

DWR WAREHOUSE

## I. Executive Summary

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of the proposal entitled  
Urban Contribution of Diazinon and Chlorpyrifos to the Instream  
Aquatic Habitat of the Lower Sacramento and San Joaquin Rivers

Submitted by the  
Department of Pesticide Regulation  
to the  
CALFED BAY-DELTA PROGRAM

**Project Description/Ecological Objectives**

Every department or agency (Department of Pesticide Regulation, U.S. Geological Survey, U.C. Davis and the Regional Water Quality Control Board) which has investigated the presence of diazinon and chlorpyrifos in the instream aquatic habitat in January and February in the Central Valley have found concentrations known to be toxic to sensitive aquatic organisms. This project would enable the Department of Pesticide Regulation (DPR) to evaluate the urban activities which contribute to finds of diazinon and chlorpyrifos in the instream aquatic environment and determine the scope of the problem.

Through the identification of problem use patterns and the subsequent implementation of mitigation measures, episodes of contamination can be reduced or eliminated in the areas of concern. This will improve the health of the instream aquatic habit, including the fishery, which will in turn enhance the recreational value of the river systems.

**Approach/Tasks/Schedule**

DPR will first gather information from the open literature, other state departments and publicly owned treatment works. Interviews with individuals holding Qualified Applicator Certificates will follow. The end result will be a picture of the scope and magnitude of the problem, as well as an understanding of the mechanism(s) of contamination as they relate to diazinon and chlorpyrifos use.

DPR proposes the following schedule for the two year study:

- Year 1: Complete literature search of diazinon and chlorpyrifos; gather information from state departments and POTWs. Begin interviewing QACs.
- Year 2: Complete QAC interviews; compile report; develop recommendations for solutions to identified problems.

## **Justification for Project and Funding by CALFED**

Budgetary restrictions will not allow DPR to expend currently available resources on this project which is designed to improve the water quality of the instream aquatic habitat.

## **Budget Costs and Third Party Impacts**

The total budget for this project is approximately \$232,000: \$62,232 for phase one; \$54,232 for phase two; \$58,832 for phase three; and \$56,232 for phase four. We request \$232,000 from CALFED.

The activities of the public in the urban environment, and those of PCAs and QACs may be impacted as a result of this study. These groups may be the target of educational programs, in the case of the public, and revised training programs, in the case of PCAs and QACs.

## **Applicant Qualifications**

DPR bears responsibility for the regulation of pesticides in the state and as such is staffed with scientists familiar with pesticide issues. The principal investigator for this project will be Mr. Roger Sava, Senior Environmental Research Scientist.

## **Monitoring and Data Evaluation**

Data evaluation will include examining the occurrences, causes and sources of diazinon and chlorpyrifos contamination, especially from the information gathered from the State Water Resources Control Board, the Regional Water Quality Control Boards and publicly owned treatment works. DPR staff will attempt to define the scope and sources of the contamination derived from the urban environment.

## **Local Support/Coordination with other Programs/Compatibility with CALFED Objectives**

The CALFED Water Quality Program's goal is to provide good water quality for environmental, agricultural, drinking water, industrial, and recreational beneficial uses. The water quality program includes programmatic actions to reduce water quality degradation from agricultural drainage, urban and industrial runoff, and other sources. This project's purpose is to develop management practices to reduce urban sources of diazinon and chlorpyrifos which are contaminants of concern to the CALFED Bay Delta Program.

## II. TITLE PAGE

Urban Contribution of Diazinon and Chlorpyrifos  
to the Instream Aquatic Habitat of the Lower Sacramento  
and San Joaquin Rivers

### Name of Applicant

California Department of Pesticide Regulation

### Principal Investigator

Mr. Roger Sava  
Senior Environmental Research Scientist  
Environmental Monitoring and Pest Management Branch  
Department of Pesticide Regulation  
1020 N Street, Room 161  
Sacramento, California 95814

