Implementing the Pesticide Registration Improvement Act - Fiscal Year 2012

Ninth Annual Report

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Process Improvements in the Pesticide Program

Science Review Improvements

OPP Science Policy Council

The Office of Pesticide Programs (OPP) Science Policy Council (SciPoc) provides a central forum that assists in identifying cross cutting science issues in pesticide safety, formulating solutions, providing input into transitioning new science, and reviewing new methodologies and policies relevant to the Pesticide Program. In FY 2012, SciPoc provided guidance and review for a set of procedures that describe how the Office of Pesticide Programs will search the scientific literature and evaluate open literature studies to support the risk assessments that underlay pesticide risk management decision-making (see http://www.epa.gov/pesticides/science/literature-studies.html). SciPoc prepared two guidance documents that share common goals and principles: "Evaluation Guidelines for Ecological Toxicity Data in the Open Literature" and "Guidance for Considering and Using Open Literature Toxicity Studies to Support Human Health Risk Assessment." These documents are intended to ensure consistency within OPP and to make transparent to the public how we search the open literature and ensure that the data we use in pesticide risk assessments is documented as to scientific quality for the intended application. Another new science policy developed and reviewed under the auspices of SciPoc concerns a new science policy acknowledging the advances in genetic toxicology and integration of in vivo testing into standard repeat dose toxicology studies (see http://www.epa.gov/pesticides/science/integrating-gentox-studies.html). This science policy is reflective of OPP's commitment to using current state-of-the-science methods to enable a more effective and efficient testing and assessment paradigm for chemical risk management and OPP's commitment to reducing the number of animals used in testing, while still producing a reliable safety assessment of pesticide chemicals. SciPoc has also interacted with the EPA's Office of Research and Development's (ORD) on its new integrated transdisciplinary research program called "Chemical Safety for Sustainability (CSS)" to ensure that the Pesticide Program's priorities were addressed. The CSS focuses on developing scientific knowledge, tools, and models needed to improve chemical safety information that can be used in risk assessments, and includes a systems approach to implementing the 2007 National Research Council (NRC) report recommendations on Toxicity Testing in the 21st Century.

Ecological Risk Assessments

The agency continued to improve its review and communication of ecotoxicity studies through the following efforts: joint review and work sharing of study reviews with other countries; harmonization of ecotoxicity endpoints with other EPA programs; verification of drift reduction technologies; development of new models; and training, outreach activities, and development of risk assessment approaches for pollinators. Examples of these improvements include the following:

OECD Pollinator Activities. The EPA Pesticide Program is a member and co-chair of the international Orgnisation for Economic Cooperation and Development (OECD) Pesticide Effects

on Insect Pollinators (PEIP) sub-group of the Pollinator Expert Group. This sub-group was formed to address four main goals: (1) develop a mechanism for efficiently communicating accurate and necessary information on pollinator incidents among regulatory authorities of member countries; (2) review study designs for pollinator toxicity tests to determine if they can be enhanced or if new tests are needed to better assess acute, chronic, and sub-lethal effects on pollinators and to develop such guidelines; (3) develop a mechanism for sharing risk management tools, including precautionary labeling, use restrictions, technologies, training materials, best management practices, and integrated pest management practices used by various countries to mitigate pollinator risks and to recommend when and how tools should best be applied and characterize their effectiveness; and (4) establish a communication "clearinghouse" on research efforts to facilitate coordination and collaboration of research activities.

In 2012, we began developing portals for communicating pollinator incidents, sharing risk mitigation tools, and providing research on pollinators. In addition, we updated the pollinator testing guideline inventory and submitted the results of a survey on the importance of and need for risk assessment for non-Apis pollinators to OECD.

More Pollinator Activities. The EPA Pesticide Program continued to reach out and to meet with its state, federal, and global regulatory partners and advisory committees (the FIFRA Scientific Advisory Panel (SAP) and the Pesticide Program Dialogue Committee) as well as other stakeholders, including the National Honey Bee Advisory Board (NHBAB), pesticide registrants, academic researchers, industry, environmental groups, and beekeepers, on pollinator protection efforts that focus on (1) advancing tools for risk assessment, (2) advancing tools for risk management, and (3) communication and outreach. EPA staff also participated in several seminars, conferences, and scientific meetings concerned with pollinator issues this year.

