

Improving Urban Pesticide Regulatory Activities to Protect Water Quality



Annual Update 2007

*Prepared for the
San Francisco Estuary Project*

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PREFACE

This is a report of research performed by TDC Environmental, LLC for the San Francisco Estuary Project. This report was prepared for the San Francisco Estuary Project to fulfill the annual reporting requirement in Task 7.2.4 of its grant agreement with the State Water Resources Control Board (Agreement Number 06-342-552-0) for Taking Action for Clean Water.

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1.0 INTRODUCTION

1.1 Background

The U.S. Environmental Protection Agency (U.S. EPA) has determined that use of some registered pesticides is a source of water quality impairments.¹ This determination demonstrates that current U.S. EPA and California Environmental Protection Agency (Cal-EPA) procedures for regulating pesticides are insufficient to ensure that pesticide use does not cause violations of the Federal Clean Water Act and California Porter-Cologne Water Quality Control Act.

Federal law provides U.S. EPA with the ability to protect surface water from pesticides. California law provides the California Department of Pesticide Regulation (DPR) with the ability to protect surface water from pesticides. The different procedures used by pesticide regulators (i.e., the U.S. EPA Office of Pesticide Programs and DPR) and water quality regulators (i.e., the U.S. EPA Office of Water and California State and Regional Water Quality Control Boards) to manage pesticides create a regulatory gap that leaves states and municipalities responsible for solving water quality problems that could have been prevented at the time a pesticide was registered or re-registered. The agencies that manage California's water quality are working with pesticide regulators to address this regulatory gap.

In California urban areas, three types of government agencies have water quality protection as their primary responsibility:

- The *State and Regional Water Quality Control Boards* ("Water Boards") are responsible for maintaining water quality in California to protect designated uses of surface and ground waters. Among their important activities are solving water pollution problems ("impairments") with regulatory plans (Total Maximum Daily Loads or TMDLs) and issuing permits for surface water discharges (National Pollutant Discharge Elimination System or NPDES permits).
- *Municipal wastewater treatment plants* are also known as sewage treatment plants or publicly-owned treatment works (POTWs). These plants receive anything that is discharged into urban sewer systems. While they can regulate large industrial dischargers and a few commercial businesses, they cannot readily control most commercial and all residential discharges. They have NPDES permits with specific numeric limits based on water quality standards.
- *Urban runoff management agencies* oversee urban stormwater runoff drainage systems, which generally flow directly to surface waters without treatment. Under the Clean Water Act, municipalities in urban areas are issued permits for their discharges through storm drains, making them legally responsible for any water pollutants that wash off when it rains (or when irrigation, car washing, and other water flows into gutters and storm drains).

This report refers to the above agencies collectively as "California water quality agencies."

¹ Strauss, Alexis, Acting Director, Water Division, U.S. EPA Region 9 (1999). Letter to the California State Water Resources Control Board modifying California's list of impaired water bodies (303[d] list), May 12. An impaired water body is one that does not meet water quality standards.

Since late 1999, California water quality agencies have participated in selected U.S. EPA pesticide regulatory processes. California water quality agencies have also worked less formally with DPR. The goals of these activities are:

1. To prevent surface water impairment.
2. To prevent violations of wastewater and stormwater NPDES permits.

The focus of these activities has been on pesticide use in urban areas. Since mid-2004, the Urban Pesticide Pollution Prevention (UP3) Project has provided scientific and regulatory support to help California water quality agencies achieve these goals.

Although California's long history of pesticide-related water quality and NPDES permit compliance challenges does not appear to be unique, California water quality agencies are apparently currently the only water quality protection agencies in the nation to be working with U.S. EPA on these important issues for urban areas.² California water quality agency teamwork with pesticide regulatory agencies and other stakeholders to address pesticide-related water quality problems in urban areas is also unique. To date, the UP3 Project has not identified any other U.S. state or region that has established a program to address pesticide-related water quality issues related to use of pesticides in urban areas, even though California data indicate that at least half of all pesticide use occurs in urban areas.³

This is one of three reports prepared annually by the UP3 Project. (The other two reports are a review of California urban pesticide sales and use trends and a summary of recent scientific findings that are relevant to urban surface water quality management activities). The purpose of the UP3 Project is to help implement the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy and Total Maximum Daily Load ("Bay Area Urban Creeks Pesticides TMDL")⁴ and to help California Water Boards and municipalities prevent pesticide-related water quality problems. The San Francisco Estuary Project (SFEP) has been awarded California water bond grant funds from the State Water Resources Control Board to implement the UP3 Project through mid-2009. TDC Environmental is providing technical support for the project.

1.2 Scope of This Report

This is the fifth review of California water quality agencies' urban pesticide water quality regulatory activities. In 2003, 2004, 2005, and 2006, TDC Environmental reviewed and evaluated the outcomes of these efforts.⁵ This report summarizes California water

² The UP3 Project is seeking to identify other agencies working on these issues, but has yet to identify any such group of agencies. The most relevant groups identified to date are the Pacific Northwest Regional Pesticide Coordinating Committee, which focuses on urban pesticides use reduction, but has not generally engaged U.S. EPA on water quality issues, and the State-FIFRA Issues Research and Evaluation Group (SFIREG), which is a group of pesticide regulators that has a water quality subcommittee, but does not generally focus on urban issues.

³ TDC Environmental (2006). *Urban Pesticide Use Trends Annual Report*, prepared for the San Francisco Estuary Project. June.

⁴ Johnson, B. (2005). Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks. Water Quality Attainment Strategy and Total Maximum Daily Load (TMDL). Proposed Basin Plan Amendment and Staff report. November.

⁵ TDC Environmental (2003). "Evaluation of Regional Efforts to Improve Existing Federal Regulatory Processes to Prevent Water Quality Impairment from Pesticides," memorandum from Kelly Moran to Bill Johnson, San Francisco Bay Regional Water Quality Control Board, April 23; TDC Environmental (2004). *Improving Urban Pesticide Regulatory Activities to Protect Water Quality. Annual Update 2004*, prepared for the San Francisco Estuary Project, December; TDC Environmental (2005). *Improving Urban Pesticide Regulatory Activities to Protect Water Quality. Annual Update 2005*, prepared for the San Francisco Estuary

quality agency input into urban water quality-related pesticide regulatory actions since late 1999 and evaluates the outcomes from that input, focusing on information received since the December 2006 review.

This report summarizes the activities of many organizations. Leaders have included:

- San Francisco Bay and Central Valley Regional Water Quality Control Boards
- California State Water Resources Control Board
- California Stormwater Quality Association (CASQA)
- County of Sacramento Department of Water Resources
- Tri-TAC (the technical advisory committee representing California municipal wastewater management agencies⁶)
- Los Angeles County Sanitation Districts (LACSD)
- San Francisco Department of the Environment (SF Environment)

Other members of the Urban Pesticides Committee have also participated in and supported these efforts.

1.3 Data Sources

This report is based on a review of:

- U.S. EPA pesticide risk assessments, registration eligibility decisions, and related documents
- Written responses to California Water Quality Agency comments
- Other regulatory decisions made by U.S. EPA and DPR relating to urban pesticides and surface water quality
- U.S. EPA and California DPR presentations at interagency and public meetings
- Informal discussion with U.S. EPA and DPR staff.

U.S. EPA's 2007 responses to California water quality agency comments are summarized and analyzed in Appendix B.

1.4 Report Organization

This report is organized as follows:

- Section 1 (this section) provides the background and scope of the report.
- Section 2 describes the scope of California water quality agency regulatory activities.
- Section 3 summarizes past and upcoming regulatory activities.
- Section 4 evaluates the outcomes of activities to date, to the extent that outcomes are known at this time (many regulatory processes that California water quality agencies have participated in are still underway).
- Section 5 reviews the progress made to date on the recommendations of the 2003-2006 evaluations.

Project, December; TDC Environmental (2007). *Improving Urban Pesticide Regulatory Activities to Protect Water Quality. Annual Update 2006*, prepared for the San Francisco Estuary Project, January

⁶ Tri-TAC is a technical advisory committee on state and Federal regulatory issues affecting publicly owned treatment works that is jointly sponsored by the League of California Cities, the California Association of Sanitation Agencies, and the California Water Environment Association.

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- Section 6 gives the conclusions of this evaluation and provides recommendations for future activities.
- Appendix A summarizes U.S. EPA activity for urban pesticides of interest to California water quality agencies.
- Appendix B provides an analysis of U.S. EPA's 2007 responses to comments by California water quality agencies.

2.0 SCOPE OF CALIFORNIA WATER QUALITY AGENCY REGULATORY ACTIVITIES

2.1 U.S. EPA

California water quality agencies participate in U.S. EPA pesticide regulatory processes affecting urban surface water quality as follows:

- Identify and track U.S. EPA regulatory processes with implications for urban surface water quality.
 - Keep an updated schedule of anticipated U.S. EPA public comment opportunities.
 - Review *Federal Register* notices, risk assessments, and relevant scientific information and consult with water quality agencies and other experts to determine whether specific pesticides under U.S. EPA review have the potential to affect surface water quality, municipal wastewater, and/or urban runoff NPDES permit compliance.
- Identify specific information that would be valuable for California water quality agencies to share with U.S. EPA.
 - Identify specific shortcomings in U.S. EPA environmental risk assessments for urban pesticide uses that have the potential to adversely affect surface water quality or NPDES permit compliance.
 - Obtain missing information that is available from California or from the literature (e.g., water quality criteria, monitoring data, risk assessment methods, technical reports).
 - Identify critical data gaps in the information available to assess the impacts of urban pesticide use.
- Where potentially significant risks are evident, identify risk mitigation options.
 - Consider changes in allowable pesticide uses, application rates, and label language and develop recommendations for feasible use changes to prevent water quality problems.
- Communicate information to U.S. EPA. Previous activities have determined that the primary mechanism for agencies to share relevant information with U.S. EPA is by writing letters. U.S. EPA's pesticide evaluation processes are set up to accept letters with technical information during public review periods. Less formal communications with U.S. EPA staff (telephone calls and meetings) are important to explain further key points in comments letters for pesticide regulators (who are used to different scientific and regulatory frameworks) and to provide context for comments.
- Review outcomes. U.S. EPA responds to the information provided by California water quality agencies several ways:
 - (1) by its actions in registration decisions and risk assessments,
 - (2) in formal written responses prepared for some—but not all—actions,
 - (3) informally in telephone conversations and e-mails.

Given the time and complexity involved in these tasks, California water quality agencies have found that they need scientific and regulatory support to complete the above tasks.

In 2007, the UP3 Project conducted most of the above activities (with the exception of communications to U.S. EPA about specific regulatory actions) and provided general scientific and regulatory support about pesticides to the California water quality agency community.

2.2 California Department of Pesticide Regulation

Primarily because DPR is a sister agency to the Water Boards within Cal-EPA, California water quality agency interaction with DPR has generally been relatively informal. For example, water quality agencies have participated in various work groups with DPR, such as the Urban Pesticides Committee and the Copper Antifouling Paint work group. Water quality agency representatives have met with DPR staff and management to discuss specific pesticide-related water quality problems (e.g., pyrethroids) and general regulatory issues (e.g., improving regulatory approaches to preventing water quality problems from pesticides).⁷

Not all interactions are informal. Water quality agency representatives have been appointed to both of DPR's formal advisory committees, the Pesticide Registration and Evaluation Committee and the Pest Management Advisory Committee. Water quality agency participation in DPR's regulatory actions on pyrethroid insecticides (the "pyrethroids reevaluation") has included written comment letters in addition to informal engagement with DPR, other agencies, and other stakeholders.

With the assistance of the UP3 Project, water quality agencies track DPR's routine activities, which include two types of regulatory decisions relevant to urban surface water quality for which public comment opportunities are offered.

1. Annual re-registration of all pesticides. Each year, DPR renews the registration of the more than 11,000 pesticide products registered for use in the state. The process is essentially a formality—public documents include only a short summary of the legal requirements for renewing registrations. Requests for pesticide reevaluation are commonly made at this time, although such requests can be submitted at any time.
2. Pesticide product registration. Each week, DPR announces which pesticide products it is considering for registration. Most pesticide product registration requests are for products with pesticide active ingredients and uses that have previously been approved in California.

While these routine regulatory decisions offer formal opportunities for public comments on water quality related issues, on a practical basis, monitoring these processes is difficult because public documents do not contain DPR's assessment of the potential water quality impacts from each product. For this reason, water quality agency input to formal DPR regulatory decisions (other than the pyrethroids reevaluation) has been limited to a few test cases that were initiated to improve understanding of DPR's registration process (see Section 3.2).

2.3 Other Agencies

When other regulatory agency activities may affect the ability to ensure water quality protection from potentially adverse effects of pesticide use, contacts may be made on a case-by-case basis.

⁷ Formally the Copper Antifouling Paint Sub-Workgroup of the Marina and Recreational Boating Workgroup of the Interagency Coordinating Committee (IACC). The IACC is a working group composed of 28 State agencies involved in implementing California's Nonpoint Source Pollution Control Program.

2.4 Coordination Among Agencies

California water quality agency pesticide regulatory activities have been coordinated primarily through the Urban Pesticides Committee (UPC). Since the mid-1990s, the UPC has served as a center for information exchange, coordination, and collaboration among local, regional, and state agencies seeking to end pesticide-related surface water toxicity problems. Today, the UPC is a collaboration of more than 210 individuals representing water quality regulatory agencies, pesticide regulatory agencies (U.S. EPA and DPR), agricultural commissioners, industry representatives, pesticide/water quality technical experts, municipal wastewater treatment plants, environmental nonprofits, community organizations, and stormwater management agencies. This network, which was organized by the San Francisco Bay and Central Valley Regional Water Quality Control Boards, is currently being managed by the UP3 Project.

The UP3 Project convenes bimonthly UPC meetings (which can be accessed by teleconference). The UP3 Project also maintains a web site (www.up3project.org) that provides documents and other resources to assist agencies with implementing programs to prevent pesticide-related water quality problems and an announcement-only e-mail list for UPC members to keep them up to date on regulatory, scientific, and educational program developments.

