



California Notice 2011-09

SEMIANNUAL REPORT SUMMARIZING THE REEVALUATION STATUS OF PESTICIDE PRODUCTS DURING THE PERIOD OF July 1, 2010 THROUGH December 31, 2010

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 and 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 demonstrate 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, which 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 (page 15).

I. FORMAL REEVALUATION

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

ANTIFOULING PAINT PESTICIDES (COPPER-BASED) – 191 Products

On June 1, 2010, DPR placed into reevaluation certain pesticide products containing the active ingredients copper oxide, copper hydroxide, and cuprous thiocyanate intended for use as antifouling paint (AFP) pesticides.

Copper AFP pesticides are used in the form of a paint to protect against the accumulation of barnacles, etc. on the underwater surfaces of boats and ships. DPR initiated this reevaluation based on findings from a June 2009 DPR report titled, “Monitoring for Indicators of Antifouling Paint Pollution in California Marinas.” The report indicates that dissolved copper concentrations in more than half the water samples taken from salt and brackish water marinas exceeded the California Toxics Rule (CTR) chronic water quality standard for copper. Dissolved copper concentrations in about a third of the water samples in these marinas also exceeded the acute standard.

In the DPR study, tests indicated that copper was the likely cause of the toxicity. California Regional Water Quality Control Boards’ (RWQCB) water quality control plans require that all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The dissolved copper concentrations were found to violate RWQCBs’ water quality objectives for toxicity.

DPR’s report concluded that in salt and brackish water marinas, copper AFP pesticides applied to boat hulls are likely a major source of copper in these areas, particularly during dry weather periods. The main pathways of copper contamination appear to be passive leaching of AFP-painted boat hulls and underwater boat-hull cleaning.

Pursuant to this reevaluation, copper based AFP pesticides were required to submit:
(1) information regarding the identification of the type of paint product (e.g. soft sloughing, epoxy ester conventional, vinyl conventional, vinyl thin film Teflon, water-based ablative, copolymer ablative, etc.); (2) data indicating the products’ copper leach rate; (3) specific mitigation strategies on pesticide use or reformulation that will reduce dissolved copper concentrations in California salt and brackish water marinas to levels below CTR or regionally

applicable standards as supported with scientific data demonstrating effectiveness; and (4) marina monitoring data to determine compliance with CTR standards after mitigation strategies have been implemented. DPR has notified copper AFP registrants of the data requirements and anticipates receiving information on paint type categories and receiving leach rate data in the third quarter of 2011.

BRODIFACOUM – 26 Products

The pesticide active ingredient brodifacoum is a second-generation anticoagulant rodenticide registered in California for use in residential, industrial, commercial, agricultural, and public buildings.

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 delivers a delayed lethal dose to the target rodent with its first feeding. After multiple feedings, a rodent may have a significant "body burden" of this persistent pesticide at death and is implicated in non-target wildlife exposures. Given the increased public interest in wildlife issues associated with brodifacoum and the length of time U.S. EPA had taken to complete its risk 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 of 2006, DPR mailed letters to second-generation anticoagulant rodenticide registrants proposing that rodenticide baits containing brodifacoum, bromadiolone, and difethialone be restricted to indoor structural use only. 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.

In January of 2007, U.S. EPA provided its proposed *Risk Mitigation Decision for Nine Rodenticides*. DPR provided comments supporting U.S. EPA's proposed risk mitigation decision (RMD). In May of 2008, U.S. EPA announced its final *Risk Mitigation Decision for Ten Rodenticides*. The ten rodenticides are 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 rodenticides 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. DPR has begun to receive the amended rodenticide labels. DPR staff is discussing the impact of the revised labels and the direction of this reevaluation with respect to the federal mitigation measures and DFG concerns.

CHLOROPICRIN – 46 Products

Chloropicrin is a colorless liquid that volatilizes readily when released into the atmosphere. Chloropicrin has been used as an insecticide and a soil or structural pest control fumigant to control nematodes, bacteria, fungi, insects, and weeds.

DPR initiated this reevaluation based on data submitted under the Birth Defect Prevention Act that indicate chloropicrin has the potential to cause adverse health effects at low doses. The National Institute for Occupational Safety & 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.