In September 2012, the EPA Pesticide Program, in collaboration with the Canadian Pest Management Regulatory Agency and the California Department of Pesticide Regulation, presented a proposed framework for quantifying the potential risks of pesticides to honeybees to the FIFRA SAP. Consistent with the EPA's current pesticide risk assessment processes, the framework proposed a multi-tiered approach that initially relies on laboratory-based studies on individual bees, and then transitions to more realistic field-based studies involving whole colonies for chemicals that do not pass the screening-level assessment.

Label Checklist. In 2012, OPP developed and started implementing a label review checklist for risk managers to use when reviewing proposed labels for new use and new chemical registration actions. The checklist is used by regulatory division staff to ensure that the proposed labels contain all of the information necessary to conduct environmental and human health risk assessments before they are sent to the science divisions. If pertinent information is missing from the proposed labels, it can result in decreased efficiency and overly conservative assumptions being made during the risk assessment process. The decreased efficiency results

from the need to devise assumptions for missing information and possibly re-doing assessments if a registrant comes in later with additional label information. There is also a chance of inconsistencies across the science divisions (e.g., the different science divisions may make different assumptions regarding the missing label information). Therefore, the label checklist provides a simple way to increase efficiency, decrease inconsistencies, and avoid overly conservative use restrictions and mitigations.

OPP/OW Harmonization of Aquatic Life Assessments. The EPA's Office of Pesticide Programs (OPP) and Office of Water (OW), with support from the Office of Research and Development (ORD), presented a Common Effects Methodology on possible methods to harmonize the analysis and characterization of aquatic ecotoxicity data to the FIFRA Scientific Advisory Panel (SAP) on January 31 through February 2, 2012. The methods and subsequent analysis presented by EPA provided examples of approaches that could be used to leverage OPP data to meet the minimum data requirements established by OW for Aquatic Life Criteria derivation. In the SAP meeting, the EPA evaluated several possible approaches for analyzing available data to estimate effects on aquatic organisms.

Feedback from this external peer review is a key step in establishing new approaches and methods. The SAP issued a written response to these analyses on April 30, 2012. In general, the SAP report provided positive feedback on the analysis and made recommendations for future efforts. OPP, OW and ORD are currently in discussions surrounding both short term and long term research efforts to advance and achieve the EPA's goal of improved harmonization between OPP and OW to characterize aquatic effects (toxicity) of pesticides.

OCSPP Harmonization of Series 850--Ecological Effects Test Guidelines (Groups B,C,D and F). In June 2012 the EPA's Office of Chemical Safety and Pollution Prevention announced the availability of the final test guidelines for Series 850 – Ecological Effects Test Guidelines, consisting of Groups B, C, D, and F. These test guidelines are part of a series of test guidelines established by OCSPP for use in testing pesticides and chemical substances to develop data for submission to the agency under the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and section 408 of the Federal Food, Drug and Cosmetic Act (FFDCA). As guidance documents, the test guidelines are not binding on either the EPA or any outside parties, but are recommended for generating the data that are the subject of the test guideline.

Drift Reduction Technologies. In FY 2012, the Pesticide Program continued to work with the EPA's National Risk Management Research Laboratory (ORD) to develop the Drift Reduction Technology Program. The purpose of this voluntary program is to encourage the identification and use of spray application technologies capable of significantly reducing spray drift. Under ORD's Environmental and Sustainable Technology Evaluation program, OPP and ORD, with input from external experts, developed a draft verification protocol. The DRT testing protocol

was adapted from standard test methods and regulatory methods used in the US and other countries, and it describes the testing approach that will be used to generate high-quality, peer-reviewed data for DRTs. The protocol also describes the test design and quality assurance aspects. On November 21, 2012, OPP posted the draft DRT testing protocol and program description to the docket (EPA-HQ-OPP-2012-0631) and published a *Federal Register* Notice seeking public comment on the draft protocol and program description by January 22, 2013. Additional information is available at: http://www.epa.gov/oppfead1/cb/csb_page/updates/2012/drift-reduction.html.

