STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – DIVISION OF WATER QUALITY
FEBRUARY 15, 2011

ITEM 3

SUBJECT

CONSIDERATION OF ADOPTION OF THE STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES FROM VECTOR CONTROL APPLICATIONS (VECTOR CONTROL PERMIT)

DISCUSSION

The proposed Vector Control Permit has been prepared in response to the *National Cotton Council of America vs. USEPA* decision by the Sixth Circuit Court of Appeals which requires that pesticide applications at, near, or over water that could result in a discharge of pollutants to waters of the United States must be covered by an NPDES permit.

Applicability: The proposed Vector Control Permit covers discharges of biological and residual pesticides from vector control applications. The proposed permit does not authorize the discharge of biological and residual pesticides and their degradation byproducts to waters of the United States that are impaired by the active ingredients of the products covered in the proposed permit. Impaired waters are those waters not meeting water quality standards pursuant to Section 303(d) of the CWA. California impaired waters are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls.

Enrollment Process: To obtain authorization under the proposed Vector Control Permit, dischargers must submit a complete application package [Notice of Intent (NOI) Form, Pesticide Application Plan (PAP), and an application fee] to the State Water Board. Permit coverage will be effective when (1) the discharger has submitted a complete permit application; (2) the PAP has been posted on the State Water Board's website for a 30-day public comment period; and (3) the State Water Board Deputy Director of the Division of Water Quality (Deputy Director) has approved the PAP and issued a Notice of Applicability (NOA). The discharger is authorized to discharge starting on the date of the NOA. Alternatively, the Deputy Director may: (1) issue a Notice of Exclusion, which either terminates coverage under the Vector Control Permit; or (2) require submittal of an application for an individual permit or an alternative general permit.

Effluent Limitations: It is infeasible for the State Water Board to establish numeric effluent limitations because: (1) in pesticide applications, there is no effluent per se because the pesticide products do not become pollutants until after they become residuals; (2) at which point the pesticide products become residuals and, therefore, pollutants is unknown because of the varying amounts of pesticides applied and different environmental conditions when they are applied; (3) it would be impractical to treat numerous short duration intermittent biological and residual pesticide releases to surface waters from many different locations; and (4) treatment, in many cases, may render the pesticide useless for vector control. Therefore, the effluent limitations contained in the proposed Vector Control Permit are narrative and include requirements to develop and implement a PAP that describes appropriate Best Management Practices (BMPs), including compliance with all pesticide label instructions and narrative receiving water limitations.

Receiving Water Limitations: U.S. EPA has established an ambient water quality criterion of 0.1 µg/l both as a continuous concentration (four-day average) and an instantaneous maximum concentration for the protection of freshwater aquatic life for malathion. Thus, to protect the beneficial uses of the receiving water from residual malathion, the Vector Control Permit contains an instantaneous maximum limitation of 0.1 µg/l.

Receiving Water Monitoring Triggers: With the exception of malathion, information regarding biological and residual pesticides discharged to the receiving water as a result of pesticide applications is not adequate to develop receiving water limitations for individual and combinations of pollutants. Therefore, the proposed Vector Control Permit contains Receiving Water Monitoring Triggers, instead of Receiving Water Limits for residual pesticides of concern, other than malathion.

Monitoring and Reporting Program: The Vector Control Permit requires dischargers to submit a monitoring and reporting program to determine compliance with permit requirements. The monitoring program shall include chemical and toxicity testing. Chemical testing will be used to determine if the active ingredients in the pesticide products exceed their receiving water limit (malathion) or triggers. For chemical testing, the discharger shall collect in each environmental setting (agricultural, urban, or wetland), six samples for each active ingredient if the pesticide containing the active ingredient is applied six or more times a year. If applying less than six times a year, the discharger shall collect a sample for each active ingredient every time the product containing the active ingredient is applied in each environmental setting (agricultural, urban, or wetland). For toxicity testing, the discharger must comply with the requirements that the State Water Board will adopt at the Board meeting. The State Water Board may choose one of the five options shown below or decide on its own motion what the toxicity requirements should be, if any. If the State Water Board adopts the Vector Control Permit with toxicity testing requirements, such requirements will apply to each adulticide active ingredient, but only to temephos for the larvicides. Staff recommends Option D of the five options shown below:

A. Toxicity Testing

   This General Permit does not require toxicity testing.

B. Toxicity Testing

   This General Permit does not require toxicity testing. However, the coalition or discharger shall conduct a priority pollutant scan and a pesticide scan of each product to determine if priority pollutants and/or pesticides [constituents of concern (COCs)] are present in the formulation that may pose a threat to water quality. If the scan shows the presence of COCs, besides the active ingredient, this General Permit may be reopened to set receiving water limits or triggers on the COCs to protect water quality. If the scan shows no COCs, this General Permit will require continued testing for the active ingredient only.

C. Toxicity Testing

   The coalition or discharger shall meet the following toxicity testing requirements:

   1. Monitoring Frequency – Each coalition or discharger shall conduct toxicity testing at each environmental setting (agricultural, urban, or wetland) in conjunction with the chemical testing for each active ingredient to determine whether residual pesticides including active ingredients, inert ingredients, and degradation byproducts, in any combination, are causing or contributing toxicity to the receiving water. If feasible, the required six consecutive samples specified below shall be collected in the same water body.

Larvicides
For the first application, the coalition or discharger shall collect samples only for Post-Event toxicity testing. If the Post-Event toxicity testing shows no toxicity, the coalition or discharger shall continue taking only Post-Event samples until a total of six consecutive Post-Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Post-Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the discharger is causing or adding toxicity in the Background receiving water, the coalition or discharger shall collect paired Background and Post-Event samples. When a total of six consecutive paired Background and Post-Event sample results show that the discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Post-Event sample result shows that the discharger is causing or adding toxicity to the receiving water, the coalition or discharger shall evaluate its application methods, BMPs, or the use of alternative products. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application.

Adulticides
For the first application, the coalition or discharger shall collect samples only for Event toxicity testing. If the Event toxicity testing shows no toxicity, the coalition or discharger shall continue taking only Event samples until a total of six consecutive Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the discharger is causing or adding toxicity in the Background receiving water, the coalition or discharger shall collect paired Background and Event samples. When a total of six consecutive paired Background and Event sample results show that the discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Event sample result shows that the discharger is causing or adding toxicity to the receiving water, the coalition or discharger shall evaluate its application methods, BMPs, or the use of alternative products. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application.

2. Requirements C.2 through C.7 (Sample Types, Sample Volumes, Test Species, Methods, Quality Assurance, and Dilution Series, respectively) remain the same as presented in the draft permit posted for public comment.

D. Toxicity Testing

The coalition or discharger shall meet the following toxicity testing requirements:

1. *Monitoring Frequency* – Each coalition or discharger shall conduct toxicity testing at each environmental setting (agricultural, urban, or wetland) in conjunction with chemical testing to determine whether residual pesticides including active ingredients, inert ingredients, and degradation byproducts, in any combination, are causing or contributing toxicity to the receiving water. If feasible, the required six consecutive samples specified below shall be collected in the same water body.

   Larvicides
   For the first application, the coalition or discharger shall collect one Background sample and one Post-Event sample in the application area for toxicity testing. If the Background sample result shows no toxicity, the coalition or discharger shall continue taking only Post-Event samples until a total of six consecutive Post-Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Post-Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the discharger is causing or adding toxicity to the Background receiving water, the coalition or discharger shall collect paired Background and Post-Event samples. When a total of six consecutive paired Background and Post-Event sample results show that the discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Post-Event sample result shows that the discharger is causing or adding toxicity to the receiving water, the coalition or discharger shall evaluate its application methods, BMPs, or the use of alternative products.

   Adulticides
   For the first application, the coalition or discharger shall collect one Background sample and one Event sample in the application area for toxicity testing. If the Background sample result shows no toxicity, the coalition or discharger shall continue taking only Event samples until a total of six consecutive Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the discharger is causing or adding toxicity to the Background receiving water, the coalition or discharger shall collect paired Background and Event samples. When a total of six consecutive paired Background and Event sample results show that the discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Event sample result shows that the discharger is causing or adding

toxicity to the receiving water, the coalition or discharger shall evaluate its application methods, BMPs, or the use of alternative products.

2. Requirements C.2 through C.7 (Sample Types, Sample Volumes, Test Species, Methods, Quality Assurance, and Dilution Series, respectively) remain the same as presented in the draft permit posted for public comment.

E. Toxicity Testing

This is the language in the draft permit posted for public comment:

Each coalition or discharger shall conduct toxicity testing to determine whether residual pesticides are contributing toxicity to the receiving water. The coalition or discharger shall meet the following toxicity testing requirements:

1. *Monitoring Frequency* – For larvicides, each coalition or discharger shall perform the toxicity testing in conjunction with the Background and Post-Event Monitoring for active ingredients and at testing frequency specified in Tables C-1 (Coalition or Individual Monitoring Requirements for Larvicides). For adulticides, each coalition or discharger shall perform the toxicity testing in conjunction with the Background and Event Monitoring for active ingredients and at testing frequency specified in Tables C-2 (Coalition or Individual Monitoring Requirements for Adulticides).
2. Requirements C.2 through C.7.

POLICY ISSUE

Should the State Water Board adopt the proposed Vector Control Permit?

FISCAL IMPACT

State Water Board staff work associated with or resulting from this action will be addressed with existing and future budgeted resources.

REGIONAL BOARD IMPACT

Yes. The Regional Water Boards have the responsibility to enforce the proposed Vector Control Permit.

STAFF RECOMMENDATION

The State Water Board should adopt the proposed Vector Control Permit.

State Water Board action on this item will assist the Water Boards in reaching Goal 6 of the Strategic Plan Update: 2008-2012 to enhance consistency across the Water Boards, on an ongoing basis, to ensure our processes are effective, efficient, and predictable, and to promote fair and equitable application of laws, regulations, policies, and procedures. In particular, approval of this item will assist in fulfilling Objective 6.2 to target consistency improvements in program delivery identified through past input, and solicit input to identify consistency issues as they arise.

STATE WATER RESOURCES CONTROL BOARD

1001 I Street, Sacramento, California 95814
http://www.waterboards.ca.gov/water_issues/programs/npdes/aquatic.shtml

WATER QUALITY ORDER NO. 2011-XXXX-DWQ
GENERAL PERMIT NO. CAG XXXXXX

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM VECTOR CONTROL APPLICATIONS

The following Dischargers may apply for coverage under this General Permit in compliance with the waste discharge requirements as set forth in this General Permit:

Table 1. Discharger Information

Dischargers	Dischargers of biological and residual pesticides to waters of the United States (US) for vector control.

Table 2. Administrative Information

This General Permit was adopted by the State Water Resources Control Board (hereinafter State Water Board) on:	**<Adoption Date>**
This General Permit shall become effective on:	**<Effective Date>**
This General Permit shall expire on:	**<Expiration Date>**
The U.S. Environmental Protection Agency (USEPA) and the State Water Board have classified this discharge as a **minor** discharge.	

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this General Permit with all attachments is a full, true, and correct copy of the General Permit adopted by the State Water Board on **<Adoption Date>**.

AYE: _____

NO: _____

ABSENT: _____

ABSTAIN: _____

_____

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I. DISCHARGE INFORMATION

Pesticide formulations may include "active ingredients"[1] and "inert ingredients"[2]. Adjuvants[3] or surfactants may be added to the ingredients in the application equipment that is used in the delivery of the pesticide. As part of the registration process of pesticides for use in California, USEPA and the California Department of Pesticide Regulation (DPR) evaluate data submitted by registrants to ensure that a product used according to label instructions will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions. The Clean Water Act (CWA), at section 301(a), broadly prohibits the discharge of any pollutant to waters of the US*, except in compliance with an NPDES permit. Biological and r~~R~~esidual pesticides* discharged into surface waters constitute pollutants within the meaning of the CWA even if the discharge is in compliance with the registration requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Therefore, coverage under an NPDES permit is required.

The discharge of biological and residual pesticides to waters of the US from larvicide* and adulticide*[4] applications for vector control[5] throughout the State of California may pose a threat to existing and potential beneficial uses of waters of the US if not properly controlled and regulated. Therefore, this General Permit incorporates discharge prohibitions contained in water quality control plans (Basin Plans), as implemented by the State Water Board and the nine Regional Water Quality Control Boards (Regional Water Boards).

II. PERMIT COVERAGE AND APPLICATION REQUIREMENTS

A. General Permit Coverage

This General Permit covers the point source discharge of biological and residual pesticides ~~pesticide residues~~ resulting from direct and spray applications for vector control using: 1) larvicides containing monomolecular films, methoprene, *Bacillus thuringiensis* subspecies *isralensis* (or *Bti*), *Bacillus sphaericus* (or *B. Sphaericus*), temephos, petroleum distillates, or spinosad; and 2) adulticides containing malathion, naled, pyrethrin, permethrin, resmethrin, sumithrin, prallethrin, piperonyl butoxide (PBO), etofenprox, or N-octyl bicycloheptene dicarboximide (or MGK-264). Users of products containing these active ingredients are required to obtain coverage under this General Permit prior to application to waters of the US. This General Permit only covers the discharge of larvicides and adulticides that are currently registered in

[1] Active ingredients are manufacturer disclosed ingredients that yield toxic effects on target organisms.
[2] Inert ingredients are additional ingredients and are often trade secrets; therefore, they are not always disclosed by the manufacturer.
[3] Adjuvants are ingredients that are added to pesticides during an application event and are often trade secrets. These ingredients are chosen by the Discharger, based on site characteristics, and typically increase the effectiveness of pesticides on target organisms.
[*] Defined in Attachment A – Definitions.
[4] This General Permit does not cover biological pesticides for adulticide applications.
[5] Vector is defined in this General Permit as mosquitoes, black flies, and midges.

California. Attachments E and F[6] list the currently registered products containing these active ingredients.

B. Discharger

A Discharger under this General Permit ~~is~~ includes any entity involved in the application of vector control pesticides that results in a discharge of biological and residual pesticides~~pesticide residuals~~ to waters of the US, and meets either or both of the following two criteria:

1. The entity has control over the financing for or the decision to perform pesticide applications that result in discharges including the ability to modify those decisions; or
2. The entity has day-to-day control of pesticide application or performs activities that are necessary to ensure compliance with this General Permit. For example, the entity is authorized to direct workers to carry out activities required by this General Permit or perform such activities themselves.

C. General Permit Application

To obtain authorization under this General Permit, Dischargers must submit a complete application ~~as described below~~ to the State Water Board as described below:

1. A Notice of Intent (NOI shown as Attachment G) signed in accordance with the signatory requirements of the Standard Provisions in Attachment B;
2. An application fee; and
3. A Pesticide Application Plan (PAP).

State and Regional Water Board staff will review the application package for completeness and applicability under this General Permit. Additionally, the State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) may issue a Notice of Exclusion (NOE)[7], which either terminates coverage under this General Permit or requires submittal of an application for an individual permit or alternative general permit.

Permit coverage will be effective when all of the following have occurred:

1. The Discharger has submitted a complete permit application;

[6] The California Department of Public Health (formerly Department of Health Services) has provided the State Water Board with the lists of mosquito adulticides and larvicides most commonly used in California.

[7] An NOE is a one-page notice that indicates and justifies why the Discharger or proposed Discharger is not eligible for coverage under this General Permit. This justification can include, but is not limited to, the necessity to comply with a total maximum daily load (~~TDML~~TMDL) or to protect sensitive water bodies. The NOE can also indicate that the coverage is denied if feasible alternatives to the selected pesticide application project are not analyzed.

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2. The PAP has been ~~accepted by~~ posted on the State Water Board's ~~Deputy Director of the Division of Water Quality~~ website for a 30-day for comment period[8] and approved by the Deputy Director; and

3. The ~~State Water Board~~ Deputy Director ~~of the Division of Water Quality~~ has issued a Notice of Applicability (NOA). The NOA will specify the pesticide products or type(s) of pesticides that may be used and any Regional Water Board specific conditions and requirements not stated in this General Permit. Any such Region-specific conditions and requirements shall be enforceable. The Discharger is authorized to discharge starting on the date of the NOA.

D. Fees

~~Under this General Permit, pesticide discharges require minimal or no treatment systems to meet the limits and pose no significant threat to water quality. As such, they are eligible for~~ The annual fee for enrollment under this General Permit shall be based on Category 3 in section 2200(b)(8) of Title 23, California Code of Regulations (CCR). This category is appropriate because pesticide applications incorporate best management practices (BMPs) to control potential impacts to beneficial uses, and this General Permit prohibits the discharge of biological and residual pesticides ~~-~~causing exceedance of water quality objectives. The annual fee associated with this rating can be found in section 2200(b)(8) of Title 23, CCR, which is available at http://www.waterboards.ca.gov/resources/fees/docs/fy10_11_fee_schedule.pdfhttp://www.waterboards.ca.gov/resources/fees/~~http://www.waterboards.ca.gov/resources/fees/~~ and is payable to the State Water Board.

E. Terminating Coverage

To terminate permit coverage, a Discharger must submit a complete and accurate Notice of Termination (NOT) provided in Attachment H. ~~-~~The Discharger's authorization to discharge under this General Permit terminates on the date of the coverage termination letter issued by the State Water Board. ~~-~~Prior to the termination effective date, the Discharger is subject to the terms and conditions of this General Permit and is responsible for submitting the annual fee and all reports associated with this General Permit.

A Discharger must submit an NOT when one of the following conditions occurs:

1. The Discharger has ceased all discharges from the application of pesticides for which it obtained General Permit coverage and does not expect to discharge during the remainder of the permit term; or

2. The Discharger has obtained coverage under an individual permit or an alternative general permit for all discharges required to be covered by an NPDES permit.

[8] *See Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486 (2nd Cir. 2005).

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III. FINDINGS

The State Water Board finds:

A. Background

1. An NPDES Permit is required for applications of pesticides that result in a discharge of pollutants to waters of the US. Courts have determined that pesticides may constitute chemical wastes or biological materials within the meaning of the CWA.[9] Under current case law, whether a permit is required depends upon whether it is a biological or chemical pesticide and, for chemical pesticides, whether there is any residue or unintended effect from its application.
2. USEPA's 2006 regulation attempting to exempt certain FIFRA-compliant applications of pesticides was invalidated and vacated by the Sixth Circuit Court of Appeals in 2009.[10] A two-year stay of the effect of that decision was granted, such that the invalidated regulation will remain in effect until April 9, 2011.
3. Although the point at which a pesticide becomes a pollutant may not be known, a permit is required if a pollutant will be deposited into waters of the US. This General Permit is intended to regulate applications of pesticides that result in a discharge of pollutants to waters of the US, consistent with the CWA.
4. In 2001, the State Water Board adopted Water Quality Order No. 2001-12-DWQ, Statewide General NPDES Permit for Discharges of Aquatic Pesticides to Waters of the US. Issued in response to a Ninth Circuit Court of Appeals decision,[11] Order No. 2001-12-DWQ covered broad categories of aquatic pesticide use in California. When that permit expired in 2004, it was replaced by Order Nos. 2004-0008-DWQ (larvicide discharges for vector control) and 2004-0009-DWQ (aquatic herbicide discharges for weed control). This General Permit will replace Order No. 2004-008-DWQ and will cover adulticides in addition to larvicides.
5. This General Permit was drafted with input from members of the Mosquito and Vector Control Association of California (MVCAC), representatives of the Department of Pesticide Regulation (DPR), California Department of Public Health (CDPH), USEPA Headquarters, and USEPA Region 9.

B. Legal Authorities

This General Permit is issued pursuant to section 402 of the federal CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). Section 122.28(a)(1) of Title 40 of the Code of Federal Regulations [40 C.F.R. §122.28(a)(1)] allows NPDES permits to be written to cover a category of discharges within the State political boundaries as a general NPDES permit. USEPA Region 9 has granted the State Water Board the authority to issue general NPDES permits.

[9] *Headwaters, Inc. v. Talent Irrigation District*, (9th Cir. 2001) 243 F.3d 526; *League of Wilderness Defenders v. Forsgren* (9th Cir. 2002) 309 F.3d 526; *Fairhurst v. Hagener* (9th Cir. 2005) 422 F.3d. 1146.
[10] *National Cotton Council v. U.S. EPA* (6th Cir. 2009) 553 F.3d 927.
[11] *Headwaters, Inc. v. Talent Irrigation District* (9th Cir. 2001) 243F.3d 526.

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This General Permit shall serve as a General NPDES permit for point source discharges of biological and residual pesticides to waters of the US from larvicide and adulticide applications for vector control. This General Permit also serves as general Waste Discharge Requirements pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260).

C. Background and Rationale for Requirements

The State Water Board developed the requirements in this General Permit based on information submitted as part of the applications from the MVCAC (which represents the vast majority of governmental vector control program in the California), through monitoring and reporting programs, and through special studies. The Fact Sheet (Attachment D), which contains background information and rationale for General Permit requirements, is hereby incorporated into this General Permit and constitutes part of the Findings for this General Permit. Attachments A through H are all incorporated into this General Permit.

D. California Environmental Quality Act (CEQA)

Pursuant to California Water Code section 13389, State and Regional Water Boards are exempt from the requirement to comply with Chapter 3, Division 13 of the Public Resources Code when adopting NPDES permits.

E. Related Pesticide Regulations

USEPA, DPR, County Agricultural Commissioners, and CDPH regulate pesticide uses in California. The applicable responsibility of each agency is summarized below:

1. USEPA

USEPA has the sole jurisdiction of pesticide label language according to the FIFRA. Label language and any changes thereto must be approved by USEPA before the product can be sold in this country.

As part of the labeling process, USEPA evaluates data submitted by registrants to ensure that a product, if it is used in accordance with label instructions, will cause no harm (or “adverse impact”) on non-target organism. Pesticide registrants are required to submit data on the effects of pesticides on target pests (efficacy) as well as effects on non-target pests. Data on non-target effects include plant effects (phytotoxicity), fish and wildlife hazards (ecotoxicity), impacts on endangered species, effects on the environment, environmental fate, breakdown products, leachability, and persistence. However, FIFRA is not necessarily as protective of water quality as the CWA.

2. DPR

DPR regulates the sale and use of pesticides in California. DPR is responsible for reviewing the toxic effects of pesticide formulations and determining whether a pesticide is suitable for use in California through a registration process. DPR also reviews data submitted by the registrants. Although DPR cannot require

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manufacturers to make changes in labels, it can refuse to register products in California unless manufacturers address unmitigated hazards by amending the pesticide label. Consequently, many pesticide labels that are already approved by USEPA also contain California-specific requirements.

DPR also conducts scientific evaluations of potential health and environmental impacts and provides County Agricultural Commissioners with information in the form of suggested permit conditions for the Use Permit if the proposed use is a restricted material[12]. DPR's suggested permit conditions reflect minimum measures necessary to protect people and the environment.

3. County Agricultural Commissioners

County Agricultural Commissioners also regulate sale and use of pesticides in California. In addition, County Agricultural Commissioners issue Use Permits for applications of pesticides that are deemed as restricted materials by DPR.

During the Use Permit permitting process, County Agricultural Commissioners determine if the pesticide use will result in substantial adverse environmental impact, whether appropriate alternatives were considered, and if any potential adverse effects are mitigated. The Use Permit conditions contain minimum measures necessary to protect people and the environment. The County Agricultural Commissioners also conduct pre-project inspections on at least five percent of projects.

4. CDPH

The State's pesticide regulation laws provide special procedures for vector control agencies that operate under a cooperative agreement with CDPH. The application of pesticides by vector control agencies is regulated by a special and unique arrangement among the CDPH, DPR, County Agricultural Commissioners, and vector control agencies. Vector control agencies are not directly regulated by DPR. CDPH provides regulatory oversight for vector control agencies that are signatory to the cooperative agreement and all individuals working for those agencies.

F. Technology-Based Effluent Limitations

Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations (40 C.F.R. §122.44), require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards.

G. Water Quality-Based Effluent Limitations

Section 301(b) of the CWA and 40 C.F.R § 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements

[12] DPR designates a pesticide as a restricted material in California if it poses hazards to public health, farm workers, domestic animals, honeybees, the environment, wildlife, or crops other than those being treated ("Regulating Pesticides: A Guide to Pesticide Regulation in California," October 2001, CDPR).

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where necessary to achieve applicable water quality standards. The federal regulation mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an excursion of a water quality standard, including numeric and narrative objectives within a standard. Section 122.44(k)(3) of 40 C.F.R. allows the use of other requirements such as BMPs in lieu of numeric effluent limits if the latter are infeasible. The State Water Board finds that numeric effluent limits for pollutant discharges associated with the application of pesticides are infeasible because:

1. This General Permit regulates biological and residual pesticides which are pesticide ingredients or ~~breakdown~~ degradation by-products that are present after the use of the pesticide for vector control. Therefore, the exact effluent is unknown;
2. It would be impracticable to provide effective treatment of biological and residual pesticides to protect water quality, given that typically, pesticide applications consist of ~~the~~ numerous short duration intermittent pesticide releases to waters of the US from many different locations; and
3. Treatment may render the pesticides useless for pest control.

The effluent limitations contained in this General Permit are narrative and include requirements to develop and implement a PAP that describes appropriate BMPs, including compliance with all pesticide label instructions, as well as requirements to comply with receiving water limitations.

The BMPs required herein ~~constitute Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) and~~ are intended to: 1) minimize the area and duration of impacts caused by the discharge of biological and residual pesticides in the target area* and 2) allow for restoration of water quality and protection of beneficial uses of the receiving waters to pre-application quality following completion of an application event.

H. Receiving Water Monitoring Triggers

Following pesticide applications in or near surface waters, residual pesticides may cause both acute and chronic toxicity to aquatic life. Regional Water Boards in their Water Quality Control Plans (Basin Plans) include a narrative toxicity objective ("no toxics in toxic amounts), which specifically prevents the presence of toxic substances, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Since information regarding residual pesticides deposited in the receiving water as a result of larvicide and adulticide applications for vector control is not adequate to develop receiving water limitations for individual and combinations of pesticides, this General Permit only contains receiving water monitoring triggers for residual pesticides of concern. The monitoring triggers will be used to assess whether the discharge of residual pesticides has the reasonable potential to cause or contribute to an excursion of a water quality standard, including numeric and narrative objectives within a standard.~~compliance with the narrative toxicity receiving water limitation and initiate additional investigations for the toxicity caused by the larvicides and adulticides used and their additive or~~

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~~synergistic effects.~~ If monitoring data for residual pesticides ~~of concern indicate~~ show ~~that concentrations of these residual pesticides exceed~~ exceedance of the monitoring triggers, the Discharger shall, at a minimum, evaluate its application methods, BMPs, and the appropriateness of using alternative products. As a result of the evaluation, this General Permit may be re-opened to add numeric Receiving Water Limitations for the residual pesticides exceeding the triggers. ~~this General Permit may be re-opened and Receiving Water Limitations for these pesticide ingredients could be added.~~ This General Permit includes an Instantaneous Maximum Receiving Water Monitoring Trigger for residual pesticides of concern. Receiving Water Monitoring Triggers for residual pesticides of concern are summarized in Section VII, Table ~~3~~ 4 (Receiving Water Monitoring Triggers) of this General Permit.

I. Beneficial Uses in Basin Plans

The typical relevant beneficial uses identified in the Regional Water Boards' Basin Plans include: municipal and domestic supply*, agricultural irrigation, stock watering, process supply*, service supply, hydropower supply*, water contact recreation*, canoeing and rafting recreation, other non-contact water recreation*, warm freshwater aquatic habitat*, cold freshwater habitat, warm fish migration habitat*, cold fish migration habitat*, warm and cold spawning habitat*, wildlife habitat*, navigation*, rare, threatened, or endangered species habitat*, groundwater recharge*, and freshwater replenishment*. Requirements of this General Permit implement the applicable Basin Plans.

J. National Toxics Rule (NTR) and California Toxics Rule (CTR)

USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR were applicable in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality standards for priority pollutants*.

