



Integrated Mosquito Management Program

Solano County Mosquito Abatement District

Final Programmatic EIR
January 2016

EXHIBIT A
Responses to Comments
Text Revisions

State Clearinghouse No.
2012052070



Document Information

Prepared for Solano County Mosquito Abatement District
Project Name Integrated Mosquito Management Program
Final Programmatic Environmental Impact Report
Date January 2016
State Clearinghouse No. 2012052070

Prepared for:



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Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per liter
2,4-D	2,4-dichlorophenoxyacetic acid
AB	Assembly Bill
AMMs	Avoidance and minimization measures
APAP	Aquatic Pesticide Application Plan
APEs	alkylphenol ethoxylates
ATCM	Airborne Toxic Control Measure
ATV	all-terrain vehicle
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Water Quality Control Plan
BCDC	San Francisco Bay Conservation and Development Commission
BDCP	Bay Delta Conservation Plan
BMP	best management practice
Bs	<i>Bacillus sphaericus</i>
Bti	<i>Bacillus thuringiensis israelensis</i>
CAA	Clean Air Act of 1970
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal-EPA	California Environmental Protection Agency
CARB	California Air Resources Board
cc	cubic centimeter(s)
CCD	colony collapse disorder
CCR	California Code of Regulations
CDC	Centers for Disease Control and Prevention
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife (formerly Fish and Game [CDFG])
CDPH	California Department of Public Health (formerly Health Services [CDHS])
CDPR	California Department of Pesticide Regulation
CEC	California Energy Commission
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations

CH ₄	methane
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent(s)
CRLF	California red-legged frog
CTS	California tiger salamander
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel(s)
dba	A-weighted sound level/decibel(s)
DCPA	chlorthal dimethyl
DPM	diesel particulate matter
DPS	Distinct Population Segment
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Parks District
FAA	Federal Aviation Administration
FFDCA	Federal Food, Drug, and Cosmetic Act
FHSZ	Fire Hazard Severity Zone
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FYLF	foothill yellow legged frog
GHG	greenhouse gas
GPS	global positioning system
GWP	global warming potential
HCP	Habitat Conservation Plan
HPS	Hantavirus Pulmonary Syndrome
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
IVM	Integrated Vector Management
IVMP	Integrated (Mosquito and) Vector Management Program
JH	juvenile hormone
LC50	50 percent lethal concentration
LD50	50 percent lethal dose
L _{dn}	day/night average sound level
L _{eq}	energy-equivalent sound/noise descriptor
LOAEL	lowest observed adverse effect level
LS	less than significant

MBUAPCD	Monterey Bay Unified Air Pollution Control District
MCLs	Maximum Contaminant Levels
MEI	Maximally Exposed Individual
mg/L	milligram(s) per liter
MMT	million metric tonne(s)
MRP	Monitoring and Reporting Program
MSDS	material safety data sheet
MT	metric tonne(s)
MVCAC	Mosquito Vector Control Association of California
N	no impact
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCPP	Natural Community Conservation Plan
ng/L	nanogram(s) per liter
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOAEL	no observed adverse effect level
NOP	Notice of Preparation
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NSCAPCD	Northern Sonoma County Air Pollution Control District
O ₃	ozone
OP	organophosphate
PAP	Pesticide Application Plan (NPDES)
Pb	lead
PBO	piperonyl butoxide
PCBs	polychlorinated biphenyls
PEIR	Programmatic Environmental Impact Report
PERP	Portable Equipment Registration Program
PHG	Public Health Goal
PM ₁₀	respirable particulate matter
PM _{2.5}	fine particulate matter
POD	pelagic organism decline
ppb	part(s) per billion
ppm	part(s) per million

ppt	part(s) per trillion
PUP	Pesticide Use Proposal (USFWS)
RHA	Rivers and Harbors Act
RIM	rotational impoundment management
ROC	reactive organic compound
ROG	reactive organic gas
RWQCBs	Regional Water Quality Control Boards
SCWA	Solano County Water Agency
SF ₆	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SIP	State Implementation Plan
SLE	Saint Louis encephalitis
SM	potentially significant but mitigable
SO ₂	sulfur dioxide
SU	significant and unavoidable
SUP	Supplemental Use Proposal (USFWS)
SWRCB	California State Water Resources Control Board
TMDL	total maximum daily load
TPA	tetrachloroterephthalic acid
ULV	ultralow volume
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFS	USDA Forest Service
USFWS	US Fish and Wildlife Service
VBDS	Vector Borne Disease Section
VCMS	Vector Control Management System
VOC	volatile organic compound
WEE	western equine encephalomyelitis
WNV	West Nile virus

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1 Introduction

This Final PEIR document has been prepared to accompany the Draft Programmatic Environmental Impact Report (Draft PEIR) for the proposed Integrated Mosquito Management Program (IMMP) by the Solano County Mosquito Abatement District (District). The Draft PEIR identified the environmental consequences associated with a range of chemical and nonchemical treatment alternative methods/tools for its ongoing program of surveillance and control of mosquitoes as a vector of human and animal disease and discomfort. It included discussion of best management practices (BMPs) to avoid and/or minimize potential impacts and additional proposed mitigation measures to reduce potentially significant impacts to less than significant. No oral comments were received on the Draft PEIR; however, three letters providing written comments were received and are included herein. The Final PEIR document makes revisions to the Draft PEIR text and appendices, as appropriate and/or necessary. **Together with the Draft PEIR (dated April 2014), this Final PEIR document constitutes the entire Final PEIR for the District's proposed IMMP, e.g., it incorporates the Draft PEIR in its entirety by reference.**

The District is the lead agency under the California Environmental Quality Act (CEQA) with responsibility for preparing responses to public comments and the Final PEIR. The Final PEIR is an informational document that must be considered by the District's Board of Trustees decision makers before approving or denying the Proposed Program. CEQA Guidelines (§15132) require the following contents for the Final PEIR:

- a. Draft PEIR or a revision of the draft
- b. Comments and recommendations received on the Draft PEIR, either verbatim or in summary
- c. A list of persons, organizations, and public agencies commenting on the Draft PEIR
- d. Responses of the lead agency to significant environmental points raised in the review and consultation process
- e. Any other information added by the lead agency

1.1 Environmental Review Process

The District released the *Integrated Mosquito Management Program, Solano County Mosquito Abatement District, Draft Programmatic EIR* on April 29, 2014 for public review (State Clearinghouse No.2012052070). The Notice of Availability was sent by the District to its mailing list of 54 agencies, organizations, and individuals. Copies of the Draft PEIR on CD were distributed to the State Clearinghouse, to 12 area libraries, and to the Solano County Resource Management Department. The Draft PEIR was posted on the District's website: <http://www.solanomosquito.com>, and a hard copy was made available for review at the District's office.

The 48-day public review and comment period began on April 29 and concluded on June 16, 2014, which allowed for additional time after the official close of review by the State Clearinghouse on June 13, 2014. During this public review period, the District held a public hearing on June 10 from 4:00 pm to 6:00 pm at its office: 2950 Industrial Ct., Fairfield, CA within the Program Area. No members of the public attended or provided any oral comments at the public hearing, and no transcript is provided herein.

The State of California Governor's Office of Planning and Research State Clearinghouse and Planning Unit provided a letter dated June 16, 2014 that the District has complied with the State Clearinghouse review requirements for draft environmental documents pursuant to the California Environmental Quality Act. This letter is provided herein at the end of this chapter. The Central Valley Regional Water Quality Control Board's comments were submitted to the State Clearinghouse and enclosed with the

Clearinghouse letter. Both the California Department of Fish and Wildlife (CDFW) and the Delta Protection Commission provided comment letters directly to the District prior to the close of the comment period.

Section 21092.5 of the Public Resources Code requires that the lead agency provide the "written proposed response" to a public agency on comments made by that public agency on the EIR at least 10 days before the lead agency certifies the document. See also State CEQA Guidelines §15088(b). Three agency comments were received, written responses were prepared, and the responses were distributed prior to December 31, 2015 for a final review.

Following review of this Final PEIR and submission of any additional comments from the agencies or other parties, the District Board of Trustees will consider all comments and any additional responses from staff prior to certification of the Final PEIR. Certification is a finding that the PEIR complies with the requirements of CEQA. Following PEIR certification and prior to approval of the alternatives to comprise the IMMP, the Board shall make findings for each significant environmental impact that are supported by substantial evidence in the record and shall adopt the Mitigation Monitoring Program (MMP).

Based upon the fact that no public comments were received on the Draft PEIR beyond the three agencies listed above and based upon minor revisions of the Draft PEIR provided in this Final PEIR, recirculation of the PEIR is not required under the CEQA Guidelines §15088.5 because no new significant information is added to the PEIR, and under subsection (b) recirculation is not required where the new information added merely clarifies or amplifies or makes insignificant modifications in an adequate EIR.

1.2 Report Organization

This Final PEIR contains the following chapters with a brief explanation of chapter contents.

- > **Chapter 1. Introduction:** Introductory material on the CEQA process and public review of the Draft PEIR is provided along with a description of document contents. The State Clearinghouse letter is located at the end of this chapter.
- > **Chapter 2. Public Agency Comments and Responses:** Comments received from one state (CDFW), and two regional (CVRWQCB and Delta Protection Commission) agencies are provided with District responses following each letter. The following is a list of all public agencies who submitted written comments on the Draft PEIR during the comment period. Each letter is assigned a code that includes at least three letters for the agency name.

> California Department of Fish and Wildlife	S-CDFW
> Central Valley Regional Water Quality Control Board	R-CVRWQCB
> Delta Protection Commission	R-DPC
- > **Chapter 3. Revisions to Draft PEIR:** This chapter presents minor revisions to text and appendices based on errors/errata discovered by the Draft PEIR preparers, responses to comments from CDFW and limited additional material being incorporated into some other mosquito and vector control district PEIRs after the District's April 2014 Draft PEIR was released. None of these text changes results in any changes to the conclusions and determinations of significant impact. In other words, no "less than significant" impacts were changed to "potentially significant" or "significant and unavoidable" impacts. The revised Appendices A and B are incorporated herein by reference and are available at the District's office.
- > **Chapter 4. References:** References cited in the responses to comments or text revisions that were not included previously in Chapter 17 References of the Draft PEIR are listed here, and the documents are available for review at the District's office.



EDMUND G. BROWN, JR.
GOVERNOR

June 16, 2014

STATE OF CALIFORNIA
GOVERNOR'S OFFICE of PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT



KEN ALEN
DIRECTOR

Jon Blegen
Solano County Mosquito Abatement District
2950 Industrial Ct.
Fairfield, CA 94533

Subject: Integrated Mosquito Management Program PEIR
SCH#: 2012052070

Dear Jon Blegen:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on June 13, 2014, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

"A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

**Document Details Report
State Clearinghouse Data Base**

SCH# 2012052070
Project Title Integrated Mosquito Management Program PEIR
Lead Agency Solano County Mosquito Abatement District

Type EIR Draft EIR
Description The Solano County Mosquito Abatement District under-takes activities through its integrated Mosquito Management Program (IMMP) to control mosquitoes in Solano County. The District is preparing a PEIR to evaluate the effects of the continued implementation of the control strategies and methods prescribed in its IMMP.

Lead Agency Contact

Name Jon Blegen
Agency Solano County Mosquito Abatement District
Phone 707 437 1116 **Fax**
email
Address 2950 Industrial Ct.
City Fairfield **State** CA **Zip** 94533

Project Location

County Solano
City
Region
Lat / Long
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways Hwy 12, 37, 29, 113, 84
Airports Travis AFB, Vacaville
Railways
Waterways Sacramento River, Suisun Bay, San Pablo Bay
Schools UC Davis
Land Use NA - covers all cities and incorporated area of Solano County, developed and undeveloped

Project Issues Biological Resources; Noise; Public Services; Toxic/Hazardous; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Landuse; Air Quality; Cumulative Effects; Other Issues

Reviewing Agencies Resources Agency; Department of Boating and Waterways; Department of Fish and Wildlife, Region 3; Delta Protection Commission; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 4; Air Resources Board; Regional Water Quality Control Bd., Region 5 (Sacramento); Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; Native American Heritage Commission

Date Received 04/29/2014 **Start of Review** 04/30/2014 **End of Review** 06/13/2014

2 Public Agency Comments and Responses

State Department of Fish and Wildlife

Central Valley Regional Water Quality Control Board

Delta Protection Commission



State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND GAME
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



June 30, 2014

Mr. Jon Blegen, Manager
Solano County Mosquito Abatement District
2950 Industrial Court
Fairfield, CA 94533

Dear Mr. Blegen:

Subject: Integrated Mosquito Management Program, Draft Program Environmental Impact Report, SCH #2012052070, Solano County

The California Department of Fish and Game (CDFW) has reviewed the draft Program Environmental Impact Report (PEIR) for the Solano County Mosquito Abatement District (District) Integrated Mosquito Management Program (IMMP; Project). CDFW is providing comments on the draft PEIR as a Trustee Agency and Responsible Agency. As Trustee for the State's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of the fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species for the benefit and use by the people of California. On May 16, 2014, the District accepted CDFW's request to extend the deadline to submit comments from June 16, 2014 to June 30, 2014.

Project Location and Description

The proposed Project area for the PEIR consists of the District's Service Area boundaries, and includes all developed and undeveloped lands located within the County of Solano. The proposed Project area includes watersheds such as the Sacramento River, Suisun Bay, San Pablo Bay, Grizzly Bay, Carquinez Strait, and others.

Since the mid 1980s, the District has taken an integrated systems approach to mosquito control in Solano County based on a program that involves monitoring or surveying mosquito abundance and/or potential contact with people, establishing treatment criteria (thresholds), and selecting from a range of mosquito control methods. The District conducts these mosquito control activities in Solano County through the IMMP.

The PEIR evaluates the effects of the continued implementation of the mosquito control strategies and methods prescribed in the IMMP. The Project proposes to implement the following general types of activities: surveillance, physical control, vegetation management, biological control, and chemical control.

The PEIR is unclear on the type of activities that would require further environmental review. The California Environmental Quality Act (CEQA) Guidelines §15168(c)(4) states, "Where the subsequent activities involve site-specific operations, the agency should use a



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S-CDFW

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written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR." CEQA Guidelines §15168(c)(5) states that, "A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required." CDFW recommends a checklist be developed and included in the PEIR.

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The PEIR alternatively uses special-status species and sensitive species and does not indicate if there is a difference in the terminology. CDFW recommends the PEIR clearly define what a sensitive species is. Additionally, the PEIR does not include several special-status designations, such as, California Endangered Species Act (CESA) candidate species, rare plants listed under the California Native Plant Protection Act, California Fully Protected Species, or California Rare Plant Rank species. CDFW recommends the PEIR include these species designations under the term special-status species.

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Page 2-9 of the PEIR says that "major physical control activities or projects (beyond the scope of the District's 5-year regional wetlands permits with the United States Army Corps of Engineers (USACE), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and San Francisco Bay Conservation and Development Commission (BCDC) are addressed under this PEIR where known and identified." However the PEIR does not disclose these activities. CDFW recommends the PEIR clearly identify the activities that have been permitted by other responsible agencies.

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Surveillance Alternative

Impact AR-1 and TR-1 identifies that activities associated with the Surveillance Alternative would have a less-than-significant impact. CDFW believes that these activities may have a significant impact. This Surveillance Alternative includes activities such as maintaining paths and clearings to allow access to inspections sites. Within the Project area there are a number of special-status species that might be affected by such actions. For instance clearing and vegetation maintenance in pickleweed habitat may impact salt-marsh harvest mouse (SMHM) which is identified in Fish and Game Code §4700 as a fully protected species which may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and is listed as endangered under the federal Endangered Species Act and CESA. CDFW recommends that Surveillance Alternative impacts be analyzed by the habitat types present in the Project area and mitigation measures be developed in consultation with CDFW for habitats that likely contain special-status species. This approach would minimize further environmental review as the significant impacts and the mitigation measures would be included in the PEIR.

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Physical Control Alternative and Vegetation Management Alternative

The Physical Control Alternative is divided into the following habitats: freshwater habitats including livestock ponds and retention ponds; seasonal wetlands and vernal pools; freshwater marshes and seasonal wetlands managed as waterfowl habitat; saline and brackish habitats; temporary standing water and artificial ponds; riparian areas; tree holes; wastewater treatment facilities/septic systems; and artificial container habitats. The types of physical controls are categorized into maintenance, new construction, and cultural practices. Maintenance activities include; sediment removal from ditches; removal of debris, weeds and emergent vegetation from channels; clearing, trimming, and removal of brush for access; and filling of ditches. New construction activities include the creation of new ditches to enhance tidal flow. Cultural practices include vegetation and water management, placing of culverts or other engineering works, and making other physical changes to the land. Some of these activities are not currently being conducted by the District but may be used in the future.

Activities associated with the Vegetation Management Alternative are generally the same as those described for the Physical Control Alternative with the exception that herbicides may be used.

Page 2-10 says that “the District may request/require landowners and stewards to maintain and clear debris from drainage channels and waterways; excavate built-up spoil material; remove water from tires and other urban containers; cut, trim, mow, and harvest aquatic and riparian plants (but not including any mature trees, threatened or endangered plant species, or sensitive habitat areas); and install minor trenching and ditching.” The District is requesting/requiring landowners to conduct these activities within a number of habitats where the PEIR has identified these actions as potentially significant but mitigable. The PEIR does not disclose the extent of impacts associated with the District requests/requirements for landowners and stewards to undertake activities nor are these impacts analyzed under the cumulative impacts section of the PEIR. Additionally it is unclear how the District assesses the potential for significant impacts on special-status species and their habitats when working with landowners and stewards. Mitigation Measure AR-4 does not apply to activities which are not directly conducted by the District. CDFW recommends the District analyze the potential for significance of the Physical Control Alternative and Vegetation Management Alternative activities that are being conducted by landowners and stewards at the request/requirement of the District.

6

Physical Control Alternative activities conducted in freshwater habitats and riparian areas include vegetation removal and drainage projects. Freshwater habitats include livestock ponds that special-status species such as California tiger salamander and California red-legged frog can inhabit. The PEIR does not mention the potential for presence of special-status species other than fish and therefore does not appear to comprehensively discuss the impacts of activities conducted in freshwater habitats. The potentially significant but mitigable impacts on special-status species is mitigated by implementation of Mitigation Measure AR-4 which requires activities to occur when special-status species are not present, and if presence of special-status species is continuous then activities will not occur.

7

S-CDFW

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The impact analysis does not disclose potentially significant impacts associated with habitat modification of special-status species habitats, such as breeding pools, that species may use seasonally. 7
cont'd

Mitigation Measure AR-4 relies on databases such as the California Natural Diversity Database (CNDDDB) to assess special-status species presence. CDFW does not consider this measure to be capable of reducing impacts to a level of less-than-significant. Reliance on this approach will likely underrepresent the scope of impacts and their significance on special-status species. Databases such as CNDDDB are presence only and lack of occurrence information in a particular area should not be interpreted as species absence. Additionally, Mitigation Measure AR-4 and the other mitigation measures which reference it (Mitigation Measure AR-5, AR-7, AR-9) rely on a qualified biologist to conduct surveys to determine if sensitive species are present. The PEIR should include the specific survey protocols that will be used in each habitat and for each special-status species, and provide a set of qualifications which need to be met in order to be considered a qualified biologist. CDFW also recommends the District develop criteria in consultation with CDFW and other regulatory and trustee agencies to be used by the District when assessing the potential for impact to special-status species and their habitats. 8

Physical Control Alternative activities conducted in saline and brackish habitats include: the creation and maintenance of small ditches (18 inches wide by 18 inches deep) created by a speed scavel; the creation and maintenance of shallow ditches (4 feet wide by 3 feet deep) created using high speed rotary equipment with spoil materials distributed over the marsh surface; and excavation using a low pressure excavator. These types of activities have the potential to directly impact special-status species. For instance, CDFW staff has documented SMHM using a variety of salt marsh vegetation species, including, salt grass, reeds, saltmarsh mulefat and birds-beak. 9

The impacts of Physical Control Alternative and Vegetation Management Alternative activities on terrestrial species in all habitat types are considered to be less-than-significant due to the implementation of best management practices (BMPs). CDFW considers these impacts to be significant without mitigation incorporated. CDFW recommends the BMPs described in Section 2.9 of the PEIR be included as mitigation measures and be presented in sufficient detail to thoroughly evaluate the likelihood that the proposed remedy will actually reduce impacts to a less-than-significant level. CDFW recommends a reassessment of the BMPs associated with Nonchemical Physical Control and Vegetation Management (page 2-41) that is similar in scope to the recommendations made for Mitigation Measure AR-4. 10

California Endangered Species Act

CDFW has regulatory authority over projects that could result in the "take" of any species listed by the State as threatened, endangered or candidate, pursuant to Fish and Game Code §2050 et seq. Please be advised that a CESA Permit, pursuant to Fish and Game Code §§2050 et seq., must be obtained if the Project has the potential to result in take of species of plants or animals listed under CESA, either during Project activities or over the 11

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life of the Project. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the PEIR must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the proposed Project will impact CESA-listed species, early consultation with CDFW is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit. More information about the CESA permit process can be found on the CDFW website at <http://www.dfg.ca.gov/habcon/cesa/>.

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Lake and Streambed Alteration Agreement

CDFW may require a Lake and Streambed Alteration Agreement (LSAA), pursuant to Fish and Game Code §1600 et seq. Notification is required for any activity that will divert or obstruct the natural flow, change the bed, channel, or bank including associated riparian or wetland/marsh resources, use material from the stream/channel bed, or substantially adversely affect fish and wildlife resources. Issuance of an LSAA is subject to CEQA. CDFW, as a Responsible Agency under CEQA, will consider the CEQA document for the Project. Therefore, the CEQA document must specify impacts, mitigation measures, and include a mitigation monitoring and reporting program. More information about the LSAA process can be found on the CDFW website at <http://www.dfg.ca.gov/habcon/1600/>.

