

Strategy for Reducing Organophosphate Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks



Final

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Preface

The purpose of this document is to present a comprehensive Pesticide-Related Toxicity Reduction Strategy (Strategy) for reducing organophosphate pesticide-related toxicity in San Francisco Bay Area urban creeks. The Strategy, organized into three basic types of actions – education, regulatory, and monitoring – includes actions that are or should be taken by local, regional, state, and federal government agencies. The actions are distributed among these various levels of government based on each agency's regulatory authority, constituency, and resources.

First, some facts about the problem:

- Toxicity identification evaluations have found the organophosphate pesticide diazinon is a major cause of toxicity in urban runoff.
- Diazinon is the most popular insecticide used for homes and gardens in the country.
- Diazinon is soluble (60 mg/L) and has a relatively long half-life (about 40 days in surface waters).
- Based on monitoring data collected from multiple storm events in the Bay Area and other parts of the country, storm event mean concentrations of diazinon typically range from several hundred parts per trillion (ppt)(ng/L) to several thousand parts per trillion in urban runoff.
- It's estimated that only 0.3% of diazinon applied outdoors need run off an application site to generate the mean concentrations measured in urban runoff.
- USEPA's proposed acute freshwater water quality criterion for diazinon is 90 ppt.

Based on these facts, it seems quite clear that until the current amount and pattern of diazinon usage changes, the pesticide will be a pollutant of concern in freshwater bodies throughout the nation. It's also clear from the miniscule amounts of diazinon that cause a problem, that the actions of local governments and consumer education alone will not solve this problem. In addition, the treatment of urban runoff to remove concentrations of diazinon in the parts per trillion range is neither practicable nor effective.

The basic premise behind the Strategy is that it will take the combined and coordinated effort of each level of government to solve this problem in a way that minimizes duplication of effort, avoids transfer of the problem or risk to other media besides urban runoff, and prevents substitution of the use of organophosphate pesticides with other, possibly more toxic pesticides.

The Strategy has these basic attributes:

- Relatively large scale – The scale of agencies covered ranges mostly from the countywide scale to the federal scale.
- Generic actions – Actions are listed at the most general level of detail.
- Storm water-specific – Although the Strategy mentions wastewater, the basic coverage is storm water discharges or urban runoff.
- San Francisco Bay Area-specific - Although the Strategy mentions other geographic locations, it focuses on the Bay Area.

Implementation of the actions listed herein will require responsible agencies to further refine the general list of actions into work plans with sub-actions, budgets, and more specific implementation schedules. Although the concepts and actions were developed with Bay Area storm water or urban runoff in mind, their generic nature allows them to be adopted and further refined by other types of agencies in other geographic locations.

Executive Summary

Water quality research conducted by San Francisco Bay Area storm water programs and wastewater treatment plants over the last several years has identified widespread toxicity in local creeks and wastewater treatment plant effluent. The toxicity problem was ultimately traced to diazinon and chlorpyrifos – commonly used organophosphate (OP) pesticides contained in hundreds of consumer products. In May 1999, San Francisco Bay and 35 Bay Area urban creeks were listed by the U.S. Environmental Protection Agency (USEPA) as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA).

The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. The San Francisco Bay Regional Water Quality Control Board (Regional Board) initiated the TMDL process by developing a work plan. The Regional Board's work plan calls for an urban creeks diazinon TMDL to be developed by June 2002, followed by an Implementation Plan by June 2003.

In addition to potential regulatory requirements as a result of the TMDL, municipalities must meet two broad goals to comply with their NPDES storm water permits:

1. effectively prohibit non-storm water discharges to storm drain systems and water courses, and
2. reduce pollutants in storm water discharges to the maximum extent practicable (MEP).

To meet these goals and to address the 303(d) listing, the Regional Board requested that Bay Area storm water programs develop a strategy to help address pesticide-related toxicity in urban creeks. The Bay Area Stormwater Management Agencies Association (BASMAA), a consortium of the seven municipal storm water programs in the San Francisco Bay Area, was a natural forum for developing such a strategy. BASMAA convened a Pesticide Work Group, consisting of storm water program managers and staff, the BASMAA Executive Director, and Regional Board staff, to draft the strategy.

There are a number of actions Bay Area storm water programs have taken or plan to take that may reduce pesticide-related toxicity in surface waters. In addition, other government agencies are taking or could take actions to address the problem as well. These actions are packaged in this Pesticide-Related Toxicity Reduction Strategy. The following provides a list of the actions called for in this Strategy. The action items are grouped by responsible government agencies and organized by three basic types of actions – education, regulatory, and monitoring. Action items are also included for coordination and evaluation functions. Actions listed for “Bay Area storm water management programs” are not necessarily meant to be implemented by all such programs. For some actions, one program or BASMAA will take the lead or complete the work.

Action Items for Bay Area Storm Water Programs

Education – Household hazardous waste collection

E-1: Continue to support and promote household hazardous waste collection as an important pesticide disposal option for residents.

E-2: Investigate with the appropriate oversight agencies ways to enhance the use of household hazardous waste collection programs to dispose of pesticides properly (e.g., joint advertising).

Education – Pesticide-related toxicity / proper use and disposal / less-toxic methods (in the context of this Strategy, “less-toxic” is meant to connote less risk of storm water pollution)

E-3: Continue to develop and distribute information to the general public on pesticide-related toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.

E-4: Investigate ways to enhance the accessibility of general and targeted educational materials to the general public and to pesticide users.

E-5: Train municipal employees who use pesticides about pesticide-related surface water toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.

E-6: Educate selected businesses (e.g., restaurants, supermarkets) about pesticide-related surface water toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.

Education – Pest control operators (PCOs)

E-7: Sponsor accredited PCO training workshops (after their initial development by CCCSD) that provide information and demonstrations of practices protective of water quality. Invite private company PCOs as well as PCOs from municipalities and special districts (e.g., open space districts, mosquito abatement districts, and school districts).

E-8: Investigate and, if feasible, use opportunities to integrate educational materials and test questions about potential surface water quality impacts and ways to avoid them into the State's licensing procedures and continuing education curriculum for PCOs.

E-9: Coordinate with County Agricultural Commissioners regarding pesticide discharges to storm water.

E-10: Develop a canned awareness-raising presentation for PCO chapter meetings and conferences.

E-11: Investigate and, if feasible, work with PCO trade associations to either endorse specific BMPs protective of wastewater and storm water or integrate wastewater and storm water concerns into “Industry Standards.”

E-12: Develop a boilerplate article on water quality issues and Integrated Pest Management or Less-Toxic Pest Management for general consumer and local business publications (e.g., Chambers of Commerce).

E-13: Develop a consumer guide to help consumers make more informed choices about pest control services.

Regulatory – Pesticide re-registration

R-1: Review and comment on USEPA’s Preliminary Risk Assessments (Phase 3) for diazinon and chlorpyrifos (may implement by collaborating with the California Stormwater Quality Task Force).

R-2: Assist USEPA with Revised Risk Assessments (Phase 4) by:

- A.** Providing existing, pertinent OP pesticide data from the San Francisco Bay Area, if these data are missing from the Preliminary Risk Assessments.
- B.** Helping identify uses of OP pesticides that are likely to come in contact with water, and working with USEPA and manufacturers to eliminate these uses from those listed on product labels.

R-3: Submit risk management ideas and proposals to USEPA during Phase 5 for potential inclusion in the Risk Management Strategies (Phase 6).

Regulatory – Total Maximum Daily Loads

R-8: Volunteer to assist in development of a scope for a USEPA case study of a diazinon TMDL for urban creeks, and consider participation in the case study.

Regulatory – Local government actions

R-15: Track implementation of San Francisco and Marin’s IPM (Integrated Pest Management) ordinances. Using these ordinances as models, facilitate their consideration and potential adoption, in some form, by Bay Area municipalities. Provide the model IPM ordinances to

neighboring special districts (e.g., open space districts, mosquito abatement districts, and school districts).

R-16: Track implementation of San Francisco's purchasing policy/specification for pest prevention/control. Using the purchasing policy/specification as a model, facilitate its consideration and potential adoption, in some form, by Bay Area municipalities. Provide the model purchasing policy/specification to neighboring special districts (e.g., open space districts, mosquito abatement districts, and school districts).

Monitoring

M-3: Use monitoring and science to further investigate local impacts and sources, and to host case studies, if USEPA or California DPR provide financial and other support, with the goal of conducting representative case studies whose results can be extrapolated across the country.

Coordination

C-1: Coordinate implementation of the SWMPs/BASMAA portions of the Strategy by: 1) convening meetings of the Pesticide Work Group and other interested individuals to review information, build consensus conclusions, and make recommendations; 2) producing an annual report on implementation of the Strategy; and 3) providing timely information on implementation of Strategy elements via reports to the Urban Pesticide Committee as well as the appropriate BASMAAA committees, including the Executive Board, Monitoring Committee, and Public Information / Participation Committee.

Evaluation

V-1: Evaluate implementation of the SWMPs/BASMAA portions of the Strategy by: 1) reviewing each of the action items and either develop and conduct, or recommend that others develop and conduct, evaluations as appropriate; and 2) reporting on the results of the evaluations either via presentations at committee meetings and/or as a part of annual reports.

Action Items for U.S. Environmental Protection Agency

Regulatory – Pesticide re-registration

R-4: As part of the Revised Risk Assessments (Phase 4) USEPA should:

- A.** Include all of the surface water data and studies demonstrating pesticide-related toxicity and potential water quality standard exceedances from across the country.

- B.** Identify potentially problematic uses including those that: 1) require mixing; 2) recommend being “watered-in” or applied just before a rain; 3) involve application in areas likely to contact water such as manholes, impervious surfaces (e.g., “crack and crevice”), and in and around creeks; and 4) come in formulations that may run off (e.g., granules or flakes that float).
- C.** Require diazinon and chlorpyrifos manufacturers to conduct studies and submit results on the legal but potentially problematic uses identified as described above.

R-5: USEPA should consider and initiate one or more methods for conducting cost/benefit analyses:

- A.** Conduct more comprehensive cost/benefit analyses including more accurate assessments of the environmental cost, and the mounting cost to local public agencies of dealing with the regulatory and legal liability of pesticide-related surface water toxicity.
- B.** Consider the costs and benefits of urban uses separately from agricultural uses to separate the very different needs, costs, and benefits of pesticide use in these two environments.

R-6: As part of the Risk Management Strategies (Phase 6) USEPA should:

- A.** Ensure that TMDL implementation plans can be developed to comply with the requirement to demonstrate “that the control actions and/or management measures are expected to achieve the required pollutant loads” (Federal Register 64, No. 162, 46051; 40 CFR 130.33(b)(10)(i), August 23, 1999).
- B.** Identify and describe how USEPA will use the registration process to ensure that registered pesticides do not cause or contribute to the impairment of surface waters.
- C.** Identify pest prevention and control methods that can effectively substitute for the problematic uses identified under Phase 4.
- D.** Identify and make label changes to ensure that pesticide use in accordance with label directions does not cause impairment of surface waters.

Regulatory – Total Maximum Daily Loads

R-7: Continue to pursue, on an as aggressive a timetable as possible, the development and implementation of at least one case study of a diazinon TMDL for urban creeks.

Action Items for State and Regional Boards

Regulatory – Pesticide re-registration

R-1: Review and comment on USEPA's Preliminary Risk Assessments (Phase 3) for diazinon and chlorpyrifos.

R-3: Review and comment to USEPA on the Risk Management Strategies (Phase 6).

Regulatory – Total Maximum Daily Loads

R-9: Continue to develop and refine a diazinon TMDL for San Francisco Bay Area urban creeks, including refinement of the problem statement.

R-10: Name all sources when doing TMDLs by expanding on existing source categories and develop new categories to name sources as far back as possible in time and space in the life cycle of pollutants.

Regulatory – NPDES permits

R-11: Coordinate the timing and content of NPDES permit provisions related to diazinon with the timing and content of the diazinon TMDL for urban creeks.

Coordination

C-2: Coordinate implementation of the overall Strategy by: 1) convening meetings to review information, build consensus conclusions, and make recommendations; 2) producing an annual report on implementation of the Strategy; and 3) providing timely information to the appropriate organizations.

Evaluation

V-2: Evaluate implementation of the overall Strategy by: 1) reviewing each of the action items and either develop and conduct, or recommend that others develop and conduct, evaluations as appropriate; and 2) reporting on the results of the evaluations either via presentations at committee meetings and/or as a part of annual reports.

Action Items for California Department of Pesticide Regulation

Education

E-14: Provide support to Bay Area storm water programs in their efforts to carryout actions related to pest control operators.

E-15: Continue to support the outreach efforts of other agencies and organizations through grant programs. Funding priority should be given to projects and programs focused directly on reducing organophosphate pesticide-related toxicity in urban surface waters.

Regulatory

R-1: Review and comment on USEPA's Preliminary Risk Assessments (Phase 3) for diazinon and chlorpyrifos.

R-3: Review and comment to USEPA on the Risk Management Strategies (Phase 6).

R-12: Complete its current pest management assessment as soon as possible, and disseminate information on effective alternatives to as wide an audience as possible.

R-13: Initiate pest management assessments as soon as possible on other common pests for which diazinon is used for control, such as aphids, cockroaches, spiders, and yellow jackets.

R-14: Invoke California Food & Agriculture Code Section 12824 et. seq. authorities. The focus of the State's efforts should be those potentially problematic uses, identified under Phase 4 of pesticide re-registration, that are not eliminated or significantly curtailed by USEPA as part of the current re-registration process.

Monitoring

M-1: Earmark funds to support monitoring studies and coordinate their expenditure with the State and Regional Boards.

M-2: Appropriate and expend funds to provide the information necessary to implement California Food & Agriculture Code Section 12824 et. seq. authorities in a timely manner.

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1.0 Introduction

Water quality research conducted by San Francisco Bay Area storm water programs and wastewater treatment plants over the last several years has identified widespread toxicity in local creeks and wastewater treatment plant effluent (California Regional Water Quality Control Board, 1997; San Francisco Bay Area Pollution Prevention Group, 1998). The toxicity problem was ultimately traced to diazinon and chlorpyrifos – commonly used organophosphate (OP) pesticides contained in hundreds of consumer products (Alameda Countywide Clean Water Program, 1997). Study results also indicated that use in accordance with label directions is a primary cause of elevated concentrations in storm water (Alameda Countywide Clean Water Program, 1997). In May 1999, San Francisco Bay and 35 Bay Area urban creeks were listed by the U.S. Environmental Protection Agency (USEPA) as impaired by diazinon (USEPA, 1999) under Section 303(d) of the Clean Water Act (CWA).

