two study proposals entitled, “Study Number 08-01: Building Material Wash-off Study” and “Study Number 08-02: Grass Runoff Study.” In April 2008, DPR received comments from U.S. EPA Headquarters and Region 9, SWRCB, and CASQA on these two proposals. In May 2008, DPR notified PWG that their study protocols should accomplish the stated objectives which are to: identify the most important above ground building material scenarios for potential future management practice studies; and to compare runoff losses from grass irrigated under best practice to runoff losses from excessive lawn irrigation. DPR anticipates receiving the final reports for the above studies in the fourth quarter of 2008.

In May 2008, PWG submitted a 1989 study investigating the amount of runoff from products containing cyfluthrin applied to turf. DPR anticipates reviewing this study in the fourth quarter of 2008.

In June 2008, PWG submitted a final report entitled, "GIS Land Use Analysis of Kirker Creek and Pleasant Grove Creek Sampling Site Watersheds." DPR anticipates receiving the final report on agricultural sediment basins and providing a review of the land use study in the third quarter of 2008.

#### **Part 4 – Monitoring in Publicly Owned Treatment Works (POTWs)**

In March 2007, PWG submitted a proposal to address the fate of pyrethroids in POTWs. DPR sent the POTW proposal to key stakeholders for comment. In April 2007, DPR received comments on the proposal from Tri-TAC, a technical advisory committee for POTWs in California. The PWG established a small working group with DPR staff and members of Tri-TAC to exchange information and to jointly develop study protocols. In October 2007, DPR determined that the proposal is likely to provide acceptable information. DPR requested a list of activities and milestones by the last quarter of 2007. In April 2008, the PWG provided a progress report with draft activities and milestones developed in concert with Tri-TAC. DPR anticipates a final list of activities and milestones in the fourth quarter of 2008.

In April 2007, DPR hosted a Pyrethroid Forum bringing together pesticide registrants and stakeholders. The Pyrethroid Forum agenda and presentations are available on the DPR Registration Branch Web site at:  
<<http://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/pyrethroids.htm>>.

#### **Additional Information on Pyrethroids**

In April 2008, DPR hosted a meeting with SWRCB, Central Coast Regional Water Quality Control Board, members of PWG, and Dr. Lenwood Hall from the University of Maryland, to discuss bioassessment as a tool to look at holistic stream health. DPR anticipates receiving additional information on bioassessment from Dr. Hall in the third quarter of 2008.

In May 2008, PWG submitted a report entitled "Barriers to Adoption of Irrigation Reducing Technologies." DPR anticipates reviewing the report to determine if it is relevant to the reevaluation in the third quarter of 2008.

By the fourth quarter of 2008, DPR anticipates notifying additional registrants of new pyrethroid containing products that products registered after the initiation of the pyrethroid reevaluation are included and subject to the data requirements.



### CERTAIN FIELD SOIL FUMIGANT PRODUCTS – 74 Products

Soil fumigants are pesticides which, when applied to soil, form a gas to control pests that live in the soil and can disrupt plant growth and crop production. The fumigants are either volatile chemicals that become gases at relatively low temperatures, around 40 degrees Fahrenheit, or are chemicals that react to produce such a gas. On January 18, 2008, DPR initiated a reevaluation of certain pesticide products intended for use in field fumigation and containing one or more of the following active ingredients: methyl bromide, 1,3-dichloropropene, chloropicrin, metam-sodium, metam-potassium, dazomet, and sodium tetrathiocarbonate. The basis for this reevaluation is the same as the TGA data call-in and reformulation reevaluations, to reduce VOCs from fumigant use. Fumigants are among the highest pesticide VOC contributors due to both their high levels of use and high emission potentials. DPR is requiring registrants to conduct and submit ambient or direct flux monitoring studies under a variety of prescribed field fumigation application methods.

