ATTACHMENT G – NOTICE OF INTENT

WATER QUALITY ORDER NO. 2011-0002-DWQ
GENERAL PERMIT NO. CAG 990004

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 NORTHERN SALINAS VALLEY MOSQUITO ABATEMENT DISTRICT			
B. Mailing Address 342 AIRPORT BOULEVARD			
C. City SALINAS	D. County MONTEREY	E. State CALIFORNIA	F. Zip Code 93905
G. Contact Person DENNIS D. BORONDA	H. Email address DBORONDANSVMAD@YAHOO.COM	I. Title MANAGER-BIOLOGIST	J. Phone (831) 422-6438

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

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

IV. RECEIVING WATER INFORMATION

A. 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: MONTEREY COUNTY WATER RESOURCES AGENCY
   Name of the conveyance system: RECLAMATION DITCH 1665

3. ☒ Directly to river, lake, creek, stream, bay, ocean, etc.
   Name of water body: SALINAS RIVER AND ELKHORN SLOUGH

   * 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 3 (CENTRAL COAST 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: X Vector Larvae X Adult Vector

B. Pesticides Used: List name, active ingredients and, if known, degradation by-products

SEE ATTACHMENT – "TABLE 1" ALSO ATTACHMENTS E & F

C. Period of Application: Start Date JANUARY 1ST End Date DECEMBER 31ST

D. Types of Adjuvants Added by the Discharger: IMPED

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

VII. NOTIFICATION

Have potentially affected governmental agencies been notified?

☒ Yes ☐ No

NOTE: by telephone and e-mail (see Attachment 1)

* 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: DENNIS D. BORONDA

B. Signature: Dennis D. Boronda **Date:** 5-27-11

MAY 27, 2011

C. Title: MANAGER-BIOLOGIST

X. FOR STATE WATER BOARD USE ONLY

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

Northern Salinas Valley Mosquito Abatement District
Pesticide Application Plan

*The following **boldface text** was excerpted from pages 16-18 of the Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Biological and Residual Pesticide Discharges to Waters of the United States from Vector Control Applications (Water Quality Order No. 2011-0002-DWQ, General Permit No. CAG 990004), which specifies the information that must be included in the PAP and BMPs for each agency's NPDES Permit.*

The Discharger shall develop a Pesticides Application Plan (PAP) that contains the following elements:

1. **Description of ALL target 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;** *See attached map Table 2.* The target area is potentially any fresh or brackish water within the boundaries of the Northern Salinas Valley Mosquito Abatement District (NSVMAD). These are still or standing water sites, permanent or temporary, natural or man-made, that may or may not have potential inflow or outflow, wetland or wildlife values. A majority of these sites are attractive to mosquitoes by flooding ,natural event, artificial means or be subject to high organic nutrient load and reduced animal and plant diversity. Within this area there are also discrete artificial and natural containers that breed mosquitoes.

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. And also Larval Treatment Criteria, Attachment 2

3. **Pesticide 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 adjuvents and surfactants used;**
   Please see Attachments E and F within NPDES Permit for Biological and Residual Pesticide Discharges to Waters of the U.S. for Vector Control Applications. Products may be applied by hand, truck, backpack, hand can, helicopter, or airplane according to label directions.

4. **Description of ALL the application areas* and the target areas in the system that are being planned to applied or may be applied. Provide a map showing these areas;**
   Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is the District's preferred solution, and whenever possible the District works with property owners to affect long-term solutions to reduce or eliminate the need for

Asterisks indicate terms that are defined in Attachment A of the NPDES Permit for Vector Control

continued applications as described in Best Management Practices for Mosquito Control in California. The typical sources treated by this District include: Elkhorn Slough, Salinas River, wet lands, creeks, ponds, street gutters and catch basins, green swimming pools, rain gutters, old tires and other containers around homes. Table 2 shows the District boundaries with most of the main sources listed. Table 3 lists typical source habitats.

5. **Other control methods used (alternatives) and their limitations;**
   With any source of mosquitoes or other vectors, the District's first goal is to look for ways to eliminate the source, or if that is not possible, for ways to reduce the potential for vectors. The most commonly used methods and their limitations are included in the Best Management Practices for Mosquito Control in California.

   Specific methods used by the NSVMAD include stocking mosquito fish (*Gambusia Affinis*), education residents that mosquitoes develop in standing water and encouraging them to remove 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. To do this we utilize heavy equipment to maintain waterways by: cleaning out obstructions, mowing vegetation and using herbicides to prevent mosquito production. The NSVMAD also reviews development plans that create, restore or affect wetlands or storm water BMP's to evaluate and consult on their vector potential. We have a education program in the schools reaching about 5,000 students a year. Also agriculture farm days for kids, County Fair, civic groups are all educated on mosquito prevention.

6. **How much product is needed and how this amounts was determined;**
   The need to apply product is determined by surveillance. Actual use varies annually depending on the mosquito activity. The pesticide amounts presented below were taken from the NSVMAD's 2010 PUR as an estimate of pesticide use in 2011. (See Table 1) Other public health pesticides in addition to those listed below may be used as part of the District's best management practices. Please see the Best Management Practices for Mosquito Control in California in References.
   Pesticide Use Report for 2010 is on Attachment 4 (4-pages long)

7. **Representative monitoring locations* and the justification for selecting these monitoring locations**
   Please see the 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.**
   Refer to Attachment 2 and Attachment 3 for alternatives and criteria for pesticide use.
   Please see the Best Management Practices for Mosquito Control in California

9. **Description of the BMPs to be implemented. The BMPs shall include at a minimum:**

The District's BMPs are described in the Best Management Practices for Mosquito Control in California and in the California Mosquito-borne Virus Surveillance and Response Plan. 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. District 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.;**
   The NSVMAD calibrates truck-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 District 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; and**
   Please see the Best Management Practices for Mosquito Control in California for general pesticide application BMPs, and 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).** See Attachment 2 and Attachment 3 and Please see the Best Management Practices for Mosquito Control in California.

10. **Identification of the problem. 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:**

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

    The NSVMAD 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 District's resources, disease activity, 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.

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

    Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is the District's preferred solution, and whenever possible the District 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.

    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 and the California Mosquito-borne Virus Surveillance and Response Plan that the Districts uses. The District continually collects adult and larval mosquito surveillance data, dead bird reports, and sentinel chicken test results and uses these data to guide mosquito control activities.

11. Examination 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 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.

The Northern Salinas Valley Mosquito Abatement District uses the principles and practices of integrated vector management (IVM) as described on pages 26 and 27 of Best Management Practices for Mosquito Control in California. 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 a variety of factors including availability of agency resources, cooperation with stakeholders, coordination with other regulatory agencies, and the 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.

The NSVMAD employs an integrated approach towards vegetation management to prevent Mosquito production with a minimum amount of pesticide use. This is done by using several methods to control vegetation. We have a Excavator and D-3 Bulldozer for doing maintenance and repair work. We have a tractor with a mower attached for thinning tulles. We also selectively use herbicides and hand tools. This work is done with necessary permits and attention to threatened and endangered species. See in the References: Statement of Best Management Practices for the Northern Salinas Valley Mosquito Abatement District and our Web Site for photos.

b. Applying pesticides only when vectors are present at a level that will constitute a nuisance.

The NSVMAD follows an existing integrated vector management (IVM) program which includes practices described in the California Mosquito-borne Virus Surveillance and Response Plan , Best Management Practices for Mosquito Control in California and our Larval Treatment Criteria, Attachment 2.

A "nuisance" is specifically defined in California Health and Safety Code (HSC) §2002(j). This definition allows vector control agencies to address situations where even a low level of vectors may pose a substantial threat to public health. In practice, the definition of a "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 Surveillance and 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 right spraying techniques and equipment, taking account of weather conditions and the need to protect the environment.

This is an existing practice of the Northern Salinas Valley Mosquito Abatement District and is required to comply with the Department of Pesticide Regulation's (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.