The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. TMDLs are written plans and analyses, including an expression of the pollutant load or load reduction necessary to ensure that waterbodies will attain and maintain water quality standards, including consideration of reasonably foreseeable increases in pollutant loads. Under proposed revisions to the TMDL regulations, TMDLs would have to contain ten prescribed elements including an implementation plan. The implementation plan would have to include “a demonstration that the control actions and/or management measures are expected to achieve the required pollutant loads” (Federal Register 64, No. 162, 46051; 40 CFR 130.33(b)(10)(i), August 23, 1999).

2.0 Impact of 303(d) Listing on Local Governments

In its action, USEPA listed 53 waterbodies in California as impaired due to diazinon in urban runoff and 7 waterbodies as impaired due to chlorpyrifos in urban runoff. By definition under the Clean Water Act, this action means that there is a water quality problem, regardless of the problem definitions under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (i.e., “unreasonable adverse effect”) or the Food Quality Protection Act (FQPA). The listing action put over 100 municipalities in the San Francisco Bay Area and Central Valley at immediate regulatory, legal, and financial risk.

- Regulatory risk - The State Water Resources Control Board and USEPA can take enforcement against and fine these municipalities for violating their NPDES (National Pollution Discharge Elimination System) storm water permits.
- Legal risk - Citizen and environmental groups can sue municipalities for the same reasons.

- Financial risk - These municipalities must now spend local public tax dollars proactively addressing this problem, and potentially reacting to fines and lawsuits.

3.0 Municipalities' Response

To comply with their NPDES storm water permits, municipalities must meet two broad goals:

- effectively prohibit non-storm water discharges to storm drain systems and water courses, and
- reduce pollutants in storm water discharges to the maximum extent practicable (MEP).

To meet these goals and to address the 303(d) listing, there are a number of actions Bay Area storm water programs have taken or plan to take that may reduce pesticide-related toxicity in surface waters. These actions are packaged in this Pesticide-Related Toxicity Reduction Strategy (see Table 1). The Strategy is a multi-faceted effort including:

- Education/outreach - Educating residents and other audiences about pesticide-related toxicity, less-toxic methods for pest control, and proper use and disposal of pesticides
- Regulatory – Identifying opportunities to reduce toxicity and advocating state and federal agencies to seize these opportunities through regulation and re-registration; limiting or prohibiting pesticide use by municipal staff and contractors; and regulating the discharge of pesticides to storm drains
- Monitoring - Investigating the extent and causes of toxicity, and assessing impacts on beneficial uses

4.0 Strategy Elements

For each Strategy element and sub-element, background information is provided followed by action items. The Strategy – as a plan for the future rather than a report on the past – provides only cursory details in each background section. Further details can be provided by BASMAA or its member agencies. The term “Bay Area storm water programs” is used generically in these action items and could include BASMAA, the seven member agencies of BASMAA, and/or the City and County of San Francisco. The most appropriate organizations to be involved will be determined as action items are planned and implemented.

4.1 Education

The authority and ability of local governments to implement the Strategy varies with each element. The most cost-effective and appropriate aspect for local governments to implement is education. Local governments usually have established systems in place to provide information to their citizens on matters ranging from government business (e.g., development proposals,

fees) to administration (e.g., licensing, permitting) to community programs. Local governments know their citizens better and can respond quicker to their citizens' interests than any other level of government. The education/outreach element of the Strategy includes the following major efforts:

4.1.1 Household hazardous waste collection

Background

Virtually all Bay Area municipalities provide adequate and convenient options for disposal of unused pesticides and pesticide containers through household hazardous waste collection programs. The extensiveness of these programs varies with location, population base, and municipal resources. Some municipalities support permanent collection facilities while others run mobile or appointment-based collection services.

***Action E-1:** Bay Area storm water programs will continue to support and promote household hazardous waste collection as an important pesticide disposal option for residents.*

***Action E-2:** Bay Area storm water programs will investigate with the appropriate oversight agencies ways to enhance the use of household hazardous waste collection programs to dispose of pesticides properly (e.g., joint advertising).*

4.1.2 Pesticide-related toxicity / proper use and disposal / less-toxic methods

Background

Bay Area storm water programs have developed extensive public education programs about pesticide-related toxicity and proper use and disposal of pesticides. Educational materials have included brochures (e.g., Pests Bugging You?, Grow It! Guide), newsletter articles, fact sheets, utility bill inserts, movie theater slides, and calendars. Storm water programs have delivered this information in a variety of ways including: on request, at public counters, and at fairs and exhibitions.

Storm water programs have also developed and implemented local and regional media and advertising campaigns. Stories about pesticide-related surface water toxicity have been proposed to local and regional (i.e., Bay Area wide) print and electronic media outlets for articles and coverage. In addition, storm water programs have purchased local and regional advertising time (TV and radio) and space (billboards, signage, and newspapers) in order to broadcast messages to the general public.

Many of the educational programs and materials described above on proper use and disposal have also included messages on less-toxic methods of pest prevention and pest control. In the

context of this Strategy, “less-toxic” is meant to connote less risk of storm water pollution. In addition, storm water programs have initiated programs to provide more targeted education to pesticide users on less-toxic methods and products through such programs as demonstration gardens and point-of-purchase campaigns in hardware stores and nurseries (i.e., IPM Partnership or *Our Water, Our World* promotion).

To a lesser extent, storm water management programs have educated municipal staff and local businesses about pesticide-related surface water toxicity and steps these audiences can take to prevent pollution.

Action E-3: *Bay Area storm water programs will continue to develop and distribute information to the general public on pesticide-related toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.*

Action E-4: *Bay Area storm water programs will investigate ways to enhance the accessibility of general and targeted educational materials to the general public and to pesticide users.*

Action E-5: *Bay Area storm water programs plan to train municipal employees who use pesticides about pesticide-related surface water toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.*

Action E-6: *Bay Area storm water programs plan to educate selected businesses (e.g., restaurants, supermarkets) about pesticide-related surface water toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.*

4.1.3 Pest control operators

Background

Pest control operators (PCOs) are individuals who use or supervise the use of pesticides – either for hire or as part of their occupation (e.g., grounds supervisors, landscapers, gardeners). The California Department of Pesticide Regulation (DPR) licenses all pest control operators (advisors, applicators, dealers, pilots, brokers, and businesses including maintenance gardeners) except those licensed by the Structural Pest Control Board (SPCB) (structural pest control) and Department of Health Services (vector control).

The Central Contra Costa Sanitary District (CCCSD) and the City and County of San Francisco (CCSF) have taken the lead in researching and developing educational materials and programs for PCOs in the Bay Area. In 1995/96, CCCSD sampled wastewater from the base of operations of several pest control companies and found organophosphate pesticides in their discharges to the sewer. CCCSD worked with a few local PCOs to develop best management

practices (BMPs) designed to reduce the discharge of pesticides in wastewater. Although the PCO trade association—the Pest Control Operators of California (PCOC)—questioned the gravity of the problem and the role of PCOs in it, they did endorse the BMPs and recommended that pest control operators follow the BMPs. In addition, DowElanco (manufacturer of chlorpyrifos) provided artwork, printed, and distributed BMP posters to all PCOs in Contra Costa County. CCCSD distributed BMP brochures, as well as a problem statement and a solicitation for help to the PCOs in their service area.

In 1998/99, CCSF conducted a scoping effort that is summarized in a two-part report. *Water Pollution Prevention and Pest Control Operators Part 1: Pest Control Industry Scoping Report* (SFPUC, 1999a), presents findings on the attributes of the pest control industry and makes recommendations for pollution prevention actions. *Water Pollution Prevention & PCOs Part 2: Characterization of the PCO Client Base in San Francisco* (SFPUC, 1999b), presents information on pesticide demand and pesticide consumers.

Currently, CCCSD is developing an accredited training workshop for PCOs that will highlight surface water quality issues and provide training on Integrated Pest Management (IPM) techniques. At the same time, San Francisco is developing an outreach program that will encourage restaurants, bakeries, bars, and clubs to request IPM services from pest control operators.

Action E-7: *After their initial development by CCCSD, Bay Area storm water programs will sponsor accredited PCO training workshops that provide information and demonstrations of practices protective of water quality. Private company PCOs as well as PCOs from municipalities and special districts (e.g., open space districts, mosquito abatement districts, and school districts) will be invited to attend.*

Action E-8: *Bay Area storm water programs will investigate and, if feasible, use opportunities to integrate educational materials and test questions about potential surface water quality impacts and ways to avoid causing them into the State's licensing procedures and continuing education curriculum for PCOs.*

Action E-9: *Bay Area storm water programs will coordinate with County Agricultural Commissioners regarding pesticide discharges to storm water.*

Action E-10: *Bay Area storm water programs will develop a canned awareness-raising presentation for PCO chapter meetings and conferences.*

Action E-11: *Bay Area storm water programs will investigate and, if feasible, work with PCO trade associations to either endorse specific BMPs protective of wastewater and storm water or integrate wastewater and storm water concerns into “Industry Standards.”*

Action E-12: *Bay Area storm water programs will develop a boilerplate article on water quality issues and Integrated Pest Management or Less-Toxic Pest Management for general consumer and local business publications (e.g., Chamber of Commerce).*

Action E-13: *Bay Area storm water programs will develop a consumer guide to help consumers make more informed choices about pest control services.*

4.1.4 Limitations

Despite the success of many of the educational aspects of the Pesticide-Related Toxicity Reduction Strategy, it is clear to Bay Area water pollution prevention agencies that their educational efforts alone will not be enough to solve the problem. Study results indicate that less than 1% of applied diazinon runs off, yet it takes less than a fluid ounce of active ingredient flushed into storm water runoff to cause toxicity in urban creeks (Regional Water Quality Control Plant–Palo Alto, 1996). Educational programs run by Bay Area water pollution prevention agencies are some of the most developed in the country and they have won numerous awards for their quality and effectiveness. Nevertheless, even the best education programs are not 100% effective. It is clear that education alone will not solve this problem.

In looking at regulatory and monitoring elements of a strategy, local governments can and have identified the issues and opportunities to reducing pesticide-related toxicity but they have limited ability or authority to actually implement corrective actions. Those responsibilities and authorities come under the jurisdiction of other levels and types of government agencies including the California Regional Water Quality Control Boards (Regional Boards) and Department of Pesticide Regulation, and the U.S. Environmental Protection Agency. These regulatory responsibilities and authorities are discussed in the next section.

4.2 Regulatory

4.2.1 U.S. Environmental Protection Agency

4.2.1.1 Pesticide Re-registration

Background

Regulation of pesticides including their registration for use in the United States is the responsibility of USEPA. Prompted by the Food Quality Protection Act, USEPA is reassessing older pesticides to make sure that they meet current scientific and regulatory standards. Based on this reassessment, USEPA will make regulatory decisions about the future uses of hundreds of pesticides, including all of the organophosphate pesticides.

Opportunities for Public Comment

To provide ample opportunity for participation, USEPA is piloting a more extensive, inclusive, public review and comment process for the OP pesticides. The process includes six phases:

- Phase 1 – Registrant Error Only Review (30 days)
- Phase 2 – USEPA Considers Registrants' and USDA's Comments (up to 30 days)
- Phase 3 – Public Comment on Preliminary Risk Assessment (60 days)
- Phase 4 – USEPA Revises Risk Assessments, Holds Public Meetings/Technical Briefings (90 days plus USDA review and public meetings/briefings)
- Phase 5 – USEPA Solicits Risk Management Ideas (60 days)
- Phase 6 – USEPA Develops Risk Management Strategies (up to 60 days)

The process provides two opportunities for local and State governments to submit formal comments. Phase 3 provides the first opportunity for public comment including review of the preliminary risk assessments and submittal of additional data, review of risk assessment methodologies and assumptions, and early submittal of proposals to address risks identified in the preliminary risk assessments. During this phase, USEPA will receive information directly related to OP pesticides and associated issues. USEPA will provide other opportunities for comment on broader science issues related to OP pesticides. The revised risk assessments are made public in Phase 5 and USEPA will receive additional risk management ideas during that phase.

Action R-1: *Bay Area storm water programs will review and comment on the Preliminary Risk Assessments (Phase 3) for diazinon and chlorpyrifos. State agencies (State and Regional Board and DPR) should also review and comment on the Preliminary Risk Assessments. Bay Area storm water programs may implement this action item by collaborating with the California Stormwater Quality Task Force.*

Action R-2A: *If existing, pertinent data from the San Francisco Bay Area is missing from the Preliminary Risk Assessments, Bay Area storm water programs will provide these data to USEPA for potential inclusion in the Revised Risk Assessments (Phase 4).*

Risk Assessment and Management Strategies

Action R-3: *Bay Area storm water programs will submit risk management ideas and proposals to USEPA during Phase 5 for potential inclusion in the Risk Management Strategies (Phase 6). State agencies (State and Regional Board and DPR) should review and comment on the Risk Management Strategies.*

As the agency that sanctions the use of pesticides and the agency that lists waterbodies as impaired, USEPA is the ultimate regulatory authority on this issue. The re-registration process provides two opportunities for USEPA to address the problem of OP pesticides causing impaired waterbodies.