Endangered Species. During 2012, the National Research Council (NRC) of the National Academy of Sciences continued their review of scientific and technical issues that have risen as the EPA has tried to meet its respective responsibilities under the Endangered Species Act and FIFRA. The scientific and technical topics on which the EPA, USDA and the Departments of Commerce and Interior are seeking advice pertain to the approaches used by the EPA, the Fish and Wildlife Service (FWS), and the National Marine Fisheries Service (NMFS) in assessing the effects of proposed FIFRA actions on endangered species and their habitats. These topics include the identification of best available scientific data and information; consideration of sub-lethal, indirect, and cumulative effects; the effects of chemical mixtures and inert ingredients; the use of models to assist in analyzing the effects of pesticide use; incorporating uncertainties into the evaluation of effects; and the use of geospatial information and datasets that can be employed by the EPA and the Services in the course of their assessments.

In 2012, the NRC committee held two public meetings, in January and April. During the January meeting in Seattle, Washington, the NRC committee listened to comments from a diverse group of stakeholders including grower groups, industry, academia, and environmental organizations. In March 2012, the EPA, FWS, and NMFS each provided written responses to a set of questions from the NRC committee on the methods and assumptions used in their pesticide scientific assessments of endangered species. Following submittal of the written responses, the NRC committee held a public meeting on April 4, 2012, in Washington D.C., where they asked each of the agencies follow-up questions on their written responses and provided an opportunity for public comments from the audience.

The NRC committee expects to make its recommendations concerning scientific principles and techniques the agencies might apply or use to improve methods and support decision-making for pesticide scientific assessments of endangered species available in the spring of 2013.

ESA Knowledge Base. EFED's current ecological risk assessments for pesticides consider potential impacts of pesticides on broad taxa (e.g., freshwater fish, terrestrial plants, birds). For terrestrial animals, including mammals, birds, reptiles and terrestrial-phase amphibians, generic body weights and diets are used to estimate pesticide exposures and subsequent risks. The most conservative exposures from these generic animals are currently used to assess risks to federally

listed endangered and threatened species (referred to as "listed species"). In order to consider species-specific body weights and diets that result in more representative, less conservative estimates of pesticide exposure and risk, EFED has compiled data on all currently listed species of mammals, birds, reptiles and amphibians. We obtained these data from USFWS and NMFS documentation describing species (e.g., recovery plans, critical habitat descriptions) as well as published scientific literature. We have entered species specific parameters into EFED's current exposure models (T-REX and KABAM) to allow EFED scientists to calculate risk quotients for individual listed species of mammals, birds, reptiles and amphibians. We have also collected other data, such as obligate relationships, habitat descriptions, and elevation restrictions, all of which may be used in species-specific effects determinations for pesticides that may be used on a national scale. All data are captured in a series of reports that include the source information as well as justification for model parameterization. In addition, species specific information are being captured in an OPP database that is designed to house biological and geographic data on all listed species (including terrestrial animals as well as aquatic animals and plants). This database will allow users to search for species based on their characteristics.

Modeling and Use of Geospatial Tools – Percent Crop Area Update. EFED uses percent crop area (PCA) adjustment factors in its drinking water assessments to account for the fact that a watershed of sufficient size to supply a drinking water source is not likely to be devoted entirely to agriculture. These PCAs were originally developed in the late 1990s and mid 2000s using the best available data from the USDA's Census of Agriculture and GIS coverage data. The process was vetted through a Scientific Advisory Panel and, based on the recommendations and concurrence of the SAP, we developed the PCAs for a limited crop set (corn, soybean, wheat, and cotton). The PCAs had not been updated since the mid 2000s and remain linked to 8-digit hydrologic units (HUC-8), which are larger (average 700 square miles) than the smaller, more vulnerable drinking water watersheds that tend to have the highest pesticide concentrations. Advancements in USDA and GIS data allowed EFED to update these PCA values and develop new ones for other needed crops or non-cropped areas, such as turf. In 2012, EFED completed the project updating PCA adjustment factors for use in estimating the concentrations of pesticides in drinking water derived from vulnerable surface water.

Modeling – Use of Geospatial Tools. EFED is developing a Spatial Aquatic Model (SAM) for use in aquatic exposure assessments for pesticides. Currently EFED models aquatic exposures with PRZM-EXAMS, which uses scenarios to represent a combination of factors that are expected to contribute to high-end pesticide concentrations in water. Although representative of vulnerable areas where a pesticide may be used, these modeling scenarios do not identify specific geographic areas where off site transport of a pesticide may pose a risk. With the increased demand for a spatial context to both human health (drinking water) and ecological (endangered species) aquatic exposure assessments, OPP needs a means for adding a spatial context to aquatic exposure in an efficient, consistent way without increasing the workload for the risk assessor.