3.0 SUMMARY OF PAST AND UPCOMING REGULATORY ACTIVITIES

3.1 U.S. EPA

Together, California water quality agencies have sent U.S. EPA more than 200 letters since 1999. To participate in U.S. EPA re-registration and registration review processes for the following 32 pesticides, California water quality agencies sent more than 170 letters on environmental risk assessments and re-registration decisions (see Appendix A, Table A-2 for details):

- Allethrin
- Atrazine
- Carbaryl
- Chlorpyrifos
- Copper compounds
- Cypermethrin
- Diazinon
- Linalool
- Lindane
- Malathion
- Metaldehyde
- Metam sodium
- Permethrin
- Pyrethrins
- Resmethrin
- Zinc pyrethione
- Miscellaneous antimicrobials (PHMB, Halohydrantoin, Pine oil, Phenol)
- Phenoxy herbicides (2,4-D, 2,4-DB, Dicamba, MCPP, and MCPA)
- Other herbicides (Arsenic-containing herbicides; Pentachloronitrobenzene)
- Synergists (Piperonyl butoxide and MGK-264)
- Wood preservatives (Arsenic and chromium compounds, Creosote, and Pentachlorophenol)

California water quality agencies have elected to comment on only a small fraction (<10%) of the pesticides that U.S. EPA is evaluating in its pesticide re-registration process, focusing on those chemicals that have been determined to have the greatest potential to cause urban surface water impairment and NPDES permit compliance problems. Initially, California water quality agencies focused on diazinon, chlorpyrifos, copper, and lindane, which were proven causes of urban surface water impairment and NPDES permit compliance problems. Once U.S. EPA announced the cancellation of most urban diazinon and chlorpyrifos uses, attention shifted to insecticide replacements that commonly occur in urban surface waters at levels that may cause adverse impacts to aquatic life (e.g., carbaryl, malathion, and pyrethroids).⁸ Recognizing that the re-registration process offers a unique opportunity to prevent future water quality problems, agencies recently have begun to comment on pesticides for which there are little or no

⁸ These were selected based on a review of the replacement products: TDC Environmental (2003). *Insecticide Market Trends and Water Quality Implications*, report prepared for the San Francisco Estuary Project and the San Francisco Bay RWQCB, April.

environmental data, but for which urban uses have the potential to cause exceedances of water quality criteria, aquatic toxicity, or violations of NPDES permits.⁹

In addition, agencies have sent more than 30 letters to U.S. EPA regarding 20 other decisions (see Appendix A, Table A-3 for details). The most important of these were:

- Request to regulate washing machines that release silver ions into wash water
- Procedural regulations for pesticide registration review
- Proposed rule: Data requirements for pesticides (“conventional chemicals”)
- Organophosphorous pesticide cumulative risk assessment
- Proposed rule: Endangered species act consultations on pesticide registrations
- U.S. EPA guidance on applications of pesticides to surface waters
- Proposed rule: Standards for pesticide containers and containment
- Guidance on recommended environmental hazard statements for outdoor residential pesticides

3.2 California Department of Pesticide Regulation

Most California water quality agency interaction with DPR has been informal and collaborative in nature. For example, DPR and the Water Boards have coordinated on development of implementation plans for several pesticide-related TMDLs.

Water quality agency representatives have been appointed to both of DPR’s formal advisory committees. Representatives of wastewater and stormwater agencies participated in DPR’s Pest Management Advisory Committee and its Urban Pest Management Work Group. A State Water Board representative is part of DPR’s interagency Pesticide Registration and Evaluation Committee.

While Water Boards generally do not write formal letters to DPR since they are sister agencies in Cal-EPA, other California water quality agencies have sent letters to DPR regarding specific actions within its authority:

- Reevaluation requests.
 - *Diazinon and Chlorpyrifos.* In 2001, the California Stormwater Quality Task Force (the predecessor of CASQA) requested that DPR reevaluate urban uses of diazinon and chlorpyrifos.
 - *Pyrethroids.* In 2005, water quality agencies discussed possible reevaluations for pyrethroid insecticides and marine antifouling paints with DPR; both CASQA and Tri-TAC formally requested that DPR place all pyrethroids into reevaluation. Subsequent to DPR’s decision to place pyrethroids into reevaluation, both Tri-TAC and CASQA sent DPR letters providing recommendations for the reevaluation data requirements.
- Reevaluation requirements.
 - *Off-site movement of pyrethroids.* CASQA provided a scientific review of a proposal by the pyrethroids manufacturers to conduct studies of pyrethroids in urban runoff. The CASQA comments included a set of recommendations for next steps that could be taken to bring the reevaluation to a timely and effective outcome.

⁹ Such pesticides are identified on the basis of the UP3 Project’s annual review of relevant research and monitoring data, pesticide use patterns, and information in U.S. EPA environmental risk assessments such as pesticide chemical properties and ecotoxicity.

- *Fate of pyrethroids in POTWs.* Tri-TAC provided scientific comments on pyrethroid registrants'¹⁰ proposal for actions to address DPR's requirement that pyrethroid registrants monitor wastewater treatment plant effluent.
- Registration requests.
 - *Impregnated products.* In 2004, Tri-TAC asked DPR to register pesticide-impregnated clothing. In 2007, Tri-TAC requested that DPR require registration of copper-impregnated clothing.
 - *Pesticide-generating products.* In 2006, Tri-TAC asked DPR to register washing machines that release silver ions into wash water.
- Registration water quality assessments. Water quality agencies have asked DPR staff to conduct analyses of water quality impacts of several pesticide products being evaluated for registration. Some of these requests (identified below) were made informally. These products and uses include copper-containing roofing material (2001), permethrin use in floor drains (2005), permethrin impregnated clothing (2005), a variety of products proposed to be used in or that would be discharged to sewers or storm drains (informal, 2004 and 2005), permethrin-impregnated mattress liners (2006), and silver-containing dental biocides (2006).

3.3 Other Agencies

The Structural Pest Control Board (SPCB), which is part of the California Department of Consumer Affairs, regulates professional structural pest control operators (PCOs). One of the SPCB's regulations (California Code of Regulations Section 1999.5 [CCR 1999.5]) prohibits PCOs from making claims of environmental benefits of their services, regardless of the veracity of such claims.¹¹ California water quality agencies have been involved in the development of a structural pest control integrated pest management (IPM) certification program called "Ecowise Certified,"¹² recognizing that PCOs providing IPM services could reduce the potential for water quality impacts associated with pest management activities. Using IPM for structural pest control reduces runoff from outdoor pesticide applications around buildings (among the most common urban use of pesticides). Because the CCR 1999.5 restrictions constituted a significant barrier to informing the public about the benefits of IPM, California water quality agencies and other partners in the Ecowise Certified program sought assistance from the SPCB.

In 2005, in support of Ecowise Certified, CASQA sent a letter to the SPCB requesting that it review and revise its regulations to allow specific, truthful, and substantiated claims of environmental benefit provided by a bona fide IPM service that is backed by a reputable certification system. In response to this letter and a presentation to the Board by the San Francisco Bay Water Board and CASQA, the SPCB established an ad hoc

¹⁰ A "registrant" is a company that legally registers a pesticide for use with U.S. EPA and California DPR. This report often uses the word "manufacturer" to refer to registrants.

¹¹ CCR 1999.5 (f) (6) currently prohibits "any statement or representation that a pest control service, product, pesticide, or device offers a general environmental protection or benefit, or that the pest control products, pesticides, or devices the licensee uses, the applications of such products, pesticides, or devices, or any of them, are 'among the least toxic chemicals known,' 'relatively non-toxic,' 'pollution approved,' 'environmentally aware,' 'environmentally sensitive,' 'environmentally preferable,' 'environmentally benign,' or 'contains all natural ingredients'".

¹² Ecowise Certified certifies qualified professional structural pest control operators that employ integrated pest management-based structural pest control services, including measures to reduce the threat to urban surface water quality.

committee dealing with IPM and water quality issues. Representatives from the San Francisco Bay Water Board and the Pest Control Operators of California were invited to participate in the committee, which met in 2006 and 2007 (DPR was also invited to sit in on these meetings).

In 2007, the SPCB established two additional committees— the “CCR 1999.5 Task Force” which addressed barriers to advertisement of IPM services in the California Code of Regulations, and the “IPM Task Force” to consider how the SPCB might be involved in promoting IPM, including education requirements for licensees and IPM certification. A CASQA representative regularly participated in the open, public meetings that these committees held.

In late 2007, the three committees forwarded the following recommendations to the SPCB:

- The CCR 1999.5 Task Force made a set of recommendations to the SPCB, including a recommendation that the SPCB make regulatory changes to remove barriers to advertising environmentally preferable structural pest management services while maintaining the integrity of the regulation’s overall purpose to prevent false and misleading pest control advertising claims.
- The IPM Task Force recommended to the SPCB that it develop an IPM certification program for structural pest control licensees, and that it establish IPM education requirements for licensees.
- The Water Quality Committee recommended to the SPCB that it develop an IPM certification program.

All of the committee recommendations were unanimously supported by committee members, which included representatives of the structural pest control industry, Californian water quality agencies, and other interest groups. CASQA also supported the recommendations. The recommendations were presented at the October 2007 SPCB meeting, where they received a positive response. As a result, the SPCB has proposed regulation changes to establish the recommended IPM definition (laying the groundwork for establishment of IPM certification and education requirements), and to amend CCR 1999.5 to permit verifiable claims of environmental benefits while maintaining protection against overly broad or unsubstantiated claims.¹³ The proposed regulations are scheduled for public hearing at the SPCB meeting of January 11, 2008.

3.4 2007 Milestones

Table 1 (on the next page) lists notable events that occurred in 2007 (through November).

3.5 2008 Schedule

3.5.1 U.S. EPA

Federal law requires U.S. EPA to evaluate pesticide registrations periodically based on current scientific information and modern environmental and human health risk assessment methods. In the next several years, U.S. EPA plans to complete a special process of evaluating the registrations of all pesticides registered prior to November

¹³ The proposed regulations are available on the SPCB internet site:
http://www.pestboard.ca.gov/pestlaw/proposed_regs/index.htm

Table 1. 2007 Milestones

Date	Event
March 30	DPR provided California water quality agencies with the opportunity to review and comment on the Pyrethroid Working Group's (PWG's) proposed approach to developing a monitoring protocol for pyrethroids in POTW effluent.
April 30	DPR hosted a Pyrethroid Forum in Sacramento. Presentations on pyrethroids and water quality were made by pyrethroids registrants, U.S. EPA, Pest Control Operators of California, California water quality agencies, and the UP3 Project. ¹⁴
May 1	U.S. EPA Office of Pesticide Programs hosted a stakeholder meeting in Sacramento to discuss risk mitigation options for cypermethrin pre-construction termiticide treatments. Pest control operators, California water quality agencies, DPR, U.S. EPA Region 9, and others participated in a productive discussion of options to reduce the potential for cypermethrin to be carried away from treated areas subsequent to pre-construction termiticide applications.
August 20	DPR provided California water quality agencies with the opportunity to review and comment on the PWG's proposed approach to mitigating the movement of pyrethroids to surface water sediments.
August 30	Tri-TAC and PWG held first meeting in Los Angeles. POTW representatives and pyrethroid registrants shared information about POTW operations, water quality regulations, and the PWG's proposed approach to evaluating the fate of pyrethroids in POTWs.
October 5	DPR provided California water quality agencies with the opportunity to review and comment on the PWG's proposal to address the pyrethroid reevaluation sediment toxicity data requirement.

1984 (“re-registration”). Most pesticides commonly used in urban areas were re-registered by August 2006, because U.S. EPA coordinated re-registration with food safety evaluations required by the Food Quality Protection Act to be completed by that date (most pesticides that are commonly used in urban areas are also used on food crops). Remaining pesticides—which include several that are of interest for urban surface water quality—are planned for re-registration in the next several years. For these pesticides, the re-registration will be the first evaluation since the pesticide was originally registered, which may have been decades ago.

In late 2006, U.S. EPA initiated a new cycle of pesticide registration evaluations that will include all registered pesticides (not just those registered prior to November 1984). This evaluation cycle is called “registration review.” A group of pyrethroids (many, but not all pyrethroids of interest for water quality) is planned to be considered in registration review starting in about 2010.

A schedule of anticipated upcoming U.S. EPA pesticide re-registration activities relevant to urban water quality is in Appendix A, Table A-1. This schedule is subject to change.

¹⁴ DPR has made presentations from this forum available on the Internet:
<http://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/pyrethroids.htm>

The anticipated public input opportunities in 2008 for pesticides of interest for surface water quality and for pesticide-related decisions that may set precedents for surface water quality protection are:

- Risk assessments: copper compounds (copper compounds and copper uses that were not included in the 2006 risk assessment), pentachlorophenol, p-dichlorobenzene, tributyltin, triclosan, and the pyrethroids sumithrin, and tetramethrin.
- Re-registration decisions: metam sodium, tributyltin, triclosan, and three types of wood preservatives (arsenic and chromium compounds, creosote, and pentachlorophenol).
- Registration review workplans: None.
- Registration review risk assessments: Linalool.
- Other: Proposed rule—Data requirements for antimicrobial pesticides (i.e., biocides).

3.5.2 California Department of Pesticide Regulation

California water quality agencies' primary engagement with DPR in 2008 is anticipated to involve DPR's regulatory process for reevaluation of pyrethroids and its likely process for reevaluation of marine antifouling coatings. For pyrethroids, DPR communications with water quality agencies have been more extensive than they have for any previous reevaluation. Formal processes for engagement of California water quality agencies have been established within Cal-EPA (between DPR and the Water Boards) and among pyrethroids manufacturers and Tri-TAC members. No communications forum has been established to address urban or agricultural runoff. Since urban runoff agencies have information that will be valuable to DPR and pesticide registrants in their work to meet the reevaluation's goal of preventing adverse impacts from pyrethroid use on California water quality, they are seeking to work with DPR to establish a process for information sharing and collaboration about urban runoff that will be beneficial to both pesticide and water quality agencies throughout the reevaluation process.

For marine antifouling paint, DPR has established a process for collaboration with stakeholders through the Copper Antifouling Paint Sub-Workgroup of the state's Marina and Recreational Boating Workgroup. The State Water Board and several Regional Water Boards participate in this workgroup, which is sharing scientific information regarding the known and potential water quality impacts of marine antifouling coatings.

DPR's routine activities include:

- Annual renewal of all pesticide product registrations (usually in November or December)
- Weekly announcements of pesticide products entering evaluation for registration

When items of interest for urban surface water quality are identified, California water quality agencies will respond to these routine DPR announcements.

Water quality agencies have representatives on two DPR permanent advisory committees:

- Pest Management Advisory Committee (PMAC) meetings (quarterly)
- Pesticide Registration and Evaluation Committee (PREC) meetings (bimonthly)

Improving Urban Pesticide Regulatory Activities to Protect Water Quality

Organizational representatives from Tri-TAC and/or CASQA often participate in these meetings when agenda items relevant to pesticides and urban surface water quality are considered. The Water Boards, Tri-TAC, and CASQA have all been represented on DPR-sponsored working groups, the most notable of which is the Urban Pest Management Workgroup, which is working on recommendations to the PMAC and to DPR specific to urban areas.

Other DPR-related activities could occur at any time. For example, under a Management Agency Agreement (MAA) between DPR and the State Water Board, DPR and the State Water Board indicated their intent to hold public meetings to discuss pesticide water quality regulatory issues, including urban issues. No such meetings have been held to date.

DPR and the State Water Board maintain an open line of communication through their MAA coordinators (two staff members, one from DPR and one from the State Water Board who have been designated by their agency to serve as the liaison to the other for purposes of implementing the MAA). While the MAA coordinators work primarily through informal communication, they have arranged formal DPR—State Water Board meetings.

4.0 EVALUATION OF OUTCOMES

U.S. EPA and DPR are changing the way they conduct pesticide regulatory activities based on information from California water quality agencies. In 2005, the primary outcome was a growing understanding of pesticide-related water quality issues by both pesticide and water quality agencies. In 2006 and 2007, results were more concrete—pesticide regulatory agencies took several specific steps to address pesticide-related urban surface water quality problems. These outcomes reflect meaningful progress toward achieving the goals listed in Section 1.1.