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 of 2005. In February of 2010, DPR completed a risk characterization document (RCD) for chloropicrin as a toxic air contaminant (TAC) and an assessment of risks associated with potential exposures to residents and bystanders from ambient and off-site air concentrations of agricultural use chloropicrin pesticides products. Based on the RCD and other information, DPR issued a risk management directive in December 2010 establishing regulatory target levels for the development of mitigation measures to restrict acute exposure. DPR anticipates a determination on chloropicrin as a TAC in the first quarter of 2011, and a comprehensive RCD, including dietary and occupational exposure scenarios in the second quarter of 2012. DPR will defer concluding the reevaluation until the comprehensive RCD is completed and mitigation measures are instituted.

CHLORPYRIFOS – 33 Products

The pesticide active ingredient chlorpyrifos is a commonly used organophosphate insecticide registered for use on a variety of agricultural crops and turf.

In March of 2004, DPR placed all agricultural use (including turf use) products containing chlorpyrifos into reevaluation based on monitoring data collected by the Central Valley Regional Water Quality Control Board (CVRWQCB). The data revealed that chlorpyrifos levels exceeded water quality objectives (WQO) for aquatic invertebrates in the rivers and tributaries of the

San Joaquin (SJ) Valley, the Sacramento/ SJ Delta, and Monterey County. These detections of chlorpyrifos have resulted in the development of an organophosphate pesticide total maximum daily load (TMDL) in identified segments of the SJ River and Sacramento/ SJ Delta.

Pursuant to this reevaluation, chlorpyrifos registrants were required to do the following: (1) identify the process by which chlorpyrifos pesticides are contributing to detections in surface water at levels that exceed WQOs; and (2) identify mitigation strategies that have been shown to reduce or eliminate chlorpyrifos residues in surface water. The basic manufacturer responded with the submission of data and information and identified mitigation measures intended to reduce chlorpyrifos residues in surface water when the products are used under California conditions. DPR reviewed and agreed with the basic manufacturer's assessment of the modes of transport of chlorpyrifos residues to surface water.

In April 2008, the basic manufacturer submitted a final report entitled, "Surface Water Monitoring and Use Investigations for Determining Effectiveness of Chlorpyrifos Mitigation Measures – 2007 Final Report." DPR scientists' reviewed the report and found 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, it was determined by DPR scientists that exceedances occur throughout the year and appear to result from numerous crops and application methods. In May 2009, the basic manufacturer submitted a report entitled, "Historical Trend Analysis and Field Investigations of Chlorpyrifos Exceedances in Surface Water." DPR scientists determined that the submitted data and field investigations show the following: (1) chlorpyrifos continues to be detected in surface water at levels that exceed water quality thresholds; (2) exceedances occur at multiple sites in the SJ, Santa Maria, and Salinas River watersheds; (3) multiple crops and agricultural practices potentially contribute to the off-site movement of chlorpyrifos; and (4) both applications made in accordance and in violation of label requirements potentially contribute to off-site movement of chlorpyrifos.

As a result, DPR has required the basic manufacturer to provide a summary of all relevant recent (2004-2010) surface water monitoring data to determine if current mitigation measures are adequate to prevent chlorpyrifos exceedances of WQOs. DPR anticipates receiving this information in the third quarter of 2011.

CYFLUTHRIN – 43 Products

The pesticide active ingredient cyfluthrin is a pyrethroid insecticide registered for use on numerous field, vegetable, and fruit crops. It is also used for lawns, ornamental plants, animals, and around industrial, institutional, agricultural, and household structures.

In May of 1998, DPR initiated this reevaluation based on its investigations 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, DPR's Worker Health & 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 normal working environment, something different in the work environment led to the workers' respiratory irritation symptoms experienced. DPR compiled the results of its monitoring study in "Health and Safety Report, HS – 1765."

In October of 2001, the basic manufacturer submitted the following: two worker exposure studies regarding hand harvesting of oranges and sweet corn; four indoor exposures studies; and a study entitled "Study on the RD₅₀ 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; therefore, DPR required a sweet corn worker exposure study. The results of the study were submitted to DPR in October 2004. In September of 2008, DPR presented an exposure scoping document for cyfluthrin intended to lay the groundwork for the risk assessment process. All of the submitted data and relevant information will be used in the pending final risk assessment of cyfluthrin. The final risk assessment is anticipated to be completed by 2013.

DIAZINON – 4 Products

The pesticide active ingredient diazinon is a commonly used organophosphate insecticide registered for use on a variety of agricultural crops, livestock, and turf.