13. If applicable, specify a website where public notices, required in Section VIII.B, may be found. Our Web Site is: http://www.montereycountymosquito.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.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 Northern Salinas Valley Mosquito Abatement District at (831) 422-6438

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.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 Northern Salinas Valley Mosquito Abatement District at (831) 422-6438

MVCAC NPDES Coalition Monitoring Plan. 2011. [In development at the time of this draft]

Statement of Best Management Practice and Monitoring Plan for Northern Salinas Valley Mosquito Abatement District. Web – Site: http://www.montereycountymosquito.com/

NSVMAD'S Projected Mosquitocide Useage – 2011, Table 1

NSVMAD Map, Table 2

NSVMAD Habitat Type, Table 3

NSVMAD Example of E-Mail Notice to Public and Governmental Agencies, Attachment 1

Larval Treatment Criteria, Attachment 2

Pre-Treatment Decision Making, Attachment 3

Pesticide Use Report for 2010, Attachment 4

List of Permitted Adulticide Products, Attachment E

List of Permitted Larvicide Products, Attachment F

TABLE 1

NSVMAD'S PROJECTED MOSQUITOCIDE USEAGE - 2011

Below is the NSVMAD's anticipated mosquitocide use for 2011 year. The amounts listed were based in part upon reported useage in 2010.

AMOUNT	EPA#	MFG./PRODUCT	ACTIVE INGREDIENTS
15 gals.	2302-14	Henkel-Agnique	isostearyl alcohol ethoxylate
210 gals.	73049-404	Valent-Teknar HP-D	*Bacillus thuringiensis israelensis*
10,000 lbs.	73049-10	Valent-Vectobac G	*Bacillus thuringiensis israelensis*
125 lbs.	73049-20	Valent-Vectolex CG	*Bacillus thuringiensis israelensis*
1,800 lbs.	2724-489	Zoecon-Altosid SBG	*s-Methoprene*
14 gals.	2724-392	Zoecon-Altosid ALL-SR5	*s-Methoprene*
1 gal.	2724-421	Zoecon-Altoside XR	*s-Methoprene*
10,000 lbs.	8329-80	Clarke-Natular G	*spinoside A & D*
600 lbs.	8329-83	Clarke-Natular XRG	*spinoside*
500 gals.	70589-1	Clarke-BVA 2	highly refined petroleum distillate
2 gals.	73748-4	Masterline-Kontrol 4-4	permetherin & piperonyl butoxide technical

TABLE 2

The yellow area shows 458 sq. miles within NSVMAD boundaries of Monterey County. Hundreds of mosquito breeding sources found could drain into major receiving waters of the U.S. that flow into Monterey Bay (Salinas River, Elkhorn Slough, Moro Cojo Slough and Reclamation Ditch 1665).

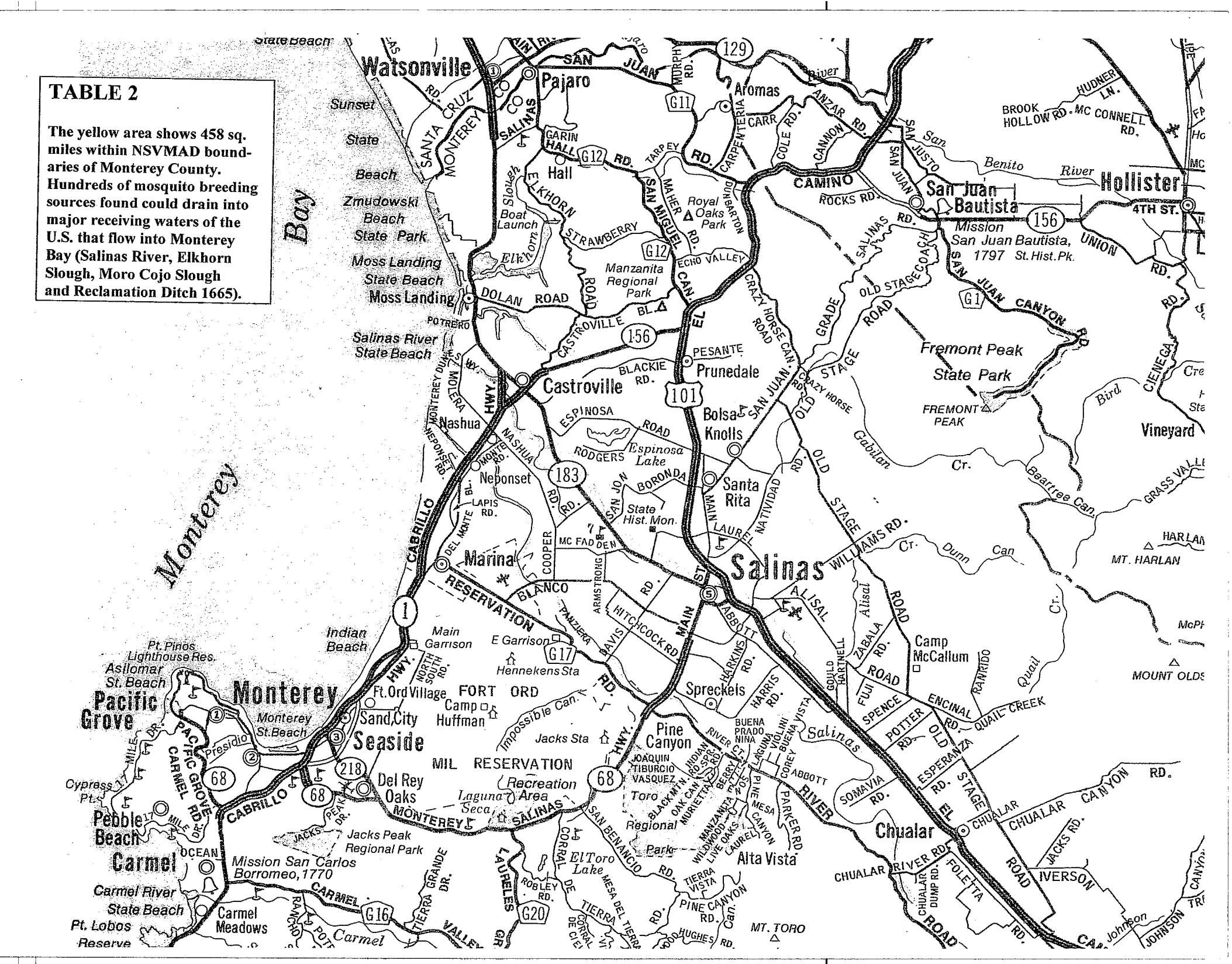

Table 3

Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is the Mosquito Districts preferred solution, and whenever possible the Mosquito District works with property owners to effect long-term solutions to reduce or eliminate the need for continued applications as described in Best Management Practices for Mosquito Control in California. The typical source treated by the Mosquito District include:

Habitat Type

TYPE CODE	HABITAT TYPE	ABBREVIATION	DESCRIPTION
0	CATCH BASIN	CB	INCLUDES GUTTERS, STREET DRAINS AND BMPs
1	PERMANENT POND	PD	PONDS THAT HOLD WATER YEAR ROUND
2	EPHEMERAL POND	EP	NATURAL SEASONAL PONDING
3	FRESHWATER MARSH	MA	LOWLYING AREA OF SOFT WATERLOGGED GROUND, STANDING WATER, characterized by a growth of grasses, sedges, cattails, and rushes
4	BRACKISH MARSH	BM	SOMEWHAT SALTY MARSH
5	FLOODED AREA	FA	ANY AREA THAT EXPERIENCES INFREQUENT OR SEASONAL FLOODING FROM NATURAL OR IRRIGATION SOURCES
6	CHANNEL, DITCH	CH	MAN-MADE CONCRETE, WOODEN OR EARTHEN CHANNELS FOR WATER DIVERSION
7	AGRICULTURAL USE	AG	ALL MAN-MADE SOURCES CREATED FOR AGRICULTURAL USE
8	ARTIFICIAL CONTAINER	AC	KIDDIE POOLS, HORSE TROUGHS, JUNKYARD ITEMS, BOATS, BUCKETS, TARPS, ROOF TOPS, URNS, ORNAMENTAL PONDS, ETC.
9	MISCELLANEOUS PONDING	MP	RUTS, UNDER HOUSES, RAILROAD TRACKS
10	TREEHOLE	TH	HOLES IN THE TREE ITSELF
11	CREEK/STREAM/ NATURAL DRAINAGE	CK	NOT MAN-MADE
12	GREEN POOLS & JACUZZIS	GP	NEGLECTED
13	SEWAGE/SEPTIC	SE	INCLUDES PONDS, SEPTIC TANKS, DRAINS, TREATMENT PLANTS