K. State Implementation Policy (SIP)

The State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters*, Enclosed Bays*, and Estuaries* of California* (State Implementation Policy or SIP) in March 2000 and amended it in February 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. This General Permit includes a narrative Receiving Water Limitation for toxicity and acute and chronic toxicity testing requirements for residual pesticides of concern. Therefore, this General Permit is consistent with the SIP.

L. Antidegradation Policy

Section 131.12 of 40 C.F.R. requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board

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established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plans implement, and incorporate by reference, both the state and federal antidegradation policies.

This General Permit requires that discharges must be consistent with the provisions of 40 C.F.R. § 131.12 and Resolution No. 68-16. The conditions of this General Permit require residual pesticide discharges to meet applicable water quality objectives. Specifically, the General Permit sets receiving water limitations for malathion and receiving water monitoring triggers for the other active ingredients of chemical pesticides. The General Permit also requires toxicity testing to determine if residues, including active ingredients, inert ingredients, and degradation byproducts, in any combination, from pesticide applications cause toxicity to the receiving water or add toxicity to it if there is pre-existing toxicity prior to pesticide applications. If residues cause toxicity or add to an existing toxicity, the Discharger is required to perform an iterative process of evaluating its application methods, BMPs, or alternatives to the pesticide causing toxicity until the applications no longer cause or add toxicity. The BMPs and other controls required pursuant to the General Permit constitute Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT).

The General Permit requirements are protective of the broad range of beneficial uses set forth in basin plans throughout the state, constituting best control available consistent with the purposes of the pesticide application in order to ensure that pollution or nuisance will not occur. The conditions also ensure maintenance of the highest water quality consistent with maximum benefit to the people of state. The nature of pesticides is to be toxic in order to protect beneficial uses such as human health or long-term viability of native aquatic life. Lake Davis and Silver King Creek are examples of water bodies where the Department of Fish and Game has used chemical pesticides to eradicate the Northern Pike and non-native trout, respectively. Waters of exceptional quality may be degraded due to the application of pesticides; however, it would only be temporary and in the best interest of the people of the State. While surface waters may be temporarily degraded, water quality standards and objectives will not be exceeded after project completion.

Another example of the benefits of pesticide application and any temporary degradation of water quality occurring as a result is the Asian clam infestation in Lake Tahoe which may require the use of pesticides to eradicate the pest. The Asian clam is undesirable because it: (1) displaces native clams, snails, and other organisms living on the lake bottom, which are important members of the lake's native food web; (2) fosters the growth of bright green algae, which change the look of the water, and smell when they decompose; and (3) could help foster an invasion of quagga mussels, another aggressive non-native species, by creating desirable habitat for them. Eradication of these species is important to protect beneficial uses, including habitat for native species, and water conveyance. Discharges in compliance with this permit will maintain existing levels of water quality over the long term.

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Given the nature of a General Permit and the broad range of beneficial uses to be protected across the state, data analysis of specific water bodies is infeasible. However, compliance with receiving water limitations and other permit requirements will ensure that degradation of the State's waters will be temporary and that the waters will be returned to pre-application conditions after project completion. Therefore, this General Permit is consistent with State and federal antidegradation policies.

~~**Section 131.12 of 40 C.F.R. requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing high quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plans implement, and incorporate by reference, both the state and federal antidegradation policies. The conditions of this General Permit require residual pesticide discharges to meet applicable water quality objectives. Waters of exceptional quality may be degraded due to the application of pesticides; however, it would only be temporary and in the best interest of the people of the State. While surface waters may be temporarily degraded; water quality standards and objectives will not be exceeded. The nature of pesticides is to be toxic in order to protect human health. However, compliance with receiving water limitations is required. Therefore, this General Permit is consistent with State and federal antidegradation policies.**~~

M. Endangered Species Act

This General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 et. seq). This General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

N. Monitoring and Reporting

Section 122.48 of Title 40 C.F.R. requires that all NPDES permits specify requirements for recording and reporting monitoring results. California Water Code sections 13267 and 13383 authorize the State and Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. The Monitoring and Reporting Program is provided in Attachment C.

O. Standard and Special Provisions

Attachment B provides the Standard Provisions which apply to all NPDES permits in accordance with 40 C.F.R. § 122.41, and additional conditions applicable to specified

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categories of permits in accordance with 40 C.F.R. § 122.42. The Discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 C.F.R. § 122.42. In addition, the Discharger must comply with all the Special Provisions which are provided in Section IX.C of this General Permit.

P. Notification of Interested Parties

The State Water Board has notified interested agencies and persons of its intent to prescribe WDRs and has provided them with an opportunity to submit comments. Details of the notifications are provided in the Fact Sheet of this General Permit.

Q. Consideration of Public Comment

The State Water Board, in a public meeting, heard and considered all comments pertaining to discharges to be regulated by this General Permit. Details of the Public Hearing are provided in the Fact Sheet of this General Permit.

THEREFORE, IT IS HEREBY ORDERED, that in order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this General Permit.

IV. DISCHARGE PROHIBITIONS

A. The discharge of biological and residual pesticides at a location or in a manner different from that described in this General Permit is prohibited.

B. The discharge of biological and residual pesticides shall not create a nuisance as defined in section 13050 of the California Water Code.

C. The discharge of biological and residual pesticides from larvicide and adulticide applications for vector control shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable standard or criterion promulgated by USEPA pursuant to Section 303 of the CWA, or water quality objective adopted by the State or Regional Water Boards. For larvicide applications, this prohibition shall apply outside the treatment area during treatment, and in the treatment area after treatment has been completed.

V. EFFLUENT LIMITATIONS

A. The discharge of biological and residual pesticides must meet applicable water quality standards; and

B. Dischargers shall implement BMPs when applying pesticides. The BMPs must be provided in the PAP, which is described in Section VIII.C.

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VI. RECEIVING WATER LIMITATIONS

The discharge shall not result in any of the following:

A. Cause or contribute to an exceedance of the numeric Receiving Water Limitation shown in Table 3 below.

Table 3. Receiving Water Limitation

Ingredient	Unit	Instantaneous Maximum	Basis
Malathion	µg/L	0.1	USEPA's Ambient Water Quality Criteria

B. Floating Material. Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.

C. Settleable Substances. Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

D. Suspended Material. Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

E. Taste and Odors. Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses or domestic or municipal water supplies.

F. Toxic Pollutants. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

G. Temperature. The ambient temperature to increase more than 5ºF.

H. Color. Esthetically undesirable discoloration.

I. Aquatic Communities. Aquatic communities and populations, including vertebrates, invertebrates, and plant species to be degraded, except for target species.

VII. RECEIVING WATER MONITORING TRIGGERS

The Receiving Water Monitoring Triggers shown in Table ~~3~~ 4 below will be used to assess whether the discharge of residual pesticides has the reasonable potential to cause or contribute to an excursion of a water quality standard, including numeric and narrative objectives within a standard.~~compliance with the narrative toxicity receiving water limitation and trigger additional investigations for the toxicity caused by the larvicides and adulticides used and their additive or synergistic effects.~~

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Table ~~3~~4. Receiving Water Monitoring Triggers

Ingredient	Units	Instantaneous Maximum Monitoring Triggers	Basis
Temephos	µg/L	8	USEPA's Office of Pesticides' Ecotoxicity Database
~~Malathion~~	~~µg/L~~	~~0.1~~	~~USEPA's Ambient Water Quality Criteria~~
Naled	µg/L	0.014	USEPA's Office of Pesticides' Ecotoxicity Database
Pyrethrin	µg/L	0.14	USEPA's Office of Pesticides' Ecotoxicity Database
Permethrin	µg/L	0.03	California Department of Fish and Game's Ambient Criterion
Resmethrin	µg/L	0.028	USEPA's Office of Pesticides' Ecotoxicity Database
Sumithrin	µg/L	0.0025	USEPA's Office of Pesticides' Ecotoxicity Database
Prallethrin	µg/L	0.39	USEPA's Office of Pesticides' Ecotoxicity Database
Piperonyl Butoxide (PBO)	µg/L	49	USEPA's Office of Pesticides' Ecotoxicity Database
PBO (in PBO/Resmethrin Mixture)	µg/L	0.13	USEPA's Office of Pesticides' Ecotoxicity Database
PBO (in PBO/Pyrethrin Mixture)	µg/L	0.014	USEPA's Office of Pesticides' Ecotoxicity Database
Etofenprox	µg/L	0.0019	USEPA's Office of Pesticides' Ecotoxicity Database
MGK-264	µg/L	16.9	USEPA's Office of Pesticides' Ecotoxicity Database

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VIII. PESTICIDE USE REQUIREMENTS

A. Application ~~Information~~ Schedule

The Discharger shall provide a phone number or other specific contact information to all persons who request the Discharger's application information. The Discharger shall provide the requester with the most current application information. Information may be made available by electronic means, including posting prominently on a well-known web page.

B. Public Notice Requirements

Every calendar year, prior to the first application of pesticides, the Discharger shall notify potentially affected governmental agencies and post the notification at its website. The notification shall include the following information:

1. A statement of the Discharger's intent to apply pesticide(s);
2. Name of pesticide(s);
3. Purpose of use;
4. General time period and locations of expected use;
5. Any water use restrictions or precautions during treatment; and
6. A phone number that interested persons may call to obtain additional information from the Discharger.

C. Pesticides Application Plan (PAP)

The Discharger shall develop a PAP that contains the following elements:

~~a.~~1. Description of ~~the~~ ALL target ~~area and adjacent~~ areas, if different from the water body of the target area, in to which larvicides and adulticides~~pesticides~~ are being planned to be applied or may be applied to control vectors. The description shall include ~~and~~ adjacent areas, if different from the water body of the target areas;

~~b.~~2. Discussion of the factors influencing the decision to select pesticide applications for ~~mosquito~~ vector control;

~~c.~~3. ~~Type(s) of pesticides~~Pesticide products or types expected to be ~~pesticides~~ used and if known, their degradation by-products, the method in which they are applied, and if applicable, the adjuvants and surfactants used;

~~d.~~4. Description of ALL the application areas* and the target areas in the system that are being planned to be applied or may be applied. Provide a map showing these areas~~Description of ALL the types and locations of the anticipated application areas* and the target areaareas to be treated by the Discharger, recognizing that, with vector control, the precise locations may not be known until after surveillance~~;

~~e.~~5. Other control methods used (alternatives) and their limitations;

~~f.~~6. ~~Approximately howh~~How ~~how~~ much product is needed ~~anticipated to be used~~ and how this amount was determined;

~~g.~~7. Representative monitoring locations* and the justification for selecting these ~~monitoring~~ locations;

8. If applicable, list the gates or control structures and inspection schedule of those gates or control structures to ensure that they are not leaking;

~~h.~~9. Evaluation of available BMPs to determine if there are feasible alternatives to the selected pesticide application project that could reduce potential water quality impacts; and

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10. Description of the BMPs to be implemented. The BMPs shall include, at the minimum:

a. measures to prevent pesticide spill;

b. measures to ensure that only a minimum and consistent amount is used;

c. a plan to educate Coalition's or Discharger's staff and pesticide applicator on any potential adverse effects from the pesticide application;

d. descriptions of specific BMPs for each spray mode, e.g. aerial spray, truck spray, hand spray, etc.; cease and desist order

e. descriptions of specific BMPs for each pesticide product used; and

~~i.~~f. descriptions of specific BMPs for each type of environmental setting (agricultural, urban, and wetlands).

~~The Discharger shall update the PAP periodically and submit the revised PAP to the State Water Board for approval if there are any changes to the original PAP.~~

~~**D. Best Management Practices (BMPs)**~~

~~The Discharger shall develop BMPs that contain the following elements:~~

~~4. Identify the Problem~~

11. Identification of ~~y~~ the p~~P~~roblem. Prior to first pesticide application covered under this General Permit that will result in a discharge of biological and residual pesticides to waters of the US, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the Discharger must do the following for each vector management area:

~~Prior to first pesticide application covered under this General Permit that will result in a discharge of residual pesticides to waters of the US, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the Discharger must do the following for each vector management area:~~

a. If applicable, e~~E~~stablish densities for larval and adult vector populations to serve as action threshold(s) for implementing pest management strategies;

b. Identify target vector species to develop species-specific pest management strategies based on developmental and behavioral considerations for each species;

c. Identify known breeding areas for source reduction, larval control program, and habitat management; and

d. Analyze existing surveillance data to identify new or unidentified sources of vector problems as well as areas that have recurring vector problems.

12. Examination of Alternatives. Dischargers shall continue to examine alternatives to pesticide use reduce the need for applying larvicides that contain temephos and for spraying adulticides. Such methods include:

~~Examinee~~**Examine** ~~the Possibility of Alternatives~~

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~~Dischargers should continue to examine the possibility of alternatives to reduce the need for applying larvicides that contain temephos and for spraying adulticides. Such methods include:~~

a. Evaluating the following management options, in which the impact to water quality, impact to non-target organisms, vector resistance, feasibility, and cost effectiveness should be considered:

- No action
- Prevention
- Mechanical or physical methods
- Cultural methods
- Biological control agents
- Pesticides

If there are no alternatives to pesticides, dischargers shall use the least toxic pesticide necessary to control the target pest.

~~f.~~b. Applying pesticides only when vector are present at a level that will constitute a nuisance

~~c. Using the least intrusive method of pesticide application.~~

~~d. Public education efforts to reduce potential vector breeding habitat.~~

~~e. Applying a decision matrix concept to the choice of the most appropriate formulation.~~

~~6.~~13. Correct Use of Pesticides

~~Users~~ Coalition's or Discharger's use of pesticides must ensure that all reasonable precautions are taken to minimize the impacts caused by pesticide applications. Reasonable precautions include using the right spraying techniques and equipment, taking account of weather conditions and the need to protect the environment.

~~All errors in application and spills are reported to the proper authority.~~

~~Staff training in the proper application of pesticides and handling of spills.~~

14. Specify a website where public notices, required in Section VIII.B, may be found.

D. PAP Processing, Approval, and Modifications

Upon receipt of a PAP, staff will post it on the State Water Board website for a 30-day public comment period[13]. If no comments are received and staff deems the APAP complete, the Deputy Director will issue an NOA within three (3) working days following closure of the comment period. If comments are received, staff will try to address the comments as expeditiously as possible to allow the Deputy Director to issue an NOA within 10 working days.

[13] *See Waterkeeper Alliance, Inc. v. EPA,* 399 F.3d 486 (2nd Cir. 2005).

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Major changes to the PAP shall be submitted to the Deputy Director for approval. Examples of major changes include using a different product other than what is specified in the PAP, changing an application method that may result in different amounts of pesticides being applied, or adding or deleting BMPs. Since the PAP shall include ALL the water bodies or water body systems in which pesticides are being planned to be applied or may be applied to control vectors and ALL the application areas and the target areas in the system that are being planned to be applied or may be applied, changes in monitoring locations are not considered major changes. However, these changes need to be reported in the annual report.

E. Pesticide Application Log

The Discharger shall maintain a log for each pesticide application. The application log shall contain, at a minimum, the following information, when practical, for larvicide or adulticide applications:

1. Date of application;
2. Location of the application and target areas (e.g., address, crossroads, or map coordinates);
3. Name of applicator;
4. The names of the water bodies treated (~~i.e.~~e.g., specific canal, creek, lake, etc.);
5. Application details, such as application started and stopped, pesticide application rate and concentration, flow rate of the target area, surface water area, volume of water treated, pesticide(s) and adjuvants used by the Discharger, and volume or mass of each component discharged; ~~and~~
6. Visual monitoring assessment; and~~.~~
7. Certification that applicators followed the PAP.

IX. PROVISIONS

A. Standard Provisions

1. All Dischargers authorized to discharge under this General Permit shall comply with the Federal Standard Provisions included in Attachment B of this General Permit.
2. This General Permit does not authorize the discharge of biological and residual pesticides or their ~~breakdown~~ degradation by-products to waters of the US that are impaired by the pesticide active ingredients included in permitted larvicides and adulticides listed in Attachments E and F. Impaired waters are those waters not meeting water quality standards pursuant to ~~Section~~ section 303(d) of the CWA. California impaired waters, as approved by the State Water Board, are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls

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~~http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010~~ (to be reviewed and adopted by USEPA).

3. The State Water Board may use this General Permit to regulate the discharge of biological and residual pesticides to waters of the US classified as Outstanding National Resource Waters (Lake Tahoe and Mono Lake) or as a water body impaired by unknown toxicity only after the following conditions are satisfied: 1) ~~a project-specific antidegradation analysis was completed and found that the proposed pesticide application is consistent with State and federal antidegradation policies; 2)~~ the proposed project will comply with the limitations and discharge requirements specified in the General Permit; and ~~3~~2) if required, the proposed pesticide application qualifies for and has been granted a Basin Plan prohibition exception prior to discharge.

4. The Discharger must follow all FIFRA pesticide label instructions and any applicable Use Permits issued by a County Agricultural Commissioner.

5. The Discharger or its vector control technicians must be in compliance with the ~~Memorandum of Understanding~~Cooperative Agreement issued by the CDPH to apply pesticides for public health vector control.

6. The Discharger must be licensed by DPR if such licensing is required for the pesticide application project.

7. The Discharger must comply with effluent limitations and must develop and implement a PAP.

8. In accordance with the PAP, Section VIII.C.~~1.j~~12, the Discharger shall implement the identified alternative measures that are ~~any~~ feasible and effective ~~BMPs~~ to the selected pesticide application project that could reduce potential water quality impacts.

9. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State and the nine Regional Water Boards.

10. All Dischargers authorized to discharge under this General Permit shall comply with the following provisions:

a. After notice and opportunity for a hearing, this General Permit may be terminated or modified for cause, including, but not limited to:

   i. violation of any term or condition contained in this General Permit;

   ii. obtaining this General Permit by misrepresentation or by failing to disclose fully all relevant facts;

   iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and

   iv. a material change in the character, location, or volume of discharge (if applicable).

b. The provisions of this General Permit are severable. If any provision of this General Permit is found invalid, the remainder of this General Permit shall not be affected.

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c. The Discharger shall maintain a copy of this General Permit and make it available at all times to operating personnel. Key operating personnel shall be familiar with its content.

d. To demonstrate compliance with Title 16, CCR, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

e. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the State ~~and Regional~~ Water Board.

f. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.

g. Each Discharger shall file with the State Water Board and the appropriate Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this General Permit.

h. The State and Regional Water Board are authorized to enforce the terms of this General Permit under several provisions of the California Water Code, including, but not limited to, sections 13385, 13386, and 13387.

B. Monitoring and Reporting Program (MRP) Requirements

1. The Discharger shall comply with the MRP, and future revisions thereto, in Attachment C of this General Permit.

2. The ~~State Water Board~~ Deputy Director ~~of the Division of Water Quality~~ may add monitoring and reporting requirements to the ~~PAP~~MRP.

3. The ~~State Water Board~~ Deputy Director ~~of the Division of Water Quality~~ may approve reductions in monitoring frequencies if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

C. Special Provisions

1. Reopener Provisions

a. This General Permit may be re-opened for modification, or revocation and reissuance in accordance with the provisions contained in 40 C.F.R. § 122.62. This General Permit may also be re-opened ~~if additional aquatic pesticides are~~to add pesticide products for vector control that are newly-registered by DPR.

b. Conditions that necessitate a major modification of a permit are described in 40 C.F.R. § 122.62, including:

~~ii.~~i. If new or amended applicable water quality standards are promulgated or approved pursuant to section 303 of the CWA, or amendments thereto,

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this General Permit may be re-opened and modified in accordance with the new or amended standards.

~~iii.~~ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.

c. **Acute and Chronic Toxicity.** If the State Water Board revises ~~the SIP's~~ its toxicity control provisions that would require the establishment of numeric acute and chronic toxicity limitations, this General Permit may be re-opened to include numeric acute and chronic toxicity receiving water limitations based on the new provisions.

d. **Receiving Water Limitations**. If monitoring data for residual pesticides show exceedance of monitoring triggers, the Discharger shall conduct additional investigations to determine the cause of exceedance. At a minimum, the Discharger shall evaluate its application methods, BMPs, and the appropriateness of using alternative products. As a result of the evaluation, ~~This~~ this General Permit may be re-opened to add numeric Receiving Water Limitations for the residual pesticides exceeding the triggers.~~to add receiving water limitations if the monitoring result for residual pesticides specified in the Table 3 (Receiving Water Monitoring Triggers) exceed the associated monitoring trigger.~~

e. **Endangered Species Act**. If USEPA develops biological opinions regarding pesticides included in this General Permit, this General Permit may be re-opened to add or modify Receiving Water Monitoring Triggers for residual pesticides of concern, if necessary.

2. Special Studies, Technical Reports, and Additional Monitoring Requirements

Each Discharger must conduct additional investigations when toxicity testing shows toxicity or increased toxicity in the receiving water, or when the chemical monitoring shows exceedance of any monitoring trigger. The additional investigations shall identify corrective actions to eliminate toxicity and or exceedance of monitoring trigger caused by the pesticide application. The investigation should include, but not be limited to, revising and improving the existing BMPs, revising mode of application, using less toxic pesticide products or selecting alternative methods for pest control.~~This General Permit requires the Discharger or if applicable, the Coalition, to conduct additional investigations for compliance with the narrative toxicity Receiving Water Limitation if the monitoring results for residual pesticides listed in Table 3 exceed their monitoring triggers.~~

3. Reporting

a. **Twenty-Four Hour Report**

The Discharger shall report to the State Water Board and the appropriate Regional Water Board any noncompliance, including any effect of a pesticide's use that is unexpected or unintended, that may endanger health or the environment. Any information shall be provided orally within 24 hours

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from the time the Discharger becomes aware of the circumstances and must include the following information:

i. The caller's name and telephone number;

ii. Applicator name and mailing address;

iii. WDID number;

iv. The name and telephone number of a contact person, if different than the person providing the 24-hour notice;

v. How and when the Discharger become aware of the noncompliance;

vi. Description of the location of the noncompliance;

vii. Description of the noncompliance identified and the USEPA pesticide registration number for each product the Discharger applied in the area of the noncompliance; and

viii. Description of any steps the Discharger has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects.

If the Discharger is unable to notify the State Water Board and the appropriate Regional Water Board within 24 hours, the Discharger must do so as soon as possible and also provide the rationale for why the Discharger was unable to provide such notification within 24 hours.

b. **Five-Day Written Report**

The Discharger shall also provide a written submission within five (5) days of the time the Discharger becomes aware of the noncompliance. The written submission shall contain the following information:

i. Date and time the Discharger contacted the State Water Board and the appropriate Regional Water Board notifying of the noncompliance and any instructions received from the Regional Water Board ;

ii. Information required to be provided in Section C.3.a above;

iii. A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size of dead or distressed organisms (other than the target species);

iv. Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc);

v. Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected);

vi. Pesticide application rate, intended use site (e.g., banks, above, or direct to water), method of application, and name of pesticide product, description of pesticide ingredients, and USEPA registration number;

vii. Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available data on ambient

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water, which is water in the immediate surrounding area, ~~data~~ for pesticides applied~~)~~;

viii. Laboratory tests performed, if any, and timing of tests. Provide a summary of the test results within five days after they become available;

ix. If applicable, explain why the Discharger believes the noncompliance could not have been caused by exposure to the pesticide from the Discharger's application; and

x. Actions to be taken to prevent recurrence of adverse incidents*

~~The State Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours.~~

4. Corrective Action

a. **Situations Requiring Revision of Control Measures.** If any of the following situations occur, the Discharger must review and, as necessary, revise the evaluation and selection of the control measures to ensure that the situation is eliminated and will not be repeated in the future:

i. An unauthorized release or discharge associated with the application of pesticides (e.g., spill, leak, or discharge not authorized by this or another NPDES permit) occurs;

ii. The Discharger becomes aware, or the State Water Board concludes, that the control measures are not adequate/sufficient for the discharge to meet applicable water quality standards or Receiving Water Monitoring Triggers for the concerned pesticides;

iii. Any monitoring activities indicate that the Discharger failed to:

- Follow the label instructions for the products used;
- Perform regular maintenance activities to reduce leaks, spills, or other unintended discharges of pesticides associated with the application of pesticides covered under this General Permit; or
- Maintain pesticide application equipment in proper operating condition by adhering to any manufacturer's conditions and industry practices, and by calibrating, cleaning, and repairing such equipment on a regular basis to ensure effective pesticide application and vector control. The Discharger must ensure that the equipment's rate of pesticide application is calibrated to deliver the precise minimum quantity of pesticide needed to achieve greatest efficacy against vectors.

b. **Corrective Action Deadlines.** If the Discharger determines that changes to the control measures are necessary to eliminate any situation identified in Section C.4.a above, the Discharger shall make such changes within 60 days. The Discharger shall take the corrective action before further discharge of the biological or residual pesticides will be allowed. ~~must be~~

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~~made before the next pesticide application that results in a discharge if practicable, or if not, as soon as possible thereafter.~~

c. **Effect of Corrective Action.** The occurrence of a situation identified in Section C.4.a above may constitute a violation of this General Permit. Correcting the situation according to Section C.4.b does not absolve the Discharger of liability for any original violation. However, failure to comply with Section C.4.b constitutes an additional permit violation. The State Water Board will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

The State Water Board and the appropriate Regional Water Boards may impose additional requirements and schedules of compliance, including requirements to submit additional information concerning the condition(s) triggering corrective action or schedules and requirements more stringent than specified in this General Permit. Those requirements and schedules will supersede those of Section C.4.b if such requirements conflict.

5. Adverse Incident to Threatened or Endangered Species or Critical Habitat

If the Discharger becomes aware of an adverse incident to a federally-listed threatened or endangered species or its federally-designated critical habitat, that may have resulted from the Discharger's pesticide application, the Discharger must immediately notify the National Marine Fisheries Service (NMFS) in the case of an anadromous or marine species, or the U.S. Fish and Wildlife Service (FWS) in the case of a terrestrial or freshwater species. This notification must be made by telephone or email immediately when the Discharger becomes aware of the adverse incident and must include at least the following information:

a. The caller's name, telephone number, and email address;

b. Applicator name and mailing address;

c. The name of the affected species;

d. How and when the Discharger became aware of the adverse incident;

e. Description of the location of the adverse incident;

f. Description of the adverse incident, including the USEPA pesticide registration number for each product applied in the area of the adverse incident; and

g. Description of any steps that have been taken or will be taken to alleviate the adverse impact to the species.

Additional information on federally-listed threatened or endangered species and federally-designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species.

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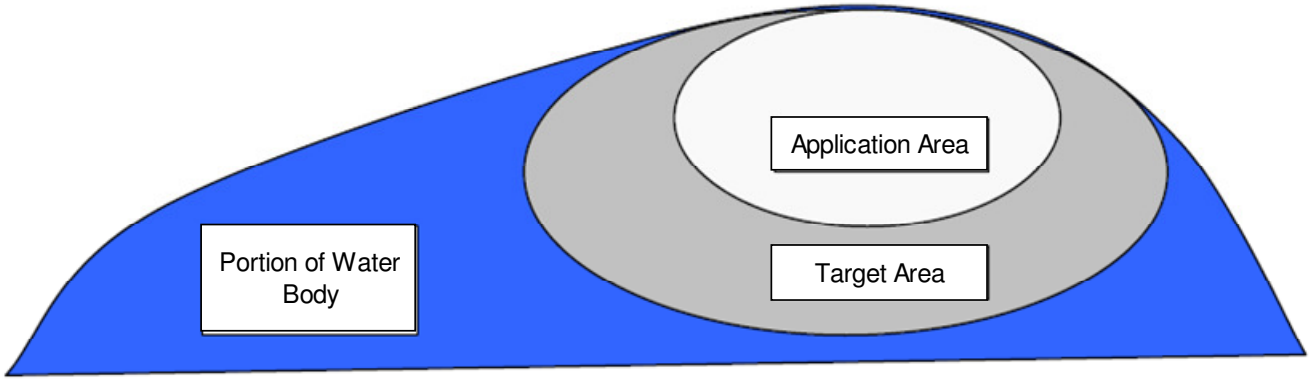

FIGURE 1. Location of application area and target area in a portion of a water body.