In March of 2003, 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, CVRWQCB, State Water Resources Control Board (SWRCB), and DPR. These studies reported the presence of diazinon in surface waters of the Sacramento and SJ Valleys at levels that exceed water quality criteria (WQC), especially during the dormant spray season.

Pursuant to this reevaluation, diazinon registrants developed supplemental labeling for dormant spray products to mitigate off-site movement of diazinon residues and were required to conduct monitoring studies to confirm the effectiveness of the strategies. In February of 2007, DPR received a report prepared by UC Davis entitled, "Residues of the 2006 TMDL Monitoring of Pesticides in California's Central Valley Waterways, January – March 2006." This study showed diazinon concentrations measured during the 2006 dormant spray season were still exceeding WQC. In March of 2007, DPR forwarded the February 2007 UCD study to the registrants and requested development and implementation of further mitigation measures to reduce or eliminate diazinon residues in surface water.

In February of 2008, DPR decided that recent monitoring data needed to be evaluated to determine the relationship between diazinon use and exceedances of the WQC. The registrant submitted two reports entitled, "Analysis of Diazinon Environmental Monitoring Data from the

Sacramento/ Feather River Watersheds: 2001-2007” and “Project Report: Landguard OP-A as a Best Management Practice in Dormant Season Use, December 2007.” In October 2008, the registrant submitted another report entitled, “Analysis of Diazinon Environmental Monitoring Data from the San Joaquin River Watershed: 2001 – 2007.”

On June 22, 2010, the Director expanded the current reevaluation based upon an analysis of DPR’s 2003 – 2008 monitoring data. The analysis revealed 637 diazinon detections out of 2,635 samples from water bodies located in the Central Valley, Central Coast, and Southeastern California. In addition to the monitoring data provided for the dormant spray season, DPR requested the registrants to do the following: (1) collect and evaluate all relevant (2005-2009) surface water monitoring data to determine if application of diazinon to specific irrigated fields is resulting in exceedances of water quality criteria; and (2) establish crop specific mitigation measures based upon results of submitted monitoring data. DPR anticipates receiving the monitoring data in the second quarter of 2011.

CERTAIN AGRICULTURAL & COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (DATA CALL-IN) – 432 Products

In February of 2005, DPR placed certain liquid formulation agricultural and commercial structural-use pesticide products in reevaluation based on concern over release of volatile organic compounds (VOCs) into the atmosphere from these products. Many pesticide active ingredients and inert ingredients are VOCs and react in the presence of sunlight to create ground-level ozone.

The U.S. 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 non-attainment area (NAA). In 1994, to address several California air quality control regions that do not meet NAAQS for ozone, the California Air Resources Board (ARB) submitted a SIP to the U.S. EPA that included a pesticide element (Pesticide SIP).

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. To implement the 1994 SIP, DPR placed all agricultural and commercial structural-use pesticides formulated as liquids into reevaluation.

Under the reevaluation, DPR gave registrants the option of calculating the VOC emission potential of a pesticide product using water and/ or inorganic subtraction, instead of submitting thermogravimetric analysis (TGA) data. DPR calculated estimated annual VOC emission totals for those pesticide products using VOC emission potential data and DPR Pesticide Use Report data. The VOC emission potential data used was from any of the following: measured TGA data,

the water and/or inorganic subtraction method, or an assigned default emission potential value. A few registrants of new pesticide products submitted TGA data; however, the majority of registrants did not, and DPR had to assign default emission potential values to many new pesticide products. This meant that due to the default emission assignments, DPR's calculations of total VOC emission from pesticide products might have been inaccurate.

In February 2005, DPR initiated a reevaluation in order to obtain TGA data on all currently registered liquid agricultural and commercial structural products for which TGA data had not previously been submitted. DPR needs TGA emission potential data on all liquid agricultural and commercial structural-use pesticides in order to comply with the Clean Air Act, for an accurate emission inventory, and to meet VOC attainment goals. Pursuant to this reevaluation, all new agricultural and commercial structural use liquid products are required to submit TGA data under Food and Agricultural Code section 12824 and California Notice 2005-7.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION (REFORMULATION) – 250 Products

Fumigants and liquid pesticide products make up most of the San Joaquin Valley pesticide VOC emission inventory. Pesticide reformulation is a potential strategy to reduce pesticide VOC emissions. Although fumigant products comprise a substantial portion of the inventory, fumigants are not amenable to reformulation because the active ingredient itself is the main source of VOCs and comprises a high percentage of the product. Liquid products, particularly those formulated as emulsifiable concentrates, are significant contributors to the pesticide VOC inventory.