This section employs two approaches to evaluate outcomes. Most of the analysis uses an outcome assessment approach adapted from an approach developed by CASQA¹⁵ that defines outcomes of water quality protection programs in terms of the following six general levels:

- Level 1—Activities were performed
- Level 2—Changes in attitudes, knowledge, and awareness were achieved
- Level 3—Behavioral change occurred
- Level 4—Pesticide load reductions occurred
- Level 5—Urban runoff and wastewater discharge quality improved
- Level 6—Receiving water quality improved

These outcomes are shown graphically in Figure 1 (on the next page). The advantage of this approach is that it allows assessment of outcomes that demonstrate progress toward water quality improvements that may not be immediately measurable. Sections 4.1 through 4.5 present the evaluation based on this approach. Because the evaluation is outcome-based, activities are only presented in the Level 1 assessment. The remaining assessment levels evaluate the outcomes of the activities conducted, but do not attempt to list the specific activities that created each identified outcome (which would generally be challenging, as the types of outcomes being evaluated usually occur in response to multiple individual actions completed over a period of years).

A second evaluation approach is used to look at U.S. EPA pesticide regulatory decisions for pesticides where California water quality agencies participated in the regulatory process. This analysis is necessarily more limited, as it looks only at a specific type of activity by one pesticide agency—and can only be completed for pesticides where U.S. EPA has completed the re-registration process. Section 4.6 presents this analysis.

It is important to recognize that this evaluation is necessarily an interim evaluation. The types of processes that California water quality agencies have engaged in take years to complete—and the systemic changes desired will probably take many years to implement fully. Even interim feedback is delayed—U.S. EPA has not yet responded to many of the comments sent by water quality agencies because the regulatory processes are still underway.

¹⁵ CASQA (2007), *Municipal Stormwater Program Effectiveness Assessment Guidance*.

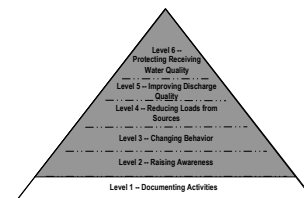
Figure 1: Assessment Outcome Levels



Source: Adapted from CASQA (2007) *Municipal Stormwater Program Effectiveness Assessment Guidance*.

4.1 Level 1 Outcomes: Documenting Activities

Sections 2 and 3 describe how California water quality agencies have worked with pesticide regulatory agencies. The most important activity accomplishments of California water quality agencies' urban pesticide water quality regulatory activities are listed below. The activities documented below are among the primary means that higher level outcomes (Levels 2 through 6) been achieved.



- Agency team established through UP3 project. California Water Boards (lead by the State Water Board and San Francisco Bay, and Central Valley Regional Water Boards), wastewater agencies (coordinated by Tri-TAC) and stormwater agencies (coordinated by CASQA) have established a teamwork approach to participation in pesticide regulatory activities. Teamwork is facilitated by the UP3 Project, which provides a cost-effective approach for agencies to complete the scope of activities listed in Section 2.
- More than 200 unique comment letters submitted. As summarized in Section 3, California water quality agencies have researched, prepared, and submitted more than 200 comment letters to U.S. EPA and several letters to DPR since 1999. Water quality is not regularly raised by other commenters on U.S. EPA pesticides actions. Since 1999, no water quality agency that is not part of the California water quality agency effort has regularly submitted written comments to U.S. EPA regarding pesticides regulatory processes.
- Regular and special interagency meetings held. California water quality agencies meet with pesticide regulatory agencies and other interested parties bimonthly at UPC meetings. Several California Water Boards participate in bimonthly copper antifouling paint meetings (see Section 3.4.2). Many other productive meetings were held between DPR, U.S. EPA, and water quality agencies in 2007, including the April 30th Pyrethroid Forum and a stakeholder meeting with U.S. EPA about mitigation options to prevent runoff of cypermethrin

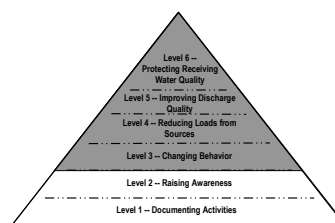
from pre-construction termiticide treatments. The UP3 Project worked with DPR and U.S. EPA staff to help ensure that interagency meetings would be productive.

- Presentations given. California water quality agency representatives gave presentations at regional and statewide water quality and IPM conferences to educate agency representatives and other interested parties about pesticide-related urban surface water quality issues. A few presentations have been given at national water quality events (e.g., UP3 Project and CASQA presentations at the U.S. EPA pesticide/water quality Pesticide Registration Education Program [PREP training]). Pesticide regulators have participated in organizing sessions and giving presentations on scientific research on pesticides and surface water quality at national scientific conferences.

4.2 Level 2 Outcomes: Raising Awareness

Communication with California water quality agencies' has raised pesticide regulators' awareness of urban surface water quality issues. Key outcomes regarding awareness are as follows:

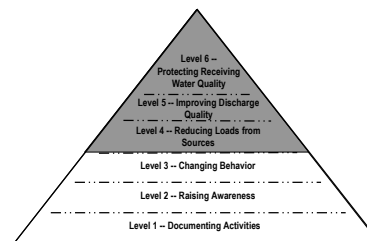
- U.S. EPA Office of Pesticide Programs (OPP) staff is aware of urban pesticides water quality issues. Ongoing communication with California water quality agencies has made the U.S. EPA OPP generally more willing to consider and address water quality issues than it has been in years past. These changes can be directly linked to the efforts of California agencies. California water quality agencies' comment letters have reached a relatively large fraction (but not all) of U.S. EPA OPP environmental risk assessors and risk managers. While there is substantial room for improvement in U.S. EPA risk assessment methods, increased general awareness of water quality concerns has been reflected in the tone and content of recent pesticide environmental risk assessments and re-registration decisions. U.S. EPA has also become aware of the need to develop water quality modeling tools to address urban pesticide use (past tools have only addressed agricultural pesticides).
- Both DPR and the California SPCB are aware of urban pesticides water quality issues. As described below, both agencies have shaped decisions on the basis of information about the relationship of urban pesticide use to surface water quality.



4.3 Level 3 Outcomes: Changing Behavior

California water quality agencies provided pesticide regulators with scientific and water quality regulatory information, which helped shape changes in procedures and regulatory decisions related to pesticides and urban surface water quality:

- DPR initiated reevaluation of pyrethroid products. In response to research findings of toxicity in urban and agricultural surface water sediments, DPR initiated its regulatory program to respond to environmental problems with currently registered pesticides, which is called "reevaluation." In this reevaluation, DPR required registrants to complete various actions such as conducting special studies to



- elucidate the linkage between pesticide use and water quality problems, developing solutions to pesticide-related water quality problems, supplying product or active ingredient-related data, and completing monitoring to assess efficacy of proposed solutions to water quality problems. Water quality agencies have an unprecedented level of involvement in this reevaluation. DPR has consulted with water quality agencies to focus the reevaluation, to refine various data requirements for registrants (i.e., procedures for conducting scientific studies), and to set up a network of key stakeholders.
- DPR integrated water quality agencies into its advisory committees. Water quality agency representatives were appointed to the relevant DPR advisory committees and have actively engaged in committee processes.
 - DPR decided to require registration of pesticide-impregnated fabric products. In early 2006, DPR reversed a prior decision and decided to require registration of pesticide impregnated products like mattress liners and clothing. This decision was made in response to letters from Tri-TAC regarding concerns about wastewater discharges from washing such products.
 - DPR has changed the way it works with California water quality agencies in regard to urban pesticide issues. In 2005, DPR management and water quality agencies established multiple lines of productive communication and collaboration. Collaboration has continued to improve in subsequent years as is reflected throughout this report. The Deputy Director for Policy Coordination has played a key role in the continuing productive engagement between DPR and water quality agencies. These changes appear to be permanent and have successfully addressed some important information and communication gaps that existed for decades.
 - California's SPCB has proposed regulatory changes to address urban pesticides water quality issues. In response to a presentation by the San Francisco Bay Water Board and a letter from CASQA, the SPCB established a subcommittee to address water quality issues. Subsequently, it established two additional committees to consider how to remove regulatory barriers to advertising of environmentally preferable structural pest control services and to consider involvement in IPM. Two of the three committees recommended that the SPCB establish an IPM certification program and IPM education requirements. The other committee recommended specific regulatory changes to permit verifiable claims of environmental benefits of IPM services. The SPCB has proposed regulations to implement the recommendations; these regulations will be considered at a public hearing scheduled for January 2008.
 - U.S. EPA has begun to integrate urban water quality protection measures into its regulatory actions; however, integration is inconsistent. In 2007, some U.S. EPA actions integrated water quality protection measures. For example, in 2007, U.S. EPA proposed improved language on residential pesticide product labels that would generally direct purchasers not to apply pesticides outdoors when rain is forecast. However, other actions did not consider surface water quality. A 2007 pesticide registration data rule update did not require manufacturers to supply data essential for environmental risk assessments of indoor pesticide uses.
 - U.S. EPA clarified that its definition of a pesticide includes pesticide-generating devices like silver ion-generating washing machines. In response to a letter from Tri-TAC requesting that U.S. EPA consider registering silver ion generating

washing machines (which was followed by a similar letter from NACWA), U.S. EPA reviewed its policies and procedures and determined that it should consider certain items to be pesticides rather than as devices not subject to regulation.¹⁶ Registration provides U.S. EPA the opportunity to evaluate—and mitigate, as necessary—any water quality impacts from the silver wastewater discharges associated the use of these machines.

- U.S. EPA has improved environmental risk assessment procedures. The following significant improvements made in 2005 - 2007 appear to be linked directly to California water quality agency comments:
 - U.S. EPA has used a screening-level model (the “down-the-drain” model) to estimate potential risks from pesticide discharges to municipal wastewater treatment facilities. In 2006 and 2007, U.S. EPA completed “down-the-drain” assessments in the majority of risk assessments reviewed by the UP3 Project that included pesticide uses that involve discharge into sewers (however, the “down-the-drain” assessment was often in response to comment letters from water quality agencies requesting the analysis be performed). Registration review workplans issued in 2007 usually included plans to complete a “down-the-drain” assessment for pesticides that may be discharged to sewers.
 - U.S. EPA is willing to use all available scientific data, whether from manufacturers or the published literature, including available surface water monitoring data and aquatic toxicity data from the agency-wide ECOTOX environmental toxicity database. A Standard Operating Procedure for inclusion of water quality and impaired water body data into pesticide Registration Review recognized the importance of obtaining available surface water monitoring data.¹⁷ Previously risk assessments relied primarily or exclusively on manufacturer-supplied information.
 - To the extent information is available (which it rarely is), U.S. EPA assesses the environmental risks from pesticide degradates, inert ingredients, formulations, and cumulative exposures to multiple pesticides.
 - U.S. EPA identifies uncertainty in its environmental risk assessments.

These improvements increase the potential for U.S. EPA to identify water quality problems in its pesticide registration and re-registration processes. Since risk mitigation measures are only considered when problems are identified, these changes are crucial first steps for water quality protection and Clean Water Act compliance.

- U.S. EPA has begun to improve cooperation between its offices. In response to water quality agencies' requests for cooperation between U.S. EPA OPP and Office of Water, U.S. EPA has pursued several initiatives. The primary outcome of these initiatives has been a willingness to improve staff-level communications between the Office of Water and OPP. Office of Water staff have limited interactions with pesticides staff, but there is evidence that relationships are being initiated (e.g., Office of Water staff have provided models and data to pesticides staff, have participated in teleconference meetings between California water quality agencies and U.S. EPA OPP, and have joined with OPP to develop

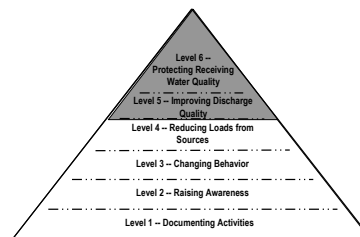
¹⁶ Registration is only required for devices claimed to control pests (this includes biocides, but excludes claims like “freshens your clothes”).

¹⁷ U.S. EPA OPP (2007). Standard Operating Procedure: Inclusion of Water Quality & Impaired Water Body Data in OPP's Registration Review Risk Assessment & Management Process. January 18.

a standard operating procedure for including water quality and impaired water body data in U.S. EPA pesticide registration reviews). These developments are encouraging, but are only the first step to addressing the many fundamental scientific and policy communications gaps that have been identified by California water quality agencies.

4.4 Level 4 Outcomes: Reducing Loads from Sources

When a pesticide agency regulatory process for a pesticide of interest for urban surface water quality is completed and a decision is made, the UP3 Project qualitatively evaluates the action to determine the potential for changes in pesticide discharges to municipal wastewater treatment plants or releases into urban runoff.



Since most regulatory decisions have multi-year implementation time frames and phase-out periods, there is usually a significant time lag between a regulatory decision and its environmental effect (i.e., reducing pesticide loads in surface water discharges). The time lag between decisions and environmental effects increases if the pesticide is environmentally persistent. *Although most of the pesticide regulatory decisions reviewed by the UP3 Project involved pesticides where significant water quality impacts were identified by U.S. EPA, only a few decisions included regulatory actions that have the potential to prevent identified impacts and to create meaningful reductions in wastewater or urban runoff loads.*¹⁸ These are listed below. All of the decisions described below are anticipated to begin reducing pesticide loads in the next few years.

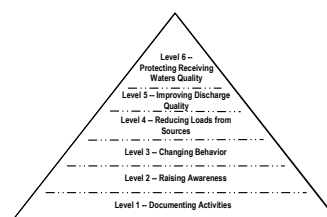
- Allethrins. This family of pyrethroids is most commonly used in aerosol and fogger products; however, prior to this decision, some of the allethrins were registered for a variety of other urban uses that could have released environmentally meaningful quantities of pyrethroid to urban environments (these uses were limited, but could have increased in the event of a market shift). When the decision was released in 2007, U.S. EPA announced that registrants have agreed to eliminate registrations for the primary allethrins uses that could have posed threats to water quality (such as treatment of pets, boat hulls, drainage systems, paved areas, and golf course turf), and to limit all other outdoor uses to spot treatments only.
- Arsenic-containing herbicides (MSMA, DSMA, CAMA, and Cacodylic Acid). In 2006, U.S. EPA released a decision calling for the phase out of all urban uses of arsenic containing herbicides to protect water quality.
- Carbaryl. Pet care applications were terminated, apparently partly in response to California water quality agency questions about this use, which involved discharges to municipal wastewater treatment plants. Changes in urban outdoor uses were not significant—in fact, the potential for increased use remains a concern for water quality agencies.

¹⁸ Based on data about behavior change due to educational programs See Larry Walker Associates, *Tools to Measure Source Control Program Effectiveness*, prepared for the Water Environment Research Foundation, Project #98-WSM-2, 1999. The data assembled in this report show that even highly targeted, well-designed education programs can only achieve behavior change rates in the 10-15% range. Based on these data, minor wording changes on products for non-professional applicators and general directions other than Best Management Practices for professional products are considered unlikely to generate significant load reductions.