12

Section 4.1.4: Habitat Conservation Plans and Natural Community Conservation Plans

The PEIR states (page 4-2) that, "[a] number of HCP's and NCCP's are in effect or development within the Program Area...The District is not signatory to these HCPs or NCCPs, but will consult with the HCP managers and agency biologists when their activities occur within the boundaries of an existing HCP or NCCP or that may be developed during the Program lifetime, to ensure that their activities comply with the provisions of those plans." Further, Mitigation Measure AR-14 states, " [t]o avoid conflict with the provision of an HCP/NCCP, the District will determine whether any of its treatment areas lies within the boundaries of an HCP/NCCP. Prior to the application of any treatment, excluding surveillance monitoring, the District will review the requirements of the HCP/NCCP. The District will work with the HCP/NCCP holder and appropriate regulatory agencies to identify alternatives to avoid or minimize potential impacts to a species or habitat protected by the HCP/NCCP."

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Federal and state permits for endangered and threatened species have been or will be issued to local jurisdictions based on plan conservation, and "take" levels and the configuration of conserved habitats. If those conservation levels and the locations of conserved lands are significantly altered by the Project, then permits for NCCPs/HCPs may need to be modified (to the detriment of conserved resources) or comprehensively re-evaluated. If the Project will be inconsistent with such a plan, inconsistencies should be specifically identified and remedied. For example, the activities proposed by the Project may not be "covered" activities under existing approved NCCPs or HCPs but may require environmental review and permitting outside of, but consistent with, those plans, or it may directly conflict with the goals and objectives of those plans, forcing a comprehensive public review.

S-CDFW

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CDFW recommends that the District incorporate the goals, objectives, and preserve design criteria associated with affected NCCP/HCPs into the PEIR. Additionally, CDFW recommends that alternatives that minimize adverse impacts on native vegetation communities and associated species be evaluated and considered. This could partially be accomplished by adherence to the conservation objectives and strategies identified within approved and draft NCCP/HCPs, such as the Solano Multispecies Habitat Conservation Plan.

13

CDFW Recommendation

CDFW recommends the District work with CDFW and other resource agencies in correcting the deficiencies identified, and in developing mitigation measures that are capable of reducing impacts to less-than-significant. The PEIR should then be recirculated for further environmental review.

14

If you have any questions, please contact Ms. Lorie Hammerli, Environmental Scientist, at (707) 944-5568; or Ms. Karen Weiss, Senior Environmental Scientist (Supervisory), at (707) 944-5525.

Sincerely,



Scott Wilson
Regional Manager
Bay Delta Region

cc: State Clearinghouse

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RESPONSE S-CDFW

Department of Fish and Wildlife
June 30, 2014

Scott Wilson, Regional Manager

1

The comment summarizes SCMAD's Program and Service Areas, and no response is needed.

2

The focus of PEIR is on the activities described in the IMMP, which are a continuation of present operations, maintenance and other mosquito control activities, rather than new construction projects or the use of new measures/chemical formulations for mosquito control. PEIR Section 1.8 explains how the District plans to use the program EIR in connection with future projects and activities, some of which may require separate environmental review.

Concerning a checklist that would be followed when the District proposes a subsequent project or activity that is not within the scope of the Program and that may require further environmental review, the following process will be inserted into Section 1.8 of the PEIR as a new Section 1.8.2 and reported in text changes for the Final PEIR.

1.8.2 Future Nonchemical Activities

Future site-specific projects, activities or operations that are not part of the regular and ongoing Program and that are not within the scope of the activities specifically addressed in the PEIR, and that involve physical modification of the environment or potential impacts to special-status plant and animal species ("future activities") would be subject to the following evaluation procedures to determine whether CEQA compliance has been achieved through this PEIR. The steps outlined below would be contained in a "checklist" for use by District staff to document its evaluation of the future activity.

Prior to initiating the future activity, the District will conduct the following review to:

1. Evaluate whether the future activities involve new or more severe potential significant environmental effects under the standards of CEQA Guidelines Section 15162.
2. Determine size and location of area to be physically modified or treated to ensure it is within scope of the District's USACE, San Francisco Bay Conservation and Development Commission (BCDC), and California State Water Resources Control Board (SWRCB) permits. These permits require the preparation of annual work plans, and the USACE permit requires maps of the affected areas. The permits are issued after consultation with the appropriate resource agencies (such as CDFW and USFWS) and contain special conditions that address site-specific or species-specific considerations.
3. For a future activity involving physical control or vegetation management, review whether the activity is covered under another agency's (e.g., flood control district, public works or sewerage agency) permit.
4. If the future activity is outside of any of the District or other agency permits, then evaluate whether the activity is an emergency action exempt from CEQA compliance. Emergency actions are not subject to CEQA requirements (CEQA Guidelines Section 15269), so no further CEQA analysis is required. A written evaluation/rationale will be provided in a staff report to the District's Board of Trustees.

5. If an action is being carried out by a landowner or entity other than the District, and such entity requests that the District conduct such activities on their behalf, then the District will only consider doing so if the entity has satisfied all applicable legal requirements.¹
6. If the action is not within the scope of the Program evaluated in the PEIR or exempt, then the District would prepare a CEQA Initial Study to determine what type of further environmental review is appropriate (e.g., PEIR addendum, negative declaration, mitigated negative declaration, or supplemental EIR).

As part of any further environmental review (Initial Study, EIR, etc.), the District will be required to identify any potential impacts to special-status species, through the following steps:

1. Check CNDDDB, USFWS, and other databases and studies for the area to determine if special-status species or their habitat is present.
2. If suitable habitat is present, do surveys for special-status species, as required.
3. If a special-status species is (are) present, evaluate whether the proposed vector management activity can be scheduled around the species' critical life-stage periods to avoid disturbance.
4. If the proposed vector management activity cannot be scheduled around a special-status species' critical life-stage periods and must be performed in order to meet the District service objectives, confirm that the lowest impact effective mosquito management option is proposed for use.

Examples of activities that have not been addressed in a site-specific fashion in this PEIR are the various tidal marsh restoration projects planned for the North Bay to expand existing state and federal wildlife refuges, including the San Pablo Bay National Wildlife Refuge Sonoma Creek Enhancement Project and the Sears Point Restoration Project. The District is coordinating with the state and federal resource agencies on mosquito and vector management in the refuges and wildlife areas.

3

Concerning the comment to clearly define terminology “special-status species” and “sensitive species,” and CDFW’s recommendation to include the species designations of the California Native Plant Protection Act (CNPPA), California Fully Protected Species, or California Rare Plant Rank species, the following response is provided.

The two terms are used interchangeably in the document. The following definition of special-status species will be added to its first occurrence in the PEIR document (on pages S-4 and 1-11): Special-status species (a.k.a. sensitive species) are those listed as endangered, threatened or candidate species under the federal Endangered Species Act (ESA), endangered or threatened under the California Endangered Species Act (CESA), or listed as a species of special concern by the State (Draft PEIR p. 4-1). Species lists in Sections 4.1 and 5.1 are hereby modified to identify these fully protected species for the Final PEIR for the SCMAD Service Area of Solano County and adjacent counties in the Program Area. Revised and updated special-status species lists for Solano County prepared in September 2015 are attached to this response as part of the Final PEIR. For the adjacent counties, species tables created for Napa County Mosquito Abatement District include the adjacent counties of Napa and Yolo.

¹ In these circumstances, the District's decision whether to act may be the only public agency decision if the requesting entity is a private party. In that event, if the District decides to act, it must comply with CEQA. The District may require landowners who request District assistance to pay for any necessary additional environmental work.

4

This comment refers to a sentence in the SCMAD PEIR that reads: “major physical control activities or projects beyond the scope of the District’s 5-year regional wetlands permit with the United States Army Corps of Engineers (USACE), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and San Francisco Bay Conservation and Development Commission (BCDC) are addressed under this PEIR where known and identified.” (Draft PEIR, p. 2-9) This language was placed in the text so that if the District had a project not covered by its USACE, BCDC, SFBRWQCB, or National Pollutant Discharge Elimination System (NPDES) permits, then it could include it but the project needs to be identified. Section 2.8.1 explains the activities covered by the various permits obtained by the District. For SCMAD there are no major physical control activities or projects outside of the permitted activities at present, and this sentence on page 2-9, therefore, will be modified from the PEIR as indicated below:

Major physical control activities or projects beyond the scope of the District’s 5-year regional wetlands permit with the United States Army Corps of Engineers (USACE), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and San Francisco Bay Conservation and Development Commission (BCDC) are not identified or known at this time ~~addressed under this PEIR where known and identified.~~

5

Concerning CDFW’s concern that activities under the Surveillance Alternative may have a significant impact, SCMAD activities under Surveillance are less intense and less disruptive to natural habitats than are the activities proposed under the Physical Control and Vegetation Management Alternatives. The amount of vegetation clearance is minimal in part because it is associated most often with the maintenance of previously disturbed paths and access roads.

The District trains staff to use preexisting roads, trails, walkways, and open areas and to otherwise conduct routine and essential surveillance activities with the least impact on vegetation and habitat (SCMAD Draft PEIR, p. 2-7). The BMPs followed by District staff when they are engaging in mosquito surveillance are recognized as being effective by the California Department of Public Health (CDPH) and the Mosquito and Vector Control Association of California (MVCAC). These BMPs are part of the District’s existing program of activities and continued in the Proposed Program, and serve to avoid substantial impacts to special-status species, so the impact under CEQA is less-than-significant. The BMPs include the following (Draft PEIR pp. 2-41, 42):

- > Conduct worker environmental awareness training for all treatment field crews and contractors for special-status species and sensitive natural communities a qualified person (e.g., District biologist) determines to have the potential to occur on the treatment site. Conduct the education training prior to starting work at the treatment site and upon the arrival of any new worker onto sites with the potential for special-status species or sensitive natural communities.
- > If suitable habitat necessary for special-status species is found, including vernal pools, and if nonchemical physical and vegetation management control methods have the potential for affecting the potential species, then the District will coordinate with the CDFW, USFWS, and/or NMFS before conducting control activities within this boundary or cancel activities in this area. If the District determines no suitable habitat is present, control activities may occur without further agency consultations.

As part of this BMP, the District also does the following: check databases and other sources to determine if special-status species or their habitat is present, including but not limited to the CNDDDB, other online surveys, and available reports; discuss findings with CDFW biologist (and USFWS and NMFS if applicable); if suitable habitat is present, prior to conducting surveillance activities, ensure that District staff will receive environmental

awareness training for potentially affected special-status species; if special-status species are present, evaluate whether the surveillance activity can be scheduled around critical life stage periods; if surveillance can't be scheduled around critical life stage periods, evaluate whether a different surveillance option can be used (e.g., avoid noise-generating equipment, avoid extreme high tides).

- > When using heavy equipment for vegetation management, District staff (and contractors) will not operate such equipment in the water and will provide appropriate containment and cleanup systems to avoid, contain, and clean up any leakage of toxic chemicals into the aquatic environment, controlling turbidity and minimizing the area that is affected by the vegetation management activity.
- > Properly train all staff, contractors, and volunteer crew leaders to prevent spreading weeds and pests to other sites.
- > Operation of noise-generating equipment (e.g., chainsaws, wood chippers, brush-cutters, pickup trucks) will abide by the time-of-day restrictions established by the applicable local jurisdiction (i.e., City and/or County) if such noise activities would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship) located in the applicable local jurisdiction. Shut down all motorized equipment when not in use.
- > For operations that generate noise expected to be of concern to the public (e.g., that may exceed applicable local standards), the following measures would be implemented:
 - Measure 1: Provide Advance Notices. A variety of measures are implemented depending on the nature/magnitude of the activities, including press releases, social media, District websites, hand-delivered flyers, posted signs, emails, and/or phone alerts. Public agencies and elected officials also may be notified of the nature and duration of the activities, including the local Board of Supervisors or City Council, environmental health and agricultural agencies, emergency service providers, and airports.
 - Measure 2: Provide Mechanism to Address Complaints. The District staff is available during regular business hours to respond to service calls and may staff phone lines to address concerns during nighttime operations.
 - Measure 3: Follow Established Procedures for Airboat Operations. Airboat operators are limited to certain areas and follow the guidelines established for those areas.
- > The District will perform public education and outreach activities upon request.

Additionally, the District instructs its staff to follow the practices described in the USFWS guide "Walking in the Marsh: Methods to Increase Safety and Reduce Impacts to Wildlife/Plants," which is available at http://www.fws.gov/uploadedFiles/South%20Bay%20Weed%20Management%20Plan_%201st_edition_1_20_13.pdf, Appendix 3.

The PEIR BMPs demonstrate that regular surveillance by District staff will not result in any significant environmental impacts.

6

Concerning the comment that the District's PEIR should analyze the activities under Physical Control and Vegetation Management Alternatives being conducted by landowners and stewards at the request of the District, the District's response is that property owners are obligated under California law to not allow the property to generate mosquitoes that cause nuisance or public health impacts (see California Health and Safety Code Section 2060). From time to time, the District will provide directions and recommendations to a property owner for it to better manage mosquitoes on its property. However, the property owner is responsible for any actions that it may undertake on its land to avoid producing mosquitoes, and the property owner must comply with applicable laws and permit requirements. The District works closely with

landowners and stewards/managers in order to educate them about and assist them in complying with applicable laws and permit requirements.

The District's public education program to landowners involves mostly small scale, back yard or commercial/industrial building site maintenance activities that would most often be exempt from CEQA as part of the landowner's landscaping or as minor alterations in land, water, and vegetation on existing officially designated wildlife management areas or fish production facilities which result in improvement of habitat for fish and wildlife resources or greater fish production (CEQA Guidelines Section 15304). (See also Section 15301 (h) and (i) on exemptions for existing facilities (Class 1) including wildlife habitat areas.)

7

Freshwater habitats include livestock ponds that special-status species such as California tiger salamander (CTS) and California red-legged frog (CRLF) (both amphibians) can inhabit. The nonfish species are covered selectively in Chapters 4 and 5 and listed in Table 5-1. Revisions to Table 5-1 to remove the fish species and additional text on the amphibians in terrestrial resources Section 5.1.2 and in aquatic resources Section 4.1.2 are included below and in the text changes chapter of this document.

California tiger salamanders (CTS) require underground refuges, especially ground squirrel burrows, where adults can stay moist and cool for most of the year. Stock ponds, vernal pools or other seasonal water sources with few predators that may be as distant as 1.3 miles away are necessary for breeding and egg laying which is stimulated by the first rains of the season. The tadpoles and larvae feed on zooplankton, aquatic insects and small tadpoles of Pacific tree frogs and CRLF and require 3-6 months before leaving the wetland to find an upland small mammal burrow or other underground refuge.

California red-legged frogs (CRLF) are found in lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. CRLF requires 11-20 weeks of permanent water for larval development. Metamorphosed and adult frogs must have access to estivation habitat and adults may travel up to 1 mile in search of breeding habitat especially on warm damp nights.

Habitat modification by the District is limited to vegetation removal, circulation improvements, and draining of temporary ponded water (excluding vernal pools) that could become stagnant which represents a small portion of freshwater habitat in the District's Program Area. The effects of draining habitats on amphibian tadpoles would be similar to those described for fish and would be subject to the same BMPs and mitigation. PEIR Section 4.2.4.1.1 is modified to read as follows:

Draining areas of shallow freshwater habitat to reduce the amount of standing water or reduce the amount of time such water remains standing could result in adverse effects to young fish and amphibians using those habitats, leaving fish and tadpoles that cannot vacate the area without water, requiring fish and tadpoles that can leave the area to move to new locations, and reducing the amount of larval rearing habitat present. Where native or special-status fish and amphibian species are not present, these impacts would be negligible. Where native or special-status species are present, these areas could be important nursery areas for young fish and amphibians, depending on location, season, fish and amphibian species present, accessibility for adult fish and amphibians to enter these areas to deposit eggs, and amount of other habitat available to the species.

Because their rapid currents do not provide suitable habitat for mosquitoes, streams and rivers generally do not support substantial numbers of mosquitoes, although, some mosquitoes can be found in slow eddies and back channels, or in pools isolated on the banks as flows recede. Streams and rivers may support ~~sensitive special-status~~ fish species (including steelhead, Chinook salmon, and Sacramento perch) and amphibian

species (including CTS, CRLF and foothill yellow legged frog (FYLF). Isolated ponds and back channels may provide habitat for mosquito larva, but these areas may also provide excellent rearing habitat (i.e., breeding pools) for young fish and amphibians, as they provide warmer water temperatures, higher primary productivity and protection from predaceous fish. Habitat alterations to drain or reconnect such areas should be avoided.

Impact AR-3. Draining areas of shallow freshwater habitats would have a **less-than-significant** impact on aquatic habitats, native fish or aquatic invertebrates, as only a small proportion of such habitat would be drained. No mitigation is required.

Impact AR-4. Draining areas of shallow freshwater habitats would have a **potentially significant but mitigable** impact on special-status species including amphibians, if these species are present when the habitat is drained.

8

In response to the Department's comments on Mitigation Measure AR-4, the District very rarely pursues projects involving the draining of habitat areas. Therefore, it is premature and speculative to determine the particular survey protocols for any particular habitat source and project. The mitigation measure will be revised as follows:

Mitigation Measure AR-4. The District will coordinate with appropriate resource agency personnel, whenever a habitat treatment is under consideration in an area potentially supporting special-status species, as indicated by the California Natural Diversity Database, Calfish.org, NOAA Fisheries, and USFWS websites. If shallow freshwater habitats associated with natural waterways where ~~sensitive~~ special-status species could be present need to be drained, the District will schedule such activity at a time of year when these species are absent from the treatment site. In the event that such activity cannot be postponed, or must be performed in habitat that has the potential for continuous occupancy, the District will have a qualified biologist conduct surveys to determine if ~~sensitive~~ special-status fish and amphibian species are present. This treatment would be avoided where ~~sensitive~~ special-status species are present.

To clarify, before proceeding with a project to drain a wetland, marsh or other habitat area, the District will retain a qualified biologist to conduct a site-specific biological survey to determine if sensitive species are present. The District will determine the survey scope and protocols and the qualifications of the biologist on a case-by-case basis depending upon the location and circumstances of the particular project. If the survey determines that sensitive species are present and would be impacted by the draining, then the District will not proceed with the draining project.

With implementation of this mitigation measure, the impact of this activity would be **less than significant**.

9

Comment noted. See Response 8 above. The BMPs and mitigation measures described in the PEIR will avoid the potential impact to special-status species discussed in the comment.

10

CDFW questions the incorporation of BMPs into the Program Description and wants the format of the impact analyses to recognize significant impacts without the BMPs and then use the BMPs as mitigation measures. The Department states that it "considers these impacts to be significant without mitigation

incorporated,” but it does not explain or support why it considers the impacts to be significant without mitigation.

The BMPS described in the PEIR are an integral, long-standing and nondiscretionary component of the District's ongoing Program, and most have been implemented over the past several years. District staff are regularly trained to comply with and implement the BMPs. Many of the BMPs are incorporated into various permit requirements. Therefore, the BMPs appropriately are a fundamental part of the Program and project description. They are not new CEQA mitigation measures. The District as the lead agency has decided to incorporate their BMPs into the Program Description, and they are properly included in the determinations of less-than-significant impacts under all of the Program alternatives. In Section 1.7, the definition of “less than significant” will be expanded to reference the BMPs listed in Section 2.9 as being part of the approach to the impact analysis with text changes incorporated into Chapter 3 of the Final PEIR document.

11

Comment noted. While the District does not anticipate undertaking any action that would result in a take of any protected species, it will apply for a CESA permit if it does pursue such an action. The need for any project-level CEQA review at a particular source control/treatment site would be considered at the time the District applied for a CESA permit (if required).

Furthermore, in April 2015, in a letter to CDPH's Karen Smith from CDFW's Charlton H. Bonham, CDFW determined that CDPH, and the districts operating under a valid Cooperative Agreement with CDPH to conduct surveillance, prevention, or control of vectors and vector-borne diseases, are not required to obtain a scientific collecting permit (SCP) under Fish and Game Codes Sections 1002, 4005(e), and 4011. A SCP is required for any scientific study conducted by or in collaboration with CDPH or local agencies that is not routine surveillance and control activities and includes take of animals or plants. SCMD has a Cooperative Agreement with CDPH that is described in Section 1.1.3 of the Draft PEIR. (CDFW 2015)

State-listed species are identified in Table 5-1 and in the updated tables at the end of these responses to comments.

12

Concerning the comments that a Lake and Streambed Alteration Agreement (LSAA) may be required, the following response is provided.

The District does not anticipate undertaking any project that would require a Lake and Streambed Alteration Agreement; however, if it does pursue such a project, it would request a LSAA for the particular activity. The need for any subsequent project-level CEQA review at a particular source control/treatment site would be considered at the time the District applied for a required LSAA permit.

13

CDFW states that if the Project will be inconsistent with an HCP or NCCP, the inconsistencies should be specifically identified and remedied. Incorporate the goals, objectives, and preserve design criteria associated with affected NCCP/HCPs into the PEIR. Alternatives that minimize adverse impacts on native vegetation communities and associated species should be evaluated and considered.

Most of the HCCPs and NCPs listed in Table 4-2 (on pp 4-7 and 4-8 of the Draft PEIR) are very site-specific and generally not applicable to most IMMP activities. The District's Program adheres to IPM principles, and all feasible alternatives have been considered for inclusion in the Program. The District's Program goals and objectives address public health, while the HCPs and NCCPs are focused on natural community health and do not consider directly the vectors of human and animal disease in most cases.

Summaries of the HCCPs and NCPs are included in the text changes to the PEIR (Chapter 3 of the Final PEIR). The HCP/NCCPs are not intended to address mosquito and vector control, and the District recognizes that its activities are not covered actions under the plans. Therefore, it is not appropriate to expressly incorporate the full plans as part of the District PEIR. The District anticipates and expects that its vector control activities will be consistent with the plans. As explained in PEIR Section 4.1.4, the District will consult with HCP managers and agency biologists when vector control activities occur within the boundaries of an HCP or NCCP to ensure that the activities and consistent with those plans.

14

CDFW recommends that SCMAD correct PEIR deficiencies and develop effective mitigation measures then recirculate the PEIR for further environmental review.