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 this reevaluation is to examine VOC contribution due to a pesticide product's formulation.

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: (1) 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; (2) submit a request for exemption if the product does not meet the established reevaluation criteria; or (3) submit a detailed explanation as to why the pesticide product cannot be reformulated.

In February of 2010, DPR notified all registrants in the reformulation reevaluation that DPR's review of their response is complete. DPR determined that the best way to reduce VOC

emissions from non-fumigants is to concentrate on those products that contribute the most VOCs during the ozone season in the three NAAs (San Joaquin Valley, Southeast Desert, and Ventura). Therefore, DPR narrowed the reformulation reevaluation to focus on the following seven active ingredients: abamectin, chlorpyrifos, dimethoate, gibberellins, oxyfluorfen, permethrin, and trifluralin. As a result, DPR staff has met to discuss concepts to meet the SIP goal. Concepts discussed include, but are not limited to, restricting non-fumigant use, prohibiting use of identified VOC emitting products, and/or applying formulation restrictions during ozone season in the NAAs. DPR anticipates releasing a notice to the affected registrants in the fourth quarter of 2011.

CERTAIN FIELD SOIL FUMIGANT PRODUCTS – 68 Products

Fumigants are among the highest pesticide VOC contributors due to both their high levels of use and high emission potentials.

In January of 2008, DPR initiated a reevaluation of certain pesticide products intended for use as field soil fumigants 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 pesticide products. DPR is requiring registrants to conduct and submit ambient or direct flux monitoring studies under a variety of prescribed field fumigation application methods.

DPR met with registrants and task force members such as Alliance of Methyl Bromide Industry (AMBI) and Chloropicrin Manufacturers' Task Force (CMTF) to discuss several aspects of the reevaluation. DPR presented three objectives of the reevaluation to registrants and task force members: (1) review single-active ingredient monitoring data for each fumigant and application method; (2) investigate the difference among emissions and climates in specified NAAs; and (3) investigate VOC emissions for combination products such as methyl bromide + chloropicrin and 1,3-dichloropropene + chloropicrin. In a subsequent meeting, attendees discussed options for conducting computer modeling in lieu of field monitoring studies, combining field studies, and scenarios to achieve results in a shorter timeframe due to limited research facilities to perform the field studies.

In August 2008, registrants submitted statements of intent to generate studies, identified a prioritization scheme for development of study protocols to address the data requirements of the reevaluation, and requested that they be allowed to use computer modeling to satisfy some of the study requirements. In March of 2010, AMBI submitted a flux study entitled "Monitoring of methyl bromide and chloropicrin field emissions from shank applications at shallow and deep injection depths," which DPR has reviewed. DPR anticipates that field monitoring data will be submitted in the second quarter of 2011. DPR is conducting an extensive evaluation to determine whether computer modeling would be an appropriate substitute for performing some field

monitoring studies and an evaluation report by DPR scientists is anticipated in the first quarter of 2011.

CERTAIN SULFURYL FLUORIDE PRODUCTS INTENDED FOR STRUCTURAL FUMIGATION – 3 Products

On June 27, 2008, DPR placed all sulfuryl fluoride products intended for structural fumigation into reevaluation. DPR based its reevaluation on DPR's July 2006 risk assessment of sulfuryl fluoride. In the risk assessment, DPR scientists identified several scenarios where exposures to sulfuryl fluoride are of concern. DPR based the exposure assessment for these scenarios on limited data, using health-protective factors to compensate for the lack of data. Based on the current exposure assessment, it appears that worker exposure may not be mitigated using current mitigation strategies. DPR is concerned that workers using the Tarpaulin Removal Aeration Plan (TRAP) may be exposed to sulfuryl fluoride levels above the permissible reentry level of 1 ppm, thereby triggering the requirement to wear self-contained breathing apparatus (SCBA). 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 this reevaluation, 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). In October 2009, DPR announced that in addition to monitoring data from the fumigation of a single-story single family residence, monitoring data are also needed involving multiple-story multiple dwelling units (i.e., condominiums, town houses, apartment complexes). In February of 2010, DPR received a revised study protocol for both the single and multiple story structures.