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ATTACHMENT A – DEFINITIONS

Active Ingredient
Active ingredients are manufacturer disclosed ingredients that yield toxic effects on target organisms.

Adjuvants
Adjuvants are ingredients that are added to pesticides during an application event and are often trade secrets. These ingredients are chosen by the Discharger, based on site characteristics, and typically increase the effectiveness of pesticides on target organisms.

Adverse Incident
Adverse Incident means a situation where the Discharger observes upon inspection or becomes aware of in which**:**

- A person or non-target organism may have been exposed to a ~~pesticide residue~~biological or residual pesticide, and
- The person or non-target organism suffered an adverse or toxic effect.

Adverse or Toxic Effect
An "adverse or toxic effect" includes are impacts that occur within US waters on non-target plants, fish, or wildlife that is unusual or unexpected (e.g., effects are to organisms not otherwise described on the pesticide product label or otherwise not expected to be present) as a result of exposure to a ~~pesticide residue~~biological or residual pesticide, and may include:

- Distressed or dead juvenile and small fishes
- Washed up or floating fish
- Fish swimming abnormally or erratically
- Fish lying lethargically at water surface or in shallow water
- Fish that are listless or nonresponsive to disturbance
- Stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants
- Other dead or visibly distressed non-target aquatic organisms (amphibians, turtles, invertebrates, etc.)

An "adverse or toxic effect" also includes any adverse effects to humans (e.g., skin rashes) or domesticated animals that occur either directly or indirectly from a discharge to waters of the US that are temporally and spatially related to exposure to a ~~pesticide residue~~ biological or residual pesticide (e.g., vomiting, lethargy).

Adulticides
Insecticides used to kill adult vectors.

Agricultural Supply
Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.

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Application Area
The application area is the area to which pesticides are directly applied. It is the responsibility of the Discharger to determine the application area. The application area may be synonymous with the target area. (See Figure 1.)

Application Event
The application event is the time that introduction of the pesticide to the application area takes place, not the length of time that the environment is exposed to the pesticide.

Cold Freshwater Habitat
Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Enclosed Bays
Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Estuaries
Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuaries do not include inland surface waters or ocean waters.

Freshwater Replenishment
Uses of water for natural or artificial maintenance of surface water quantity or quality.

Groundwater Recharge
Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Half-Life
Half-life is the time required for half of the compound introduced into an ecosystem to be eliminated or disintegrated by natural processes.

Hydropower Supply
Uses of water for hydropower supply.

Industrial Process Supply
Uses of water for industrial activities that depend primarily on water quality.

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Inert Ingredients
Inert ingredients are additional ingredients and are often trade secrets; therefore, they are not always disclosed by the manufacturer.

Larvicides
Insecticides used to control vector larvae in their aquatic habitat. Larvicides include biological insecticides, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis,* and other pesticides, such as petroleum distillates, temephos, methoprene, spinosad, and monomolecular films. Larvicide treatment of breeding habitats helps reduce the adult vector population in nearby areas.

Migration of Aquatic Organisms
Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Municipal and Domestic Supply
Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Navigation
Uses of water for shipping, travel, or other transportation by private, military, orcommercial vessels.

Non-Contact Water Recreation
Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, etc.

Point Source
Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Priority Pollutants
Priority pollutants are listed within the California Toxics Rule in 40 Code of Federal Regulations, section 131.38(b)(1). Criteria to protect aquatic life and human health are set for priority pollutants in the California Toxics Rule.

Rare, Threatened, or Endangered Species Habitat
Uses of water that support aquatic habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Receiving Waters
See Waters of the US.

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Representative Monitoring Location
To be considered "representative," at a minimum, a location must be similar in hydrology, pesticide use, and other factors that affect the biological and residual pesticide discharge to the areas being represented in that environmental setting. ~~The representative monitoring location is a location within or near the application area that is typical of the hydrologic and vegetative conditions present at the application area.~~

Residual Pesticides
Residual pesticides are those portions of the pesticides that remain in the water after the application and its intended purpose (elimination of targeted pests) have been completed. ~~Residual pesticides are pesticide ingredients or breakdown products that are present after the use of the pesticide for vector control.~~

Source of Drinking Water
Any water designated as municipal or domestic supply in a Regional Water Board Basin Plan and/or as defined in SWRCB Resolution No. 88-63.

Spawning, Reproduction, and/or Early Development
Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Target Area
The target area is the area designated for vector control. This may be synonymous with the application area. (See Figure 1.)

Vector Management Area/Unit
Area of land, including any water, for which the discharger is conducting vector management activities covered by this permit

Warm Freshwater Habitat
Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Water Contact Recreation
Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

Waters of the US
(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands;"

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa

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lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. [See Note 1 of this section.] Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wildlife Habitat
Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

~~Waters of the US~~
~~Waters of the US means:~~
~~All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;~~
~~All interstate waters, including interstate "wetlands;"~~
~~All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:~~
~~Which are or could be used by interstate or foreign travelers for recreational or other purposes;~~

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~~From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or~~
~~Which are used or could be used for industrial purposes by industries in interstate commerce;~~
~~All impoundments of waters otherwise defined as waters of the US under this definition;~~
~~Tributaries of waters identified in paragraphs (a) through (d) of this definition;~~
~~The territorial sea; and~~
~~"Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.~~

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ATTACHMENT B – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE (IF APPLICABLE)

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this General Permit. Any noncompliance constitutes a violation of the CWA and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. §122.41(a).)
2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement. (40 C.F.R. § 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit. (40 C.F.R. § 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this General Permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d).)

~~D. Proper Operation and Maintenance~~

~~The Discharger shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. (40 C.F.R. § 122.41(e).)~~

D. Property Rights

1. This General Permit does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)
2. The issuance of this General Permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

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E. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i); Wat. Code, § 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this General Permit (40 C.F.R. § 122.41(i)(1));
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Permit (40 C.F.R. § 122.41(i)(2));
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Permit (40 C.F.R. § 122.41(i)(3)); and
4. Sample or monitor, at reasonable times, for the purposes of assuring General Permit compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any General Permit condition. (40 C.F.R. § 122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this General Permit after the expiration date of this General Permit, the Discharger must apply for and obtain a new permit. (40 C.F.R. § 122.41(b).)

C. Transfers

This General Permit is not transferable to any person except after notice to the State Water Board. The State Water Board may require modification or revocation and reissuance of the General Permit to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § 122.41(l)(3); § 122.61.)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)

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B. Monitoring results must be conducted according to test procedures under Part 136 unless other test procedures have been specified in this General Permit. (40 C.F.R. § 122.41(j)(4); § 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this General Permit, and records of all data used to complete the application for this General Permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the State Water Board Deputy Director of the Division of Water Quality (Deputy Director) at any time.

–(40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));
2. The individual(s) who performed the sampling or measurements (§ 122.41(j)(3)(ii));
3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));
4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));
5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and
6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and
2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this General Permit or to determine compliance with this General Permit. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records

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required to be kept by this General Permit. (40 C.F.R. § 122.41(h); Wat. Code, § 13267.)

B. Signatory and Certification Requirements

All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)

1. **For a municipality, State, federal, or other public agency:** All permit applications shall be signed by either a principal executive officer or ranking elected official. (40 C.F.R. § 122.22(a)(3).)
2. All reports required by this General Permit and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.1 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.1 above (40 C.F.R. § 122.22(b)(1));
   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity ~~such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility,~~ or an individual or a position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and
   c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)
3. If an authorization under Standard Provisions – Reporting V.B.1 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.1 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)
4. Any person signing a document under Standard Provisions – Reporting V.B.1 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the

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information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment C) in this General Permit.

   (40 C.F.R. § 122.41(l)(4).)

2. Monitoring results must be reported on a ~~Discharge Monitoring Report (DMR) form or forms provided or~~ Self Monitoring Report (SMR) or form as agreed by ~~specified by~~ the ~~Regional Water Board or State Water Board~~Deputy Director and the Discharger ~~for reporting results of monitoring of sludge use or disposal practices.~~
   ~~(40 C.F.R. § 122.41(l)(4)(i).)~~

3. If the Discharger monitors any pollutant more frequently than required by this General Permit using test procedures approved under Part 136 or as specified in this General Permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the SMR~~DMR or sludge~~ or other reporting form specified by the State Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this General Permit. (40 C.F.R. § 122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this General Permit, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. § 122.41(l)(5).)

E. Planned Changes

The Discharger shall give notice to the State Water Board and Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted activity or discharge. Notice is required under this provision (40 C.F.R. § 122.41(l)(1)) only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this General Permit nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 C.F.R. § 122.41(l)(1)(ii).)

F. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board and State Water Board of any planned changes in the permitted discharge or activity that may result in noncompliance with General Permit requirements. (40 C.F.R. § 122.41(l)(2).)

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G. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.F above. (40 C.F.R. § 122.41(l)(7).)

H. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

The State Water Board and Regional Water Board is authorized to enforce the terms of this General Permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

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ATTACHMENT C – MONITORING AND REPORTING PROGRAM

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ATTACHMENT C – MONITORING AND REPORTING PROGRAM

Title 40 of the Code of Federal Regulations (C.F.R.), § 122.48 requires that all NPDES permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the State Water Board and Regional Water Quality Control Board to require technical and monitoring reports. This Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements which implement federal and California laws and regulations.

This ~~Monitoring and Reporting Program~~MRP is designed to address the two key questions shown below. It also encourages Dischargers to form monitoring coalitions with others doing similar applications within a given watershed or doing applications of similar ~~use patterns~~environmental settings (~~urban,~~ agricultural, urban, and wetlands). The Coalition or Discharger may select sites representing worst case scenarios or high use areas for each active ingredient in each environmental setting. If the Discharger elects in its Pesticide Application Plan (PAP) to undertake monitoring and reporting through a Coalition, then the Coalition will prepare and implement a MRP (pursuant to this Attachment C) and act on behalf of the Discharger with respect to monitoring and reporting. Otherwise, the Discharger will prepare and implement an individual MRP.

Question No. 1: Does the ~~pesticide residue~~biological or residual pesticide from applications cause an exceedance of receiving water limitations or monitoring triggers?

Question No. 2: Does the biological or ~~pesticide residue~~residual pesticide, including active ingredients, inert ingredients, and ~~breakdown~~ degradation by-products, in any combination cause or contribute to an exceedance of the "no toxics in toxic amount" narrative toxicity objective?

~~Each Coalition's or individual Discharger's PAP must demonstrate how this will be accomplished by including the following information:~~

~~Evaluation of the Coalition's or Discharger's ability to answer the two key questions listed above with the information presently available, with the understanding that the ability to answer may vary from waterbody to waterbody.~~

~~Identification of critical gaps in knowledge (e.g., inability to document impacts, lack of knowledge about potential sources, absence of trend monitoring components) relevant to the Coalition's or Discharger's circumstances.~~

~~Description of how the PAP will be used as a framework for filling in the data gaps and for developing monitoring components suited to the Coalition's or Discharger's circumstances, documenting how the two key questions will be answered.~~

If the Discharger elects in its PAP to undertake monitoring and reporting through a Coalition, then the PAP should reference and attach the Coalition's monitoring plan.

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I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the nature of the monitored discharge. All samples shall be taken at the anticipated monitoring locations specified in the Discharger's or Coalition's PAP, unless otherwise specified. ~~The Discharger shall modify the PAP to include specific monitoring locations, recognizing that with vector control, the precise monitoring locations may not be available until after surveillance. The revised PAP, including the updated monitoring locations, shall be submitted to the State Water Board for approval.~~

~~Monitoring locations shall not be changed without notification to and approval by the State Water Board Deputy Director of the Division of Water Quality.~~

B. All laboratory analyses shall be conducted at a laboratory certified for such analyses by the Department of Public Health (CDPH, formerly Department of Health Services). Laboratories that perform sample analyses shall be identified in all monitoring reports. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by the State Water Board and the appropriate Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board.

C. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" (Guidelines), promulgated by the USEPA (40 C.F.R. Part 136). Any procedures to prevent the contamination of samples as described by the PAP shall be implemented.

D. Records of monitoring information shall include the following:

1. The date, exact place, and time of sampling or measurements;
2. The individuals who performed the sampling or measurements;
3. The dates analysis were performed;
4. The individuals who performed the analyses;
5. The analytical techniques or methods uses; and
6. The results of such analyses.

E. All monitoring instruments and devices used by the Discharger or Coalition to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their accuracy.

F. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this ~~Monitoring and Reporting Program~~MRP.

G. Laboratories analyzing monitoring samples shall be certified by CDPH, in accordance with the provision of California Water Code section 13176, and must include quality assurance/quality control data with their reports.

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II. MONITORING LOCATIONS AND SAMPLE TYPES

A. Monitoring Locations

Each Discharger or Coalition shall establish monitoring locations specified in the Discharger's or Coalition's PAP, to demonstrate compliance with the receiving water limitations, discharge specifications, and other requirements in this General Permit. The number and location of samples shall be selected to answer the two key questions. A Discharger may use representative monitoring locations to characterize water quality for all waters of the US within the Discharger's boundaries for each environmental setting (agriculture, urban, and wetland). However, the Discharger must provide justification for the selection of the representative monitoring locations. To be considered "representative," at a minimum, a location must be similar in hydrology, pesticide use, and other factors that affect the discharge of biological and residual pesticides to surface waters as a result of applications to the areas being represented in that environmental setting. Each Discharger must provide technical justification and identify which areas are to be considered representative. Monitoring location information shall include a description of the treatment area, GPS coordinates, and pesticides being applied. ~~The specific monitoring locations initially identified as representative monitoring locations may be changed based on surveillance of the Discharger or Coalition.~~

B. Sample Types

1. **Background Monitoring.** Background samples shall be collected in the application area or target area, just prior (up to 24-hours in advance of application) to the application event.
2. **Event Monitoring.** Event monitoring samples shall be collected in the application or target area for adulticide applications and downstream of the application or target area for larvicide applications immediately after the application event but shall not exceed 24 hours after the application event.
3. **Post-Event Monitoring.** Post-event samples shall be collected within the application area or the target area for larvicide applications after project completion as determined by the Coalition or Discharger.

III. TOXICITY TESTING REQUIREMENTS

Sections A-E provide the toxicity testing requirements the State Water Board may choose from. State Water Board staff recommends Section D. This paragraph will be deleted after the State Water Board chooses one of the options below or decides on its own motion what the toxicity requirements should be, if any.

A. Toxicity Testing

This General Permit does not require toxicity testing.

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B. Toxicity Testing

This General Permit does not require toxicity testing. However, the Coalition or Discharger shall conduct a priority pollutant scan and a pesticide scan of each product to determine if priority pollutants and/or pesticides [constituents of concern (COCs)] are present in the formulation that may pose a threat to water quality. If the scan shows the presence of COCs, besides the active ingredient, this General Permit may be reopened to set receiving water limits or triggers on the COCs to protect water quality. If the scan shows no COCs, this General Permit will require continued testing for the active ingredient only.

C. Toxicity Testing

The Coalition or Discharger shall meet the following toxicity testing requirements:

1. *Monitoring Frequency* – Each Coalition or Discharger shall conduct toxicity testing at each environmental setting (agricultural, urban, or wetland) in conjunction with the chemical testing for each active ingredient to determine whether residual pesticides including active ingredients, inert ingredients, and degradation byproducts, in any combination, are causing or contributing toxicity to the receiving water. If feasible, the required six consecutive samples specified below shall be collected in the same water body. The Coalition or Discharger shall meet the following toxicity testing requirements:

   Larvicides-

   Monitoring Frequency – For the first application, the larvicides, each Coalition or Discharger shall perform the toxicity testing in conjunction with the Background and Event Monitoring for active ingredients and at testing frequency specified in Tables C-1 (Coalition or Individual Monitoring Requirements for Larvicides). For adulticides, each Coalition or Discharger shall collect samples only for Post-Event perform the toxicity testing. If the Post-Event toxicity testing shows no toxicity, the Coalition or Discharger shall continue taking only Post-Event samples until a total of six consecutive Post-Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Post-Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the Discharger is causing or adding toxicity inconjunction with the receiving water, the and Event Monitoring for active ingredients and at testing frequency specified in Tables C-2 (Coalition or Discharger shall collect paired Background and Post-Event samples. When a total of six consecutive paired Background and Post-Event sample results show that the Discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Post-Event sample result shows that the Discharger is causing or adding toxicity to the receiving water, the Coalition or Discharger

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shall evaluate its application methods, BMPs, or the use of alternative products. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application.

~~Individual Monitoring Requirements for~~ Adulticides-

For the first application, the Coalition or Discharger shall collect samples only for Event toxicity testing. If the Event toxicity testing shows no toxicity, the Coalition or Discharger shall continue taking only Event samples until a total of six consecutive Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the Discharger is causing or adding toxicity in the receiving water, the Coalition or Discharger shall collect paired Background and Event samples. When a total of six consecutive paired Background and Event sample results show that the Discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Event sample result shows that the Discharger is causing or adding toxicity to the receiving water, the Coalition or Discharger shall evaluate its application methods, BMPs, or the use of alternative products. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application~~)~~. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application.

2. *Sample Types* – Receiving water samples shall be grab samples and shall be taken at receiving water monitoring locations specified in the Discharger's or Coalition's PAP. The receiving water control shall be a grab sample taken ~~from a receiving water sampling location (outside of the application influence) as specified in the PAP or~~ within the application area or target area 24 hours before application.

3. *Sample Volumes* – The sample volume is determined by the specific test methods to be used. Sufficient sample volume shall be collected to perform the required toxicity tests.

4. *Test Species* – Each Coalition or Discharger shall conduct chronic toxicity tests with *Ceriodaphnia dubia* to measure survival and reproduction endpoints to *C.dubia* exposed to the receiving water that contains residual pesticides from the application of organophosphate pesticides, piperonyl butoxide (or PBO), and N-Octyl Bicycloheptene Dicarboximide (or MGK-264) compared to that of the control organisms.

   Each Coalition or Discharger shall conduct acute toxicity tests with *Hyalella aztec* exposed to the receiving water that contains residual pesticides from the

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application of pyrethrin and pyrethroid products compared to that of the control organisms.

5. *Methods* – The presence of chronic toxicity shall be estimated as specified in Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002; Table IA, 40 C.F.R. Part 136 and its subsequent amendments or revisions. The test endpoint data are analyzed using a t-test approach as described in USEPA test method manuals (~~see~~ EPA/821/R-02/~~012~~013, page ~~86~~37), or in USEPA's NPDES Test of Significant Toxicity Implementation Document
June 2010.

   The presence of acute toxicity shall be estimated as specified in Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA/821-R-02-012, October 2002, Table 1A, 40 C.F.R. Part 136 and its subsequent amendments or revisions. The test endpoint data are analyzed using a standard t-test approach. Statistical analysis methods shall be consistent with USEPA test method manuals (see EPA/821/R-02/012, page 86).

6. *Quality* Assurance – The toxicity test must meet all test acceptability criteria as specified in the Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002.

7. *Dilution Series* – None. The tested sample must be 100% receiving water of the representative monitoring locations.

D. Toxicity Testing

The Coalition or Discharger shall meet the following toxicity testing requirements:

1. *Monitoring Frequency* – Each Coalition or Discharger shall conduct toxicity testing at each environmental setting (agricultural, urban, or wetland) in conjunction with chemical testing to determine whether residual pesticides including active ingredients, inert ingredients, and degradation byproducts, in any combination, are causing or contributing toxicity to the receiving water. If feasible, the required six consecutive samples specified below shall be collected in the same water body.

   Larvicides~~,~~-

   For the first application, the Coalition or Discharger shall collect one Background sample and one Post-Event sample in the application area for toxicity testing. If the Background sample result shows no toxicity, the Coalition or Discharger shall continue taking only Post-Event samples until a total of six consecutive Post-Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Post-Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing

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toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the Discharger is causing or adding toxicity to the receiving water, the Coalition or Discharger shall collect paired Background and Post-Event samples. When a total of six consecutive paired Background and Post-Event sample results show that the Discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Post-Event sample result shows that the Discharger is causing or adding toxicity to the receiving water, the Coalition or Discharger shall evaluate its application methods, BMPs, or the use of alternative products. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application.

Adulticides~~,~~-

For the first application, the Coalition or Discharger shall collect one Background sample and one Event sample in the application area for toxicity testing. If the Background sample result shows no toxicity, the Coalition or Discharger shall continue taking only Event samples until a total of six consecutive Event sample results show no toxicity in the receiving water. Thereafter, no further testing for toxicity will be required for the active ingredient used at that representative site. However, the presence of toxicity in the Event sample at anytime indicates that: (1) there is pre-existing toxicity in the receiving water, but the application is not adding to the pre-existing toxicity; (2) there is pre-existing toxicity in the receiving water and the application is adding toxicity to the pre-existing toxicity; or (3) there is no pre-existing toxicity in the receiving water, but the application itself is responsible for the toxicity. To determine whether the Discharger is causing or adding toxicity to the receiving water, the Coalition or Discharger shall collect paired Background and Event samples. When a total of six consecutive paired Background and Event sample results show that the Discharger is not causing or adding toxicity to the receiving water, no further testing for toxicity will be required for the active ingredient used at that representative site. However, if any paired Background and Event sample result shows that the Discharger is causing or adding toxicity to the receiving water, the Coalition or Discharger shall evaluate its application methods, BMPs, or the use of alternative products. The purpose of the evaluation is to identify corrective actions to be taken to eliminate any toxicity caused by the pesticide application.

Note: Add Section III.C, 2-7 for the remaining toxicity testing requirements.

E. Toxicity Testing (Public Notice Draft Permit Language)

Each Coalition or Discharger shall conduct toxicity testing to determine whether residual pesticides are contributing toxicity to the receiving water. The Coalition or Discharger shall meet the following toxicity testing requirements:

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1. *Monitoring Frequency* – For larvicides, each Coalition or Discharger shall perform the toxicity testing in conjunction with the Background and Post-Event Monitoring for active ingredients and at testing frequency specified in Tables C-1 (Monitoring Requirements for Larvicides). For adulticides, each Coalition or Discharger shall perform the toxicity testing in conjunction with the Background and Event Monitoring for active ingredients and at testing frequency specified in Tables C-2 (Monitoring Requirements for Adulticides).

2. *Sample Types* – Receiving water samples shall be grab samples and shall be taken at receiving water monitoring locations specified in the Discharger's or Coalition's PAP. The receiving water control shall be a grab sample taken ~~from a receiving water sampling location (outside of the application influence) as specified in the PAP or~~ within the application area or target area 24 hours before application.

3. *Sample Volumes* – The sample volume is determined by the specific test methods to be used. Sufficient sample volume shall be collected to perform the required toxicity tests.

4. *Test Species* – Each Coalition or Discharger shall conduct chronic toxicity tests with *Ceriodaphnia dubia* to measure survival and reproduction endpoints to *C.dubia* exposed to the receiving water that contains residual pesticides from the application of organophosphate pesticides, piperonyl butoxide (or PBO), and N-Octyl Bicycloheptene Dicarboximide (or MGK-264) compared to that of the control organisms.

   Each Coalition or Discharger shall conduct acute toxicity tests with *Hyalella aztec* exposed to the receiving water that contains residual pesticides from the application of pyrethrin and pyrethroid products compared to that of the control organisms.

   Methods – The presence of chronic toxicity shall be estimated as specified in Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002; Table IA, 40 C.F.R. Part 136 and its subsequent amendments or revisions. The test endpoint data are analyzed using a standard t-test approach. Statistical analysis methods shall be consistent with USEPA test method manuals (see EPA/821/R-02/012, page 86), or in USEPA's NPDES Test of Significant Toxicity Implementation Document June 2010.

   The presence of acute toxicity shall be estimated as specified in Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA/821-R-02-012, October 2002, Table 1A, 40 C.F.R. Part 136 and its subsequent amendments or revisions. The test endpoint data are analyzed using a t-test approach as described in USEPA test method manuals (see EPA/821/R-02/012, page 86), or in USEPA's NPDES Test of Significant Toxicity Implementation Document June 2010.

5. *Quality* Assurance – The toxicity test must meet all test acceptability criteria as specified in the Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002.

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6. *Dilution Series* – None. The tested sample must be 100% receiving water of the representative monitoring locations.

~~E.~~F. Toxicity Testing Notification Requirements

Each Coalition or Discharger shall notify the State Water Board and the appropriate Regional Water Board within 24 hours after the receipt of any test result indicating a "fail" result.

1. **Toxicity Reporting.** Acute and Chronic toxicity monitoring results shall be reported to the State Water Board and the appropriate Regional Water Board within 30 days following completion of the test, and shall contain, at minimum:
   a. The results expressed as either pass or fail using the standard t-test statistics;
   b. The dates of sample collection and initiation of each toxicity test;
   c. The results compared to the numeric toxicity monitoring trigger, in which the numeric monitoring trigger is any sample that shows a statistically significant difference compared to the control.
   d. Any toxicity test result indicating toxicity within the receiving stream must be immediately reported to the State Water Board and the appropriate Regional Water Board as a potential violation of this General Permit.

   Additionally, the annual discharger self-monitoring reports shall contain the following:
   a. A full laboratory report for all toxicity testing and monitoring frequency;
   b. The dates of sample collection and initiation of each toxicity test; and
   c. All results for receiving water parameters monitored concurrently with the toxicity test(s).
2. **Quality Assurance (QA).** The Coalition or Discharger must provide the following information for QA purposes:
   a. Toxicity data with the statistical output page giving the species, statistical endpoints, dilution water used, and dates tested.
   b. Any information on deviations or problems encountered and how they were dealt with.

IV. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

~~A. Watershed Monitoring~~

~~The State Water Board and Regional Water Boards have been implementing a Watershed Management Approach (WMA) to address water quality protection in the state following USEPA's guidance in *Watershed Protection: A Project Focus* (EPA841-R-95-003, August 1995). The objective of the WMA is to provide a more comprehensive and integrated strategy resulting in water resource protection,~~

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~~enhancement, and restoration while balancing economic and environmental impacts within a hydrologically-defined drainage basin or watershed. The WMA emphasizes cooperative relationships between regulatory agencies, the regulated community, environmental groups, and other stakeholders in the watershed to achieve the greatest environmental improvements with the resources available.~~

~~To foster the implementation of the WMA approach, this General Permit encourages MVCAC, its member organizations, and other vector control agencies to participate in the development and implementation of a watershed-wide monitoring program to determine the water quality impacts of their vector control activities. Whether conducting monitoring through the Coalition approach or individually, Dischargers must submit a PAP to the State Water Board before they can proceed with their application activities.~~

A. General Monitoring Requirements

The PAP shall be designed to answer the two key questions stated above. The PAP shall describe the tasks and time schedule in which these two key questions will be addressed. Monitoring shall take place at locations that are planned for pesticide applications or locations at which pesticides may be applied, as described in the Discharger's PAP.