Telephone: (916) 324-4131

Fax: (916) 324-4088

### Type of Organization/Tax Status/Tax Identification Number

California state Agency; Tax Exempt  
Tax Identification Number: 68-0325102

### Technical and Financial Contact Person

Technical: Mr. Roger Sava (see above)  
Financial: Ms. Toni Boyer  
Department of Pesticide Regulation  
1020 N Street, Room 129  
Sacramento, California 95814  
(916) 445-3891  
Fax: (916) 445-4149

### Participants/Collaborators in Implementation

Ms. Valerie Conner  
Regional Water Quality Control Board, Region 5  
3443 Routier Road  
Sacramento, California 95827-3098  
(916) 255-3111  
Fax: (916) 255-3015

### Request for Proposal Group Type

Group 3: Other Services

### III. Project Description

#### a. Project Description and Approach

This project would enable the Department of Pesticide Regulation (DPR) to evaluate the urban activities which contribute to finds of diazinon and chlorpyrifos in the instream aquatic environment. In addition, DPR hopes to estimate the scope of the urban contribution to contamination.

The project would focus on the Delta area, specifically the lower reaches of the Sacramento and San Joaquin river systems. This project would lay the foundation for further DPR activities.

DPR has developed a standard approach to pesticide contamination identification and solution implementation; this approach includes drawing upon all available information in the scientific literature and from the various agencies, departments and private water treatment facilities. DPR then correlates finds of pesticides with finds of toxicity to determine if there is a pattern over time and space. Our task is to identify such patterns and then evaluate their specific causes. This study will allow DPR to make such an evaluation.

Achieving the stated objective would entail compiling and evaluating information to identify the urban use patterns which enable diazinon and chlorpyrifos to contaminate surface water. This evaluation would also focus on determining the scope of contamination which is derived from urban activity.

The objective of this project would be achieved through the following actions:

- A literature review of appropriate scientific articles.
- Evaluation of pesticide sales data, specifically for diazinon and chlorpyrifos.
- Review of product labels for products containing diazinon and chlorpyrifos to identify "problem use patterns"--uses which may enable the chemicals to gravitate to surface water.
- Compilation of data from publicly owned treatment works (POTWs).
- Compilation of State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB) memos which identify contamination episodes and contain information on toxicity test results from urban runoff.
- Evaluation of stormwater runoff data, including data from POTWs.

- Interviews with individuals who hold Qualified Applicator Certificates (QACs), namely the staff of public agencies or private businesses who are not required by law to report pesticide use. (Interview 10% of the QACs in the three counties of interest--240 individuals.)

b. Project Location

The project location will include the lower Sacramento and San Joaquin River watershed areas including Sacramento, San Joaquin and Contra Costa counties.

c. Expected Benefits

The primary benefit this study will provide will be the eventual reduction of instream aquatic habitat contamination by diazinon and chlorpyrifos. Contamination by these two pesticide active ingredients has been observed in recent years and is believed to be responsible for toxicity to native aquatic organisms.

Through the identification of problem use patterns and the subsequent implementation of mitigation measures, episodes of contamination can be reduced or eliminated in the areas of concern. This will improve the health of the instream aquatic habit, including the fishery, which will in turn enhance the recreational value of the river systems.

d. Background and Biological/Technical Justification

Every department or agency (Department of Pesticide Regulation, U.S. Geological Survey, U.C. Davis and the RWQCB) which has investigated the presence of diazinon and chlorpyrifos in the instream aquatic habitat in January and February in the Central Valley have found concentrations known to be toxic to sensitive aquatic organisms.

The RWQCB conducted a study in 1992 in which they found diazinon in about half of all small water courses surveyed during dry periods; all drainages became toxic after a large storm. The San Joaquin River exported acutely toxic concentrations of diazinon for eight days after the largest storm of the year.

The U.S. Geological Survey and RWQCB followed up on these observations in the winter of 1993 and attempted to measure dormant spray insecticides (including diazinon and chlorpyrifos) in both the Sacramento and San Joaquin Rivers after rainstorms. Elevated concentrations of diazinon were observed in both rivers after the two largest rainfall events of the year. During the first storm, the San Joaquin River at Vernalis contained toxic concentrations of diazinon for 12 days. Toxic pulses of pesticide were traced as far north as Rough and Ready Island at the city of Stockton. On the second occasion, diazinon concentrations from the Sacramento River were sufficiently high

to cause the water flea, *Ceriodaphnia*, mortality in water samples taken as far west in the estuary as Port Chicago.