Before the registrant could initiate the monitoring study, DPR announced another data requirement on June 14, 2010. Sulfuryl fluoride product labels require the use of chloropicrin, a toxic gas that causes eye and respiratory irritation at low levels, as a warning agent when fumigating homes. DPR is requiring registrants to monitor for both sulfuryl fluoride and chloropicrin in single and multiple-story, multiple dwelling residences. In June 2010, one registrant submitted an existing residential and multi-unit structure sulfuryl fluoride and chloropicrin monitoring study. In August 2010, the other registrant submitted a draft protocol for addressing single and multi-unit structure monitoring for sulfuryl fluoride and chloropicrin. DPR anticipates providing feedback on the draft study protocol in the first quarter of 2011.

CERTAIN PESTICIDE PRODUCTS CONTAINING PYRETHROIDS – 709 Products

On August 31, 2006, DPR placed certain pesticide products containing pyrethroids into reevaluation. The reevaluation is based on monitoring surveys and toxicity studies revealing the widespread presence of synthetic pyrethroid residues in the sediment of California waterways

dominated by both agricultural and urban runoff, at levels toxic to *Hyalella azteca* (*H. azteca*). Scientist commonly use *H. azteca*, an aquatic crustacean found in some Central Valley water bodies, as an indicator of environmental health and water quality in streams, lakes, and other water bodies. Significant toxicity was observed at numerous sites and 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 a synthetic class of insecticides. DPR did not include pesticide products containing pyrethrins, a naturally occurring insecticide found in *Chrysanthemum cinerariaefolium*, in this reevaluation because pyrethrins are known to breakdown rapidly in the environment. Additionally, DPR excluded from this reevaluation the following product types: (1) formulated as pressurized liquids, pressurized gasses, or pressurized dusts; (2) where the chemical is impregnated into another material (e.g., ear tags, pet flea collars, ant disks/stakes, but not including fabric); and (3) labeled solely for manufacturing use. DPR excluded these formulation categories because it is unlikely that the pyrethroids in these types of products will move into surface waters or sediments.

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 second (Group II) and third groups (Group III) consist of the newer second-generation pyrethroids, most of which are “Type II” pyrethroids. The more toxic Group II and Group III pyrethroids are less photosensitive and persist longer in the environment. The two active ingredients identified as belonging in Group II have not been detected (or monitored for) in California aquatic sediments. Group III pyrethroids have been detected in aquatic sediments, and both Group II and III pyrethroids are widely used in both agricultural and urban settings.

Pursuant to this reevaluation, registrants with products containing active ingredients in Group I are required to submit certain environmental fate data. Registrants with products in Group II are required to submit sediment persistence and ecotoxicology data, and monitoring in areas appropriate to their use patterns. Registrants with products in Group III are required to submit the following: (1) certain environmental fate data; (2) sediment persistence and ecotoxicology data; and (3) transport mechanisms and mitigation data. In addition, registrants of products containing permethrin are required to conduct monitoring in Publicly Owned Treatment Works (POTWs).

Group I Active Ingredients

The active ingredients that fall into this group are bioallethrin, d-allethrin, imiprothrin, phenothrin, prallethrin, resmethrin, and tetramethrin. Typically these pyrethroids are used indoors and around residential areas.

DPR has completed its review of environmental fate data submitted for Group I pyrethroids, with the exception of a photolysis study for imiprothrin. These data are important to understanding the nature of these chemicals and will contribute to the comprehensive characterization of pyrethroids. DPR anticipates releasing a notice informing registrants of its future direction.

Group II Active Ingredients

The active ingredients that fall into this group are tau-fluvalinate and tralomethrin. Based on a commitment by registrants of Group II products to implement the same mitigation measures developed for Group III products with similar use, DPR determined that additional studies are not required at this time.

Group III Active Ingredients

The active ingredients that fall into this group are (S)-cypermethrin, beta-cyfluthrin, bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, fenpropathrin, gamma-cyhalothrin, lambda-cyhalothrin, and permethrin.

Part 1 – Environmental Fate Data

DPR has completed its review of environmental fate data provided for the requested Group III pyrethroids. The Department will use these data in its comprehensive characterization of pyrethroids for this reevaluation.