- Chlorpyrifos. Most urban uses have been terminated, but some potentially problematic uses continue (e.g., golf courses). Applications in storm drain manholes were specifically prohibited in response to California water quality agencies' requests.
- Cypermethrin. U.S. EPA has decided to change directions for professional use of the pyrethroid cypermethrin significantly (little cypermethrin is used by non-professionals). The changes include Best Management Practices intended to prevent runoff from pre-construction termiticide applications, and limitations on applications to impervious surfaces (where runoff fractions are highest). These changes, which are anticipated to provide meaningful reduction in cypermethrin loads in urban runoff, were made in direct response to California water quality agency comments.
- Diazinon. All urban uses were terminated (however, continuing cut flower and nursery uses could occur in urban areas). Use of diazinon trunk wraps in urban areas was specifically prohibited in response to California water quality agencies' requests.
- Lindane. In 2006, U.S. EPA announced plans to phase out all remaining lindane uses. U.S. EPA also asked FDA to enact measures to reduce use of lindane pharmaceuticals (which are not regulated by U.S. EPA). Because lindane pharmaceutical use has already ended in California in response to state legislation, all current lindane sources to municipal wastewater treatment plants and urban runoff are being phased out. Since lindane is environmentally persistent (and since phase outs do not require collection of remaining products), it may continue to be found in discharges for many years to come. These changes—particularly the termination of the pharmaceutical uses—are expected to keep wastewater lindane levels below concentrations needed to comply with water quality based effluent limits.
- Pentachloronitrobenzene (PCNB). In 2006, U.S. EPA decided to terminate all urban uses of the fungicide PCNB due in part to concerns about water quality.

4.5 Levels 5 and 6 Outcomes: Improving Discharge Quality and Protecting Receiving Waters

Most pesticide regulatory decisions that have been made since California water quality agencies became engaged in pesticide regulatory programs are too recent to be reflected in the environment—or have involved relatively small load changes that are unlikely to be measurable in receiving water monitoring. Evaluating these changes is challenging because most pesticide regulatory programs do not include surface water monitoring to evaluate water quality environmental outcomes of regulatory decisions¹⁹—and monitoring of the hundreds of currently registered pesticides is not a routine part of water quality agency monitoring programs. No Level 5 outcomes were found; only one Level 6 outcome was identified.



- Diazinon and chlorpyrifos levels in urban surface waters are decreasing and the frequencies of organophosphorous pesticide-related toxicity in urban surface

¹⁹ An important exception is DPR's reevaluation process, which generally includes post-implementation monitoring to ensure that the goals of the reevaluation are achieved.

waters is dropping. In response to the U.S. EPA phase out of almost all urban uses of diazinon and most urban chlorpyrifos uses, urban diazinon and chlorpyrifos use has declined. A few potentially problematic uses remain—for diazinon these include cut flower and nursery uses; for chlorpyrifos these include golf courses and non-residential outdoor uses. Available surface water monitoring data (which is not designed to address remaining potentially problematic uses [see the UP3 Project Annual Research and Monitoring Update]) have shown a decline in diazinon and chlorpyrifos levels and a reduction in the incidence of acute toxicity to aquatic organisms from water column samples (in contrast to the increased toxicity in sediments).

4.6 Evaluation of U.S. EPA Pesticide Regulatory Decisions

Unlike many pesticide regulatory actions, U.S. EPA's pesticide re-registration process has a specific set of steps that lead to a clearly recorded decision that can be directly assessed for its impact on urban surface water quality. An analysis of the 22 U.S. EPA completed pesticide re-registration decisions for pesticides of interest to urban surface water quality (those which California water quality agencies participated in) is in Table 2 (on the next three pages).

Table 2 contains a summary of the most common urban uses of each pesticide, the urban use changes made in the re-registration process and the likely relevance of water quality agency comments in these changes. The assessment of the relationship of water quality agency comments to urban pesticide use changes was made on the basis of the explanation of U.S. EPA's regulatory rationale in its pesticide re-registration decisions and U.S. EPA's written responses to water quality agency comments. In evaluating regulatory outcomes, it is important to recognize that water quality is but one of many economic, social, and environmental factors that U.S. EPA and DPR consider when making regulatory decisions. The extent that water quality agency comments contributed to U.S. EPA's decision generally cannot be determined with complete specificity based on available documents; however, in a few cases, U.S. EPA clearly made specific changes in response to California water quality agency comments.

Table 2. Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2007

Pesticide	Most Common Urban Uses	Urban Use Changes	Assessment of Relationship of Water Quality Agency Comments to Urban Use Changes
<i>2,4-D</i>	Lawns	Application rates were reduced.	Comments were not directly related to this change.
<i>2,4-DB</i>	Open land	No changes that would affect water.	None.
<i>Allethrin</i>	Indoors, lawn, garden, around buildings	Pets, boat hull, drainage system, paved area, and golf course turf treatments terminated. All other outdoor uses to spot treatments.	Changes appear to respond to both human health and water quality factors. Market forces (i.e., limited sales for canceled use patterns) may have also played a role in the decision.
<i>Arsenic-containing herbicides</i>	Turf	All urban uses cancelled.	Probably none since comments were not made until after decision was published. Decision included an assessment of alternatives for urban uses, which has been a regular request of water quality agencies.
<i>Atrazine</i>	Lawn	Reduced application rate.	Comments were related to how U.S. EPA approaches its decisions, not to specific uses
<i>Carbaryl</i>	Lawn, garden, pets	Pet applications terminated. Residential lawn applications temporarily limited, but may be reauthorized.	Water quality likely a factor in pet care use termination, but does not seem to be a factor in the ongoing evaluation of lawn uses.
<i>Chlorpyrifos</i>	Lawn, garden, around buildings, manholes	Most urban uses terminated, but some potentially problematic uses remain. Applications in storm drain manholes was prohibited.	Water quality was probably not a factor in U.S. EPA's decision, except that applications in storm drain manholes were specifically prohibited in response to California water quality agencies' requests.
<i>Copper (Group 1 of two groups)</i>	Fungicides, water applications, root killer	Application rates and maximum frequencies were set (and in some cases reduced).	Water quality was a factor in U.S. EPA's decision; however, urban uses other than aquatic applications were not assessed or addressed directly in risk management.
<i>Cypermethrin</i>	Around buildings	New label language requires controls on pre-construction termiticide treatments to prevent runoff. Restricted applications to impervious surfaces to spot treatments, except for "foundation treatments" up the walls of buildings. New label language added to prevent outdoor applications when rain is imminent. Added other label instructions to reduce potential for releases to surface water.	Water quality was the basis for the listed changes, which appear to be direct responses to comments, particularly pre-construction termiticide label instructions to prevent cypermethrin wash-off.

Table 2. Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2007 (Continued)

Pesticide	Most Common Urban Uses	Urban Use Changes	Assessment of Relationship of Water Quality Agency Comments to Urban Use Changes
<i>Diazinon</i>	Lawn, garden, around buildings	All urban uses terminated; however, cut flower and nursery uses (which are still allowable) could occur in urban areas.	Water quality was probably a minor factor in U.S. EPA's decision. As requested, U.S. EPA added label language to clarify that diazinon trunk wraps should not be used in urban areas. Requested evaluations of nurseries and cut flowers uses were rejected.
<i>Dicamba</i>	Lawns, golf courses	Reduced application rate.	Comments were not directly related to this change.
<i>Lindane</i>	Lice and scabies treatments	EPA asked FDA to enact measures to reduce use and modified national lindane water quality criteria. In 2006, EPA phased out all remaining pesticidal uses.	Data provided by water quality agencies were critical to the U.S. EPA decision. Water quality agency comments were likely a major factor in the decision to address pharmaceuticals that are not regulated by U.S. EPA and the decision to modify the lindane water quality criteria.
<i>MCPA</i>	Lawns and rights of way	Application rates were reduced.	Comments were not directly related to this change.
<i>Mecoprop-p (MCP-P)</i>	Lawns and rights of way	Application rates were reduced.	Comments were not directly related to this change.
<i>MGK-264</i>	Indoors, lawn, garden, around buildings	Label directions to reduce releases were added. Maximum allowable outdoor application rate was reduced.	Water quality agency comments were probably a meaningful factor in the decision to make label direction changes.
<i>Malathion</i>	Lawn, garden, around buildings	Canceled broadcast applications on residential lawns and golf course turf, as well as applications on human clothing, mattresses, cats, dogs and other animals; kennels, and sewage systems. Limited applications around buildings to 2-foot band.	Water quality was probably not a major factor in U.S. EPA's decision, which was driven by human health; however, water quality may have been a factor in the use cancellations.
<i>Metaldehyde</i>	Garden	Greatly limited the types of plants that can be treated. Required graphic warning of child and pet hazard. Required barriers to prevent child or animal access to treated areas.	Changes were supported by information provided by San Francisco Department of the Environment, which U.S. EPA contacted while developing its risk management strategy.
<i>Permethrin</i>	Indoors, lawn, garden, around buildings	Added label directions to reduce releases, such as directions to clean up granules that land on impervious surfaces, not to overwater after lawn and garden applications, and not to apply prior to heavy rainfall.	Water quality was the basis for the listed changes, which appear to be directly in response to comments; however, measures were relatively minor because U.S. EPA deferred cumulative pyrethroids review until 2010.

Table 2. Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2007 (Continued)

Pesticide	Most Common Urban Uses	Urban Use Changes	Assessment of Relationship of Water Quality Agency Comments to Urban Use Changes
<i>PCNB</i>	Turf (particularly golf courses)	All urban uses cancelled.	Probably none since comments not made until after decision was published. Decision included an assessment of alternatives for urban uses, which has been a regular request of water quality agencies.
<i>PBO</i>	Indoors, lawn, garden, around buildings	Label directions to reduce releases were added.	Water quality agency comments were probably a meaningful factor in the decision to make label direction changes.
<i>Pyrethrins</i>	Indoors, lawn, garden, around buildings	Label directions to reduce releases were added.	Water quality agency comments were probably a meaningful factor in the decision to make label direction changes.
<i>Resmethrin</i>	Indoors, lawn, garden, around buildings	Added label directions to reduce releases, such as directions not to overwater after lawn and garden applications, not to apply to drains, and not to apply prior to heavy rainfall.	Water quality was the basis for the listed changes, which appear to be direct responses to comments; however, measures were relatively minor because U.S. EPA deferred cumulative pyrethroids review until 2010.

Source: TDC Environmental evaluation of U.S. EPA Re-registration Eligibility Decisions and related documents.

5.0 PROGRESS ON PREVIOUS RECOMMENDATIONS

The 2003-2006 reviews and evaluations of California water quality agency participation in pesticide regulatory activities included several recommendations, most of which generated follow-up actions. Below is a progress report on each recommendation (with the year and number of the previous recommendation identified).

Previous Recommendations 2003-1, 2004-1, 2004-2, 2005-1, and 2006-1: *Continue to provide U.S. EPA and DPR with information to prevent potential water quality problems associated with urban pesticide use and to press for consistency in implementation of water quality and pesticide regulatory programs within U.S. EPA and California EPA.*

Action to date: California water quality agencies have continued to provide information to U.S. EPA and DPR. Water quality agencies increased their activity level beginning in 2005. This increase was a direct result of UP3 Project scientific and regulatory support, which had not previously been available.

Previous Recommendations 2003-2, 2003-3, 2004-3, 2004-4, 2004-6, 2005-2, and 2006-2: *Continue to strengthen the network of water quality agencies working on urban pesticides issues.*

Action to date: The network of California water quality agencies that regularly provide information to U.S. EPA continues to grow. Initially a regional group, the UPC is now a statewide organization that has begun to attract national attention. With UP3 Project support, the two key municipal water quality agency organizations—CASQA and Tri-TAC—have become routinely engaged in work on pesticides.

Priorities for network strengthening include streamlining comment preparation processes and involving national organizations. Through Tri-TAC, wastewater agencies have successfully developed methods for timely processing of letters to U.S. EPA and DPR by state and (to some extent) national wastewater agency organizations. In 2007, CASQA developed an organized approach to comment preparation, but faced challenges in meeting comment period deadlines due to the time required for standard CASQA review processes.

Tri-TAC has begun to engage the national wastewater agency organization the National Association of Clean Water Agencies (NACWA). There is particularly a need to determine whether national coordination of urban runoff and water quality regulatory agencies is possible.

Further strengthening of the network should focus on (1) increasing state and national organization engagement in pesticide/water quality issues and (2) institutionalizing pesticide/water quality activities within these organizations.

Previous Recommendations 2003-3, 2004-6, 2005-4, and 2006-4: *Increase efforts to raise urban pesticide surface water quality issues at the national level.*

Action to date: Action on this recommendation has been limited, but successful. An important next step for national engagement is educating potential allies through presentations at national meetings. For example, in 2006, both the UP3 Project and Sacramento County have given presentations at U.S. EPA-sponsored trainings for state pesticide and water quality agency staff from around the nation. Interested agencies have been encouraged to join the UPC. In 2007, Sacramento County gave a presentation to the National Association of Local Government Environmental Professionals. In 2005, a presentation by a

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Los Angeles County Sanitation Districts staff member at a national Association of Metropolitan Sewerage Agencies (AMSA, now NACWA) conference generated a flurry of activity by wastewater agency leaders, U.S. EPA Office of Water managers, and the press.

For the coming years, a key step will be to participate in public forums such as national advisory committees and national conferences to enhance nationwide understanding of managing urban pesticides to prevent surface water quality programs. Recently, a Sacramento County stormwater quality program staffer (who is also a leader in CASQA) applied to sit on U.S. EPA's Pesticide Program Dialogue Committee. Budget restrictions limit out of state travel, making participation in national forums difficult for most state and municipal staff.

Previous Recommendations 2005-6 and 2006-8: Actively seek to strengthen communication between California water quality agencies and California and U.S. EPA pesticide regulators.

Action to date: Since 2005, California water quality agencies participated in several meetings with U.S. EPA to discuss comments on re-registration of pyrethroids and related compounds, including a very productive meeting on cypermethrin re-registration in 2007. Other communications—particularly direct telephone calls and in-person meetings—have been relatively rare. Although communication with U.S. EPA Region 9 has been good, additional effort is needed to improve communication with U.S. EPA headquarters pesticides staff, which will promote improved understanding of scientific and regulatory issues and barriers that agencies are facing in managing pesticide-related urban water quality problems.

At the state level, good progress has been made, often with the assistance of the UP3 Project. In-state communication, which has been strengthened by the commitment of DPR's senior management to cooperation with water quality agencies, is easier and occurs in a variety of venues, including in-person meetings and telephone calls. A challenge for 2007 will be to strengthen communications in relation to the urban runoff portion of the pyrethroids reevaluation.

Communication can be improved if water quality agency representatives initiate meetings and telephone calls—and when they do, they should strive to provide information using terminology that is accessible for all participants (i.e., not relying on Clean Water Act-based regulatory terminology and approaches). In-person briefings of key decision makers—particularly at the Federal level—are strongly recommended.

Previous Recommendations 2003-4, 2004-7, 2005-5, and 2006-5: Continue efforts to determine possible approaches and next steps toward developing practical methods for U.S. EPA and DPR to address the environmental effects of all ingredients in individual pesticide products when those products are registered or re-registered.