Action R-4: Phase 4–Revised Risk Assessments - *The revised risk assessments produced during Phase 4 should:*

- *Include all of the surface water data and studies demonstrating pesticide-related toxicity and potential water quality standard exceedances from across the country (see 4.3 Monitoring).*
- *Identify potentially problematic uses – Given the growing evidence of ubiquitous pesticide-related surface water toxicity, USEPA should review and identify all uses that are likely to come into contact with water. These uses would include those that: 1) require mixing; 2) recommend being “watered-in” or applied just before a rain; 3) involve application in areas likely to contact water such as manholes, impervious surfaces (e.g., “crack and crevice”), and in and around creeks; and 4) come in formulations that may run off (e.g., granules or flakes that float).*

Action R-2B: *Bay Area storm water programs will help identify these uses and work with USEPA and manufacturers to eliminate these uses from those listed on product labels.*

- *Require diazinon and chlorpyrifos manufacturers to conduct studies and submit results on the legal but potentially problematic uses identified as described above. Studies should test a representative suite of legal but potentially problematic uses and sites of application. Samples should be taken of runoff from application sites with a potential to discharge runoff to storm drain systems including discharges from impervious areas directly connected to storm drains (e.g., driveways, sidewalks, patios, gutters, streets). The samples should be analyzed using state-of-the-art detection limits.*

Action R-5: *Revise the cost/benefit analyses – Considering the new evidence of widespread toxicity in urban areas, USEPA should consider and initiate one or more methods for conducting cost/benefit analyses:*

- *More comprehensive cost/benefit analyses – The current cost/benefit approach is incomplete and therefore inaccurate. On the environmental cost side, the impacts on urban surface waters are underrepresented. On the economic benefit side, the mounting cost to local public agencies of dealing with the regulatory and legal liability caused by this national problem must be added to the calculation and considered against the private gains made by manufacturers.*
- *FIFRA – Consider the costs and benefits of urban uses separately from agricultural uses. The needs, costs, and benefits of pesticide use are very different in these two environments and the cost/benefit analyses should reflect that fact.*

Action R-6: Phase 6–Risk Management Strategies *should be used to:*

- *Ensure that TMDL implementation plans can be developed to comply with the requirement to demonstrate “that the control actions and/or management measures are expected to achieve the required pollutant loads” (Federal Register 64, No. 162, 46051; 40 CFR 130.33(b)(10)(i), August 23, 1999). It’s quite possible that a diazinon toxicity TMDL that allocates loads to point and nonpoint sources, atmospheric deposition, and natural background will not be able meet this requirement. These four “source” categories do not have absolute control over the uses, discharges, and emissions of pesticides to the environment. A significant amount of control rests with USEPA via the pesticide registration process.*
- *To demonstrate that pollutant loads will be met, the risk management strategies developed under Phase 6 must identify and describe how USEPA will use the registration process to ensure that registered pesticides do not cause or contribute to the impairment of surface waters.*
- *Identify pest prevention and control methods that can effectively substitute for the problematic uses identified under Phase 4. While solving one environmental problem, it’s vital to avoid creating a new one. Pest prevention and control will remain necessary activities so the key will be to identify and disseminate methods that have a significantly lower risk of causing water quality problems than the current methods.*
- *Identify and make label changes to ensure that pesticide use in accordance with label directions does not cause impairment of surface waters.*

4.2.1.2 Total Maximum Daily Loads

Background

Under the TMDL regulations, States must develop TMDLs for waterbodies and pollutants listed under CWA section 303(d). USEPA must approve or disapprove state TMDLs. If a state TMDL is inadequate, USEPA must establish the TMDL. The California State and Regional Boards are already using their regulatory authorities to develop, in cooperation with USEPA, eight diazinon TMDLs in California, including two in the San Francisco Bay Area – one for urban creeks and one for the Bay (Appendix A). As discussed in section 4.3 (Monitoring), the mounting evidence of the widespread presence of diazinon and chlorpyrifos in surface waters across the country – often at toxic levels or levels exceeding water quality standards – means that with each biannual 303(d) listing cycle, USEPA and the states will ultimately be responsible for diazinon TMDLs on hundreds, if not thousands, of waterbodies. Faced with this prospect, USEPA's Office of Water and Office of Pesticide Programs initiated discussions in November 1999 on the development and implementation of several case studies. The purpose of the case studies would be to establish theoretical TMDLs for specific waterbodies and theoretical proposals for achieving compliance through the most effective use of available Federal, State, and local authorities.

Action R-7: *USEPA should continue to pursue, on an as aggressive a timetable as possible, the development and implementation of at least one case study of a diazinon TMDL for urban creeks.*

Action R-8: *Bay Area storm water programs will volunteer to assist in development of a scope for a USEPA case study of a diazinon TMDL for urban creeks, and consider participation in the case study.*

4.2.2 California Regional Water Quality Control Board – San Francisco Bay Region

Background

TMDLs - The urban creek TMDL work plan for diazinon has the most direct impact on municipal storm water programs (Appendix B). Over the next three and one-half years, the Regional Board, with cooperation from USEPA and local municipalities, plans to:

- refine the TMDL problem statement,
- derive target total loads,
- conduct source analyses,
- allocate loads among sources,
- develop the TMDL, and
- develop the Implementation Plan by June 2003.

Action R-9: *The Regional Board should continue to develop and refine a diazinon TMDL for San Francisco Bay Area urban creeks, including refinement of the problem statement.*

In March 1999, BASMAA convened a Pesticide Work Group comprised of representatives from several storm water programs in the Bay Area and a representative from the Regional Board. The purpose of the work group is to coordinate a response (including this Strategy) to the 303(d) listing of urban creeks as impaired due to diazinon. In July 1999, the Pesticide Work Group submitted comments (Appendix C) to the Regional Board on its draft Urban Creeks Diazinon TMDL Work Plan. In the comment letter, the Work Group offered to assist the Regional Board in refining the problem statement for the diazinon TMDL.

Clean Water Act section 305(b) requires that each State, on a biannual basis, assess its navigable waters, and submit a report describing: their water quality status, support of beneficial uses, pollutant sources, recommendations for additional actions, and cost-benefit analyses. The 305(b) guidance (1997 supplement, page 1-12, 2nd paragraph) (USEPA, 1997) states that "States can also add their own source codes to the WBS" (EPA waterbody system).

Action R-10: *The State and Regional Boards should heed this advice and name all sources when doing TMDLs. The USEPA 305(b) guidance includes a list of source categories and sub-categories (Appendix D). However the level of detail among categories is inconsistent with some categories divided into several tiers of sub-categories while others provide no sub-category sources. The latter is particularly true for other media categories (e.g., 8100 - Atmospheric Deposition) or the source category "9050 - Sources outside State Jurisdiction or Borders." The use of these generic source categories will leave agencies charged with implementing TMDLs far short of their source identification and characterization needs. The State and Regional Boards should expand on existing source categories and develop new categories to name sources as far back as possible in time and space in the life cycle of pollutants.*

The new or expanded categories should be consistent, comprehensive, and non-duplicative of the current categories. The following are examples of categories and sub-categories that could be created:

8110...8190 - A list of source sub-categories similar to the terms used by the California Air Resources Board and Air Quality Management Districts (e.g., "stationary," "mobile") that would make a clear connection to air regulators and air quality regulations.

9100 - Sources outside United States Jurisdiction or Borders (emphasis added to distinguish from 9050 - Sources outside State Jurisdiction or Borders)

9200...9xxx - A list of "establishments" like the Standard Industrial Classification (SIC) Code using either the 99 Major Groups or more practically, the 11 (A through K) Divisions (e.g., Division B Mining, Division D Manufacturing) to keep the list of numbers relatively short. If a specific establishment type could be named, like for diazinon, the actual 303(d) listing and the TMDL could show the SIC code -- "2879 Pesticides and Agricultural Chemicals" -- in this case.

NPDES permit requirements - In addition to TMDL development, the Regional Water Quality Control Board–San Francisco Bay Region has already added provisions to National Pollutant Discharge Elimination System (NPDES) permits requiring storm water management programs to increase their efforts to reduce pesticide-related toxicity of surface waters. Specifically, these new provisions require:

- Analysis of diazinon-related water quality concerns stemming from 303(d) listing, including identification of potential sources, evaluation of current BMP effectiveness, characterization of drainage areas and discharges, and development of control measures plans
- Development of diazinon toxicity reduction strategies or plans

Action R-11: *The Regional Board should coordinate the timing and content of NPDES permit provisions related to diazinon with the timing and content of the diazinon TMDL for urban creeks.*

4.2.3 California Department of Pesticide Regulation

Background

California's Department of Pesticide Regulation (DPR) has responsibility for regulating the sale and use of pesticides in California. California DPR, with few exceptions, registers pesticides only after they have been registered by USEPA. California DPR cannot register pesticides that have been denied registration by USEPA.

In 1997, DPR and the State Water Resources Control Board (State Board) produced the California Pesticide Management Plan for Water Quality. The document is an implementation plan for the Management Agency Agreement adopted by the two agencies that same year. It describes how the agencies will protect water quality from the use of pesticides using a four-stage process:

Stage 1 – Outreach and education – This stage is already being implemented. As described previously, local governments have led the way in developing and conducting outreach and education programs to prevent surface water toxicity from pesticides. The current licensing programs run by DPR and the Structural Pest Control Board have provided limited education on

pesticide-related toxicity of surface waters to-date but DPR has developed outreach materials of its own and supports the outreach efforts of others through grant programs.

Action E-14: *California DPR should provide support to Bay Area storm water programs in their efforts to carryout actions related to pest control operators.*

Action E-15: *California DPR should continue to support the outreach efforts of other agencies and organizations through grant programs. Funding priority should be given to projects and programs focused directly on reducing organophosphate pesticide-related toxicity in urban surface waters.*

Stage 2 – Self-regulation and cooperative efforts – To-date, manufacturers and formulators of diazinon have not availed themselves of this opportunity.

Stage 3 – Regulatory approach using DPR’s authority – In exercising stage 3, DPR may conduct an “pest management assessment” to identify and evaluate the efficacy of alternatives to specific pesticides or to preventing/controlling specific pests. Currently, DPR is conducting such an analyses to evaluate alternatives to diazinon use for ants, fleas, and grubs. The results of this analysis are expected to be available very shortly.

One of the key authorities available to DPR to reduce the risk of pesticide-related toxicity in surface waters is California Food & Agriculture Code §12824 et. seq. Section 12824 says in part “The director shall endeavor to eliminate from use in the state any pesticide that endangers the agricultural or nonagricultural environment...All pesticides for which renewal of registration is sought also shall be evaluated in accordance with this section.”

Action R-12: *California DPR should complete its current pest management assessment as soon as possible, and disseminate information on effective alternatives to as wide an audience as possible. In disseminating the information, DPR should use every means available to the agency including: public education materials, web pages, the State’s licensing procedures and continuing education curriculum for PCOs, and priority support – through grant programs – of others’ outreach efforts on alternatives.*

Action R-13: *California DPR should initiate pest management assessments as soon as possible on other common pests for which diazinon is used for control, such as aphids, cockroaches, spiders, and yellowjackets.*

Action R-14: *Given the widespread toxicity in local creeks and wastewater treatment plant effluent caused by diazinon, the subsequent listing of 53 waterbodies in California as impaired due to diazinon and 7 waterbodies as impaired due to chlorpyrifos, and the ensuing eight*

diazinon TMDLs in the state, it seems clear that diazinon is endangering the “agricultural or nonagricultural environment,” and therefore the DPR director should invoke §12824 et. seq. authorities. The focus of the State’s efforts should be those potentially problematic uses identified in section 4.2.1.1 Pesticide Re-registration that are not eliminated or significantly curtailed by USEPA as part of the current re-registration process.

Stage 4 – Regulatory approach using State and Regional Board’s authority – This stage is already being implemented. As previously discussed, the State and Regional Boards are using their regulatory authorities to develop, in cooperation with USEPA, eight diazinon TMDLs in California. In addition, the Regional Water Quality Control Board–San Francisco Bay Region has added provisions into National Pollutant Discharge Elimination System permits requiring municipalities to increase their efforts to reduce pesticide-related toxicity of surface waters.

4.2.4 Local Government

Background

At the local government level, the California Food and Agriculture Code grants some authority to county agricultural commissioners for local enforcement of pesticide regulations, record keeping, and outreach to applicators. However, with the exception of county agricultural commissioners, local governments are prohibited from regulating the registration, sale, transportation, or use of “economic poisons” (California F&A Code §11501). This regulatory structure means that the ability and authority of local governments is limited to:

- limiting or prohibiting pesticide use by municipal staff and contractors and/or requiring use of best management practices (BMPs) such as Integrated Pest Management;
- identifying opportunities to reduce toxicity, such as eliminating potentially problematic uses, and advocating that state and federal agencies seize these opportunities through regulation and re-registration; and
- in the case of wastewater and storm water agencies, regulating the discharge of pesticides to the sewer or storm drain to ensure local agencies’ compliance with state and federal laws (e.g., Clean Water Act).

Within these regulatory constraints, both the City and County of San Francisco (1996) and Marin County (1998) have passed IPM ordinances that regulate the use of pesticides on their property.

- San Francisco’s ordinance is intended to “eliminate or reduce the use of pesticide applications by City departments to the maximum extent feasible and to develop and implement Integrated Pest Management policies in City departments.” Allowing for a few justified exceptions, the ordinance bans the use of pesticides by City departments or their contractors by January 1, 2000.

- San Francisco is in the midst of developing and completing various aspects of the City's IPM program including: an advisory committee, departmental IPM Plans, IPM purchasing policy and Request for Proposals (RFP) process, new staff positions, fact sheets, IPM training curriculum, and a list of least-toxic chemical pesticides. The City's ordinance also affects City-owned properties in other counties (e.g., San Francisco Water Department lands in San Mateo and Alameda counties).
- Marin's ordinance has similar implementation provisions as San Francisco's ordinance, and sets an overall goal of reducing countywide total yearly pesticide use by 75% by weight (1997 is base year), no later than January 1, 2004.

In addition to these specific ordinances and policies aimed at pesticides, every storm water program in the San Francisco Bay Area has a storm water ordinance that includes provisions prohibiting the discharge of non-storm water to storm drain systems. Non-storm water is generally defined as any discharge that is not entirely composed of storm water. These ordinances also typically provide municipalities with the authority to: conduct inspections, sample discharges, require others to monitor and analyze samples of discharges, and take enforcement actions.

Bay Area storm water programs have also advocated that state and federal agencies act to reduce pesticide-related surface water toxicity through regulation and re-registration. In July 1999, BASMAA transmitted a "call-to-action" letter to USEPA's Office of Pesticide Programs (Appendix E), and in November, the California Stormwater Quality Task Force transmitted a similar "call-to-action" letter to the highest levels of management at USEPA, the Office of Water, and the Office of Pesticide Programs (Appendix F).

Action R-15: *Bay Area storm water programs will track implementation of San Francisco and Marin's IPM (Integrated Pest Management) ordinances. Based on information from San Francisco and Marin on the strengths and weaknesses of their approaches, Bay Area storm water programs will facilitate their consideration and potential adoption, in some form, by all Bay Area storm water programs. Bay Area storm water programs will provide the model IPM ordinances to neighboring special districts (e.g., open space districts, mosquito abatement districts, and school districts).*

Action R-16: *Bay Area storm water programs will track implementation of San Francisco's purchasing policy/specification for pest prevention/control. Based on information from San Francisco on the strengths and weaknesses of their approach, Bay Area storm water programs will facilitate its adoption, in some form, by all Bay Area storm water programs. Bay Area storm*

water programs will provide the model purchasing policy/specification to neighboring special districts (e.g., open space districts, mosquito abatement districts, and school districts).