In March and again in May 2008, DPR met with registrants and task force members such as AMBI and CMTF to discuss several aspects of the reevaluation. At the first meeting, DPR presented the objectives of the reevaluation which are the following: look at single active ingredient fumigant monitoring data for each fumigant and application method; investigate the differences among emissions and climates in specified NAAs; and investigate VOC emissions for combination products such as methyl bromide + chloropicrin and 1,3-dichloropropene + chloropicrin. At the second meeting, discussions included: modeling options; combining field studies; and scenarios to achieve results in a shorter timeframe due to limited research facilities to perform the monitoring studies. Subsequent to the May 2008 meeting, DPR requested registrants submit a statement of intent to comply with the data requirements as a sole entity or through the formation of a task force and a proposed prioritization scheme for providing the required data. DPR anticipates receiving the compliance proposals and prioritization scheme by the third quarter of 2008.

### CERTAIN SULFURYL FLUORIDE PRODUCTS INTENDED FOR STRUCTURAL FUMIGATION – 3 Products

Sulfuryl fluoride is an insecticide and rodenticide used to fumigate closed structures and their contents such as domestic dwellings, garages, barns, storage buildings, commercial warehouses, ships in port, and railroad cars. Sulfuryl fluoride controls numerous insect pests including termites, powder post beetles, old house borers, bedbugs, carpet beetles, clothes moths, and cockroaches, as well as rats and mice. The end-use products are marketed as a liquid gas in pressurized steel containers.

On June 27, 2008, DPR placed three structural fumigation products into reevaluation. The basis for the reevaluation is DPR's July 2006 risk assessment of sulfuryl fluoride as used in structural fumigation. In the risk assessment, DPR scientists identified several scenarios

where exposure to sulfuryl fluoride is of concern. DPR based the exposure assessment for these scenarios on limited data, using health-protective factors to compensate for data uncertainties. Based on the current exposure assessment, it appears that worker exposure cannot be mitigated using currently known mitigation strategies. DPR is also concerned that current sulfuryl fluoride labels in combination with California regulations require workers to use self-contained breathing apparatus (SCBA) until air levels are confirmed to be below 1 part per million (ppm). However, DPR and the structural pest control industry developed a Tarpaulin Removal Aeration Plan (TRAP) to reduce worker exposure to 5 ppm (the standard on older labels). DPR is concerned that workers removing tarpaulins using the TRAP method may be exposed to sulfuryl fluoride levels above the permissible reentry level of 1 ppm, thereby triggering the requirement to wear SCBA. The worker exposure monitoring data are needed to assess whether the TRAP plan is adequate to reduce fumigation worker sulfuryl fluoride exposures to 1 ppm (the current label standard). DPR also needs monitoring data to develop mitigation methods that will reduce the risks to workers.

Pursuant to the reevaluation data call-in, sulfuryl fluoride registrants are required to submit: fumigation worker exposure data (area air monitoring and personal air monitoring) and residential post-application monitoring (instantaneous and continuous air measurements). DPR anticipates receiving a written statement from each registrant of their intent to comply with the data requirements as a sole entity or through the formation of a task force by the third quarter of 2008.

## **II. PRELIMINARY INVESTIGATIONS (EVALUATIONS)**

DPR conducts preliminary investigations of products for which DPR or other State or county agencies have identified possible hazards. As a result of evaluation, the investigations may lead to formal reevaluation.

Copper-based antifouling paint (AFP) water quality impairment workgroup activities and a statewide monitoring of AFP active ingredients are ongoing. These efforts will allow DPR to determine whether AFPs, particularly those that contain copper, should be placed into reevaluation.

Imidacloprid is a relatively new, systemic insecticide. It has a wide range of uses: in agriculture, on turf, on pets, and for household pests. DPR recently received adverse effect information. This information is under review to determine if a reevaluation is warranted.

For more information, please contact Ms. Denise Webster, Program Specialist in the Pesticide Registration Branch, by e-mail at <dwebster@cdpr.ca.gov> or by telephone at (916) 324-3522.

*Original signed by*

\_\_\_\_\_  
Ann Prichard, Acting Branch Chief  
Pesticide Registration Branch  
(916) 324-3931

*November 14, 2008*

\_\_\_\_\_  
Date

cc: Ms. Denise Webster