Send Save as a Draft Cancel

Insert addresses (separated by commas) Show Bcc

To: "Kim Hayes" <khayes@elkhornslough.org>

Cc:

Subject: Mosquito Abatement Air Spray in Elkhorn Slough Area

Attach Files Plain Text

The Northern Salinas Valley Mosquito Abatement District Will be spraying mosquito larvae by helicopter in the North Marsh and the Porter / Blohm property on **May 6, 2011 in the morning** with Vectobac G. The Mosquito control granule that will be applied is the biological microbial, *Bacillus thuringiensis israelensis* (Bti) on corncob granules. This product is very selective; meaning it targets immature mosquitoes (aquatic stages). This application will prevent the emergence of adult mosquitoes and is not harmful to humans, birds,, fish or other wildlife.

Dennis D. Boronda
Manager-Biologist
Northern Salinas Valley
Mosquito Abatement Dist.

Send Save as a Draft Cancel

Example of E-mail sent to Public and Governmental Agencies Notified.

ATTACHMENT 2

Larval Treatment Criteria

	Species	Most Common Larval Habitats	Distance to Populated Area	Larval Treatment Threshold	Notes
AEDES	**Salt marsh mosquito** *Aedes dorsalis*	Salt marshes	0 meters - 2 miles	≥ 1 per 10 dips	High Pest Significance
	Asian tiger mosquito *Aedes albopictus*	Small Containers, Tires	**ANY DISTANCE**	**IMMEDIATE TREATMENT IF ANY DETECTED**	Found only once in San Francisco Bay area
	Tree hole mosquito *Aedes sierrensis*	Tree Holes, Tires, Miscellaneous Containers	0 - 300 meters	≥ 1 per dip or baster sample	High Pest Significance Vector of Canine Heartworm
	Winter salt marsh mosquito *Aedes squamiger*	Salt Marshes Reclaimed Marshes	0 meters - 10 miles	≥ 1 per 10 dips	High Pest Significance
	River mosquito *Aedes vexans*	Temporary Pools	0 meters - 1 mile	≥ 1 per 10 dips	Rare
	Woodland pool mosquito *Aedes washinoi*	Temporary Woodland Pools	0 meters - 1 mile	≥ 1 per 10 dips	High Pest Significance
ANOPHELES	*Anopheles franciscanus*	Shallow Pools and Streams in Algae mats	0 - 500 meters	≥ 1 >3rd instar larva per dip	Low Pest Significance
	Western malaria mosquito *Anopheles freeborni*	Seepages, Streams, Lakes, Gravel Pits	0 meters - 1 mile	≥ 1 >3rd instar larva per dip	Low Pest Significant Vector of Malaria
	Anopheles occidentalis	Streams, Lakes, Pools Occasionally in Brackish Water	0 - 500 meters	≥ 1 >3rd instar larva per dip	Low Pest Significance
	Anopheles punctipennis	Temporary Pools, Streams	0 meters - 1 mile	≥ 1 >3rd instar larva per dip	Moderate Pest Significant Vector of Malaria
CULEX	*Culex apicalis*	Woodland Creeks, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Culex boharti	Slow Streams, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Culex reevsi	Slow Streams, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Tule mosquito *Culex erythrothorax*	Lakes and Ponds Associated with Tules	0 - 500 meters	≥ 1 per dip	High Pest Significance Vector of West Nile Virus
	House mosquito *Culex pipiens*	Storm Drain Systems, Septic Tanks, Roadside Ditches, Cemetery Urns, Flooded Basements, Utility Vaults	0 meters - 1 mile	≥ 1 per 10 dips	High Pest Significance Vector of West Nile Virus
	Foul water mosquito *Culex stigmatosoma*	Foul Water, Sewage, Temporary Pools	0 - 300 meters	≥ 1 per dip	Low Pest Significance Vector of West Nile Virus
	Encephalitis mosquito *Culex tarsalis*	Creeks, Marshes, Temporary Pools, Roadside Ditches, Fresh Water	0 meters - 2 miles	≥ 1 per 10 dips	Moderate Pest Significance Vector of Encephalitis
CULISETA	**Fish pond mosquito** *Culiseta incidens*	Fish Ponds, Temporary Pools, Catch Basins, Roadside Ditches	0 meters - 1 mile	≥ 1 per dip	High Pest Significance Possible Vector of Canine Heartworm
	Winter salt marsh mosquito *Culiseta inornata*	Marshes, Temporary Pools, Roadside Ditches	0 meters - 1 mile	≥ 1 per dip	High Pest Significance
	Culiseta particeps	Shaded Clean Pools, Streams	0 - 300 meters	≥ 1 per dip	Low Pest Significance

PRE - TREATMENT DECISION MAKING

Attachment 3

Thresholds

Treatment thresholds are established for mosquito developmental sites where potential disease vector and/or nuisance risks are evident. Therefore, only those sources that represent imminent threats to public health or quality of life are treated with larvicides. Treatment thresholds are based on the following criteria:

Mosquito species present

Mosquito stage of development

Nuisance or disease potential

Biting complaints

Mosquito abundance

Flight range

Proximity to populated areas or human activity

Size of source

Presence/absence of natural enemies or predators

Presence of sensitive/endangered species

Selection of Control Strategy

Dip-sampled larvae are counted and averaged for areas of a breeding site, also trapping results are evaluated. When thresholds are exceeded an appropriate control strategy is implemented. Control strategies are selected to minimize potential environmental impacts while maximizing efficacy (see attached Larval Treatment Criteria and Control Selection Criteria, Attachment 2).

The method of control is based on the threshold criteria but also: Habitat type, Water quality, Weather conditions, Cost and Site accessibility.

Control Strategy Methods:

Source Reduction and Physical Control (Long term solution with less need for chemical applications)

Biological Control (Mosquitofish are available in sufficient quantity for practical use in mosquito control)

- **Natural Predators** (Many invertebrates including diving beetles, dragonfly naiads backswimmers, water bugs)
- **Insectivorous Bats and Birds** (Studies show that mosquitoes make up a small part of the Bats diet)

Bacterial Insecticides (*Bacillus thuringiensis* ,"Bti " is highly target-specific on mosquito larvae)

- **Methoprene** (natural growth regulator, larvae do not become adults and remain available as prey items)
- **Surfactants** (Surface-acting agents that are petroleum or alcohol based material. Used on pupal stage only)

Public Education (Work with the public on how they can prevent mosquito production on their property)

- **Vegetation management** (mowing, trimming, burning, livestock grazing or spraying to control breeding sites)

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
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

Attachment 4
(4-Pages)

2010 PUR

STATE OF CALIFORNIA

MONTHLY SUMMARY PESTICIDE USE REPORT

DEPARTMENT OF PESTICIDE REGULATION
ENFORCEMENT BRANCH

PR-ENF-060 (REV. 9/07) Page 1 of 2

INSTRUCTIONS FOR COMPLETING THIS FORM ARE INDICATED BELOW AND ON THE REVERSE SIDE

OPERATOR (FIRM NAME)	ADDRESS	CITY	ZIP CODE	PHONE NUMBER
No. Salinas Vly. Mosquito D.	342 Airport Blvd.	Salinas	93905	(831) 422-6438