4.3 Monitoring

Background

Local governments have some ability, authority, and responsibility to use monitoring to address the problem of pesticide-related toxicity of surface waters. To-date, San Francisco Bay Area municipalities have used monitoring to:

- identify and define the problem (Alameda County Urban Runoff Clean Water Program, 1995; Regional Water Quality Control Plant–Palo Alto, 1996; California Regional Water Quality Control Board, 1997; San Francisco Bay Area Pollution Prevention Group, 1998),
- characterize sources (Alameda Countywide Clean Water Program, 1997), and
- recommend corrective actions (Alameda County Flood Control and Water Conservation District, 1997).

A review of monitoring data from around the country shows that municipalities in the San Francisco Bay Area and California Central Valley are not alone in their identification of this environmental problem.

- Orange County, California (Lee, et. al., 1999) – Multi-year studies of storm water runoff in San Diego Creek as it enters Upper Newport Bay have shown that the problem is not restricted to Northern California. Runoff from each storm water event has been shown to be toxic, and about half of the observed toxicity is due to diazinon and chlorpyrifos used in urban areas for structural termite and ant control, and lawn and garden pest control.
- NAWQA (USGS, 1998) – Results from the United States Geological Survey’s (USGS) National Water Quality Assessment Program from 1992 through 1996 show that the problem is in fact a national one. Over 300 samples have been taken from eleven urban streams scattered across the country from Florida to Connecticut to Oregon as part of the Pesticides National Synthesis Project. In a recent report on the first cycle of the program, USGS concluded that “urban and suburban areas are substantial sources of pesticides to streams” and that “most urban areas have similar pesticides in streams...and many urban areas may benefit from similar strategies for reduction.”

Specifically, USGS found that concentrations of diazinon exceeded the International Joint Commission (IJC) aquatic life criterion of 80 ng/L in eight of the eleven (73%) urban streams sampled around the country in 1993 and 1994. Diazinon concentrations were estimated to exceed the criterion for extended periods (9 to 250 days per year) at seven of

the eleven (64%) urban sites (USGS, 1999a). The IJC established the Great Lakes water quality objective for diazinon of 80 ng/L in 1977. USEPA plans to publish final national water quality criteria for diazinon in the very near future. The proposed freshwater acute (one-hour average) criterion is 90 ng/L to be exceeded no more than once every three years on average. The proposed saltwater acute (one-hour average) criterion is 820 ng/L to be exceeded no more than once every three years on average.

USGS also found that the most frequently detected pesticides were and continue to be the most heavily used. The most frequently detected insecticides—diazinon and chlorpyrifos—are ranked number 1 and 4 nationally among insecticides used for homes and gardens.

Of even greater concern was the USGS finding that pesticides usually occur in mixtures. More than 50 percent of all stream samples (urban, agricultural, and intermediate) contained five or more pesticides. Almost 40% of the urban samples contained a mixture of the herbicides simazine, prometon, atrazine, and the insecticide diazinon. More than 10% of the urban stream samples contained a mixture of at least four herbicides plus diazinon and chlorpyrifos. These results prompted USGS to declare: “Insecticides in urban streams, largely from use around homes and in gardens, parks, and commercial areas, frequently occur at levels of concern for aquatic life and may be a significant obstacle for restoring urban streams” (USGS, 1999b).

- Publicly-Owned Treatment Works survey (USEPA, 1989) – Results from a survey done 10 years ago by USEPA show that pesticide-related toxicity is a wastewater problem as well as a storm water problem. USEPA’s Environmental Research Laboratory in Duluth, working through the National Effluent Toxicity Assessment Center (NETAC), reported on the occurrence of diazinon in 28 POTW effluents. Diazinon was found in sixteen (62%) of the effluents, and levels were greater than or equal to 250 ng/L for nine (32%) of the effluents. NETAC concluded in part “The frequency with which we have observed diazinon in the past, in this survey, and continue to find it in effluents is indicative of a widespread problem.”

Clearly this is a national problem caused by products that are registered at the national level and sold across the country.

The pesticide registration process provides a built-in mechanism to use monitoring and science to address this national problem. During the registration process, USEPA must review and summarize the findings of studies conducted on each pesticide. During this step, USEPA may request that “registrants” (e.g., pesticide manufacturers) submit specific studies for review. Based on its review, USEPA can confirm, deny, or change the pesticide’s registration including approved uses, sites of application, formulations, and label directions.

Recently, the California DPR has announced that it has earmarked funds to support monitoring studies, and that it is consulting with Regional Boards to determine monitoring needs.

In addition to problem identification and characterization studies, Bay Area municipalities continue to support on an annual basis other pesticide-related monitoring work such as trends monitoring and episodic toxicity monitoring via the San Francisco Bay Regional Monitoring Program. But given the established mechanism in the pesticide registration process, it would be inappropriate and ineffective for local governments to do more. USEPA must exercise its federal authorities and use monitoring and scientific information to make more informed, up-to-date registration decisions.

Action R-4C: *As discussed in section 4.2.1.1 Pesticide Re-registration, USEPA should require diazinon and chlorpyrifos manufacturers to conduct studies and submit results on legal but potentially problematic uses. Potentially problematic uses are all those uses that are likely to come into contact with water via product mixing, product application, or run-on/runoff.*

Action M-1: *California DPR should continue to earmark funds to support monitoring studies and coordinate their expenditure with the State and Regional Boards.*

Action M-2: *To the extent that additional monitoring information is needed to invoke California Food & Agriculture Code §12824 et. seq. (see section 4.2.3 California Department of Pesticide Regulation) for potentially problematic uses, California DPR should appropriate and expend funds to provide such information in a timely manner.*

Action M-3: *Bay Area storm water programs are willing to use monitoring and science to further investigate local impacts and sources, and to host case studies, if USEPA or California DPR will provide financial and other support, with the goal of conducting representative case studies whose results can be extrapolated across the country.*

5.0 Coordination

Background

Until recently, coordination of agencies' responses to the discovery of pesticide-related toxicity in urban/suburban surface waters has occurred via the Urban Pesticide Committee (UPC). The Urban Pesticide Committee was formed to expedite information gathering and to coordinate the efforts of Bay Area and Central Valley agencies. The Committee includes representatives from storm water programs, wastewater plants, federal and state water quality agencies, state pesticide regulators, consultants, product manufacturers/formulators, public interest organizations, and an academic institution. The mission of the Urban Pesticide Committee is to

provide a forum for information exchange, coordination, and collaboration on the development and implementation of a pesticide toxicity control strategy with recognition that the best solutions will be based on partnership among federal, state, and local agencies, industry, businesses, and the public.

The Urban Pesticide Committee spent two years gathering information to prepare for the development of a multi-faceted strategy to eliminate Pesticide-Related Toxicity in storm water runoff and wastewater effluent. The UPC began developing elements of a strategy in 1997 but resource constraints and philosophical differences among Committee participants stymied these efforts. As a result of the Bay Area urban creeks 303(d) listing for diazinon and TMDL drivers, BASMAA's Strategy may end up defining a significant portion of any strategy that the UPC develops.

Action C-1: *Bay Area storm water programs will coordinate implementation of the SWMPs/BASMAA portions of the Strategy by: 1) convening meetings of the Pesticide Work Group and other interested individuals to review information, build consensus conclusions, and make recommendations; 2) producing an annual report on implementation of the Strategy; and 3) providing timely information on implementation of Strategy elements via reports to the Urban Pesticide Committee as well as the appropriate BASMAAA committees including the Executive Board, Monitoring Committee, and Public Information / Participation Committee.*

Action C-2: *The Regional Board should coordinate implementation of the overall Strategy by: 1) convening meetings to review information, build consensus conclusions, and make recommendations; 2) producing an annual report on implementation of the Strategy; and 3) providing timely information to the appropriate organizations.*

6.0 Evaluation

Background

Regular evaluation of the implementation of any strategy is vital to its long-term success. Evaluations provide feedback loops to planning efforts and help ensure that a strategy achieves a mode of "continuous improvement." Many of the education action items discussed above have built-in evaluation mechanisms. The formal use of evaluation techniques as a part of implementing regulatory actions is less common and may not be appropriate in some cases. Nevertheless, regulatory actions should also be evaluated. By definition, monitoring activities tend to be evaluations, however, there may be opportunities to evaluate the monitoring actions described above within a larger context (e.g., BASMAA Regional Monitoring Strategy) to provide "big picture" insights and promote adaptive management of the Strategy's implementation.

Action V-1: *Bay Area storm water programs will evaluate implementation of the SWMPs/BASMAA portions of the Strategy by: 1) reviewing each of the action items and either develop and conduct, or recommend that others develop and conduct, evaluations as appropriate; and 2) reporting on the results of their evaluations either via presentations at committee meetings and/or as a part of annual reports.*

Action V-2: *The Regional Board should evaluate implementation of the overall Strategy by: 1) reviewing each of the action items and either develop and conduct, or recommend that others develop and conduct, evaluations as appropriate; and 2) reporting on the results of their evaluations either via presentations at committee meetings and/or as a part of annual reports.*

7.0 Conclusion

The widespread toxicity in local creeks and wastewater treatment plant effluent discovered by municipal storm water programs and wastewater treatment plants over the last several years, and the resulting 303(d) listing of 53 waterbodies in California as impaired due to diazinon has put over 100 municipalities at immediate regulatory, legal, and financial risk. As a result of the 303(d) listings and other legal actions, eight TMDLs for diazinon have been initiated in California, including at least one in virtually every major urban area of the state. The TMDLs will result in limits on the amounts of diazinon that can be discharged to California waters. Complying with the limits will require significant expenditure of public tax dollars at every level of government—federal, state, and local.

Rather than being a tool in and of itself, the Pesticide-Related Toxicity Reduction Strategy should be considered a toolbox that contains a number of effective tools for reducing pesticide-related toxicity of surface waters. It is the responsibility of government agencies to be clear and disciplined about which tool and which pair of hands go with which job when fixing environmental problems. The extent to which they implement that concept will determine how successful the work of environmental protection will be. Bay Area storm water programs are committed to implementing action items to reduce pesticide-related toxicity of surface waters that are appropriate and cost-effective for local governments to undertake.

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Table 1 Summary of Actions

This table summarizes the actions listed in this Strategy by type of action (e.g., education, regulatory) and responsible government agencies. Every action has one lead agency or agency type (i.e., SWMPs) with support provided by other agencies as noted. If a specific SWMP is taking the lead on an action, they are noted in (parenthesis). The designations will likely change as the Strategy is implemented and roles and responsibilities become more defined. Therefore, the listing is conservative and some “not applicable” designations may change to “support” or even “lead” designations. Actions listed for “Bay Area storm water management programs” are not necessarily meant to be implemented by all such programs. For some actions, one program or BASMAA will take the lead or complete the work.

Education	Roles					
Household hazardous waste collection	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
E-1: Continue to support and promote household hazardous waste collection as an important pesticide disposal option for residents.	Lead	Not applicable	Not applicable	Not applicable	Not applicable	Ongoing
E-2: Investigate with the appropriate oversight agencies ways to enhance the use of household hazardous waste collection programs to dispose of pesticides properly (e.g., joint advertising).	Lead (BASMAA Support)	Not applicable	Not applicable	Not applicable	Not applicable	By June 2001
Pesticide-related toxicity / proper use and disposal / less-toxic methods (in the context of this Strategy, “less-toxic” is meant to connote less risk of storm water pollution)						
E-3: Continue to develop and distribute information to the general public on pesticide-related toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.	Lead (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Ongoing
E-4: Investigate ways to enhance the accessibility of general and targeted educational materials to the general public and to pesticide users.	Lead (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	By June 2001

Bay Area Stormwater Management Agencies Association

	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
E-5: Train municipal employees who use pesticides about pesticide-related surface water toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.	Lead (BASMAA Support)	Not applicable	Not applicable	Not applicable	Not applicable	Pilot FY 99/00
E-6: Educate selected businesses (e.g., restaurants, supermarkets) about pesticide-related surface water toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.	Lead (San Francisco) (BASMAA Support)	Not applicable	Not applicable	Not applicable	Not applicable	Pilot FY 99/00
Pest control operators (PCOs)						
E-7: Sponsor accredited PCO training workshops (after their initial development by CCCSD) that provide information and demonstrations of practices protective of water quality. Invite private company PCOs as well as PCOs from municipalities and special districts (e.g., open space districts, mosquito abatement districts, and school districts).	Lead (San Francisco) (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Pilot FY 99/00; Workshops by June 2001
E-8: Investigate and, if feasible, use opportunities to integrate educational materials and test questions about potential surface water quality impacts and ways to avoid them into the State's licensing procedures and continuing education curriculum for PCOs.	Lead (San Francisco) (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Pilot FY 99/00
E-9: Coordinate with County Agricultural Commissioners regarding pesticide discharges to storm water.	Lead (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Pilot FY 99/00

Bay Area Stormwater Management Agencies Association

	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
E-10: Develop a canned awareness-raising presentation for PCO chapter meetings and conferences.	Lead (San Francisco) (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Pilot FY 99/00
E-11: Investigate and, if feasible, work with PCO trade associations to either endorse specific BMPs protective of wastewater and storm water or integrate wastewater and storm water concerns into "Industry Standards."	Lead (San Francisco) (BASMAA Support)	Not applicable	Support	Support	Not applicable	By June 2001
E-12: Develop a boilerplate article on water quality issues and Integrated Pest Management or Less-Toxic Pest Management for general consumer and local business publications (e.g., Chambers of Commerce).	Lead (San Francisco) (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Pilot FY 99/00
E-13: Develop a consumer guide to help consumers make more informed choices about pest control services.	Lead (San Francisco) (BASMAA Support)	Not applicable	Not applicable	Support	Not applicable	Pilot FY 99/00
E-14: Provide support to Bay Area storm water programs in their efforts to carryout actions related to pest control operators.	Not applicable	Not applicable	Not applicable	Lead	Not applicable	Start FY 99/00
E-15: Continue to support the outreach efforts of other agencies and organizations through grant programs. Funding priority should be given to projects and programs focused directly on reducing organophosphate pesticide-related toxicity in urban surface waters.	Not applicable	Not applicable	Not applicable	Lead	Not applicable	Ongoing