In 2012 EFED completed a pilot project to evaluate the feasibility of using geographic information systems (GIS) to parameterize inputs for PRZM-EXAMS. Based on the success of the initial pilot, EFED is conducting a second pilot to test automation procedures for extracting data from geospatial data sets to parameterize and run multiple instances of PRZM over the Ohio River basin and to evaluate a revised aquatic model based on EXAMS. The second pilot will also evaluate data storage and computing resources to run a spatially explicit model on a large scale. Barring unforeseen limitations, EFED plans to develop and implement SAM for national scale modeling based on results and lessons learned from the second pilot study.

Modeling – PRZM-GW. EFED has been using SCI-GROW (Screening Concentration in Groundwater) as a screening-level tool to estimate drinking water exposure concentrations from groundwater resulting from pesticide use (Barrett, 1997). SCI-GROW is strictly a screening-level exposure tool and does not have the capability to consider mitigating circumstances such as variability in leaching potential of different soils, weather (including rainfall), cumulative yearly applications or depth to aquifer. If SCI-GROW-based assessment results indicate that pesticide concentrations in drinking water exceed the risk concern, the ability to refine the assessment is limited. In 2004, EFED initiated evaluation of advanced methods for estimating pesticide concentrations in groundwater as part of the cumulative risk assessment of carbamate pesticides. Similarly in 2004, Health Canada's Pest Management Regulatory Agency (PMRA) published information outlining an initial direction on use of modeling to estimate pesticides in groundwater. Because groundwater resources in Canada and the United States are similar and many modeling aspects and needs are the same, the two organizations combined efforts as part of the North American Free Trade Agreement (NAFTA) to develop a harmonized groundwater modeling protocol. The NAFTA team developed and harmonized the groundwater conceptual model with input from the FIFRA Scientific Advisory Panel. The team evaluated several existing computer models for suitability for regulatory purposes, intensively evaluated three models and selected PRZM-GW as the best fit for the NAFTA partners. The team produced a final report for the NAFTA project including harmonized implementation guidance for scenario development and the use of chemical input parameters. The team has also conducted additional model evaluations with various monitoring data-sets to assess model performance as a screening and refined assessment tool. The team has presented results of the model evaluation to internal and external stakeholders. Implementation of PRZM-GW in OPP's assessment methodology increases our ability to refine assessments and tailor risk mitigation decisions to various geographic conditions across the country, supporting OPP's mission by ensuring the safe use of pesticides and protecting human health.

Human Health Risk Assessments

Science Review Committees. The Residues of Concern Knowledgebase Subcommittee (ROCKS) continues to lead the application of predictive Tox 21 tools for metabolites, residues,

and environmental degradation products. In fiscal year 2012, the ROCKS held 15 meetings on 15 chemicals, in addition to two training sessions for new committee members. The Dose Adequacy Review Team (DART) reviewed study protocols submitted by various registrants for 5 chemicals. The Cancer Assessment Review Committee (CARC) met ten times on numerous chemicals, and the Toxicology Science Advisory Council (ToxSAC) met 29 times to discuss and determine end-points of concern. The Risk Assessment Review Committee (RARC) met nineteen times to peer review risk assessments that will undergo public comment.

Integrated Approaches to Testing and Assessment. Agency scientists continue to participate in the NAFTA Joint Integrated Approach to Testing and Assessment (IATA) Projects on computational tools such as Quantitative Structure-Activity Relationship models ((Q)SAR) and MetaPath. Included in this NAFTA project is the development of a guidance document for use of (Q)SAR in pesticide risk assessments. This is an on-going project that includes collaboration between the EPA, Canada's Pest Management Regulatory Agency (PMRA), and the Food and Drug Administration (FDA). Efforts continued within the Organization for Economic and Cooperative Development (OECD) MetaPath Users Group (MUG) to further explore opportunities to use MetaPath in global pesticide risk assessments and to continue its database development, along with the customization of the MetaPath DER Composer. The Pesticide Program is using the composer for rat and livestock metabolism studies. Current international collaborators include: Health Canada, PMRA, the European Food Safety Authority (EFSA), the Australian Pesticides and Veterinary Medicines Authority (APVMA), France, and Germany. In addition, the OECD initiated a project on Adverse Outcome Pathways (AOP), a conceptual framework designed to portray causal and predictive linkages between molecular-cellular disruption (initiation of a toxicity or disease pathway) and adverse outcomes of regulatory significance in individuals or populations. OPP created a workgroup to review OECD AOP documents as well as to propose AOPs for inclusion in the OECD project.