OPERATOR ID/PERMIT NUMBER	LICENSE NUMBER	COUNTY WHERE APPLIED	COUNTY NUMBER	MONTH/YEAR OF USE	TOTAL NUMBER OF APPLICATIONS
27-1027VC040	LARVICIDES-GROUND	Monterey	27	2010 YEAR END RPT.	1,923 Larvi apps

1. Complete Columns A, B, C, and D for All Users

2. Complete Column E by using one of the following codes:

Code 10 - Structural Pest Control..... includes any pest control work performed within or on buildings and other structures.
Code 30 - Landscape Maintenance Pest Control..... includes any pest control work performed on landscape plantings around residences or other buildings, golf courses, parks, cemeteries, etc.
Code 40 - Right-of-Way Pest Control..... includes any pest control work performed along roadsides, power lines, median strips, ditch banks, and similar sites.
Code 50 - Public Health Pest Control..... includes any pest control work performed by or under contract with State or local public health or vector control agencies.
Code 80 - Vertebrate Pest Control..... includes any vertebrate pest control work performed by public agencies or work under the supervision of the State or county agricultural commissioner.
Code 91 - Commodity Fumigation (Nonfood/Nonfeed)..... includes fumigation of nonfood/nonfeed commodities such as pallets, dunnage, furniture, burlap bags, etc.
Code 100 - Regulatory Pest Control..... includes any pest control work performed by public employees or contractors in the control of regulated pests.

3. Complete Columns F and G, if use does not fit one of the above codes

A MANUFACTURER AND NAME OF PRODUCT APPLIED	B EPA/CALIFORNIA REGISTRATION NUMBER FROM LABEL INCLUDE ALPHA CODE	C TOTAL PRODUCT USED (Check One Unit of Measure)	D NUMBER OF APPLICATIONS	E CODE	F COMMODITY OR SITE TREATED	G ACRES/UNITS TREATED
HENKEL-AQNIQUE ✓	2302-14	15.7 ☐ LB ☒ OZ ☐ PT ☐ QT ☐ GA	7	50	3 DRAINS	3.25 ACR
ZOECON-TEKNAR HPD ✓	2724-365-64833	1 ☐ LB ☐ OZ ☐ PT ☒ QT ☐ GA	1	50		1 ACRE
ZOECON-ALTOSID XR ✓	2724-421	76 ☐ LB ☒ OZ ☐ PT ☐ QT ☐ GA	38	50	38 DRAINS	
CLARKE-NATULAR G	832980	20 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	8	50		3.75 ACR
CLARKE-BVA 2 OIL	70589-1	135.25 ☐ LB ☐ OZ ☐ PT ☐ QT ☒ GA	935	50	927 DRAINS	17.5 ACR
CLARKE-GB 1111 OIL	71236-1	332.5 ☐ LB ☐ OZ ☐ PT ☐ QT ☒ GA	890	50	846 DRAINS	98.5 ACR
VALENT-VECTOBAC G ✓	73049-10	135.25 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	33	50	5 DRAINS	10.8 AC
VALENT-VECTOLEX CG ✓	73049-20	14.5 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	18	50	12 DRAINS	3.75 ACR
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				

REPORT PREPARED BY KATHY FORGNONE, ADMIN. ASSIST. DATE 3/10/2011 Print Form

STATE OF CALIFORNIA

MONTHLY SUMMARY PESTICIDE USE REPORT

DEPARTMENT OF PESTICIDE REGULATION
ENFORCEMENT BRANCH

PR-ENF-060 (REV. 9/07) Page 1 of 2

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No. Salinas Vly. Mosquito D.	342 Airport Blvd.	Salinas	93905	(831) 422-6438

OPERATOR ID/PERMIT NUMBER	LICENSE NUMBER	COUNTY WHERE APPLIED	COUNTY NUMBER	MONTH/YEAR OF USE	TOTAL NUMBER OF APPLICATIONS
27-1027VC040	ADULTICIDES-GROUND	Monterey	27	2010 YEAR END RPT.	1 ADULTICIDE

1. Complete Columns A, B, C, and D for All Users

2. Complete Column E by using one of the following codes:

Code 10 - Structural Pest Control.................................... includes any pest control work performed within or on buildings and other structures.
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Code 100 - Regulatory Pest Control................................ includes any pest control work performed by public employees or contractors in the control of regulated pests.

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MASTERLINE-KONTROL4-4	73748-4	64 ☐ LB ☒ OZ ☐ PT ☐ QT ☐ GA	1	50		11 ACRES
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				

REPORT PREPARED BY KATHY FORGNONE, ADMIN. ASSIST.

DATE 3/10/2011

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STATE OF CALIFORNIA

MONTHLY SUMMARY PESTICIDE USE REPORT

DEPARTMENT OF PESTICIDE REGULATION
ENFORCEMENT BRANCH

PR-ENF-060 (REV. 9/07) Page 1 of 2

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OPERATOR (FIRM NAME)	ADDRESS	CITY	ZIP CODE	PHONE NUMBER
No. Salinas Vly. Mosquito D.	342 Airport Blvd.	Salinas	93905	(831) 422-6438

OPERATOR ID/PERMIT NUMBER	LICENSE NUMBER	COUNTY WHERE APPLIED	COUNTY NUMBER	MONTH/YEAR OF USE	TOTAL NUMBER OF APPLICATIONS
27-1027VC040	HERBICIDES-GROUND	Monterey	27	2010 YEAR END RPT.	50 HERBICIDE apps

1. Complete Columns A, B, C, and D for <u>All Users</u>

2. Complete Column E by using one of the following codes:

Code 10 - Structural Pest Control..... includes any pest control work performed within or on buildings and other structures.
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MONSANTO-AQUAMASTER	524-343	127 ☐ LB ☐ OZ ☐ PT ☐ QT ☒ GA	46	50		105.5 AC
MONSANTO-ROUND UP PRO	524-47	3.25 ☐ LB ☐ OZ ☐ PT ☐ QT ☒ GA	3	50		6.23 ACR
DUPONT-KROVAR 1DF	352-505	18 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	1	50		2.5 ACRE
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				

REPORT PREPARED BY KATHY FORGNONE, ADMIN. ASSIST.

DATE 3/10/2011

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STATE OF CALIFORNIA

MONTHLY SUMMARY PESTICIDE USE REPORT

PR-ENF-060 (REV. 9/07) Page 1 of 2

DEPARTMENT OF PESTICIDE REGULATION
ENFORCEMENT BRANCH

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OPERATOR (FIRM NAME)	ADDRESS	CITY	ZIP CODE	PHONE NUMBER
No. Salinas Vly. Mosquito D.	342 Airport Blvd.	Salinas	93905	(831) 422-6438

OPERATOR ID/PERMIT NUMBER	LICENSE NUMBER	COUNTY WHERE APPLIED	COUNTY NUMBER	MONTH/YEAR OF USE	TOTAL NUMBER OF APPLICATIONS
27-1027VC040	AIR APPLICATIONS	Monterey	27	2010 YEAR END RPT.	78

1. Complete Columns A, B, C, and D for All Users

2. Complete Column E by using one of the following codes:

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VALENT-VECTOBAC G ✓	73049-10	26,640 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	50	50		1194 AC
decon LENT-TEKNAR HPD ✓	2724-365-AA-50809	210.25 ☐ LB ☐ OZ ☐ PT ☐ QT ☒ GA	14	50		1,536 AC
CLARKE-ABATE 2 BG —	8329-16	75.4 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	4	50		116 ACRE
ABBOTT-VECTOLEX CG ✓	275-77	120 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	1	50		6 ACRES
ZOECON-ALTOSID SBG ✓	2724-489	1,800 ☒ LB ☐ OZ ☐ PT ☐ QT ☐ GA	6	50		178 ACRE
ZOECON-ALTOSID ALL-SR5 ✓	2724-392	14 ☐ LB ☐ OZ ☐ PT ☐ QT ☒ GA	3	50		406 ACRE
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				
		☐ LB ☐ OZ ☐ PT ☐ QT ☐ GA				

