September 23, 2011

Marin/Sonoma Mosquito and Vector Control District Pesticide Application Plan

General NPDES Permit for Residual Pesticide Discharges From Mosquito Control Applications Order NO. 2004-0008-DWQ

1. **Description of the target area and adjacent areas, if different from the water body of the target area, in to which larvicides and adulticides are being planned to be applied or may be applied to control vectors. The description shall include adjacent areas, if different from the water body of the target areas;**
   The Marin/Sonoma Mosquito and Vector Control District (MSMVCD) boundaries extend north to the Mendocino County Line (just north of the town of Cloverdale), to San Francisco County to the South (just south of Sausalito), Lake, Napa, and Solano Counties to the east, and the Pacific Ocean to the west. Please see attached map and map on page 21, Best Management Practices for Mosquito Control in California (California Department of Public Health, August 2010) and Draft Initial Study and Mitigated Negative Declaration, MSMVCD CEQA 2004 (CEQA 2004 available at www.msmosquito.com), attached Notice of Intent and attached list of receiving water bodies.

2. **Discussion of the factors influencing the decision to select pesticide applications for mosquito control:**
   Please see the Best Management Practices for Mosquito Control in California (e.g. pages 26 and 27) and CEQA 2004 (pgs.14-17, 33). MSMVCD utilizes an Integrated Vector Management Program to control mosquitoes. For example, mosquito larvicides are used when mosquito source reduction or biological controls (e.g. mosquito fish) are not applicable or larval control is necessary while mosquito source reduction solutions are being planned or implemented. For example, with reference to adult mosquito control, adulticides are considered when larval control has not been effective, a new source is discovered where adult mosquitoes are present, adult mosquito trap counts and/or landing rate counts deem adult mosquito control necessary (e.g. in conjunction with service requests and/or mosquito species known to transmit disease).

3. **Pesticides products or types expected to be used and if known, their degradation by-products, the method in which they are applied, and if applicable, the adjuvants and surfactants used:**
   Please see the Best Management Practices for Mosquito Control in California (e.g. pages 27-29), attached Notice of Intent, and CEQA 2004 (pgs. 22-25).

The following products may be used by MSMVCD for larval or adult control. This list is directly from Attachment E and F within the NPDES Permit for Biological and Residual Pesticide Discharges to Waters of the U.S. for Vector Control Applications. All of these products are used according to label directions and may be applied by ground (hand, truck, ATV, backpack etc.) or by air (helicopter or fixed wing aircraft).

List of Permitted Larvicide Products

Larvicide 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 Briquets	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

Larvicide Product Name	Registration Number
Natular 2EC	8329-82
Natular G	8329-80
Natular XRG	8329-83
Natular XRT	8329-84
FourStar Briquets	83362-3
FourStar SBG	85685-1
Aquabac xt	62637-1
Spheratax SPH (50 G) WSP	84268-2
Spheratax SPH (50 G)	84268-2

List of Permitted Adulticide Products

Adulticide 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

Adulticide Product Name	Registration Number
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

4. **Description of the application areas and the target areas in the system that are being planned to be applied to or may be applied.**
Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is MSMVCD's preferred solution, and whenever possible MSMVCD works with agencies and property owners to affect long-term solutions to reduce or eliminate the need for continued applications as described in item 2 above. Please see attached map, CEQA 2004, and Notice of Intent. Sources of mosquito production and areas that require adult mosquito control are difficult to predict from year to year based on the weather and variations in local environmental conditions. However, the typical sources treated by MSMVCD include:

Seasonal wetlands

Tidal marshes

Storm water treatment, hydro modification control, and conveyance systems

Agricultural and recycled water irrigation practices (fields/pastures)

Ponds (ornamental, wildlife, recycled water irrigation recovery, frost protection…)

Low area/seasonal depressions

Septic tanks

Standing water under buildings

Containers (livestock tanks, rain barrels, planters, etc...)

Oak woodlands with populations of tree hole mosquitoes

5. **Other control methods used (alternatives) and their limitations:**
With any mosquito or other vector source, MSMVCD's first goal is to look for ways to eliminate the source, or, if that is not possible, for ways to reduce the vector potential. The most commonly used methods and their limitations are included in the Best Management Practices for Mosquito Control in California. Specific methods used by MSMVCD include educating the public regarding mosquito biology and encouraging residents to eliminate sources of standing water on their property, and working with property owners to find long-term water management strategies that meet their needs while minimizing the need for public health pesticide applications. Public relations methods utilized in this program include, newspaper articles, radio commercials, billboards, brochures, education booths (fairs, home shows, and other community events), and annual MSMVCD open house event. MSMVCD has an educational program that includes presentations at schools to educate students regarding mosquito biology, vector-borne diseases, and mosquito source reduction. MSMVCD also works collaboratively with municipalities and regulatory agencies in the design and review of projects with the intent of minimizing the potential of mosquito production and the need for repeated pesticide applications. For example, MSMVCD participates in the design and review processes for storm water conveyance, treatment, and control systems and is involved with the wetland community with regard to planning, design, and management of seasonal wetlands and tidal marshes. MSMVCD also stocks mosquito fish (*Gambusia affinis*) when and where appropriate as biological control tool.