A two-and-a-half year bioassay study conducted between 1988-1990 revealed that there was a 43 mile stretch of the San Joaquin River between the confluence of the Merced and Stanislaus rivers which tested toxic about half of the time to *Ceriodaphnia*, the invertebrate component of the bioassay test. (While *Ceriodaphnia* does not occur in California, this organism is about as sensitive as some common local organisms, such as *Chironomus tentans*, *Gammarus fasciatus* and *Daphnia magna*.) Therefore, the data suggest that pesticide levels measured in the San Joaquin Basin impact local organisms.

Mesocosm studies conducted by the manufacturer of diazinon demonstrate that it takes about two months for population levels of sensitive organisms to recover after exposure to toxic levels of the pesticide. The San Joaquin River and portions of the Delta have been found repeatedly throughout the year to contain toxic concentrations of diazinon and chlorpyrifos. Therefore, population recovery of sensitive aquatic organisms, as suggested by the mesocosm studies, seems unlikely.

Chlorpyrifos was detected in nine out of 44 samples collected along the San Joaquin River in January and February of 1993; concentrations ranged from 0.06 to 0.22 micrograms per liter (ug/L). The U.S. Environmental Protection Agency instantaneous maximum was exceeded at two sampling sites.

The goal of this new project is to identify the urban practices responsible for the contamination of the instream aquatic habitat. Through this process, DPR plans to identify subsequent actions which will mitigate identified problems. Applied mitigation will be geared toward reducing or eliminating pesticide residues and thereby improving instream water quality and providing an improved habitat for aquatic organisms.

DPR is aware of the contribution the agricultural community makes to the contamination of surface water through the use of dormant sprays (which include the active ingredients diazinon and chlorpyrifos). In response to this problem, DPR developed the Dormant Spray Program, which was initiated to develop strategies to reduce or eliminate contamination from the agricultural use of these pesticides. Unfortunately, DPR has far less information on the mechanisms and magnitude of the urban contribution to diazinon and chlorpyrifos contamination, which DPR believes may be significant.

#### e. Proposed Scope of Work

In order to complete the report which will be the end product of this study, DPR will first gather information from the open literature, other state departments and the POTWs. Interviews with QACs will follow. The end result will be a picture of the

scope and magnitude of the problem, as well as an understanding of the mechanism(s) of contamination as they relate to diazinon and chlorpyrifos use. From this study, DPR plans to determine what further action is needed.

DPR proposes the following schedule for the two year study:

Year 1: Complete literature search of diazinon and chlorpyrifos; gather information from state departments and POTWs. Begin interviewing QACs.

Year 2: Complete QAC interviews; compile report; develop recommendations for solutions to identified problems.

The report may, depending upon the conclusions reached, include:

- A list of potential regulatory solutions to identified problems.
- A recommendation for changes in training requirements for PCAs and QACs.
- A list of possible actions the department will take to eliminate or reduce contamination.
- Recommendations for a pollution prevention effort.
- A recommendation for Integrated Pest Management training for QACs and others (voluntary program).
- A recommendation to develop training manuals.
- A list of proposed best management practices.
- Monitoring recommendations.

Financial reports related to the implementation of this study will be submitted semi-annually, or at the request of CALFED.

#### f. Monitoring and Data Evaluation

Data evaluation will include examining the occurrences, causes and sources of diazinon and chlorpyrifos contamination, especially from the information gathered from the SWRCB, RWQCB and the POTWs. DPR staff will attempt to define the scope of the contamination which comes from the urban environment.

DPR plans to share this data with the POTWs and the SWRCB and the RWQCB to assist in the development and implementation of solutions to identifiable contamination problems. A draft of the report will be circulated to contributing departments and POTWs, thus enabling a peer review of the data.

#### g. Implementability

Since DPR is responsible for the regulation of pesticide use within the State of California, including the development of pesticide use permit conditions and the development of training programs through which pesticide applicator licenses are procured, it is well within DPR authority to develop the measures necessary to abate contamination from pesticide products.