REPORT PREPARED BY KATHY FORGNONE, ADMIN. ASSIST. DATE 3/10/2011

Print Form

Statement of Best Management Practices
And
Monitoring Plan
For
Northern Salinas Valley Mosquito Abatement District

FOR WATER QUALITY ORDER NO **2011-0002-DWQ** STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR DISCHARGERS OF AQUATIC PESTICIDES TO WATERS OF THE UNITED STATES (GENERAL PERMIT) NO. **CAG990004**

BACKGROUND

The above named district is seeking coverage under the General Permit as a "public entity" that applies aquatic pesticides for vector and weed control in waters of the United States. As provisioned by the State Water Resources Control Board (SWRCB) Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Mosquito Abatement Districts (MAD) are allowed categorical exemptions from meeting priority pollutant/objectives for public health pest management. The Northern Salinas Valley Mosquito Abatement District (NSVMAD) is a independent special district working under the California Department of Public Health Cooperative Agreement. (Section 116180, Health and Safety Code, Division 3.

While the primary mission of the NSVMAD is to protect the public from vector-borne diseases, the NSVMAD is also required to be good environmental stewards. The NSVMAD operates under integrated pest management programs that manage mosquitoes while minimizing environmental impacts. The mosquito larvicides used by the NSVMAD are applied to water bodies with the purpose and intent of killing mosquito larvae, extensive research has indicated that little or no lasting environmental impacts are imparted. Currently used aquatic pesticides (*Bacillus thuringiensis israelensis*, *B. sphaericus*, methoprene and surface films) degrade rapidly in the environment, thus the extent and duration of residues may be considered negligible. When integrated with other strategies including vegetation management, surface acting agents, and predatory mosquito fish, these aquatic pesticides constitute safe and effective best management practices (BMP).

This document presents the BMPs of the NSVMAD as a requisite to the General Permit. Currently established NSVMAD practices are environmentally safe, using least-toxic alternatives and proven IPM systems. Aquatic pesticides are applied at low rates leaving the physical parameters of the environment (i.e., temperature, salinity, turbidity and pH) unchanged. Therefore, the NSVMAD is proposing broad exemptions to General Permit requirements that are presented and justified below.

Statement of Best Management Practices

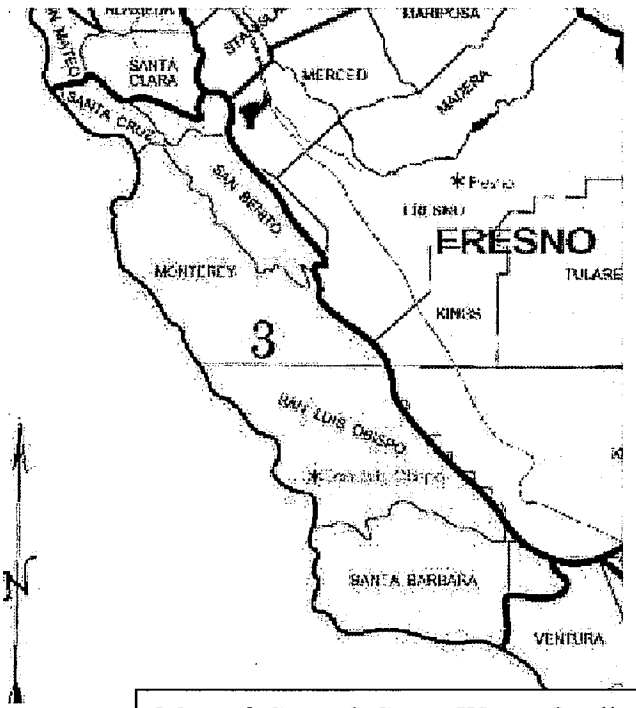
INTRODUCTION

The NSVMAD (see map below) was formed pursuant to California Health and Safety Code (Division 3, Sections 2000 *et seq.*) or Government Code (25210.80) by local citizens and governments to reduce the nuisance of biting mosquitoes and the associated risks of vector-borne disease to residents of the area. This includes vector-borne diseases such as West Nile virus and malaria.

A diverse group of agencies regulate and oversee the NSVMAD pesticide use. Vector control districts are indirectly regulated by the Department of Pesticide Regulation (DPR). Supervisors and applicators are licensed through the California Department of Public Health (CDPH). Pesticide use by vector control agencies is reported to the County Agricultural Commission (CAC) in accordance with a 1995 Memorandum of Understanding among DPR, CDPH, and the CAC's 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.

The NSVMAD has implemented Best Management Practices (BMP)s based on the philosophy of integrated pest management (IPM). The basic components of the programs are:

(1) surveillance of pest populations,
(2) determination of treatment thresholds,
(3) selection from a variety of control options including physical, cultural, biological and chemical techniques
(4) training and certification of applicators
(5) public education



Map of Central Coast Water Quality Control Region with counties

1. MOSQUITO SURVEILLANCE

Surveillance of pest populations is essential for assessing the necessity, location, timing and choice of appropriate control measures. It reduces the aerial extent and duration of pesticide use, by restricting treatments to areas where mosquito populations exceed established thresholds.

The 19 mosquito species known on the central coast differ in their biology, nuisance and disease potential and susceptibility to larvicides.

Field data such as; species, density, and stages present are used to select an appropriate control strategy from integrated pest management alternatives.

A. Larval Mosquito Surveillance

Surveillance for immature mosquitoes is conducted by NSVMAD staff assigned to zones within districts. These technicians maintain a list of known sites of mosquito development and visit them on a regular basis. When a site is surveyed, water is sampled with a 1 pint dipper to check for the presence of mosquitoes. Samples are examined in the field or laboratory to determine the abundance, species, and life-stage of mosquitoes present. This information is compared to historical records and used as a basis for treatment decisions.

B. Adult Mosquito Surveillance

Although control of larval mosquitoes is preferred, it is not possible to identify all larval sources. Therefore, adult mosquito surveillance is needed to pinpoint problem areas and locate previously unrecognized or new sites of larval development. Adult mosquitoes are sampled using standardized trapping techniques (i.e., New Jersey light traps, carbon dioxide-baited traps and oviposition traps).

Mosquitoes collected by these techniques are counted and identified to species. The spatial and seasonal abundance of adult mosquitoes is monitored on a regular basis and compared to historical data.

C. Service Requests

Information on adult mosquito abundance from traps is augmented by tracking mosquito complaints from residents. Analysis of service requests allows district staff to gauge the success of control efforts and locate undetected sources of mosquito development. The NSVMAD conduct public outreach programs and encourage local residents to contact them to request services. When such requests are received, technicians visit the area, interview residents and search for sources that may have been missed. Residents are asked to provide a sample of the insect causing the problem. Identification of these samples provides information on the species present and can be helpful in locating the source of the complaint.

2. PRE-TREATMENT DECISION-MAKING

A. Thresholds

Treatment thresholds are established for mosquito developmental sites where potential disease vector and/or nuisance risks are evident. Therefore, only those sources that represent imminent threats to public health or quality of life are treated. Treatment thresholds are based on the following criteria:

- Mosquito species present
- Mosquito stage of development
- Nuisance or disease potential
- Mosquito abundance
- Flight range
- Proximity to populated areas
- Size of source
- Presence/absence of natural enemies or predators
- Presence of sensitive/endangered species

B. Selection of Control Strategy

When thresholds are exceeded an appropriate control strategy is implemented. Control strategies are selected to minimize potential environmental impacts while maximizing efficacy. The method of control is based on the above threshold criteria but also:

- Habitat type
- Water conditions and quality
- Weather conditions
- Cost
- Site accessibility
- Size and number of developmental sites

3. CONTROL STRATEGIES

A. Source Reduction

Source reduction includes elements such as, physical control, habitat manipulation and water management, and forms an important component of our IPM program.