The District has responded to CDFW comments initially at a meeting on August 12, 2014 and then in these responses to comments and in text changes to the Draft PEIR as part of the Final PEIR document. The District has determined that all of the identified impacts can be mitigated to less than significant, and there are no new significant impacts from the IMMP or from a new mitigation measure. Therefore, we have determined that the additional material to be added as part of the Final PEIR is not significant new information and therefore, there is no need to recirculate the Draft PEIR. This response to CDFW comments and subsequent text changes clarify or amplify or make insignificant modifications to the Draft PEIR. See CEQA Guidelines Section 15088.5.

Table 4-1 California Natural Diversity Database Occurrences for Special-Status Fish Species in the SCMAD Service Area and Adjacent Program Area Counties

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Green sturgeon <i>Acipenser medirostris</i>	FT ¹	Preferred spawning habitat contains large cobble in deep and cool pools with turbulent water. Occur in shallow water and move to deeper more saline areas as they mature. Adult and juvenile green sturgeon are thought to use the same migratory routes as Chinook salmon.	●	●
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, and associated marshes. Found in slow-moving river sections and sloughs. Requires flooded vegetation for spawning and foraging for young.	●	●
Delta smelt <i>Hypomesus transpacificus</i>	SE, FT	Primarily inhabit low-salinity waters of estuary prior to migrating into freshwater habitats to spawn. Spawning occurs in slough and shallow edge area in the Delta and Sacramento River. Rearing juveniles remain in spawning areas, near or just above the X2 region of the Delta. Adult delta smelt abundance in the fall has been in the northwestern Delta in the channel of the Sacramento River. Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.	●	●
Chinook salmon - Sacramento River winter-run ESU <i>Oncorhynchus tshawytscha</i>	FE, SE	Sacramento river below Keswick Dam. Spawns in the Sacramento river but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 c for spawning.		●
Chinook salmon - Central Valley spring-run ESU <i>Oncorhynchus tshawytscha</i>	FT, ST	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 c is lethal to adults federal listing refers to pops spawning in Sacramento River and tributaries.		●
Rainbow trout / Steelhead <i>Oncorhynchus mykiss</i>	FT ⁶ , FE ⁷	Spawning occurs in tributaries to mainstem rivers of coastal and inland drainages. Habitat preferences depend on fish size/age, with fry concentrating in shallow water along stream edges with low water velocities, juveniles occurring in deeper, faster water among rocks or other cover, and larger fish seeking out a wide variety of deeper habitats close to fast water. From Russian River, south to Soquel Creek and to, but not including, Pajaro River. Also San Francisco and San Pablo Bay basins.	●	●

Table 4-1 California Natural Diversity Database Occurrences for Special-Status Fish Species in the SCMAD Service Area and Adjacent Program Area Counties

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Sacramento perch <i>Archoplites interruptus</i>	SSC	Warm-water, lacustrine fish found mostly in reservoirs and farm ponds of the Central Valley. Often associated with beds of rooted, submerged, and emergent vegetation. Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley. Prefers warm water. Aquatic vegetation is essential for young. Tolerates wide range of physio-chemical water conditions.		●
Tidewater goby <i>Eucyclogobius newberryi</i>	FE, SSC ⁸	Brackish water habitat along the coast from San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	●	

Listing status abbreviations

- DPS = Distinct Population Segment
- ESU = Evolutionarily Significant Unit
- FE = Federally listed as Endangered
- FT = Federally listed as Threatened
- SE = State-listed as Endangered
- SSC = California Species of Concern
- ST = State-listed as Threatened

- ¹ Southern DPS
- ² Sacramento River Spring-run
- ³ Winter-run
- ⁴ California Coastal ESU, Central Valley spring-run
- ⁵ Sacramento River winter-run
- ⁶ Northern CA ESU, Central CA Coast ESU, South-Central CA Coast ESU, Central Valley ESU
- ⁷ Southern CA ESU
- ⁸ Populations in Orange County and south; populations north of Orange County delisted

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Napa false indigo <i>Amorpha californica</i> var. <i>napensis</i>	RPR, 1B	Broadleafed upland forest, chaparral, cismontane woodland. Openings in forest or woodland or in chaparral. 150-2000 m		●
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	RPR, 1B	Cismontane woodland, valley and foothill grassland. 50-500 m.		●
Konocti manzanita <i>Arctostaphylos manzanita</i> ssp. <i>elegans</i>	RPR, 1B	Chaparral, cismontane woodland, lower montane coniferous forest. Volcanic soils. 395-1400 m.		●
Rincon Ridge manzanita <i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i>	RPR, 1B	Chaparral. Highly restricted endemic to red rhyolites in Sonoma County. 75-310 m.		●
Clara Hunt's milk-vetch <i>Astragalus claranus</i>	FE, ST, RPR, 1B	Cismontane woodland, valley and foothill grassland, chaparral. Open grassy hillsides, esp. On exposed shoulders in thin, volcanic clay soil moist in spring. 75-235 m.		●
Jepson's milk-vetch <i>Astragalus rattanii</i> var. <i>jepsonianus</i>	RPR, 1B	Cismontane woodland, valley and foothill grassland, chaparral. Commonly on serpentine in grassland or openings in chaparral. 320-700 m.		●
Ferris' milk-vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	RPR, 1B	Meadows, valley and foothill grassland. Subalkaline flats on overflow land in the central valley; usually seen in dry, adobe soil. 5-75 m.		●
alkali milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	RPR, 1B	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-170 m.		●
heartscale <i>Atriplex cordulata</i> var. <i>cordulata</i>	RPR, 1B	Chenopod scrub, valley and foothill grassland, meadows. Alkaline flats and scalds in the central valley, sandy soils. 1-150(600)m.		●
brittlescale <i>Atriplex depressa</i>	RPR, 1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools. Usually in alkali scalds or alk. Clay in meadows or annual grassland; rarely associate with riparian, marshes, or v.p.'s. 1-320 m.		●
San Joaquin spearscale <i>Atriplex joaquinana</i>	RPR, 1B	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with <i>distichlis spicata</i> , <i>frankenja</i> , etc. 1-250 m.	●	●
vernal pool small scale <i>Atriplex persistens</i>	RPR, 1B	Vernal pools. Alkaline vernal pools. 10-115 m.	●	

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
big-scale balsamroot <i>Balsamorhiza macrolepis</i>	RPR, 1B	Valley and foothill grassland, cismontane woodland. Sometimes on serpentine. 35-1000 m.	•	•
big tarplant <i>Blepharizonia plumose</i>	RPR, 1B	Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 15-455 m.	•	
watershield <i>Brasenia schreberi</i>	RPR 2	Freshwater marshes and swamps. Aquatic from water bodies both natural and artificial in California.		•
narrow-anthered brodiaea <i>Brodiaea leptandra</i>	RPR, 1B	Broadleafed upland forest, chaparral, lower montane coniferous forest. 110-915 m.		•
round-leaved filaree <i>California macrophylla</i>	RPR, 1B	Cismontane woodland, valley and foothill grassland. Clay soils. 15-1200 m.	•	•
Tiburon mariposa-lily <i>Calochortus tiburonensis</i>	FT, ST, RPR, 1B	Valley and foothill grassland. On open, rocky, slopes in serpentine grassland. 50-150 m.		•
bristly sedge <i>Carex comosa</i>	RPR 2	Marshes and swamps. Lake margins, wet places; site below sea level is on a delta island. -5-1005 m.		•
Tiburon paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	FE, ST, RPR, 1B	Valley and foothill grassland. Rocky serpentine sites. 75-400 m.		•
pink creamsacs <i>Castilleja rubicundula</i> ssp. <i>rubicundula</i>	RPR, 1B	Chaparral, meadows and seeps, valley and foothill grassland. Openings in chaparral or grasslands. On serpentine. 20-900 m.		•
Rincon Ridge ceanothus <i>Ceanothus confuses</i>	RPR, 1B	Closed-cone coniferous forest, chaparral, cismontane woodland. Known from volcanic or serpentine soils, dry shrubby slopes. 75-1065 m.		•
Calistoga ceanothus <i>Ceanothus divergens</i>	RPR, 1B	Chaparral, cismontane woodland. Rocky, serpentine or volcanic sites. 165-950 m.		•
holly-leaved ceanothus <i>Ceanothus purpureus</i>	RPR, 1B	Chaparral. Rocky, volcanic slopes. 120-640 m.	•	•
Sonoma ceanothus <i>Ceanothus sonomensis</i>	RPR, 1B	Chaparral. Sandy, serpentine or volcanic soils. 210-800 m.		•

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Congdon's tarplant <i>Centromadia parryi</i> ssp. <i>congdonii</i>	RPR, 1B	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 1-230 m.	●	
pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>	RPR, 1B	Coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernal mesic, often alkaline sites. 2-420 m.	●	●
hispid bird's-beak <i>Chloropyron molle</i> ssp. <i>hispidum</i>	RPR, 1B	Meadows, playas, valley and foothill grassland. In damp alkaline soils, especially in alkaline meadows and alkali sinks with <i>distichlis</i> . 10-155 m.	●	
soft bird's-beak <i>Chloropyron molle</i> ssp. <i>molle</i>	FE, SR, RPR, 1B	Coastal salt marsh. In coastal salt marsh with <i>distichlis</i> , <i>salicornia</i> , <i>frankenja</i> , etc. 0-3 m.	●	●
palmate-bracted bird's-beak <i>Chloropyron palmatum</i>	FE, SE, RPR, 1B	Chenopod scrub, valley and foothill grassland. Usually on pescadero silty clay which is alkaline, with <i>distichlis</i> , <i>frankenja</i> , etc. 5-155 m.		●
Bolander's water-hemlock <i>Cicuta maculata</i> var. <i>bolanderi</i>	RPR 2	Marshes, fresh or brackish water. 0-200 m.	●	●
Suisun thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	FE, RPR, 1B	Salt marsh. Grows with <i>scirpus</i> , <i>distichlis</i> near small watercourses within saltmarsh. 0-1 m.	●	
serpentine cryptantha <i>Cryptantha dissita</i>	RPR, 1B	Chaparral. Serpentine outcrops. 330-730 m.		●
Peruvian dodder <i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>	RPR 2	Marshes and swamps (freshwater). Freshwater marsh. 15-280 m.		●
recurved larkspur <i>Delphinium recurvatum</i>	RPR, 1B	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. 3-685 m.	●	
dwarf downingia <i>Downingia pusilla</i>	RPR 2	Valley and foothill grassland (mesic sites), vernal pools. Vernal lake and pool margins with a variety of associates. In several types of vernal pools. 1-485 m.	●	●
Greene's narrow-leaved daisy <i>Erigeron greenei</i>	RPR, 1B	Chaparral. Serpentine and volcanic substrates, generally in shrubby vegetation. 75-1060 m.		●
lone buckwheat <i>Eriogonum apricum</i> var. <i>apricum</i>	FE, SE, RPR, 1B	Chaparral. In gravelly openings on lone formation soil. 80-150 m.		●

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Snow Mountain buckwheat <i>Eriogonum nervulosum</i>	RPR, 1B	Chaparral. Dry serpentine outcrops, balds, and barrens. 300-2100 m.		●
Mt. Diablo buckwheat <i>Eriogonum truncatum</i>	RPR, 1B	Chaparral, coastal scrub, valley and foothill grassland. Dry, exposed clay or sandy substrates. 3-350 m.	●	
Tuolumne button-celery <i>Eryngium pinnatisectum</i>	RPR, 1B	Vernal pools, cismontane woodland, lower montane coniferous forest. Volcanic soils; vernal pools and mesic sites within other natural communities. 250-450 m.		●
fragrant fritillary <i>Fritillaria liliacea</i>	RPR, 1B	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; various soils reported though usually clay, in grassland. 3-410 m.	●	
adobe-lily <i>Fritillaria pluriflora</i>	RPR, 1B	Chaparral, cismontane woodland, foothill grassland. Usually on clay soils; sometimes serpentine. 55-820 m.	●	●
Boggs Lake hedge-hyssop <i>Gratiola heterosepala</i>	SE, RPR, 1B	Marshes and swamps (freshwater), vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins. 5-2400 m.	●	●
Hall's harmonia <i>Harmonia hallii</i>	RPR, 1B	Chaparral. Serpentine hills and ridges. Open, rocky areas within chaparral. 500-900 m.		●
two-carpellate western flax <i>Hesperolinon bicarpellatum</i>	RPR, 1B	Serpentine chaparral. Serpentine barrens at edge of chaparral. 150-820 m.		●
Brewer's western flax <i>Hesperolinon breweri</i>	RPR, 1B	Chaparral, cismontane woodland, valley and foothill grassland. Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. 30-885 m.	●	●
drymaria-like western flax <i>Hesperolinon drymarioides</i>	RPR, 1B	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland. Serpentine soils, mostly within chaparral. 390-1000 m.		●
Tehama County western flax <i>Hesperolinon tehamense</i>	RPR, 1B	Chaparral, cismontane woodland. Serpentine barrens in chaparral. 225-1155 m.		●
woolly rose-mallow <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	RPR, 1B	Marshes and swamps (freshwater). Moist, freshwater-soaked riverbanks and low peat islands in sloughs; in California, known from the delta watershed. 0-150 m.	●	●

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Carquinez goldenbush <i>Isocoma arguta</i>	RPR, 1B	Valley and foothill grassland. Alkaline soils, flats, lower hills. On low benches near drainages and on tops and sides of mounds in swale habitat. 1-20 m.	●	
Northern California black walnut <i>Juglans hindsii</i>	RPR, 1B	Riparian forest, riparian woodland. Few extant native stands remain; widely naturalized. Deep alluvial soil associated with a creek or stream. 0-395 m.	●	●
Ahart's dwarf rush <i>Juncus leiospermus</i> var. <i>ahartii</i>	RPR, 1B	Vernal pools. Restricted to the edges of vernal pools. 30-100 m.		●
Santa Lucia dwarf rush <i>Juncus luciensis</i>	RPR, 1B	Vernal pools, meadows, lower montane coniferous forest, chaparral, great basin scrub. Vernal pools, ephemeral drainages, wet meadow habitats and streamsides. 300-2040 m.		●
Burke's goldfields <i>Lasthenia burkei</i>	FE, SE, RPR, 1B	Vernal pools, meadows and seeps. Most often in vernal pools and swales. 15-580 m.		●
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE, RPR, 1B	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; extreme. Endangered. Vernal pools, swales, low depressions, in open grassy areas. 1-445 m.	●	●
Coulter's goldfields <i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	RPR, 1B	Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-1400 m.		●
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	RPR, 1B	Freshwater and brackish marshes. Often found with <i>typha</i> , <i>aster lentus</i> , <i>rosa calif.</i> , <i>juncus</i> spp., <i>scirpus</i> , etc. Usually on marsh and slough edges.	●	●
Colusa layia <i>Layia septentrionalis</i>	RPR, 1B	Chaparral, cismontane woodland, valley and foothill grassland. Scattered colonies in fields and grassy slopes in sandy or serpentine soil. 145-1095 m.		●
legenere <i>Legenere limosa</i>	RPR, 1B	Vernal pools. Many historical occurrences are extirpated. In beds of vernal pools. 1-880 m.	●	●
Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>	RPR, 1B	Valley and foothill grassland, vernal pools. Grassland and sometimes vernal pool edges. Alkaline soils. 3-30 m.	●	●

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Jepson's leptosiphon <i>Leptosiphon jepsonii</i>	RPR, 1B	Chaparral, cismontane woodland. Open to partially shaded grassy slopes. On volcanics or the periphery of serpentine substrates. 100-500 m.		●
Mason's lilaepsis <i>Lilaeopsis masonii</i>	SR, RPR, 1B	Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. 0-10 m.	●	●
Sebastopol meadowfoam <i>Limnanthes vinculans</i>	FE, SE, RPR, 1B	Mesic meadows, vernal pools, valley and foothill grassland. Swales, wet meadows and marshy areas in valley oak savanna; on poorly drained soils of clays and sandy loam. 15-115 m.		●
Delta mudwort <i>Limosella australis</i>	RPR 2	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of delta rare plants. Usually on mud banks of the delta in marshy or scrubby riparian associations; often with lilaepsis masonii. 0-3 m.	●	●
San Joaquin woollythreads <i>Monolopia congdonii</i>	FE, RPR, 1B	Chenopod scrub and valley and foothill grassland. Alkaline or loamy plains; sandy soils, often with grasses and within chenopod scrub. 60-800 m.		●
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	RPR, 1B	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales; adobe or alkaline soils. 5-950 m.	●	●
few-flowered navarretia <i>Navarretia leucocephala</i> ssp. <i>pauciflora</i>	FE, ST, RPR, 1B	Vernal pools. Volcanic ash flow, and volc substrate vernal pools. 400-855 m.		●
pincushion navarretia <i>Navarretia myersii</i> ssp. <i>myersii</i>	RPR, 1B	Vernal pools, valley and foothill grassland. Clay soils within nonnative grassland. 20-330 m.		●
Marin County navarretia <i>Navarretia rosulata</i>	RPR, 1B	Closed-cone coniferous forest, chaparral. Dry, open rocky places; can occur on serpentine. 200-635 m.		●
Colusa grass <i>Neostapfia colusana</i>	FT, SE, RPR, 1B	Vernal pools. Usually in large, or deep vernal pool bottoms; adobe soils. 5-110 m.	●	●
Antioch Dunes evening-primrose <i>Oenothera deltoides</i> ssp. <i>howellii</i>	FE, SE, RPR, 1B	Interior dunes. Remnant river bluffs and sand dunes east of Antioch. 0-30 m.		●
San Joaquin Valley Orcutt grass <i>Orcuttia inaequalis</i>	FT, SE, RPR, 1B	Vernal pools. 30-755 m.	●	

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
slender Orcutt grass <i>Orcuttia tenuis</i>	FT, SE, RPR, 1B	Vernal pools. 30-1735 m.		●
Sacramento Orcutt grass <i>Orcuttia viscid</i>	FE, SE, RPR, 1B	Vernal pools. 30-100 m.		●
Sonoma beardtongue <i>Penstemon newberryi</i> var. <i>sonomensis</i>	RPR, 1B	Chaparral. Crevices in rock outcrops and talus slopes. 180-1390 m.		●
bearded popcornflower <i>Plagiobothrys hystriculus</i>	RPR, 1B	Vernal pools, valley and foothill grassland. Wet sites. 10-50 m.	●	●
Calistoga popcornflower <i>Plagiobothrys strictus</i>	FE, ST, RPR, 1B	Broadleafed upland forest, meadows and seeps, valley and foothill grassland, vernal pools. Alkaline sites near thermal springs and on margins of vernal pools in heavy, dark, adobe-like clay. 90-160 m.		●
Napa blue grass <i>Poa napensis</i>	FE, SE, RPR, 1B	Meadows and seeps, valley and foothill grassland. Moist alkaline meadows fed by runoff from nearby hot springs. 100-125 m.		●
Marin knotweed <i>Polygonum marinense</i>	RPR 3	Marshes and swamps. Coastal salt marshes and brackish marshes. 0-10 m.	●	●
California beaked-rush <i>Rhynchospora californica</i>	RPR, 1B	Bogs and fens, marshes and swamps, lower montane coniferous forest, meadows and seeps. Freshwater seeps and open marshy areas. 45-1000 m.		●
Sanford's arrowhead <i>Sagittaria sanfordii</i>	RPR, 1B	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-610 m.	●	●
marsh skullcap <i>Scutellaria galericulata</i>	RPR 2	Marshes and swamps, lower montane coniferous forest, meadows and seeps. Swamps and wet places. 0-2100 m.		●
side-flowering skullcap <i>Scutellaria lateriflora</i>	RPR 2	Meadows and seeps, marshes and swamps. Wet meadows and marshes. In the delta, often found on logs. -3-500 m.		●
chaparral ragwort <i>Senecio aphanactis</i>	RPR 2	Cismontane woodland, coastal scrub. Drying alkaline flats. 20-575 m.	●	
Napa checkerbloom <i>Sidalcea hickmanii</i> ssp. <i>napensis</i>	RPR, 1B	Chaparral. Rhyolitic substrates. 415-610 m.		●

Table 5-1 CNDDB Occurrences for Special-Status Plant Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Keck's checkerbloom <i>Sidalcea keckii</i>	FE, RPR, 1B	Cismontane woodland, valley and foothill grassland grassy slopes in blue oak woodland. 180-425 m.	●	●
marsh checkerbloom <i>Sidalcea oregana</i> ssp. <i>hydrophila</i>	RPR, 1B	Meadows and seeps, riparian forest. Wet soil of streambanks, meadows. 545-2300 m.		●
Socrates Mine jewel-flower <i>Streptanthus brachiatus</i> ssp. <i>brachiatus</i>	RPR, 1B	Chaparral, closed-cone coniferous forest. Serpentine areas and serpentine chaparral. 480-970 m.		●
green jewel-flower <i>Streptanthus hesperidis</i>	RPR, 1B	Chaparral, cismontane woodland. Openings in chaparral or woodland; serpentine, rocky sites. 130-760 m.		●
slender-leaved pondweed <i>Stuckenia filiformis</i>	RPR 2	Marshes and swamps. Shallow, clear water of lakes and drainage channels. 15-2310 m.	●	
Suisun Marsh aster <i>Symphyotrichum lentum</i>	RPR, 1B	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with <i>phragmites</i> , <i>scirpus</i> , blackberry, <i>typha</i> , etc. 0-3 m.	●	●
Napa bluecurls <i>Trichostema ruygtii</i>	RPR, 1B	Cismontane woodland, chaparral, valley and foothill grassland, vernal pools, lower montane coniferous forest. Often in open, sunny areas. Also has been found in vernal pools. 30-590 m.	●	●
showy rancheria clover <i>Trifolium amoenum</i>	FE, RPR, 1B	Valley and foothill grassland, coastal bluff scrub. Sometimes on serpentine soil, open sunny sites, swales. Most recently sited on roadside and eroding cliff face. 5-560 m.	●	●
saline clover <i>Trifolium hydrophilum</i>	RPR, 1B	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0-300 m.	●	●
coastal triquetrella <i>Triquetrella californica</i>	RPR, 1B	Coastal bluff scrub, coastal scrub valley and foothill grasslands. Grows within 30 m from the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, rocky slopes,		●
Crampton's tuctoria or Solano grass <i>Tuctoria mucronata</i>	FE, SE, RPR, 1B	Vernal pools, valley and foothill grassland. Clay bottoms of drying vernal pools and lakes in valley grassland. 5-10 m.	●	●
oval-leaved viburnum <i>Viburnum ellipticum</i>	RPR 2	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1400 m.		●