Regulatory	Roles					
	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
Pesticide re-registration						
R-1: Review and comment on USEPA's Preliminary Risk Assessments (Phase 3) for diazinon and chlorpyrifos.	Support	Lead	Support	Support	Not applicable	According to re-registration schedule
R-2: Assist USEPA with Revised Risk Assessments (Phase 4) by:						
A. Providing existing, pertinent OP pesticide data from the San Francisco Bay Area, if these data are missing from the Preliminary Risk Assessments.	Lead (BASMAA Support)	Support	Support	Support	Not applicable	According to re-registration schedule
B. Helping identify uses of OP pesticides that are likely to come in contact with water, and working with USEPA and manufacturers to eliminate these uses from those listed on product labels.	Support	Lead	Support	Support	Not applicable	According to re-registration schedule
R-3: Submit risk management ideas and proposals to USEPA during Phase 5 for potential inclusion in the Risk Management Strategies (Phase 6).	Support	Lead	Support	Support	Not applicable	According to re-registration schedule
R-4: As part of the Revised Risk Assessments (Phase 4) USEPA should:						
A. Include all of the surface water data and studies demonstrating pesticide-related toxicity and potential water quality standard exceedances from across the country.	Support	Not applicable	Support	Support	Lead	According to re-registration schedule

	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
B. Identify potentially problematic uses including those that: 1) require mixing; 2) recommend being “watered-in” or applied just before a rain; 3) involve application in areas likely to contact water such as manholes, impervious surfaces (e.g., “crack and crevice”), and in and around creeks; and 4) come in formulations that may run off (e.g., granules or flakes that float).	Support	Support	Support	Support	Lead	According to re-registration schedule
C. Require diazinon and chlorpyrifos manufacturers to conduct studies and submit results on the legal but potentially problematic uses identified as described above.	Not applicable	Not applicable	Not applicable	Support	Lead	According to re-registration schedule
R-5: USEPA should consider and initiate one or more methods for conducting cost/benefit analyses:						
A. Conduct more comprehensive cost/benefit analyses including more accurate assessments of the environmental cost, and the mounting cost to local public agencies of dealing with the regulatory and legal liability of pesticide-related surface water toxicity.	Support	Not applicable	Support	Support	Lead	According to re-registration schedule
B. Consider the costs and benefits of urban uses separately from agricultural uses to separate the very different needs, costs, and benefits of pesticide use in these two environments.	Not applicable	Not applicable	Support	Support	Lead	According to re-registration schedule

Bay Area Stormwater Management Agencies Association

R-6: As part of the Risk Management Strategies (Phase 6) USEPA should:	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
A. Ensure that TMDL implementation plans can be developed to comply with the requirement to demonstrate “that the control actions and/or management measures are expected to achieve the required pollutant loads” (Federal Register 64, No. 162, 46051; 40 CFR 130.33(b)(10)(i), August 23, 1999).	Not applicable	Not applicable	Support	Support	Lead	According to re-registration schedule
B. Identify and describe how USEPA will use the registration process to ensure that registered pesticides do not cause or contribute to the impairment of surface waters.	Not applicable	Not applicable	Support	Support	Lead	According to re-registration schedule
C. Identify pest prevention and control methods that can effectively substitute for the problematic uses identified under Phase 4.	Not applicable	Not applicable	Not applicable	Support	Lead	According to re-registration schedule
D. Identify and make label changes to ensure that pesticide use in accordance with label directions does not cause impairment of surface waters.	Not applicable	Not applicable	Not applicable	Support	Lead	According to re-registration schedule
Total Maximum Daily Loads						
R-7: Continue to pursue, on an as aggressive a timetable as possible, the development and implementation of at least one case study of a diazinon TMDL for urban creeks.	Support	Support	Support	Support	Lead	Start FY 99/00
R-8: Volunteer to assist in development of a scope for a USEPA case study of a diazinon TMDL for urban creeks, and consider participation in the case study.	Support	Lead	Support	Support	Support	Start FY 99/00

Bay Area Stormwater Management Agencies Association

	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
R-9: Continue to develop and refine a diazinon TMDL for San Francisco Bay Area urban creeks, including refinement of the problem statement.	Support	Not applicable	Lead	Not applicable	Support	According to TMDL schedule
R-10: Name all sources when doing TMDLs by expanding on existing source categories and develop new categories to name sources as far back as possible in time and space in the life cycle of pollutants.	Not applicable	Not applicable	Lead	Not applicable	Support	According to TMDL schedule
NPDES permits						
R-11: Coordinate the timing and content of NPDES permit provisions related to diazinon with the timing and content of the diazinon TMDL for urban creeks.	Not applicable	Not applicable	Lead	Not applicable	Support	Ongoing
State pesticide regulations						
R-12: Complete its current pest management assessment as soon as possible, and disseminate information on effective alternatives to as wide an audience as possible.	Not applicable	Not applicable	Not applicable	Lead	Not applicable	FY 99/00
R-13: Initiate pest management assessments as soon as possible on other common pests for which diazinon is used for control, such as aphids, cockroaches, spiders, and yellow jackets.	Not applicable	Not applicable	Not applicable	Lead	Not applicable	FY 99/00
R-14: Invoke California Food & Agriculture Code Section 12824 et. seq. authorities. The focus of the State's efforts should be those potentially problematic uses, identified under Phase 4 of pesticide re-registration, that are not eliminated or significantly curtailed by USEPA as part of the current re-registration process.	Not applicable	Not applicable	Support	Lead	Support	FY 99/00

Bay Area Stormwater Management Agencies Association

Local government actions	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
R-15: Track implementation of San Francisco and Marin's IPM (Integrated Pest Management) ordinances. Using these ordinances as models, facilitate their consideration and potential adoption, in some form, by Bay Area municipalities. Provide the model IPM ordinances to neighboring special districts (e.g., open space districts, mosquito abatement districts, and school districts).	Lead (San Francisco/ Marin) (BASMAA Support)	Not applicable	Not applicable	Not applicable	Not applicable	By June 2002
R-16: Track implementation of San Francisco's purchasing policy/specification for pest prevention/control. Using the purchasing policy/specification as a model, facilitate its consideration and potential adoption, in some form, by Bay Area municipalities. Provide the model purchasing policy/specification to neighboring special districts (e.g., open space districts, mosquito abatement districts, and school districts).	Lead (San Francisco/ Marin) (BASMAA Support)	Not applicable	Not applicable	Not applicable	Not applicable	By June 2002
Monitoring		Roles				
	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
M-1: Earmark funds to support monitoring studies and coordinate their expenditure with the State and Regional Boards.	Not applicable	Not applicable	Support	Lead	Not applicable	Ongoing
M-2: Appropriate and expend funds to provide the information necessary to implement California Food & Agriculture Code Section 12824 et. seq. authorities in a timely manner.	Not applicable	Not applicable	Support	Lead	Not applicable	FY 00/01

Bay Area Stormwater Management Agencies Association

	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
M-3: Use monitoring and science to further investigate local impacts and sources, and to host case studies, if USEPA or California DPR provide financial and other support, with the goal of conducting representative case studies whose results can be extrapolated across the country.	Lead (Alameda) (BASMAA Support)	Not applicable	Support	Support	Support	As funding allows
Coordination		Roles				
	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
C-1: Coordinate implementation of the SWMPs/BASMAA portions of the Strategy by: 1) convening meetings of the Pesticide Work Group and other interested individuals to review information, build consensus conclusions, and make recommendations; 2) producing an annual report on implementation of the Strategy; and 3) providing timely information on implementation of Strategy elements via reports to the Urban Pesticide Committee as well as the appropriate BASMAAA committees, including the Executive Board, Monitoring Committee, and Public Information / Participation Committee.	Lead (BASMAA) (SWMPs Support)	Not applicable	Support	Support	Not applicable	Ongoing, beginning FY 99/00
C-2: Coordinate implementation of the overall Strategy by: 1) convening meetings to review information, build consensus conclusions, and make recommendations; 2) producing an annual report on implementation of the Strategy; and 3) providing timely information to the appropriate organizations.	Support	Support	Lead	Support	Support	Ongoing, beginning FY 99/00

Evaluation	Roles					
	Bay Area SWMPs	SWQTF	RWQCB	DPR	USEPA	Schedule
V-1: Evaluate implementation of the SWMPs/ BASMAA portions of the Strategy by: 1) reviewing each of the action items and either develop and conduct, or recommend that others develop and conduct, evaluations as appropriate; and 2) reporting on the results of the evaluations either via presentations at committee meetings and/or as a part of annual reports.	Lead (BASMAA) (SWMPs Support)	Support	Support	Support	Support	Annually
V-2: Evaluate implementation of the overall Strategy by: 1) reviewing each of the action items and either develop and conduct, or recommend that others develop and conduct, evaluations as appropriate; and 2) reporting on the results of the evaluations either via presentations at committee meetings and/or as a part of annual reports.	Support	Support	Lead	Support	Support	Annually

Legend

Bay Area SWMPs = Bay Area storm water management programs and BASMAA

BASMAA = Bay Area Stormwater Management Agencies Association

SWQTF = Stormwater Quality Task Force

RWQCB = Regional Water Quality Control Board

DPR = Department of Pesticide Regulation

USEPA = U.S. Environmental Protection Agency

Appendix A
Master Schedule of Diazinon TMDLs in California
(Regional Water Quality Control Boards)

Waterbodies	Region	Stressor	Problem statement	Target	Source analysis	Allocation	Technical TMDL	Implementation Plan
Chollas Creek	9 – San Diego	Diazinon	Aug. 3, 1999	Aug. 3, 1999	Nov. 15, 1999	Feb. 15, 2000	April 2000	
Newport Bay/San Diego Creek	8 – Santa Ana	Toxic substances, including Diazinon & chlorpyrifos	Winter 1999	Summer 2000	Winter 1999	Summer 2000	Summer 2000	Summer 2000
Sacramento/Stockton urban creeks*	5 – Central Valley	Diazinon & chlorpyrifos	Dec. 1999	April 2000	June 2001	June 2001	June 2001	
San Joaquin River*	5 – Central Valley	Diazinon & chlorpyrifos	June 2000	June 2002	June 2001	June 2001	June 2001	
Sacramento River*	5 – Central Valley	Diazinon	June 2000	June 2002	June 2001	June 2001	June 2002	
Sacramento/San Joaquin Delta*	5 – Central Valley	Diazinon & chlorpyrifos	June 2000	June 2002	June 2002	June 2002	June 2002	
SF Bay Area urban creeks	2 – San Francisco	Diazinon	June 2000	June 2002	June 2001	June 2002	June 2002	June 2003
San Francisco Bay	2 – San Francisco	Diazinon	June 2005	June 2006	June 2005	June 2006	June 2006	June 2007

Notes:

TMDLs are listed in chronological order based on due date for Technical TMDL

* Dates for Central Valley Region TMDLs are somewhat tentative and can change due to litigation and/or work plan agreements with USEPA and the State Board

Appendix B
Draft Urban Creeks Diazinon TMDL Work Plan
(San Francisco Bay Regional Water Quality Control Board)

SF BAY URBAN CREEKS - DIAZINON TMDL WORKPLAN

DRAFT - TASKS, TIMEFRAMES, AND RESOURCES ARE DEPENDENT ON AVAILABILITY OF RESOURCES AND STAKEHOLDER SUPPORT

(This draft is same version under review by the Urban Pesticide Committee; only minor format changes have been made.)

Water Body: Urban Creeks

Stressor: Diazinon

General Approach:

Resolution of water quality impairment due to diazinon in urban creeks will require a stakeholder involvement process. This is due to the nature of the problem and complications related to regulatory authority. Although primary source of diazinon in urban creeks is storm water runoff from urban areas, storm water runoff is just the conveyance mechanism. The actual sources are urban uses of the pesticide diazinon. Municipalities responsible for storm water runoff cannot regulate use of pesticides; neither can Regional Boards. Authority for pesticide regulation resides with USEPA at the national level and the Department of Pesticide Regulation in California.

Through a stakeholder forum, we will seek development of a diazinon load reduction strategy that integrates actions in the key TMDL elements, Problem Definition, Source Analysis, and Implementation Plan. Derivation of a Total Maximum Daily Load will be only be done on representative urban creeks to the extent necessary to link implementation actions on significant sources sufficient to resolve the impairment problem.

We also recognize that there are other organophosphate pesticides, particularly chlorpyrifos, that are used for purposes similar to diazinon and which may also cause toxicity, and as such, we will seek opportunity to consider them in the strategy. We also want to preclude establishing a control strategy that would result in substituting use of diazinon with another possibly more toxic pesticide.

Furthermore, we recognize that diazinon (and chlorpyrifos) has been observed to cause toxicity in municipal wastewater discharges, and we will seek opportunity to consider control of wastewater toxicity as part of the strategy. Most importantly, we want to preclude establishing a strategy that converts an urban runoff toxicity problem into a municipal wastewater toxicity problem.

Problem Statement:

Status:

Diazinon is a common organophosphate pesticide, one of the most widely used for insect control in urban areas. Diazinon has been confirmed through toxicity identification evaluation (TIE) procedures using *Ceriodaphnia dubia* to be a major cause of toxicity observed in urban creeks and storm water discharges, including discharges from exclusively residential watersheds.

Monitoring effort found diazinon in urban creeks and storm water discharges at concentrations above levels that are both acutely and chronically toxic to aquatic organisms. Of particular

concern is the extensive household use of diazinon that implies diazinon presence, and possibly toxicity, throughout most urban watersheds.

Currently, there is no water quality objective for diazinon, and the impairment findings are based on assessment of only a few urban creeks that are considered representative of all urban creeks in the Region.

Additional Work Needed:

There are several outstanding problem definition issues in need of resolution. These include: review and potential revision of the environmental indicators and associated benchmarks or threshold levels that are the basis of the finding of impairment or threat of impairment including establishing a water quality objective for diazinon; development and implementation of a watershed/waterbody characterization and assessment strategy; and refinement of the list of impaired urban creeks.

- Establish indicators, benchmarks, sampling and analysis protocols, data quality and quantity requirements, and develop and implement monitoring plan **Year 1 ¼ PY \$250,000 contracts**
Year 2 ¼ PY
- Refine problem statement and revised list of impaired creeks **Year 3 ¼ PY**

TMDL product: 303(d) listing review and refinement, method for assessing the narrative standard.

Numeric Targets: The Desired Future Condition:

The desired future condition is elimination of observed toxicity in urban creeks and attainment of a water quality objective for diazinon.