B. Physical Control

The goal of physical control is to eliminate or reduce mosquito production at a particular site through alteration of habitat. Physical control is usually the most effective mosquito control technique because it provides a long-term solution by reducing or eliminating mosquito developmental sites and ultimately reduces the need for chemical applications.

Physical control programs conducted by the NSVMAD may be categorized into three areas: "maintenance", "new construction", and "cultural practices" such as vegetation management and water management.

Maintenance activities are conducted within managed tidal and non-tidal marshes, seasonal wetlands, flood control channels and in some creeks adjacent to wetlands. The following activities are classified as maintenance:

* Removal of sediments from existing water circulation ditches
* Repair of existing water control structures
* Removal of debris, weeds and emergent vegetation in natural channels
* Clearance of brush for access to wetland areas
* Filling of existing, non-functional water circulation ditches to achieve required water circulation dynamics and restore ditched wetlands.

The preceding activities are included within the permits required by U.S. Army Corps of Engineers (USACE) and Central Coast Regional Water Quality Control Board (CCRWQCB) and coordinated by the CDPH. Additional agencies involved include the Coastal Conservancy.

New projects, such as wetland restoration, excavation of new ditches, construction of new water control structures, all require application by individual districts directly to the USACE. The NSVMAD has the resources available to initiate new physical control projects.

We work with landowners and other agencies to manage their lands in a manner that does not promote mosquito development and many times will enhance the environment for threatened and endangered species. The NSVMAD staff review proposals for wetlands construction to assess their impact on mosquito production. The NSVMAD then submit recommendations on hydrological design and maintenance that will reduce the production of mosquitoes and other vectors. This proactive approach involves a collaborative effort between landowners and the NSVMAD. Implementation of these standards may include cultural practices such as water management and aquatic vegetation control.

C. Biological control

Biological control agents of mosquito larvae include predatory fish, predatory aquatic invertebrates and mosquito pathogens. Of these, only mosquitofish are available in sufficient quantity for use in mosquito control programs. Natural predators may sometimes be present in numbers sufficient to reduce larval mosquito populations. Biological control is sometimes used in conjunction with selective bacterial or chemical insecticides.

Mosquitofish (*Gambusia affinis*)

The mosquitofish, *Gambusia affinis*, is a natural predator of mosquito larvae used throughout the world as a biological control agent for mosquitoes. Although not native to California, mosquitofish are now ubiquitous throughout most of the State's waterways and tributaries, where they have become an integral part of aquatic food chains. They can be stocked in mosquito larval sources by trained district technicians or distributed to the public for stocking in backyard ornamental ponds and other artificial containers.

Advantages: The use of mosquitofish as a component of an IPM program may be environmentally and economically preferable to habitat modification or the exclusive use of pesticides, particularly in altered or artificial aquatic habitats. Mosquitofish are self-propagating, have a high reproductive potential and thrive in shallow, vegetated waters preferred by many mosquito species. They prefer to feed at the surface where mosquito larvae concentrate. These fish can be readily mass-reared for stocking or collected seasonally from sources with established populations for redistribution.

Barriers to Use: Water quality conditions, including temperature, dissolved oxygen, pH and pollutants may reduce or prevent survival and/or reproduction of mosquitofish in certain habitats. Mosquitofish may be preyed upon by other predators. They are opportunistic feeders and may prefer alternative prey when available. Introduction of mosquitofish may modify food chains in small contained pools and have potential impacts on endemic fish and shrimp in such situations. Some wildlife agencies suspect mosquitofish may impact survival of amphibian larvae through predation. Recent research has shown no significant impact on survival of the threatened California red-legged frog (Lawler et al. 1998), but mosquitofish have been shown to negatively impact the survival of the California tiger salamander (Leyse and Lawler 2000).

Impact on water quality: Mosquitofish populations are unlikely to impact water quality.

Solutions to Barriers: Strict stocking guidelines adopted by MAD restrict the use of mosquitofish to habitats such as artificial containers, ornamental ponds, abandoned swimming pools, cattle troughs, stock ponds, etc. . . . where water quality is suitable for survival and sensitive or endangered aquatic organisms are not present.

Fish are generally stocked at population densities lower than those required for effective mosquito control and allowed to reproduce naturally commensurate with the availability of mosquito larvae and other prey. Guidelines prevent seasonal stocking in natural habitats during times of year when amphibian larvae or other sensitive species/life stages may be present.

Natural predators: Aquatic invertebrates

Many aquatic invertebrates, including diving beetles, dragonfly and damselfly naiads, backswimmers, water bugs and hydra are natural predators of mosquito larvae.

Advantages: In situations where natural predators are sufficiently abundant, additional mosquito control measures including application of pesticides may be deemed unnecessary.

Barriers to Use: Predatory aquatic invertebrates are frequently not sufficiently abundant to achieve effective larval control, particularly in disturbed habitats. Most are generalist feeders and may prefer alternative prey over mosquito larvae if available and more accessible. Seasonal abundance and developmental rates often lag behind mosquito populations. Introduction or augmentation of natural predators has been suggested as a means of biological control, however there are currently no commercial sources since suitable mass-rearing techniques are not available.

Solutions to Barriers: The presence and abundance of natural predators is noted and taken into account during the larval surveillance process. Conservation of natural predators, whenever possible, is achieved through use of highly target-specific pesticides including bacterial insecticides, with minimal impacts on non-target taxa.

Impact on water quality: As predatory invertebrates represent a natural part of aquatic ecosystems, they are unlikely to impact water quality. There are no established standards, tolerance, or EPA approved tests for aquatic invertebrate populations.

Fungal pathogens (*Lagenidium giganteum*)

Product name: Laginex

Lagenidium giganteum is a fungal parasite of mosquito larvae. It is highly host-specific; other aquatic organisms are not susceptible and there is no mammalian toxicity. Unfortunately, the effectiveness of this pathogen has proven to be extremely variable due to stringent environmental requirements for growth and development of the fungus. Although commercial formulations (aqueous suspension) of this pathogen have been produced, severe limitations on its availability, shelf life and handling, as well as inconsistent results have prevented its integration into mosquito control programs in California.

Advantages: Use of fungal pathogens as part of an integrated pest management program may reduce the need for use of conventional insecticides. *Lagenidium* may recycle naturally in certain habitats, providing long-term larval reducing the need for repeated applications.

Barriers to Use: Commercial availability is uncertain. Because it contains living fungal mycelium the material has a very limited shelf life and is difficult to handle and apply. It is also very sensitive to environmental conditions (i.e., pH, salinity, and temperature), which makes its effectiveness highly variable.

Solutions to Barriers: *Lagenidium* is not currently in routine use in Coastal Region mosquito control programs due to problems with availability and reliability of control.

Impact on water quality: *Lagenidium* is a naturally occurring biological control agent. At a typical application rate of 10 oz of active ingredient (mycelium) per acre it is unlikely to have any detectable effect on water quality. There are no established standards, tolerances or EPA approved tests for *Lagenidium.*

D. Bacterial insecticides

Bacterial insecticides contain naturally produced bacterial proteins that are toxic to mosquito larvae when ingested in sufficient quantity. Although they are biological agents, such products are labeled and registered by the Environmental Protection Agency as pesticides and are considered by some to be a form of Chemical Control.

***Bacillus thuringiensis* var. *israelensis* (BTI)**

Product names: Acrobe, Bactimos pellets, Teknar HP-D, Vectobac 12AS, Vectobac G, Vectobac CG.