1A = plants believed to be extinct in California

1B = plants rare or endangered in California and elsewhere

2 = plants rare or endangered in California, but more common elsewhere

3 = plants for which more information is needed

FE = federally listed as endangered

FT = federally listed as threatened

RPR = state Rare Plant Rank

SE = listed by California as endangered

SR = listed by California as rare

ST = listed by California as threatened

Table 5-2 CNDDDB Occurrences for Special-Status Wildlife Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
Invertebrates				
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	●	●
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	●	●
valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	●	●
Delta green ground beetle <i>Elaphrus viridis</i>	FT	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis AFB. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25-100% cover.	●	
vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE	Inhabits vernal pools and swales in the Sacramento valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	●	●
California freshwater shrimp <i>Syncaris pacifica</i>	FE, SE,	Endemic to Marin, Napa, and Sonoma Counties. Found in low elevation, low gradient streams where riparian cover is moderately shallow pools away from main streamflow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.		●
Amphibians				
California tiger salamander <i>Ambystoma californiense</i>	FT, ST, SSC	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma Counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding	●	●
foothill yellow-legged frog <i>Rana boylei</i>	SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	●	●

Table 5-2 CNDDDB Occurrences for Special-Status Wildlife Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
California red-legged frog <i>Rana draytonii</i>	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	●	●
western spadefoot <i>Spea hammondi</i>	SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.		●
Reptiles				
western pond turtle <i>Emys marmorata</i>	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, be need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	●	●
giant garter snake <i>Thamnophis gigas</i>	FT, ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	●	●
Birds				
tricolored blackbird <i>Agelaius tricolor</i>	SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	●	●
grasshopper sparrow <i>Ammodramus savannarum</i>	SSC	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	●	
golden eagle <i>Aquila chrysaetos</i>	FP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	●	●
short-eared owl <i>Asio flammeus</i>	SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	●	

Table 5-2 CNDDDB Occurrences for Special-Status Wildlife Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
burrowing owl <i>Athene cunicularia</i>	SSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	●	●
Swainson's hawk <i>Buteo swainsoni</i>	SSC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	●	●
western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT, SSC	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.		●
mountain plover <i>Charadrius montanus</i>	SSC	Short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms short vegetation, bare ground and flat topography. Prefers grazed areas and areas with burrowing rodents.	●	●
northern harrier <i>Circus cyaneus</i>	SSC	Coastal salt and fresh-water marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	●	●
western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FC, SE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.		●
black swift <i>Cypseloides niger</i>	SSC	Coastal belt of Santa Cruz and Monterey County; central and southern Sierra Nevada; San Bernardino and San Jacinto Mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; foraging		●
white-tailed kite <i>Elanus leucurus</i>	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	●	●
American peregrine falcon <i>Falco peregrinus anatum</i>	SSC	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	●	●

Table 5-2 CNDDDB Occurrences for Special-Status Wildlife Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	SSC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	●	●
bald eagle <i>Haliaeetus leucocephalus</i>	SE	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.		●
yellow-breasted chat <i>Icteria virens</i>	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.	●	
California black rail <i>Laterallus jamaicensis coturniculus</i>	ST	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that does not fluctuate during the year and dense vegetation for nesting habitat.	●	●
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	SSC	Resident of brackish-water marshes surrounding Suisun Bay. Inhabits cattails, tules and other sedges, and salicornia; also known to frequent tangles bordering sloughs.	●	●
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	SSC	Resident of salt marshes along the north side of San Francisco and San Pablo Bays. Inhabits tidal sloughs in the salicornia marshes; nests in grindelia bordering slough channels.	●	●
purple martin <i>Progne subis</i>	SSC	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly, also in human-made structures. Nest often located in tall, isolated tree/snag.		●
California clapper rail <i>Rallus longirostris obsoletus</i>	FE, SE	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	●	●
bank swallow <i>Riparia</i>	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.		●

Table 5-2 CNDDDB Occurrences for Special-Status Wildlife Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
California least tern <i>Sternula antillarum browni</i>	FE, SE	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	●	
least Bell's vireo <i>Vireo bellii pusillus</i>	FE, SE	Summer resident of southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, baccharis, mesquite.		●
yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects such as odonata are abundant, nesting timed with maximum emergence of aquatic insects.		●
Mammals				
pallid bat <i>Antrozous pallidus</i>	SSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	●	●
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	SSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.		●
western red bat <i>Lasiurus blossevillii</i>	SSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	●	●
salt-marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE, SE	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.	●	●
Suisun shrew <i>Sorex ornatus sinuosus</i>	SSC	Tidal marshes of the northern shores of San Pablo and Suisun Bays. Require dense low-lying cover and driftweed and other litter above the mean high tide line for nesting and foraging.	●	

Table 5-2 CNDDDB Occurrences for Special-Status Wildlife Species in the Solano County Mosquito Abatement District Program Area

Species Name	Status	Habitat	Solano County (Service Area)	Adjacent Program Area Counties
salt-marsh wandering shrew <i>Sorex vagrans halicoetes</i>	SSC	Salt marshes of the south arm of San Francisco Bay. Medium high marsh 6-8 ft above sea level where abundant driftwood is scattered among salicornia.		●
American badger <i>Taxidea taxus</i>	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	●	●

1A = plants believed to be extinct in California

1B = plants rare or endangered in California and elsewhere

2 = plants rare or endangered in California, but more common elsewhere

3 = plants for which more information is needed

FE = federally listed as endangered

FT = federally listed as threatened

RPR = state Rare Plant Rank

SE = listed by California as endangered

SR = listed by California as rare

ST = listed by California as threatened



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R-CVRWQCB



Central Valley Regional Water Quality Control Board

12 May 2014

RECEIVED

MAY 13 2014

Jon Blegen
Solano County Mosquito Abatement District
2950 Industrial Court
Fairfield, CA 94533-6500

STATE CLEARING HOUSE

CERTIFIED MAIL
13 2250 0000 3465 9885

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, INTEGRATED MOSQUITO MANAGEMENT PROGRAM PROGRAMMATIC EIR PROJECT, SCH# 2012052070, SOLANO COUNTY

Pursuant to the State Clearinghouse's 30 April 2014 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environmental Impact Report* for the Integrated Mosquito Management Program Programmatic EIR Project, located in Solano County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

1

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

KARL E. LONGLEY ScD, P.E., CHAIR | FANELA G. CREEDON P.E., BOEE EXECUTIVE OFFICER
11020 Sun Center Drive #200, Rancho Cordova, CA 95670 | www.waterboards.ca.gov/centralvalley

RECYCLED PAPER

R-CVRWQCB

Integrated Mosquito Management
Program Programmatic EIR Project
Solano County

- 2 -

12 May 2014

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits¹

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

2

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

3

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

4

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

¹ Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit, or any other federal permit, is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

5

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

6

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Low or Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

7

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

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Integrated Mosquito Management
Program Programmatic EIR Project
Solano County

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12 May 2014

If you have questions regarding these comments, please contact me at (916) 464-4684 or
tcleak@waterboards.ca.gov.



Trevor Cleak
Environmental Scientist

cc: State Clearinghouse Unit, Governor's Office of Planning and Research, Sacramento

RESPONSE R-CVRWQCB

**Central Valley Regional Water Quality
May 12, 2014**

Trevor Cleak, Environmental Scientist

1

The District does not need to apply for a Construction Storm Water General Permit because it does not anticipate engaging in ground disturbing activities as part of a development project or any other activity that may potentially disturb one or more acres of soil. Neither the physical control work that is done to maintain water circulation in existing drainage channels nor the minor vegetation removal that is done to access an area on foot to monitor mosquito presence and abundance would result in a discharge of sediment to adjacent waterways.

2

The MS4 Permit is not required because the District is not engaged in land development or redevelopment that could generate runoff into adjacent waterways.

3

District activities at industrial sites are limited to surveillance and control of mosquito breeding habitat in adjacent waterways and water bodies. These activities would not result in an increase in storm water flows from industrial sites.

4

Concerning a CWA Section 404 permit, because the District may remove silt and accumulated materials in navigable waters and wetlands, the District has obtained a 5-year regional permit from the USACE in the past that needs to be renewed pending completion of this PEIR. See Section 2.8.1.4 of the Draft PEIR. We do not anticipate that our channel maintenance activities will require a Streambed Alteration permit from the USFWS. Mosquito control work performed within the San Pablo Bay National Wildlife Refuge is done in coordination with the USFWS.

5

Concerning a CWA Section 401 permit, this has not been required in the past. However, as a reviewing agency for the Section 404 permit, the Central Valley Water Board can determine if this water quality certification is required. The District will apply for the permit if required.

6

The District is not proposing to discharge wastewater to any waters of the State at this time. Therefore, WDRs are not required for mosquito abatement activities.

7

The District does not propose to engage in construction dewatering in the foreseeable future, so this type of general NPDES permit is not applicable. However, see Sections 2.8.1.2 and 2.8.1.3 of the Draft PEIR on the NPDES permits applicable for the discharge of pesticides for vector and aquatic weed control.

R-DPC

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY

EDMUND G. BROWN, JR., Governor

DELTA PROTECTION COMMISSION

2101 Stone Blvd., Suite 210
West Sacramento, CA 95691
Phone (916) 375-4800 / FAX (916) 376-3962
Home Page: www.delta.ca.gov



Contra Costa County Board of Supervisors

June 13, 2014

Sacramento County Board of Supervisors

Jon Blegen
Solano County Mosquito Abatement District
2950 Industrial Court
Fairfield, California 94533

San Joaquin County Board of Supervisors

Solano County Board of Supervisors

SUBJECT: Integrated Mosquito Management Program PEIR
(SCH2012052070)

Yolo County Board of Supervisors

Dear Mr. Blegen:

Cities of Contra Costa and Solano Counties

Delta Protection Commission (Commission) staff have reviewed the proposed Integrated Mosquito Management Program (Project). As part of the Project is located within the Primary Zone of the Legal Delta, it must be consistent with our Land Use and Resource Management Plan (LURMP). After careful review we have determined that the Project is consistent with our LURMP and associated goals to reduce and control mosquito breeding in the Delta.

Cities of Sacramento and Yolo Counties

Cities of San Joaquin County

Central Delta Reclamation Districts

North Delta Reclamation Districts

South Delta Reclamation Districts

CA State Transportation Agency

CA Department of Food and Agriculture

CA Natural Resources Agency

CA State Lands Commission

Sincerely,

Erik Vink
Executive Director



RESPONSE R-DPC

**Delta Protection Commission
June 13, 2014**

Erik Vink, Executive Director

1

Comment noted and considered. No response is needed.

3 Revisions to Draft PEIR

3.1 Introduction

This chapter presents minor revisions to text and Appendices A and B based on errors/errata discovered by the Draft PEIR preparers and/or District staff and changes made in response to agency comments. Some additional information was added to clarify or update information received since the Draft PEIR was distributed in April 2014. None of these text changes or additions result in any changes to the conclusions and determinations of significant impact. In other words, no “less than significant” impacts were changed to “potentially significant” or “significant and unavoidable” impacts.

3.2 Text Revisions in Response to District Identified Errors and Omissions/Clarifications

The sections below explain both content clarifications and typographical and transcriptional errors that were identified since the public release of the Solano County Mosquito Abatement District’s Integrated Mosquito Management Program, Draft Programmatic EIR. All page numbers refer to the Draft PEIR released in April 2014. Material to be added is underlined; material to be deleted is shown with ~~strikethrough font~~.

3.2.1 Summary

Section S.5.1 Proposed Program

On page S-4, the terminology “special-status species” should be defined in a footnote as follows: Special-status species (a.k.a. sensitive species) are those listed as endangered, threatened or candidate species under the federal Endangered Species Act (ESA), endangered or threatened under the California Endangered Species Act (CESA), or listed as a species of special concern by the State.

Section S.5.3 Environmentally Superior Alternative

On page S-8, sentences are added and minor edits are made to the last paragraph:

From a biological resource perspective, elements of the Physical Control Alternative dealing with drainage control in aquatic habitats and with Vegetation Management’s potential conflicts with HCP/NCCPs would not make these environmentally superior alternatives. Protection of surface and groundwater resources mean components of the Vegetation Management and Chemical Treatment Alternatives would not make these alternatives environmentally superior. To the extent the District can modify elements of these three alternatives to avoid identified impacts and lessen mitigation requirements, without increasing reliance on elements with greater potential for environmental impacts, then the environmentally superior alternative would be a complete Program of all five alternatives by incorporating modifications to these three alternatives as components of the overall control Program: Physical Control, Biological Control, and Chemical Control Alternatives. Alternatively, the decision on which alternative to employ at a specific site or location could reflect use of a different alternative than the one initially planned for the site. For example, if a special-status species is located or likely to be present at the site where physical control through draining was to be used for mosquito control, then another option would be to avoid the draining activity and use a larvicide instead. See Section 15.4.3 for a discussion of a Program based on the Reduced Physical Control, Reduced Biological Control, and Reduced Chemical Control Alternatives. The District could select any or all of the three “reduced alternatives” as part of the overall Program.

Section S.6 Summary of Environmental Impacts and Mitigation Measures

In Table S-2 for physical control, Impact AR-4 and subsequent mitigation measures are modified on pages S-13 and S-14 as follows consistent with the changes reported to the sections in the PEIR text.

Impact AR-4. Draining areas of shallow freshwater habitats would have a **potentially significant but mitigable** impact on special-status species including amphibians, if these species are present when the habitat is drained.

Mitigation Measure AR-4: The District will coordinate with appropriate resource agency personnel, whenever a habitat treatment is under consideration in an area potentially supporting special-status species, as indicated by the California Natural Diversity Database, Calfish.org, NOAA Fisheries, and USFWS websites. If shallow freshwater habitats associated with natural waterways where ~~sensitive~~ special-status species could be present need ~~to be drained~~, the District will schedule such activity at a time of year when these species are absent from the treatment site. In the event that such activity cannot be postponed, or must be performed in habitat that has the potential for continuous occupancy, the District will have a qualified biologist conduct surveys to determine if sensitive special-status fish and amphibian species are present. This treatment would be avoided where sensitive special-status species are present.

To clarify, before proceeding with a project to drain a wetland, marsh or other habitat area, the District will retain a qualified biologist to conduct a site-specific biological survey to determine if special-status species are present. The District will determine the survey scope and protocols and the qualifications of the biologist on a case-by-case basis depending upon the location and circumstances of the particular project. If the survey determines that special-status species are present and would be impacted by the draining, then the District will not proceed with the draining project.

These changes also apply to Mitigation Measure AR-5 for seasonal wetlands, Mitigation Measure AR-7 for freshwater marshes and seasonal wetlands managed as waterfowl habitat, and Mitigation Measure AR-9 for saline and brackish habitats.

Mitigation Measure AR-14: To avoid conflicts with the provisions of an HCP/NCCP, the District will determine whether any of its treatment areas lie within the boundaries of an HCP/NCCP. Prior to application of any treatments, excluding surveillance monitoring, the District will review the requirements of the HCP/NCCP and determine whether this activity will conflict with the provisions of that HCP/NCCP. The District will work with the HCP/NCCP holder and appropriate regulatory agencies to identify and implement alternatives to avoid or minimize any potential impacts to a species or habitat protected by the HCP/NCCP. Such determination will be documented and relayed to the HCP/NCCP holder and the regulating entity (USFWS, NOAA Fisheries, CDFW). If agreement cannot be reached on measures to avoid or minimize impacts, then the physical control activity will not be performed and control will be achieved using other Program alternatives.

In Table S-3 for vegetation management, Mitigation Measure AR-16 on page S-16 needs to be revised to be consistent with Mitigation Measure AR-14 above.

Mitigation Measure AR-16: To avoid conflicts with the provisions of an HCP/NCCP, the District will determine whether any of its treatment areas lie within the boundaries of an HCP/NCCP. Prior to application of any treatments, excluding surveillance monitoring, the District will review the requirements of the HCP/NCCP and determine whether this activity will conflict with the provisions of that HCP/NCCP. The District will work with the HCP/NCCP holder and appropriate regulatory agencies to identify and implement

alternatives to avoid or minimize any potential impacts to a species or habitat protected by the HCP/NCCP. Such determination will be documented and relayed to the HCP/NCCP holder and the regulating entity (USFWS, NOAA Fisheries, CDFW). If agreement cannot be reached on measures to avoid or minimize impacts, then the vegetation control activity will not be performed and control will be achieved using other Program alternatives.

In Table S-5 for chemical control, Mitigation Measure AR-25 on page S-21 needs to be modified to be consistent with the changes in previous mitigation measures for other alternatives.

Mitigation Measure AR-25: To avoid conflicts with the provisions of an HCP/NCCP, the District will determine whether any of its treatment areas lie within the boundaries of an HCP/NCCP. Prior to application of any treatments, excluding surveillance monitoring, the District will review the requirements of the HCP/NCCP and determine whether this activity will conflict with the provisions of that HCP/NCCP. The District will work with the HCP/NCCP holder and appropriate regulatory agencies to identify and implement alternatives to avoid or minimize any potential impacts to a species or habitat protected by the HCP/NCCP. Such determination will be documented and relayed to the HCP/NCCP holder and the regulating entity (USFWS, NOAA Fisheries, CDFW). If agreement cannot be reached on measures to avoid or minimize impacts, then the chemical control activity will not be performed and control will be achieved using other Program alternatives.

Mitigation measures on pages S-22 and S-24 are modified as follows consistent with the changes reported to the sections in the PEIR text.

Mitigation Measure WR-16a: Application of permethrin would occur only when other IMM options have been exhausted. Alternative mosquito adulticides ~~should~~ would be considered whenever possible.

Mitigation Measure 16b: Application of ~~these~~ this chemicals would not occur in locations where receiving waters are 303(d) listed for pyrethroids or sediment toxicity. Consistent with the District's current IMM plan, application of chemicals would occur only when other IPM options have been exhausted. Because permethrin has relatively high toxicity and persistence in comparison to other pyrethroids, the District's current IMM plan will be updated to give lower priority to the use of permethrin than other pyrethroids in instances requiring chemical control. Permethrin use will be reserved for specific cases where alternative pesticides would not be as effective. Prior to chemical applications, the location of the application area will be reviewed with respect to proximity to impaired water bodies. Application of permethrin would not be conducted in locations where receiving waters are 303(d) listed for pyrethroids or sediment toxicity.

Mitigation Measure WR-16c: If application of permethrin must be conducted in locations where receiving waters are 303(d) listed for pyrethroids or sediment toxicity, then the ULV application method would be employed. When applied in accordance with ULV label instructions, studies have shown rapid dissipation, low persistence, and no observed aquatic fish and invertebrate toxicity following aerial ULV applications (Appendix B). Although one study found higher levels of permethrin on the surface microlayer of the waterbody, corresponding water samples did not contain detected residues, and higher surface microlayer concentrations were not correlated with toxic effects in the waterbody. Permethrin use is restricted to situations when it is absolutely necessary and in ULV applications that are designed to have the ingredients degrade rapidly and, thus, reduce the potential for impacts to nontarget ecological receptors.

Under 10, Air Quality, the following has been added to mitigation for **Impact AQ-25**, preceding Mitigation Measure AQ 25a: To mitigate Impact AQ-25, the District and its contractors will implement one or more of the following measures as applicable to the

specific application situation to reduce drift towards human populations/residences from the ground and aerial applications of odorous treatment compounds:

Impact WR-19 on the use of resmethrin is deleted from the Final PEIR and CEQA subsequent documents because it will not be used in 2016 and beyond.

3.2.2 Chapter 1, Introduction

Revisions are made as indicated to the following Sections of the Draft PEIR.

Section 1.1.3 Legislative and Regulatory Actions

On page 1-3, the subheading needs to be added: 1.1.3.1 State Regulation.

On page 1-4, at the end of the section, the following material is added:

On September 20, 2014, Section 1506 of the Fish and Game Code, relating to wildlife management, was approved (known as AB 896, Eggman). It clarifies the intent of the Legislature to control mosquito production on managed wetland habitat owned or managed by CDFW and to increase coordination and communication between CDFW, local mosquito abatement and vector control districts, and CDPH.

Subheading 1.1.3.1.1 on the Cooperative Agreement should be renumbered to 1.1.3.2, and Section 1.1.3.1.2 on the Pesticide Regulatory Program should be renumbered 1.1.3.3.

Section 1.5.2 Biological Resources-Aquatic

On page 1-11 at the top, the use of the term species should be revise to special-status species and then should be defined in a footnote as follows: Special-status species (a.k.a. sensitive species) are those listed as endangered, threatened or candidate species under the federal Endangered Species Act (ESA), endangered or threatened under the California Endangered Species Act (CESA), or listed as a species of special concern by the State.

Section 1.8 Use of This PEIR for Future CEQA Compliance

Beginning on page 1-17, the entire section is deleted and replaced with the following edited and expanded section. Table 1-1 is not underlined for clarity and was included in the original language.