Action to date: U.S. EPA has indicated that it agrees that additional tools need to be developed—particularly methods to model runoff of pesticides from urban areas. California water quality agencies shared information identified by the UP3 Project about U.S. EPA Office of Water modeling resources and examples of watershed modeling that are analogous to the modeling needed for urban pesticides; however, U.S. EPA stated that no adequate modeling tools exist for urban runoff. At workshops, U.S. EPA representatives have indicated that they are informally exploring urban runoff modeling options; however, U.S. EPA has

yet to start formal development of an approach for conducting urban runoff modeling for pesticides. Continuing to facilitate the process of finding ways to fill methodology gaps needs to be a priority for California water quality agencies.

U.S. EPA determined that an existing screening model is available to assess sewer discharges of pesticides. Tri-TAC intends to continue to work with U.S. EPA to refine methods used in these “down-the-drain” assessments because the current methodology does not adequately evaluate the potential impacts to POTWs (e.g., it does not account for common situations like discharges to effluent-dominated water bodies and predictable events like multiple coincident discharges during a pest outbreak).

Previous Recommendations 2004-5, 2005-3, and 2006-3: Develop a stable funding mechanism to continue scientific and regulatory support for California water quality agency participation in U.S. EPA and California DPR regulatory activities affecting water quality.

Action to date: Currently, UP3 Project funding provides this technical support; however, current UP3 Project funding ends in mid-2009. In the past, California water quality agency participation in California and Federal pesticide regulatory processes has been limited in time periods when there was no or limited funding for technical support for the program. A long-term strategy is needed to provide stable, continuing funding for work on urban pesticides and water quality beyond the life of the grant.

Previous Recommendation 2006-6: Improve the pesticide registration public involvement process.

Action to date: None.

Previous Recommendation 2006-7: Restore and enhance DPR funding for programs that prevent or solve pesticide-related urban surface water quality problems.

Action to date: This recommendation was largely implemented in 2007, with restoration of DPR’s pest management alliance grants and increased funding for its water quality monitoring activities. Current funding levels remain lower than past levels—and may still be below levels needed to support both water quality monitoring and implementation of pest management practices that limit or eliminate potential contributions to surface water quality problems.

Previous Recommendation 2004-8: Strengthen relationships with California DPR’s regulatory programs. Water quality agencies need to explore how registration, reevaluation, and other authorities work.

Action to date: This recommendation was fully implemented in 2005:

- Communication was improved. In 2005, the UP3 Project opened a dialogue between DPR’s regulatory programs and California water quality agencies.
- Complete information on DPR registration reviews was obtained. The UP3 Project facilitated presentation of DPR’s pesticide registration review process and other regulatory authorities to the UPC. The presentation specifically explained that DPR reviews aquatic toxicity data, but completes no water quality modeling or environmental risk assessment when pesticide products are registered. Two sets of wastewater agency comment letters²⁰ prepared at

²⁰ One was on insecticide-impregnated clothing that DPR declined to register. The other was in regard to a pyrethroid product proposed for application in floor drains.

the recommendation of the UP3 Project clarified DPR's registration processes and allowed water quality agencies to obtain and review the water quality related analysis performed by DPR when registering pesticide products.

- Appointments to DPR Committees and positions have improved consideration of water quality. The Director of DPR appointed a water quality agency representative to the DPR Pest Management Advisory Committee. (The UP3 Project suggested that wastewater and stormwater agencies request this appointment.) A water quality agency representative was also appointed to a special Pest Management in the 21st Century task force established by the DPR Director. A new State Water Board representative was appointed to DPR's other advisory committee, the Pesticide Registration and Evaluation Committee (PREC). Both the Water Board and U.S. EPA Region 9 representatives on the PREC have begun to coordinate with water quality agencies, with the assistance of the UP3 Project. Both DPR and the State Water Board appointed new Management Agency Agreement coordinators with unique backgrounds on urban pesticides and water quality. With the assistance of the UP3 Project, both coordinators are actively working with water quality agencies.
- DPR regulatory authorities clarified. With the assistance of the UP3 Project, California water quality agencies have established that reevaluation is DPR's preferred regulatory tool for managing surface water quality problems with currently registered pesticide products.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The finding that pyrethroid insecticides are linked to widespread toxicity to sediment-dwelling organisms in Northern California urban creeks has increased the importance of active California water quality agency participation in California and Federal pesticide regulatory processes. Since California law precludes local regulation of pesticides, municipal urban runoff programs and wastewater agencies must rely on pesticide regulators to solve this problem. While pesticide regulators—particularly at the state level—are moving to improve the way they address water quality, *strong participation by water quality agencies is necessary to resolve problems with pyrethroids and to achieve compliance with the Clean Water Act.*

6.1 Conclusions

Conclusion 1: The most cost-effective approach to protecting surface water from pesticide-related toxicity is to prevent pesticide uses that have significant potential to cause water quality impairment. The most significant opportunities to prevent problem pesticide uses are the old U.S. EPA pesticide re-registration process and the new U.S. EPA registration review process. These are the only ongoing processes that combine an evaluation of the water quality impacts of pesticides with the regulatory authority to terminate or modify any use that causes significant impacts. While DPR has the authority necessary to prevent water quality impacts, its current pesticide registration process does not include routine evaluation of these impacts. Alternative water quality protection strategies (i.e., public outreach and education) are more expensive and less effective than preventing problematic pesticide uses (or integrating measures into the design of allowable uses that prevent pesticide runoff). Both professional and non-professional (e.g., residential) pesticide users generally assume that pesticide regulatory programs ensure that pesticides can be used without causing environmental harm, especially if used according to the label. As a result, alternative water quality protection strategies can be undermined by regulatory decisions allowing continued use of pesticides in manners that cause or contribute to water quality problems.

Conclusion 2: DPR is taking steps to address urban surface water quality. DPR actions are occurring in many arenas, for example:

- DPR brought pyrethroid products with urban uses into reevaluation, because of their impacts on urban surface water quality. Communication among water quality agency staff, university researchers, and DPR quickly made data available to DPR, facilitating a timely DPR decision.
- In response to a request from Tri-TAC, DPR determined that it will require registration of products where pesticides are impregnated in fabrics that may be washed (e.g., clothing, mattress pads).
- In response to a recommendation of DPR's Pest Management Advisory Committee, DPR is exploring how it can expand its efforts to address urban pest management.

Conclusion 3: In response to information from California water quality agencies, U.S. EPA has improved its assessment of surface water quality impacts during pesticide registration and has begun to exercise its authorities to prevent adverse water quality impacts from urban pesticide use. U.S. EPA staff has indicated that California water quality agency efforts are effective and are changing the way that U.S. EPA assesses the environmental risks of pesticides. Responses to written comments and conversations with staff from U.S. EPA OPP, Office of Water, and Region 9 show that

consistent engagement with U.S. EPA through written comments, teleconference meetings, and other interactions have been valuable to achieving California water quality agency goals. Specific, detailed written comments based on scientific information have proven the most effective in achieving water quality agency goals.

Conclusion 4: Although progress with California and U.S. EPA pesticide regulators provides reason for optimism, the ultimate outcomes of California water quality agency efforts remains uncertain. Changing California and Federal regulatory processes within existing law is likely to take years. Recent actions by both U.S. EPA and DPR are encouraging, but final decisions in two critical processes—DPR’s pyrethroids reevaluation and U.S. EPA’s planned registration review of pyrethroids—will not be completed for several years.

Conclusion 5: California water quality agencies are the only government agencies calling for changes in pesticide regulatory practices that have proven insufficient to ensure that pesticide use does not cause violations of the Federal Clean Water Act and California Porter-Cologne Water Quality Control Act in urban areas. Although California’s long history of pesticide-related water quality and NPDES permit compliance problems does not appear to be unique,²¹ water quality agencies from other states apparently have not actively engaged in efforts to ensure that pesticide regulatory processes do not result in water quality problems in urban areas.

Conclusion 6: The Urban Pesticides Committee is the nation’s only agency and stakeholder group working to address pesticide-related water quality problems associated with the use of pesticides in urban areas. No other U.S. state or region has established a similar program.

Conclusion 7: Significant communications gaps remain between California water quality agencies and California and Federal pesticide regulators. Communication has improved significantly (particularly at the state level, thanks in part to UP3 Project efforts and in part to DPR’s increased management commitment to cooperation and collaboration with water quality agencies); however, fully collaborative relationships do not yet exist. Among the most common—and most readily addressed—communications problems are the differences in terminology and lack of familiarity among the majority of pesticide regulators of the pathways by which pesticides used in urban areas can reach surface water. Moreover, Federal pesticide regulators do not often have an appreciation for Federal Clean Water Act regulatory processes, regulatory requirements, and costs for non-compliance. Water quality agencies are not familiar with state and Federal pesticide regulatory processes and requirements. At the state level, many regulatory decision processes (particularly pesticide registrations) are not structured in a manner that facilitates meaningful input from water quality agencies. At both the state and Federal levels, communications are complicated by requirements that pesticide regulators protect data that are considered confidential business information—even though such data may be necessary for full evaluation of a pesticide product’s water quality impacts.

6.2 Recommendations

Recommendation 1: Continue to provide U.S. EPA and DPR with information to prevent potential water quality problems associated with urban pesticide use and to press for consistency in implementation of water quality and pesticide regulatory programs within U.S. EPA and California EPA. U.S. EPA and DPR staff have recommended that water quality agencies continue to communicate information and recommendations to U.S.

²¹ Data from the USGS National Water Quality Assessment suggest that California is not unique (USGS [2006] Fact Sheet 2006-3028).

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EPA and DPR and expand efforts to meet in person and via teleconference directly with agency management. Regular communication is important to ensure that U.S. EPA OPP staff (including chemical review managers) and DPR have an appreciation for water quality issues. Regular communication appears to be the most likely way to encourage U.S. EPA management to acknowledge and address the costly regulatory gaps created by uncoordinated implementation of Federal water quality and pesticide laws. At the state level, regular communication can facilitate sharing of scientific information that has the potential to improve the effectiveness of both pesticide and water quality agency regulatory processes.

***Recommendation 2:** Continue to strengthen the network of water quality agencies working on urban pesticides issues.* Priorities include involving national organizations and state and local agencies elsewhere in the United States (see Recommendation 4). There is particularly a need to determine whether coordination with urban runoff and water quality regulatory agencies elsewhere in the United States is possible.

***Recommendation 3:** Develop a stable funding mechanism to continue scientific and regulatory support for California water quality agency participation in U.S. EPA and California DPR regulatory activities affecting water quality.* Funding is also needed for interagency coordination and communication functions, such as those provided by the UPC and the UP3 Project web site. While the UP3 Project has secured additional grant funds, these term-limited funds do not provide for all types of support needed by water quality agencies. A long-term strategy is needed to provide stable, continuing funding for work on urban pesticides and water quality.

***Recommendation 4:** Increase efforts to raise urban pesticide surface water quality issues at the national level.* It is unlikely that California's experience with pesticide-related surface water quality problems in urban areas is unique.²² Water quality agency staff should increase efforts to participate in public forums (such as national advisory committees and national conferences) to enhance nationwide understanding of managing urban pesticides to prevent surface water quality problems. Participation in different types of events will be important, as pesticide regulators and industry representatives participate in different conferences than water quality regulators. Becoming involved in U.S. EPA's Pesticide Program Dialogue Committee (PPDC) is a priority, because U.S. EPA seeks advice on pesticide regulatory, policy and program implementation issues from this committee. (The PPDC does not currently include any water quality agency representatives or any local government representatives.)²³ While budgets may limit travel, opportunities may exist for scholarships, U.S. EPA-funded travel, attending meetings in California, or participation by teleconference.

***Recommendation 5:** Continue efforts to determine possible approaches and next steps toward developing practical methods for U.S. EPA and DPR to address the environmental effects of all ingredients in individual pesticide products when those products are registered or re-registered.* Continuing to facilitate the process of finding ways to fill methodology gaps needs to be a priority for California water quality agencies. The UP3 Project and CASQA recently drafted a conceptual model of pesticide fate and transport in urban environments that may be a useful tool to facilitate dialogue about predictive modeling among water quality agencies, pesticide regulators and pesticide manufacturers.

²² Data from the USGS National Water Quality Assessment suggest that California is not unique (USGS [2006] Fact Sheet 2006-3028).

²³ State Water Board member Art Baggett serves on a spray drift work group under the PPDC's umbrella (but is not a member of the PPDC).

Recommendation 6: Improve the pesticide registration public involvement process. At both the state and Federal levels, pesticide registration and re-registration are governed by formalized processes that do not always facilitate sharing of information relevant to identification of and mitigation of urban surface water quality problems. Cooperation among agencies could be improved if pesticide regulatory agencies were able to provide more transparent and straightforward public involvement processes within the constraints of laws and regulations that control their programs.

The most significant opportunities for improvement exist at the state level. DPR's pesticide registration process currently provides public input opportunities, but these opportunities are structured in a way that makes providing meaningful input very difficult. DPR's public notices provide little information about products entering DPR's registration process and do not explain how to provide scientific information or other comments to assist it during the registration process.²⁴ When a pesticide product is proposed for registration, DPR's normal procedure does not involve making its assessment of the product's potential water quality impacts readily available (in contrast to U.S. EPA, which posts its assessments on the Internet). It is possible to obtain documents associated with DPR's registration water quality review (those that do not contain confidential business information) upon written request. The time required for the written request makes it difficult for an agency to make such requests regularly and makes it difficult for agencies to obtain the documents and provide meaningful comments on proposed registrations within DPR's standard 30-day comment period.

Making changes could be challenging, because DPR's public involvement process is constrained by current laws and regulations. For example, DPR must protect confidential business information, must carefully document its decisions, and is required to process registration applications in a timely manner. These requirements constrain opportunities for process improvement.

Recommendation 7: Restore and enhance DPR staffing and funding for programs that prevent or solve pesticide-related urban surface water quality problems. DPR's ongoing resource limitations could restrict its ability to complete actions necessary to protect water quality. For example, DPR currently must redirect staff from other activities to support its scientific involvement in pesticide re-evaluations, because it has no dedicated funding for the labor-intensive activities it needs to conduct to support a re-evaluation. DPR does not currently have staff that routinely conduct environmental risk assessments or urban watershed modeling. These functions are necessary for predicting water quality problems from pesticides.

In 2007, DPR revived its pest management alliance grant program. This grant program was previously DPR's primary method of developing and promoting less toxic pest control methods.

DPR has convened an Urban Pest Management workgroup to provide it with recommendations; it has also been exploring on its own initiative how it might modify its programs to more effectively address urban pesticide issues, including water quality. At this point, it is unknown whether DPR would need additional funds to implement changes that could ensure protection of water quality.

²⁴ DPR registers every individual pesticide product separately. U.S. EPA focuses on registering pesticide active ingredients. U.S. EPA registers individual products after active ingredient registration, primarily by reviewing and approving their labels. When a pesticide enters DPR's registration process, the public notice usually provides relatively limited information: the product name, manufacturer name, a simplified one-sentence description of the general type of use proposed for the product, the name of the registration action being considered, and the pesticide active ingredient.

Recommendation 8: *Actively seek to strengthen communication between California water quality agencies and California and U.S. EPA pesticide regulators.* Enhanced communication will increase pesticide regulator appreciation for and consideration of the scientific and regulatory issues around pesticides and water quality. Water quality agencies can facilitate communication by initiating requests for dialogue and becoming familiar with pesticide regulatory processes and terminology.