~~Selection of monitoring areas must be scientifically based and sufficiently representative to characterize water quality for all waters of the US that may be affected by applications within the Coalition or individual Discharger boundaries.~~

The PAP must consider watershed specific attributes and waste constituents, based on the ~~natural~~ characteristics of applications within the Coalition's or Discharger's area, as well as the receiving water quality conditions. ~~Watershed specific requirements will include follow-up sampling and analyses on exceedances that may be unique for specific pesticides.~~

~~Monitoring area information shall include a description of the study area, GPS coordinates, and pesticides being applied. The numbers and locations of the monitoring areas must be sufficient to characterize water quality, based on specific watershed characteristics, and be supported by a detailed discussion of these characteristics.~~

~~Monitoring areas shall be selected for water bodies in order to answer the two key questions. Water bodies that carry residual pesticides as a result of applications must be represented in selection of monitoring areas.~~

~~The following monitoring is required for each sampling:~~

~~**Background Monitoring.** Background samples shall be collected at the application area or target area, just prior (up to 24-hours in advance of application) to the application event.~~

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~~**Event Monitoring.** Event monitoring samples shall be collectedcollected in the application area or the target area immediately after the application event but shall not exceed 24 hours after the application event.~~

~~**Post-Event Monitoring.** Post-event samples shall be collected within the application area or the target area within one week after the application event (applicable to adulticide applications) and after project completion as determined by the Coalition or Discharger (applicable to larvicide applications.)~~

Developing the details of a monitoring design requires clearly defining several inputs to the design and then organizing these in a logical framework that supports effective decision making about indicators, monitoring ~~area~~ locations, and monitoring frequency. The logical framework should describe:

1. The basic geographic and hydrographic features of the area, particularly application points and the pathways(s) of residue flows;
2. Pesticide application practices and how they are distributed in space and time;
3. Relevant knowledge about the transport, fates, and effects of pesticides, including best- and worst-case scenarios;
4. Description of the designated uses in each water body;
5. Relevant knowledge about the action of cumulative and indirect effects, and of other sources of impact;
6. Mechanisms through which pesticide applications could lead to designated use impacts, given the basic features of the area;
7. Known and potential impacts of pesticide applications on water quality, ranked in terms of relative risk, based on factors such as magnitude, frequency and duration;
8. Sufficient number of sampling areas to assess the entire Discharger's or Coalition's area of influence; and
9. The approach, including a schedule, to sample monitoring areas.

~~Monitoring shall also be used to provide supporting data that may allow consideration of the use of monitoring areas to be representative of other locations within the Discharger's or Coalition's boundaries. In order to be considered "representative," each Coalition or Discharger must provide technically valid justification for the representative nature of the monitoring locations to include similarities in hydrology, pesticide use, and other factors that affect the discharge of residual pesticides to surface waters as a result of applications. Each Coalition or Discharger must provide technical justification and identify which areas are to be considered representative in its PAP.~~

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by the treatment area. Attention shall be given to the presence or absence of:

1. Floating or suspended matter;

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2. Discoloration;
3. Bottom deposits;
4. Aquatic life;
5. Visible films, sheens, or coatings;
6. Fungi, slimes, or objectionable growths; and
7. Potential nuisance conditions.

Notes on receiving water conditions shall be summarized in the monitoring report.

~~Coalition or Individual Monitoring Requirements~~

~~On March 15, 2010, MVCAC submitted a Draft Conceptual Monitoring Plan for Mosquito Larvicides and Adulticides. MVCAC submitted a revised plan on June 22, 2010. The revised plan did not provide the following information: sampling frequency to characterize the discharge of residual pesticides; sampling for malathion, resmethrin, prallethrin, etofenprox, and MGK-264; and a detailed sampling plan for larvicides. In addition, sampling in the revised plan was still based solely on the most commonly used active ingredients. Thus, this Monitoring and Reporting Program includes requirements to collect this information. Monitoring shall be conducted on each type of sites representative of statewide applications (urban, agricultural, and wetlands.)~~

- ~~A Discharger that does not belong to a Coalition must fulfill monitoring requirements as described below.~~
- ~~Monitoring shall take place at locations that are described and scheduled in the Coalition's or Discharger's PAP.~~

~~**Coalition or Individual Monitoring Requirements for Larvicides**~~

B. Monitoring Requirements for Larvicides

Monitoring locations for larvicides ~~(temephos)~~ must include frequent and routine monitoring on a pre-determined schedule, as summarized in the Table C-1. ~~-~~The active ingredient temephos is the only larvicide that requires chemical and toxicity testing. ~~below:~~

Table C-1. ~~Coalition or Individual~~ Monitoring Requirements for Larvicides

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description (pond, lake, open waterway, channel, etc.) 2. Appearance of	Not applicable	Visual Observation	All applications at all application	Background, Event, and Post-Event Monitoring	Not applicable

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Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
	waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)			areas[1]		
Physical	1. Temperature[2]	ºF	Grab[4]	1	Background, Event, and Post-Event Monitoring	5
	2. pH[3]	Number				
	3. Turbidity[3]	NTU				
	4. Electrical Conductivity[3] @ 25℃	µmhos/cm				
Chemical	1. Active Ingredient[6]	µg/L	Grab[4]	1	Background, Event, and Post-Event Monitoring	5
	2. Dissolved Oxygen[3]	mg/L				
Toxicity[7]	Toxicity	Pass/Fail	Grab[4]	1See Section III.A.1	Background and Post-Event MonitoringSee Section III.A.1	5

1 If applying six or more times a year, collect six samples for each environmental setting (urban, agricultural, or wetlands), If applying less than six times a year, collect a sample during each application for each environmental setting (urban, agricultural, or wetlands). A minimum of six samples per year for the life of the General Permit shall be required for each type of representative site (urban, agricultural, and wetlands) as specified in the Coalition's or Discharger's PAP.

2 Field testing.

3 Field or laboratory testing.

4 Samples shall be collected at three feet below the surface, or mid-depth if water body is less than six feet deep.

5 Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. Part 136.

6 Active ingredient required to be tested is temephos.

7 Toxicity testing shall be taken in conjunction with the Background and Post-Event Monitoring for temephos. If no toxicity within the receiving stream has been found on all toxicity testing results (see footnote 1 for the minimum required sampling frequency) during the first year of the life of the General Permit, the Coalition or Discharger may discontinue toxicity testing. If any toxicity testing result indicating toxicity within the receiving stream, the Coalition or Discharger shall modify its BMPs to identify corrective actions to eliminate any toxicity caused by residual pesticides from larvicide applications and continue another cycle of toxicity testing (see footnote 1 for the minimum required sampling frequency) during the next year.

Coalition or Individual Monitoring Requirements for Adulticides

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C. Monitoring Requirements for Adulticides

Monitoring locations for adulticides must include frequent and routine monitoring on a pre-determined schedule, as summarized in Table C-2 below:

Table C-2. ~~Coalition or individual~~ Monitoring Requirements for Adulticides

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description (pond, lake, open waterway, channel, etc.) 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)	Not applicable	Visual Observation	All applications at all application areas[1]	Background and~~,~~ Event~~, and Post-Event~~ Monitoring	Not applicable
Physical	1. Temperature[2]	ºF	Grab[4]	1	Background and~~,~~ Event~~, and Post-Event~~ Monitoring	5
	2. pH[3]	Number				
	3. Turbidity[3]	NTU				
	4. Electrical Conductivity[3] @ 25°C	µmhos/cm				
Chemical	1. Active Ingredient[6]	µg/L	Grab[4]	1	Background, and Event~~, and Post-Event~~ Monitoring	5
	2. Dissolved Oxygen[3]	mg/L				
Toxicity~~[7]~~	Toxicity	Pass/Fail	Grab[4]	See Section III.A.1[1]	~~Background and Event Monitoring~~See Section III.A.1	5

[1] If applying six or more times a year, collect six samples for each environmental setting (agricultural, urban or wetlands). If applying less than six times a year, collect a sample during each application for each environmental setting (agricultural, urban, or wetlands). The remaining samples required to meet the minimum of six shall be collected subsequently the following year(s). ~~A minimum of six samples per year shall be required for each type of representative sites (urban, agricultural, and wetlands) as specified in the Coalition's or Discharger's PAP.~~

[2] Field testing.

[3] Field or laboratory testing.

[4] Samples shall be collected at the surface of the water body.

[5] Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. Part 136. For pyrethrin and pyrethroids, the Coalition or Discharger may use alternative analytical methods in which analytical methods used must be capable of achieving the MDLs below the Receiving Water Monitoring Trigger for each active ingredient analyzed if the analytical methods described in 40 C.F.R. Part 136 are not capable of achieving these MDLs.

[6] First year sampling shall include pyrethrin, permethrin, resmethrin, sumithrin, prallethrin, etofenprox, PBO, PBO (in PBO/Pyrethrin mixture), and PBO (in PBO/ Resmethrin mixture). Second year sampling shall include naled and

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Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
~~7~~	malathion. Third year sampling shall include MGK-264. If applying six or more times a year, collect six samples for each environmental setting (agricultural, urban, or wetlands). If applying less than six times a year, collect a sample during each application for each environmental setting (agricultural, urban, or wetlands). The remaining samples required to meet the minimum of six shall be collected subsequently the following year(s).~~If the active ingredient required to be tested in the specified year would not be used in that year or if a minimum of six samples could not be achieved for that year, the Coalition or Discharger is required to conduct one-full year of sampling or achieve the requirement of a minimum of six samples when that active ingredient will be used in the upcoming years. Toxicity testing shall be taken in conjunction with the Background and Event Monitoring for active ingredients specified in Footnote 6. If no toxicity within the receiving stream has been found on all toxicity testing results (see footnotes 1 and 6 for the minimum required sampling frequency, the year and associated active ingredients that are required to be tested), the Coalition or Discharger may discontinue toxicity testing. If any toxicity testing result indicating toxicity within the receiving stream, the Coalition or Discharger shall modify its BMPs to identify corrective actions to eliminate any toxicity caused by residual pesticides from adulticide applications and continue another cycle of toxicity testing (see footnote 1 for the minimum required sampling frequency) during the fourth and the fifth year of the life of the General Permit.~~						

V. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger or Coalition shall inform the State Water Board and the appropriate Regional Water Board 24 hours before the start of ~~the~~ each application or the earliest feasible time.

~~7.~~2. The Discharger or Coalition shall comply with all Standard Provisions (Attachment B) related to monitoring, reporting, and recordkeeping.

~~8.~~3. Upon written request of the State Water Board or the appropriate Regional Water Board, the Discharger or Coalition shall submit a summary monitoring report.

~~9.~~4. The Discharger or Coalition shall report to the State Water Board and appropriate Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act" of 1986 (42 U.S.C. §11001 et. seq.)

~~10.~~5. Monitoring frequencies may be adjusted by the State Water Board Deputy Director of the Division of Water Quality (Deputy Director) to a less frequent basis if the Discharger or Coalition makes a request and the request is backed by statistical trends of monitoring data submitted.

~~11.~~6. Additional monitoring and reporting requirements may be added to the ~~PAP~~ MRP by the ~~State Water Board~~ Deputy Director ~~of the Division of Water Quality~~.

B. Annual Reports

Each Coalition or Discharger, including members of a Coalition, shall submit an Annual Report. Dischargers, who are members of a Coalition, may reference monitoring information in the Coalition's Annual Report.

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1. Annual reports shall contain the following information:
   a. An Executive Summary discussing compliance or violation of this General Permit and the effectiveness of the PAP to reduce or prevent the discharge of biological and residual pesticides for vector control;
   b. A summary of monitoring data, including the identification of water quality improvements or degradation, and recommendations for improvements to the PAP (including proposed BMPs) and monitoring program based on the monitoring results. All receiving water monitoring data shall be compared to applicable water quality standards or Receiving Water Monitoring Triggers;
   c. Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in this General Permit;
   d. A discussion of BMP modifications addressing violations of this General Permit;
   e. A map showing the location of each application area and the target area;
   f. Types and amounts of pesticides used at each application event during each application;
   g. Information on surface area and/or volume of application and target areas and any other information used to calculate dosage, concentration, and quantity of each pesticide used;
   h. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling area (i.e., address, cross roads, etc.), collection date, name of constituent/parameter and its concentration detected, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled, and a comparison with applicable water quality standards, description of analytical QA/quality control plan. Sampling results shall be tabulated so that they are readily discernible; and
   i. Recommendations to improve the monitoring program, BMPs, and PAP to ascertain compliance with this General Permit.
   j. Pesticide Application Log
2. The Discharger or the Coalition shall include in the Annual Report any updated information regarding specific monitoring locations from its PAP.
3. At any time during the term of this General Permit, the State Water Board or the appropriate Regional Water Board may notify Dischargers or Coalition of the requirement to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, each Coalition or Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

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4. The Discharger or Coalition shall report the results for all monitoring specified in this ~~Monitoring and Reporting Program~~MRP in the SMR. The Discharger or Coalition shall submit annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this General Permit. If a Discharger or Coalition monitors any pollutant more frequently than required by this General Permit, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.
5. Monitoring reports shall be submitted to the ~~State Water Board~~Deputy Director ~~Board~~ and the appropriate Regional Water Board Executive Officer in accordance with the following schedule:

Table C-3. Reporting Schedule

Reporting Frequency	Reporting Period	Annual Report Due
Annual	1 January through 31 December	1 March

C. Reporting Protocols

The Discharger or Coalition shall report with each sample result the applicable reported Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 C.F.R. Part 136.

The Discharger or Coalition shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

1. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
2. Sample results less than the Reporting Limit (RL), but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

   For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (plus a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
3. Sample results less than the laboratory's MDL shall be reported as "<" followed by the MDL.
4. Dischargers or Coalition are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger or Coalition to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

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5. Multiple Sample Data: If two or more sample results are available, each Discharger or Coalition shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger or Coalition shall compute the median in place of the arithmetic mean in accordance with the following procedure:

   a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

   b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

6. Dischargers ~~or~~ and Coalition shall submit the Annual Report in accordance with the following requirements:

   a. The Discharger or Coalition shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with effluent and receiving water limitations. The Discharger or Coalition is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger or Coalition shall electronically submit the data in a tabular format as an attachment.

   b. Each Discharger or Coalition shall attach a cover letter to the Annual Report. The information contained in the cover letter shall clearly identify violations of the permit; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

   c. Annual Report must be submitted to the State Water Board and the appropriate Regional Water Board, signed and certified as required by the Standard Provisions (Attachment B).

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As described in the Findings in section III of this General Permit, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this General Permit.

This General Permit has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California.

I. PERMIT INFORMATION

A. Background

~~1.~~7. The Regulatory Background

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act) was amended to provide that the discharge of pollutants to waters of the US from any point source is effectively prohibited unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit.

On September 22, 1989, the USEPA granted the State of California, through the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards), the authority to issue general NPDES permits pursuant to 40 Code of Federal Regulations (C.F.R.) Parts 122 and 123.

Section 122.28 of 40 C.F.R. provides for issuance of general permits to regulate a category of point sources if the sources involve the same or substantially similar types of operations; discharge the same type of waste; require the same type of effluent limitations or operating conditions; require similar monitoring; and are more appropriately regulated under a general order rather than individual ~~orders~~permits.

On March 12, 2001, the Ninth Circuit Court of Appeals held that discharges of pollutants from the use of aquatic pesticides in waters of the US require coverage under an NPDES permit. (*Headwaters, Inc. v. Talent Irrigation District)*[14]. The *Talent* decision was issued just prior to the major season for applying aquatic pesticides.

Because of the serious public health, safety, and economic implications of delaying pesticide applications, in 2001 the State Water Board adopted Water Quality Order (Order) No. 2001-12-DWQ, Statewide General NPDES Permit for Discharges of Aquatic Pesticides to Waters of the US on an emergency basis to provide immediate NPDES permit coverage for broad categories of aquatic pesticide use in California.

[14] 243 F.3d 526 (9th Cir 2001).

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Order No. 2001-12-DWQ imposed requirements on any discharge of aquatic pesticides from public entities to waters of the US in accordance with the State Water Board's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP establishes procedures for implementing water quality standards for priority pollutants in NPDES permits.

Section 5.3 of the SIP allows for short-term or seasonal exceptions from its requirements for resource or pest management conducted by public entities. In order to qualify for an exception from meeting priority pollutant standards, a public entity must fulfill the requirements listed in section 5.3 and the State Water Board must decide to grant the exception. Among other requirements, entities seeking an exception to complying with water quality standards for priority pollutants must submit documents in compliance with California Environmental Quality Act (CEQA)[15] . Because of the emergency adoption of Order No. 2001-12-DWQ, the State Water Board invoked an exemption to the requirements of section 5.3 of the SIP and issued the permit incorporating a categorical exception to water quality standards for priority pollutants.

Order No. 2001-12-DWQ required that Dischargers develop a best management practices (BMPs) plan that minimizes adverse impacts to receiving waters and a monitoring and reporting plan that is representative of each type of aquatic pesticide application.

In August 2001, Waterkeepers Northern California (Waterkeepers) filed a lawsuit against the State Water Board challenging several aspects of Order No. 2001-12-DWQ. Major aspects of the challenge included the emergency adoption of the Order without compliance with CEQA and other exception requirements of the SIP; failure to address cumulative impacts; and failure to comply with the California Toxics Rule (CTR)[16].

In a settlement of the Waterkeepers' lawsuit, the State Water Board agreed to fund a comprehensive aquatic pesticide monitoring program that would assess receiving water toxicity caused by aquatic pesticide residues. In November 2002, the Ninth Circuit issued another opinion concerning the need for an NPDES permit for pesticide application. (*League of Wilderness Defenders v. Forsgren*[17].) In this case, the court held that the U.S. Forest Service must obtain an NPDES permit before it sprays insecticides from an aircraft directly into or over rivers as part of silviculture activities. The court found that the insecticides are pollutants under the CWA. The court also ~~defined~~ found the exemption for silvicultural pest control from the definition of "point source" in USEPA's regulations to be limited to pest control activities from which there is natural run~~off.~~

Also in 2002, the Second Circuit issued an unpublished decision regarding the need for an NPDES permit for application of pesticides for vector control in federal wetland areas. (*Altman v. Town of Amherst*.) The lower court had dismissed a citizens' suit, holding that pesticides, when used for their intended purpose, do not

[15] Cal. Pub. Resources Code §§ 21000 et. seq.
[16] § 131.38.
[17] 309 F.3d 1181 (9th Cir. 2002).

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constitute a "pollutant" for purposes of the CWA, and are more appropriately regulated under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The appeals court vacated the trial court's decision and remanded the matter. In its unpublished decision, the Second Circuit expressed concern that: [u]ntil the EPA articulates a clear interpretation of current law - among other things, whether properly used pesticides released into or over waters of the United States can trigger the requirements for NPDES permits - the question of whether properly used pesticides can become pollutants that violate the [Clean Water Act] will remain open.

Order No. 2001-12-DWQ expired on January 31, 2004. In May 2004, it was replaced by two general permits: a vector control permit for larvicides (Order No. 2004-0008-DWQ) and a weed control permit (Order No. 2004-0009-DWQ). The vector control permit does not cover spray applications of pesticides to control adult mosquitoes. The State Water Board determined that adoption of these two permits was consistent with the Ninth Circuit decisions.

In 2005, the Ninth Circuit held that a pesticide that is applied consistent with FIFRA is not a "chemical waste" (*Fairhurst v. Hagener*[18]*),* but also stated that it would not change its decision in *Headwaters.* The court stated that whether an NPDES permit was required depends on whether there was any "residue or unintended effect" from application of the pesticide. In *Fairhurst*, the court found neither residue nor unintended effect was present. Therefore, the pesticide application at issue did not require an NPDES permit.

USEPA's Final Rule: On November 20, 2006, USEPA adopted a final regulation providing that NPDES permits are not required for pesticide applications as long as the discharger follows FIFRA label instructions. According to this new regulation, pesticides applied under the following two circumstances are not pollutants and, therefore, are not subject to NPDES permitting requirements:

(1) The application of pesticides directly to waters of the US in order to control pests. Examples of such applications include applications to control vector larvae, aquatic weeds, or other pests that are present in waters of the United States.

(2) The application of pesticides to control pests that are present over waters of the US, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the US in order to target the pests effectively; for example, when insecticides are aerially applied to a forest canopy where waters of the US may be present below the canopy or when pesticides are applied over or near water for control of adult mosquitoes or other pests.

Lawsuits Against USEPA's Final Rule: After USEPA's new regulation was adopted in 2006, lawsuits were filed by both the pesticide industry and environmental groups in 11 of the 13 Circuits, including the Ninth Circuit Court, challenging USEPA's Final Rule.

[18] 422 F.3d 1146 (9th Cir. 2005).

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***The National Cotton Council of America v. USEPA*[19]:** The petitions for review were consolidated in the Sixth Circuit Court by an order of the Judicial Panel on Multidistrict Litigation.

On January 7, 2009, the Sixth Circuit Court determined that USEPA's Final Rule is not a reasonable interpretation of the CWA and vacated the Final Rule. USEPA did not request reconsideration of the decision, but did file a motion for a two-year stay of the effect of the decision in order to provide agencies time to develop, propose, and issue NPDES general permits for pesticide applications covered by the ruling. On June 8, 2009, the Sixth Circuit granted the motion, such that the USEPA exemption will remain in place until April 9, 2011.

8. **Drafting of the Vector Control General Permit:** In February 2009, State Water Board staff met with members of the Mosquito and Vector Control Association of California (MVCAC) which represents the vast majority of governmental vector control programs in the state. The California Department of Pesticide Regulation (DPR) and California Department of Public Health (CDPH) representatives were also present at the meeting, the purpose of which was to discuss MVCAC's need for a mosquito adulticide permit as a result of the Sixth Circuit Court's ruling. In subsequent meetings, representatives of these groups formed a technical committee together with State Water Board staff to facilitate drafting of the adulticide permit. Representatives from USEPA Headquarters and Region 9 joined the technical committee after its initial formation.

In November 2009, staff posted the Draft Adulticides Permit on the State Water Board's website. The main purpose of posting the draft permit was to inform interested parties and the public of State Water Board staff's activities in response to the Sixth Circuit Court's decision; the other purpose was to solicit comments from these groups. The deadline for comments was January 31, 2010. State Water Board staff did not receive any comments.

In February 2010, MVCAC requested that the Adulticides Permit be combined with the Larvicides Permit. Due to time constraints associated with issuing the combined Adulticide and Larvicide Permit by April 9, 2011, the technical committee agreed that the combined permit only include the most commonly used adulticide and larvicide products that are currently registered in California. CDPH and MVCAC provided State Water Board staff with lists of the most commonly used adulticide and larvicide products.

On March 15, 2010, MVCAC submitted a Draft Conceptual Monitoring Plan for Mosquito Larvicides and Adulticides. On April 14, 2010, USEPA and State Water Board staff discussed their comments on the draft monitoring plan with MVCAC representatives. USEPA and State Water Board staff's main concerns were: 1) the lack of specificity in sampling location and frequency; 2) no sampling/testing for malathion, resmethrin, prallethrin, etofenprox, and MGK-264; 3) sampling/testing for toxicity is not adequate; 4) sampling priority scheme is based

[19] 553 F.3d 927 (6th Cir. 2009).

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on the most commonly used active ingredients; and 5) monitoring proposal for larvicides is not adequate. In response to the concerns, MVCAC submitted a revised plan on June 22, 2010. Although the revised plan addressed USEPA and State Water Board staff's major concern by including an adequate sampling/testing for toxicity, it still does not provide the following: sampling frequency to characterize the discharge of biological and residual pesticides; sampling for malathion, resmethrin, prallethrin, etofenprox, and MGK-264; and a detailed sampling plan for larvicides. In addition, sampling in the revised plan was still based solely on the most commonly used active ingredients. At the April 14, 2010 meeting, USEPA and State Water Board staff had requested that the sampling priority scheme be based on both the most commonly used active ingredients and the most toxic ingredients. Thus, the Monitoring and Reporting Program includes requirements to collect this information.

~~3.~~9. Related Aquatic Pesticide Regulation Information

Pesticide formulations may include "active ingredients" and "inert ingredients". Adjuvants or surfactants may be added to the ingredients in the application equipment that is used in the delivery of the pesticide.

As part of the registration process of pesticides for use in California, USEPA and DPR evaluate data submitted by registrants to ensure that a product used according to label instructions will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions. Registrants are required to submit data on the effects of pesticides on target pests (efficacy) as well as non-target effects. Data on non-target effects include plant effects (phytotoxicity), fish and wildlife hazards (ecotoxicity), impacts on endangered species, effects on the environment, environmental fate, breakdown products, leachability, and persistence. Requirements that are specific to use in California are included in many pesticide labels that are approved by USEPA. Use must be reported to the County Agricultural Commissioner where required by law or by agreement with DPR.

The Clean Water Act (CWA), at section 301(a), broadly prohibits the discharge of any pollutant to waters of the US, except in compliance with an NPDES permit. Pesticides discharged into surface waters may constitute pollutants within the meaning of the CWA even if the discharge is in compliance with the registration requirements of FIFRA, thus, requiring coverage under a valid NPDES permit.

DPR and the County Agricultural Commissioners regulate the sale and use of pesticides in California. Pesticide applications subject to this General Permit must be consistent with applicable Use Permits issued by County Agricultural Commissioners and the pesticide label instructions approved by USEPA under FIFRA. According to federal law, pesticide label language is under the sole jurisdiction of USEPA. Label language and any changes thereto must be approved by USEPA before the product can be sold in this country. DPR cannot require manufacturers to make changes on labels; however, DPR can refuse to register products unless manufacturers address unmitigated hazards by amending the pesticide label.

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State regulations require that the County Agricultural Commissioners determine if a substantial adverse environmental impact will result from the proposed use of a restricted material. If the County Agricultural Commissioner determines that this is likely, the commissioner may deny the Use Permit or may issue it under the condition that site-specific use practices be followed (beyond the label and applicable regulations) to mitigate potentially adverse effects. DPR conducts scientific evaluations of potential health and environmental impacts and provides commissioners with information in the form of suggested permit conditions. DPR's suggested permit conditions reflect minimum measures necessary to protect people and the environment. County Agricultural Commissioners use this information and its evaluation of local conditions to set site-specific limits in permits.

The State's pesticide regulations provide special procedures for vector control agencies operating under cooperative agreements [For example, see Food and Agricultural Code § 11408(e)]. The application of pesticides by vector control agencies is regulated by a special arrangement among the CDPH, DPR, County Agricultural Commissioners, and vector control agencies. Vector control agencies are not directly regulated by DPR. Instead, supervisors or applicators are licensed by CDPH. Pesticide use by vector control agencies is reported to the County Agricultural Commissioner in accordance with a 1995 Memorandum of Understanding among DPR, DHS, and County Agricultural Commissioners for the *Protection of Human Health from the Adverse Effects of Pesticides* and with cooperative agreements entered into between CDPH and vector control agencies, pursuant to Health and Safety Code section 116180.

~~4.~~10. Mosquitoes

~~iv.~~a. Mosquito Life Cycle

There are several species of mosquitoes that readily feed on people, and domestic animals, and some species are capable of transmitting organisms that cause diseases such as malaria and encephalitis in people, domestic animals, and wildlife.

Mosquitoes are classified as Insects in the Order Diptera. They undergo a complete metamorphosis, which involves four stages of development: egg, larva, pupa, and adult. The first three stages occur in water, but the adults are active flying insects and the female feeds upon the blood of humans and/or animals. The female mosquito lays her eggs directly on water or on moist substrates that may later be flooded with water. The eggs later hatch into larvae, the focus of most vector agencies control programs. The larvae go through four growth stages called instars. During these stages, the larvae continue to feed and grow in size. Once the larvae have developed to the fourth instar, they stop feeding and pupate. This is a resting (i.e., non-feeding) period. At this point, biological control (larvicides) and growth regulators no longer work as control measures because they require ingestion/absorbtion. Draining or emptying the water, predation by

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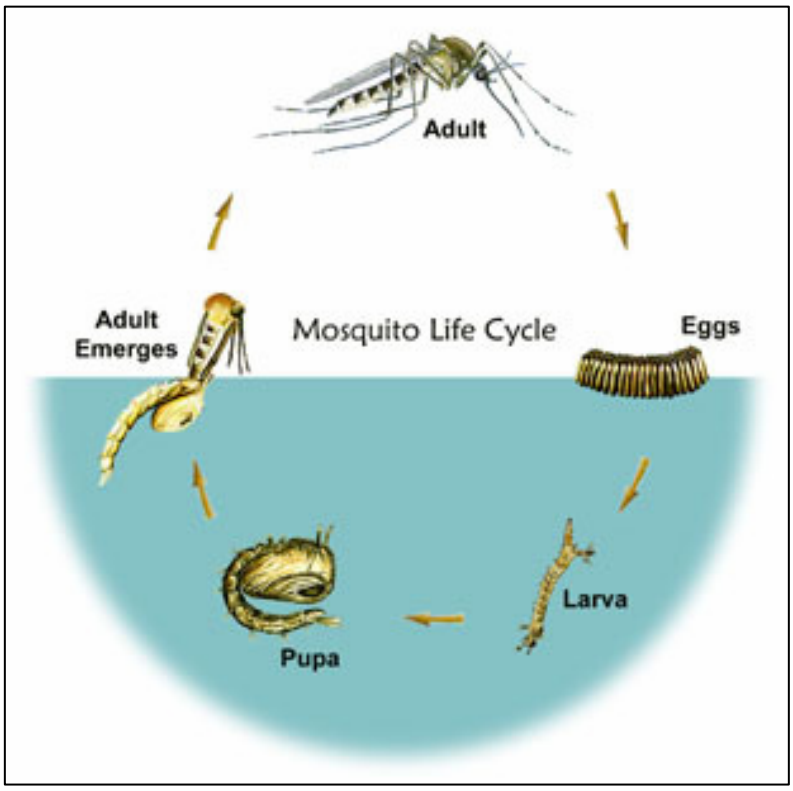
fish and other aquatic predators, surface film larvicides, waves, or currents sufficient to flush pupae to open or moving water will also kill the pupae.