6. **How much product is needed and how these amounts are determined:**
The need to apply product is determined by surveillance. Actual use varies annually depending on mosquito abundance. The pesticide amounts presented in the MSMVCD's attached 2010 PUR as an estimate of pesticide use in 2011. Other public health pesticides in addition to those listed below may be used as part of the agency's best management practices.

7. **Representative monitoring locations and the justification for selecting these monitoring locations:**
Please see the Mosquito and Vector Control Association of California (MVCAC) NPDES Coalition Monitoring Plan

8. **Evaluation of available BMPs to determine if there are feasible alternatives to the selected pesticide application project that could reduce potential water quality impacts:**
   Please see the Best Management Practices for Mosquito Control in California, CEQA 2004 (e.g. pgs. 5-8, 14-20), and items 2 and 5 above.

9. **Description of the BMPs to be implemented. The BMPs shall include at a minimum:** MSMVCD's BMPs are described in CEQA 2004 and items 2 and 5 above. Specific elements have been highlighted below under items a-f.
   a. **Measures to prevent pesticide spill;**
      All pesticide applicators receive annual spill prevention and response training. Agency employees ensure daily that application equipment is in proper working order. Spill mitigation devices are placed in all vehicles and pesticide storage areas.
   b. **Measures to ensure that only a minimum and consistent amount is used;** Application equipment is calibrated at least annually as required by the Department of Pesticide Regulations (DPR) and the terms of a cooperative agreement with the California Department of Public Health (CDPH).

   c. **A plan to educate Coalition's or Discharger's staff and pesticide applicator on any potential adverse effects to waters of the U.S. from the pesticide application;** This will be included in our pesticide applicators annual pesticide application and safety training, continuing education programs, and/or regional NPDES Permit training programs.

   d. **Descriptions of specific BMPs for each application mode, e.g. aerial, truck, hand, etc.;** MSMVCD calibrates vehicle-mounted and handheld larviciding equipment each year to meet application specifications. Supervisors review application records daily to ensure appropriate amounts of material are being used. Ultra-low volume (ULV) application equipment is calibrated for output and droplet size to meet label requirements. Aerial larviciding equipment is calibrated by the Contractor. Aerial adulticide equipment is calibrated regularly and droplet size will be monitored by the agency to ensure droplets meet label requirements. Airplanes used in urban ULV applications and the primary airplane used for rural ULV application is equipped with advanced guidance and drift management equipment to ensure the best available technology is being used to place product in the intended area. If a secondary airplane is used in rural ULV applications it will be equipped with an advanced guidance system.

e. **Descriptions of specific BMPs for each pesticide product used;** Please see the Best Management Practices for Mosquito Control in California for the current approved pesticide labels for application BMPs for specific products.

f. **Descriptions of specific BMPs for each type of environmental setting (agricultural, urban, and wetland).** Please see CEQA 2004 and items 2 and 5 above. In addition, MSMVCD's operations include a wastewater irrigation program that works collaboratively with private property owners and municipalities to minimize (i.e. source reduction) associated mosquito production and pesticide applications. MSMVCD staff also works with agricultural operations to achieve source reduction in relation to general irrigation.

10. Identification of the problem. Prior to first pesticide application covered under the 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:

a. If applicable establish densities for larval and adult vector populations to serve as action threshold(s) for implementing pest management strategies

MSMVCD staff only applies pesticides to sources of mosquitoes that represent imminent threats to public health or quality of life. The presence of any mosquito may necessitate treatment, however higher thresholds may be applied depending on the agency's resources, disease activity, surveillance data, or local needs. Treatment thresholds are based on a combination of one or more of the following criteria:

- Mosquito species present
- Mosquito stage of development
- Pest, nuisance, or disease potential
- Disease activity
- Mosquito abundance
- Flight range
- Proximity to populated areas
- Size of source
- Presence/absence of natural enemies or predators
- Presence of sensitive/endangered species or habitats

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

Please see the Best Management Practices for Mosquito Control in California and the California Mosquito-borne Virus Surveillance and Response Plan CEQA 2004, and items 2 and 5 above. Target vector species include, *Aedes* sp., *Culex* sp, *Culiseta* sp., and *Anopheles* sp..

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

Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is MSMVCD's preferred solution, and whenever possible MSMVCD works with property owners to implement long-term solutions to reduce or eliminate the need for continued applications as described in Best Management Practices for Mosquito Control in California and CEQA 2004 (e.g. pages 16 and 17).