The UP3 Project recommends that the following communications strategies be considered, because it appears that these activities would enhance cooperative efforts to address water quality problems from urban pesticide use.

- Establish a process for dialogue on pyrethroids in urban runoff. Regular interagency meetings on marine antifouling coatings convened by DPR have afforded valuable opportunity for water quality and pesticide regulatory agencies to share scientific information and to improve stakeholder understanding of the regulatory context for managing water quality problems associated with marine antifouling coatings. These meetings have demonstrated the value of communication and collaboration for both pesticide and water quality agencies—both in enhancing the value and quality of the scientific information they are collecting and in designing their work to address regulatory needs.

Similar regular opportunities for productive engagement of pesticide regulatory agencies, water quality agencies, and other interested parties (e.g., pesticide registrants, environmental community members) could enhance the effectiveness of agency and industry responses to water quality problems from pyrethroids. A working group is currently being initiated to address scientific questions about pyrethroids in municipal wastewater. A second group focused specifically on addressing scientific questions about pyrethroids in urban runoff is recommended.

- Increase engagement of DPR's Pesticide Registration and Evaluation Committee (PREC) in the effort to prevent water quality problems from pesticides. The PREC is an interagency advisory committee that includes representatives from both the State Water Board and U.S. EPA.²⁵ Its mission is to foster communication about cross-agency pesticides issues and to provide advice and guidance to DPR on regulatory initiatives, scientific information, and public policy options. DPR expects the PREC to develop practical approaches to addressing pesticide issues. One of the PREC's major roles is to provide interagency consultation to DPR on pesticide registration. In the last year, DPR has brought both marine antifouling and pyrethroids water quality issues to the PREC for discussion. The PREC has the potential to provide invaluable assistance to DPR not only with response to water quality problems, but also with development of methods to prevent water quality problems.
- Identify mechanisms for regular communication with U.S. EPA OPP. Communication between California water quality agencies and U.S. EPA has primarily been in writing. In some cases, U.S. EPA responses to comments have appeared off-topic or inappropriate from the water quality agency perspective; this may be the result of difficulties interpreting written comments. Physical

²⁵ PREC membership currently includes a representative of county agricultural commissioners, but does not include representatives of other types of local government agencies that are engaged in pesticides issues (e.g., wastewater treatment plants, urban runoff programs, IPM programs). The DPR Director has the authority to appoint a representative of any other public agency that she deems appropriate after consultation with the existing committee membership.

distance and programmatic differences are barriers to improving communication quality. Forms of engagement other than letters will be helpful in working with U.S. EPA to address systemic issues like how U.S. EPA can assess urban surface water risks in pesticide environmental risk assessments.

Structuring interactions around individual regulatory decisions is somewhat limiting, as this is not the context where U.S. EPA normally considers procedure changes. U.S. EPA obtains advice for the design and operation of its pesticide regulatory programs from committees that do not currently include urban water quality agency representatives or urban surface water quality scientific experts. California agencies should evaluate potential options for participation in one of the groups that currently advise U.S. EPA OPP (e.g., the Pesticide Program Dialogue Committee, the State FIFRA Issues Research and Evaluation Group) and/or collaboration with national organizations (e.g., NACWA) to create a new forum for engaging OPP on urban surface water quality issues.

- Provide all pesticide monitoring data and pesticide 303(d) list updates to U.S. EPA and DPR. Both U.S. EPA and DPR rely on environmental monitoring data to evaluate the environmental impacts of pesticide use. Providing all relevant monitoring data to U.S. EPA and DPR strengthens these agencies' ability to prevent water quality problems from pesticides.²⁶ Since management actions by both U.S. EPA and DPR are triggered by 303(d) listings, updated listings—and the monitoring data supporting the listings—should be provided to U.S. EPA and DPR at the conclusion of each update. The UP3 Project recommends that the Water Boards work with DPR's Management Agency Agreement coordinator and U.S. EPA Region 9's pesticides team to ensure that 303(d) listing updates are directed to the appropriate staff at each agency.

***Recommendation 9:** When implementing pesticide regulatory controls, consider the environmental properties and relative toxicity of the pesticides likely to replace any pesticides proposed for phase out (or great reduction of) urban uses and design a program to avoid environmental impacts from replacements.* Both U.S. EPA and DPR have evaluated selected pesticides based on usage category (e.g., fumigants, rodenticides, marine antifouling coatings) to ensure consideration of potential environmental effects of replacement pesticides. Past experience suggests that leaving these changes solely to the free market may not ensure protection of human health and the environment.

²⁶ Recommendation 5 in the UP3 Project's Annual Review of New Scientific Findings 2007 provides detailed recommendations for submitting pesticide monitoring data to U.S. EPA and DPR.

APPENDIX A. U.S. EPA PESTICIDE REGULATORY ACTIVITY

Tables in this appendix:

- A-1. U.S. EPA Pesticide Re-Registration Schedule
- A-2. List of U.S. EPA Pesticide Re-Registration Comment Letters by California Water Quality Agencies
- A-3. List of U.S. EPA Pesticide Regulatory Activity Comment Letters by California Water Quality Agencies

The following acronyms are used in these tables:

ACCWP — Alameda Countywide Clean Water Program

CASQA — California Stormwater Quality Association

CCCSD — Central Contra Costa Sanitary District

CCSF — City and County of San Francisco

CVRWQCB — Central Valley Regional Water Quality Control Board

LACSD — Sanitation Districts of Los Angeles County

NACWA — National Association of Clean Water Agencies

SFBRWQCB — San Francisco Bay Regional Water Quality Control Board

SWQTF — California Stormwater Quality Task Force (predecessor of CASQA)

SWRCB — California State Water Resources Control Board

Note: Where the tables say "Plan to skip" or "Skipped," this means that U.S. EPA plans to omit or has omitted this public input step.

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Table A-1. U.S. EPA Pesticide Re-Registration Schedule

Pesticides of Urban Surface Water Quality Interest

Pesticide	Preliminary Risk Assessment	Revised Risk Assessment	Registration Eligibility Decision	Notes
Atrazine				EPA attempted to integrate water & pesticide regulatory actions
Carbaryl				
<i>Copper</i>				Includes most copper-containing pesticides
Copper compounds		Skipped		
Copper quinolate			Planned for 9/07	
Other copper	Planned in 2008		Planned by 10/3/08	Copper pesticides without food uses like marine antifouling paint and wood preservatives were excluded from first process; no dates for these remaining copper compounds are on EPA's schedule
Dicamba		Skipped		
p-Dichlorobenzene	Planned for 8/07		Planned for 12/07	
Lindane				All remaining pesticidal uses cancelled 8/06
<i>Organophosphates</i>				
Diazinon				
Chlorpyrifos				
Malathion				
MGK-264		Skipped		Synergist for pyrethrins & pyrethroids
Metam Sodium			Planned for 9/07	
Naphthalene	Planned for 8/07			
<i>Phenoxy herbicides</i>				
2,4-D				
2,4-DB		Skipped		
2,4-DP		Skipped		
MCPA		Skipped		
MCPP		Skipped		
Piperonyl Butoxide				Synergist for pyrethrins & pyrethroids
Pyrethrins				
<i>Pyrethroids</i>				
Allethrin		Plan to skip		
Cypermethrin		Skipped		
Permethrin		Skipped		
Resmethrin		Skipped		
Sumithrin			Planned for 9/08	
Tetramethrin			Planned for 9/08	
Tributyltin			Planned for 9/08	
Triclosan			Planned for 9/07	EPA referred to it as Irgasan
<i>Wood Preservatives</i>				
As/Cr Compounds		To be skipped?	Planned for 12/07	Arsenic and chromium-containing wood preservatives like CCA
Creosote			Planned for 12/07	May not be completed until FY 2009
Pentachlorophenol	?		Planned by 12/07	Plan to re-release preliminary risk assessment; not on EPA schedule
Zinc Pyrithione		Skipped	Planned by 9/04	Marine antifouling paint use of interest; no dates on EPA re-reg schedule
<i>Antimicrobials</i>				
PHMB		Skipped		
Pine Oil		Skipped		
Phenol		Skipped	Planned by 9/04	No dates on EPA re-reg. schedule
Halohydrantoin		Skipped	Planned by 9/04	No dates on EPA re-reg. schedule

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Table A-2. List of U.S. EPA Pesticide Re-Registration Comment Letters by California Water Quality Agencies
Activities of Urban Surface Water Quality Interest

Pesticide	Preliminary Risk Assessment	Revised Risk Assessment	Registration Eligibility Decision	Notes
Arsenic-containing herbicides	--	Skipped	CCSF, SFBRWQCB	RED complete
Atrazine	--	SFBRWQCB	SFBRWQCB	Revised IRED and water quality criteria: SFBRWQCB, CASQA, LACSD, AMSA
Carbaryl	SWQTF, SFBRWQCB	CASQA, SFBRWQCB, LACSD	SFBRWQCB, CASQA, LACSD	RED complete
Copper compounds	SFBRWQCB, Tri-TAC, LACSD, CASQA	Plan to Skip	SFBRWQCB, SWRCB, Tri-TAC, LACSD, CASQA	RED complete
Lindane	LACSD	SFBRWQCB, LACSD	SFBRWQCB, LACSD	RED complete
<i>Organophosphates</i> Diazinon	SWQTF, ACCWP, CCCSD	SWQTF, SFBRWQCB, CVRWQCB, SWRCB, SFEI	SFBRWQCB, BASMAA, CCSF	Interim RED (IRED) revised 5/04, but no public comment period was noticed
Chlorpyrifos	SWQTF, CCSF, SFBRWQCB, CCCSD	SWQTF	SWQTF, SFBRWQCB	IRED process completed. Also commented on FR Notice changing manufacturer agreement: SWQTF, SFBRWQCB, Tri-TAC
Malathion	None	SFBRWQCB, SWQTF	SFBRWQCB, SWRCB, Tri-TAC, LACSD, CASQA, CCSF	Re-revised risk assessment was issued: SFBRWQCB, CASQA, LACSD
MGK-264	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, LACSD	RED complete
Metaldehyde	CCSF	Plan to Skip	CCSF	RED complete
Metam Sodium	SFBRWQCB, CASQA, LACSD	SFBRWQCB, CASQA, LACSD		Re-revised human health risk assessment: LACSD; Risk Management: Tri-TAC
PCNB	--	Skipped	CCSF, SFBRWQCB	RED complete
<i>Phenoxy herbicides</i> 2,4-D	SFBRWQCB, CCSF	SFBRWQCB, CASQA, CCSF	None	RED complete
2,4-DB	SFBRWQCB	Skipped	None	RED complete
Dicamba	CCSF	Plan to Skip	CCSF	RED complete
MCPA	SFBRWQCB	Skipped	None	RED complete
MCPP	CCSF	Plan to Skip	None	RED complete
Piperonyl Butoxide	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, LACSD	RED complete
Pyrethrins	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, SWRCB, CASQA, LACSD	RED complete
<i>Pyrethroids</i> Allethrin	SFBRWQCB, CASQA	EPA to skip	None	EPA provided no comment period on RED
Cypermethrin	SFBRWQCB, SWRCB, CASQA, CCSF, San Jose	EPA to skip	SFBRWQCB, SWRCB, CASQA, CCSF	RED complete
Permethrin	SFBRWQCB, CASQA, CCSF, Tri-TAC, LACSD, NACWA	EPA to skip	SFBRWQCB, SWRCB, CASQA, CCSF, Tri-TAC, LACSD	RED complete
Resmethrin	SFBRWQCB, Tri-TAC, LACSD	EPA to skip	SFBRWQCB, CASQA, CCSF, Tri-TAC, LACSD	RED complete
<i>Wood Preservatives</i> As/Cr Compounds	SFBRWQCB, CCSF			
Creosote	SFBRWQCB, CCSF, Tri-TAC			
Pentachlorophenol	SFBRWQCB, CCSF			Separate risk assessment on dioxins and HCB in penta: SFBRWQCB, CCSF
Zinc Pyriithione	SFBRWQCB	EPA to skip		
<i>Antimicrobials</i> PHMB	SFBRWQCB, CASQA, LACSD, CCSF	EPA to skip	SFBRWQCB, SWRCB, Tri-TAC, LACSD, CASQA	RED complete
Pine Oil	SFBRWQCB, LACSD	EPA to skip	None	RED complete
Phenol	SFBRWQCB, LACSD	EPA to skip		
Halohydantoin	SFBRWQCB, LACSD	EPA to skip		

Table A-3. List of U.S. EPA Pesticide Regulatory Activity Comment Letters by California Water Quality Agencies
Activities of Urban Surface Water Quality Interest

Pesticide Regulatory Activity	Who Commented
Cumulative risk assessment for organophosphorous pesticides	SWQTF
OPP Strategic Plan, 2002	SFBRWQCB
Methodology for lower toxicity chemicals (risk assessments)	SFBRWQCB
Endangered species consent decree	SFBRWQCB
ANPRM: Endangered species act consultations	SFBRWQCB
Proposed rule: Endangered species act consultations	SFBRWQCB
Interim statement & guidance: application of pesticides to waters of the U.S.	SFBRWQCB, SWRCB, CASQA
S. 1664, Pesticide registration improvement act of 2003	CASQA
Proposed rule: Standards for pesticide containers & containment	LACSD
Globally Harmonized System for Pesticide Hazard Classification and Labeling	CCSF
Rodenticides: Revised Risk Assessment for Rodenticides Cluster	CCSF
Rodenticides: Proposed Risk Mitigation Decision	CCSF
Registration of Antimicrobial Products Containing New Active Ingredients	LACSD
Procedural Regulations for Registration Review	SFBRWQCB, CASQA, LACSD, Tri-TAC, CCSF
Data Requirements for Conventional Chemicals	SFBRWQCB, CASQA, LACSD, CCSF, Tri-TAC, San Jose, NACWA
Request to Require Registration of Samsung Silver Wash Clothing Washing Machine and Silver Ion Pesticide Products	Tri-TAC, NACWA
Request to require registration of copper-containing clothing	Tri-TAC
Petition to disclose inert ingredients on pesticide labels	CCSF
Linalool Registration Review workplan	Tri-TAC
Guidance on Recommended Environmental Hazard Statements for Outdoor Residential Pesticides	SFBRWQCB, CASQA

APPENDIX B. ANALYSIS OF U.S. EPA RESPONSES TO CALIFORNIA WATER QUALITY AGENCIES

Tables in this appendix:

- B-1. Metaldehyde RED Comment Summary—Comments from California Water Quality Agencies
- B-2. Linalool Workplan Comment Summary—Comments from California Water Quality Agencies
- B-3. Copper Clothing Special Letter Comment Summary—Comments from California Water Quality Agencies
- B-4. Allethrin Revised Risk Assessment Comment Summary—Comments from California Water Quality Agencies
- B-5. Mecoprop-p (MCP-p) Risk Assessment Comment Summary —Comments from California Water Quality Agencies
- B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary—Comments from California Water Quality Agencies

These tables are intended to provide the reader with brief summaries of comments and responses. Readers interested in the details of a comment or response should consult the original water quality agency letters and U.S. EPA response documents, which are available in U.S. EPA's electronic dockets (go to www.regulations.gov, select "Advanced Search" from the menu at the top of the page, and search on the pesticide active ingredient name).