Once larvae transform into pupae, internal changes occur and the adult mosquitoes take form. After a few hours to a few days in the pupae stage, the adult mosquitoes emerge at the water surface and seek shelter in shady, moist areas. Adult mosquitoes must find shelter during the heat to avoid dehydration and are generally most active during the hours around dusk and dawn, although some species are active throughout daylight hours or during the night. After a brief period of rest, adult females seek ~~of~~ blood meals and the cycle continues. The time frame for completion of this cycle is highly variable, anywhere from less than a week to several months, depending primarily on the species and the temperature of the water. The warmer the water, the quicker the development will be. A very small amount of water in a container in the sun may produce a batch of adult mosquitoes very quickly.



(Leon County Mosquito Control, Tallahassee, FL)

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Mosquito biology can follow two general scenarios. The first involves those species that lay their eggs in masses or rafts on the water's surface. Some of these species, which are found throughout the United States, often lay their eggs in natural or artificial water-holding containers found in the domestic environment, or in naturally occurring pools. In summer, the entire life cycle, from egg to adult, may be completed in a week or less.

The second scenario includes *Aedes* mosquitoes that lay their eggs on moist soil or other substrates in areas that will be flooded with water later. After a few days, these eggs are ready to hatch but, if not flooded, can withstand drying for months and longer. In inland areas of the United States where these mosquitoes breed, heavy rains, irrigation, or other simultaneous flooding can produce millions of mosquitoes in a short time. Similar situations occur along coastal areas with mosquitoes adapted to salt marsh habitats, where high tides can initiate simultaneous development of large mosquito populations. Some salt marsh mosquitoes are strong fliers and can sometimes travel up to 50 miles from the breeding site.

Only female mosquitoes require a blood meal and bite animals or birds, warm or cold blooded. Stimuli that influence biting (blood feeding) include a combination of carbon dioxide, temperature, moisture, smell, color and movement. Male mosquitoes do not bite, but feed on the nectar of flowers or other suitable sugar source. Acquiring a blood meal (protein) is essential for egg production, but mostly both male and female mosquitoes are nectar feeders. Female *Toxorhynchites* actually cannot obtain a bloodmeal and are restricted to a nectar diet. ~~Of those~~ F~~f~~emale mosquitoes, capable of blood feeding, prefer horses, cattle, smaller mammals and/or birds over human blood meals. ~~are seldom first or second choices. Horses, cattle, smaller mammals and/or birds are preferred.~~

Aedes mosquitoes are painful and persistent biters. They search for a blood meal early in the morning, at dusk (crepuscular feeders), and in the evening. Some are diurnal (daytime biters) especially on cloudy days and in shaded areas. They usually do not enter dwellings, and they prefer to bite mammals like humans. Aedes mosquitoes are strong fliers and are known to fly many miles from their breeding sources.

Culex mosquitoes are painful and persistent biters also, but prefer to feed at dusk and after dark. They readily enter dwellings for blood meals. Domestic and wild birds usually are preferred over humans, cows, and horses. Culex mosquitoes are generally weak fliers and do not move far from home, although they have been known to fly up to two miles. Culex mosquitoes usually live only a few weeks during the warm summer months; however, the life of these mosquitoes can be extended in warm weather locales. Those females that emerge in late summer search for sheltered areas where they "hibernate" until spring. Warm weather brings them out again in search of water on which to lay their eggs.

Culiseta mosquitoes are moderately aggressive biters, attacking in the evening hours or in the shade during the day. *Psorophora*, *Coquillettidia,* and *Mansonia* mosquitoes are becoming more pestiferous as an ever-expanding human population invades their natural habitats. Anopheles mosquitoes are persistent biters and are the only mosquitoes which transmit malaria to man.

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b. **Public Health Impacts**

Female mosquitoes of nearly all species require blood from vertebrate animals to develop eggs, and bite people, pets, and livestock for this purpose. Mosquitoes are found throughout the world and many transmit pathogens, which may cause disease. These diseases include a variety of mosquito-borne viral encephalitides, dengue, yellow fever, malaria, and filariasis. Most of these diseases have been prominent as endemic or epidemic diseases in the United States in the past, but today, only the insect-borne (arboviral) encephalitides occur annually and dengue occurs periodically in the US. The most important consequence of this is the transmission of microorganisms that cause diseases such as Western equine encephalomyelitis St. Louis encephalitis and West Nile virus. All of these diseases can cause serious, sometimes fatal neurological ailments in people. (Western equine encephalomyelitis virus also causes disease in horses.) Western equine encephalomyelitis infections tend to be more serious in infants while St. Louis encephalitis can be a problem for older people. These viruses are normally infections circulating in birds or small mammals. During outbreaks; however, the level of the virus present may increase facilitating transmission to humans by mosquitoes.

Human cases of encephalitis range from mild to very severe illnesses that, in a few cases, can be fatal. Other pathogens transmitted by mosquitoes include a protozoan that causes malaria, and *Dirofilaria immitis*, a parasitic roundworm and the causative agent of dog heartworm. Disease carrying mosquito species are found throughout the United States, especially in urban areas and coastal or inland areas where flooding of low lands frequently occurs. Even when no infectious diseases are transmitted by mosquitoes, they can be a health problem to people and livestock. Mosquito bites can result in secondary infections, allergic reactions, pain, irritation, redness, and itching.

c. **West Nile Virus**

West Nile virus (WNV) is a mosquito-borne disease that has been found in parts of Asia, Eastern Europe, Africa, and the Middle East. WNV, which can also cause encephalitis, was found in the northeastern United States for the first time in 1999 and is a good example of infected animals facilitating transmission to humans by mosquitoes. Since then, more than 28,000 cases of infection with WNV have been detected in 47 states, including California. California led the nation in human WNV cases for four years consecutively. Most people and horses that are infected with WNV do not become ill or have only mild to moderate symptoms. In some cases, the virus can cause a more serious condition called encephalitis, an inflammation of the brain, which is potentially fatal.

While West Nile virus is initially spread between mosquitoes and birds, infected mosquitoes will occasionally bite other hosts such as horses and people, and transmit the virus to them. People typically develop symptoms between 3 and 14 days after they are bitten by an infected mosquito.

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Numerous local agencies throughout California routinely conduct surveillance and control of mosquitoes and the diseases they transmit. In 2000, the statewide surveillance program added WNV to the list of diseases monitored. Extensive information on WNV in California, including current and historic activities throughout the state, can be found at http://westnile.ca.gov.

5.11. Black Flies

Unlike mosquitoes and midges, black flies breed in flowing water from rivers and streams to irrigation ditches. After mating, the female black fly deposits her fertilized eggs on rocks or other substrate in swift flowing water. Larvae emerge from eggs and develop aquatically, feeding on algae and organic matter in the moving water. It will take seven to ten days for them to develop into pupae. Adults emerge from the pupal case through a slit and float to the surface on a bubble of air. Emerging adults live between two to three weeks. They are usually found from spring through fall, with the greatest numbers appearing in the late spring and summer. They are active during the day, with peak activity in the morning and early evening. The adults are small, menacing, biting flies that are a nuisance to people and animals living, working, or playing near rivers and streams. These small flies are commonly called "buffalo gnats" because of their humped- back appearance. They are typically dark in color and appear in a variety of neutral shades from light gray to black.

The painfully itchy bite of the black fly is created when the female cuts a hole in the skin to suck blood from animals and people. Females will attack incessantly around the eyes, ears, scalp and, occasionally, on the arms and exposed legs. Pain and swelling from the bites can occur due to allergic reactions to foreign proteins and toxins that the female injects when feeding. In the tropics, black flies transmit diseases, such as River Blindness. Fortunately, they do not transmit any diseases to humans in California, but can cause extreme discomfort and irritation due to their biting habits and great numbers. Thus, they are considered a 'nuisance vector' under the provisions of the California Health and Safety code.

Black fly control programs will include monitoring for black fly larval occurrence and abundance, the application of larvicides when larval numbers exceed predetermined thresholds, as well as monitoring for treatment effectiveness.

6.12. Midges

Midges comprise many kinds of very small two-winged flies, found mostly in Northern England, Scotland, Ireland, Norway, Russia and in parts of North America. The term does not encapsulate a well-defined taxonomic group, but includes animals in several families of Nematoceran Diptera. The habits of midges vary greatly among the component families, which include Blephariceridae (net-winged midges), Ceridomviidae,(gall midges), Ceratopogonidae (biting midges, also known as no-see-ums or punkies in North America), Chaoboridae (phantom midges), Chironomidae (non-biting midges, also known as muffleheads in the Great Lakes region of North America), Deuterophlebiidae (mountain

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midges), Dixidae (meniscus midges), Scatopsidae (dung midges), and Thaumaleidae (solitary midges).

The Ceratopogonidae (biting midges) are serious biting pests, and can spread the livestock diseases Blue Tongue and African Horse Sickness – but the other midge families are not. Most midges, apart from the gall midges (Cecidomyiidae), are aquatic during the larval stage.

Midges are usually a problem from April to September and will typically emerge in swarms around sunset. They survive the winter as larvae in mud and at the bottom of water sources. The larvae develop and breed in aquatic habitats similar to those of mosquitoes. The adults are flying insects which emerge in masses and become especially bothersome for residents near sources such as flood control channels, lakes, ponds, reservoirs, or spreading basins. When midges emerge as adults in enormous numbers, they invade nearby residences, disrupt outdoor and indoor activities, and create stressful living conditions in affected areas. Flying adult midges can stick on newly painted surfaces or deface walls, ceilings, curtains, and other property. Swarms can cause discomfort or irritation by entering the eyes, ears, nose, and mouth. While they tend to lessen real estate value in residential areas, midge swarms can also interfere with processing of food, paper products, plastic, and automotive refinishing operations in industrial situations, causing significant economic impact. Although these insects do not transmit diseases, except for the biting midges, they have been documented as the cause of allergic reactions and are considered a 'nuisance vector' under the provisions of the California Health and Safety Code.

Vector control agencies have been involved in collaborative research programs concerning the biology, ecology, and control of midges since the early 1960's. Research concluded that physical control, the ability to manage the movement of water to and from midge habitats, is the most effective method for preventing midge occurrence. This method properly disrupts the midge life cycle and prevents adult emergence. Midge control program methodologies are based upon the maximization of physical control and restriction of the use of larvicides or adulticides to situations where water rotation or drainage to prevent midge mass emergences is not an option.

~~7.~~13. Other Public Health Impacts

In addition to transmitting pathogenic disease, vectors also can cause significant impacts to the public in general, to farm workers and other outdoor workers in particular, to outdoor recreation and tourism, and to real estate values, etc., and therefore are recognized as public nuisances under the law. (California Health and Safety Code section 2002(j).) Specifically, the California Legislature also has recently found that, "the protection of Californians and their communities against the discomforts and economic effects of vector-borne diseases is an essential public service that is vital to public health, safety, and welfare." (Health and Safety Code section 2001(b)(3); Senate Bill No. 1588 (2002)).

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B. General Criteria

1. This General Permit serves as a general NPDES Permit for the discharge of biological and residual pesticides to surface waters as a result of direct or spray applications for vector control.
2. Dischargers who submit a complete application under this General Permit are not required to submit an individual permit application. The State Water Board may request additional information and determine that a Discharger is not eligible for coverage under this General Permit and would be better regulated under an individual or other general NPDES permits to be issued by the appropriate Regional Water Board. If the discharge becomes covered by ~~Regional Water Board issues~~ an individual or another General NPDES permit, the applicability of this General Permit to the specified discharge is immediately terminated on the effective date of the ~~NPDES~~ individual NPDES permit or coverage under the other General NPDES permit.

II. NOTIFICATION REQUIREMENTS

A. General Permit Application

To obtain authorization under this General Permit, Dischargers must submit ~~to the State Water Board~~ a complete application to the State Water Board as described below:

1. A Notice of Intent (NOI shown as Attachment G) signed in accordance with the signatory requirements of the Standard Provisions in Attachment B;
2. An application fee; and
3. A Pesticide Application Plan (PAP).

State and Regional Water Board staff will review the application package for completeness and applicability to this General Permit. Additionally, the State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) may issue a Notice of Exclusion (NOE)[20], which either terminates permit coverage or requires submittal of an application for an individual permit or alternative general permit.

Permit coverage will be effective when all of the following have occurred:

1. The Discharger has submitted a complete permit application;

[20] An NOE is a one-page notice that indicates and justifies why the Discharger or proposed Discharger is not eligible for coverage under this General Permit. This justification can include, but is not limited to, the necessity to comply with a total maximum daily load (TDML) or to protect sensitive water bodies. The NOE can also indicate that the coverage is denied if feasible alternatives to the selected pesticide application project are not analyzed.

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2. The PAP has been ~~accepted by~~ posted on the State Water Board's website for a 30-day comment period[21] and approved by the Deputy Director ~~of the Division of Water Quality~~; and

3. The ~~State Water Board~~ Deputy Director ~~of the Division of Water Quality~~ has issued a Notice of Applicability (NOA). The NOA will specify the pesticide products or type(s) of pesticides that may be used and any Regional Water Board specific conditions and requirements not stated in this General Permit. Any such region-specific conditions and requirements shall be enforceable. The Discharger is authorized to discharge starting on the date of the NOA.

B. Fees

~~Under this General Permit, pesticide residue discharges require minimal or no treatment systems to meet limits and pose no significant threat to water quality. As such, they are eligible for~~ The annual fee for enrollment under this General Permit shall be based on Category 3 in section 2200(b)(8) of Title 23, California Code of Regulations (CCR). This category is appropriate because pesticide applications incorporate BMPs to control potential impacts to beneficial uses, and this General Permit prohibits pollutant discharge associated with pesticide applications from causing exceedance of CTR criteria or water quality objectives. Information concerning the applicable fees can be found at http://www.waterboards.ca.gov/resources/fees/docs/fy10_11_fee_schedule.pdfhttp://www.waterboards.ca.gov/resources/fees/~~http://www.waterboards.ca.gov/resources/fees/~~ and is payable to the State Water Board.

C. Public Notification

~~The public comment period is generally limited to 30 days upon notice of the Discharger's proposed action.~~ The State Water Board has notified interested agencies and persons of its intent to prescribe waste discharge requirements in this General Permit and provided them with an opportunity to submit their written comments and recommendations.

III. DISCHARGE DESCRIPTION

A. Discharge Description

1. Vector control agencies in California follow an integrated pest management (IPM) approach that strives to minimize the use of pesticides and their impact on the environment while protecting public health. These agencies generally determine what is appropriate in their districts, and many follow response plans that use surveillance tools to determine the extent of the problem and guide treatment decisions, with an emphasis on source reduction and control of vectors in their immature stages. Control of adult vectors may become necessary under some circumstances, such as in the event of a disease outbreak (documented presence of infectious virus in active host-seeking adult mosquitoes) or lack of access to larval sources leading to the emergence of large numbers of biting adult

[21] See Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486 (2nd Cir. 2005).

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mosquitoes. In their control programs, vector control agencies in California use larvicides and adulticides.

2. The presence of biological and residual pesticides in surface waters from direct or spray applications of pesticides for vector control at various areas throughout the State of California may pose a threat to existing and potential beneficial uses of waters of the US if not properly controlled and regulated. This General Permit covers the discharge to waters of the US of biological and residual pesticides related to the direct or spray application, either ground application or aerial application, of: 1) larvicides containing monomolecular films, methoprene, *Bacillus thuringiensis* subspecies *israelensis* (or *Bti*), *Bacillus sphaericus* (or *B. sphaericus*), petroleum distillates, temephos, and spinosad; and 2) adulticides containing naled, malathion, pyrethrin, permethrin, sumithin, resmethrin, piperonyl butoxide (PBO), prallethrin, etofenprox, and N-octyl bicycloheptene dicarboximide (or MGK 264).

3. The discharge is necessary only when no feasible alternative to the discharge (alternative application techniques, etc) is available and the discharge is limited to that increment of waste that remains after implementation of all reasonable alternatives for avoidance is employed.

4. A study by Weston, et al. (*Aquatic Effects of Aerial Spraying for Mosquito Control over an Urban Area*, Environ. Sci. Technol. 2006, 40, 5817-5822) has shown the accumulation of pyrethroids, which are chemically similar to pyrethrin, in sediments in amounts that can be toxic to invertebrates. The study indicated that PBO concentrations from spray applications were high enough to enhance toxicity of pyrethroids already existing in creek sediments from general urban pesticide use. The study also states that risk assessments for vector control agents have focused on the active ingredients but have failed to recognize the potential for interactions with pesticides previously existing in the environment, which in this case appeared to represent a risk to aquatic life greater than that of the active ingredients themselves.

   Another study by Lawler, et. al [Does Synergized Pyrethrin Applied Over Wetlands for Mosquito Control Affect Daphnia Magna Zooplankton or Callibaetis Californicus Mayflies? Pest Manag Sci 64:843-847, (2008)] tested whether repeated applications of synergized pyrethrin over wetlands caused mortality of two aquatic invertebrates: the zooplankton Daphnia magna Straus and a mayfly, Callibaetis californicus Banks. The results showed that there were no detectable effects of synergized pyrethrin on 36-hour survival of Daphnia or mayflies, but some exposed sediments yielded pyrethrin and most showed PBO.

   Due to the potential for toxicity resulting from the synergistic effect of PBO on pyrethroids and the additive effects of larvicide and adulticide products on pesticides that are already in creek sediments or in the water column, this General Permit requires toxicity monitoring of pesticide applications.

5. This General Permit requires toxicity monitoring of residual discharges from pesticide applications to control vectors.

6. The discharge is necessary only when no feasible alternative to the discharge (alternative treatment methods, alternative application techniques, etc.) is

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available and the discharge is limited to that increment of waste that remains after implementation of all reasonable alternatives for avoidance is employed.

B. Pesticide Applications

1. Larviciding

Larviciding involves applying pesticides to breeding habitats to kill vector larvae. Larviciding can reduce overall pesticide usage in a control program. Killing vector larvae before they emerge as adults can reduce or eliminate the need for spray application of pesticides to kill adult vectors.

As stated in MVCAC's *Draft Conceptual Monitoring Plan for Mosquito Larvicides and Adulticides*, vector larvicides may be applied in a variety of locations, including irrigation ditches, roadside ditches, flood water, standing pools, woodland pools, snowmelt pools, pastures, stock ponds, duck ponds, catch basins, storm water retention areas, tidal water, creeks, marshes, and rice fields. Locations may be urban, suburban, agricultural, recreational, or wildlife refuge areas. Application areas may vary in size from a fraction of an acre to several thousand acres. In some cases, treatment may be limited to the edge of water bodies or tidal marshes; in other cases, treatment would occur over entire water bodies. Treatment frequency for larvicides can be weekly (for hot weather and liquid formulations that have little or no residual) to once every three months (for moderately small sites that are hard to reach like a heavily vegetated marsh treated with pellets or granules). Types of locations, frequency, and size of application areas vary by region. The following are main techniques and equipment used to apply larvicides:

a. Ground Application Equipment

Larvicides can be applied with pickup trucks or all terrain vehicles (ATVs). A chemical-container tank, high-pressure, low-volume electric or gas pump, and spray nozzle are mounted in the back of the truck bed, with a switch and extension hose allowing the driver to operate the equipment and apply the larvicide from the truck's cab. The ATVs have a chemical container mounted on the vehicle, a 12-volt electric pump supplying high–pressure, low-volume flow, and booms and/or hoses and spray tips allowing for application while steering the vehicle. ATVs are ideal for treating areas such as agricultural fields, pastures, and other off-road sites. Additional training in ATV safety and handling is provided to employees before operating these machines.

Additional equipment used in ground applications includes hand-held sprayers and backpack blowers. Hand-held sprayers (hand cans) are standard 1- or 2-gallon garden-style pump-up sprayers used to treat small, isolated areas. Backpack sprayers are gas-powered blowers with a chemical tank and calibrated proportioning slot. Generally, a pellet or small granular material is applied with a backpack sprayer or "belly grinder" machine designed to distribute pellets or granules.

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There are several advantages of using ground application equipment, both when on foot and when conveyed by vehicles. Ground larvicide application allows applications while in proximity to the actual treatment area, and consequently treatments to only those microhabitats where larvae are actually present. This also reduces both the unnecessary pesticide load on the environment and the financial cost of the amount of material used, as well as its application. Both the initial and maintenance costs of ground equipment are generally less than those for aerial equipment. Ground larvicide applications are less affected by weather conditions than are aerial applications.

Ground larvicide application is impractical for large or densely wooded areas. There is also a greater risk of chemical exposure to applicators than there is during aerial larvicide operations. Damage may occur from the use of a ground vehicle in some areas. Ruts and vegetation damage may occur, although both conditions are reversible and generally short-lived. Technicians are trained to recognize sensitive areas and to use good judgment to avoid significant impacts.

b. **Aerial Application Equipment**

When several large areas are simultaneously producing vector larvae at densities exceeding treatment thresholds, then helicopters or other aircraft may be used to apply the larvicides. As stated in MVCAC's *Draft Conceptual Monitoring Plan for Mosquito Larvicides and Adulticides*, many agencies contract with independent flying services to perform aerial applications, with guidance to the target area provided by the vector control agency staff. A few agencies make applications with their own aircraft. The number and extent of ~~serial~~ aerial application of larvicides differ among agencies, from only a few times each year, covering a few hundred acres, to more frequent or extensive operations in the Central Valley districts.

There are three advantages to using fixed- or rotary-wing (helicopter) aerial larvicide application equipment compared to ground application. First, it can be more economical for large target areas with extensive vector production. Second, by covering large areas quickly, it can free staff to conduct other needed surveillance or control. Third, it can be more practical for remote or inaccessible areas, such as islands and large marshes, than ground larvicide application. However, maintaining aircraft or contracting for aerial applications is expensive; and, in addition to the timing constraints inherent in most larvicide use, the potential application window can be very narrow for aerial activities due to weather conditions.

2. Adulticiding

Adulticiding is the process of controlling vectors when they are mature and flying. Adult female vectors are the ones that bite, so ultimately they provide the largest threat to the public health and welfare. Adulticiding is necessary because larviciding is not 100 percent effective and some larval sources may be unknown or inaccessible.

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Chemical control of adult vectors is implemented when vector populations reach a level that is thought by health officials to represent an unacceptable increase in the risk of disease transmission to humans or domestic animals, or when biting vectors become intolerable to the local population. The action level or threshold is determined by each vector control program and varies according to local conditions. The threshold for adult vector control is variable and depends on several local factors, including:

- The presence and intensity of vector-borne disease in the region;
- The abundance of vector species populations; and
- The tolerance of local citizens to nuisance vector populations.

There are two basic techniques for applying adulticides:

a. **Barrier Application**

Adulticides are sprayed onto vegetation or other surfaces to leave a residual adulticide intended to kill vector that land on that surface. Barrier application is typically done with backpack sprayers that produce large droplets that immediately fall out of the air onto the intended surface. Barrier type adulticides can kill "non-target" insects.

b. **ULV (Ultra Low Volume) Application**

Adulticides are sprayed into the air with the intent of killing vectors that are flying in the sprayed area. ULV application is typically done with truck-mounted sprayers, but can be done with aircraft. ULV produces very small droplets that hang in the air for a few hours. Droplet sizes range from 8 to 30 microns. According to CDPH, spray drift may occur for a distance of up to a half mile via truck-mounted applications and more than a mile for aerial applications from the path or point of application. Most spray applications occur in the evening or early morning when female vectors are seeking a blood meal and many other arthropods, particularly pollinators, are inactive. By definition, ULV uses that smallest possible amount of adulticide that will kill adult vectors. ULV applied adulticides can also kill "non-target" insects.

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IV. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this General Permit are based on the applicable plans, policies, and regulations identified in the Findings in Section III of this General Permit. This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

A. Legal Authorities

This General Permit is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code; commencing with section 13370). It shall serve as an NPDES permit for point source discharges of biological and residual pesticides to surface waters. This General

Permit also serves as WDRs pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260).

B. California Environmental Quality Act (CEQA)

Pursuant to California Water Code section 13389, State and Regional Water Boards are exempt from the requirement to comply with Chapter 3, Division 13 of the Public Resources Code when adopting NPDES permits.

C. State and Federal Regulations, Policies, and Plans

1. Water Quality Control Plans

The Regional Water Boards have adopted Water Quality Control Plans (hereinafter Basin Plans) that designate beneficial uses, establish water quality objectives, and contain implementation programs and policies to achieve those objectives for all waters addressed through the plans. In addition, the Basin Plans implement State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. The Basin Plans identify typical beneficial uses as follows: municipal and domestic supply, agricultural irrigation*, stock watering, process supply, service supply, hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater habitat, warm fish migration habitat*, cold fish migration habitat*, warm and cold spawning habitat*, wildlife habitat, navigation, rare, threatened, or endangered species habitat, groundwater recharge, and freshwater replenishment.

Requirements of this General Permit implement provisions contained in the applicable Basin Plans.

2. National Toxics Rule (NTR) and California Toxics Rule (CTR)

USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

3. State Implementation Policy (SIP)

On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plans. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP

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establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this General Permit implement the SIP.

4. Antidegradation Policy

Section 131.12 of 40 C.F.R. requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plans implement, and incorporate by reference, both the state and federal antidegradation policies.

This General Permit requires that discharges must be consistent with the provisions of 40 C.F.R. § 131.12 and Resolution No. 68-16. The conditions of this General Permit require residual pesticide discharges to meet applicable water quality objectives. Specifically, the General Permit sets receiving water limitations for malathion and receiving water monitoring triggers for the other active ingredients of chemical pesticides. The General Permit also requires toxicity testing to determine if residues, including active ingredients, inert ingredients, and degradation byproducts, in any combination, from pesticide applications cause toxicity to the receiving water or add toxicity to it if there is pre-existing toxicity prior to pesticide applications. If residues cause toxicity or add to an existing toxicity, the Discharger is required to perform an iterative process of evaluating its application methods, BMPs, or alternatives to the pesticide causing toxicity until the applications no longer cause or add toxicity. The BMPs and other controls required pursuant to the General Permit constitute Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT).

The General Permit requirements are protective of the broad range of beneficial uses set forth in basin plans throughout the state, constituting best control available consistent with the purposes of the pesticide application in order to ensure that pollution or nuisance will not occur. The conditions also ensure maintenance of the highest water quality consistent with maximum benefit to the people of state. The nature of pesticides is to be toxic in order to protect beneficial uses such as human health or long-term viability of native aquatic life. Lake Davis and Silver King Creek are examples of water bodies where the Department of Fish and Game has used chemical pesticides to eradicate the Northern Pike and non-native trout, respectively. Waters of exceptional quality may be degraded due to the application of pesticides; however, it would only be temporary and in the best interest of the people of the State. While surface waters may be temporarily degraded, water quality standards and objectives will not be exceeded after project completion.