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

This is included in the Best Management Practices for Mosquito Control in California, CEQA 2004, and the California Mosquito-borne Virus Surveillance and Response Plan. MSMVCD continually collects adult and larval mosquito surveillance data, sentinel chicken test results, and monitors regional mosquito-borne disease activity detected in humans, horses, birds, and/or other animals, and uses these data to guide mosquito control activities.

11. Examine of Alternatives. Dischargers shall continue to examine alternatives to pesticide use in order 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 source reduction methods

• Cultural methods

• Biological control agents

• Pesticides

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

MSMVCD uses the principles and practices of Integrated Vector Management (IVM). MSMVCD's IVM program includes the following:

- Education
- Source Reduction
- Biological Control (e.g. mosquitofish)
- Chemical Control
    - o Larval mosquito Control (including biological materials)
    - o Adult Mosquito Control

MSMVCD's IVM program is discussed in its CEQA document (CEQA 2004) and practices are also discussed in Best Management Practices for Mosquito Control in California (e.g. pages 26 and 27). As stated in item #10 above, locations where vectors may exist are assessed, and the potential for using alternatives to pesticides is determined on a case-by-case basis. Commonly considered alternatives include: 1.) Eliminate artificial sources of standing water; 2.) Ensure temporary sources of surface water drain within four days (96 hours) to prevent adult mosquitoes from developing; 3.) Control plant growth in ponds, ditches, and shallow wetlands; 4.) Design facilities and water conveyance and/or holding structures to minimize the potential for producing mosquitoes; and 5.) Use appropriate biological control methods that are available. Additional alternatives to using pesticides for managing mosquitoes are listed on pages 4-19 of the Best Management Practices for Mosquito Control in California.

Implementing preferred alternatives depends on a variety of factors including availability of agency resources, cooperation with stakeholders, coordination with other regulatory agencies, and the anticipated efficacy of the alternative. If a pesticide-free alternative does not sufficiently reduce the risk to public health, pesticides are considered, beginning with the least amount necessary to effectively control the target vector.

b. Applying pesticides only when vectors are present at a level that will constitute a nuisance or threat to public health.
MSMVCD follows an existing IVM program (see a. above and CEQA 2004) which includes practices described in the California Mosquito-borne Virus Surveillance and Response Plan and Best Management Practices for Mosquito Control in California.

A "nuisance" is specifically defined in California Health and Safety Conde (HSC) §2002(j). This definition allows vector control agencies to address situations where even a low number of vectors may pose a substantial threat to public health and quality of life. In practice, the definition of "nuisance" is generally only part of a decision to apply pesticides to areas covered under this permit. As summarized in the California Mosquito-borne Virus Response Plan, the overall risk to the public when vectors and/or vector-borne disease are present is used to select an available and appropriate material, rate, and application method to address that risk in the context of our IVM program.

12. Correct Use of Pesticides
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 proper spraying techniques and equipment, taking account of weather conditions and the need to protect the environment.

This is an existing practice of MSMVCD, and is required to comply with the Department of Pesticide regulations (DPR) requirements and the terms of our California Department of Public Health (CDPH) Cooperative Agreement. All pesticide applicators receive annual safety and spill training in addition to their regular continuing education. Each applicator receives forty hours of continuing education units (CEU) in a two year cycle.

13. **If applicable, specify a website where public notices, required in Section VIII.B, may be found.** www.msmosquito.com

References:

Best Management Practices for Mosquito Control in California. 2010. Available by download from the California Department of Public Health—Vector-Borne Disease Section at http://www.cdph.ca.gov/HealthInfo/discond/Pages/MosquitoBorneDiseases.aspx or http://www.westnile.ca.gov/resources.php under the heading Mosquito Control and Repellent Information. Copies may be also requested by calling the California Department of Public Health—Vector-Borne Disease Section at (916) 552-9730 or the Marin/Sonoma Mosquito and Vector Control District at 800-231-3236.

California Mosquito-borne Virus Surveillance and Response Plan. 2010. [Note: this document is updated annually by CDPH]. . Available by download from the California Department of Public Health—Vector-Borne Disease Section at http://www.cdph.ca.gov/HealthInfo/discond/Pages/MosquitoBorneDiseases.aspx or http://www.westnile.ca.gov/resources.php under the heading Response Plans and Guidelines. Copies may be also requested by calling the California Department of Public Health—Vector-Borne Disease Section at (916) 552-9730 or the Marin/Sonoma Mosquito and Vector Control District at 800-231-3236

Marin/Sonoma Mosquito and Vector Control District, California Environmental Quality Act (CEQA), Revised June 14, 2004. Available at www.msmosquito.com

MVCAC NPDES Coalition Monitoring Plan. 2011.

Statement of Best Management Practices and Proposed Monitoring Plan for Coastal Region Mosquito and Vector Control Districts. 2002.