The "U.S. EPA Response" column contains verbatim excerpts from U.S. EPA response documents. These excerpts were occasionally summarized or edited to clarify content but were not edited for style. U.S. EPA responses use many acronyms that are not defined in the response excerpts. These include:

CWA — Clean Water Act
EECs — Estimated Environmental Concentrations
EFED — U.S. EPA Office of Pesticide Programs Environmental Fate & Effects Division
EP — End-use Product
LOCs — Levels of Concern (risk assessment significance threshold)
OPP — U.S. EPA Office of Pesticide Programs
OPPTS — Office of Prevention, Pesticides, and Toxic Substances
OW — U.S. EPA Office of Water
POTWs — Publicly Owned Treatment Works (municipal wastewater treatment plants)
PWG — Pyrethroids Working Group
SDLAC — Sanitation Districts of Los Angeles County (LACSD)
SRRD — U.S. EPA Office of Pesticide Programs Special Review and Reregistration Division
TEP — Typical End-use Product
TGAI — Technical Grade Active Ingredient
WQC — Water Quality Criteria

Note: In the tables that follow, "Water Board" refers to the California Regional Water Quality Control Board, San Francisco Bay Region, which normally submits the most detailed comment letters. "State Water Board" refers to the California State Water Resources Control Board.

**Table B-1. Metaldehyde RED Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>1. Would prefer that EPA prohibit residential use of metaldehyde. If residential use continues, support proposed label warnings and graphic that includes the red circle with the line through it. (SF Environment)</p>	<p>EPA believes that multiple approaches are needed to inform users and reduce metaldehyde poisoning incidents in children and pets—strengthening precautionary information on residential product labels, placing restrictions on the use of these products in yards and areas with the potential for similar exposures, and providing specifications for how the materials may be formulated. A key component of the precautionary labeling is emphasizing the hazard to children and pets. Currently, most residential use products bear text warnings; in order to improve risk communication, the Agency believes that additional, uniform language and the graphic are needed.</p> <p>The graphic is not intended to be a substitute for the language. It should draw the attention of the consumer to precautions that might otherwise be overlooked, as it appears to be common that consumers do not closely examine the labels of familiar products. If there is a question about the meaning of the graphic, the user can find written precautions and instructions about pets and children in the text portion of the label.</p> <p>The Agency does not feel that the purported failure of the “Mr. Yuk” graphic to prevent children from exposure to poisonous materials is relevant in this case. Although some metaldehyde products will bear the Mr. Yuk graphic in association with their incorporation of a particular form of the bittering agent, the new graphic required on the metaldehyde product labels is aimed not at children, but at the consumer and adult user. It is the Agency’s expectation that children and pets will be prevented access to metaldehyde products by responsible, informed adults.</p> <p>The Agency solicited input on the type of graphic that should be used, but no new ideas were brought forth. The type of graphic discussed in the RED is a familiar format used to convey prohibitions for smoking, littering, and keeping pets away from certain areas (such as designated areas of roadside rest stops). While the Agency agrees that there is no standard for the use of such symbols on pesticide labels, and believes that refinements may be suggested by the incident monitoring data, the use of graphic cues should complement new label text and other efforts to reduce poisoning incidents. The risk mitigation program for metaldehyde is performance-based, so that if these new risk mitigation measures aimed</p>	<p>EPA cites SF Environment’s comments on its experience with similar types of symbolic graphics as one line of evidence for the precedent-setting warning symbol requirement.</p>

**Table B-1. Metaldehyde RED Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
[#1, Warning graphics on labels, continued]	<p>at reducing the number and severity of poisoning incidents are not successful, more restrictions may be added in the future.</p> <p>EPA will amend the RED to specify that the graphic discussed in the original RED (i.e., a red circle with a diagonal line through it, the words “Children and Pets” inside the circle) is the only acceptable graphic at this time.</p>	
<p>2. Recommend graphical depictions to support label language describing which home crops can be treated. (SF Environment)</p>	<p>Registrants will be required to list the uses for their products on all labels. Labels must also provide application rates, retreatment intervals, numbers of applications, and any specialized instructions relating to application method. For residential products, application rates must be given in user-friendly terms, e.g., “Apply one teaspoon of pellets per linear foot around the plants to be protected.” Since many use sites share use parameters, a table may not be the most efficient way to communicate the information. In this instance, the manner in which this information is presented is left to the discretion of the registrant, but labels will be reviewed for compliance and clarity.</p> <p>The Agency will require that the statement about the 1-foot setback, since it is unusual, be printed on the labels of residential products with fruit or vegetable uses in a manner which draws attention to the change in use practices.</p>	<p>According to the revised RED, changes in home application instructions (now a band at least 1 foot from food crops) must be designed to draw the attention of users to the change in use practices, i.e., in boldface type or another contrasting color that is readily distinguishable from the surrounding text.</p>
<p>3. Oppose metaldehyde/ insecticide combination products; if kept, need to require more differentiation between these and metaldehyde-only products. (SF Environment)</p>	<p>Information on alternatives to and benefits of metaldehyde combination products are extremely limited, but some registrants assert that they fill an important niche. It is known that the same pests targeted by these combination products can be controlled with other pesticides applied separately. EPA has reexamined the requirements for formulation and labeling of the combination products and agrees that certain elements must be emphasized to discourage unnecessary use. Labeling requirements will be revised to address this issue.</p>	<p>According to the revised RED, requirements for using these products only when both types of pests are present must be emphasized, both by placing the text on the front of the label and using boldface or other contrasting type to draw attention to subject language</p>

**Table B-1. Metaldehyde RED Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>4. Support bittering agent requirement and support requirement for data to demonstrate bittering agent effectiveness. (SF Environment)</p>	<p>As noted above, if the implementation of mitigation measures does not bring about a reduction in poisoning incidents, EPA will consider additional restrictions on the metaldehyde registrations, possibly including the termination of residential uses.</p> <p>The registrants and the public at large were given a 60-day period after release of the metaldehyde RED in which they were free to comment on the decision and submit any information they thought would bear on that decision. No substantive information on the effectiveness of denatonium benzoate was submitted during that time. The Agency considered the open and proprietary literature on the subject before determining that empirical data were needed to show the efficacy of bittering agents in preventing ingestion of snail baits by domestic animals.</p> <p>The Agency is working with the registrant of technical-grade metaldehyde to develop a protocol for aversion testing of bittering agents for use in metaldehyde formulations. Unless and until an effective substitute is identified, metaldehyde formulators will be required to continue with the current practice of incorporating the specific bittering agent at the current concentration.</p> <p>EPA acknowledges that dogs in particular can eat very quickly, and may not detect the bitterness of an aversion agent at all or until it is too late. Required testing will examine this issue.</p> <p>While EPA will encourage formulators to market their products in tear-resistant packaging, we believe that emphasis on storage of metaldehyde products out of the reach of children and pets is a more suitable approach to mitigating risks.</p>	
<p>5. Avian hazard warning needed for urban uses. (SF Environment)</p>	<p>No response.</p>	<p>The RED includes a standard avian hazard label warning for residential granular products.</p>

**Table B-1. Metaldehyde RED Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>6. Skeptical about value of cultural control label requirement. (SF Environment)</p>	<p>The Agency has formulated its labeling strategy to promote the use of metaldehyde products according to the new information on the label. Consumers who make note of the new restrictions and information about cultural practices may use that information to reduce the exposure potential in their own yards.</p> <p>The Agency believes that a requirement to incorporate information about cultural controls on product labels is more equitable than allowing registrants to choose whether or not to include such information on their labels.</p> <p>In response to concerns that residential product labeling is excessive in length, the Agency has reconsidered the labeling requirements for cultural controls. Rather than the more general statement suggested by the comment, the Agency will abbreviate the statement from the RED that gives specific examples of easy-to-implement cultural practices.</p> <p>EPA does not agree that these measures fall outside of the scope of risk mitigation for metaldehyde, since they do indeed advise users on how to reduce exposures to metaldehyde.</p> <p>Information on how to reduce exposures to metaldehyde may be made more effective when supplemented with outreach efforts. Outreach can include materials developed by the registrants to be read at the time of sale, contact with Cooperative Extension agents, or the placement of detailed information on cultural aspects of slug/snail control on company websites. An educational effort of this nature should enhance the registrants' efforts to reduce incidents and the performance of the mitigation plan overall. We will discuss options in public outreach with the registrants of metaldehyde products.</p>	
<p>7. Support proposed aquatic toxicity data call-in. (SF Environment)</p>	<p>The Agency will review the ecotoxicity data required by the Generic DCI, and they will be considered in the development of future decisions on metaldehyde—for the registration of new uses, during Registration Review, and in implementing the Endangered Species program. The ecological risk assessments conducted for these decisions will be modeled using parameters associated with relevant risk mitigation measures imposed by the RED.</p>	

**Table B-1. Metaldehyde RED Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>8. Concerned about blue dye proposal. (SF Environment)</p>	<p>Based on this input, EPA believes that there is enough uncertainty about the impact of color on children’s exposures to warrant reconsideration of this requirement. The Agency has also reconsidered this requirement because the body of literature contains numerous studies with conflicting results on the effectiveness of dyes in discouraging ingestion of food pellets by wildlife.</p> <p>Without conclusive information of the effect of blue or other coloration on ingestion by wildlife species, domestic animals, and children, EPA is unable to confirm the utility of this approach. EPA withdraws the requirement that residential metaldehyde products be colored with blue dye, but agricultural products may be colored at the discretion of the formulator.</p>	<p>EPA received many conflicting comments on its blue dye proposal.</p>

**Table B-2. Linalool Registration Review Workplan Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>1. Consider indoor pesticides uses in environmental risk assessment. For Linalool, wastewater discharges to POTWs should be evaluated with a down-the-drain assessment that looks at effluent, biosolids, air emissions, and operational impacts. Data requirements should reflect data needed for this assessment. (Tri-TAC)</p>	<p>The Agency performed a down the drain risk assessment in response to the Tri-TAC request. Based on the model, the amounts of Linalool in surface water was [sic] found to be low, and if it is assumed that this same surface water, without going through further purification ends up as drinking water, it is not likely a risk of concern in drinking water. In addition, even if fish ingestion of Linalool has taken place, its occurrence is less than a day in 7 years. Hence biomagnification from fish to humans has a low probability occurrence. Please refer to Attachment A of this document for the Agency’s complete Science Review.</p>	<p>The response is in terms of risks to drinking water, and the potential for bioaccumulation, which are not the primary concerns for Tri-TAC. The UP3 Project is working with EPA Region 9 to clarify the Tri-TAC comment (the purpose of which is precedent, not concerns specific to linalool.)</p>

**Table B-3. Copper Clothing Special Letter Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>1. Request EPA require registration of copper biocide-containing fabric products. (Tri-TAC)</p>	<p>The Agency appreciates your comments, and will consider them, as appropriate, as part of the reregistration review process for the antimicrobial uses of copper, scheduled for 2008.</p> <p>Additionally, possibly unlawful sale and distribution of unregistered articles treated or impregnated with antimicrobial compounds and making antimicrobial claims certainly concerns the Agency. Please be assured that EPA is looking into this matter to address any possible compliance issues, following our usual procedures with the Office of Enforcement and Compliance Assurance. The Agency will get back to you with our findings.</p>	<p>The EPA response letter lists some of Tri-TAC's specific requests, including evaluation of wastewater discharges from washing copper-treated clothing.</p>

**Table B-4. Allethrins Revised Risk Assessment Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
1. Water quality criteria should be used to assess risks. (Water Board)	There are currently no TMDLs or NPDES permit requirements for the allethrins. Therefore, there is no potential for compliance problems at this time. The decision to advance the allethrins for consideration in establishing a Water Quality Criteria (WQC) lies within the purview of Office of Water (OW). The OPP stands ready to collaborate with the OW within the confines of Confidential Business Information (CBI).	The response does not mention that the Clean Water Act, also regulates toxicity and has compliance mechanisms that can be triggered without a TMDL or a numeric effluent limit in a permit.
2. Temperature needs to be considered. (Water Board)	Sufficient data to establish the potential effects of water temperature on the toxicity of the allethrins to aquatic organisms is not available. There are data available, however, to suggest that a variety of organisms are more sensitive to pyrethroids (in general) at lower temperatures (which is likely due to enhanced detoxification at higher temperatures) (e.g., Cremlyn 1978; Hill 1985; Li, et al. 2006). We agree to include the following statement in the uncertainties section of an amended environmental risk assessment for the allethrins: “A variety of terrestrial and aquatic organisms are more sensitive to pyrethroids at lower temperatures (i.e., pyrethroids have negative temperature coefficients of toxicity) (e.g., Cremlyn 1978; Hill 1985; Li, et al. 2006); however, the magnitude of the effects of temperature on allethrin toxicity is not known at this time.”	
3. Cumulative risks and synergism need to be evaluated. (Water Board)	As noted by the CRWQCB, EFED did consider the potential increased toxicity of allethrins when mixed with other pesticides and PBO (e.g., see pp. 8, 33, and 43 of our [risk] assessment). However, as concluded in the RED chapter, even with the potential for increased toxicity when mixed with other chemicals, the allethrin uses are not expected to produce water concentrations that would result in risk (p. 43 [of U.S. EPA risk assessment]). Therefore, additional data on the potential synergistic effects of mixtures would not likely change our risk conclusions for the allethrins.	

**Table B-4. Allethrans Revised Risk Assessment Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
4. Improved modeling methods are needed for all pesticides. (Water Board)	We appreciate CRWQCB's comments on ways to improve OPP's modeling efforts for assessing risks to aquatic organisms, especially those at potential risk from urban pesticide uses. OPP is currently working on methods for assessing potential terrestrial and aquatic risks associated with urban pesticide uses. OPP will give consideration to the recommendation of developing empirical models when evaluating storm water discharges and/or urban runoff. Regarding the "down-the-drain" model, it was developed and is maintained by the OPPTS; EFED will forward this comment to them for their consideration. OPP does not believe, however, that any of the proposed changes would alter our risk conclusions for the allethrans because of the limited exposures expected from current use patterns.	Selection of modeling parameters and interpretation of results in the down-the-drain model are the topic of the comment (these are controlled by users, not by model developers).
5. Allow only localized, spot, and crack-and-crevice outdoor treatments. (Water Board, CASQA)	[U.S. EPA and allethrans registrants agreed to terminate all outdoor treatments except localized or spot treatments.]	
6. Prohibit outdoor applications of the allethrans during rain and when rain is imminent. (Water Board, CASQA)	No response. [This change was not made.]	
7. Add product stewardship language. (Water Board, CASQA)	No response. [Past version of language was required, rather than improved version requested in comments.]	
8. Use icons to communicate water quality stewardship concepts. (CASQA)	No response. [None were required.]	