Advantages: BTI is highly target-specific and has been found to have significant effects only on mosquito larvae, and closely related insects (eg., blackflies and some midges). It is available in a variety of liquid, granular and pelleted formulations which provide some flexibility in application methods and equipment. BTI has no measurable toxicity to vertebrates and is classified by EPA as "Practically Non-Toxic" (Caution). BTI formulations contain a combination of five different proteins within a larger crystal. These proteins have varying modes of action and synergistically act to reduce the likelihood of resistance developing in larval mosquito populations.

Barriers to Use: Bacterial insecticides must be fed upon by larvae in sufficient quantity to be effective. Therefore applications must be carefully timed to coincide with periods in the life cycle when larvae are actively feeding. Pupae and late 4th stage larvae do not feed and therefore will not be controlled by BTI. Low water temperature inhibits larval feeding behavior, reducing the effectiveness of BTI during the cooler months. High organic conditions also reduces the effectiveness of BTI. Cost per acre treated is generally higher than surfactants or organophosphate insecticides.

Solutions to Barriers: An increased frequency of surveillance of larvae ensures that bacterial insecticides can be applied during the appropriate stages of larval development to prevent adult mosquito emergence.

Impact on water quality: BTI contains naturally produced bacterial proteins generally regarded as environmentally safe. It leaves no residues and is quickly biodegraded. At the application rates used in mosquito control programs, BTI is unlikely to have any measurable effect on water quality. There are no established standards, tolerances or EPA approved tests. Other naturally occurring strains of this bacterium are commonly found in aquatic habitats.

***Bacillus sphaericus* (BS)**

Product names: Vectolex CG, Vectolex WDG

Advantages: BS is another bacterial pesticide with attributes similar to those of BTI. The efficacy of this bacterium is not affected by the degree of organic pollution in larval development sites and it may actually cycle in habitats containing high densities of mosquitoes, reducing the need for repeated applications.

Barriers to Use: Like BTI, BS must be consumed by mosquito larvae and is not is therefore not effective against nonfeeding stages such as late 4th instar larvae or pupae. BS is also ineffective against certain mosquito species such as those developing in saltmarshes, seasonal forest pools or treeholes. Toxicity of BS to mosquitoes is due to a single toxin rather than a complex of several molecules as is the case with BTI. Development of resistance has been reported in Brazil. Thailand and France in sites where BS was the sole material applied to control mosquitoes for extended periods of time.

Solutions to Barriers: Information obtained from larval surveillance on the stage and species of mosquitoes present can increase the effectiveness of this material, restricting it use to sources containing susceptible mosquitoes. Development of resistance can be delayed by rotating BS with other mosquitocidal agents.

Impact on water quality: BS is a naturally occurring bacterium and is environmentally safe. It leaves no residues and is quickly biodegraded. At the application rates used in mosquito control programs, BS is unlikely to have any measurable effect on water quality. There are no established standards, tolerances or EPA approved tests. Other naturally occurring strains of this bacterium are commonly found in aquatic habitats.

E. Methoprene

Product Names: Altosid briquets, Altosid liquid larvicide, Altosid pellets, Altosid SBG, Altosid XR briquets, Altosid XRG

Advantages:

Methoprene is a larvicide that mimics the natural growth regulator used by insects. Methoprene can be applied as liquid or solid formulation or combined with BTI or BS to form a "duplex" application. Methoprene is a desirable IPM control strategy since affected larvae remain available as prey items for predators and the rest of the food chain. This material breaks down quickly in sunlight and when applied as a liquid formulation it is effective for only 3 to 5 days. Methoprene has been impregnated into charcoal-based carriers such as pellets and briquettes for longer residual activity ranging up to 150 days. The availability of different formulations provides options for treatment under a wide range of environmental conditions. Studies on nontarget organisms have found methoprene to be nontoxic to vertebrates and most invertebrates when exposed at concentrations used for mosquito control.

Barriers to Use: Methoprene products must be applied to larval stage mosquitoes since it is not effective against the other life stages. Monitoring for effectiveness is difficult since mortality is delayed. Methoprene is more expensive than most other mosquitocidal agents. Methoprene use is avoided in vernal pools. There may be toxicity to certain nontarget crustacean and insect species.

Solutions to Barriers: Surveillance and monitoring can provide information on mosquito larval stage present, timing for applications and efficacy of the treatments.

Impact on Water Quality: Methoprene does not have a significant impact on water quality. It is rapidly degraded in the environment and is not known to have persistent or toxic breakdown products. It is applied and has been shown to be effective against mosquitoes at levels far below those that can be detected by any currently available test. Methoprene has been approved by the World Health Organization for use in drinking water containers.

F. Surfactants

Product Names: Golden Bear 1111, Agnique MMF

Surfactants are "surface-acting agents" that are either petroleum or isostearyl alcohol-based materials that form a thin layer on the water surface. These materials typically kill surface-breathing insects by mechanically blocking the respiratory mechanism.

Advantages: These materials are the only materials efficacious for reducing mosquito pupae since other larviciding strategies (i.e., methoprene, BTI and BS) are ineffective to that life stage. Agnique forms an invisible monomolecular film that is visually undetectable. Treatments are simplified due to the spreading action of the surfactant across the water surface and into inaccessible areas. These surfactants are considered "practically nontoxic" by the EPA. Agnique is labeled "safe for use" in drinking water.

Barriers to Using: The drawback of using oils in habitats where natural enemies are established is that surface-breathing insects, particularly mosquito predators, are similarly affected. GB1111 forms a visible film on the water surface that disapates in two or three days.

Solutions to Barriers: As a general rule, surfactant use is considered after alternate control strategies have been ruled out or in habitats that are not supporting a rich macro-invertebrate community (i.e., manmade sites).

G. Cultural Practices

Wetland design criteria were developed and endorsed by CDPH and described in their booklet "Best Management Practices for Mosquito Control on California State Properties". Guidelines for the following source types are included in the above publication and may be considered cultural control techniques:

* Drainageway construction and maintenance practices
* Dredge material disposal sites
* Irrigated pastures
* Permanent ponds used as waterfowl habitat
* Permanent Water impoundments

* Salt marsh restoration of exterior levee lands
* Sedimentation ponds and retention basins
* Tidal marshes
* Utility construction practices

The NSVMAD also provide literature and education programs for homeowners and contractors on elimination of mosquito developmental sites from residential property. These sources include rain gutters, artificial containers, ornamental ponds, abandoned swimming pools, tree holes, septic tanks, and other impounded waters.
Water Management consists of techniques to control the timing, quantity and flow rate of water circulation in managed wetlands to minimize mosquito development. MAD have established guidelines for water management based on information from University of California Agricultural Extension Service (UCAES). Districts provide these guidelines to property owners to promote proper irrigation techniques for pastures, duck clubs and other wetlands to reduce mosquito development. The NSVMAD helps maintain structures such as tide gates that control water levels in marshes to minimize mosquito production.

Vegetation Management

Vegetation Management consists of the removal of vegetation within mosquito developmental sites to promote water circulation, increase access of natural predators such as fish or provide NSVMAD staff access for surveillance and treatment operations. Vegetation management is achieved either through recommendations to the landowner or by the use of hand tools and the application of selective herbicides.

Vegetation management, one aspect of physical mosquito control, is an effective long-term control strategy that is employed by NSVMAD. This methodology utilizes water management, burning, physical removal, mowing and chemical means to manage vegetation within mosquito developmental sites. The presence of vegetation provides harborage for immature and adult mosquitoes by protecting them from potential predators as well as the effects of wind and wave action, which readily cause mortality. Vegetation reduction not only enhances the effects of predators and abiotic factors, but also reduces the need for chemical control. Several factors can limit the utilization of vegetation management. These include: sensitivity of the habitat, presence of special status species, size of the site, density and type of vegetation, species of mosquito and weather.