Part 2 – Sediment Persistence and Ecotoxicology Data

In June of 2007, DPR found that the submitted sediment analytical method studies by the Pyrethroid Working Group (PWG) to be adequate to satisfy the DPR's analytical method data requirement for all Group III pyrethroids in sediment. Revised 10-day acute sediment toxicity tests with *H. azteca* and *Chironomus dilutus* (*C. spp*) and cold temperature studies were submitted, reviewed, and satisfied. DPR deferred the 42-day *H. azteca* chronic studies until U.S. EPA's Office of Chemical Safety and Pollution Prevention (OCSPP) finalizes the 850 series test guidelines addressing whole sediment life cycle toxicity tests for *H. azteca* and *C. spp*. In May of 2010, DPR received an aerobic/anaerobic California sediment half-lives progress report in lieu of the final report documenting challenges experienced with the method. PWG has committed to conduct the study using the previous protocol, an improved analytical method, and recently issued U.S. EPA study guidelines. DPR anticipates that these data to be submitted in the third quarter of 2012.

Part 3 – Transport Mechanisms and Mitigation

Development of Monitoring Plans in Areas Appropriate to Use Pattern – In July 2007, PWG submitted an overall plan to address transport mechanisms and mitigation in agricultural and urban settings, and explained how the study proposals address off-site movement of pyrethroid residues.

In January and April 2009, PWG submitted final reports from their investigation of building materials and turf. The objectives of these studies were to (1) identify the most important above-ground building material scenarios for potential future best management practices (BMP) studies; and (2) compare runoff losses from grass irrigated under BMPs to reduce runoff losses from excessive lawn irrigation. On June 4, 2009, U.S. EPA notified registrants of required label changes to address environmental hazards and general labeling for pyrethroid non-agricultural outdoor products.

Identification of Off-site Movement – Due to the complexity of developing studies to identify off-site movement and source identification, DPR proposed additional data requirements and allowed stakeholders and registrants to provide comments. After considering the provided comments, DPR finalized its decision to require additional studies investigating off-site movement of pyrethroids specific to urban uses. Source identification for agricultural settings will be addressed thereafter.

In November 2009, DPR required Group III pyrethroid registrants to develop an urban pathway conceptual model and conduct a survey of pest control businesses. In February 2010, DPR found the pest control business survey adequate to gather information regarding pyrethroid use in urban areas required as part of the reevaluation. In December 2010, PWG submitted a final report titled, “California 2009 Urban Pesticide Use Pattern Study.” DPR’s review of the submitted study found several conclusions of interest that could contribute to mitigation measures targeting outdoor perimeter treatment. In September of 2010, PWG submitted a report titled “Pathway ID Study Protocol,” which received feedback from DPR and stakeholders. DPR scientists will work with PWG scientists to develop a final study protocol that investigates off-site movement of pyrethroids in urban settings and anticipates this in the third quarter of 2011.

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 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 April 2008, the PWG provided a progress report with draft activities and milestones developed in concert with Tri-TAC. In November 2008, PWG provided DPR with a preliminary study design for POTW monitoring. In April 2009, DPR reviewed the preliminary POTW monitoring study design and determined that the sampling regime should accomplish the stated objective. In July 2009, DPR coordinated review of PWG’s preliminary study design with Tri-TAC. In October 2009, Tri-TAC provided comments supporting DPR in requesting a final POTW monitoring study protocol from PWG. DPR anticipates receiving a final POTW monitoring study protocol in the first quarter of 2011.

NITROGUANIDINE INSECTICIDE CLASS OF NEONICOTINOIDS – 280 Products

In February of 2009, DPR placed certain pesticide products within the nitroguanidine insecticide class of neonicotinoids containing the active ingredients, imidacloprid, clothianidin, dinotefuran, and thiamethoxam into reevaluation. This reevaluation is based on an adverse effects disclosure regarding the active ingredient imidacloprid. The disclosure included twelve ornamental plant residue studies and two combination residue, honey, and bumble bee studies of imidacloprid use on a number of ornamental plants. DPR's evaluation of the data noted two critical findings: (1) high levels of imidacloprid in leaves and in blossoms of treated plants, and (2) increases in residue levels over time. Data indicate that use of imidacloprid on an annual basis may be additive, in that significant residues from the previous use season appear to be available to the treated plant.