Another example of the benefits of pesticide application and any temporary degradation of water quality occurring as a result is the Asian clam infestation in Lake Tahoe which may require the use of pesticides to eradicate the pest. The Asian clam is undesirable because it: (1) displaces native clams, snails, and other

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organisms living on the lake bottom, which are important members of the lake's native food web; (2) fosters the growth of bright green algae, which change the look of the water, and smell when they decompose; and (3) could help foster an invasion of quagga mussels, another aggressive non-native species, by creating desirable habitat for them. Eradication of these species is important to protect beneficial uses, including habitat for native species, and water conveyance. Discharges in compliance with this permit will maintain existing levels of water quality over the long term.

Given the nature of a General Permit and the broad range of beneficial uses to be protected across the state, data analysis of specific water bodies is infeasible. However, compliance with receiving water limitations and other permit requirements will ensure that degradation of the State's waters will be temporary and that the waters will be returned to pre-application conditions after project completion. Therefore, this General Permit is consistent with State and federal antidegradation policies.

~~Section 131.12 of 40 C.F.R. requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plans implement, and incorporate by reference, both the state and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provision of 40 C.F.R. § 131.12 and Resolution No. 68-16. The conditions of this General Permit require residual pesticide discharges to meet applicable water quality objectives. Waters of exceptional quality may be degraded due to the application of pesticides; however, it would only be temporary and in the best interest of the people of the State. While surface waters may be temporarily degraded; water quality standards and objectives will not be exceeded. The nature of pesticides is to be toxic in order to protect beneficial uses such as human health. However, compliance with receiving water limitations is required. Therefore, this General Permit is consistent with State and federal antidegradation policies.~~

5. Endangered Species Act

This General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 et. seq). This General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

D. Impaired Water Bodies on CWA 303(d) List

Under section 303(d) of the 1972 CWA, states, territories, and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists

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do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On November 30, 2006 USEPA gave final approval to California's 2006 section 303(d) List of Water Quality Limited Segments. The Basin Plans reference this list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources* (40 C.F.R. Part 130.2(j))." The Basin Plans also state, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment*." Impaired waters do not support beneficial uses.

This General Permit does not authorize the discharge of biological and residual pesticides and their ~~breakdown~~ degradation by-products to water of the US that are impaired by pesticide active ingredients included in permitted larvicides and adulticides listed in Attachments E and F. Impaired waters are those waters not meeting quality standards pursuant to Section 303(d) of the CWA. California impaired waters, as approved by the State Water Board, are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls ~~http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml~~ (to be reviewed and adopted by USEPA).

E. Other Plans, Polices, and Regulations

The State Water Board adopted the *Water Quality Control Policy for the Enclosed Bays and Estuaries of California*. The requirements within this General Permit are consistent with the Policy.

V. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the CWA and amendments thereto are applicable to the discharge.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., §1311(b)(1)(C); 40 C.F.R. 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to numeric criteria specifying maximum amounts of particular pollutants. Pursuant to 40 C.F.R. § 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality*." Section 122.44(d)(1)(vi) of 40 C.F.R. further provides that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or*

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contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits."

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in 40 C.F.R.: Section 122.44(a) requires that permits include applicable technology-based limitations and standards; and Section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established.

With respect to narrative objectives, the State Water Board must establish effluent limitations using one or more of three specified sources: (1) USEPA's published water quality criteria; (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria; or (3) an indicator parameter (i.e., 40 C.F.R. 122.44(d)(1)(vi)(A), (B) or (C)). Basin Plans contain a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" Basin Plans require the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. Basin Plans state that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. Basin Plans also limit chemical constituents in concentrations that adversely affect surface water beneficial uses. Basin Plans further state that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. The discharge of biological and residual pesticides at a location or in a manner different from that described in the Findings is prohibited.
2. The discharge of biological and residual pesticides shall not create a nuisance as defined in section 13050 of the California Water Code.
3. The discharge of biological and residual pesticides shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable criterion promulgated by USEPA pursuant to Section 303 of the CWA, or any water quality objective adopted by the State or Regional Water Boards. For larvicide applications, this prohibition shall apply outside the treatment area during treatment, and in the treatment area after treatment has been completed.

B. Effluent Limitations

NPDES permits for discharges to surface waters must meet all applicable provisions of sections 301 and 402 of the CWA. These provisions require controls that use BAT,

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BCT, and any more stringent controls necessary to reduce pollutant discharge and meet water quality standards.

Title 40, C.F.R. § 122.44 states that if a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a numeric or narrative water quality criterion, the permitting authority must develop effluent limits as necessary to meet water quality standards. Section 122.44(k)(3) of 40 C.F.R. allows the use of other requirements such as BMPs in lieu of numeric effluent limits if the latter are infeasible. It is infeasible for the State Water Board to establish numeric effluent limitations in this General Permit because:

1. The application of pesticides is not necessarily considered a discharge of pollutants according to the *National Cotton Council of America v. USEPA* 553 F.3d 927 (6th Cir. 2009) and other applicable case law. The Sixth Circuit Court of Appeals ruled that residual pesticides associated with the application of pesticides at, over, or near water constitute pollutants within the meaning of the CWA and that the discharge of such pollutants must be regulated under an NPDES permit;
2. This General Permit regulates biological and residual pesticides which are ~~breakdown~~ degradation by-products or other pesticide ingredients that are present after the use of the pesticide for vector control. In larvicide applications, pesticides are applied directly to the water body and/or to vector larvae in the water or on the water surface and are not considered pollutants until some time after actual discharge. In adulticide applications, any pesticide product or its ~~breakdown~~ degradation by-product that is deposited in waters of the US is a pollutant. However, at what point the pesticide becomes a residue is not precisely known and varies depending on the type of spray system, wind speed and direction, temperature, droplet size distribution, droplet drift, water chemistry, etc. Therefore, in the application of pesticides, the exact effluent is unknown;
3. It would be impractical to provide effective treatment of biological and residual pesticides from vector control applications, given that typically, pesticide applications consist of~~treat the~~ numerous short duration intermittent pesticide residue releases to surface waters from many different locations; and
4. Treatment~~, in many cases,~~ may render the pesticide useless for pest control.

Therefore, the effluent limitations contained in this General Permit are narrative and include requirements to develop and implement a PAP that describes appropriate BMPs, including compliance with all pesticide label instructions, and to comply with narrative receiving water limitations.

The BMPs required herein constitute BAT and BCT and will be implemented to minimize the area and duration of impacts caused by the discharge of biological and residual pesticides in the target area and to allow for restoration of water quality and protection of beneficial uses of the receiving waters to pre-application quality following completion of an application event.

C. Best Management Practices

~~**Scope and Authority**~~

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The development of BMPs provides the flexibility necessary to establish controls to minimize the area extent and duration of impacts caused by the discharge of biological and residual pesticides. This flexibility allows dischargers to implement appropriate BMPs for different types of applications and different types of waters.

Much of the BMP development has been incorporated into the pesticide regulation process by the USEPA, DPR, CDPH, and County Agricultural Commissioners. The Dischargers must be licensed by DPR or CDPH if such licensing is required for the pesticide application project. The pesticide use must be consistent with the pesticide label instructions and any Use Permits issued by County Agricultural Commissioners.

USEPA and DPR scientists review pesticide labels to ensure that a product used according to label instructions will cause no harm (or "adverse impact") on non-target organisms that cannot be reduced (or "mitigated") with protective measures or use restrictions. Many of the label directions constitute BMPs to protect water quality and beneficial uses. Label directions may include: precautionary statements regarding toxicity and environmental hazards; directions for proper handling, dosage, application, and disposal practices; prohibited activities; spill prevention and response measures; and restrictions on type of water body and flow conditions.

A Use Permit issued by the County Agricultural Commissioner incorporates applicable suggested permit conditions from DPR and local site-specific conditions necessary to protect the environment. State regulations require that specific types of information be provided in an application to the County Agricultural Commissioners for a pesticide use permit. The County Agricultural Commissioners review the application to ensure that appropriate alternatives were considered and that any potential adverse effects are mitigated. The County Agricultural Commissioners also conduct pre-project inspections on at least five percent of projects.

This General Permit requires that Dischargers use BMPs when implementing vector control programs in order to mitigate effects to water quality ~~resulting from~~ due to biological and residual pesticide discharges from pesticide applications. Dischargers are required to ~~consider alternative control measures~~ to determine and implement ~~if there are~~ feasible non-toxic and least toxic alternatives to the selected pesticide application project that could reduce potential water quality impacts. ~~If the Discharger identifies alternative control measures to the selected pesticide application project that could reduce potential water quality impacts and that are also feasible, practicable, and cost-effective, the discharger shall implement the identified alternative measures.~~ The selection of ~~control measures that use~~ non-toxic and ~~less~~ least toxic alternatives is an example of an effective BMP.

D. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

Section 122.44(d)(1)(i) of 40 C.F.R. mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where

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reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using: (1) USEPA criteria under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 C.F.R. § 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plans, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Receiving Water Beneficial Uses

Direct and spray applications for vector control may potentially deposit ~~residual pesticides~~ biological and residual pesticides to surface waters. Beneficial uses of receiving waters may include the following: municipal and domestic supply, agricultural irrigation, agricultural stock watering, process water supply, service water supply, and hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm and cold spawning habitat, wildlife habitat, navigation, groundwater recharge, and freshwater replenishment.

3. Determining the Need for WQBELs

~~a.~~c. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR, as well as antidegradation policies. The Basin Plans include numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*." With regard to the narrative chemical constituents objective, the Basin Plans state that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "…*water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)" in Title 22 of CCR.* The narrative tastes and odors objective states: *"Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses*."

~~b.~~d. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential

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to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard.

4. Antidegradation Policy

The permitted discharge is consistent with the antidegradation provisions of 40 C.F.R. § 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. Due to the low volume of discharge expected from discharges regulated under this General Permit, the impact on existing water quality will be insignificant. Dischargers seeking authorization to discharge under this General Permit are required to demonstrate compliance with receiving water limitations during the application. If, however, the appropriate Regional Water Board, subsequent to review of any application, finds that the impact of a discharge will be significant, then authorization for coverage under this General Permit will be denied and coverage under an individual permit will be required (including preparation of an anti-degradation analysis).

VI. RATIONALE FOR RECEIVING WATER LIMITATIONS AND MONITORING TRIGGERS

A. Groundwater

[Not Applicable]

B. Surface Water

CWA section 303(a-c), requires states to adopt water quality standards, including criteria necessary to protect beneficial uses. Regional Water Boards adopted water quality criteria as water quality objectives in the Basin Plans. The Basin Plans state that "[t]*he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.*" The Basin Plans include numeric and narrative water quality objectives for various beneficial uses and water bodies. This General Permit contains receiving surface water limitations based on the Basin Plans' numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, temperature, floating material, settleable substances, suspended material, tastes and odors, and toxicity. This General Permit also requires compliance with any amendment or revision to the water quality objectives contained in the Basin Plans adopted by Regional Water Boards subsequent to adoption of this General Permit.

Once a pesticide has been applied to an application area, the pesticide product can actively control vector within the application area. Discharge of biological and residual pesticides produced by the application to surface water must meet applicable water quality criteria and objectives. The receiving water limitations ensure that an application event does not result in an exceedance of a water quality standard in the receiving water. Receiving water is defined as any surface water or drainage courses where the pesticide may be deposited as a result of larvicide and adulticide applications.

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To protect all designated beneficial uses of the receiving water, the most protective (lowest) and appropriate (to implement the CTR criteria and WQOs in the *Water Quality Control Plans*) limit should be selected as the water quality limit for a particular water body and constituent. In many cases, water quality standards include narrative, rather than numerical, water quality objectives. In such cases, numeric water quality limits from the literature or publicly available information may be used to ascertain compliance with these standards.

Pesticide formulations contain disclosed "active" ingredients that yield toxic effects on target organisms and may also have toxic effects on non-target organisms.~~-~~ Residual active ingredients that do not contain pollutants for which there are applicable numeric CTR criteria may still have toxic effects on receiving water bodies. In addition, the inactive or "inert" ingredients of pesticides, some of which are trade secrets and have not been publicly disclosed, may also contain toxic pollutants or pollutants that could affect water quality.

DPR is responsible for reviewing toxic effects of product formulations and determining whether a pesticide is suitable for use in California's waters. In this General Permit, inert ingredients are also considered on a constituent-by-constituent basis. USEPA regulates pesticide use through strict labeling requirements in order to mitigate negative impacts to human health and the environment.~~, and~~ DPR environmental and medical toxicologists review toxicity data on formulations and can deny registration or work with registrants or County Agricultural Commissioners to impose additional requirements in order to protect human health or the environment.

USEPA and DPR require that pesticides undergo toxicity testing and meet specific toxicity requirements before registering the pesticide for application to surface waters. USEPA has found that the application of properly registered pesticides pose a minimum threat to people and the environment. In addition, the effects of these biological and residual pesticides on water quality will be mitigated through application of BMPs and compliance with FIFRA label requirements, ~~application of BMPs, and~~ monitoring requirements, and receiving water limitations.

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) set forth in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plans require the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations

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that adversely affect domestic drinking water supply, agricultural supply*, or any other beneficial use.

Establishing Receiving Water Monitoring Triggers

In pesticide applications for vector control, it is reasonable to conclude that some residual pesticides will be deposited in surface waters. These residual pesticides may cause toxicity to aquatic life. However, information regarding residual pesticides deposited in the receiving water as a result of direct or spray applications for vector control is not adequate to develop receiving water limitations for individual and combinations of pesticides; therefore, this General Permit only contains Receiving Water Monitoring Triggers. The monitoring triggers will be used to assess whether the discharge of residual pesticides has the reasonable potential to cause or contribute to an excursion of a water quality standard, including numeric and narrative objectives within a standard.~~compliance with the narrative toxicity receiving water limitation and trigger additional investigations for the causes of toxicity caused by the larvicides and adulticides used and their additive or synergistic effects~~. This General Permit includes an Instantaneous Maximum Receiving Water Monitoring Trigger for residual pesticides of concern.

The Instantaneous Maximum Receiving Water Monitoring Triggers are based on promulgated water quality criteria such as those provided in the CTR, water quality objectives adopted by the State and Regional Water Boards in their water quality control plans, water quality criteria adopted by the California Department of Fish and Game, or water quality standards such as drinking water standards adopted by the California Department of Public Health. In the absence of these adopted criteria, objectives, or standards, the State Water Board used USEPA's *Ambient Criteria for the Protection of Freshwater Aquatic Life* (Ambient Water Quality Criteria) which are directly applicable as a regulatory level to implement narrative toxicity limitations included in all Regional Water Board Basin Plans. Where Ambient Water Quality Criteria are unavailable in addition to adopted criteria, objectives, or standards, the State Water Board used data from the *Ecotoxicity Database* to develop the Receiving Water Monitoring Triggers for individual pesticides and combinations of pesticides to protect all beneficial uses of the receiving water. In most, if not all cases, protection of the most sensitive aquatic life in a receiving water provides protection of all beneficial uses of that receiving water.

For constituents that do not have Ambient Water Quality Criteria, the Instantaneous Maximum Receiving Water Monitoring Trigger is based on one-tenth of the lowest 50 Percent Lethal Concentration (LC50) from the *Ecotoxicity Database*. Using one-tenth of the lowest LC50 for freshwater vertebrates as the receiving water monitoring trigger is consistent with the Central Valley Regional Water Board's Basin Plan approach when developing the Daily Maximum limitation for pesticides that do not have water quality criteria.

* Defined in Attachment A – Definitions.

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The following is a detailed discussion of toxicity data, applicable water quality criteria, if available, and Receiving Water Monitoring Triggers, if required, for: 1) larvicides, including microbial larvicides (*Bti* and *B. sphaericus*), petroleum distillates, methoprene, temephos, monomolecular films, and spinosad; and 2) adulticides, including organophosphate insecticides (malathion and naled), pyrethrin, pyrethoids (permethrin, resmethrin, sumithrin, prallethrin, and etofenprox), piperonyl butoxide (PBO), and N-octyl bicycloheptene dicarboximide (or MGK-264). Among these pesticides, only malathion and permethrin have Ambient Water Quality criteria. Thus, the Instantaneous Maximum Receiving Water Monitoring Trigger for temephos, naled, pyrethrin, resmethrin, sumithrin, prallethrin, etofenprox, PBO, and MGK-264 is based on one-tenth of the lowest LC50.

This General Permit may be re-opened to add receiving water limitations if the monitoring result for temephos, malathion, naled, pyrethrin, permethrin, resmethrin, sumithrin, prallethrin, etofenprox, PBO, and MGK-264 exceed the associated monitoring trigger.

~~f.~~1. Larvicides

a. Microbial Larvicides

Microbial larvicides are bacteria that are registered as pesticides for control of vector larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas. Duration of effectiveness depends primarily on the vector species, the environmental conditions, the formulation of the product, and water quality. Microbial larvicides may be used along with other vector control measures in an Integrated Pest Management (IPM) program. The microbial larvicides used for vector control are *Bti* and *B. sphaericus*.

- ***Bti*** is a naturally occurring soil bacterium registered for control of mosquito and midge larvae as well as blackflies. *Bti* was first registered by USEPA as an insecticide in 1983. *Bti* is typically in liquid, granular or pellet form and is distributed on the surface of standing waters. When the mosquito larvae ingest the bacteria, crystallized toxins are produced which destroy the larvae's digestive tract. Larvae become sluggish and die within 24 hours. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, but not in mammals. Persistence of *Bti* is low in the environment. It usually lasts 1 to 4 days due to sensitivity to ultraviolet light.
- ***B. sphaericus*** is a naturally occurring bacterium that is found throughout the world. *B. sphaericus* was initially registered by USEPA in 1991 for use against various kinds of mosquito larvae. *B. sphaericus* works in a manner very similar to *Bti*. Mosquito larvae of susceptible species ingest a lethal dose of *B. sphaericus* crystals and spores. Toxins are released in the larval midgut, paralyzing and damaging the digestive system. The larvae undergo tremors, become sluggish, and die with 48 hours.

The microbial pesticides have undergone extensive testing prior to registration. USEPA has determined that microbial pesticides are essentially

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non-toxic to humans and do not pose risks to wildlife, non-target species, or the environment when they are used according to label directions.

Therefore, this General Permit does not include a Receiving Water Monitoring Trigger for *Bti* and *B. sphaericus*.

b. **Methoprene**

Methoprene was first registered by USEPA as a conventional chemical pesticide in 1975. USEPA issued a Registration Standard for methoprene in February 1982. Subsequently, USEPA reclassified methoprene as a biochemical pesticide. USEPA issued the Reregistration Eligibility Document (RED) in 1991 and reregistration of the active ingredient and all end-use products was completed in 1997.

Methoprene is the common name for isopropyl-(2*E*,4*E*,7*R*,*S*)-11-methoxy-3,7,11-trimethyldodeca-2,4-dienoate. It is a racemic mixture of two enantiomers (R and S in a ratio of 1:1). The activity of the compound as a juvenile hormone is restricted to the S enantiomer. All of larvicide products listed on the Attachment F of this General Permit are formulated with the resolved S-methoprene enantiomer. Methoprene is an insect growth regulator with activity against a variety of insect species including mosquitoes. Methoprene is considered a biochemical pesticide because rather than controlling target pests through direct toxicity, methoprene interferes with an insect's life cycle and prevents it from reaching maturity or reproducing by mimicking the activity of natural juvenile insect hormone[22]. It is applied to water to kill mosquito larvae, and it may be used along with other vector control measures in an IPM program. Methoprene can be applied as briquets (similar in form to charcoal briquets), pellets, sand granules, and liquids. The liquid and pelletized formulations can be applied by helicopter and fixed-wing aircraft.

According to USEPA's *June 2001 Update of the March 1991 Methoprene RED Fact Sheet* (2001 RED), methoprene is of low toxicity and poses very little hazard to people and other non-target species. Exposure to methoprene residues is not expected from drinking water. It is also indicated that methoprene will not result in unreasonable adverse effects on the environment since methoprene degrades rapidly in sunlight, both in water and on inert surfaces. Methoprene is also metabolized rapidly in soil and does not leach. Thus, methoprene is not expected to persist in soil or contaminate ground water. The 2001 RED also concluded that ecological concerns contained in the 1991 RED related to toxicity to estuarine invertebrates have been alleviated as a result of submission of the estuarine invertebrate life cycle toxicity study in 1996, which indicated minimal chronic risk to mysid shrimp.

[22] The juvenile hormone, also called ECDYSONE, a hormone in insects, secreted by glands near the brain, that controls the retention of juvenile characters in larval stages. The hormone affects the process of molting, the periodic shedding of the outer skeleton during development, and in adults it is necessary for normal egg production in females *(Enclycopaedia Britannica Online)*

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Based on the above considerations, this General Permit does not contain a Receiving Water Monitoring Trigger for methoprene.

c. **Temephos**

Temephos is an organophosphate (OP) pesticide registered by USEPA in 1965 to control mosquito larvae. It is the only OP pesticide with larvicidal use. It is an important resistance management tool for vector control programs. Its use helps prevent vector from developing resistance to the bacterial larvicides. Temephos is used in areas of standing water, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other vector control measures in an IPM program. Temephos is applied to water most commonly by helicopter but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.

USEPA has determined that when temephos is applied according to the label for vector control, it does not pose unreasonable risks to human health. It is applied to water and the amount of temephos is very small in relation to the area covered (less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.) Temephos breaks down within a few days in water, and post-application exposure is minimal. However, at high dosages, temephos, like other OP pesticides, can overstimulate the nervous system causing nausea, dizziness, and confusion.

Because temephos is applied directly to water, it is not expected to have a direct impact on terrestrial animals or birds. Current mosquito larviciding techniques pose some risk to non-target aquatic species and the aquatic ecosystem. Although temephos presents relatively low risk to birds and terrestrial species, available information suggests that it is more toxic to aquatic invertebrates than alternative larvicides. For this reason, USEPA is limiting temephos use to areas where less-hazardous alternatives would not be effective, specifying intervals between applications, and limiting the use of high application rates.

Toxicity data for temephos were obtained from the *Ecotoxicity Database* to assess toxicity of temephos to freshwater aquatic life. Table D-1 summarizes toxicity data for temephos.

Table D-1. Summary of Toxicity Data for Temephos

Test Species	Study Length	LC50 (µg/l)
Scud	96 hrs	80
Scud	96 hrs	640
Bluegill sunfish	96 hrs	21,800
Bluegill sunfish	96 hrs	1,140
Bluegill sunfish	96 hrs	43,000
Bluegill sunfish	96 hrs	9,900
Fathead minnow	96 hrs	34,100
Rainbow trout	96 hrs	160
Rainbow trout	96 hrs	9,580

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Test Species	Study Length	LC50 (µg/l)
Rainbow trout	96 hrs	3,490
Rainbow trout	96 hrs	13,800
Rainbow trout	96 hrs	4,750
Rainbow trout	96 hrs	158
Rainbow trout	96 hrs	18,800
Brook trout	96 hrs	12,800
Brook trout	96 hrs	5,000
Channel catfish	96 hrs	3,230
Lake trout	96 hrs	3,650
Largemouth trout	96 hrs	1,440
Lowest LC50 = 80 µg/l		
Lowest LC50/10 = 8 µg/l		

Ambient Water Quality Criteria are unavailable for temephos. Table D-1 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for temephos is 8 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 8 µg/l for temephos. This monitoring trigger is based on implementing the Basin Plans' narrative toxicity objective of no toxics in toxic amounts and is only applicable to applications using temephos-based larvicide products.

d. **Monomolecular Films**

Monomolecular films are low-toxicity pesticides that spread a thin film on the surface of the water that makes it difficult for mosquito larvae, pupae, and emerging adults to attach to the water's surface, causing them to drown. Reported half-lives of monomolecular films in water range from 5 to 22 days. They have been used in the United States in floodwaters, brackish waters, and ponds. They may be used along with other vector control measures in an IPM program. They are also known under the trade name Agnique monomolecular film with the active ingredient as Poly (oxy-1,2-ethanediyl), α-(C_{16-20} branched and linear alkyl)-ω-hydroxy. Agnique has an average persistence in the environment of 5 to 21 days at label application rates.

USEPA has concluded that monomolecular films, when used according to label directions for larva and pupa control, pose minimal risks to the environment. They do not last very long in the environment, and are usually applied only to standing water, such as roadside ditches, woodland pools, or containers which contain few non-target organisms. Therefore, this General Permit does not include a Receiving Water Monitoring Trigger for monomolecular films.

e. **Petroleum Distillates**

Petroleum distillates, like monomolecular films, are pesticides used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes. Special-derived petroleum distillates are mineral oils. Petroleum distillates have been used for many years in the United States to kill aphids

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on crops and orchard trees, and to control mosquitoes. They may be used along with other vector control measures in an IPM program.

Petroleum distillates are effective in many situations in which monomolecular films do not give effective control. Petroleum distillates generally have a shorter environmental persistence (approximately 2-3 days) than most chemical larvicide alternatives. They are also effective in areas known to produce mosquitoes for only a very short time duration, areas which are expected to be dry for some time periods, or where the use of longer duration products would not be warranted, such as swales along rivers and lakes, and certain types of floodwater habitats.

USEPA has determined that petroleum distillates, when used according to label directions for mosquito larva and pupa control, do not pose a risk to human health. In addition to low toxicity, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

According to the July 12, 2006 *Reregistration Eligibility Decision for Aliphatic Solvents*, there was no lethality observed in any of the tests conducted with fish species, estuarine/marine invertebrates (mysid shrimp), mammals, or birds. Due to the characteristics of the products, it is likely that petroleum distillates would not mix within the water column and the exposures would be restricted to a much higher concentration at the film layer on the surface of the water. Thus, there would be a higher concentration exposure at the surface, but in a smaller proportion of the entire water body, and a lower concentration throughout the vertical extent of the water body. Therefore, any possible adverse effects on the critical components of the aquatic ecosystem would be much lower within the water column than on the surface layer.

Petroleum distillates, if misapplied, may be toxic to fish and other aquatic organisms. For that reason, USEPA has established specific precautions on the label to reduce such risks.

Based on the above considerations, this General Permit does not contain a Receiving Water Monitoring Trigger for petroleum distillates.

f. **Spinosad**

Spinosad is a biologically derived insecticide produced via fermentation culture of the actinomycete *Saccharopolyspora spinosa*, a bacterial organism isolated from soil. It is composed of a mixture of two members of the chemical class of 12-membered macrocyclic lactones in a unique tetracyclic ring. Each component, designated spinosyn A and spinosyn D, is an unsaturated tetracyclic ester with two sugar derivatives (forosamine and rhamnose sugars) attached through ether linkages. Spinosyn A and D are identical in structure except for an additional methyl group on the core macrolide of spinosyn D. Technical grade spinosad is a light gray to white crystalline solid with an odor of slightly stale water.

Spinosad is a naturally occurring insecticide with stomach poison and contact activity. It activates the central nervous system of insects through interaction

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with the nicotinic acetylcholine receptors. Immediately after application, insect pests exhibit irreversible tremors, prostrate trembling, paralysis, and death.

It is stable to metal and metal ions for 28 days, degrades under ultra-violet light, and is non-phytotoxic when used as directed. It is non-explosive, non-reactive toward monoammonium phosphate, zinc, and water, and reactive toward potassium permanganate. Spinosad is soluble in water, and soluble in common organic solvents such as acetone, acetonitrile, methanol, and toluene. Spinosad is relatively short-lived in the field and photodegrades rapidly. Its half-life* is less than one day.

USEPA determined that spinosad does not leach, bioaccumulate, volatilize, or persist in the environment, Spinosad will degrade photochemically when exposed to light after application, Because spinosad strongly adsorbs to most soils, it does not leach through soil to groundwater. Spinosad demonstrates low mammalian and avian toxicity. It does not pose long-term health problems in mammals. In addition, a low potential for acute toxicity exists due to low oral, dermal, and inhalation toxicity from the use of spinosad.

Spinosad is the winner of both 1999 and 2010 *Designing Greener Chemicals Award*. This Award promotes pollution prevention through partnerships with the chemistry community. Through high level recognition and support, the Award promotes innovative developments in and uses of green chemistry for pollution prevention. USEPA's Office of Pollution Prevention and Toxics is leading this voluntary partnership program with other USEPA offices, other federal agencies, members of the chemical industry, trade associations, scientific organizations, and academia.