Status:

A preliminary analysis of the mass load of diazinon indicates that as little as 30 grams of diazinon out of an estimated total of 100,000 grams applied in an urban watershed in a year can account for observed concentration in the urban creek. These numbers are gross estimates and can only be confirmed through more extensive creek monitoring and source analysis. Deriving and verifying a reasonably accurate total maximum daily load of diazinon for each urban creek listed as impaired will be difficult and resource intensive.

Additional Work Needed:

As a start, derive “simple” TMDL using data generated to refine the problem definition as described above and to complete the source analysis described below. Such “simple” TMDLs would be derived for watersheds deemed representative of impaired urban creeks and would guide development of potential prevention and control options.

- Derive “simple” TMDL for representative urban creeks **Year 3 ¼ PY \$100,000 contracts**

TMDL product: TMDLs for representative urban creeks

Source Analysis:

Status:

The primary source of diazinon in urban creeks is storm water runoff from urban areas. Sampling of runoff from urbanized areas in Alameda County indicated that residential areas were a significant source of diazinon, but runoff from commercial areas also may have been a source. It is not known what portion of the diazinon found in local creeks is attributable to use in accordance with label directions versus improper disposal or over-application, but a preliminary study of runoff from residential properties suggests that the concentrations found in creeks may be attributable to proper use.

Additional Work Needed:

- Conduct studies to evaluate sources of diazinon in urban creeks, including: proper versus improper uses; applications to pervious versus impervious areas; and if certain formulations have a greater tendency to be transported by urban runoff than other formulations. **Year 1 ¼ PY \$400,000 contracts**
Year 2 ¼ PY

TMDL product: source and loading characterization, identification of problematic uses, applications, and/or formulations.

Allocations:

Status:

As noted in the Source Analysis discussion, the primary source of diazinon in urban creeks is storm water runoff from urban areas. Although this may imply that load reduction responsibility should be allocated to urban runoff discharges, such an allocation is not feasible or appropriate. Municipalities responsible for urban runoff discharges do not have authority to regulate pesticides and pesticide uses. They can only control their own uses and implement outreach and education measures to promote proper use and disposal practices. The allocation issue is further compounded by the unresolved issue as to whether toxic levels of diazinon in creeks may be attributable to proper uses in accordance with label instructions.

Additional Work Needed:

The Source Analysis task described previously should result in the identification and characterization of problematic uses, applications, and/or formulations. This would lead to a combination of actions as discussed in the Implementation Plan element. Further, refinement of the allocation process would require much more detailed monitoring and modeling data.

Implementation Plan:

Status:

The Urban Pesticide Toxicity Control Strategy, Bay Area / Central Valley Coordinating Committee (Urban Pesticide Committee) was formed in December 1995 by the Central Valley and San Francisco Bay Regional Boards and Bay Area and Central Valley urban runoff

dischargers when the urban pesticide toxicity issue surfaced. It's original purpose was to coordinate its participant's activities to develop and implement an urban pesticide toxicity control strategy. This approach/formula worked reasonably well in the early days of the committee (1996) as participants coordinated and/or shared fact finding activities and results. However, as of late progress has stagnated since participation is limited and participants have few activities to coordinate.

Additional Work Needed:

Despite its shortcomings, the Urban Pesticide Committee strives to coordinate urban pesticide toxicity reduction activities and actions by its participants within three areas: (1) Outreach and Education; (2) Regulatory Improvements; and (3) Monitoring and Science. Monitoring and Science activities and actions encompass tasks identified in the Problem Definition, Source Analysis, and Monitoring/Reevaluation elements of this workplan. The Urban Pesticide Committee also provides a forum to coordinate or engage the activities and actions of all stakeholders including: municipal urban runoff dischargers; municipal wastewater dischargers, Regional Water Quality Control Boards; California Department of Pesticide Regulation; US Environmental Protection Agency; County Agriculture Commissioners; Pest Control Operators; pesticide manufacturers and formulators; academia; consultants; and public interest groups.

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> • Recognize the Urban Pesticide Committee as a Stakeholder Forum charged with development of an implementation plan of prevention and control actions and to tract and review current and additional work. | <p>Year 1</p> <p>Year 2</p> <p>Year 3</p> <p>Year 4</p> | <p>¼ PY</p> <p>¼ PY</p> <p>¼ PY</p> <p>¼ PY</p> | <p>\$50,000 contracts</p> <p>\$50,000 contracts</p> <p>\$50,000 contracts</p> <p>\$50,000 contracts</p> |
|--|---|---|---|
- | | | | |
|---|----------------------|--------------------|-----------------------------------|
| <ul style="list-style-type: none"> • Develop outreach and education strategy: <ul style="list-style-type: none"> – identify target audiences including residential users, distributors, commercial and institutional facilities, and public agencies; and – establish rationales, strategies, messages, and tracking and effectiveness measures for each target audience. | <p>Year 1</p> | <p>¼ PY</p> | <p>\$100,000 contracts</p> |
|---|----------------------|--------------------|-----------------------------------|
- | | | | |
|---|----------------------|--------------------|----------------------------------|
| <ul style="list-style-type: none"> • Develop regulatory improvement strategy including restrictions on problematic uses, applications, and formulations. | <p>Year 2</p> | <p>¼ PY</p> | <p>\$50,000 contracts</p> |
|---|----------------------|--------------------|----------------------------------|

- Establish prevention and control actions **Year 3** **¼ PY** **\$50,000 contracts**
Implementation Plan **Year 4** **¼ PY** **\$50,000 contracts**

TMDL product: Implementation Plan for prevention and control actions.

Monitoring/ Reevaluation:

Status:

None.

Additional Work Needed:

- Develop and implement program to track and verify effectiveness of prevention and control measures and attainment of desired end point (e.g., no toxicity in urban creeks). **Year 4** **½ PY** **\$100,000 contracts**

TMDL product: monitoring program to track success of actions and progress towards attainment.

Basin Planning Process:

This section describes the additional work required to adopt the regulatory provisions developed in the course of completing all of the tasks outlined above--i.e. all stakeholder negotiations and technical documentation are completed in the other tasks.

Status:

None.

Additional Work Needed:

- Prepare package for Regional Board consideration (CEQA documentation, documentation of stakeholder processes and comments, responses to comments, peer review, notice of filing, etc.) **Year 5** **½ PY**
- Prepare administrative record and OAL regulatory summary; provide staff support for State Board, OAL, and USEPA review. **Year 5** **½ PY**

TMDL product: integration of all pieces, formal adoption

TOTALS:

Year 1	1 PY	\$800,000 contracts
Year 2	1 PY	\$100,000 contracts
Year 3	1 PY	\$200,000 contracts
Year 4	1 PY	\$100,000 contracts
Year 5	1 PY	

Appendix C

**Comment Letter on Draft Urban Creeks Diazinon TMDL Work Plan
(Santa Clara Valley Urban Runoff Pollution Prevention Program)**



**Santa Clara Valley
Urban Runoff
Pollution Prevention Program**

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

July 22, 1999

Dr. Tom Mumley
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: BASMAA Pesticide Work Group Comments on the Draft *Urban Creeks Diazinon TMDL Work Plan*

Dear Tom:

The Pesticide Work Group¹ was formed with representatives of BASMAA member agencies to develop a coordinated strategy for addressing controllable sources of pesticides, including diazinon. As part of developing the strategy, the Work Group has focused on defining the appropriate role of Bay Area municipal storm water programs in controlling widespread uses and disposal of legal pesticide products. The Work Group recently reviewed the Draft *Urban Creeks Diazinon TMDL Work Plan* (1/28/99) developed by Regional Board staff and offers the following comments. The comments are targeted toward the General Approach section and the key TMDL elements of Problem Statement, Source Analysis, and Implementation Plan.

General Approach

We support the general approach of the TMDL Work Plan and appreciate the recognition that: 1) storm water runoff is just a conveyance mechanism; and 2) municipalities (and the Regional Board) do not have authority to regulate the use of pesticides. However, we are unclear on the concept of deriving TMDLs only on representative urban creeks. We are concerned about highlighting the selected representative creeks as problem areas, and the willingness of regulated agencies to accept TMDLs for other creeks based solely on data from the representative creeks.

The Work Group believes that the TMDL Work Plan needs to explicitly identify the parties responsible for each action. In general, USEPA and the California Department of Pesticide Regulation (DPR) need to address the regulatory issues, the State and Regional Boards are responsible for the implementation plan, and municipal storm water programs should be required to address controllable sources within their legal authority to the maximum extent

¹ Work Group Members include: Liz Lewis, MCSTOPPP; Jim Scanlin, ACCWP; Robert Davidson, SMSTOPPP; Larry Bahr, FSURMP; John West, RWQCB; Adam Olivieri and Jill Bicknell, SCVURPPP; and Geoff Brosseau, BASMAA.

practicable. The attached Table 1 presents a first cut at identifying the responsible party(ies) for the tasks described in the key elements of the TMDL Work Plan.

Problem Statement

We agree that current data indicate that diazinon is causing toxicity in urban creeks; however, it is not clear whether this is an ecological problem or a regulatory problem. Existing studies document levels of diazinon in storm water discharges, but do not address impacts on receiving waters and beneficial uses. The problem statement should identify data gaps and the data necessary to: 1) identify beneficial uses; 2) evaluate beneficial use impairment utilizing a “weight of evidence” type of approach; and 3) determine whether diazinon is the cause of impairment. The problem statement should also recognize that the presence of diazinon in storm water runoff is a national problem and should be addressed on a national scale. The Work Group is willing to assist Regional Board staff in drafting an initial problem statement as a basis for defining a near-term strategy for municipal storm water program actions.

Responsibilities for the tasks listed under “Additional Work Needed” are suggested in Table 1. The development and implementation of a watershed assessment strategy should include an evaluation of which beneficial uses are being impaired and whether diazinon is the cause of impairment. USEPA and pesticide product manufacturers should help fund the impairment studies. Finally, we think that the goal of only assessing a narrative standard (under “TMDL Product”) is in conflict with a watershed assessment approach and a use assessment strategy based on “weight of evidence”.

Source Analysis

The studies done to date in the Bay area establish the presence and toxicity of diazinon in creeks, even in areas where the pesticide was used properly. The Source Analysis should build upon these studies. The initial Problem Statement will help to define additional studies that are needed. These studies could be implemented as part of the BASMAA Regional Monitoring Strategy.

Implementation Plan

The Work Group has concerns about whether the Urban Pesticide Committee, in its current form, can effectively serve as a stakeholder forum to develop an implementation plan. The group’s opinion is that the Committee’s function should be one of information sharing, at least initially, and that the Regional Board(s) should develop the implementation plan with input from USEPA and municipal dischargers.

The Work Group discussed that there are two aspects of the diazinon problem: regulatory and scientific. Municipalities are very limited in what they can regulate regarding use of pesticides. Municipal agencies cannot: 1) ban production or sales of products containing diazinon; 2) prohibit use by residents and businesses; or 3) prohibit use by pest control operators (PCOs) or require PCOs to implement BMPs.

However, there are a number of things that are reasonable for municipalities to implement as part of controlling pollutants in storm water to the maximum extent practicable. These include:

- Limiting or prohibiting use by municipal staff and contractors (e.g., parks departments, landscape maintenance, road embankment maintenance) and/or requiring implementation of BMPs;
- Providing adequate and accessible options for disposal of unused pesticides and pesticide containers through household hazardous waste collection programs;

- Educating residents about pesticide toxicity and proper use, alternatives, and proper disposal (continue ongoing efforts such as the IPM store training program, provide incentives, etc.);
- Educating businesses about proper use and disposal, as well as alternative methods and products for use at their facilities;
- Educating pest control operators and recommending implementation of BMPs.

Most of these activities are currently being implemented in some or all of the municipal storm water programs. On a regional level, the municipal programs are also funding BASMAA efforts to continue the Regional IPM Store Training Program and conduct outreach to PCOs (i.e., participate in the PCO outreach program funded by the CCSD CALFED grant) during FY 99-00.

One regulatory-related task to which the municipal storm water programs (through BASMAA) would like to provide input is to recommend restrictions to USEPA and DPR on certain uses of pesticide products. As many as 300 different products contain diazinon as an active ingredient. We can review the recommended uses of these products and determine which uses are likely to impact water quality (e.g., use in manholes, "crack & crevice" use on impervious surfaces, and use in and around creeks). We can identify uses that pose the most threat to water quality and work with USEPA to get manufacturers to eliminate these uses from those listed on the product label.. (For example, chlorpyrifos is no longer registered for use in manholes and other underground utilities.).

Monitoring

The Work Group believes that a different approach is needed for monitoring watershed assessment/use impairment than was historically used for storm water discharge characterization. Water quality sampling of creeks is not a good use of resources, as previous studies have shown that detectable levels of diazinon are found in almost every residential watershed. The Work Group recommends that monitoring efforts focus on assessment of impacts to beneficial uses.

We look forward to discussing these comments with you at our next Work Group meeting. I will contact you to coordinate a meeting date and time. In the interim, please feel free to call me with any comments or questions.