Hazard and Science Policy Committee (HASPOC). As the central forum to address science, policy, hazard data waivers, and risk deliberation and coordination issues that are of central importance to OPP, the HASPOC, was very active this year. HASPOC reviewed data waivers for 94 chemicals for a variety of toxicity studies, primarily for the acute and subchronic neurotoxicity and the subchronic inhalation toxicity studies. Waivers were granted for 42 of the 58 requests for subchronic inhalation studies resulting in the savings of approximately 5000 animals and $11 million, the cost of conducting these studies. Similarly, waivers were granted for 28 of the 36 requests for the neurotoxicity studies, resulting in the saving of approximately 6000 animals and $9 million.

Crop Grouping Work. The Crop Grouping Regulation for stone fruit group and tree nut group published in August 2012. This final rule revises the current pesticide tolerance crop grouping regulations, which allow for the establishment of tolerances for multiple related crops based on data from a representative set of crops. This is the third in a series of planned crop group updates expected to be promulgated over the next several years and is expected to reduce the cost of generating residue data for pesticide registration and new food uses because it has the effect of reducing the number of residue chemistry studies because fewer representative crops would need to be tested under a crop grouping scheme than would otherwise be required. The action will promote more extensive use of crop group tolerances and will assist in making available lower

risk pesticides for minor crops, both domestically and in countries that export to the United States, as well as developing integrated pest control programs. In addition, the expansion of these crop groups will allow USDA's IR-4 and the EPA to be more efficient in registering pesticides on specialty crops and reduce the administrative costs of both the IR-4 testing protocols and the EPA review process. By harmonizing U.S. crop groups with the International Codex Food Classification System, trade barriers will be reduced. In addition to this crop group regulation for 2012, three other crop groups have been approved by HED and PMRA, and these are expected to be promulgated in 2013.

Adjuvant Policy. HED concluded a multi-year evaluation of the impacts of adjuvant use in field trials. The "adjuvant question" has been particularly problematic for registrants and led to delayed approvals and sometimes perhaps inconsistent decisions. Based on the Agency's internal analysis, as well as review of two independent industry statistical assessments, HED was able to conclude that submission of additional separate information on this issue by registrants was unnecessary and that there would be little value added in requiring additional field trials reflecting adjuvant use. This finding will save both the regulated community and the agency significant resources as unnecessary field trials will not need to be generated by the registrants or evaluated by the scientists in HED.

Dietary Exposure Assessment. OPP released the Dietary Exposure Evaluation Model (DEEM) Update to the public. The EPA recently purchased this software (DEEM-Calendex/FCID 2003-2008) – previously available by license from Exponent. It uses the newest 2003-2008 NHANES/"What We Eat in America" dietary consumption data. The update from the earlier 1994-96/1998 survey was a multiyear effort on the part of HED and involved developing recipes for hundred of new foods that appear in this newest survey, generating new food consumption estimates based on these recipes, and incorporating them into the updated DEEM software. The software is now fully publically available for download on the web (see http://www.epa.gov/opp00001/science/deem/) and is now being used for regulatory risk assessments, superseding the older DEEM/CSFII version OPP had been using, which was based on the Continuing Survey of Food Intake by Individuals (CSFII) 1994-96/1998. http://www.epa.gov/pesticides/science/deem/

Updated *Transfer Coefficient (TC)* Policy. This update represents the culmination of a 25-year effort that involved development of guidelines, issuance of a 1992 Data Call-In, collaboration with the Agricultural Re-Entry Task Force (ARTF), collaboration with other regulatory Agencies (e.g., Cal-DPR and PMRA), and a Scientific Advisory Panel review in 2008 of the findings of ARTF. This policy provides a systematic basis for evaluating the risks associated with hand labor activities for all major crops that are commercially produced. It also identifies activities that do not require assessments, which is a resource savings, because their exposure potential was determined to be negligible (e.g., operation of a mechanical combine for grain harvest).