Based on the above considerations, this General Permit does not contain a Receiving Water Monitoring Trigger for spinosad.

2. Adulticides

The receiving water monitoring trigger for each constituent below is based on the Basin Plans' narrative toxicity objective of no toxics in toxic amounts. This trigger is only applicable to spray applications using each of the adulticide products.

a. **Organophosphate Insecticides**

i. **Malathion**

Malathion is an OP insecticide that has been registered for use in the United States since 1956. It is used in agriculture, residential gardens, public recreation areas, and in public health pest control programs.

Malathion is an adulticide, which is used to kill adult mosquitoes. In vector control programs conducted by state or local authorities, malathion is applied by truck-mounted or aircraft-mounted sprayers. Malathion is applied as an ultra-low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

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Malathion is highly toxic to insects, including beneficial insects such as honeybees. For that reason, USEPA has established specific precautions on the label to reduce such risks. Malathion is classified as an Acute Toxicity Category III compound. Although it is less acutely toxic than other OP insecticides, adverse health effects have been reported by exposed persons.

~~According to a Report from the CDC that summarizes investigations of illnesses associated with exposures to insecticides uses during 1999-2002 to control mosquito populations in nine states (including California), 133 cases of acute insecticide-related illness associated with vector control were identified. Of the 133 reported cases of pesticide-related illness, 95 (71.4%) cases were associated with OP insecticides, mainly malathion. Malathion was associated with 64 (67.4%) of the 95 cases.~~

USEPA has also refined its characterization of the potential risk from *malaoxon*, a more toxic compound that is formed from malathion under certain conditions. For example, malathion runoff and spray drift may reach drinking water sources downstream from where the malathion was used. Malathion present in untreated water will form malaoxon during the chlorination process in water treatment facilities. Malaoxon can also form more slowly when malathion is deposited on hard, dry surfaces and exposed to air over time. USEPA's assessment shows that even when considering the presence of malaoxon on surfaces following applications of malathion for vector control, the relatively low application rates and small droplet sizes used in these types of applications result in minimal exposure to people in the treated area.

USEPA has established an ambient water quality criterion of 0.1 µg/l both as a continuous concentration (four-day average) and instantaneous maximum concentration for the protection of freshwater aquatic life for malathion. The USEPA Integrated Risk Information System (IRIS) Reference Dose as a drinking water level for malathion is 140 µg/L. The USEPA Suggested-No-Adverse-Response-Level (SNARL) for toxicity other than cancer risk for malathion is 100 µg/L.

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a list of water quality limited segments. The waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires for waters on the list that priority rankings be established for the development of action plans, called Total Maximum Daily Loads (TMDLs), to improve the water quality. California impaired waters due to malathion, as approved by the State Water Board, are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls ~~http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml~~ (to be reviewed and adopted by USEPA). Due to impairment by malathion, this General Permit does not authorize the discharge of

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residual malathion to the water bodies identified on the California 303(d) listing as impaired by malathion.

DPR collected water and sediment samples during the summer of 2003 for OP and pyrethroid pesticides in the San Joaquin River Watershed (Stanislaus County) and Salinas River Watershed (Monterey County). The purpose of this study was to determine the presence of pyrethroid insecticides in water and bed sediments and the presence of OP pesticides in water during the summer growing season. The Salinas and San Joaquin valleys were selected because they are important agricultural regions in California. Sampling sites were chosen on waterways whose flows are dominated by summer agricultural run-off. For Monterey County, malathion was detected in 17 of 64 samples with a maximum concentration of 0.544 µg/l, while 9 of 17 detected samples were reported as "trace," which means the concentration was detected above the method detection limit (MDL) but below reporting limit (RL). The MDL and RL for malathion were reported at 0.0117 µg/l and 0.04 µg/l, respectively. For Stanislaus County, malathion was detected in 1 of 68 samples at a concentration of 0.0741 µg/l.

Based on the information set forth above, this General Permit contains ~~an~~a ~~Instantaneous Maximum~~ Receiving Water ~~Monitoring Trigger~~Limitation of 0.1 µg/l for malathion.

ii. **Naled**

Naled is an OP insecticide that has been registered since 1959 for use in the United States. It is used primarily for controlling adult mosquitoes, but naled is also used on food and feed crops and in greenhouses.

In vector control programs conducted by state or local authorities, naled is applied by truck-mounted or aircraft-mounted sprayers.~~-~~ Naled is applied as an ULV spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

At high doses, naled like other OP pesticides, can overstimulate the nervous system causing nausea, dizziness, or confusion. Severe high-dose poisoning with any OP pesticide can cause convulsions, respiratory paralysis, and death. There is potential for risks to invertebrates from the repeated use of naled. Naled is highly toxic to insects, including beneficial insects such as honeybees. For that reason, USEPA has established specific precautions on the label to reduce such risk.

~~According to a report from the CDC that summarizes investigations of illnesses associated with exposures to insecticides uses during 1999-2002 to control mosquito populations in nine states (including California), naled was associated with 23 of 133 reported cases of pesticide-related illness associated with vector control.~~ Naled is an acute toxicity level I OP pesticide.

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Toxicity data for naled were obtained from the *Ecotoxicity Database* to assess toxicity of naled to freshwater aquatic life. Table D-2 summarizes toxicity data for naled.

Table D-2. Summary of Toxicity Data for Naled

Test Species	Study Length	LC50 (µg/l)
Scud	96 hrs	18
Scud	96 hrs	14
Scud	48 hrs	0.14
Fathead minnow	96 hrs	3,300
Bluegill sunfish	96 hrs	2,200
Rainbow trout	96 hrs	195
Rainbow trout	96 hrs	345
Rainbow trout	96 hrs	160
Mysid	96 hrs	8.8
Channel catfish	96 hrs	710
Cutthroat trout	96 hrs	127
Lake trout	96 hrs	87
Largemouth bass	96 hrs	1,900
Striped bass	96 hrs	500
Lowest LC50 = 0.14 µg/l		
Lowest LC50/10 = 0.014 µg/l		

Ambient Water Quality Criteria are unavailable for naled. Table D-2 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for naled is 0.014 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.014 µg/l for naled.

b. **Pyrethrin**

Pyrethrin is an insecticide that is derived from the extract of chrysanthemum flowers. Pyrethrins have a soil half-life of 12 days. The plant extract called pyrethrum contains pyrethrin I and pyrethrin II; collectively, these are called pyrethrins.

A study from the UC Berkeley (*Aquatic Effects of Aerial Spraying for Mosquito Control over an Urban Area*, Weston, et al., Environ. Sci. Technol. 2006, 40, 5817-5822) on aquatic effects of aerial spraying for adult mosquito control found that a few hours after spraying, 35% of the water samples contained measurable pyrethrin residues (up to 3.8 µg/l), but pyrethrin was not detected in any water sample collected before or 10 to 34 hours after spraying. Water sampling results were similar to that conducted by the local mosquito control district in which none of 14 water samples was detected with pyrethrin prior to spraying. Pyrethrin was not detected in any sediment sample in two creeks before spraying for which pre-spray data were available; however, sediments in these two creeks were found to contain pyrethrin at a maximum concentration of 372 µg/kg immediately following the aerial application (8

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days later). This study was conducted to evaluate effects of mosquito control agents on aquatic life within an urban setting due to aerial applications of insecticide containing pyrethrin and the synergist PBO over Sacramento in an effort to combat West Nile virus in 2005.

Toxicity data for pyrethrin were obtained from the *Ecotoxicity Database* to assess toxicity of pyrethrin to freshwater aquatic life. Table D-3 summarizes toxicity data for pyrethrin.

Table D-3. Summary of Toxicity Data for Pyrethrin

Test Species	Study Length	LC50 (µg/l)
Scud	96 hrs	1.4
Bluegill sunfish	96 hrs	104
Bluegill sunfish	96 hrs	41
Bluegill sunfish	96 hrs	10
Fathead minnow	96 hrs	74
Rainbow trout	96 hrs	20
Rainbow trout	96 hrs	3.2
Rainbow trout	96 hrs	5.1
Mysid	96 hrs	1.4
Brown trout	96 hrs	19.4
Channel catfish	96 hrs	8.96
Chinook salmon	96 hrs	44.5
Lake trout	96 hrs	19.7
Largemouth trout	96 hrs	33
Smallmouth bass	96 hrs	22
Yellow perch	96 hrs	44.5
Lowest LC50 = 1.4 µg/l		
Lowest LC50/10 = 0.14 µg/l		

Ambient Water Quality Criteria are unavailable for pyrethrin. Table D-3 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for pyrethrin is 0.14 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.14 µg/l for pyrethrin.

c. **Pyrethroids**

Pyrethroids are synthetic (human-made) chemical insecticides that act in a similar manner to pyrethrins. They work by quickly paralyzing the nervous systems of insects, producing a quick "knockdown" effect on insect pest populations. Pyrethroids are widely used for controlling various insects. Permethrin, resmethrin, and sumithrin are synthetic pyrethroids commonly used in vector control programs to kill adult vectors.

~~Most pyrethroid vector control products can be applied only by public health officials and trained personnel of vector control districts.~~ Vector control professionals apply pyrethroids as an ULV spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

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Pyrethroids used in vector control are typically mixed with a synergist compound, such as PBO, which enhances the effectiveness of the active ingredient.

Pyrethroids are considered to pose slight risks of acute toxicity to humans, but at high doses, pyrethroids can affect the nervous system. Vector control formulations of permethrin break down in the environment, and high temperatures and sunlight accelerate this process. However, pyrethroids are toxic to fish and to bees.

Pyrethroids are designed to breakdown more slowly than the naturally occurring pyrethrin. While pyrethrins, extremely sensitive to light, heat and moisture, break down in a few hours, the synthetic pyrethroids are stable and persist in the environment much longer. With a few exceptions, pyrethroids break down most quickly in direct sunlight, usually just a few days after application. However, in areas with limited sunlight, pyrethroids can persist for months.

According to the Scientific Investigations Report (Hladik M.L., Orlando J.L., and K.M. Kuivila. 2009. Collection of Pyrethroids in Water and Sediment Matrices: Development and Validation of a Standard Operating Procedure: U.S. Geological Survey Scientific Investigations Report 2009-5012, 22p.) from U.S. Geological Survey prepared in cooperation with the USEPA, pyrethroids are challenging to measure accurately in environmental samples. Sample-collection devices, sample-collection and laboratory-container material, container size, holding conditions, and sample-handling procedures have been found to have significant influences on the losses of pesticides onto container walls. The Report identifies the following techniques to minimize pyrethroid sorption to sample containers:

- Container composition affects the extent of pyrethroid loss:
  - Pyrethroids associate less to glass containers than plastic (HDPE or LDPE);
  - Teflon has the greatest pyrethroid association;
- Containers should be agitated vigorously for at least one minute before transfer to another container;
- Use larger sample containers;
- When pumping through larger filtration apparatuses (plate filter, autosampler), pump speeds should be greater than 500 mL/min;
- Composition of the water affects the extent of association of pyrethroids to container surfaces: when adding higher amounts of dissolved organic carbon (DOC) or suspended sediments to a water matrix, a lower amount of pyrethroids associated to the container surfaces;
- Appreciable losses of pyrethroids were not found for sediment samples collected in glass containers; and

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- When possible, water samples should be analyzed within three days of collection. Sediment samples can be frozen for up to six months.

The Report is available at http://pubs.usgs.gov/sir/2009/5012/.

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a list of water quality limited segments. The waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires for waters on the list that priority rankings be established for the development of action plans, called TMDLs, to improve the water quality. California impaired waters due to pyrethroids, as approved by the State Water Board, are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls ~~http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml~~ (to be reviewed and adopted by USEPA). The pyrethroids of concern for this listing are bifenthrin, lamdba cyhalothrin, efenvalerate/fedvalerate, and permethrin. This General Permit does not authorize the discharge of residual pyrethroids to the water bodies identified on the California 303(d) listing as impaired for pyrethroids.

i. **Permethrin**

Permethrin is an odorless, colorless crystalline solid or a viscous liquid that is white to pale yellow. Permethrin has been registered by USEPA since 1977. It is currently registered and sold in a number of products such as household insect foggers and sprays, tick and flea sprays for yards, flea dips and sprays for cats and dogs, termite treatments, agricultural and livestock products, and vector abatement products. The results of one study indicate that permethrin has a half- life of less than 2.5 days. When exposed to sunlight, the half-life was 4.6 days. Compared to other pyrethroids, permethrin is very stable, even when exposed to ultraviolet light. Permethrin is strongly absorbed to soil and other organic particles, with half-lives in soil of up to 43 days.

The California Department of Fish and Game (CDFG) developed the maximum concentration criterion of 0.03 µg/l as a one-hour average to protect the freshwater aquatic life for permethrin. The USEPA IRIS Reference Dose as a drinking water level for permethrin is 350 µg/L.

DPR conducted samplings from November 2002 through March 2003, in tributaries to the Sacramento and San Joaquin Rivers for the Surface Water Protection Program to determine if insecticides esfenvalerate and permethrin were moving off site into surface waters during winter storm events. All of four sites selected are dominated by agricultural inputs. During this monitoring period, permethrin was detected in 1 of 39 samples, at a concentration of 0.094 µg/l.

DPR also collected water and sediment samples during the summer of 2003 for organophosphate and pyrethroid pesticides in the San Joaquin River Watershed (Stanislaus County) and Salinas River Watershed

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(Monterey County). The purpose of this study was to determine the presence of pyrethroid insecticides in water and bed sediments and the presence of OP pesticides in water during the summer growing season. The Salinas and San Joaquin valleys were selected because they are important agricultural regions in California. Sampling sites were chosen on waterways whose flows are dominated by summer agricultural run-off. For Monterey County, permethrin was detected in 13 of 64 samples with a maximum concentration of 162 µg/l. Four of 13 detected samples were reported as "trace," which means the concentration was detected above the MDL but below RL. The MDL and RL for permethrin were reported at 0.0169 µg/l and 0.05 µg/l, respectively. For the Stanislaus County, permethrin was detected in 1 of 68 samples and was reported as "trace."

USEPA's Ambient Water Quality Criteria are unavailable for permethrin. Since CDFG has developed a maximum concentration criterion of 0.03 µg/l as a one-hour average to protect freshwater aquatic life for permethrin, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger based on this criterion.

ii. **Resmethrin**

Resmethrin is a waxy, off-white to tan solid with an odor characteristic of chrysanthemums. It is stable under normal temperatures and pressures, but decomposes in the presence of alkalis and light. Resmethrin breaks down in the presence of light and humidity. Its half-life in the environment is 15 minutes. Degradation end-products reported for resmethrin are chrysanthemic acid, benzaldehyde, benzyl alcohol, benzoic acid, phenylacetic acid, and various esters. Resmethrin is considered slightly toxic to humans and is rated USEPA toxicity class III (I = most toxic, IV = least toxic), bearing the word CAUTION on its label.

Resmethrin has been registered by USEPA since 1971 and is used to control flying and crawling insects in the home, lawn, garden, and industrial sites. It can also be used to control insects on ornamental plants (outdoor and greenhouse use), on pets and horses, and as a mosquitocide. Because of its toxicity to fish, resmethrin is a restricted use pesticide that is available for use only by certified pesticide applicators in public health and vector control districts or persons under their direct supervision.

According to a report from the CDC that summarizes investigations of illnesses associated with exposures to insecticides uses during 1999-2002 to control mosquito populations in nine states (including California), of 133 reported cases of pesticide-related illness associated with vector control, resmethrin was associated with 10 cases. When combined with PBO, resmethrin is a highly effective insecticide that is of low-order toxicity to mammals, including humans.

Toxicity data for resmethrin were obtained from the *Ecotoxicity Database* to assess toxicity of resmethrin to freshwater aquatic life. Table D-4 summarizes toxicity data for resmethrin.

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Table D-4. Summary of Toxicity Data for Resmethrin

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	0.75
Bluegill sunfish	96 hrs	8
Bluegill sunfish	96 hrs	1.7
Bluegill sunfish	96 hrs	2.6
Bluegill sunfish	96 hrs	13.4
Rainbow trout	96 hrs	0.82
Rainbow trout	96 hrs	3.1
Rainbow trout	96 hrs	2.4
Rainbow trout	96 hrs	5.6
Rainbow trout	96 hrs	0.28
Rainbow trout	96 hrs	0.45
Rainbow trout	96 hrs	1.8
Fathead minnow	96 hrs	2.96
Fathead minnow	96 hrs	6.6
Fathead minnow	96 hrs	2.7
Brown trout	96 hrs	0.75
Channel catfish	96 hrs	3.2
Channel catfish	96 hrs	16.6
Common carp	96 hrs	3.95
Green sunfish	96 hrs	4.6
Lake trout	96 hrs	0.74
Lake trout	96 hrs	1.7
Largemouth bass	96 hrs	0.66
Northern pike	96 hrs	1.1
White sucker	96 hrs	2.3
White sucker	96 hrs	3.3
Yellow perch	96 hrs	2.4
Yellow perch	96 hrs	0.51
Lowest LC50 = 0.28 µg/l		
Lowest LC50/10 = 0.028 µg/l		

Ambient Water Quality Criteria are unavailable for resmethrin. Table D-4 shows that one-tenth of the lowest LC50 to protect the most sensitive aquatic life for resmethrin is 0.028 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.028 µg/l for resmethrin.

iii. **Sumithrin**

Sumithrin has been registered by USEPA since 1975 and is used to control adult mosquitoes and as an insecticide in transport vehicles such as aircraft, ships, railroad cars, and truck trailers. It is also used as an insecticide and miticide in commercial, industrial, and institutional nonfood areas, in homes and gardens, in greenhouses, and in pet

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quarters and on pets. Sumithrin is a combination of two cis and two trans isomers.

Sumithrin is slightly toxic and is rated USEPA toxicity class IV (I = most toxic, IV = least toxic) bearing the word CAUTION on its label. Sumithrin degrades rapidly, with a half-life of 1-2 days under dry, sunny conditions. Under flooded conditions, the half-life increases to 2-4 weeks for the trans isomer and 1-2 months for the cis isomer. With no sunlight and little air circulation, most of the product still remains after one year (WHO, 1990). Symptoms of acute sumithrin poisoning include hyperexcitability, prostration, slow respiration, salivation, tremor, ataxia and paralysis.

According to a report from CDC that summarizes investigations of illnesses associated with exposures to insecticides uses during 1999-2002 to control mosquito populations in nine states (including California), of 133 reported cases of mosquito-control insecticide-related illness, sumithrin was associated with 24 cases. When combined with PBO, sumithrin is a highly effective insecticide that is of low-order toxicity to mammals, including humans.

Toxicity data for sumithrin were obtained from the *Ecotoxicity Database* to assess toxicity of sumithrin to freshwater aquatic life. Table D-5 summarizes toxicity data for sumithrin.

Table D-5. Summary of Toxicity Data for Sumithrin

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	18
Bluegill sunfish	96 hrs	15.8
Rainbow trout	96 hrs	16.7
Rainbow trout	96 hrs	1.4
Mysid	96 hrs	0.025
Inland silverside	96 hrs	94.2
Lowest LC50 = 0.025 µg/l		
Lowest LC50/10 = 0.0025 µg/l		

Ambient Water Quality Criteria are unavailable for sumithrin. Table D-5 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for sumithrin is 0.0025 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.0025 µg/l for sumithrin.

iv. **Prallethrin**

Prallethrin is a synthetic pyrethroid with fast knock-down activity against household insect pests. It is used in household insecticide products against mosquitoes, houseflies, and cockroaches. Prallethrin also has veterinary uses in the treatment of domestic pets. Prallethrin is very toxic to bees and fish but of low toxicity to birds.

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Toxicity data for prallethrin were obtained from the *Ecotoxicity Database* to assess toxicity of prallethrin to freshwater aquatic life. Table D-6 summarizes toxicity data for prallethrin.

Table D-6. Summary of Toxicity Data for Prallethrin

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	22
Rainbow trout	96 hrs	12
Mysid	96 hrs	3.9
Lowest LC50 = 3.9 µg/l		
Lowest LC50/10 = 0.39 µg/l		

Ambient Water Quality Criteria are unavailable for prallethrin. Table D-6 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for prallethrin is 0.39 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.39 ug/l for prallethrin.

v. **Etofenprox**

Etofenprox is a synthetic pyrethroid-like substance. It differs in structure from pyrethroids in that it lacks a carbonyl group. Etofenprox contains an ether moiety whereas pyrethroids contain ester moieties. Its mode of action against insects is very similar to that of pyrethroids, and its main action site is the neuronal axon.

Toxicity data for etofenprox were obtained from the *Ecotoxicity Database* to assess toxicity of etofenprox to freshwater aquatic life. Table D-7 summarizes toxicity data for etofenprox.

Table D-7. Summary of Toxicity Data for Etofenprox

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	13
Bluegill sunfish	96 hrs	2.4
Rainbow trout	96 hrs	2.7
Rainbow trout	96 hrs	3.3
Mysid	96 hrs	0.019
Lowest LC50 = 0.019 µg/l		
Lowest LC50/10 = 0.0019 µg/l		

Ambient Water Quality Criteria are unavailable for etofenprox. Table D-7 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for etofenprox is 0.0019 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.0019 ug/l for etofenprox.

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d. **Piperonyl Butoxide (PBO)**

PBO is a synergist used to increase the potency of insecticides like pyrethrins and pyrethroids. According to USEPA, PBO is one of the most commonly used ingredients in household pesticide products.

PBO acts as a synergist by inhibiting the activity of a family of enzymes called P450s in the target organism that would otherwise detoxify the pyrethrin or pyrethroid. These enzymes have many functions, including breakdown of toxic chemicals and transformation of hormones. Symptoms of PBO poisoning include anorexia, vomiting, diarrhea, intestinal inflammation, pulmonary hemorrhage and perhaps mild central nervous system depression. Repeated contact may cause slight skin irritation. USEPA's classification of PBO is "Group C," a possible human carcinogen based on a study result on mice. The study found that PBO caused liver tumors and cancer.

In field tests of agricultural soils conducted in California by a manufacturers' task force, PBO persisted (measured as the time required for all applied PBO to dissipate) up to 30 days. The manufacturers' task force also measured PBO's half-life (the time required for half of applied PBO to break down or move away from the application site) and persistence in water and aquatic sediments. In water tested in California, PBO's half-life is about a day. In sediment, the half-life is up to 24 days and PBO persisted up to 120 days.

A study from the UC Berkeley (Weston, Et Al.) on aquatic effects of aerial spraying for adult mosquitoes over Sacramento in 2005 found that PBO was detected in every creek sample at concentrations ranging from 0.44 µg/L to 3.92 µg/L after a completion of an aerial application. These results are similar to the local Vector Control District's post-application sampling that reported PBO was detected at about 4 µg/L in four of ten creeks and 20 µg/L in one creek. The study also found PBO detections after spraying in sediment samples at 16 to 61 µg/kg in 4 of 6 samples (these 4 samples also contains pyrethrin), where PBO was not detected in sediment samples collected just before aerial spraying. As indicated in this study, the greatest risk of aerial application to aquatic lives is the synergy between the PBO and insecticides already presented in the environment, or in this case, pre-existing pyrethroids. These insecticides may not be related to spray application to control adult mosquitoes. The synergistic effect is proportional to the logarithm of the PBO concentration.

Toxicity data for PBO, for the mixture of PBO and resmethrin, and for the mixture of PBO and pyrethrin were obtained from USEPA's *Ecotoxicity Database* to assess the toxicity of PBO and its mixtures to freshwater aquatic life. Tables D-8, D-9, and D-10 below summarize the toxicity data for PBO and its mixtures.

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Table D-8. Summary of Toxicity Data for PBO

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	5,370
Fathead minnow	96 hrs	6,200
Rainbow trout	96 hrs	1,800
Rainbow trout	96 hrs	3,400
Rainbow trout	96 hrs	2,820
Rainbow trout	96 hrs	6,100
Mysid	96 hrs	490
Black bullhead	96 hrs	5,650
Channel catfish	96 hrs	6,400
Common carp	96 hrs	4,220
Green sunfish	96 hrs	12,200
White sucker	96 hrs	6,950
Yellow perch	96 hrs	6,900
Lowest LC50 = 490 µg/l		
Lowest LC50/10 = 49 µg/l		

Ambient Water Quality Criteria are unavailable for PBO. Table D-8 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for PBO is 49 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 49 µg/l for PBO.

Table D-9. Summary of Toxicity Data for PBO (in the PBO/Resmethrin Mixture)

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	13.4
Rainbow trout	96 hrs	2.4
Pink shrimp	96 hrs	1.3
Lowest LC50 = 1.3 µg/l		
Lowest LC50/10 = 0.13 µg/l		

Ambient Water Quality Criteria are unavailable for PBO (in the PBO/Resmethrin Mixture). Table D-9 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for PBO (in the PBO/Resmethrin Mixture) is 0.13 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.13 µg/l for PBO (in the PBO/Resmethrin Mixture).

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Table D-10. Summary of Toxicity Data for PBO (in the PBO/Pyrethrin Mixture)

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	3.4
Mysid	96 hrs	0.14
Lowest LC50 = 0.14 µg/l		
Lowest LC50/10 = 0.014 µg/l		

Ambient Water Quality Criteria are unavailable for PBO (in the PBO/Pyrethrin Mixture). Table D-10 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for PBO (in the PBO/Pyrethrin Mixture) is 0.014 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 0.014 µg/l for PBO (in the PBO/Pyrethrin Mixture).

e. **N-Octyl Bicycloheptene Dicarboximide (or MGK-264)**

MGK-264 is an ingredient in some common pesticides. It is a synergist used to enhance the potency of pyrethroids. It is used in a variety of household and veterinary products.

Toxicity data for MGK-264 were obtained from the *Ecotoxicity Database* to assess toxicity of MGK-264 to freshwater aquatic life. Table D-11 summarizes toxicity data for MGK-264.

Table D-11. Summary of Toxicity Data for MGK-264

Test Species	Study Length	LC50 (µg/l)
Bluegill sunfish	96 hrs	2,400
Rainbow trout	96 hrs	1,400
Rainbow trout	96 hrs	169
Lowest LC50 = 169 µg/l		
Lowest LC50/10 = 16.9 µg/l		

Ambient Water Quality Criteria are unavailable for MGK-264. Table D-11 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for MGK-264 is 16.9 µg/l. Therefore, this General Permit contains an Instantaneous Maximum Receiving Water Monitoring Trigger of 16.9 µg/l for MGK-264.

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Summary of Receiving Water Limitation

Table D-12 below summarizes the Receiving Water Limitation and controlling water quality criteria for malathion.

Table D-12. Summary of Receiving Water Limitation

Ingredient	Unit	Instantaneous Maximum	Basis
Malathion	µg/L	0.1	USEPA's Ambient Water Quality Criteria

Summary of Receiving Water Monitoring Triggers

Table D-~~12~~ 13 below summarizes the Receiving Water Monitoring Triggers and controlling water quality criteria and standards for ~~all~~ larvicides and adulticides active ingredients.