This PEIR evaluates the potential environmental impacts associated with the District's current Program and its future Program when the activities and materials can be identified at present. For activities and materials not within the current Program that could be proposed at a future date to be included in the District's IMMP ("future activities"), the District will evaluate whether the proposed action or material was within the scope of the Program evaluated within the PEIR and whether additional environmental documentation is required. In making this determination, the District will first determine whether the activity would result in environmental effects that were not considered in the PEIR. If the subsequent activity involved site-specific operations, the District will evaluate the site and the activity to determine whether the environmental effects were covered in the PEIR and document its findings. Second, the District will evaluate the proposed activity or material to determine whether any new environmental effects could occur, or new mitigation measures would be required, due to changes in the activity or changes in the circumstances under which it is undertaken. If the District determines that the future activity is within the scope of the Program examined in the PEIR that no new effects that were not examined in the PEIR could occur, and that no new information shows that new mitigation measures or alternatives are required, the District may approve the activity as being within the scope of the PEIR, and no new environmental documentation is required. (CEQA Guidelines Section 15168(c)(1)-(2))

If the District determines that the future activity was not within the scope of the Program evaluated in the PEIR, the action will be considered a “new action.” The District will determine whether the new action would result in environmental effects that were not examined in the PEIR by preparing an initial study. The initial study will be the basis for determining whether the effects of the new action require an EIR or a negative declaration. (CEQA Guidelines Section 15168(c)(1). A subsequent or supplemental EIR could be required if any of the following occur (CEQA Guidelines Section 15162[c]):

- > Substantial changes proposed for the District’s IMMP would require major revisions to this PEIR because of new significant environmental impacts that cannot be mitigated below a level of significance or a substantial increase in the severity of the previously identified significant impacts in this PEIR.
- > Substantial changes to the circumstances under which the District’s IMMP is undertaken would require major revisions to this PEIR because of new significant environmental impacts that could not be mitigated below a level of significance or a substantial increase in the severity of the identified significant impacts in this PEIR.
- > New information of substantial importance that could not have been known at the time the PEIR was certified shows significant effects not discussed in this PEIR that cannot be mitigated below a level of significance; significant effects would be substantially more severe; mitigation measures found to be infeasible in this PEIR would, in fact, be feasible and substantially reduce one of more significant effects, but the District decides not to adopt them; or mitigation measures or alternatives are identified that are considerably different from those analyzed in this PEIR that would substantially reduce one of more significant effects, but the District decides not to adopt them.

The specific process the District will follow to ensure CEQA compliance as it moves forward implementing its Program is explained in greater detail below. This PEIR evaluates the potential environmental impacts associated with the District’s current Program and its future Program when the activities and materials can be identified at present. For activities and materials not within the current Program that are proposed at a future date to be included in the District’s IMMP, the District will evaluate whether the proposed activity or material was within the scope of the Program evaluated within the PEIR and whether additional environmental documentation is required. Future activities not within the scope of the Program evaluated in the PEIR are considered “new actions” and may be subject to future environmental review under CEQA. All new actions will be subject to the District’s BMPs and may be subject to mitigation measures identified in the PEIR, as appropriate, including new mitigation measures that may be identified as being necessary through potential future CEQA review. This section provides more information about the process by which the District will determine whether future activities are within the scope of the Program and the PEIR. The evaluation process for future activities is organized under two categories: chemical treatment and nonchemical treatment.

Section 1.8.1 Future Chemical Treatments

All pesticides in current use have been evaluated in the PEIR (mostly under the Chemical Control Alternative), including the supporting Appendix B, Ecological and Human Health Assessment Report, along with a number of pesticides not currently in use but with the potential for use in the foreseeable future. A similar scenario occurs for herbicides. The herbicides most likely to be used are addressed under the Vegetation Management Alternative in this PEIR. Future formulations are likely to include ingredients already evaluated in this PEIR, as summarized below following the summary of the contents of Appendix B and materials that are exempt from USEPA reporting and use requirements.

Section 1.8.1.1 Appendix B Summary and Exempt Materials

The PEIR’s Appendix B reports on the evaluation of 42 pesticide (insecticides and herbicides) active ingredients and 4 adjuvants, for a total of 46 chemical ingredients used in 57 insecticides and 36 herbicides. An adjuvant is any compound that is added to an herbicide/pesticide formulation or tank mix to facilitate the mixing, application, or effectiveness of that herbicide/pesticide. The actual pesticide formulations used by the District are listed by active ingredient in the PEIR text Table 6-1 (insecticides) and Table 6-2 (herbicides). The PEIR also considers materials such as PBO, which acts as a synergist. Synergists are chemicals that primarily enhance the pesticidal properties of other active ingredients, such as pyrethrins and synthetic pyrethroids. No pesticide products contain only PBO.

Most chemicals produced for general or specialized uses are subject to a rigorous suite of dozens of laboratory and field tests to evaluate the relative toxicity of the ingredient(s) in the product proposed for use. As a result of the testing, the chemical is given one of four USEPA toxicity categories ranging from highly toxic to practically nontoxic (Category I - *highly toxic and severely irritating*; Category II - *moderately toxic and moderately irritating*; Category III - *slightly toxic and slightly irritating*; and Category IV - *practically nontoxic and not an irritant*). The tests used to develop these categories are designed to address potential toxicity to humans, but also to address the potential toxicity to nontarget aquatic and terrestrial species. Table 1-1 presents the USEPA toxicity categories for human health risk assessments.

Table 1-1 USEPA Toxicity Categories

Toxicity Study	Category I High Toxicity	Category II Moderate Toxicity	Category III Low Toxicity	Category IV Very Low Toxicity
Acute Oral	Up to and including 50 mg/kg	> 50 thru 500 mg/kg	> 500 thru 5,000 mg/kg	> 5,000 mg/kg
Acute Dermal	Up to and including 200 mg/kg	> 200 thru 2,000 mg/kg	> 2,000 thru 5,000 mg/kg	> 5,000 mg/kg
Acute Inhalation	Up to and including 0.05 mg/L	> 0.05 thru 0.5 mg/L	> 0.5 thru 2 mg/L	> 2 mg/L
Eye Irritation	Corrosive (Irreversible destruction of ocular tissue) or corneal involvement or irritation persisting for more than 21 days	Corneal involvement or irritation clearing in 8 to 21 days	Corneal involvement or irritation clearing in 7 days or less	Minimal effects clearing in less than 24 hours
Skin Irritation	Corrosive (tissue destruction into the dermis and/or scarring)	Severe irritation at 72 hours (severe erythema or edema)	Moderate irritation at 72 hours (moderate erythema)	Mild or Slight irritation (no irritation or slight erythema)

Note:

kg” is the body weight in kilograms as a universal metric for a reference. The toxicity is a function of the milligrams per kilogram (mg/kg) of body weight that elicits the noted response.

mg/L = milligram(s) per liter

USEPA also maintains a list of exempt and partially exempt chemicals for which the Chemical Data Reporting (CDR processing and use information is of "low current interest" and are listed in the USEPA CDR website and in the Federal Register at 40 Code of Federal Regulations [CFR] 711.6[b][2][iv]). Manufacturers of the chemicals in this category are exempt from reporting the processing and use information required and as defined by 40 CFR 711.15(b)(4).

The general category of exempt chemicals includes many culinary oils, specialized uses of common extracts of plants, and some chemicals consumed as food items, to name only a few. USEPA, at any time however, may amend the list of partially exempt chemicals on its own initiative or in response to a request from the public. The public may submit a petition to request that a chemical be added to or removed from the partial exemption.

Section 1.8.1.2 Future Formulations

Future formulations are likely to be based on the existing active ingredients, adjuvants, surfactants, and synergists, and would be expected to have toxicity and potential effects similar to those reported in this PEIR. When considering a new pesticide formulation for use, the District will implement the following procedures to determine whether the information in this PEIR is applicable and sufficient to support the same conclusions on potential environmental impacts to human and ecological health or whether sufficiently different information identified that would mean additional evaluation and analysis under CEQA would be appropriate, prior to its inclusion in the District's IMMP.

1. Obtain the materials safety data sheets and laboratory test information on the new formulation or material from the company producing the product or from the appropriate federal or state regulatory agencies.
2. For the new formulation review, consider whether it is in the same toxicity hazard category as the active ingredients, adjuvants, and synergists addressed in this PEIR, or whether it has been classified as exempt by USEPA. The general toxicity hazard categories for humans, mammals, birds, fish, aquatic invertebrates, honeybees, and other receptors are found in Appendix B, Table 4-1 of the PEIR:
 - a. Very Low
 - b. Low
 - c. Moderate
 - d. High
 - e. Nontoxic
3. If reported toxicity is similar to, or less than, the related formulation or material addressed in Appendix B, and the District does not have any evidence that the formulation or material would result in new significant impacts, or substantially more severe impacts, on human health and on ecological health that were not disclosed in the PEIR, then the District can reasonably proceed to make the finding that the information contained in the PEIR is sufficient to support a finding that no additional analysis under CEQA is required.
4. If the ingredients in the formulation have been classified as Exempt by USEPA, the District will independently review and evaluate the ingredients and product for efficacy and potential nontarget effects. If after this review, the evidence supports a finding that the new formulation or material will not have a new or substantially more severe significant effect than those included in the PEIR, the District can reasonably proceed to make the finding that no additional analysis under CEQA is required.

5. If the reported toxicity of the new formulation is greater than the reported toxicity in the PEIR for the similar formulation or material, leading to a conclusion that the use of the formulation by the District would result in new or substantially more severe significant impacts than those disclosed in the PEIR, then a subsequent PEIR would be prepared addressing the major revisions needed, or a supplemental PEIR would be prepared addressing any minor revisions needed, to adequately evaluate the new product for incorporation into the District's IMMP.
6. If the new formulation contains ingredients that were not addressed in Appendix B, then an analysis of toxicity hazard will be conducted. If reported toxicity is similar to, or less than, the materials addressed in Appendix B, then the process under Step 3 above would apply. If the new formulation's toxicity is greater than the reported toxicity in the PEIR for similar formulation or material, then Step 5 would apply.

Section 1.8.2 Future Nonchemical Activities

Section 1.8.2.1 Future Nonchemical Activities by District

Future site-specific projects, activities or operations that are not part of the regular and ongoing Program and that are not within the scope of the activities specifically addressed in the PEIR, and that involve physical modification of the environment or potential impacts to special-status plant and animal species ("future activities") would be subject to the following evaluation procedures to determine whether CEQA compliance has been achieved through this PEIR. The steps outlined below would be contained in a "checklist" for use by District staff to document its evaluation of the future activity.

Prior to initiating treatment, the District will conduct the following review to:

- > Evaluate whether the future activities involve new or more severe potential significant environmental effects under the standards of CEQA Guidelines Section 15162.
- > Determine size and location of area to be physically modified or treated to ensure it is within scope of the District's USACE, San Francisco Bay Conservation and Development Commission (BCDC), and California State Water Resources Control Board (SWRCB) permits. These permits require the preparation of annual work plans, and the USACE permit requires maps of the affected areas. The permits are issued after consultation with the appropriate resource agencies (such as CDFW and USFWS) and contain special conditions that address site-specific or species-specific considerations.
- > For a future activity involving physical control or vegetation management, review whether the activity is covered under another agency's (e.g., flood control district, public works or sewerage agency) permit.
- > If the future activity is outside of any of the District or other agency permits, then evaluate whether the activity is an emergency action exempt from CEQA compliance. Emergency actions are not subject to CEQA requirements (CEQA Guidelines Section 15269), so no further CEQA analysis is required. A written evaluation/rationale will be provided in a staff report to District Board of Trustees.
- > If an action is being carried out by a landowner or entity other than the District, and such entity requests that the District conduct such activities on their behalf, then the District will only consider doing so if the entity has satisfied all applicable legal requirements.²

² In these circumstances, the District's decision whether to act may be the only public agency decision if the requesting entity is a private party. In that event, if the District decides to act, it must comply with CEQA. The District may require landowners who request District assistance to pay for any necessary additional environmental work.

- > If the action is not within the scope of the Program evaluated in the PEIR or exempt, then the District would prepare a CEQA Initial Study to determine what type of further environmental review is appropriate (e.g., PEIR addendum, negative declaration, mitigated negative declaration, or supplemental PEIR).

As part of any further environmental review (Initial Study, EIR, etc.), the District will be required to identify any potential impacts to special status species, through the following steps:

- > Check CNDDDB, USFWS, and other databases and studies for the area to determine if special status species or their habitat is present.
- > If suitable habitat is present, do surveys for special-status species, as required.
- > If a special-status species is (are) present, evaluate whether the proposed vector management activity can be scheduled around the species' critical life-stage periods to avoid disturbance.
- > If the proposed vector management activity cannot be scheduled around a special status species' critical life-stage periods and must be performed in order to meet the District service objectives, confirm that the lowest impact effective mosquito management option is proposed for use.

Examples of activities that have not been addressed in a site-specific fashion in this PEIR are the various tidal marsh and riverine restoration projects planned for the North Bay to expand existing state and federal wildlife refuges, including the San Pablo Bay National Wildlife Refuge Sonoma Creek Enhancement Project and the Sears Point Restoration Project. The District is coordinating with the state and federal resource agencies on mosquito and vector management in the refuges.

Section 1.8.2.2 Future Nonchemical Treatments by Landowners/Managers

As part of its mission to protect public health, the District advises landowners and land management agencies about the need for mosquito abatement with regard to their projects or when mosquito issues become an issue on their lands. The District does not manage land directly, as a park district or a property owner would; rather, it provides advice to the land manager/property owner on how to minimize the production of mosquitoes as a vector of human disease and discomfort. The District derives its authority to proactively manage mosquito populations and protect public health from the Mosquito and Vector Control District Law (Health and Safety Code Sections 2000 et seq.). In enacting that law, the California Legislature recognized the importance to public health and the economy of active management of mosquitoes.

Notwithstanding this grant of power, the law does not mandate action by the District and provides that landowners and land managers ultimately are responsible for the abatement of vector populations that breed on their properties and affect public health. (Health & Safety Code, Section 2060.) The District may provide guidance for mosquito abatement activities to landowners. However, it will be the landowner's responsibility to determine and comply with all legal requirements necessary to perform the activity.³ For nonchemical actions that could be taken by landowners/managers at the recommendation of the District, District staff will advise the landowner/manager to consult further with the appropriate city or county planning agency on whether the activity is within the scope of the Program and PEIR, or whether there is a need for further CEQA analysis. If the activity is outside the scope of the Program, it may be necessary for the landowner/manager to conduct a site-specific survey of special status species. Consultations with appropriate resource agencies on survey protocols and any necessary permits would be

³ CEQA applies where there is a discretionary approval of a project by a public agency. If the District is merely advising, and not authorizing an action, its action is not subject to CEQA. However, projects requiring approval by another public agency would be subject to CEQA.

initiated by the landowner/manager prior to conducting the surveys. Because the District's Service Area contains both urban and nonurban properties adjacent to or in close proximity with wildlife management and conservation areas, the need for close coordination with the refuge managers/resource agencies is paramount for such future activities.

The landowner/land manager is responsible for environmental review of physical control/vegetation management site-specific activities such as those proposed for recent marsh restoration and enhancement projects.

In cases outside of the federal wildlife refuges, and where the landowner does not address the mosquito problem, the District is authorized to manage vector populations (Health and Safety Code Section 2040). The District can request inspection and abatement warrants, if needed, to access and inspect properties that may be breeding/have the potential to produce vectors (Health and Safety Code Section 2053). Otherwise, landowner permission to enter is sufficient for the District to enter the property to conduct abatement activity. For example, abandoned swimming pools require immediate attention; if the landowner fails to abate the problem, the District may act. Mosquito abatement activities are often located on private property in urbanized areas that are not expected to provide habitat for special-status species. The District would conduct only the activities addressed in this PEIR. Abatement actions by the District on private property are subject to the BMPs and PEIR mitigation measures, as appropriate. For those activities that are on public property, including parks and open-space areas, or on nonurbanized/undeveloped or "open" private property, where potential exists to encounter habitat for special-status species, the District will follow the BMPs and mitigation measures identified in the PEIR, with the assistance of the landowner and resource agencies wherever possible. The District engages in public education and outreach to advise the landowner on reduction and prevention of mosquito habitats (see Section 2.4 of this PEIR). For discussion of required permits to perform abatement activity (e.g., discharges of pesticides into waters of the United States, whether the site is on or off a USFWS refuge), see Section 2.8.1 of this PEIR.

3.2.3 Chapter 2. Program Description

Section 2.3.2 Physical Control Alternative

On page 2-9, the following text was revised in response to CDFW comment 4.

Major physical control activities or projects beyond the scope of the District's 5-year regional wetlands permit with the United States Army Corps of Engineers (USACE), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and San Francisco Bay Conservation and Development Commission (BCDC) are not identified or known at this time ~~addressed under this PEIR where known and identified.~~

Section 2.3.5.1.2 Mosquito Adulticides

Products containing resmethrin are removed from Table 2-3 on page 2-29, because the District will not be using these products in 2016 and beyond.

Section 2.9 Best Management Practices

On page 2-39, the categories of BMPs are modified as follows.

Subsequent environmental impact assessments in this PEIR reflect the continued use of these measures, which are organized under the following categories:

- > Pesticide Applications to Product Label Requirements
- > Pesticides₁, Surfactants₁, and/or Herbicides Applications ~~with Best Management Practices~~

- > Surveillance and Nonchemical Vector Physical Control Best Management Practices and Vegetation Management
- > Hazardous Materials Spill Management
- > Worker Illness and Injury Prevention Program and Emergency Response.

On Page 2-41, the fourth BMP under Pesticides, Surfactants, and/or Herbicides Applications is replaced as indicated below:

- > ~~Do not apply pesticides that could affect insect pollinators during the day when honeybees are active or at dawn/dusk when other pollinators are active. Applications of these specific pesticides are to occur after dark. Do not apply pesticides that could affect insect pollinators in liquid or spray/fog forms over large areas (more than 0.25 acres) during the day when honeybees are present and active or when other pollinators are active. Applications of these specific spray or fog (i.e., ULV) application pesticides are to occur in areas with no honeybee or pollinator activity or after dark. These treatments may be applied over smaller areas (with hand held equipment), but the technician shall first inspect the area for the presence of bees and other pollinators. If such are present in substantial numbers, the treatment will be made at an alternate time when these pollinators are absent.~~

On page 2-41, the first BMP under BMPs for Surveillance and Nonchemical Physical Control and Vegetation Management has the following clarifying material added based on CDFW Response 5.

- > If suitable habitat necessary for special-status species is found, including vernal pools, and if nonchemical physical and vegetation management control methods have the potential for affecting the potential species, then the District will coordinate with the CDFW, USFWS, and/or NMFS before conducting control activities within this boundary or cancel activities in this area. If the District determines no suitable habitat is present, control activities may occur without further agency consultations.

As part of this BMP, the District also does the following: check databases and other sources to determine if special-status species or their habitat is present, including but not limited to the CNDDDB, other online surveys, and available reports; discuss findings with CDFW biologist (and USFWS and NMFS if applicable); if suitable habitat is present, prior to conducting surveillance activities, ensure that District staff will receive environmental awareness training for potentially affected special-status species; if special-status species are present, evaluate whether the surveillance activity can be scheduled around critical life stage periods; if surveillance can't be scheduled around critical life stage periods, evaluate whether a different surveillance option can be used (e.g., avoid noise-generating equipment, avoid extreme high tides).

3.2.4 Chapter 4, Biological Resources - Aquatic

Section 4.1.2 Special-Status Species

On pages 4-1 and 4-2, the following clarifications are made/added.

A number of special-status species are found in the Program Area. Special-status species are those that are listed as endangered, threatened or candidate species under the federal Endangered Species Act, endangered or threatened under the California Endangered Species Act, or listed as species of special concern by the State of California. ~~Brief life-history descriptions for special-status species represented in~~ See Appendix A, Attachment A, Table A-3. These fish species are listed in Table 4-1.

While amphibians are listed in Table 5-2 in Chapter 5, Biological Resources-Terrestrial, the aquatic lifestages of two special-status species are considered herein.

California tiger salamanders (CTS) require underground refuges, especially ground squirrel burrows, where adults can stay moist and cool for most of the year. Stock ponds, vernal pools or other seasonal water sources with few predators that may be as distant as 1.3 miles away are necessary for breeding and egg laying which is stimulated by the first rains of the season. The tadpoles and larvae feed on zooplankton, aquatic insects and small tadpoles of Pacific tree frogs and CRLF and require 3-6 months before leaving the wetland to find an upland small mammal burrow or other underground refuge.

California red-legged frogs (CRLF) are found in lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. CRLF requires 11-20 weeks of permanent water for larval development. Metamorphosed and adult frogs must have access to estivation habitat and adults may travel up to 1 mile in search of breeding habitat especially on warm damp nights.

Table 4-1 on pages 4-5 and 4-6 is revised to the updated table provided at the end of the response to CDFW comments in Chapter 2 of this Final PEIR document.

Section 4.1.3 Regulatory Setting

The following regulation is added to the federal subsection on page 4-2. It was originally contained in Appendix A and is updated in this section.

> Stipulated Injunction and Order, Protection of California Red-Legged Frog from Pesticides

On October 20, 2006, the US District Court for the Northern District of California imposed no use buffer zones around California red legged frog upland and aquatic habitats for certain pesticides. This injunction and order will remain in effect for each pesticide listed in the injunction until the USEPA goes through formal 7(A)(2) consultation with the USFWS on each of the 66 active ingredients, and the USFWS issues a Biological Opinion including a “not likely to adversely affect” statement for the pesticides. Under the injunction and order, no use buffer zones of 60 feet for ground applications and 200 feet for aerial applications apply from the edge of the following California red legged frog habitats as defined by the USFWS and the Center for Biological Diversity: Aquatic Feature, Aquatic Breeding Habitat, Nonbreeding Aquatic Habitat, and Upland Habitat. These habitats are found in 33 counties of California including Solano County.

Of the 66 pesticides listed in the injunction, the District may employ glyphosate (herbicide), methoprene, and naled for mosquito control. Methoprene is used for larval mosquito control, and naled may be used for adult mosquito control. However, vector control programs are exempt. Specifically, for applications of a pesticide for purposes of public health vector control under a program administered by a public entity, the injunction does not apply. Where glyphosate is used for vegetation management for control of mosquito-breeding habitat, the injunction would not apply. If this herbicide was to be used for invasive species management to assist other agencies or landowners, then the injunction generally applies until such time that the material has been reviewed by USEPA and USFWS determines that it does not apply or the following “exceptions for invasive species and noxious weed programs” can be met:

- a. You are applying a pesticide for purposes of controlling state-designated invasive species and noxious weeds under a program administered by a public entity; and
- b. You do not apply the pesticide within 15 feet of aquatic breeding critical habitat or non-breeding aquatic critical habitat within critical habitat areas, or within 15 feet of aquatic features within non-critical habitat sections subject to the injunction; and
- c. Application is limited to localized spot treatment using hand-held devices; and
- d. Precipitation is not occurring or forecast to occur within 24 hours; and

- e. You are a certified applicator or working under the direct supervision of a certified applicator;
and
- f. If using 2,4-D or triclopyr, you are using only the amine formulations. (USEPA 2014)

Section 4.1.4 Habitat Conservation Plans and Natural Community Conservation Plans

The last paragraph on page 4-2 introduces the HCPs and NCCPs within the Program Area. In response to CDFW Comment 13, the following material highlights the scope of the HCPs and NCCPs most relevant to the District's Service Area in Solano County.