Release of the Revised Residential SOPs. Following an approximately 2-year effort involving almost all of HED's occupational and residential exposure (ORE) assessment staff, the team completed the first formal update to the operational procedures for assessing residential exposure since 1997. Efforts to complete this project involved extensive collaboration with both internal and external partners. HED worked closely with ORD to identify the latest and most relevant

exposure research. Additionally, HED prepared briefings for OPP senior management, as well as the Office of Children's Health Protection (OCHP), and shared draft versions of the document with ORD, OCHP, PMRA and CDPR. HED's SOP document represents a substantial advance in residential exposure assessment that will be utilized throughout the international regulatory community.

Updated *Unit Exposure (UE)* Surrogate Table. Following a multi-year effort, OPP released an updated unit exposure surrogate table, a quick reference guide that presents the current recommended unit exposures for standard agency occupational pesticide handler exposure scenarios. This surrogate reference table is the culmination of a number of sources of exposure data including the Pesticide Handler Exposure Database (PHED), the Outdoor Residential Exposure Task Force (ORETF), the Agricultural Handler Exposure Task Force (AHETF), and other available registrant-submitted exposure monitoring studies. This effort ensured that all of the data sources used in the surrogate table are compliant with applicable ethics requirements pursuant to 40 CFR 26. For certain studies, that review has included review by the Human Studies Review Board. As more reliable data become available the agency will continue to replace existing data and update and re-post the surrogate reference table**.**

Guidance for Requiring or Waiving Turf Transferrable Residue (TTR) and Dislodgeable Foliar Residue (DFR) Studies. In accordance with the updated Part 158 data requirements (2007), both turf transferable residue (TTR) and dislodgeable foliar residue (DFR) studies are required when pesticides are applied to turf grass and to the foliage of plants other than turf grass, respectively. Under 40 CFR 158.45, OPP may waive a data requirement if "it would not be possible to generate the required data" or "the data would not be useful in the agency's evaluation of the risks or benefits of the product." The guidance document provides criteria for requiring or waiving TTR and DFR studies. This guidance document has resulted in significant cost saving attributable to conducting and reviewing these studies.

OECD Activities. OPP continued to coordinate US Government participation in the Organization for Economic and Cooperative Development (OECD) Test Guideline Program. The program develops and updates test guidelines and guidance documents that are the most relevant for the testing the safety of chemicals. Harmonizing testing across the 34 member countries of the OECD can reduce testing costs for pesticide manufacturers since a study conducted under the test guidelines and good laboratory practices will be considered acceptable for review by all member countries. The OECD harmonized Test guidelines are the foundation of the global pesticide review process, since studies submitted to the participating countries are conducted under these standards. Several new and updated test guidelines and guidance documents were approved this year, including *in vitro* tests that avoid testing on animals as well as studies that can be used in the Endocrine Disrupter Screening Program. Although coordination of the OECD Test Guideline efforts is housed in the Office of Pesticide Programs, several offices in the EPA participate, as well as representatives of the Food and Drug Administration, Consumer Product Safety Commission, National Institute for Environmental Health Sciences, and the US Army.

Global Review Work. OPP continued to lead in collaboration on global joint review activities for new conventional pesticides. In addition to tackling a larger portion of the primary reviews

for several large submissions, OPP prepared documents to support the international residues of concern discussion through the agency's Residues of Concern Knowledge-Based Subcommittee (ROCKS) of the RARC. For each of the global reviews, OPP shared documentation and proposed decisions with international partners and considered their perspectives in preparing the final decision. Without this leadership, decisions would have to be made by individual teams on a per-chemical basis. In addition to the ROCKs committee, international partners were invited to participate in numerous peer review committees, including ChemSAC, ToxSAC, RARC, and CARC. The agency has taken a leadership role by providing draft documents for review, ultimately resulting in better support for proposed decisions, including buy-in from global partners.

Human Health Benchmarks for Pesticides (HHBPs). The HHBPs in water are now available for about 350 chemicals and can be found on the EPA's website www.epa.gov/pesticides/hhbp. The HHBPs were developed jointly by OPP and OW under Administrator Jackson's new drinking water strategy and will be used to assist states, the public and other stakeholders to determine whether the detection of a pesticide in drinking water or source waters for drinking water may indicate a potential health risk. The water benchmarks were derived using peer reviewed Reference Dose values from OPP's human health risk assessments along with typical methods used in developing OW's drinking water health advisories.