Imidacloprid is a systemic insecticide that has a wide range of uses: in agriculture, on turf, on pets, and for household pests. Clothianidin, dinotefuran and thiamethoxam are in the same chemical family as imidacloprid, and have similar characteristics, soil mobility and half-lives, and toxicity to honeybees. The DPR has excluded certain formulation categories and product types from the reevaluation because the manner in which the products are formulated or applied makes it unlikely that the neonicotinoid will move into plants that bloom or be a source of forage for honey bee pollinators.

In September of 2009, DPR notified registrants of the data requirements, which include field-based residue analysis in pollen and nectar from specific agricultural orchard and row crops for each of the four active ingredients, and an LC₅₀ study on honey bees starting at the larval stage through emergence. To determine the crops of focus for data requirements, DPR utilized California's Pesticide Use Report (PUR) database.

DPR has been in close contact with the imidacloprid registrant as they develop the largest data set of the four active ingredients. In November and December 2009, the registrant submitted information and existing data to address DPR's reevaluation data requirements for field data on almonds, citrus, cotton, cucurbits, fruiting vegetables, pome fruit, and strawberries. In March 2010, DPR hosted a technical meeting with the registrant, with U.S. EPA and Pest Management Regulatory Agency (PMRA) participating by conference call. At this meeting, the registrant discussed study protocols for the crops identified in DPR's reevaluation, provided their plan for addressing almonds through removing the use on their labels federally, and discussed existing research on citrus being conducted at UC Riverside. In April 2010, DPR, U.S. EPA, and PMRA participated in a technical conference call between UC Riverside and the registrant to discuss the ongoing research with citrus trees for managing Asian citrus psyllid. Also in April 2010, the registrant submitted draft study protocols for cotton, fruiting vegetables, melons, pome fruit, and strawberries, which were reviewed by DPR, U.S. EPA, and PMRA. DPR anticipates receiving proof of label amendment submission to U.S. EPA, and final reports from their investigations in citrus, cotton and fruiting vegetables in the first quarter of 2011. DPR expects a final strawberry

protocol to be submitted and to provide feedback on all study protocols in the third quarter of 2011.

DPR has been in close contact with the thiamethoxam registrant as they locate fields to conduct field sampling on pome fruit, fruiting vegetables, strawberries, and cucurbits. Draft study protocols were received and reviewed by DPR, U.S. EPA, and PMRA. DPR anticipates a final report to be submitted along with the final results of their acute toxicity study in the fourth quarter of 2011.

In November 2009, the dinotefuran registrant submitted information about the environmental fate and behavior of their products as well as existing data they felt satisfied the reevaluation data requirements in lieu of the requested study protocols. DPR anticipates providing an evaluation of the existing data submitted in 2009 in the fourth quarter of 2011.

Additionally, in November 2009, the clothianidin registrant documented its limited use in California and inability to perform field studies as requested under the reevaluation. Instead, they proposed to conduct small-scale studies, analogous to magnitude of residues studies, on cucurbit. DPR anticipates an acute toxicity study protocol and draft protocol for conducting pollen and nectar residue sampling in cucurbits in the second quarter of 2011.

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.

Endosulfan is a broad spectrum contact insecticide and acaricide registered for use on a wide variety of vegetables, fruits, cereal grains, and cotton, as well as ornamental shrubs, trees, vines, and ornamentals for use in commercial agricultural settings. DPR initiated investigations into recent research suggesting that endosulfan may adversely effect amphibian populations in the Sierra Nevada and Coastal Range of California to determine whether to place currently registered pesticide products containing the active ingredient endosulfan into reevaluation. However, in November of 2010, U.S. EPA took action to end the use of the pesticide endosulfan because it can pose unacceptable health risks to farmworkers and wildlife and can persist in the environment. A formal Memorandum of Agreement with manufacturers of the agricultural insecticide will result in voluntary cancellation and phase-out of all existing endosulfan uses in the United States. Terminating uses of endosulfan will address DPR's preliminary reevaluation inquiry.

For more information, please contact Ms. Denise Alder, Staff Environmental Scientist in the Pesticide Registration Branch, by e-mail at <dalder@cdpr.ca.gov> or by telephone at (916) 324-3522.

Original signed by

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Ann M. Prichard, Chief
Pesticide Registration Branch
(916) 324-3931

Date

cc: Ms. Denise Alder