California Department of Corrections Statewide Electrified Fence Project

This HCP was prepared by the California Department of Corrections for their Statewide Electrified Fence Project and addresses mortality or the potential for mortality of special status species and native migratory birds at 25 prisons where lethal electrified fences are operational and 4 future sites where electrified fences are planned. The HCP provides for take of 62 species covered by the federal Endangered Species Act, California Endangered Species Act, or listed as California Species of Concern, along with an additional 57 species covered under the Migratory Bird Treaty Act, but not included in the preceding category. This HCP would apply to the Solano State Prison located in Vacaville within the District's Service Area. As the HCP is confined to the prison sites and specifically to mortality due to electrocution of covered species on those fences, this HCP does not apply to the District's mosquito surveillance and control activities which exclude electrocution of mosquitoes.

Shiloh III

This HCP was prepared by enXco, Inc. to cover the potential impacts of construction of the Shiloh III Wind Project, near Rio Vista, California. The HCP addresses impacts to the central California Distinct Population Segment (DPS) of California tiger salamander (CTS) over an area of 4,600 acres for a period of 36 years. The activities covered under the HCP are the construction and installation of wind turbines and associated facilities, maintenance of these facilities, and decommissioning of these facilities in the future. These activities are anticipated to impact both permanent and temporary loss of CTS habitat. Avoidance and minimization measures (AMMs) include minimizing impact area; avoiding injury to salamanders during implementation; avoiding erosion and sedimentation impacts to habitat; avoidance of toxic spills; restoration of temporarily disturbed habitat; and ensuring AMMs are implemented. Mitigation is to offset unavoidable permanent impacts at an approved conservation bank. The District's activities could occur within the boundaries of this HCP and would not be inconsistent with the AMMs. Note that the District has an Emergency Response Plan to cover small spills which is described in Section 8.1.1 of the Draft PEIR.

Shiloh IV

This HCP was prepared by Shiloh IV Wind Project, LLC to cover the potential impacts of construction of the Shiloh IV Wind Project, near Rio Vista, California. The project covers impacts to the central California DPS of CTS over an area of 3,514 acres for a period of 36 years. The activities covered under the HCP are installation of an operations and maintenance yard, a substation, wind turbines and associated facilities (including access roads), and decommissioning of these facilities in the future. These activities are anticipated to result in both permanent and temporary loss of CTS habitat. Avoidance and minimization measures include minimizing impact area; avoiding injury to salamanders during implementation; avoiding erosion and sedimentation impacts to habitat; avoidance of toxic spills; restoration of temporarily disturbed habitat; and ensuring AMMs are implemented. Mitigation is to offset unavoidable permanent impacts at an approved conservation bank. The District's activities could occur within the boundaries of this

HCP and would not be inconsistent with the AMMs. Note that the District has an Emergency Response Plan to cover small spills which is described in Section 8.1.1 of the Draft PEIR.

Bay Delta Conservation Plan

The Bay Delta Conservation Plan (BDCP) is an HCP being developed as part of California's overall water management portfolio. It is being developed as a 50-year habitat conservation plan with the goals of restoring the Sacramento-San Joaquin River Delta (Delta) ecosystem and securing California water supplies. The plan area encompasses the legal Delta and surrounding areas. It encompasses parts of Solano and Yolo counties (along with Contra Costa, San Joaquin, and Sacramento counties). The activities covered under the BDCP include improvements to water infrastructure facilities in and around the Delta and the protection of approximately 150,000 acres of habitat to address the Delta's environmental challenges. The BDCP includes 22 conservation measures aimed at improving water operations, protecting water supplies and water quality, and restoring the Delta ecosystem within a stable regulatory framework (BDCP 2014).

The BDCP seeks coverage for 56 species and identifies conservation measures designed to contribute to their protection and recovery. The plan includes 67 goals and 165 objectives that form the basis of the conservation strategy, which includes landscape scale, natural community and biological and species- specific goals and objectives. The BDCP also includes 37 AMMs that are incorporated into covered activities to minimize the effects of these actions on various resources. Many of these AMMs focus on minimizing the general environmental effects of construction activities and many others are species- specific AMMs.

AMM 33 Mosquito Management calls for management and control of mosquitoes during construction of project facilities. The HCP Implementation Office will accomplish this AMM through consultation with appropriate mosquito and vector control districts and for the HCP Implementation Office to carry out mosquito control activities as necessary and applicable. The types of mosquito control activities that may be carried out under this AMM include surveillance, biological controls, physical controls, vegetation management, and use of larvicides and adulticides, as necessary. Therefore, the District's IMMP activities are covered under and would be consistent with the BDCP.

Solano Multispecies Habitat Conservation Plan

The Solano Multispecies Habitat Conservation Plan is being developed by the Solano County Water Agency (SCWA) and will cover activities over a plan area of 577,000 acres in Solano County and 8,000 acres in Yolo County. The purpose of the Solano HCP is to: (a) promote the conservation of biological diversity and the preservation of endangered species and their habitats consistent with the recognition of private property rights; (b) provide for a healthy economic environment for the citizens, agriculture, and industries; and (c) allow for the ongoing maintenance and operation of public and private facilities in Solano County. The plan is intended to cover activities undertaken by or under the permitting authority/control of the plan participants. Coverage may also be extended to third parties who fall under the direct regulatory control of the plan parties. The plan covers a number of natural communities and 36 covered species (SCWA 2014). SCMA is not a plan participant and has not requested coverage as a third party to date.

The Solano HCP would set up a reserve system with measurable biological standards to measure the overall success of the HCP conservation program. The plan specifies specific acreages of habitat to be established within the reserve system for different natural habitat types and species. Plan goals and objectives would be accomplished through implementation of AMMs. To obtain coverage under the Solano HCP will require that baseline studies be conducted for any proposed projects, the plan AMMs are implemented, and the mitigation measures of the plan are carried out when impacts do occur. AMMs include general measures for operation, maintenance

and construction activities; habitat and covered species-specific AMMs; and special management species AMMs, with corresponding mitigation requirements for each covered resource.

Section 4.2.4.1 Mosquitoes

On page 4-11, the following information is added to the last sentence of the introductory paragraph, prior to the sections by habitat type.

The District is rarely involved in new drainage projects, and when they are, they consult with the appropriate agencies and acquire all required permits for implementing that work, including, if necessary, any authorization for incidental take of special-status species (for which the permitting agency would require mitigation) for implementing that work, which provides protection for native and special-status fish species.

Section 4.2.4.1.1 Freshwater Habitats and Riparian Areas

On page 4-12, the third paragraph is modified as indicated.

Draining areas of shallow freshwater habitat to reduce the amount of standing water or reduce the amount of time such water remains standing could result in adverse effects to young fish and amphibians using those habitats, leaving fish and tadpoles that cannot vacate the area without water, requiring fish and tadpoles that can leave the area to move to new locations, and reducing the amount of larval rearing habitat present. Where native or special-status fish and amphibian species are not present, these impacts would be negligible. Where native or special-status species are present, these areas could be important nursery areas for young fish and amphibians, depending on location, season, fish and amphibian species present, accessibility for adult fish and amphibians to enter these areas to deposit eggs, and amount of other habitat available to the species.

Because their rapid currents do not provide suitable habitat for mosquitoes, streams and rivers generally do not support substantial numbers of mosquitoes, although, some mosquitoes can be found in slow eddies and back channels, or in pools isolated on the banks as flows recede. Streams and rivers may support ~~sensitive~~ special-status fish species (including steelhead, Chinook salmon, and Sacramento perch) and amphibian species (including CTS, CRLF and foothill yellow legged frog (FYLF)). Isolated ponds and back channels may provide habitat for mosquito larva, but these areas may also provide excellent rearing habitat (i.e., breeding pools) for young fish and amphibians, as they provide warmer water temperatures, higher primary productivity and protection from predaceous fish. Habitat alterations to drain or reconnect such areas should be avoided.

Impact AR-3. Draining areas of shallow freshwater habitats would have a **less-than-significant** impact on aquatic habitats, native fish or aquatic invertebrates, as only a small proportion of such habitat would be drained. No mitigation is required.

Impact AR-4. Draining areas of shallow freshwater habitats would have a **potentially significant but mitigable** impact on special-status species including amphibians, if these species are present when the habitat is drained.

On page 4-15, Mitigation Measure AR-4 and the conclusion are modified as follows.

Mitigation Measure AR-4. The District will coordinate with appropriate resource agency personnel, whenever a habitat treatment is under consideration in an area potentially supporting special-status species, as indicated by the California Natural Diversity Database, Calfish.org, NOAA Fisheries, and USFWS websites. If shallow freshwater habitats associated with natural waterways where ~~sensitive~~ special-status species could be present need to be drained, the District will schedule such activity at a time of year

when these species are absent from the treatment site. In the event that such activity cannot be postponed, or must be performed in habitat that has the potential for continuous occupancy, the District will have a qualified biologist conduct surveys to determine if sensitive special-status fish and amphibian species are present. This treatment would be avoided where sensitive special-status species are present.

To clarify, before proceeding with a project to drain a wetland, marsh or other habitat area, the District will retain a qualified biologist to conduct a site-specific biological survey to determine if special-status species are present. The District will determine the survey scope and protocols and the qualifications of the biologist on a case-by-case basis depending upon the location and circumstances of the particular project. If the survey determines that special-status species are present and would be impacted by the draining, then the District will not proceed with the draining project.

With implementation of this mitigation measure, the impact of this activity would be **less than significant**.

Mitigation Measure AR-4 will reduce the impact to less than significant by ensuring that physical control activities in freshwater habitats are scheduled at times when special-status species are not present, or the activity is avoided if species are present and not performed and control is achieved at a site or location using other Program alternatives.

These changes are also repeated in Mitigation Measures AR-5, AR-7, and AR-9, which reference AR-4.

On pages 4-17 and 4-18, Mitigation Measure AR-14 is revised as indicated.

Mitigation Measure AR-14: To avoid conflicts with the provisions of an HCP/NCCP, the District will determine whether any of its treatment areas lie within the boundaries of an HCP/NCCP. Prior to application of any treatments, excluding surveillance monitoring, the District will review the requirements of the HCP/NCCP and determine whether this activity will conflict with the provisions of that HCP/NCCP. The District will work with the HCP/NCCP holder and appropriate regulatory agencies to identify and implement alternatives to avoid or minimize any potential impacts to a species or habitat protected by the HCP/NCCP. Such determination will be documented and relayed to the HCP/NCCP holder and the regulating entity (USFWS, NOAA Fisheries, CDFW). If agreement cannot be reached on measures to avoid or minimize impacts, then the physical control activity will not be performed and control will be achieved using other Program alternatives. With implementation of this mitigation measure, the impacts would be **less than significant**.

Mitigation measures AR-16 (vegetation management) and AR 25 (chemical control) reference AR-15, and the text is changed as appropriate.

3.2.5 Chapter 5, Biological Resources - Terrestrial

Section 5.1.2 Special-Status Species

On pages 5-1 and 5-2, the following clarifications are made/added.

A number of special-status species are found in the Program Area. Special-status species are those that are listed as endangered, threatened or candidate species under the federal Endangered Species Act, endangered or threatened under the California Endangered Species Act, or listed as species of special concern by the state. ~~Brief life-history descriptions for~~ These special-status species as well as their presence or absence within the Program Area are presented in Tables 5-1 (plants) and 5-2 (wildlife).

California tiger salamanders (CTS) require underground refuges, especially ground squirrel burrows, where adults can stay moist and cool for most of the year. Stock ponds, vernal pools or other seasonal water sources with few predators that may be as distant as 1.3 miles away are necessary for breeding and egg laying which is stimulated by the first rains of the season. The tadpoles and larvae feed on zooplankton, aquatic insects and small tadpoles of Pacific tree frogs and CRLF and require 3-6 months before leaving the wetland to find an upland small mammal burrow or other underground refuge.

California red-legged frogs (CRLF) are found in lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. CRLF requires 11-20 weeks of permanent water for larval development. Metamorphosed and adult frogs must have access to estivation habitat and adults may travel up to 1 mile in search of breeding habitat especially on warm damp nights.

Table 5-1 on pages 5-5 through 5-12 and Table 5-2 on pages 5-13 through 5-18 are revised to the updated tables provided at the end of the response to CDFW comments in Chapter 2 of this Final PEIR document.

Section 5.1.3 Regulatory Setting

The following regulation is added to the federal subsection on page 5-2. It was originally contained in Appendix A and is updated in this section.

> Stipulated Injunction and Order, Protection of California Red-Legged Frog from Pesticides

On October 20, 2006, the US District Court for the Northern District of California imposed no use buffer zones around California red legged frog upland and aquatic habitats for certain pesticides. This injunction and order will remain in effect for each pesticide listed in the injunction until the USEPA goes through formal 7(A)(2) consultation with the USFWS on each of the 66 active ingredients, and the USFWS issues a Biological Opinion including a “not likely to adversely affect” statement for the pesticides. Under the injunction and order, no use buffer zones of 60 feet for ground applications and 200 feet for aerial applications apply from the edge of the following California red legged frog habitats as defined by the USFWS and the Center for Biological Diversity: Aquatic Feature, Aquatic Breeding Habitat, Nonbreeding Aquatic Habitat, and Upland Habitat. These habitats are found in 33 counties of California including Solano County.

Of the 66 pesticides listed in the injunction, the District may employ glyphosate (herbicide), methoprene, and naled for mosquito control. Methoprene is used for larval mosquito control, and naled may be used for adult mosquito control. However, vector control programs are exempt. Specifically, for applications of a pesticide for purposes of public health vector control under a program administered by a public entity, the injunction does not apply. Where glyphosate is used for vegetation management for control of mosquito-breeding habitat, the injunction would not apply. If this herbicide was to be used for invasive species management to assist other agencies or landowners, then the injunction generally applies until such time that the material has been reviewed by USEPA and USFWS determines that it does not apply or the following “exceptions for invasive species and noxious weed programs” can be met:

- a. You are applying a pesticide for purposes of controlling state-designated invasive species and noxious weeds under a program administered by a public entity; and
- b. You do not apply the pesticide within 15 feet of aquatic breeding critical habitat or non-breeding aquatic critical habitat within critical habitat areas, or within 15 feet of aquatic features within non-critical habitat sections subject to the injunction; and
- c. Application is limited to localized spot treatment using hand-held devices; and

- d. Precipitation is not occurring or forecast to occur within 24 hours; and
- e. You are a certified applicator or working under the direct supervision of a certified applicator; and
- f. If using 2,4-D or triclopyr, you are using only the amine formulations (USEPA 2014).

Because the HCPs and NCCPs are referenced in Section 4.1.4, they are not provided again here in Section 5.1.4

3.2.6 Chapter 6, Ecological Health

Section 6.1.1.1 Toxicity and Exposure

The following additional material is provided on page 6-2.

However, these, and other, coordinated and focused laboratory tests are designed to document the effects of the chemical ~~when a~~ using a continuous, controlled laboratory exposure exists and do not that does not realistically reflect the likely patchy exposures or toxicity in typical of the District field application scenarios. As such, the toxicity information is generated using laboratory tests (and some limited field tests) is intended as an overview of potential issues and that might be associated with maximum direct exposures to develop and recommend guidance for understanding the completely "safe" maximum exposure levels of applications that would not adversely impact humans or nontarget plant and animal species for use that should provide maximum exposure levels of applications that are protective of ecological health. These guidelines include numerous "safety margins" in the toxicity calculations that are intended to provide adequate efficacy to target organisms while not adversely impacting humans or nontarget plant and animal species. In some instances, the regulatory guidance may include additional suggestions for protective application to assure no significant impact on nontarget species and humans.

Although the regulatory community uses this basic information to provide a relative comparison of the potential for a chemical to result in unwanted adverse effects and this information is reflected in the approved usage labels and material safety data sheets (MSDSs), in actual practice, the amounts applied in the District's Program Area are often substantially less than the amounts used in the laboratory toxicity studies. Because of the large safety factors used to develop recommended product label application rates, the amount of chemical resulting in demonstrated toxicity in the laboratory is much higher than the low exposure levels associated with an actual application. The application concentrations consistent with the labels or MSDSs are designed to be protective of the health of humans and other nontarget species (i.e., low enough to not kill them, weaken them, or cause them to fail to reproduce). ~~However, adverse effects may still occur to some nontarget organisms. Impacts may occur to some nontarget organisms. Although numerous precautions (BMPs) and use of recommended application guidance is intended to provide efficacy without adverse effects to nontarget organisms, misapplication or unexpected weather conditions may still result in effects on some nontarget organisms in the exposure area. This potential impact is ameliorated/mitigated by careful use of BMPs and advance planning by the District.~~

Although laboratory toxicity testing focuses on tiered concentrations of chemical exposure, the results of these tests produce a series of toxicity estimates of concentrations less than those that produce mortality. Extrapolation of these data is used to generate estimates of chronic toxicity or possible effects of lower doses that may result in sublethal effects such as reproduction or metabolic changes. In reality, these low-dose exposures need to be sustained over longer periods than are relevant to typical application scenarios for vector control including multiple applications in an area such as a wetland.

Section 6.2.2 Evaluation Methods and Assumptions

The following material is added at the bottom of page 6-9 at the end of the food-web discussion.

Various biological, chemical, and physical parameters affect the behavior of a compound in the environment and its potential toxicity. The chemistry, fate, and transport of a compound must be analyzed to fully estimate potential exposure. The fate and transport of a compound is determined by the physical and chemical properties of the compound itself and the environment in which it is released. Thus, the following characteristics of a compound must be evaluated: its half-life in various environmental media (e.g., sediment, water, air); photolytic half-life; lipid and water solubility; adsorption to sediments and plants; and volatilization. Environmental factors that affect fate and transport processes include temperature, rainfall, wind, sunlight, water turbidity, and water and soil pH. Information pertaining to these parameters allows evaluation of how compounds may be transported between environmental media (e.g., from sediments to biota), how a compound may be degraded into various breakdown products, and how long a compound or its breakdown products may persist in different environmental media. Appendix B provides a discussion of the environmental fate of the pesticide active ingredients and other chemicals associated with specific pesticide formulations used in the Program alternatives.

Pesticides can kill natural predators of mosquitoes. The District's activities associated with the Physical Control and Vegetation Management Alternatives would help allow these predators to access habitats where mosquito larvae are present. When chemical control is used to manage mosquitoes it generally is used at levels that are below the effects thresholds for other insects, as described above. Although mosquito pesticides may also affect invertebrate predators (e.g., dragonflies), recovery of predator populations is usually rapid; as the predator populations extend beyond the application areas and will rapidly replace any lost individuals.

Mosquitoes are part of the food web and their loss may reduce the food base for predators. Although mosquitoes serve as prey items for some fish, avian insectivores, bats, and small reptiles and amphibians, the reduction of mosquito abundance over a small area will not affect the predator populations overall, as other prey sources are available.

3.2.7 Chapter 9, Water Resources

Section 9.1.1 California's Hydrologic and Geomorphic Regions

The second paragraph in this section on page 9-1, has a typographical error in the last line corrected.

Hydrologic regions over the District Program Area include portions of the North Coast, Sacramento River, San Francisco Bay, and San Joaquin River hydrologic regions. The District's Service Area and lands in adjacent counties comprise the District's Program Area, and the hydrologic regions with important water features for the District are shown on Figure 9-1. Description of surface water and groundwater characteristics for the differing hydrologic regions relied on *California Water Plan, Update 2009* and *California Water Plan, Update 2013, Advisory Committee Review Draft* (CDWR 2009a-c, 2013a-d).

Section 9.1.1.3 on page 9-7 should be the Sacramento River Hydrologic Region (added because it covers portions of Solano and Yolo counties) which rennumbers the subsequent section to Section 9.1.1.4 Existing Water Quality.

Section 9.1.1.3 Sacramento River Hydrologic Region

The Sacramento River Hydrologic Region comprises the entire drainage area of the Sacramento River within California and its tributaries. The region is bounded by the Sierra Nevada on the east, the Coast Ranges on the west, the Cascade and Trinity

Mountains on the north, and the Sacramento-San Joaquin River Delta on the south. It extends from Chipps Island in Solano County north to Goose Lake in Modoc County.

The northernmost part of the region is primarily high desert plateau, characterized by cold, snowy winters with only moderate rainfall and hot, dry summers. The mountainous parts in the north and east typically have cold, wet winters. The runoff from snow in the mountains serves as a water supply during the summer. The Sacramento Valley floor has mild winters with less precipitation and hot, dry summers. Annual regional precipitation generally increases from south to north and west to east. The snow and rain that fall in this region form part of the overall water supply for the entire state (CDWR 2013a).

Portions of the Sacramento River corridor have been altered by land development. Habitat has been fragmented, the fishery has been altered by factors such as railroad construction and mining, and natural geomorphic processes have been altered by water development projects such as dams in a manner that reduced spawning habitat and fragmented riparian systems. The dams, however, also create conditions more favorable to salmon by increasing the flexibility of cold water releases and providing increased flows during summer months (CDWR 2013a).

A complex water rights system is used to manage surface water supplies in this region. Many who receive water do not directly hold a water right to divert from a stream; rather, they receive water as a contractor from a water district, the State Water Project, or the Central Valley Project, which are covered by water rights held by the state and federal governments for the benefit of their contractors. Surface water availability in the Central Valley depends on primarily on hydrologic conditions but also on the type of contract, operational needs of the Sacramento Valley and the Bay-Delta, and other policies for water allocation. A water right is not a guarantee that water will be available (CDWR 2013a).

Groundwater is also an important supply for irrigation, municipal, and domestic uses, contributing to about 31 percent of the total water supply. Most groundwater is used for agricultural purposes, meeting about one-third of agricultural water demands. Groundwater use increases during dry periods when surface supplies are reduced, causing declines in groundwater levels of between 10 and 30 feet in some places. Depending on the amount, timing, and duration of groundwater level decline, nearby well owners may need to deepen wells or lower pumps to regain access to groundwater. Land subsidence associated with groundwater pumping also has occurred in the North American and Yolo subbasins (CDWR 2013a).

