

# Continuous Evaluation and Reevaluation

Before the Department of Pesticide Regulation (DPR) registers a pesticide, department scientists evaluate the pesticide's toxic effects, its potential exposure to people and the relationship between the two, as well as the potential for environmental problems. Legislation passed in 1969 (Chapter 1169<sup>1</sup>, SB 1140) requires DPR to "eliminate from use" any pesticide that "endangers the agricultural or nonagricultural environment, is not beneficial for the purposes for which it is sold, or is misrepresented." The law also required the department to have "an orderly program for the continuous evaluation" of pesticides after registration. Through continuous monitoring and surveillance, DPR can determine the fate of pesticides in the environment, detect and address unforeseen effects on human health and find ways to prevent pesticide contamination.

After registration, several DPR programs evaluate use practices to detect possible problems by:

- Completion of risk assessments on registered active ingredients. (*See Chapter 5.*)
- Exposure monitoring, including exposure and residue studies to collect data on potential exposure patterns and to assess the effectiveness of existing controls. (*See Chapter 10 for information on exposure monitoring studies.*)
- Investigation and evaluation of pesticide illnesses and incidents. (*See Chapter 10 for information on investigations.*)
- Investigation of mandatory registrant reports on adverse effects (for example, harm to humans, animals or the environment) that occur after their products are registered. (*See Adverse Effects Reporting in Chapter 3.*)
- Monitoring of air quality, ground water and surface water. (*See Chapter 12.*)
- Sampling and testing of fresh produce. (*See Chapter 9.*)

The department uses the data collected to evaluate the effectiveness of DPR's regulatory programs and assess the need for changes.

## Reevaluation

California regulations require DPR to investigate all reports of actual or potentially significant adverse effects to people or the environment resulting from the use of pesticides. Information may come from pesticide illness investigations, residue sample analyses, and monitoring of air, soil and water, or similar data generated by DPR or other government agencies, or from the public. Toxicology and environmental data, and adverse effects disclosures submitted to DPR by registrants may trigger a reevaluation.

Specific factors that may trigger reevaluation include public or worker health hazard; fish or wildlife hazard; environmental contamination; unwanted damage to plants; inadequate labeling; lack of efficacy; disruption of pest management; availability of an effective and feasible alternative material or procedure which is demonstrably less destructive to the environment; discovery that data on which DPR

The department "shall endeavor to eliminate from use in the state any economic poison which endangers the agricultural or nonagricultural environment, is not beneficial for the purposes for which it is sold, or is misrepresented. In carrying out this responsibility, the department shall develop an orderly program for the continuous evaluation" of registered pesticides.

— 1969 legislation (Chapter 1169)

<sup>1</sup> Appendix A lists this and other statutes noted in this chapter and shows the related code section it amended or added. Statutes and related code sections that have been deleted or superseded by later legislation have been omitted.



It is the public policy of the state that emissions of toxic air contaminants should be controlled to levels which prevent harm to the public health.

— *Toxic Air Contaminant Act (1983)*

relied to register a product is false, misleading or incomplete; or other information suggesting a significant adverse risk.

If DPR has reason to believe that a pesticide may cause unreasonable adverse effects to people or the environment, DPR must formally reevaluate the pesticide to decide if it should remain registered and, if so, whether changes in use practices are needed. When a pesticide enters reevaluation, DPR reviews existing data and may require registrants to provide more data.

Legislation in 1997 (Chapter 483, SB 603) gave DPR the authority to cancel the registration or refuse to register any pesticide if the registrant fails to send data requested in a reevaluation. If DPR moves to cancel a registration, the registrant may ask for a hearing.

DPR ends reevaluations in several ways. If the data show that use of the pesticide presents no significant adverse effects, DPR closes the reevaluation without added mitigation measures. If new restrictions are necessary, DPR places controls on the use of the pesticide to mitigate the potential adverse effect. DPR may also work with registrants and the U.S. Environmental Protection Agency (U.S. EPA) to revise labels to mitigate hazards. If the adverse effect cannot be mitigated, DPR suspends or cancels the product registration.