Very truly yours,

ORIGINAL SIGNED BY

Jill C. Bicknell, EOA, Inc.
SCVURPPP Assistant Program Manager
Participant, Pesticide Work Group

Attachment 1 – Table of TMDL Task Responsibilities

CC: Pesticide Work Group:
Adam Olivieri, SCVURPPP
Liz Lewis, MCSTOPPP
Jim Scanlin, ACCWP
Robert Davidson, SMSTOPPP
Larry Bahr, FSURMP
Geoff Brosseau, BASMAA
John West, RWQCB

Other BASMAA Members:
Don Freitas, CCCWP
Jack Betourne, VFCSD

Appendix D
TMDL Source Categories (U.S. Environmental Protection Agency)

**Guidelines for Preparation of the
Comprehensive State Water Quality
Assessments (305(b) Reports) and
Electronic Updates:**

Supplement

September 1997

Assessment and Watershed Protection Division (4503F)
Office of Wetlands, Oceans, and Watersheds
Office of Water

U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

1. WATER QUALITY ASSESSMENTS UNDER SECTION 305(b)

Table 1-3. Source Categories (with National Codes from the Waterbody System)

0100	Industrial Point Sources
0110	Major Industrial Point Sources
0120	Minor Industrial Point Sources
0200	Municipal Point Sources
0210	Major Municipal Point Sources—dry and/or wet weather discharges
0212	Major Municipal Point Sources—dry weather discharges*
0214	Major Municipal Point Sources—wet weather discharges*
0220	Minor Municipal Point Sources—dry and/or wet weather discharges
0222	Minor Municipal Point Sources—dry weather discharges*
0224	Minor Municipal Point Sources—wet weather discharges*
0230	Package Plants (Small Flows)
0400	Combined Sewer Overflow
0500	Collection System Failure*
0900	Domestic Wastewater Lagoon
1000	Agriculture**
1050	Crop-related Sources*
1100	Nonirrigated Crop Production
1200	Irrigated Crop Production
1300	Specialty Crop Production (e.g., horticulture, citrus, nuts, fruits)
1350	Grazing-related Sources*
1400	Pasture grazing—Riparian and/or Upland
1410	Pasture Grazing--Riparian*
1420	Pasture Grazing--Upland*
1500	Range Grazing—Riparian and/or Upland
1510	Range Grazing--Riparian*
1520	Range Grazing--Upland*
1600	Intensive Animal Feeding Operations*
1620	Concentrated Animal Feeding Operations (CAFOs; permitted, PS)
1640	Confined Animal Feeding Operations (NPS)
1700	Aquaculture
2000	Silviculture
2100	Harvesting, Restoration, Residue Management
2200	Forest Management (e.g., pumped drainage, fertilization, pesticide application)
2300	Logging Road Construction/Maintenance
2400	Silvicultural Point Sources

1. WATER QUALITY ASSESSMENTS UNDER SECTION 305(b)

Table 1-3 (continued)

3000	Construction
3100	Highway/Road/Bridge Construction
3200	Land Development
4000	Urban Runoff/Storm Sewers
4100	Nonindustrial Permitted
4200	Industrial Permitted
4300	Other Urban Runoff
4400	Illicit connections/illegal hook-ups/dry weather flows*
4500	Highway/Road/Bridge Runoff*
4600	Erosion and Sedimentation*
5000	Resource Extraction
5100	Surface Mining
5200	Subsurface Mining
5300	Placer Mining
5400	Dredge Mining
5500	Petroleum Activities
5600	Mill Tailings
5700	Mine Tailings
5800	Acid Mine Drainage
5900	Abandoned mining*
5950	Inactive mining*
6000	Land Disposal
6100	Sludge
6200	Wastewater
6300	Landfills
6350	Inappropriate Waste Disposal/Wildcat Dumping*
6400	Industrial Land Treatment
6500	Onsite Wastewater Systems (Septic Tanks)
6600	Hazardous Waste
6700	Septage Disposal
7000	Hydromodification
7100	Channelization
7200	Dredging
7300	Dam Construction
7350	Upstream Impoundment
7400	Flow Regulations/Modification

1. WATER QUALITY ASSESSMENTS UNDER SECTION 305(b)

Table 1-3 (continued)

7550	Habitat Modification (other than Hydromodification)
7600	Removal of Riparian Vegetation
7700	Bank or Shoreline Modification/Destabilization
7800	Drainage/Filling of Wetlands
7900	Marinas and Recreational Boating*
7910	In-water releases*
7920	On-land releases*
8050	Erosion from derelict land*
8100	Atmospheric Deposition
8200	Waste Storage/Storage Tank Leaks (above ground)
8250	Leaking underground storage tanks*
8300	Highway Maintenance and Runoff
8400	Spills (Accidental)
8500	Contaminated Sediments
8520	Debris and bottom deposits*
8530	Internal nutrient cycling (primarily lakes)*
8540	Sediment resuspension*
8600	Natural Sources
8700	Recreation and Tourism Activities (other than Boating; see 7900)
8710	Golf courses*
8900	Salt Storage Sites
8910	Groundwater Loadings
8920	Groundwater Withdrawal
8950	Other
9000	Unknown Source
9050	Sources outside State Jurisdiction or Borders*

Notes:

Bold type indicates a major source category; regular type indicates a subcategory. In addition to the above codes, WBS users can enter their own customized source codes. Code 8000 for "Other" has been deleted because it resulted in significant loss of detail nationwide.

See Appendix G for definitions of selected source categories.

* Codes changed or added since 1996 Guidelines.

** Agriculture is the only major source category with three tiers of codes (such as codes 1000, 1050, and 1100). EPA asks States to report size data for the "1000—Agriculture" code plus one or both of the other two tiers.

Appendix E
“Call-to-action” letter to USEPA’s Office of Pesticide Programs
(Bay Area Stormwater Management Agencies Association)



B A S M A A

July 2, 1999

Ms. Denise Keehner
Office of Pesticide Programs
Environmental Fate and Effects Division
USEPA
401 M Street, SW
Washington, DC 20460

Subject: Call to action - Pesticide-related toxicity in urban/suburban waters

Dear Ms. Keehner:

On behalf of the California Stormwater Quality Task Force, let me thank you again for making the trip to California to brief storm water agencies on the Office of Pesticide Programs' understanding and perspective on the growing problem of pesticide-related toxicity in urban and suburban surface waterbodies. We found your presentation informative and the information exchange very valuable. We were encouraged by the problem-solving opportunities raised in that meeting and it appears that recent events have brought those opportunities to the forefront.

Impact of 303(d) listing on local governments

As you no doubt know, on May 17, 1999, USEPA released a final decision on the 1998 section 303(d) (Clean Water Act) list of impaired water bodies in California. In its action, USEPA listed 53 waterbodies in California as impaired due to diazinon in urban runoff and 7 waterbodies as impaired due to chlorpyrifos in urban runoff. By definition under the Clean Water Act, this action means that there is a water quality problem, irregardless of the problem definitions under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (i.e., "unreasonable adverse effect") or the Food Quality Protection Act (FQPA). The listing action puts over 100 municipalities in the San Francisco Bay Area and Central Valley at immediate regulatory, legal, and financial risk.

- Regulatory risk - The State Water Resources Control Board and USEPA can take enforcement against and fine these municipalities for violating their NPDES storm water permits.
- Legal risk - Citizen and environmental groups can sue municipalities for the same reasons.
- Financial risk - These municipalities must now spend local public tax dollars proactively addressing this problem, and potentially reacting to fines and lawsuits.

As a result of these liabilities, we are very motivated to work with others to solve this problem.

National problem

A review of monitoring data from around the country shows that municipalities in the San Francisco Bay Area and Central Valley are not alone in this predicament.

- Orange County, California (1999) – Multi-year studies of storm water runoff in San Diego Creek as it enters Upper Newport Bay have shown that the problem is not restricted to Northern California. Runoff from each storm water event has been shown to be toxic, and about half of the observed toxicity is due to diazinon and chlorpyrifos used in urban areas for structural termite and ant control, and lawn and garden pest control.
- NAWQA (1998) – Results from the United States Geological Survey’s (USGS) National Water Quality Assessment Program from 1992 through 1996 show that the problem is in fact a national one. Over 300 samples have been taken from eleven urban streams scattered across the country from Florida to Connecticut to Oregon as part of the Pesticides National Synthesis Project. In a recent report on the first cycle of the program, USGS concluded that “urban and suburban areas are substantial sources of pesticides to streams” and that “most urban areas have similar pesticides in streams...and many urban areas may benefit from similar strategies for reduction.”
- Publicly-Owned Treatment Works survey (1989) – Results from a survey done 10 years ago by USEPA show that pesticide-related toxicity is a wastewater problem as well as a storm water problem. USEPA’s Environmental Research Laboratory in Duluth, working through the National Effluent Toxicity Assessment Center (NETAC), reported on the occurrence of diazinon in 28 POTW effluents. Diazinon was found in sixteen (62%) of the effluents, and levels were greater than or equal to 250 ng/L for nine (32%) of the effluents. NETAC concluded in part “The frequency with which we have observed diazinon in the past, in this survey, and continue to find it in effluents is indicative of a widespread problem.”

Clearly this is a national problem caused by products that are registered at the national level and sold across the country.

Municipalities’ Role

To comply with their NPDES storm water permits, municipalities must meet two broad goals:

1. effectively prohibit non-storm water discharges into storm sewers, and
2. reduce the discharge of pollutants to the maximum extent practicable (MEP).

To meet these goals, there’s a number of things Bay Area storm water programs have done or plan to do that may reduce pesticide-related toxicity in surface waters including:

- limiting or prohibiting pesticide use by municipal staff and contractors and/or requiring use of best management practices (BMPs) such as Integrated Pest Management;
- providing adequate and convenient options for disposal of unused pesticides and pesticide containers through household hazardous waste collection programs;
- educating residents about pesticide-related toxicity and proper use and disposal through distribution of educational materials, and development and implementation of media and advertising campaigns;
- educating residents about alternative methods and products through such programs as demonstration gardens and our acclaimed IPM Partnership—a point-of-purchase program in hardware stores and nurseries;
- educating businesses about proper use and disposal, as well as alternative methods and products for use around their own properties and facilities; and
- educating pest control operators and working with them to develop BMPs protective of surface waters.

We are and will continue to do our part to address the problem of pesticide-related toxicity in surface waters by way of meeting the MEP goal.

We can't do it alone

However, it is clear to us that our efforts alone will not be enough to solve this national problem. From our research, it appears that less than 1% of applied diazinon runs off, yet it takes less than a fluid ounce of active ingredient flushed into storm water runoff to cause toxicity in urban creeks. Our educational programs are some of the most developed in the country and they have won numerous awards for their quality and effectiveness. Nevertheless, even the best education programs are not 100% effective. It is clear that education alone will not solve this problem.

USEPA's Role

As the agency that sanctions the use of pesticides and the agency that lists waterbodies as impaired, USEPA's role in this situation seems very clear. The reregistration process currently underway for all organophosphate pesticides provides a timely and perhaps once-in-a-decade(s) opportunity to address this problem. With this letter, the more than 90 agencies, including 80 cities and 6 counties in the San Francisco Bay Area, represented by BASMAA formally request that USEPA exercise its federal authorities and seize this unique opportunity.

Opportunities

We see the following regulatory and scientific opportunities before us:

- Reregistration – Diazinon and chlorpyrifos are active ingredients in hundreds of products (“uses”). These potential uses are being reviewed now as part of the reregistration process. We request that the following be started immediately:
 - Identification of potentially problematic uses – Given the growing evidence of ubiquitous pesticide-related surface water toxicity, USEPA should review and identify all uses that are likely to come into contact with water. These uses would include those that: 1) require mixing; 2) recommend being “watered-in” or applied just before a rain; 3) can be applied in areas likely to contact water such as manholes, impervious surfaces (e.g., “crack and crevice”), and in and around creeks; and 4) come in formulations that may run off (e.g., granules or flakes that float). We offer to help develop the criteria for identifying these uses, and to work with USEPA and manufacturers to eliminate these uses from those listed on product labels.
 - Cost/benefit analysis – Considering the new evidence of widespread toxicity in urban areas, USEPA should consider and initiate one or more methods for conducting cost/benefit analyses:
 - More comprehensive cost/benefit analyses – The current cost/benefit approach is incomplete and therefore inaccurate. On the environmental cost side, the impacts on urban surface waters are underrepresented. On the economic benefit side, the mounting cost to local public agencies of dealing with the regulatory and legal liability caused by this national problem must be added to the calculation and considered against the private gains made by manufacturers.
 - FIFRA – Consider the costs and benefits of urban uses separately from agricultural uses. The needs, costs, and benefits of pesticide use are very different in these two environments and the cost/benefit analyses should reflect that fact.
- Case studies – California municipalities present the most advanced urban pesticide-related toxicity situation (educationally, scientifically, and regulatorily) in the country. USEPA should take advantage of this fact by supporting case studies on key scientific questions.

Our research has identified the following two categories of questions that need immediate investigation:

- Can legal use (according to label instructions) of diazinon and chlorpyrifos in urban areas be ruled out as a source of identified toxicity in urban runoff and POTW effluent?
- What application sites (e.g., pavement) and formulations (e.g., granules, flakes, non-ready-to-use) are most likely to be causing the identified toxicity?

We are ready to host case studies if USEPA will provide financial and other support, with the goal of conducting representative case studies whose results can be extrapolated across the country.

Given the gravity of the problem for cities, counties, and special districts across the country, we expect USEPA to respond to our call for action by considering all of these opportunities, and we stand ready to participate with you in that effort.

I will take the liberty of contacting you shortly to discuss these opportunities. In the meantime, if you have any questions, please contact me at (650) 322-3070.

Sincerely,

Geoff Brosseau, Executive Director

cc: Ms. Marcia Mulkey, Assistant Administrator, Office of Pesticide Programs (OPP), USEPA
Ms. Susan Wayland, Assistant Administrator, Office of Prevention, Pesticides, and Toxic Substances (OPPT), USEPA

Mr. J. Charles Fox, Assistant Administrator, Office of Water (OW), USEPA

Ms. Lois Rossi, Director, Special Review & Reregistration Division (SRRD), OPP, OPPT, USEPA

Mr. Jim Jones, Director, Registration Division, OPP, OPPT, USEPA

Mr. Ben Chambliss, SRRD, OPP, OPPT, USEPA

Mr. Michael Cook, Director, Office of Wastewater Management, OW, USEPA

Mr. Paul Helliker - Director, California Department of Pesticide Regulation (CDPR)

Mr. Doug Okumura, Asst. Director, Division of Enforcement and Environmental Monitoring, CDPR

Mr. Paul Gosselin, Asst. Director, Division of Registration and Health Evaluation, CDPR

Mr. Walt Pettit, Executive Director, State Water Resources Control Board (SWRCB)

Mr. Bruce Fujimoto, Chief, Storm Water Section, SWRCB

Ms. Loretta Barsamian, Executive Officer, California Regional Water Quality Control Board (RWQCB) – San Francisco Bay Region

Dr. Tom Mumley, Watershed Management Coordinator, California RWQCB – San Francisco Bay Region

Dr. Val Connor, Environmental Specialist, California RWQCB – Central Valley Region

Ms. Alexis Strauss, Director, Division of Water Management, Region IX, USEPA

Mr. David Smith, TMDL Coordinator, Region IX, USEPA

Mr. Dave Brent, Chairman, California Stormwater Quality Task Force

Mr. Bart Brandenburg, Source Control Superintendent, Central Contra Costa Sanitary District

BASMAA Board

Appendix F

**“Call-to-action” letter to USEPA Office of Water and Office of Pesticide Programs
(California Stormwater Quality Task Force)**



November 2, 1999

Ms. Carol Browner
Administrator
USEPA
401 M Street, SW
Washington, DC 20460

Ms. Susan Wayland
Assistant Administrator - Office of Prevention, Pesticides, and Toxic Substances (OPPTS)
USEPA
401 M Street, SW
Washington, DC 20460

Mr. J. Charles Fox
Assistant Administrator - Office of Water (OW)
USEPA
401 M Street, SW
Washington, DC 20460

Subject: Call to action – TMDLs and pesticide-related toxicity in urban/suburban surface waters

Dear Ms. Browner, Ms. Wayland, and Mr. Fox:

On behalf of the California Stormwater Quality Task Force, I am writing to urge that the U.S. Environmental Protection Agency focus its authorities and resources on the national problem of pesticide-related toxicity in urban/suburban surface waters. Our research indicates that in-stream toxicity is caused by use of common organophosphate pest control products sold at retail outlets and applied by commercial pesticide applicators throughout the country. While municipal stormwater agencies throughout California are aggressively pursuing public education campaigns it is clear to us that public education alone will not eliminate in-stream toxicity due to these pesticides. Solving a problem of such scale and complexity will take a coordinated, multi-media approach supported by USEPA's highest management levels.