Section 9.2.7.2 Mosquito Adulticides

On page 9-30, Mitigation Measure WR-16 for permethrin is revised as indicated.

Mitigation Measure WR-16a: Application of permethrin would occur only when other IMM options have been exhausted. Alternative mosquito adulticides ~~should~~ would be considered whenever possible.

Mitigation Measure 16b: Application of ~~these~~ this chemicals would not occur in locations where receiving waters are 303(d) listed for pyrethroids or sediment toxicity. Consistent with the District's current IMM plan, application of chemicals would occur only when other IMM options have been exhausted. Because permethrin has relatively high toxicity and persistence in comparison to other pyrethroids, the District's current IMM plan will be updated to give lower priority to the use of permethrin than other pyrethroids in instances requiring chemical control. Permethrin use will be reserved for specific cases where alternative pesticides would not be as effective. Prior to chemical applications, the location of the application area will be reviewed with

respect to proximity to impaired water bodies. Application of permethrin would not be conducted in locations where receiving waters are 303(d) listed for pyrethroids or sediment toxicity. ~~With implementation of Mitigation Measure WR-18, the impact is reduced to less than significant.~~

Mitigation Measure WR-16c: If application of permethrin must be conducted in locations where receiving waters are 303(d) listed for pyrethroids or sediment toxicity, then the ULV application method would be employed. When applied in accordance with ULV label instructions, studies have shown rapid dissipation, low persistence, and no observed aquatic fish and invertebrate toxicity following aerial ULV applications (Appendix B). Although one study found higher levels of permethrin on the surface microlayer of the waterbody, corresponding water samples did not contain detected residues, and higher surface microlayer concentrations were not correlated with toxic effects in the waterbody. Permethrin use is restricted to situations when it is absolutely necessary and in ULV applications that are designed to have the ingredients degrade rapidly and, thus, reduce the potential for impacts to nontarget ecological receptors.

With implementation of Mitigation Measure WR-16, the impact is reduced to **less than significant**.

On page 9-31, Impact WR-19 and Mitigation Measure WR-19 for resmethrin are not needed because the District has removed resmethrin from their IMMP for 2016 and beyond. However, the text remains in the 2014 PEIR document, and subsequent impacts and mitigation measures are not renumbered to avoid confusion.

Section 9.2.10 Mitigation and Monitoring

On page 9-36, Mitigation Measure WR-9 should be deleted, because impact WR-9 is less than significant and no mitigation is required. The revisions to Mitigation Measure WR-16 is the same as indicated above, and WR-19 is not needed for 2016 and beyond.

3.2.8 Chapter 10, Air Quality

Section 10.2.7 Chemical Control

On page 10-23, the second paragraph is revised as indicated.

Certain VOCs, sulfur compounds, and chlorine compounds found in some pesticides such as ~~Ops and~~OPs, fumigants, and organochlorines emit characteristic odors when they evaporate (volatilize) into air, even at very low concentrations well within safety limits. ~~Some P~~esticides currently used in the District, or proposed for future use, emit phenols (e.g., etofenprox, permethrin, or resmethrin). Due to limited applicability, small quantities of these types of substances are typically used. Materials such as Bti liquid and the adulticides pyrethrin and permethrin have an odor.

Also on page 10-23, portions of Mitigation Measure AQ-25 are modified as follows.

To mitigate Impact AQ-25, the District and its contractors ~~may~~will implement ~~anyone or more~~ of the following measures as applicable to the specific application situation to reduce drift towards human populations/residences from the ground and aerial applications of odorous treatment compounds:

Mitigation Measure AQ-25a: Maintain appropriate buffer zones between spray areas and sensitive receptor locations whenever possible and practicable for the application of the treatment compounds, especially true for aerial applications.

Mitigation Measure AQ-25b: Whenever possible and practicable, defer application of treatment compounds until such time that favorable wind conditions would reduce or avoid the risk of drift into populated areas.

Mitigation Measure AQ-25c: Utilize equipment such as wind meters and global positioning system (GPS) tracking when applicable that assist in documenting site-specific compliance with all label requirements for drift mitigation.

Mitigation Measure AQ-25d: Use precision application technology to reduce drift and the total amount of material applied. This measure can include (1) precision guidance systems that minimize ground or aerial spray overlap (e.g., GPS and Real Time Kinetics – GPS/RTK) and (2) computer-guided application systems that integrate real-time meteorological data and computer model guidance to reduce drift from aerial application (e.g., trade names “AIMMS,” “Wingman™ GX,” and “NextStar™ Flow Control”).

Use of any one of these measures would reduce the impact to **less than significant**.

In Section 10.2.10 Mitigation and Monitoring, on page 10-29, the following edit is made consistent with the text changes above:

To mitigate Impact AQ-25, the District and its contractors ~~may~~will implement ~~anyone or more~~ of the following measures as applicable to the specific application situation to reduce drift towards human populations/residences from the ground and aerial applications of odorous treatment compounds:

3.2.9 Chapter 15, Alternatives

Section 15.4 Alternatives to Reduce Significant Impacts

On pages 15-4 and 15-5, revisions include the following.

Section 15.4.1 Reduced Physical Control Alternative

This alternative would reduce or eliminate the draining of or making drainage improvements in areas of shallow freshwater habitats, seasonal wetlands, and freshwater marshes and duck clubs, ~~and~~ as well as saline and brackish habitats if special-status species are present at the time the improvements occur. Furthermore, any of the physical control measures determined to be in conflict with the provisions of an HCP or NCCP would be suspended as well. These modifications to the Physical Control Alternative would result in less-than-significant impacts to these specific aquatic habitats and special status species if present. It would mean greater reliance on the Chemical Control Alternative options (except for use of permethrin, resmethrin, and/or naled as adulticides) to offset the reduction in effectiveness in controlling mosquito populations from avoiding or minimizing use of the drainage control measures.

The discussion of reduced Program alternatives on page 15-5 is revised to include the following additional “no chemical alternative”.

Section 15.4.4 No Chemical Control Alternative

This alternative would exclude all of the pesticide and herbicide products associated with the Chemical Control and Vegetation Management Alternatives from the Proposed Program. It would rely solely on Surveillance, Physical Control, the nonchemical physical component of the Vegetation Management Alternative, Biological Control (mosquitofish), and the Other Nonchemical Control/Trapping Alternatives combined, along with ongoing public education. The issue is whether a Program made up only of these remaining alternatives would be effective and meet Program objectives and IVM principles.

An example of reliance on only nonchemical tools with public education is the approach the State of Texas took in 2012 to deal with a WNV outbreak.

- > In Summer 2012, the Dallas-Fort Worth Metroplex experienced a severe WNV outbreak in which more than 1,868 confirmed cases of West Nile disease and 89 WNV-related deaths were reported. The analysis of mitigation efforts for the WNV outbreak in Texas suggested two lessons for improving public health system in preparation for future events: the need for (1) clear, comprehensive, uniform data systems that include mosquito data and (2) science-based triggers for spraying, as well as mutual assistance plans with spraying companies and among jurisdictions for times when spraying is necessary. (Harris County Public Health & Environmental Services 2012)
- > Spraying larvicides and/or adulticides for mosquitoes was not part of Texas' routine protocol. Texas had not sprayed for mosquitoes in 43 years before the WNV outbreak. The WNV outbreak in Texas demonstrated the capacity for an epidemic to spread from one state to the entire country. Once the spraying was completed (2 applications), a 93 percent reduction in disease-carrying mosquitoes occurred, while areas that were not sprayed reported an increase. (Zhang 2012)
- > In 2010, 2011, and 2012, Dallas County's health department did not purchase mosquito larvicides until July 30, 2012, following the CDC telling the department that Dallas was already at the highest possible risk level for WNV. To avoid outbreaks such as what occurred in Dallas, aggressive larviciding is an effective tool along with surveillance of dead birds. (Friedman 2012)

Bandon Marsh National Wildlife Refuge (889 acres) protects the largest remaining tidal salt marsh within the Coquille River estuary in Oregon. The USFWS had restored an old hayfield back to tidal marsh by September 2011, with resultant mosquito production that resulted in an angry public with the mayor and a congressman getting involved. The USFWS now sprays for mosquitoes using Bti larvicides, methoprene and oil as a last resort.

Chemical control was required to combat an outbreak of mosquitoes (Oregon) and mosquitoes infected with WNV (Texas). Not letting mosquito populations get out of control due to inadequate surveillance and control measures is critical to avoidance of a large outbreak such as the one experienced in Texas in 2012. Consequently, a No Chemical Control Alternative would not be effective and not meet the District's Proposed Program objectives stated in PEIR Section 2.2.2. The No Chemical Control Alternative is not a feasible alternative for the following reasons:

- > It would not meet the principles of successful IVM nor would it meet the District's Program objectives.
- > The impacts to human health would be significant as follows:
 - In the absence of the chemical control tools being included in the District's IVMP, greater incidence of vector-borne disease and discomfort to people would occur in the Program Area. A wide range of public health issues would occur with the No Chemical Control Alternative.
 - > First, risk of human cases of vector-borne disease and vector interaction issues for humans, pets, and wildlife would increase. The Monterey Bay Area has a well-documented history concerning human-vector interaction, especially with mosquitoes.
 - > Second, increased production of vectors would occur on private property adjacent to areas that previously were treated with pesticide (and herbicide) products as well as increased cases of vector-borne disease in humans, their pets, and livestock would. Additionally, the increase in vector-human interactions would result in an increased risk

of severe reactions to the bites and stings of vector organisms (e.g., mosquitoes, ticks, and wasps) in sensitive and immunocompromised individuals.

- > Third, in the absence of organized mosquito and vector control programs using chemical controls and reduced effectiveness in controlling vectors, unlicensed individuals could begin applying over-the-counter pesticides on their own. Most of these individuals have little or no training in the proper and effective use of these materials, meaning a reasonable possibility exists of over- or under-application as well as the potential for creation of unrecognized resistance issues. This possibility is especially true for the indiscriminate use of aerosol foggers as well as concentrated pesticides that require mixing with water prior to application. Additionally, the health and well-being of sensitive individuals (e.g., asthmatics and chemically sensitive people) and their pets (especially birds and fish) could be affected by the unexpected drift of these pesticides into their yards, open windows, and neighborhood parks.

3.2.10 Appendix A, Biological Resources Technical Report

Section 2.5.1 Federal

On page 2-12, at the end of the section the Stipulated Injunction and Order, Protection of California Red-Legged Frog from Pesticides material is moved from page 2-13 (under State regulations).

3.2.11 Appendix B, Ecological and Human Health Assessment Report

The changes to this technical report are mostly errata (e.g., LC50 changed to LD50, Table 6.1 to 6-1) and corrections to the reference callouts primarily where there were multiple references for the same author in a year (e.g., USEPA 2008b).

Section 4.1.4 Prallethrin

On pages 4-16 and 4-17, the following change was made.

Prallethrin has low to moderate acute toxicity via the oral, dermal, and inhalation routes (Category II, III and IV). It is a moderate eye irritant (Category III), not a dermal sensitizer, and is nonirritating to skin. The oral LD₅₀ was found to be 460 to 640 mg/kg to rats, the dermal LD₅₀ was found to be greater than 5000 mg/kg, and the inhalation LC50 (rats nose exposure) was found to be 855 mg/m³ for males and 658 mg/m³ for females. ~~288 to 333 mg/m³~~ (USEPA 2003a) (Table 6.1). (USEPA 2003a)

Section 4.1.5 Deltamethrin

On page 4-18, Table 4-4, the half-life for aerobic metabolism (soil) degradation is changed from 22-25 days to 25-33 days.

Section 4.1.10 Permethrin

On page 4-26, under 4.1.10.3 Ecological Toxicity, the paragraph is revised.

Permethrin can be toxic to wildlife at high doses and it should not be applied or allowed to drift to crops or weeds where active foraging takes place (USEPA 2006d). However, in controlled toxicity tests with rats as mammalian surrogates, permethrin is considered to have low mammalian toxicity (Cantalamesa, 1993; Nowak et al. 2000). Permethrin has low toxicity to dogs (Richardson 1999), gerbils, guinea pigs, hamsters, mice and rats (Cantalamesa 1993, Sutton et al. 2007); however, dermal exposure in cats of 100 mg/kg of permethrin (equivalent to 1 mL of a 45 percent PSO in a 4.5 kg cat) has resulted in life-threatening effects (Hansen 2006).

Section 4.2.1 Naled

On page 4-33, under 4.2.1.2 Human Toxicity, the paragraph is revised.

Naled is rapidly absorbed by all routes (oral, inhalation, and intraperitoneal) and distributes to all tissues in the rat, chicken, goat, and cow. The oral LD₅₀ for naled technical grade active ingredient is 81 to 336 mg/kg in rats or mice, the dermal LD₅₀ is 354-to 800 mg/kg in rats or rabbits, and the nose exposure inhalation LC50 is as low as 0.19 3.1 to 156 mg/L in ratser mice. (CDPR 1999) (Table 6.1).

Section 4.3.4 Methoprene

On page 4-47, the first paragraph under 4.2.4.4 Summary of toxicity and Potential Effects, is modified.

Methoprene readily degrades in soil and water by a variety of processes. It may exhibit toxicity to fish and aquatic invertebrates, as well as non-target insects including moths, butterflies, and beetles, but these concentrations are much higher than would be experienced in the application scenarios currently in use.

Section 4.3.6 Aliphatic Solvents (Mineral Oils and Aliphatic Petroleum Hydrocarbons)

On page 4-49, under 4.3.6.4 Summary of Toxicity and Potential Effects, the paragraph is revised.

Aliphatic solvents have very low water solubility and high sorption to organic matter. They are practically nontoxic to most non-target organisms and rapidly break down in the environment, reducing their impact on susceptible non-targets so that, using BMP application practices, these products should not result in unwanted adverse effects. These products are used for both mosquito control and as adjuvants to some pesticides to increase or improve efficacy and/or application efficiency. Golden bear and Cocoa bear oils are pesticides used in controlling mosquito larval populations and are used to suppress mosquito related problems, including suppression of potential West Nile virus. These compounds are nontoxic food products and used in numerous cosmetic products. No general direct toxicity has been reported. When added to other compounds as a surfactant, the toxicity of the primary chemical is the issue but not the vegetable oil product.

Section 4.6.2 Glyphosate

On pages 4-63 and 4-64, under 4.6.2.3 Human Toxicity, the following paragraph is revised.

A one-year feeding study resulted in no chronic effects in beagle dogs at daily doses of 500 mg/kg (USEPA 1993). There is currently no published scientific evidence indicating that glyphosate is carcinogenic or mutagenic unless workers are exposed to extended, unrealistic industrial uses (USEPA 1993, Gertsberg 2011). Experimental evidence has shown that neither glyphosate nor its major breakdown product (aminomethylphosphonic acid [AMPA]) bioaccumulates in any animal tissue (Williams et al. 2000). Glyphosate is poorly biotransformed in rats and is excreted mostly unchanged in the feces and urine (Williams et al. 2000).

On page 4-64, under 4.6.2.5 Summary of Toxicity and Potential Effects, the following material is added to the second paragraph.

Using BMP approaches, applications of glyphosate can be used safely when an adequate buffer to water sources is maintained. Although there has been some recent concerns expressed about possible sub-lethal effects of glyphosate products, it is virtually nontoxic to mammals and practically nontoxic to birds, fish, and invertebrates. Glyphosate has been identified as a candidate by USEPA for evaluation as a potential

endocrine disruptor (USEPA 2009a). Based on these issues, it is likely that USEPA will provide an updated review of its potential risks in 2015, but until then, glyphosate products are effective, generally safe, products used for weed control. Concerns about endocrine disruption by glyphosate are not verified, and this chemical is only one of the dozens of chemicals USEPA is suggesting may have an EDC role. No significant indication of this mode of action has been reported at this time. Some reports of sub-lethal effects on disease resistance, biological diversity, enzyme activity, and increased use of genetically engineered foods are interesting but without clear mechanisms that can be related directly to glyphosate (Gertsberg 2011).

Chapter 5 Evaluations of Active Ingredients

On page 5-2, the following table is added.

Table 5-2 Chemicals Employed for Larval Mosquito Abatement

<u>Chemical Classification</u>	<u>Active Ingredient</u>	<u>Appendix B</u>
<u>Organophosphate</u>	<u>Temephos</u>	<u>Section 4.2.2</u>
<u>Bacterial larvicide</u>	<u>Bs</u>	<u>Section 4.3.1</u>
<u>Bacterial larvicide</u>	<u>Bti</u>	<u>Section 4.3.2</u>
<u>Bacterial larvicide</u>	<u>Spinosad</u>	<u>Section 4.3.3</u>
<u>Hydrocarbon ester</u>	<u>Methoprene</u>	<u>Section 4.3.4</u>
<u>Surfactant</u>	<u>Alcohol Ethoxylated Surfactant (monomolecular film)</u>	<u>Section 4.7.1</u>
	<u>Aliphatic Solvent (Mineral Oil)</u>	<u>Section 4.7.2</u>
	<u>Plant oil/vegetable oil mix</u>	<u>Section 4.7.3</u>

Chapter 6 Toxicity Summary: All Active Ingredients

On page 6-1, the following paragraph is added to explain the values in Table 6-1. Table 6-1 has been revised to include additional values. The additional values do not change the conclusions in the text of Appendix B (or the text of the PEIR).

Most of the chemical active ingredients listed in Table 6-1 below, and in the narrative sections, have undergone several levels of testing to determine potential toxicity to humans, wildlife and vegetation. The intended and expected use of each chemical and its likely target and non-target receptors are usually included in the tests. While each listed chemical has had numerous toxicity values generated for a multitude of animal and plant species and human receptors, it would not be feasible to include all the possible data published for all species/receptors in Table 6-1. The values in this table have been included to represent a realistic set of potential species that might be affected by exposure to typical applications used for vector control by the Districts. Numerous additional toxicity data are available in a multitude of publications, particularly the several compendia produced by the USEPA, the European Union, Canada and the many state and national environmental regulatory agencies. Chapter 7 References of this document includes a list of many of those additional sources. As in all determinations of the potential toxic effects of a chemical, the key is the exposure to the chemical, regardless of the potential hazard (toxicity) demonstrated in laboratory tests.

Table 6-1 Toxicity Values Reported in the Literature for Active Ingredients

Active Ingredient	Mammalian Oral LD50 (mg/kg)	Mammalian Dermal LD50 (mg/kg)	Mammalian Inhalation LC50 (mg/L)	USEPA Toxicity Rating	Avian LD50 (mg/kg)	Fish LC50 (mg/L)	Aquatic Invert EC50 (µg/L)	Honeybee LD50 (µg/bee)	Other Receptors
	Unless otherwise specified, values are for rats	Unless otherwise specified, values are for rabbits	Unless otherwise specified, values are for rats		Unless otherwise specified, values are for mallard duck or bobwhite quail	Unless otherwise specified, values are for rainbow trout or bluegill sunfish	Values are for <i>Daphnia</i> or similar species		
Pyrethrins	2370 male rats 1030 female rats 273-796 mice	>1500 rats 5000 rabbits	3.4 rats	oral and dermal (III), inhalation (IV)	>5620 mallard	0.01 bluegill 0.0052 trout	12 daphnia (LC50)	0.13-0.29 contact/bee. 0.022 oral. Toxic but exhibits repellent effect	LC50 worms 47 mg/kg soil Algae EC50 >1.27 mg/L
Allethrins and <i>d-trans</i> allethrin	2150 male rats 900 female rats	2660 (allethrin) male rabbits 4390 female rabbits	>3.875 rats	oral and dermal (III), inhalation (IV)	>2000 (allethrin) >5620 (<i>d-trans</i>) 5620 LC50 bobwhite quail and mallard	0.134 carp	8.9 daphnia (LC50)	no clear data, likely toxic	EbC50 algae 2.9 µg/L
Phenothrin (sumithrin or <i>d-phenothrin</i>)	>5000 (no deaths)	>2000 (no deaths)	>2.1 (no deaths)	oral and inhalation (IV), dermal (III)	>2500 bobwhite quail	0.016 bluegill 0.0027 trout	4.3 daphnia	toxic to bees	1 year NOEL Dogs 7.1 mg/kg b.w.
Prallethrin	>640 male rats 460 female rats >300 dogs	>5000 rats	0.855 male rats 0.658 female rats	oral and dermal (III)	>2000 mallard 1171 bobwhite quail >5620 LC50 mallard and bobwhite quail	0.022 bluegill 0.012 trout	6.2 daphnia	Highly toxic to bees	EbC50 algae 2.0 mg/L NOEL (1 yr) dogs 5 mg/kg b.w.
Deltamethrin	87 - 5000 rats depending on carrier and study conditions	>2000 rats and rabbits	0.6 rats	Oral and dermal (II)	>2250 bobwhite quail >5620 LC50 bobwhite quail	0.0014 bluegill 0.00091 trout	0.56 daphnia (LC50)	0.012 contact/bee 0.023 oral	Oral LD50 dogs >300 mg/kg LC50 worms >1290 mg/kg soil EC50 algae >9.1 mg/L NOEL (2 yr) dogs 1 mg/kg b.w.
Esfenvalerate	75-88 rats	>5000 rats >2000 rabbits	2.93 rats	Oral (II)	381 bobwhite quail 5247 LC50 mallard 5620 LC50 bobwhite quail	0.00026 bluegill 0.00026 trout 0.00069 fathead minnow	0.9 daphnia	0.017 contact/bee	ErC50 algae 10 µg/L
Lambda-cyhalothrin	79 male rats 56 female rats	632 to 696 (rats)	0.06 rats	EPA (II)	>3950 mallard >5300 LC50 bobwhite quail	0.00021 bluegill 0.00036 trout	0.26 daphnia	0.038 contact/bee 0.909 oral	LC50 worms >1000 mg/kg soil ErC50 algae >1000 µg/L NOEL (1 yr) dogs 0.5 mg/kg b.w.
Resmethrin	>2500 rats	>3000 rats >2000 rabbits	>0.01 rats USEPA reports 5.28	Oral/dermal (III) Inhalation (IV)	>2000 CA quail 75 blackbird	0.017 bluegill 0.011 sheephead minnow	3.7 daphnia (LC50)	0.015 contact/bee 0.069 oral	LC50 pink shrimp 1.3 µg/L
Tetramethrin	>5,000 rats	>2,000 rabbits	>2.73 rats	oral / dermal (IV)	>2250 bobwhite quail >5620 LC50 mallard and bobwhite quail	0.016 bluegill 0.0037 trout	110 daphnia	0.155 contact/bee	NOEL (13 wk) dogs 5000 mg/kg feeding
Permethrin	540-2690 mice 430-4000 rats	>2500 rats >2000 rabbits	>0.685 rats and mice	oral and dermal (III), inhalation (IV)	>9800 mallard >13500 Japanese quail >3000 chickens	0.0018 bluegill 0.00025 trout	0.1 (mayfly) 0.6 daphnia (LC50)	0.029 contact/bee 0.098 oral	May be toxic to cats via dermal route

Each of the chemicals listed in Table 6-1 has been tested to determine toxicity to humans and wildlife. While each listed chemical has had numerous values generated for a multitude of species and receptors, it would not be feasible to include all the possible toxicity data published for all species. The values in this table represent a portion of the toxicity data that the District uses as a guideline when considering the use of a pesticide as a part of its Integrated Vector Management Program. Toxicity values were taken from a range of sources, especially USEPA, CDPR, EXTOXNET, peer reviewed literature, and "The Pesticide Manual" published by the British Crop Protection Council (BCPC). The toxicity values included in table 6-1 are meant to provide a sense of the variety and range of values presented in the peer reviewed literature and other reference documents.