Regulations require DPR to prepare a semiannual report describing pesticides under reevaluation or for which DPR received factual or scientific information but did not open a reevaluation.

### Evaluating Pesticides in Air

DPR conducts air monitoring and evaluation under its general reevaluation mandate and under the mandates of the Toxic Air Contaminant Act (Chapter 1047, Statutes of 1983, AB 1807, amended by Chapter 1380, Statutes of 1984, AB 3219).

#### Toxic Air Contaminant (TAC) Program

The TAC program is one of several options DPR can use to control airborne pesticide residues. DPR has broad authority over the registration, sale and use of pesticides in California to protect public health and the environment. This authority is derived from several laws that cover all aspects of pesticide use in all media—air, ground and surface water, food, and in agricultural, industrial, institutional, occupational and home-and-garden settings. This regulatory authority allows DPR wide latitude to regulate application rates, ensure pesticide efficacy, designate pesticides as restricted materials, develop criteria to prevent unacceptable pesticide residues in food and water, license applicators and dealers, and adopt rules to protect workers and the public from overexposure. This full exercise of DPR's authority extends to the suspension of a pesticide's registration, ending all use immediately if evidence supports that action.

In passing the Toxic Air Contaminant Act, the Legislature created the statutory framework for listing, evaluating and controlling chemicals (including pesticides) as TACs. TACs are air pollutants that may cause or contribute to increases in serious illness or death or may pose a present or potential hazard to human health. Chemicals the federal government classifies in regulation as hazardous air pollutants (HAPs) are administratively listed and not subject to the evaluation and control provisions of the TAC statute. However, they are subject to reevaluation and possible restrictions under other statutory mandates. The Air Resources Board (ARB) is the lead agency for nonpesticidal uses of chemical substances in air. DPR is responsible for evaluating pesticidal uses of chemicals as TACs.

The law focuses on identifying, evaluating and controlling pollutants in ambient community air. In carrying out the law, DPR must:

- Review the physical properties, environmental fate and human health effects of the candidate pesticide.
- Find out the levels of the pesticide in air.
- Estimate human exposure and the potential human health risk from those exposures.

The law requires DPR to list in regulation both those pesticides previously identified under federal laws as HAPs and those identified by DPR through the evaluation process of the TAC statute. For the latter group, DPR must then decide the appropriate degree of control measures.

DPR's TAC Program consists of two phases: risk assessment (evaluation and identification) and risk management (control). The first phase involves an extensive evaluation of the candidate pesticide to assess the potential adverse health effects and to estimate levels of exposure associated with its use. DPR, in consultation with Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) and ARB, first prioritizes pesticides for risk assessment based on how much of the pesticide is used and sold in California, its persistence in the atmosphere and health effects information. DPR then requests ARB to conduct monitoring studies to measure the air concentrations of pesticides.

For each candidate pesticide, ARB collects samples near an application site and in ambient air of nearby communities. Because most large-scale pesticide applications are seasonal and occur in agricultural areas, ARB conducts monitoring in areas of high use and at times when use is at its peak. This worst-case information can help determine the ambient exposures of people living in all areas where the pesticide is used.

Continuing the evaluation for each pesticide, the law requires DPR to prepare a report that includes:

- An assessment of exposure of the public to ambient concentrations of the pesticide.
- A risk assessment which includes data on health effects, including potency, mode of action and other biological factors.
- A review of the environmental fate and use of the pesticide.
- The results of monitoring studies conducted in California to measure the levels of the candidate pesticide in ambient air.

The draft report is peer-reviewed by OEHHA and ARB and is made available for public review. Based on the results of these reviews, DPR scientists revise the draft report as appropriate. The report includes OEHHA's separate findings. The draft undergoes a rigorous peer review for scientific soundness by the TAC Scientific Review Panel (SRP), a panel of experts representing a range of scientific disciplines. Based on this comprehensive evaluation, DPR receives a recommendation from the SRP whether the pesticide meets the criteria for listing as a TAC. If the pesticide meets the criteria, DPR adopts a regulation listing it as a TAC.