Table D-~~12~~13. Summary of Receiving Water Monitoring Triggers

Ingredient	Units	Instantaneous Maximum Monitoring Triggers	Basis
Temephos	µg/L	8	USEPA's Office of Pesticides' Ecotoxicity Database
~~Malathion~~	~~µg/L~~	~~0.1~~	~~USEPA's Ambient Water Quality Criteria~~
Naled	µg/L	0.014	USEPA's Office of Pesticides' Ecotoxicity Database
Pyrethrin	µg/L	0.14	USEPA's Office of Pesticides' Ecotoxicity Database
Permethrin	µg/L	0.03	California Department of Fish and Game's Ambient Criterion
Resmethrin	µg/L	0.028	USEPA's Office of Pesticides' Ecotoxicity Database
Sumithrin	µg/L	0.0025	USEPA's Office of Pesticides' Ecotoxicity Database
Prallethrin	µg/L	0.39	USEPA's Office of Pesticides' Ecotoxicity Database
Piperonyl Butoxide (PBO)	µg/L	49	USEPA's Office of Pesticides' Ecotoxicity Database
PBO (in PBO/Resmethrin Mixture)	µg/L	0.13	USEPA's Office of Pesticides' Ecotoxicity Database
PBO (in PBO/Pyrethrin Mixture)	µg/L	0.014	USEPA's Office of Pesticides' Ecotoxicity Database
Etofenprox	µg/L	0.0019	USEPA's Office of Pesticides' Ecotoxicity Database
MGK-264	µg/L	16.9	USEPA's Office of Pesticides' Ecotoxicity Database

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Persistence of Vector Adulticides and Larvicides Active Ingredients

Tables D-~~13~~ 14 and D-~~14~~ 15 below summarize information on persistence of the active ingredients for vector adulticides and larvicides, respectively, as included in the MVCAC's *Draft Conceptual Monitoring Plan for Mosquito Larvicides and Adulticides*:

Table D-~~13~~14. Persistence of Vector Adulticides Active Ingredients

Class	Active Ingredients	Half-Life		Degradation Method (and Matrix)	Reference
Pyrethrins (naturally occurring chemicals in pyrethrum)	Pyrethrins[1]	<1	Day	Photolysis (water and soil)	USEPA 2006a (RED), Gunasekara 2005
		14-17	Hrs	Hydrolysis, pH=9 (water)	USEPA 2006a (RED)
		86.1	Days	Anaerobic metabolism (soil)	USEPA 2006a (RED)
		10.5	Days	Aerobic metabolism (soil)	USEPA 2006a (RED)
		1.8-97	~~Days~~[1] Days[2]	Volatilization (soil)	Gunasekara 2005
		"slow"		Hydrolysis, neutral or acidic	USEPA 2006a (RED)
Pyrethroids (synthetic)	d-phenothrin (Sumithrin)	6.5	Days	Photolysis (water)	USEPA 2008 (RED)
		18.6 - 25.8	Days	Aerobic metabolism (soil)	USEPA 2008 (RED)
		36.1	Days	Aerobic metabolism (water)	USEPA 2008 (RED)
		173.3	Days	Anaerobic metabolism (water)	USEPA 2008 (RED)
		Stable		Hydrolysis, all pH levels	USEPA 2008 (RED)
	Resmethrin	22	Minutes	Photolysis (sea water)	USEPA 2006b (RED)
		47	Minutes	Photolysis (distilled water)	USEPA 2006b (RED)
		198	Days	Aerobic metabolism (soil)	USEPA 2006b (RED)
		37	Days	Aerobic metabolism (water)	USEPA 2006b (RED)
		Stable		Anaerobic metabolism (soil)	USEPA 2006b (RED)
		> 89	Days	Hydrolysis, pH= 5-9	USEPA 2006b (RED)
	Permethrin	Stable		Hydrolysis, pH= 5-7	USEPA 2009a (RED), Imgrund 2003
		242	Days	Hydrolysis, pH= 9	Imgrund 2003
		125 – 350	Days	Aquatic degradation, pH= 9	USEPA 2009a (RED),

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Class	Active Ingredients	Half-Life		Degradation Method (and Matrix)	Reference
		113 – 175	Days	Anaerobic degradation (water)	USEPA 2009a (RED),
		51 -100	Days	Photolysis, pH= 5 (water)	Imgrund 2003
		<3 -197	Days	Anaerobic degradation (soil)	Imgrund 2003
		3.5 – 113	Days	Aerobic degradation (soil)	Imgrund 2003
		104 – 324	Days	Photolysis (soil)	Imgrund 2003
		<2.5	Days	Sediment/seawater degradation	Imgrund 2003
		1.8 – 20.4	Days	Stream, pH= 7 -7.5, 13 -15℃	Imgrund 2003
		19.6 -27.1	Days	Photolysis, ponds (water)	Imgrund 2003
	Prallethrin	25	Days	Photolysis (soil)	Sumitomo Chemical 2009
		13.6	Hours	Photolysis (water)	Sumitomo Chemical 2009
	Etofenprox	4.4	Days	Photolysis (soil)	Central Life Sciences 2009
		1.7	Days	Photolysis (water)	Central Life Sciences 2009
Synergist for pyrethrin and pyrethroids	Piperonyl Butoxide (PBO)	8.4	Hours	Photolysis (water)	USEPA 2006c (RED)
		"very slow"		Hydrolysis & aerobic/anaerobic metabolism	USEPA 2006c (RED)
Organophosphates	Naled	<2	Days	Hydrolysis & biodegradation (water & soil)	USEPA 2006d (RED)
		"high"		Volatilization (soil)	USEPA 2006d (RED)
	Malathion	0.1–11	Days	Aerobic metabolism (soil)	USEPA 2009b (RED), Newhart 2006
		0.67-42	Days	Photodegradation (water)	USEPA 2009b (RED)
		1-14	Days	Aerobic metabolism (water)	USEPA 2009b (RED)
		Persistence		Anaerobic degradation (water)	USEPA 2009b (RED)
		1.4-147	Days	Aerobic degradation (water)	Newhart 2006

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Class	Active Ingredients	Half-Life	Degradation Method (and Matrix)	Reference

[1]– **Note:**
[1] Pyrethrins are a mix of Pyrethrin I, Pyrethrin II, Cinerin I, Cinerin II, Jasmolin I, and Jasmolin II
[2] Estimated value

References:

Central Life Sciences. 2009. Zenivex E20 technical brochure. http://www.myadapco.com/viewproduct.jsp?id=Zenivex%20E20&cat=adulticides
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U.S. EPA. 2006b. Reregistration Eligibility Decision for Resmethrin. List A Case No. 0421. EPA 738-R-06-003. Office of Prevention, Pesticides, and Toxic Substances (7508C). June.
U.S. EPA. 2006c. Reregistration Eligibility Decision for Piperonyl Butoxide (PBO). List B Case No. 2525. EPA 738-R-06-005. Office of Prevention, Pesticides, and Toxic Substances (7508C). June.
U.S. EPA. 2006d. Reregistration Eligibility Decision for Naled. Contains Interim Reregistration Eligibility Decision for Naled (EPA 738-R-02-008). Office of Prevention, Pesticides, and Toxic Substances. July.
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U.S. EPA. 2008. Reregistration Eligibility Decision for d-Phenothrin. List A Case No. 0426. Office of Prevention, Pesticides, and Toxic Substances (7508P). September.
U.S. EPA. 2009a. Reregistration Eligibility Decision (RED) for Permethrin. Case No. 2510. EPA 738-R-09-306. Office of Prevention, Pesticides, and Toxic Substances (7508P). Revised May.
U.S. EPA. 2009b. Reregistration Eligibility Decision (RED) for Malathion. Case No. 0248. EPA 738-R-06-030. Office of Office of Prevention, Pesticides, and Toxic Substances (7508P). Revised May.
Gunasekara, A. S. 2005. Environmental Fate of Pyrethrins. Environmental Monitoring Branch. Department of Pesticide Regulation. Sacramento, CA. November 2004, Revised 2005.
Imgrund, H. 2003. Environmental Fate of Permethrin. Environmental Monitoring Branch. Department of Pesticide Regulation. Sacramento, CA. January.
Newhart, K. 2006. Environmental Fate of Malathion. Environmental Monitoring Branch. Department of Pesticide Regulation. California Environmental Protection Agency. October.
Sumitomo Chemical. 2009. Material Safety Data Sheet. Prallethrin Technical Grade. March.~~Estimated value~~

Table D-~~14~~15. Persistence of Vector Larvicides Active Ingredients

Class	Active Ingredient	Half-Life	Degradation Method (and Matrix)	Reference
Microbial[1]	*Bacillus Sphaericus*	0.5-2 weeks	Not reported (formulated product)	EPA 1999
	Bacillus Thuringiensis	1-4 days	UV light (foliage)	EPA 1998
		Several months	Not reported (soil)	EPA 1998
Surface Agents	Monomolecular films[2]	5-7 days	Not reported (water)	EPA 2007a
		5-22 days	Not reported (water)	Cognis Corporation 2004
	Petroleum Distillates[3]	2-3 days	Not reported (water)	EPA 2007b
Insect Growth Regulator	Methoprene[4]	Rapid	Photolysis (water and soil)	EPA 2001
		<1 day	Photolysis (water)	ASTDR 2005
		<13 days	Photolysis (water)	Csondes 2004
		10-14 days		EPA 1991

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Class	Active Ingredient	Half-Life	Degradation Method (and Matrix)	Reference
		>150 days	Not reported (briquettes in water)	Csondes 2004
Organophosphate	Temephos	Rapid	Not reported (natural water)	EPA 2000
		>7 days	Not reported (field data)	ASTDR 2005
Insect neuro-disruptor	Spinosad	0.84-0.96 days	Photolysis (water)	Kollman 2002
		8.68-9.44 days	Photolysis (soil)	Kollman 2002
		>30 days	Hydrolysis, pH=7-9 (water)	Kollman 2002
		14.5-17.3 days	Aerobic metabolism (soil)	Kollman 2002
		161-250 days	Anaerobic metabolism (soil)	Kollman 2002

[1] Formal environmental fate data is not generally required for microbial pesticides because it is not usually needed and it is difficult to evaluate due to the potential for microbial growth under suitable environmental conditions (EPA 1998).
[2] Alpha-isooctadecyl-Omega-Hydroxypoly (Oxyethylene)
[3] Reported as either Petroleum Distillates or Refined Petroleum Distillates
[4] S-Methoprene is the active ingredient of Methoprene

Toxicity

The narrative toxicity objective contained in the Regional Water Boards' Basin Plans states that "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" For compliance with that objective, this General Permit requires each Coalition or Discharger to conduct toxicity testing as specified in the Monitoring and Reporting Program. This General Permit also contains a receiving water limitation for toxicity and requires the Coalition or Discharger to implement BMPs to identify corrective actions to reduce or eliminate any toxicity caused by residual pesticides from ~~direct~~larvicide and~~/or spray~~ adulticide applications for vector control.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

40 C.F.R. Section 122.48 of 40 C.F.R. requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the State Water Board and Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program (Attachment C) for this General Permit establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the requirements contained in the Monitoring and Reporting Program for discharges of biological and residual pesticides from ~~direct~~larvicide and ~~spray~~adulticide applications for vector control.

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A. Effluent Monitoring

Pursuant to the requirements of 40 C.F.R. § 122.44(i) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving water and groundwater.

The application of pesticides for vector control is not necessarily considered a discharge of pollutants according to the *National Cotton Council of America v. USEPA* decision and other applicable case law. The regulated discharge is the discharge of biological and residual pesticides. At what point the pesticide becomes a residue is not precisely known. Therefore, in the application of pesticides, the exact effluent is unknown. Thus, effluent monitoring requirement is not applicable for applications of pesticides for vector control.

B. Toxicity Testing Requirements

Acute and chronic toxicity performed in conjunction with the Background and Post-Event Monitoring (for larvicide applications) and with the Background and Event Monitoring (for adulticide applications) for active ingredients and at a monitoring frequency specified in Tables C-1 and C-2 is required to demonstrate compliance with the Basin Plans' narrative toxicity objective.

C. Receiving Water Monitoring

Receiving water monitoring is necessary to determine the impacts of the discharge on the receiving stream.

All testing for both toxicity and individual chemicals have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty. The intent of this General Permit's sampling program is to select a number that will detect most events of noncompliance without requiring needless or burdensome monitoring. Table 3-1 of the EPA Region 9 and 10 Toxicity Training Tool provides guidance on the selection of the appropriate sample number. It shows that six is the minimum number of samples where there is about a 50 percent chance of detecting at least one toxic event for the three probabilities of occurrence shown on the table.

Staff also used EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) to determine the appropriate number of samples that would be needed to characterize the impacts of the residual pesticide discharge from pesticide applications. Page 53 of the TSD recommends using a coefficient of variation (CV) 0.6 when the data set contains less than 10 samples. Table 3-1 of the TSD shows that with a CV of 0.6, the multiplying factors used to determine whether a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a State water quality standard begin to stabilize when the sample number is six.

Thus, this General Permit requires six samples to characterize the effects of residual pesticide discharge from pesticide applications.

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VIII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 C.F.R. § 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 C.F.R. § 122.42, are provided in Attachment B. The Discharger must comply with applicable standard provisions and with those additional conditions that are applicable under 40 C.F.R. § 122.42.

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the General Permit.

Section 123.25(a)(12) of 40 C.F.R. allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R. § 123.25, this General Permit omits federal conditions that address enforcement authority specified in 40 C.F.R. § 122.41(j)(5) and (k)(2) because the enforcement authority under the California Water Code is more stringent. In lieu of these conditions, this General Permit incorporates by reference California Water Code section 13387(e).

B. Reopener Provisions

1. The reopener provisions allow the State Water Board to reopen the permit in accordance with 40 C.F.R. § 122.62.
2. Conditions that necessitate a major modification of a permit are described in 40 C.F.R. § 122.62, including:
   a. If new or amended applicable water quality standards are promulgated or approved pursuant to section 303 of the CWA, or amendments thereto, this General Permit may be re-opened and modified in accordance with the new or amended standards.
   b. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.
3. **Acute and Chronic Toxicity.** This General Permit may be reopened if a numeric acute and chronic toxicity water quality objective is adopted by the State Water Board. This General Permit may be reopened to include a numeric acute and chronic toxicity limitation based on that objective.
4. **Receiving Water Limitations**. This General Permit may be re-opened to add receiving water limitations to Table 3 (Receiving Water Limitations) if the monitoring result for residual pesticides specified in the Table ~~3~~ 4 (Receiving Water Monitoring Triggers) exceed the associated monitoring trigger.
5. **Endangered Species Act**. If USEPA develops biological opinions regarding pesticides included in this General Permit, this General Permit may be re-opened to add or modify Receiving Water Monitoring Triggers for residual pesticides of concern, if necessary.

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6. **Pesticide Products.** This General Permit may be re-opened to add additional pesticide products registered by DPR to control vector.

IX. PUBLIC PARTICIPATION

The State Water Board is considering the issuance of WDRs that will serve as a general NPDES permit for direct and spray applications of pesticides for vector control. As a step in the WDR adoption process, the State Water Board staff has developed tentative WDRs. The State Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The State Water Board has notified interested agencies, parties, and persons of its intent to prescribe general WDRs for direct and spray applications of pesticides for vector control and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided to interested parties through specific mailings, distribution through the State Water Board Lyris Email System and through publication in major newspapers ~~for the following~~ communities throughout California~~:~~
_____.

B. Written Comments

~~The staff determinations are tentative.~~ Interested persons ~~are~~ were invited to submit written comments concerning this tentative WDR. Comments ~~must be submitted either in person or by mail to the State Water Board at the address listed on the cover page of this General Permit.~~

~~To be fully responded to by staff and considered by the State Water Board, written comments must be received~~ were due at the State Water Board offices by 12~~5~~:00 noon~~p.m.~~ on **November 2, 2010**. Twelve comment letters were received.

C. Public Hearing and Meeting

The State Water Board ~~will hold~~ held a public hearing on the tentative WDRs during its regular Board meeting on ~~the following date and time and at the following location:~~ October 19, 2010. The State Water Board will consider adoption of the WDRs at a public meeting on the following date, time, and location:

Date:	~~**January**~~ **February 4~~1~~5, ~~2011~~2010**
Time:	9:00 a.m.
Location:	State Water Resources Control Board 1001 I Street Sacramento, CA 95814

~~Interested persons are invited to attend. At the public hearing, the State Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.~~

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Please be aware that dates and venues may change. Our web address is http://www.waterboards.ca.gov/ where you can access the current agenda for changes in dates and locations.

D. Information and Copying

The tentative effluent limitations, receiving water limitations, and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the State Water Board by calling ~~Lydia Deller at~~ (916) ~~341~~319-~~5506~~9152.

E. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding this general WDRs and NPDES permit should contact the State Water Board, reference the general WDRs and NPDES permit, and provide a name, address, and phone number.

F. Additional Information

Requests for additional information or questions regarding this General Permit should be directed to Trinh Pham at (916) 327-8117 or at tpham@waterboards.ca.gov.

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ATTACHMENT E – LIST OF PERMITTED ADULTICIDE PRODUCTS

Product Name	Registration Number
Pyrocide Mosquito Adulticiding Concentrate for ULV Fogging 7395	1021-1570
Evergreen Crop Protection EC 60-6	1021-1770
Pyrenone Crop Spray	432-1033
Prentox Pyronyl Crop Spray	655-489
Pyrocide Mosquito Adulticiding Concentrate for ULV Fogging 7396	1021-1569
Aquahalt Water-Based Adulticide	1021-1803
Pyrocide Mosquito Adulticide 7453	1021-1803
Pyrenone 25-5 Public Health Insecticide	432-1050
Prentox Pyronyl Oil Concentrate #525	655-471
Prentox Pyronyl Oil Concentrate or 3610A	655-501
Permanone 31-66	432-1250
Kontrol 30-30 Concentrate	73748-5
Aqualuer 20-20	769-985
Aqua-Reslin	432-796
Aqua-Kontrol Concentrate	73748-1
Kontrol 4-4	73748-4
Biomist 4+12 ULV	8329-34
Permanone RTU 4%	432-1277
Prentox Perm-X UL 4-4	655-898
Allpro Evoluer 4-4 ULV	769-982
Biomist 4+4	8329-35
Kontrol 2-2	73748-3
Scourge Insecticide with Resmethrin/Piperonyl Butoxide 18%+54% MF Formula II	432-667
Scourge Insecticide with Resmethrin/Piperonyl Butoxide 4%+12% MF Formula II	432-716
Anvil 10+10 ULV	1021-1688
AquaANVIL Water-based Adulticide	1021-1807
Duet Dual-Action Adulticide	1021-1795
Anvil 2+2 ULV	1021-1687
Zenivex E20	2724-791
Trumpet EC Insecticide	5481-481
Fyfanon ULV Mosquito	67760-34

ATTACHMENT F – LIST OF PERMITTED LARVICIDE PRODUCTS

Product Name	Registration Number
Vectolex CG Biological Larvicide	73049-20
Vectolex WDG Biological Larvicide	73049-57
Vectolex WSP Biological Larvicide	73049-20
Vectobac Technical Powder	73049-13
Vectobac-12 AS	73049-38
Aquabac 200G	62637-3
Teknar HP-D	73049-404
Vectobac-G Biological Mosquito Larvicide Granules	73049-10
Vectomax CG Biological Larvicide	73049-429
Vectomax WSP Biological Larvicide	73049-429
Vectomax G Biological Larvicide/Granules	73949-429
Zoecon Altosid Pellets	2724-448
Zoecon Altosid Pellets	2724-375
Zoecon Altosid Liquid Larvicide Mosquito Growth Regulator	2724-392
Zoecon Altosid XR Entended Residual Briquets	2724-421
Zoecon Altosid Liquid Larvicide Concentrate	2724-446
Zoecon Altosid XR-G	2724-451
Zoecon Altosid SBG Single Brood Granule	2724-489
Mosquito Larvicide GB-1111	8329-72
BVA 2 Mosquito Larvicide Oil	70589-1
BVA Spray 13	55206-2
Agnique MMF Mosquito Larvicide & Pupicide	53263-28
Agnique MMF G	53263-30
Abate 2-BG	8329-71
5% Skeeter Abate	8329-70
Natular 2EC	8329-82
Natular G	8329-80
Natular XRG	8329-83
Natular XRT	8329-84

ATTACHMENT G – NOTICE OF INTENT

WATER QUALITY ORDER NO. 2011-XXXX-DWQ
GENERAL PERMIT NO. CAG XXXXXX

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM VECTOR CONTROL APPLICATIONS

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item ☐ A. New Applicator ☐B. Change of Information: WDID# _____

☐C. Change of ownership or responsibility: WDID# _____

II. DISCHARGER INFORMATION

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip Code
G. Contact Person	H. Email address	I. Title	J. Phone

III. BILLING ADDRESS (Enter Information *only* if different from Section II above)

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip Code
G. Email address	H. Title	I. Phone	

IV. RECEIVING WATER INFORMATION

A. ~~Pesticide residues~~Biological and residual pesticides discharge to (check all that apply)*:

1. ☐ Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.
   Name of the conveyance system: _____

2. ☐ Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger.
   Owner's name:_____
   Name of the conveyance system: _____

3. ☐ Directly to river, lake, creek, stream, bay, ocean, etc.
   Name of water body: _____

* A map showing the affected areas for items 1 to 3 above may be included.

B. Regional Water Quality Control Board(s) where application areas are located (REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region _____
(List all regions where pesticide application is proposed.)

A map showing the locations of A1-A3 in each Regional Water Board shall be included.

V. PESTICIDE APPLICATION INFORMATION

A. Target Organisms: ____Vector Larvae _____ Adult Vector

B. Pesticides Used: List ~~Name~~name, ~~and a~~Active ingredients and, if known, degradation by-products

C. Period of Application: Start Date_____ End Date_____

D. Types of Adjuvants Added by the Discharger:

VI. PESTICIDES APPLICATION PLAN

A. Has a Pesticides Application Plan been prepared?*
☐ Yes ☐ No

If not, when will it be prepared? _____

* A copy of the PAP shall be included with the NOI.

B. Is the applicator familiar with its contents?

☐ Yes ☐ No

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VII. NOTIFICATION

Have potentially affected governmental agencies been notified?

☐ Yes ☐ No

* If yes, a copy of the notifications shall be attached to the NOI.

VIII. FEE

Have you included payment of the filing fee (for first-time enrollees only) with this submittal?

☐ Yes ☐ NO ☐ NA

IX. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the General Permit, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: _____

B. Signature: _____ **Date:** _____

C. Title: _____

X. FOR STATE WATER BOARD USE ONLY

WDID:	**Date NOI Received:**	**Date NOI Processed:**
Case Handler's Initial:	**Fee Amount Received:** **$**	**Check #:**

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INSTRUCTIONS FOR COMPLETING THE NOI

WATER QUALITY ORDER NO. 2011-XXXX-DWQ
GENERAL PERMIT NO. CAG XXXXXX

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM VECTOR CONTROL APPLICATIONS

These instructions are intended to help you, the Discharger, to complete the Notice of Intent (NOI) form for the Statewide General National Pollutant Discharge Elimination System (NPDES) permit. **Please type or print clearly when completing the NOI form**. For any field, if more space is needed, submit a supplemental letter with the NOI.

Send the completed and signed form along with the filing fee and supporting documentation to the State Water Resources Control Board (State Water Board). .

Section I – Notice of Intent Status

Indicate whether this request is for the first time coverage under this General Permit or a change of information for the discharge already covered under this General Permit. For a change of information or ownership, please supply the eleven-digit Waste Discharge Identification (WDID) number for the discharge.

Section II – Discharger Information

A. Enter the name of the Discharger.
B. Enter the street number and street name where correspondence should be sent (P.O. Box is acceptable).
C. Enter the city that applies to the mailing address given.
D. Enter the county that applies to the mailing address given.
E. Enter the state that applies to the mailing address given.
F. Enter the zip code that applies to the mailing address given.
G. Enter the name (first and last) of the contact person.
H. Enter the email address of the contact person.
I. Enter the contact person's title.
J. Enter the daytime telephone number of the contact person.

Section III – Billing Address

Enter the information **only** if it is different from Section II above.

A. Enter the name (first and last) of the person who will be responsible for the billing.
B. Enter the street number and street name where the billing should be sent (P.O. Box is acceptable).
C. Enter the city that applies to the billing address.
D. Enter the county that applies to the billing address.

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E. Enter the state that applies to the billing address.
F. Enter the zip code that applies to the billing address.
G. Enter the email address of the person responsible for billing.
H. Enter the title of the person responsible for billing.
I. Enter the daytime telephone number of the person responsible for billing.

Section IV – Receiving Water Information

A. Check all boxes that apply. At least one box must be checked.
   1. Check this box if the application area is a canal, ditch, or other constructed conveyance system owned and controlled by the Discharger. Print the name of the conveyance system.
   2. Check this box if the application area is a canal, ditch, or other constructed conveyance system owned and controlled by an entity other than the Discharger. Print the name of the owner and the name of the conveyance system..
   3. Check this box if the application area is to the river, lake, creek, stream, bay, ocean, etc. Print the name of the water body.

B. List all Regional Water Board numbers where pesticide application is proposed. Regional Water Board boundaries are defined in section 13200 of the California Water Code. The boundaries can also be found on our website at http://www.waterboards.ca.gov/waterboards_map.shtml. The numbers with corresponding Regional Water Board names are given below:

Regional Water Board Numbers	Regional Water Board Names
1	North Coast
2	San Francisco Bay
3	Central Coast
4	Los Angeles
5	Central Valley (Includes Sacramento, Fresno, Redding Offices)
6	Lahontan (South Lake Tahoe, Victorville offices)
7	Colorado River Basin
8	Santa Ana
9	San Diego

Section V – Pesticide Application Information

A. Check the appropriate target organism.
B. List the name and active ingredients of each pesticide to be used.
C. List the start and end date of proposed pesticide application event.
D. List the name(s) and type(s) of adjuvants added by the Discharger.

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Section VI – Pesticides Application Plan

The Discharger must prepare and complete a Pesticides Application Plan (PAP). The minimum contents of PAP are specified in the permit under item VIII.C of the General Permit. The Discharger must ensure that its applicator is familiar with the PAP contents before pesticide application.

If a PAP is not complete at the time of application, enter the date by which it will be completed.

Section VII – Notification

Have you notified potentially affected governmental agencies, as required under item VIII.B of the General Permit?

If yes, a copy of the notifications shall be attached to the NOI.

Section VIII – Fee

The amount of Annual fee shall be based on Category 3 discharge specified in Section 2200(b)(8) of Title 23, California Code of Regulations. Fee information can be found at http://www.waterboards.ca.gov/resources/fees/docs/fy10_11_fee_schedule.pdf ~~http://www.waterboards.ca.gov/resources/fees/.~~

Check the YES box if you have included payment of the annual fee. Check the NO box if you have not included this payment.

NOTE: You will be billed annually and payment is required to continue coverage.

Section IX– Certification

A. Print the name of the appropriate official. For a municipality, State, federal, or other public agency, this would be a principal executive officer, ranking elected official, or duly authorized representative. The principal executive officer of a federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of USEPA).

B. The person whose name is printed above must sign and date the NOI.

C. Enter the title of the person signing the NOI.

Endangered Species Act

This General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 et. seq). This

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General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

Additional information on federally-listed threatened or endangered species and federally-designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species.

Section 303(d) List

This General Permit does not authorize the discharge of biological and residual pesticides or their breakdown by-products to waters of the US that are impaired by the pesticide active ingredients included in permitted larvicides and adulticides listed in Attachments E and F. Impaired waters are those waters not meeting quality standards pursuant to Section 303(d) of the CWA. California impaired waters, as approved by the State Water Board, are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls

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ATTACHMENT H – NOTICE OF TERMINATION

WATER QUALITY ORDER NO. 2011-XXXX-DWQ
GENERAL PERMIT NO. CAG XXXXXX

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM VECTOR CONTROL APPLICATIONS

I. WDID

WDID# _____

II. DISCHARGER INFORMATION

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip Code
G. Contact Person	H. Email address	I. Title	J. Phone

III. BASIS FOR TERMINATION

IV. CERTIFICATION

"I certify under penalty of law that 1) I am not required to be permitted under the Vector control General Permit No. CAG____, and 2) this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I understand that the submittal of this Notice of Termination does not release a pesticide applicator from liability for any violations of the Clean Water Act."

A. Printed Name: _____

B. Signature: _____ **Date:** _____

C. Title: _____

V. FOR STATE WATER BOARD USE ONLY

☐ **Approved** for Termination ☐ **Denied** and Returned to the Discharger

A. Printed Name: _____

B. Signature: _____

C. Date: _____

NOT Effective Date: / /

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