The California Stormwater Quality Task Force (Task Force) was formed in 1989 to advise the California State Water Resources Control Board (State Board) on storm water discharge issues. In this capacity, the Task Force has assisted the State Board with the development and implementation of the storm water permitting processes. Our membership is composed of storm water management and storm water quality personnel from cities, counties, special districts, industries, and consultants throughout California.

In March of this year, Denise Keehner, Acting Director of the Environmental Fate and Effects Division, briefed the Task Force on the Office of Pesticide Programs' understanding and perspective on the growing problem of pesticide-related toxicity in urban and suburban surface waterbodies. We found her presentation informative and the information exchange valuable. We were encouraged by the problem-solving opportunities raised in that meeting and it appears that recent events have brought those opportunities to the forefront.

The problem

Water quality research conducted in California by storm water programs, wastewater treatment plants, and Regional Water Boards over the last several years has identified widespread toxicity in local creeks, urban runoff and wastewater treatment plant effluent. The toxicity problem was ultimately traced to diazinon and chlorpyrifos—commonly used organophosphate pesticides available in hundreds of consumer products. Study results indicated that pesticide use according to label instructions could not be ruled out as a cause of wastewater and storm water toxicity. Based on the water quality data, USEPA listed 53 waterbodies in California as impaired due to diazinon in urban runoff and 7 waterbodies as impaired due to chlorpyrifos in urban runoff as part of the final 1998 section 303(d) (Clean Water Act) list of impaired water bodies in California. As a result of the 303(d) listings and other legal actions, eight Total Maximum Daily Loads (TMDLs) for diazinon have been initiated in California, including at least one in virtually every major urban area of the state.

Impact of 303(d) listing on local governments

By definition under the Clean Water Act, the May 1999 listing action means that there is a water quality problem, regardless of the problem definitions under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (i.e., “unreasonable adverse effect”) or the Food Quality Protection Act (FQPA) (i.e., “reasonable certainty of no harm”). The listing action puts over 100 municipalities in California at immediate regulatory, legal, and financial risk.

Regulatory risk - The State Water Resources Control Board and USEPA can take enforcement action against and fine municipalities for violating their NPDES storm water permits.

Legal risk - Citizen and environmental groups can sue municipalities for the same reasons.

Financial risk - Municipalities must now spend local public tax dollars proactively addressing this problem, and potentially reacting to fines and lawsuits.

As a result of these liabilities, we are very motivated to work with others to solve this problem.

National problem

A review of monitoring data from around the country shows that municipalities in California are not alone in this predicament.

- NAWQA (1998) – Results from the United States Geological Survey's (USGS) National Water Quality Assessment Program from 1992 through 1996 show that the problem is in fact a national one. Over 300 samples have been taken from eleven urban streams scattered across the country from Florida to Connecticut to Oregon as part of the Pesticides National Synthesis Project. In a recent report on the first cycle of the program, USGS concluded that *“urban and suburban areas are substantial sources of pesticides to streams”* and that *“most urban areas have similar pesticides in streams...and many urban areas may benefit from similar strategies for reduction.”*

Specifically, USGS found that concentrations of diazinon exceeded the International Joint Commission (IJC) aquatic life criterion of 80 ng/L in eight of the eleven (73%) urban

streams sampled around the country in 1993 and 1994. Diazinon concentrations were estimated to exceed the criterion for extended periods (9 to 250 days per year) at seven of the eleven (64%) urban sites. The IJC established the Great Lakes water quality objective for diazinon of 80 ng/L in 1977. In December 1999, USEPA plans to publish final national water quality criteria for diazinon. The proposed freshwater acute (one-hour average) criterion is 90 ng/L to be exceeded no more than once every three years on the average. The proposed saltwater acute (one-hour average) criterion is 820 ng/L to be exceeded no more than once every three years on the average.

USGS also found that the most frequently detected pesticides were and continue to be the most heavily used. The most frequently detected insecticides—diazinon and chlorpyrifos—are ranked number 1 and 4 nationally among insecticides used for homes and gardens. Of even greater concern was the USGS finding that pesticides usually occur in mixtures. More than 50 percent of all stream samples (urban, agricultural, and intermediate) contained five or more pesticides. Almost 40% of the urban samples contained a mixture of the herbicides simazine, prometon, atrazine, and the insecticide diazinon. More than 10% of the urban stream samples contained a mixture of at least four herbicides plus diazinon and chlorpyrifos. These results prompted USGS to declare: *“Insecticides in urban streams, largely from use around homes and in gardens, parks, and commercial areas, frequently occur at levels of concern for aquatic life and may be a significant obstacle for restoring urban streams.”*

- Publicly-Owned Treatment Works survey (1989) – Results from a survey done 10 years ago by USEPA show that pesticide-related toxicity is a wastewater problem as well as a storm water problem. USEPA’s Environmental Research Laboratory in Duluth, working through the National Effluent Toxicity Assessment Center (NETAC), reported on the occurrence of diazinon in 28 POTW effluents. Diazinon was found in sixteen (62%) of the effluents, and levels were greater than or equal to 250 ng/L for nine (32%) of the effluents. NETAC concluded in part *“The frequency with which we have observed diazinon in the past, in this survey, and continue to find it in effluents is indicative of a widespread problem.”*

Clearly this is a national problem caused by products that are registered at the national level and sold across the country.

Municipalities’ Role

To comply with their NPDES storm water permits, municipalities must meet two broad goals:

- effectively prohibit non-storm water discharges into storm sewers, and
- reduce the discharge of pollutants to the maximum extent practicable (MEP).

To meet these goals, there are a number of things California storm water programs have done or plan to do that may reduce pesticide-related toxicity in surface waters including:

- limiting or prohibiting pesticide use by municipal staff and contractors and/or requiring use of best management practices (BMPs) such as Integrated Pest Management;
- providing adequate and convenient options for disposal of unused pesticides and pesticide containers through household hazardous waste collection programs;
- educating residents about pesticide-related toxicity and proper use and disposal through distribution of educational materials, and development and implementation of media and advertising campaigns;

- educating residents about alternative methods and products through such programs as demonstration gardens and our acclaimed IPM Partnership—a point-of-purchase program in hardware stores and nurseries;
- educating businesses about proper use and disposal, as well as alternative methods and products for use around their own properties and facilities; and
- educating pest control operators and working with them to develop BMPs protective of surface waters.

We are and will continue to do our part to address the problem of pesticide-related toxicity in surface waters by way of meeting the MEP goal.

We can't do it alone

However, it is clear to us that our efforts alone will not be enough to solve this national problem. From our research, it appears that less than 1% of applied diazinon runs off, yet it takes less than a fluid ounce of active ingredient flushed into storm water runoff to cause toxicity in an urban creek. Our educational programs are some of the most developed in the country and they have won numerous awards for their quality and effectiveness. Nevertheless, even the best education programs are not 100% effective.

It is clear that education alone will not solve this problem.

That fact will have significant regulatory, legal, and financial implications for every level of government—federal, state, and local—under the TMDL program. Under proposed revisions to the TMDL regulations, TMDLs would have to contain ten prescribed elements including an implementation plan. The implementation plan would have to include “*a demonstration that the control actions and/or management measures are expected to achieve the required pollutant loads*” (Federal Register 64, No. 162, 46051; 40 CFR 130.33(b)(10)(i), August 23, 1999).

It's highly unlikely that a diazinon toxicity TMDL could be written—that allocates loads to point and nonpoint sources, atmospheric deposition, and natural background—that will meet this requirement. These four “source” categories do not have absolute control over the uses, discharges, and emissions of pesticides to the environment. A significant amount of control rests with USEPA via the pesticide registration process.

USEPA's Role

As the agency that sanctions the use of pesticides and the agency that lists waterbodies as impaired, USEPA is the ultimate regulatory authority on this issue. The reregistration process currently underway for all organophosphate pesticides provides a timely and perhaps once-in-a-decade(s) opportunity to address this problem. With this letter, the fourteen Phase 1 municipal storm water programs represented by the California Stormwater Quality Task Force, formally request that USEPA exercise its federal authorities and seize this unique opportunity.

Opportunities

The registration review process provides two opportunities for USEPA to address the problem of organophosphate pesticides causing impaired waterbodies.

Phase 4–Revised Risk Assessments - The revised risk assessments produced during Phase 4 of the registration review should:

- Include all of the surface water data and studies demonstrating pesticide-related toxicity and potential water quality standard exceedances from across the country.
- Identify potentially problematic uses – Given the growing evidence of widespread pesticide-related surface water toxicity, USEPA should review and identify all uses that are likely to come into contact with water. These uses would include those that: 1) require mixing; 2) recommend being “watered-in” or applied just before a rain; 3) can be applied in areas likely to contact water such as manholes, impervious surfaces (e.g., “crack and crevice”), and in and around creeks; and 4) come in formulations that may run off (e.g., granules or flakes that float). We offer to help develop the criteria for identifying these uses, and to work with USEPA and manufacturers to eliminate these uses from those listed on product labels.
- Revise the cost/benefit analyses – Considering the new evidence of widespread toxicity in urban areas, USEPA should consider and initiate one or more methods for conducting cost/benefit analyses:
- More comprehensive cost/benefit analyses – The current cost/benefit approach is incomplete and therefore inaccurate. On the environmental cost side, the impacts on urban surface waters are underrepresented. On the economic benefit side, the mounting cost to local public agencies of dealing with the regulatory and legal liability caused by this national problem must be added to the calculation and considered against the private gains made by manufacturers.
- FIFRA – The costs and benefits of urban uses should be considered separately from agricultural uses. The needs, costs, and benefits of pesticide use are very different in these two environments and the cost/benefit analyses should reflect that fact.

Phase 6–Risk Management Strategies of the registration review should be used to:

- Ensure that TMDL implementation plans can be developed to comply with the requirement to demonstrate “*that the control actions and/or management measures are expected to achieve the required pollutant loads*” (Federal Register 64, No. 162, 46051; 40 CFR 130.33(b)(10)(i), August 23, 1999). To demonstrate that pollutant loads will be met, the risk management strategies developed under Phase 6 must identify and describe how USEPA will use the registration process to ensure that registered pesticides do not cause or contribute to the impairment of surface waters.
- Identify pest prevention and control methods that can effectively substitute for the problematic uses identified under Phase 4. While solving one environmental problem it’s vital to avoid creating a new one. Pest prevention and control will remain necessary activities so the key will be to identify and disseminate methods that have a significantly lower risk of causing water quality problems than the current methods.

In addition to the opportunities presented by the registration review process, we believe there are scientific opportunities as well. California municipalities present the most advanced urban pesticide-related toxicity situation (educationally, scientifically, and regulatorily) in the country. USEPA should take advantage of this fact by supporting case studies on key scientific questions. Our research has identified the following two categories of questions that need immediate investigation:

- Can legal use (according to label instructions) of diazinon and chlorpyrifos in urban areas be ruled out as a source of identified toxicity in urban runoff and POTW effluent?
- What application sites (e.g., pavement) and formulations (e.g., granules, flakes, “mix-your-own”) are most likely to be causing the identified toxicity?

In addition to the scientific work we have conducted to-date, we are ready to host case studies if USEPA will provide financial and other support, with the goal of conducting representative case studies whose results can be extrapolated across the country.

Given the gravity of the problem for cities, counties, and special districts across the country, we hope USEPA will respond to our call for action by considering all of these opportunities, and we stand ready to participate with you in that effort.

Please contact me at (916) 264-1420 if you have any questions about our comments.

Sincerely,

Dave Brent
Chairman – California Stormwater Quality Task Force

cc: Ms. Marcia Mulkey, Director, Office of Pesticide Programs (OPP), OPPTS, USEPA
Ms. Denise Keehner, Acting Director, Environmental Fate and Effects Division, OPP, OPPTS, USEPA
Ms. Lois Rossi, Director, Special Review & Reregistration Division (SRRD), OPP, OPPTS, USEPA
Mr. Jim Jones, Director, Registration Division, OPP, OPPTS, USEPA
Mr. Ben Chambliss, SRRD, OPP, OPPTS, USEPA
Mr. Michael Cook, Director, Office of Wastewater Management, OW, USEPA
Ms. Kim Kramer, Office of Wastewater Management, OW, USEPA
Ms. Hazel Groman, Office of Wetlands, Oceans and Watersheds, OW, USEPA
Mr. Paul Helliker - Director, California Department of Pesticide Regulation (CDPR)
Mr. Doug Okumura, Asst. Director, Division of Enforcement and Environmental Monitoring, CDPR
Mr. Paul Gosselin, Asst. Director, Division of Registration and Health Evaluation, CDPR
Mr. Walt Pettit, Executive Director, State Water Resources Control Board (SWRCB)
Mr. Bruce Fujimoto, Chief, Storm Water Section, SWRCB
Dr. Tom Mumley, TMDL Coordinator, California RWQCB – San Francisco Bay Region
Dr. Val Connor, Environmental Specialist, California RWQCB – Central Valley Region
Ms. Felicia Marcus, Regional Administrator, Region IX, USEPA
Ms. Alexis Strauss, Director, Division of Water Management, Region IX, USEPA
Mr. David Smith, TMDL Coordinator, Region IX, USEPA
Mr. Bart Brandenburg, Source Control Superintendent, Central Contra Costa Sanitary District
Mr. Geoff Brosseau, Executive Director, Bay Area Stormwater Management Agencies Association
Executive Committee – California Stormwater Quality Task Force