Once a candidate pesticide is listed as a TAC, it enters the mitigation phase. Consulting with OEHHA, ARB and local air pollution control districts, DPR examines the need for and suitable degree of controls. If reductions in exposure are needed, DPR must develop control measures to reduce emissions to levels that adequately protect public health. DPR must use the best practicable control techniques available, which may include:

- Requesting that the registrant work with U.S. EPA to change use instructions on the product label.
- Applicator training.
- Limits on application methods, crops or locations.
- Reclassifying the pesticide as a restricted material, meaning that a site-specific permit would be required and added controls imposed, based on local conditions.
- Banning the use by canceling a product's registration.

DPR develops control measures in consultation with ARB, OEHHA, the Department of Food and Agriculture, agricultural commissioners and air pollution control districts. DPR and other organizations may conduct monitoring or data analysis to determine the necessity or effectiveness of control measures.

From 1998 through 2000, DPR made several changes to its AB 1807 implementation policies and procedures to fully integrate the TAC process into its ongoing review and assessment of pesticides done under other statutory mandates.



*Pest control work, by reason of its technical nature, must of necessity be fostered and guided to a great extent by public institutions.*

— 1921 department annual report



*Any report of injury attributed to pesticides in California is investigated not only to ascertain if a faulty product or other violation is concerned, but also in order that knowledge of all circumstances surrounding the injury may minimize recurrence of the accident.*

— 1944 department annual report

DPR changed how it prepares risk characterizations to ensure the toxicological evaluations done under other programs could be used as the foundation for TAC analysis.

### Other programs targeted at air toxins

Separate from the TAC program, DPR conducts air monitoring as part of its continuing evaluation of pesticides. The Environmental Monitoring Branch takes the lead in characterizing the source and recommending mitigation measures for off-target movement of pesticide residues that have resulted in crop damage, illegal crop residues, environmental contamination, or public complaints of odor or other problems. These monitoring studies help DPR evaluate the likelihood of pesticides causing health problems for workers using pesticides and for people living near treated areas, and to provide data to develop new use practices designed to prevent harm. However, even the most carefully developed risk reduction measures cannot adequately consider the variety of situations that occur in nature. Various microclimates and special environmental characteristics can produce unexpected results. Therefore, DPR periodically monitors to evaluate the effectiveness of its risk reduction measures. If air monitoring finds unacceptable levels of pesticides in ambient air, the data help fine-tune control measures.

**Air Quality Initiative.** DPR launched an Air Quality Initiative in 2006 as a comprehensive effort to improve air quality related to pesticide use. The major emphasis was to set up a regulatory mechanism to reduce volatile organic compound (VOC) emissions from pesticides. VOCs contribute to the formation of smog. (See Chapter 12 for information on DPR's VOC program.) The project resulted in the nation's first-ever regulations to control pesticide VOCs by reducing emissions from agricultural fumigants. Although not the primary goal, in doing so the project helped reduce toxic exposure to these fumigants.

Another goal of the Air Quality Initiative was to promote more environmentally friendly and efficient technologies that reduce pesticide use and drift of air toxins. These included:

- Equipment designed to deliver pesticides more precisely to the target, reducing use and waste.
- Remote-sensing and mapping technologies that can reduce pesticide use; for example, mapping to pinpoint the most heavily infested areas to target applications there.
- In 2008, DPR's grant program was reinstituted. It had been suspended in 2002 because of the state's budgetary constraints. The grants promote integrated pest management (IPM), which reduces the need for and use of the more highly toxic chemicals. IPM programs incorporate various reduced-risk pest management practices such as cover-cropping, crop rotation, insect baiting, pest exclusion, sanitation, use of pest-resistant or tolerant cultivars and rootstocks, release of natural enemies, and mating disruption using pheromones. By using nonchemical management practices, the overall amount of pesticides applied can be reduced.

**Parlier Air Monitoring Project.** Throughout 2006, DPR conducted air monitoring in the Fresno County community of Parlier to learn what pesticides were in the air of a rural farm community and how levels varied over a year. The project was part of Cal/EPA's Environmental Justice Action Plan.