**IV. Costs and Schedule to Implement Proposed Project**

See Table 1 for a complete cost breakdown of each project phase.

**a. Budget Costs**

Direct Salary and benefit costs:	<u>2 Year Totals</u>
Principal Investigator (10% time)	\$11,800
Associate Environmental Research Scientist	<u>104,400</u>
TOTAL SALARY	\$116,800
Indirect Overhead Labor Costs (31.77%)	\$36,900
Costs of Service Contracts	
Temporary Student Hires (2) for 2 Years	\$48,000
Indirect Overhead Labor Costs (25%)	<u>12,000</u>
TOTAL SALARY	\$60,000
Costs of Material/Acquisition Contracts	
Printing	\$2,000
Miscellaneous and Other Direct Costs	
Dialog Searches	\$10,000
Travel (25 Interviews)	5,000
Telephone (50 Interviews)	1,500
Postage (165 Interviews)	<u>100</u>
TOTAL MISC.	\$16,600
<b>TOTAL STUDY COST</b>	<b>\$232,000</b>
	(rounded to nearest \$1,000)

**Basis/Need for CALFED Funding:**

Budgetary restrictions will not allow DPR to expend currently available resources on this particular project. If only incremental funding could be made available, Phase I funding would be the most helpful.

<b>b. <u>Schedule Milestones</u></b>	<u>Start Date</u>	<u>Completion</u>
<b>Phase I</b>	1/98	6/98
Literature Review		
Review of Pesticide Sales Data		
Review of Product Labels		
<b>Phase II</b>	7/98	12/98
Compilation of POTW Data		
Compilation of SWRCB & RWCQB Memos		
Evaluation of Stormwater Data		
<b>Phase III</b>	1/99	6/99
Interviews with Pesticide Applicators (QACs)		

**Phase IV**

7/99

12/99

Complete Evaluation, Prepare Recommendations,  
Write Report

Payments may be made to DPR on either a quarterly basis or as each project phase is completed.

c. Third Party Impacts

The activities of the public in the urban environment, and those of PCAs and QACs may be impacted as a result of this study. These groups may be the target of educational programs, in the case of the public, and revised training programs, in the case of PCAs and QACs.

In addition the POTWs may, depending upon study results, adopt their own public education campaigns to help reduce or eliminate diazinon and chlorpyrifos contamination in their districts.

**V. Applicant Qualifications**

Project Manager: Mr. Roger Sava  
Senior Environmental Research Scientist

Mr. Sava has worked with the Department of Pesticide Regulation/Department of Food and Agriculture since 1976 (See Attachment 1). During this time he has supervised numerous complex research studies (including the medfly project). In addition, he has supervised the activities of two remote field facilities.

Project Assistant: Associate Environmental Research Scientist  
(To be hired)

This classification is responsible for planning, organizing, and coordinating scientific and/or technical research and statistical work in environmental hazard assessment, pest management, biological control, and health and safety. Associates organize and direct surveys, devise survey techniques and instruct others in their use. Associates often have lead project responsibility over other scientists and seasonals.

Graduate Student Assistants (2): (To be hired)

These students would be chosen from statistical and/or biological programs at the local universities.

**VI. Compliance with Standard Terms and Conditions**

A Non-discrimination Compliance Statement is attached (Attachment 2). The terms and conditions are agreeable to, and able to be complied with, by DPR.

**NONDISCRIMINATION COMPLIANCE STATEMENT**

STD. 19 (REV. 2-93)

COMPANY NAME

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, and denial of family care leave.

**CERTIFICATION**

*I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.*

OFFICIAL'S NAME

Paul H. Gosselin

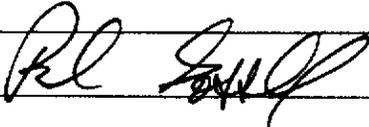
DATE EXECUTED

7/25/97

EXECUTED IN THE COUNTY OF

Sacramento

PROSPECTIVE CONTRACTOR'S SIGNATURE



PROSPECTIVE CONTRACTOR'S TITLE

Assistant Director, Division of Enforcement, Environmental Monitoring and Data Management

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Dept. of Pesticide Regulation