A. Burning

This technique is used to achieve effective mosquito control where the density of unwanted vegetation precludes the use of other methodologies. Burning requires a permit, and coordination with local fire agencies and the Air Pollution Control District or Air Quality Management District. This strategy is limited to manmade impoundments and fallow farmlands. Factors limiting the use of this technique include weather, the limited number of approved burn days, and proximity of human habitation. As a general rule, burning is a last resort and not a primary method.

B. Physical Removal/Mowing/Trimming

Physical removal of vegetation is used to clear obstructed channels and ditches to promote water circulation, effectiveness of predators and improve access for mosquito control personnel to enter mosquito developmental sites. Ditches and channels can be cleared with a variety of tools ranging from shovels and small pruners to weed whackers and large mechanized equipment. Most removal activities performed by NSVMAD utilize heavy equipment. This is the most frequently employed management technique once all necessary permits have been obtained and it is performed in all types of habitats. Unfortunately, its effectiveness is temporary and labor intensive, and therefore requires routine maintenance on an annual or at most biennial basis. Other limiting factors include cost and the limited time period that MAD are allowed to perform the activity for many types of mosquito developmental sites.

Physical removal is the most common method of vegetation management employed by NSVMAD. Channels and ditches are cleared seasonally using hand tools such as shovels, pruners, weed whackers, hedge trimmers, chainsaws and a excavator for larger projects. This technique is very labor intensive does not produce long-lasting results. Access pathways created in this manner require annual maintenance. Factors limiting the use of this technique include presence of sensitive species or habitats, and availability of sufficient staff to perform the work.

C. Chemical

Chemical control of vegetation occurs only in man-made habitats such as impoundments, channels and ditches. Post-emergent herbicides are used, with strict attention given to label requirements, weather conditions, potential for runoff and drift, and proximity of sensitive receptors such as special-status species, sensitive habitats, livestock, crops, and people. Routine intensive surveys are conducted to address many of these factors. The NSVMAD uses two herbicides currently they are: glyphosate based (Round-up pro and Aquamaster).

Chemical name: Glyphosate

Product names: Roundup, Rodeo, Gallup, Landmaster, Pondmaster, Ranger, Touchdown, Aquamaster

Advantages: Glyphosate based herbicides are not applied directly to water, but along the levee tops and margins of wastewater ponds, channels, ditches and access roads as post-emergence herbicides. These are non-selective, low-residual herbicides used to control weeds and low-growing brush. These materials come in a variety of formulations, allowing for flexibility of use and application. MVCD in recent years have only used the Roundup, Rodeo and Aquamaster formulations (Aquamaster being the registered replacement for Rodeo). Glyphosate acts in plants by inhibiting amino acid synthesis. Roundup (41% of the isopropylamine salt of glyphosate with surfactants) and Aquamaster (53% of the isopropylamine salt of glyphosate without surfactants) are applied from March through October for spot control of weed growth. Both of these materials are also occasionally used to control growth of poison oak, blackberry vines and non-native aquatic weeds such as Spartina and peppergrass that would prevent access, impede water flows or out-compete native vegetation in sensitive habitats.

Barriers to using: Landowners are notified before glyphosate is applied to any site and applications are timed with their operations. Furthermore, to prevent large, tall stands of dead vegetative material, applications must be timed so that weed growth is minimal. Weather conditions, specifically wind and rainfall, also affect timing and application of glyphosate based products. The proximity of food crops and sensitive habitats must also be considered.

Solutions to barriers: Intensive surveillance in and around target sites ensures that nontargets are not affected. Coordination with landowners and appropriate regulatory authorities verifies that reasonable and acceptable applications occur.

Impact on water quality: In water, glyphosate is strongly adsorbed to suspended organic and mineral matter and is broken down primarily by microorganisms. Its half life in pond water ranges from 12 days to 10 weeks.

H. ORGANOPHOSPHATES (OP)

Mosquito and vector control agencies that operate under the California Health and Safety Codes may utilize those materials registered as mosquito larvicides under the Federal Fungicide, Insecticide, and Rodenticide Act. Such materials used in accordance with label instructions are allowed by law. However, as a result of heightened concern over environmental impacts and worker health and safety, the NSVMAD has voluntarily eliminated their use.

4. TRAINING AND CERTIFICATION

All MAD applicators must be certified to apply public health pesticides. The CDPH Vector-Borne Disease Section administers certification training and testing. All mosquito control personnel applying pesticides or overseeing the application of pesticides must obtain a Vector Control Technician certificate number. The Mosquito and Vector Control Association of California provides training materials and exams are conducted by the CDPH. All certificate holders must maintain continuing education credit in at least two and as many as four subcategories. Category A (Laws and Regulations) and category B (Mosquito Biology) is mandatory for all certificate holders and requires 12 and 8 continuing education units (CEU) respectively, in a two year period. Category C (Terrestrial Invertebrate Control) and Category D (Vertebrate Control) are optional both with 8 hours of CEU per two-year cycle. All of this Districts employees hold all four certificates.

Individual districts conduct a number of in-house educational and safety programs to increase the expertise of the operational staff. Ultimate decisions regarding the need for and application of pesticides rest on the field staff based on information acquired from surveillance data. Decisions to apply a particular product are made in accordance to each California Environmental Quality Act (CEQA) documentation including threshold levels and other information regarding habitat type, distance from populated areas, and water quality data. Training opportunities to accumulate CEU credits are made available by the MVCAC regional committees that develop training programs fine-tuned to the local ecology and unique problems of the region. Training programs are submitted to the MVCAC state training coordinator for approval and then to the CDPH for final approval. Thirty-six hours of CEU credits are offered each two-year cycle.

5. OVERSIGHT / MONITORING PLAN

Members of the MVCAC operate under the California Health and Safety Code and the California Government Code (reference Division 1, Administration of Public Health, Chapter 2, Powers and Duties; also Part 2, Local Administration, Chapter 8, State Aid for Local Health Administration; Division 3, Mosquito Abatement and Vector Control District Law, Sections 2000 *et seq.*). In addition, members of the MVCAC that are signatories to the California Department of Public Health Cooperative Agreement (Pursuant to Section 116180, Health and Safety Code) are required to comply with the following:

1. Calibrate all application equipment using acceptable techniques before using; maintain calibration records for review by the County Agricultural Commissioner (CAC).

2. Maintain for at least two years, pesticide use data for review by the CAC including a record of each pesticide application showing the target vector, the specific location treated, the size of the source, the formulations and amount of pesticides used, the method and equipment used, the type of habitat treated, the date of the application, and the name of the applicator.

3. Submit to the CAC each month a Pesticide Use Report on Department of Pesticide Regulation form PR-ENF-060. The report shall include the manufacturer and product name, the EPA registration number from the label, the amount of pesticide used, the number of applications of each pesticide, and the total number of applications, per county, per month.

4. Report to the CAC and the CDPH, in a manner specified any conspicuous or suspected adverse effects upon humans, domestic animals and other non-target organisms, or property from pesticide applications.

5. Require appropriate certification of its employees by CDPH in order to verify their competence in using pesticides to control pest and vector organisms, and to maintain continuing education unit information for those employees participating in continuing education.

6. Be inspected by the CAC on a regular basis to ensure that local activities are in compliance with state laws and regulations relating to pesticide use.

Other agencies such as local fire departments, California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and others have jurisdiction and oversight over our activities. We work closely with these agencies to comply with their requirements.

Public Education

An integral part of the our BMP is to provide information to the public to assist them in resolving their pest problems. Specialized staff at the NSVMAD provide public outreach in the form of presentations to schools, utility districts, homeowner associations, county fairs, home and garden shows, as well through the media such as newspaper, television, and radio. Information is provided on biological, physical and cultural control methods (i.e., BMPs) that property owner and managers can use to preclude or reduce mosquitoes and other disease and nuisance pests within their jurisdictions.

RECEIPT

No. 336174

DATE 06/21/11

$ 136.00

FROM Matthew Freese - DWR

DOLLARS

○ FOR RENT
○ FOR Monterey County Special Dist. 55-0003880

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BY [signature]

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