The Parlier project built on the knowledge and experience DPR had gained in more than two decades of conducting dozens of air monitoring studies. The project marked:

- The first time a community advisory group helped DPR frame goals, select monitoring sites and decide other project elements.
- The first time DPR or any government agency in the United States did pesticide air monitoring for 12 months in a single community.
- The first project to monitor so many pesticides – 40 in all, including pesticide breakdown products. It was also the first to include monitoring conducted jointly by DPR and ARB for both pesticides and nonpesticide air pollutants like ozone.



Because there are no enforceable state or federal standards for most pesticide residues in air, DPR scientists worked with technical experts from other agencies to develop health-protective screening levels for the pesticides monitored. The screening levels were designed to point out potential concerns for noncancer health effects. Although they are not regulatory standards, these screening levels are useful for preliminary evaluations of air monitoring data.

Since Parlier is similar to many Central Valley towns, surrounded by farm fields and the associated use of pesticides, the analysis of hundreds of monitoring samples taken over a full year added substantially to the department's knowledge of pesticides in air.

Highlights of the project's report released in 2009 were:

- The greatest potential health risk in Parlier was not from substances used as pesticides but from two air pollutants found throughout California: acrolein and formaldehyde. Concentrations were similar to those found elsewhere in the state. The most likely sources are auto and industrial emissions.
- Of the 35 pesticides monitored (plus 5 pesticide breakdown products), 16 were detected (plus 3 breakdown products.) Measured amounts varied, depending on the pesticide.
- The insecticides chlorpyrifos and diazinon were among the pesticides found most often. Amounts were below health screening levels, with one exception. These chemically related pesticides posed the highest noncancer risk among pesticides detected, prompting DPR to direct added resources to ongoing risk assessments for these compounds.
- Detections of 1,3-dichloropropene (1,3-D) prompted DPR to reopen its risk assessment and reexamine the management plan designed to keep 1,3-D below levels that may pose a risk. This fumigant is a carcinogen and lifetime exposure at the levels detected may be of health concern.

Several years before the Parlier project, DPR had begun planning a network of monitoring stations to sample for pesticides in the air over two or more years. The Parlier project served to test and perfect sampling protocols, develop health screening levels, improve and expand laboratory analytical methodology, and fine-tune approaches to data analysis.

**Air Monitoring Network.** To learn more about pesticides in air and improve protective measures as necessary, DPR established the nation's first network to sample community air for pesticides in early 2011. DPR set up monitoring stations in two San Joaquin Valley communities and one in the Salinas Valley. Project objectives are to:

- Identify common pesticides in air and determine seasonal, annual and multiple-year concentrations.
- Compare concentrations to subchronic and chronic health screening levels. (The air network focuses on subchronic and chronic exposure because TAC monitoring provides sufficient information on acute exposures.)
- Track trends in air concentrations over time. Monitoring will continue for two or more years.
- Estimate cumulative exposure to multiple pesticides with common modes of action.
- Work to correlate concentrations with use and weather patterns.

The network will supplement TAC monitoring by providing data for long-term exposures to multiple pesticides. DPR selected up to 34 pesticides to monitor based on use and volatility (both indicators of exposure), their DPR risk assessment priority (an indicator of toxicity), and their suitability for laboratory analysis using available methods. DPR selected the communities based on several factors, including the amount of pesticides used and demographics related to risk assessment (for example, numbers of children and farmworkers).

DPR collects one 24-hour sample each week in each community. Based on the results from the department's Parlier study, sampling a single location weekly will provide enough data to estimate long-term concentrations.



*The use of airplanes in the application of insecticides has received considerable impetus during recent years ...*

— 1934 department annual report

Depending on the resources needed, DPR may expand the air network in later years to include more frequent sampling, more pesticides or more communities.

**Special projects.** The Environmental Monitoring Branch may conduct special projects targeted at specific regional concerns. For example, in 1999 and 2000, DPR conducted air monitoring for fumigants and other agricultural pesticides used around Lompoc in Santa Barbara County to help resolve community concerns about possible overexposure to pesticides and resulting health problems. (*See Chapter 14 for description of the Lompoc and other special projects.*)