**Table B-4. Allethrins Revised Risk Assessment Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>9. Fill data gaps. Gaps include aquatic toxicity data, environmental fate data, chemical analytical method, data to support wastewater discharge and urban runoff modeling, surface water monitoring data, and data to support assessment of environmental risks from important isomers and degradates. (Water Board, CASQA)</p>	<p>Regarding the other data gaps noted in the CRWQCB comments, OPP noted the aquatic toxicity data gaps in the allethrins RED environmental fate and effects chapter (e.g., see p. 5 [of U.S. EPA risk assessment]). Because additional toxicity data are not likely to change current risk conclusions (due to the limited uses of the allethrins), EFED recommended to SRRD that the request for toxicity data on freshwater animals (chronic) and estuarine/marine organisms (acute and chronic) be held in reserve until additional information becomes available that those data would be useful for assessment purposes. OPP will consider the potential increased sensitivity of <i>Hyalella azteca</i> to pyrethroids when compared to <i>Chironomus tentans</i> in any future requests for allethrins sediment toxicity data.</p> <p>Environmental fate data gaps were noted in the allethrins RED environmental fate and effects chapter (e.g., see pp. 6 and 8 [of U.S. EPA risk assessment]).</p>	<p>Data requirements will be issued in the future; it is unclear which (if any) of the requested data will be required.</p>

**Table B-5. Mecoprop-p (MCP-p) Risk Assessment Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
1. Assess cumulative risks of co-active ingredients. (SF Environment)	The Agency recognizes that MCP-p is often used in combination with other structurally related phenoxy herbicides such as MCPA, 2,4-DB, 2,4-DP, or 2,4-D. At this time, a cumulative risk assessment has not been performed as part of this human health risk assessment because the Agency has not yet made a determination as to whether these compounds have a common mechanism of toxicity.	Comment was about both human and environmental risks; however, response was only for human risks.
2. Prohibit weed and feed products. (SF Environment)	No response. [This change was not made.]	
3. Prohibit outdoor applications when it is raining and when rain is forecast. (SF Environment)	No response. [This change was not made on professional products, but new language required on consumer products directs users not to “ apply when raining or when rain is expected that day.”]	

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>1. Proposed rule lacks clarity and specificity. (Water Board, SF Environment)</p>	<p>Some commenters were confused by the explanations of R [required] and CR [conditionally required] in the proposed rule and requested tighter definitions and clarification of the test notes since the latter provided insufficient guidance. In the proposed rule, EPA requested comment on its R/CR designation, and received no suggestions for alternative means of presenting the data requirements. As described in the preamble to the proposed rule, the R/CR terminology is a general presentation of the likelihood that a data requirement will apply. The use of R does not necessarily indicate that a study is always required, but that it is more likely to be required than not. The use of CR means a study is less likely to be required. However, both R and CR designations must be read in the context of the accompanying test notes to provide context for the R/CR in the table. An applicant may assume that a data requirement with R will typically be required all the time. The test notes accompanying that R designation may provide supplementary information or identify some condition(s) when the study is not required. A CR designation will generally include more extensive test notes describing the limited conditionality of the requirement. The final rule continues this longstanding practice. EPA revised some of the test notes to clarify the conditions under which the data would be required.</p>	
<p>2. Support aquatic sediment testing requirements. (Water Board, CASQA, SF Environment, Tri-TAC, LACSD, NACWA)</p>	<p>The Agency listed the criteria for requirement of the acute or chronic sediment toxicity studies in the test notes. If a pesticide meets those criteria, and problem formulation indicates the potential for exposure and risk to sediment-dwelling organisms, then the data requirement will be imposed. The Agency agrees that pesticides used on residential outdoor sites should be required to be supported by sediment testing, based on the results of the problem formulation phase of the preliminary risk assessment. Therefore, we changed the condition of requirement for requirement from NR in the proposed rule to CR in the final rule for residential outdoor use patterns. However, greenhouse and indoor use patterns remain NR as the exposure to aquatic communities from the applications of conventional pesticides to these sites is relatively low from these uses.</p>	<p>The final rule implements the sediment toxicity requirements that agencies supported.</p>

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>3. Pesticide use categories need further restructuring. (Water Board, CASQA)</p> <p>Requirements for residential outdoor use pesticides need restructuring. (Water Board, CASQA, SF Environment)</p> <p>Indoor pesticide uses release pesticides to the environment. (Water Board, SF Environment, Tri-TAC, LACSD, NACWA)</p> <p>Aquatic residential uses involve environmental releases. (Water Board, CASQA, SF Environment)</p>	<p>EPA acknowledges that these issues relating to urban applications of conventional pesticides will need to be evaluated, but these issues will be addressed in a future update of the 158 rule. At this time, there are insufficient exposure and risk methodologies available to adequately assess urban uses.</p> <p>If a conventional pesticide is applied to any of the use sites such as fountains, swimming pools, lawns, around buildings, it is included in use patterns listed in the final rule. The type of data required varies depending on the use pattern and chemical-specific characteristics of the pesticide. If additional data are needed to address uncertainty in the risk assessment, EPA will employ assumptions to account for the uncertainty or require the applicant to provide the data.</p> <p>In the proposed rule, EPA subdivided the existing use patterns to assist registrants in focusing on data requirements for their particular pesticide use. EPA also included nonagricultural use patterns not reflected in the current major use patterns and believed that the resulting proposed 15 major use patterns were fairly self-explanatory. The major use patterns provide a convenient organization in the data requirement tables to determine the likelihood the data will be required. The pesticide use site groups are more specific to the registrant's use site for a particular pesticide product and can provide a starting point for determining which general use pattern(s) is(are) most appropriate for the product in question.</p> <p>The Agency appreciates commenters' assistance in locating inconsistencies between the preamble discussion and the regulatory text and corrected them in the final rule. One such inconsistency was the "Indoor medical" general use pattern. It was included when the rule was intended to update all of part 158, including antimicrobial pesticides. When the proposed rule for antimicrobials was planned as a separate entity, the "Indoor medical" use pattern was inadvertently left in the original rule instead of</p>	<p>The restructuring has improved testing for urban uses.</p> <p>The continuation of the exemption of indoor use pesticides from requirements for environmental fate and aquatic toxicity testing leaves a major gap in the ability to assess the potential for problems at POTWs and in surface waters.</p>

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
[#3 pesticide use categories, continued]	being removed to accompany the antimicrobial portion that was to be removed. There were also five Aquatic nonfood use patterns (Aquatic nonfood crop, Aquatic nonfood use, Aquatic nonfood outdoor use, Aquatic nonfood residential, and Aquatic nonfood industrial use) in the different disciplines. The five were consolidated into one major use pattern, Aquatic nonfood. With the removal of the “Indoor medical” use pattern and the reduction of aquatic nonfood patterns to one, the final number of general use patterns for conventional pesticides will be 12, rather than the 15 in the proposed rule. The Agency appreciates one commenter’s recommendation to include another major use pattern such as “terrestrial urban uses” but believes that the patterns already proposed are sufficient to cover some of the more specialized uses without increasing the number of use patterns and adding to the confusion.	
4. Data sufficient to develop water quality criteria are needed. (Water Board, CASQA, San Jose)	The Agency is confident that the pesticide registration process, including its data requirement regulations, adequately consider the endpoints that are protected under the CWA. When acceptable data are available, OPP [Office of Pesticide Programs] uses these data in its risk assessment process. The purpose of a water quality criterion under the CWA is to determine the level at which a water body may be at risk for environmental damage. The purpose of the data requirements for pesticide registration is to allow the Agency to determine ecological risk of using a pesticide. Thus, these programs have similar goals. While EPA has developed guidelines for developing WQ criteria, the Agency has also recognized that WQC can be developed with a more limited data set. For the Great Lakes Program, the Agency developed a Tier II methodology (Final Water Quality Guidance for the Great Lakes System. Federal Register, March 23, 1995. 40CFR) to be used in the absence of the full data set outlined in the WQC guidelines. The Agency recognized that for the WQC developed under the Tier II methodology, greater uncertainty factors would be needed. The Agency deliberately uses conservative assumptions in its pesticide risk assessment process to add in additional protections. Together, EPA’s OW [Office of Water] and OPP developed aquatic life benchmarks for 71 pesticides or pesticide degradation products for States to use to establish targets for safe levels of pesticides for aquatic plants and animals. The benchmarks are derived from data submitted to EPA for pesticide registration. Thus, pesticide registration data are valuable in assessing water quality risks.	The response does not directly address the comment. Due to its approach to data requirements, OPP’s evaluation levels for water quality are typically higher than (i.e., less protective than) water quality criteria.

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>5. Aquatic toxicity testing requirements are incomplete and insufficiently specific. (Water Board, CASQA, SF Environment, Tri-TAC, LACSD, San Jose, NACWA)</p>	<p>The Agency's OPP requires data from acute and chronic studies on a number of aquatic organisms spanning several taxa of vertebrates, invertebrates, and plants. The test species were chosen as surrogates for the wide range of aquatic organisms which might be exposed to pesticides during use. The number of tests and test species reflects the desire to balance the need for adequate data for ecological assessment, the use of live animals, and the need to consider the burden imposed upon the regulated community. The Agency accepts several species of test organisms as defined by ASTM, as well as EPA 821-R-02-012. <i>Ceriodaphnia dubia</i> is an acceptable species and may or may not be more sensitive than other invertebrates relative to a particular pesticide.</p> <p>OPP does summarize sublethal endpoints in the risk assessment process when this information is available. Acute and chronic study guidelines specify that the study authors report sub-lethal effects if there is an occurrence (swimming performance, lethargy, etc). The extent to which behavioral or swimming performance data are used in a quantitative fashion is limited by uncertainty in relating these responses to quantitative responses in demographic rates (e.g., mortality, reproductive fitness) that underlie population responses.</p> <p>The data requirements table for nontarget aquatic organism testing in Subpart G of the final rule lists the conditions under which TEPs [Typical End-use Products] are required (test note 9). The conditions include direct introduction into the aquatic environment; toxicity levels of the active ingredient relative to expected or estimated environmental concentrations; or other ingredients that may enhance toxicity. If the pesticide meets any of those conditions, then TEP testing must be done.</p>	<p>OPP provides a list of aquatic toxicity test organisms, but leaves specific species selection within taxa to the discretion of the registrant. In contrast, regulatory programs implementing the Clean Water Act require testing of specific species, which are generally among the more sensitive species (which is why these species are generally not selected by registrants, who have the discretion to select less sensitive species).</p>

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>6. Data requirements should include data necessary for urban runoff modeling. (Water Board, CASQA, Tri-TAC, LACSD, San Jose, NACWA)</p>	<p>The Agency does acknowledge the potential for environmental risk from some nonagricultural uses of pesticides. OPP has developed methods and carried out assessments for indoor uses which ultimately discharge through a POTW to surface water, but has made less progress in estimating discharges resulting from urban outdoor uses. OW conducts modeling for water quality impacted by pesticides, but their models are deficient as OPP conducts national level assessments and needs more flexible models to simulate large numbers of sites nationally.</p> <p>The models used by OW simulate localized impacts. If the selected models indicate that additional fate information is needed for the input data, the Agency can require the data on a case-by-case basis until future updates of this rule are promulgated. OPP will continue to rely predominately on available monitoring data for characterizing aquatic exposure from urban runoff. Risk assessments indicate that these data provide estimates of a lower bound of potential exposure.</p> <p>The Agency is currently evaluating various exposure models that might be appropriate for evaluating urban pesticide uses and possible runoff scenarios as down storm drains, for example. As part of this initiative, OPP sponsored a workshop in June 2007 to bring together exposure modelers, fate scientists and risk assessors from state and Federal government agencies, private companies, and other interested parties for presentations and discussions of the challenges of developing appropriate exposure models to simulate urban runoff and entry in urban watersheds. Some of the topics discussed were currently available agricultural models and adaptability to urban scenarios; the variability of urban scenarios that include not only sites exposed by runoff across hard surfaces such as pavement, but also sites exposed through runoff from large systems such as turfgrass; and the use of Geographic Information Systems (GIS) to refine exposure estimates. The workshop afforded OPP the opportunity to gather information on modeling techniques and available data that will improve the Program's overall exposure assessment methods.</p>	<p>The June workshop was a regular meeting of an informal U.S. EPA working group that does not include urban runoff modelers. Discussion at this workshop was not as well informed as it could have been had water quality agency or urban runoff modeling experts been invited to participate.</p>

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary (Continued)
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
7. Data sufficient to evaluate risks from sewer discharges should be required. (Water Board, LACSD, NACWA)	EPA agrees that pesticide discharge into municipal sewage systems is an important issue. This is especially true for antimicrobial pesticides which are typically rinsed down the drain. EPA is currently developing proposed data requirements for antimicrobial pesticides and intends to consider this issue in that proposal.	It appears that sewer discharge requirements will only be formally tackled in the antimicrobials rule.
8. Data requirements should include degradates. (Water Board)	The Agency evaluates degradates in relation to their potential toxicity and does require appropriate testing if the degradate appears toxic or likely to be present in the environment at levels of concern. [second response to the same comment] The Agency evaluates degradates in relation to their potential toxicity and does require appropriate testing on a case-by-case basis if the degradate appears toxic. If the environmental fate data show the degradates can potentially persist, and Subpart F toxicology data show they are toxic, then aquatic toxicity testing is required.	U.S. EPA states that it evaluates degradates for potential toxicity, yet it typically does not require generation of toxicity or fate data for degradates (and the revised rule does not so require). Without these data, U.S. EPA would not have sufficient information to make determinations of potential toxicity and persistence.
9. Cumulative aquatic risks must be evaluated. (SF Environment)	[No response.]	No data requirement associated with cumulative aquatic risk assessment was proposed.
10. U.S. EPA should use readily available literature. (Water Board, SF Environment)	This is not a 158 data requirement issue. Generally, submission of published literature can be an option available for selection by registrants to attempt to satisfy a data requirement. It is not uncommon for registrants to submit published studies as supplemental data to support their registration packages. In addition, EPA supplements the required data sets with information obtained through a systematic search of the open literature and through Agency databases for aquatic toxicology and fate data.	

**Table B-6. Data Requirements for Conventional Chemicals (Part 158) Comment Summary (Continued)
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Comment	U.S. EPA Response	Notes
<p>11. Publicly available analytical methods are needed for environmental samples. (Water Board, CASQA, San Jose)</p>	<p>The Agency included the requirement for independent laboratory validation of analytical methods for aquatic and terrestrial field studies in the draft proposal and the final rule. The validation must have detection limits that are sufficiently resolved to address biologically significant environmental media levels for the pesticide. Setting the detection limits as recommended in the comment may not be feasible for some chemicals.</p>	<p>The response does not address the key issue noted in the comment, which is that U.S. EPA does not currently require registrants to make publicly available chemical analytical methods suitable for surface water monitoring. The aquatic field studies mentioned in the response are not always required. Even when they are required, U.S. EPA does not require submittal of a publicly available analytical method suitable for surface water monitoring in conjunction with the study.</p>
<p>12. Registrants should monitor surface waters. (Water Board, CASQA)</p>	<p>The Agency's ground water monitoring data requirement is conditional (CR) pending a weight of evidence assessment. Surface water monitoring can be required on a case-by-case basis under FIFRA. Prospective ground water monitoring has been required for some pesticides during their reregistration process. Likewise, surface water monitoring has also been required for registration actions for several pesticides. Additionally, the Agency uses several other sources for surface water data such as the NAWQA (National Water Quality Assessment Program of USGS) database and water resource data from individual States, in addition to relevant data from OW.</p>	<p>No monitoring requirement was proposed.</p>