Table 6-1 Toxicity Values Reported in the Literature for Active Ingredients

Active Ingredient	Mammalian Oral LD50 (mg/kg)	Mammalian Dermal LD50 (mg/kg)	Mammalian Inhalation LC50 (mg/L)	USEPA Toxicity Rating	Avian LD50 (mg/kg)	Fish LC50 (mg/L)	Aquatic Invert EC50 (µg/L)	Honeybee LD50 (µg/bee)	Other Receptors
	Unless otherwise specified, values are for rats	Unless otherwise specified, values are for rabbits	Unless otherwise specified, values are for rats		Unless otherwise specified, values are for mallard duck or bobwhite quail	Unless otherwise specified, values are for rainbow trout or bluegill sunfish	Values are for <i>Daphnia</i> or similar species		
Etofenprox	>42880 rats >107200 female mice	>2,140 rats and mice	>5.9 rats	Formulation (IV)	>2000 mallard >5000 LC50 mallard and bobwhite quail	0.0033 trout 0.0085 bluegill 0.14 carp	>40000 daphnia (LC50)	0.13 contact 0.27 oral	7-day LC50 worms 43.1 ppm Oral LD50 dogs >5000 mg/kg
Piperonyl butoxide (PBO)	4570 - 7220 rats 7500 rabbits	>7950 rats 1880 rabbits	>5.9 rats	oral and dermal (III), inhalation (IV)	>2250 bobwhite quail	1.9 trout 3.94 sheepshead minnow 5.3 carp	510 to >2950 daphnia (LC50)	>25	LC50 Western Chorus Frog 0.21 mg/L LC50 Tadpole 0.21 mg/L LC50 mysid shrimp 0.49mg/L NOEL (1 yr) dogs 16 mg/kg b.w. daily
Naled	430 rats 81 - 336 (tech) rats	1100 rabbits 354 - 800 (tech) rats	>1.5 mg/L mice	formulation (I)	27-111 mallard, Canada geese, sharp-tailed grouse	0.08 trout 1.2 sheepshead minnow 2.2 bluegill 2 - 4 goldfish	0.3 daphnia	0.48 contact/bee	LC50 grass shrimp 8.9mg/L LC50 crabs 0.33 mg/L EC50 pink shrimp 5.5 µg/L
Temephos	444 rats (USEPA) 4204 male rats >10000 female rats	>4000 rats 970 - 2181 rabbits	1.3 (USEPA) 4.79 rats	oral and dermal (III), inhalation (III)	1200 LC50 mallard 170 LC50 pheasant	9.6 trout 3.49 bluegill	10 daphnia	1.55 contact/bee	no documented toxicity
<i>Bacillus sphaericus</i> (Bs)	>5000 rats	>2000 rabbits	>0.09 rats	Technical (III)	>9000 mallard	>15.5 bluegill & trout >100 sheepshead minnow	15500 daphnia	No effects at 10 ⁸ spores	LC50 (30 d) worms >1000 ppm dry soil EC50 Chironomus tentans >260 mg/L EC50 oysters 42 mg/L EC50 algae >2.2 mg/L
<i>Bacillus thuringiensis israelensis</i> (Bti)	>1x10 ¹¹ spores/kg rats >5000 mg/kg rats > 2 x 10 ⁹ rabbits	>4.6x10 ¹⁰ spores/kg rats >2000 mg/kg rats >6.28 g/kg rabbits	8x10 ⁷ spores/kg rats 2.84 rats	all acute (IV)	>3077	>600 mg/l bluegill >370 trout	>25000 daphnia (LC50)	No effects 14 day exposure	LC50 copepod >50 mg/kg
Spinosad	3783 male rats >5000 female rats	>2000 rabbits	>5.18 rats	oral and dermal (IV)	>2000 mallard & bobwhite quail >5156 LC50 mallard & bobwhite quail	5.9 bluegill 30 trout 5 carp 7.9 sheepshead minnow	14000 daphnia	0.0029 contact/bee 0.053 (tech) oral LC50	Butterfly/moth LD50 = 0.022 mg/kg. LC50 worms >1000 mg/kg soil EC50 grass shrimp >9.76 ppm No effect on amphibians, lacewings, or ladybirds.
Methoprene and s-Methoprene	>10000 rats >5050 (s-methoprene)	>2000 rabbits >5050 rabbits (s-methoprene)	210 rats >2.38 rats (s-methoprene)	oral and inhalation (IV)	>2000 mallard >4640 chickens	>0.37 bluegill 0.76 trout	89 daphnia 380 daphnia (s-methoprene)	>1000 contact/bee >1000 oral	Frog LC50 >10,000 µg/L EC50 algae 1.33 mg/L NOEL (18 mo) mice 1000 ppm

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	Unless otherwise specified, values are for rats	Unless otherwise specified, values are for rabbits	Unless otherwise specified, values are for rats		Unless otherwise specified, values are for mallard duck or bobwhite quail	Unless otherwise specified, values are for rainbow trout or bluegill sunfish	Values are for <i>Daphnia</i> or similar species		
Alcohol Ethoxylated Surfactant (monomolecular film)	>20000 rats (Agnique™)	>2000 rabbits (Agnique™)	29 rats (Agnique™)	no documented toxicity	>2000 mallard (Agnique™) >5000 LC50 bobwhite quail (Agnique™)	290 bluegill (Agnique™) 98 trout (Agnique™)	51000 daphnia (Agnique™) No observable effects to shrimp, snails, worms, or mayfly naiads	no documented toxicity	No observable effects to amphibians.
Aliphatic solvents (mineral oils, aliphatic hydrocarbons, petroleum distillates)	>28000 (no deaths observed)	>2000 rats >5,000 rabbits	3.9 rats	oral & dermal (IV) inhalation (III)	>2250 bobwhite quail and mallard	no documented toxicity	<900 daphnia	no documented toxicity	EC50 oysters 6 mg/L
Potassium Salts (soap salts) (M-Pede™ & Insecticidal Soap™, MSDS)	>5000 rats (M-Pede™ & Insecticidal Soap™)	>2000 rabbits (M-Pede™ & Insecticidal Soap™)	0.853 rat (M-Pede™)	all acute effects (IV)	no documented toxicity	no documented toxicity	no documented toxicity	no documented toxicity	no documented toxicity
Chlorophacinone	3.15 - 6.26 rats 0.329 male rabbits	200 rabbits	0.007 rats (USEPA) 0.0093 rats	all acute effects (I) oral, dermal and inhalation	258 bobwhite quail 204 LC50 mallard 95 LC50 bobwhite quail	0.62 bluegill 0.35 trout	420 daphnia (LC50)	Not toxic to bees	Carnivorous mammals LD50 = 2.1 to 50 mg/kg Worms LC50 >1000 ppm
Diphacinone	2.3 rats 50-300 mice 35 rabbits	<200 rats 3.6 rabbits	<2.0 rats	all acute effects (I)	1630 bobwhite quail 3158 mallard	7.5 bluegill 2.8 trout 2.1 catfish	1800 daphnia (LC50)	no documented toxicity	Dog oral LD50 = 3 to 7.5 mg/kg, Cat oral LD50 14.7 mg/kg, Pig oral LD50 150 mg/kg
Brodifacoum	0.418 male rats 0.21 male rabbits 0.25 - 25 large mammals	3.16 female rats 5.21 male rats	0.00305 female rats 0.00486 male rats	all acute effects (I)	11.6 Japanese quail 4.5 chickens 0.26 - 0.31 mallard 2.7 LC50 mallard	0.025 - 0.165 bluegill 0.04 - 0.05 trout	450 daphnia (LC50)	Not toxic to bees	LD50 carnivores 0.27 to 25 mg/kg LC50 worms >994 mg/kg soil ErC50 algae >0.27 mg/L
Bromadiolone	1.31 rats 1.75 mice 1.0 rabbits	23.31 rats 1.71 rabbits	<0.02 rats 0.43 µg/kg	all acute effects (I)	134 Japanese quail 138 bobwhite quail	3.0 bluegill 0.24 - 2.89 trout	5790 daphnia 8800 daphnia (LC50)	Not toxic to bees	Carnivorous mammals LD50 1.125 to 25 mg/kg LC50 worms >1054 mg/kg dry weight ErC50 algae 1.14 mg/L
Bromethalin	2.11 rats 2.38-5.6 dogs 0.54 cats	1,000 male rabbits	0.024 rats	oral and inhalation (II)	4.56 bobwhite quail	0.038 trout 0.598 bluegill	2.0	no documented toxicity	NOEL rats and dogs 0.025 mg/kg/day
Difethialone	0.56 rats 1.29 mice	7.9 male rats 5.3 female rats	0.005 -0.0193 rats	Oral and dermal (I)	0.264 bobwhite quail 0.56 LC50 bobwhite quail 1.94 LC50 mallard ducklings	0.075 bluegill 0.051 trout	4.4 daphnia	no documented toxicity	Oral LD50 dog 4 to 11.8mg/kg Oral LD 50 cat <16 mg/kg Oral LD50 pig 2 to 3 mg/kg

Each of the chemicals listed in Table 6-1 has been tested to determine toxicity to humans and wildlife. While each listed chemical has had numerous values generated for a multitude of species and receptors, it would not be feasible to include all the possible toxicity data published for all species. The values in this table represent a portion of the toxicity data that the District uses as a guideline when considering the use of a pesticide as a part of its Integrated Vector Management Program. Toxicity values were taken from a range of sources, especially USEPA, CDPR, EXTOXNET, peer reviewed literature, and "The Pesticide Manual" published by the British Crop Protection Council (BCPC). The toxicity values included in table 6-1 are meant to provide a sense of the variety and range of values presented in the peer reviewed literature and other reference documents.

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	Unless otherwise specified, values are for rats	Unless otherwise specified, values are for rabbits	Unless otherwise specified, values are for rats		Unless otherwise specified, values are for mallard duck or bobwhite quail	Unless otherwise specified, values are for rainbow trout or bluegill sunfish	Values are for <i>Daphnia</i> or similar species		
Cholecalciferol (vitamin D)	43.6 rats 42.5 mice	61 male rats 185 female rats >2000 rabbits	0.13-0.38 rats	Oral and dermal (III)	>2,000 mallard >2000 bobwhite quail	no documented toxicity	no documented toxicity	no documented toxicity	Oral LD50 dog 88 mg/kg
Sulfur (fumigant)	>5000 rats	>2000 rats	>5.43 rats 2.56 rats (98% sulfur)	Oral and dermal (IV)	>5000 bobwhite quail	>180 bluegill and trout	>665000 daphnia (LC50)	nontoxic	LC50 (14 d) worms >1600 mg/L soil Nontoxic to lacewings and ladybirds
Sodium Nitrate (fumigant)	3700 rats	<2000 rats	no documented toxicity	oral (III) dermal (IV)	no documented toxicity	no documented toxicity	no documented toxicity	no documented toxicity	Nontargets in burrow susceptible.
Imazapyr	>5000 rats 4800 rabbits >2000 female mice	>2000 rabbits >2000 rats	>5.1 rats	Formulation (IV) Eye (I)	>2150 bobwhite quail >2150 mallard >5000 LC50 bobwhite quail and mallard	>100 bluegill, trout, and catfish	>100000 daphnia (LC50)	>100 contact/bee	EC50 algae 59-85 µg/L NOEL (1 yr) dogs 250 mg/kg b.w.
Glyphosate	4300 (tech) rats >5000 rats >10,000 mice 3530 goats	≥ 2000 rats (tech) ≥ 5000 rabbits (salts)	≥4.43 (tech) rats >1.3 (salts) rats	oral and dermal (III)	>2000 bobwhite quail >4640 LC50 quail and duck	86 trout 120 bluegill 130 catfish >1000 sheepshead minnow	55000 to 780000 daphnia (LC50)	>100 contact/bee	LC50 Frogs 6.6 to 18.1mg/L EC50 frogs 111 to 343mg/L
Triclopyr	577 female rats 692 male rats 630 (tech) female rats 729 (tech) male rats	>2000 rabbits	>256 rats	oral and dermal (III) inhalation (IV) TBEE	1698 (tech) mallard >5000 LC50 mallard 2935 bobwhite quail	148 bluegill 117 (tech) trout 0.36 (TBEE)-bluegill	132000 daphnia (LC50)	>100 contact/bee	EC50 algae 45 mg/L NOEL (2 yr) mice 35.7mg/kg b.w.
2,4-D (2,4-dichlorophenoxy acetic acid)	639 to 1,646 rats 138 mice	>1600 rats 1829 to 2000 rabbits	0.78 - >5.4 rats, depending on formulation	Formulation (II)	>1000 mallard 668 Japanese quail & pigeon 472 pheasant	1 to >100 trout	235000 daphnia (LC50)	104.5 oral 104 to 115 LC50	LC50 (7 d) worms 860mg/kg soil NOEL (1 yr) dogs 1mg/kg b.w. EC50 algae 33.2 mg/L
Sulfometuron methyl	>5000 male rats	>2000 rabbits	5.0 rats	oral and inhalation (IV), dermal (III)	>5000 mallard >5620 bobwhite quail	>12.5 bluegill and trout	>12500 daphnia (LC50)	>100 contact/bee	EC25 values available for many non-target plants
Bentazon	>1000 rats >750 rabbits >500 dogs and cats	>2500 rats >4000 rabbits	5.1 rats	formulation (III) oral, dermal, inhalation (III)	1140 bobwhite quail >5000 LC50 bobwhite quail and mallard	>100 bluegill >100 trout	125000 daphnia (LC50)	>100 contact/bee	EC50 worms >1000mg/kg soil NOEL (1 yr) dog 13.1mg/kg b.w. Harmless to ground beetles EC50 algae 47.3 mg/L
Diuron	>4,721 male rats >5000 female rats	>2000 rabbits	>7.0 rats	Formulation (III)	>2000 mallard 1104 bobwhite quail 5000 LC50 mallard 1730 LC50 bobwhite quail	0.71 cutthroat trout 5.9 bluegill 14 fathead minnow 14.7 rainbow trout	1400 daphnia	>145 mg/kg contact/bee	LC50 worms >400 mg/kg soil EC50 scud 0.16 mg/L EC50 brown shrimp 1.0mg/L

Each of the chemicals listed in Table 6-1 has been tested to determine toxicity to humans and wildlife. While each listed chemical has had numerous values generated for a multitude of species and receptors, it would not be feasible to include all the possible toxicity data published for all species. The values in this table represent a portion of the toxicity data that the District uses as a guideline when considering the use of a pesticide as a part of its Integrated Vector Management Program. Toxicity values were taken from a range of sources, especially USEPA, CDPR, EXTOXNET, peer reviewed literature, and "The Pesticide Manual" published by the British Crop Protection Council (BCPC). The toxicity values included in table 6-1 are meant to provide a sense of the variety and range of values presented in the peer reviewed literature and other reference documents.

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	Unless otherwise specified, values are for rats	Unless otherwise specified, values are for rabbits	Unless otherwise specified, values are for rats		Unless otherwise specified, values are for mallard duck or bobwhite quail	Unless otherwise specified, values are for rainbow trout or bluegill sunfish	Values are for <i>Daphnia</i> or similar species		
Benfluralin (benefin)	>10000 rats >5000 mice >2000 dogs and rabbits	>5000 rabbits	>2.31 rats	oral & dermal (IV) formulation (II)	>2000 mallard, bobwhite quail, and chickens	0.065 bluegill 0.081 trout >1.1 sheepshead minnow	2180 daphnia (LC50)	Up to 100 ppm no effect	LC50 mysid shrimp 0.043 mg/L
Oryzalin	>10000 rats & gerbils >1000 dogs & cats	>2000 rabbits	>3.1 rats	Formulation (III)	>500 mallard and bobwhite quail >1000 chickens > 5000 LC50 mallard	2.88 bluegill 3.26 trout	1400 daphnia (LC50)	>11 contact/bee 25 oral	NOEC worms >102.6mg/kg soil
DCPA (chlorthal dimethyl) [metabolite is tetrachloroterephthalic acid (TPA)]	>10000 rats	>2000 rabbits	>4.48 rats	formulation (IV)	>2250 bobwhite quail >5620 LC50 bobwhite quail and mallard	>5.4 bluegill >4.7 trout	4600 daphnia (LC50)	>230 contact/bee	Oral LD50 10000 mg/kg dog
Dithiopyr	>5000 rats	>5,000 rats & rabbits	>5.98 rats	Formulation (III)	>2250 bobwhite quail >5620 LC50 bobwhite quail and mallard	0.7 bluegill & carp 0.5 trout	1100 daphnia (LC50)	>80 contact/bee	LC50 worms >1000mg/kg NOEL (1 yr) dogs <0.5mg/kg b.w.
Metolachlor	1936 male rats 1063 female rats	> 5050 rats	>2.02 rats	formulation (III)	>2150 bobwhite quail & mallard >10000 LC50 bobwhite quail & mallard	10 bluegill 4.9 carp 3.9 trout	25,000 daphnia (LC50)	>110 contact and oral/bee	LC50 worms 140 mg/kg soil NOEL (90 d) 300 mg/kg EC50 algae 0.1 mg/L
Pendimethalin	1050 to >5000 rats >2900 mice >5000 rabbits and dogs	>2000 rabbits	>320 rats	Oral (III) Dermal and inhalation (IV) formulation (III)	1,421 mallard 4187 LC50 bobwhite quail	0.138 – 0.89 trout 0.707 sheepshead minnow	400 daphnia 0.28 (tech) daphnia LC50 5.1 (formulation) daphnia LC50	>100 contact/bee 101.2 oral	EC50 worms >1000mg/kg soil NOEC (30 d) Chironomus riparius 0.138 mg/L EbC50 algae 0.018mg/L
Alkylphenol ethoxylate (APE)	600 to >10,000 rats	>0.22 rats	>2000 rats	low acute (III)	no documented toxicity	8.9 minnow 1.5 to 6.4 trout	460 to 740 daphnia	no documented toxicity	LC50 snails 774 µg/L
Polydimethyl-siloxane Fluids	>5000 rat	>10000 rabbit	>535 rats	no documented toxicity	no documented toxicity	no documented toxicity	>1000 mg/kg in sediment	no documented toxicity	Relatively nontoxic to benthic invertebrates.
Modified Plant Oils and Methylated Seed Oil (Competitor™ & MSO™, MSDS)	>5000 rats (Competitor™ & MSO™)	>4000 rats (MSO™) >5000 rabbits (Competitor™)	2.01 rats (MSO™)	no documented toxicity	No documented toxicity	95 rainbow trout (Competitor™)	>100 daphnia (Competitor™)	no documented toxicity	no documented toxicity
Coconut oil (MSDS COCOBEAR, >80% fatty acids 10% mineral oil)	>5000 mg/kg rats	>5050 mg/kg rats	>2.16 mg/L	No documented toxicity	>2250 mg/kg	>1000 mg/L	> 10000 mg/L microbes	no documented toxicity	no documented toxicity
Lecithin (Liberate™, MSDS)	>5000 male rat (Liberate™)	>2000 rabbit (Liberate™)	no documented toxicity	no documented toxicity	no documented toxicity	17.6 trout (Liberate™)	9300 daphnia (Liberate™)	no documented toxicity	no documented toxicity

Each of the chemicals listed in Table 6-1 has been tested to determine toxicity to humans and wildlife. While each listed chemical has had numerous values generated for a multitude of species and receptors, it would not be feasible to include all the possible toxicity data published for all species. The values in this table represent a portion of the toxicity data that the District uses as a guideline when considering the use of a pesticide as a part of its Integrated Vector Management Program. Toxicity values were taken from a range of sources, especially USEPA, CDPR, EXTOXNET, peer reviewed literature, and "The Pesticide Manual" published by the British Crop Protection Council (BCPC). The toxicity values included in table 6-1 are meant to provide a sense of the variety and range of values presented in the peer reviewed literature and other reference documents.

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Each of the chemicals listed in Table 6-1 has been tested to determine toxicity to humans and wildlife. While each listed chemical has had numerous values generated for a multitude of species and receptors, it would not be feasible to include all the possible toxicity data published for all species. The values in this table represent a portion of the toxicity data that the District uses as a guideline when considering the use of a pesticide as a part of its Integrated Vector Management Program. Toxicity values were taken from a range of sources, especially USEPA, CDP, EXTNET, peer reviewed literature, and "*The Pesticide Manual*" published by the British Crop Protection Council (BCPC). The toxicity values included in table 6-1 are meant to provide a sense of the variety and range of values presented in the peer reviewed literature and other reference documents.

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