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LETTER OF TRANSMITTAL

To: Erin Mustain
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Date: February 22, 2006

From: ☐ Mike Blankinship ☒ Kelly Buja
☐ Sara Castellanos ☐_____

Project: **SIP Exception Request for Glenn Colusa Irrigation District (GCID) IS/MND**

We are transmitting the following:

Item #	*Quantity*	*Description*
1	1	GCID Final IS/MND Document
2	1	Notice of Determination (*)
3	1	SIP Requirements List (*)

(*) – Found under the "Additional Documentation" section at the end of IS/MND document

For Your:

- ☒ Review
- ☒ Approval
- ☒ Information
- ☒ Files

Sent By:

- ☐ Regular U.S. Mail
- ☒ Federal Express
- ☐ Courier
- ☐ Other: _____

Comments:

Erin: Enclosed, find the documents necessary to apply for a SIP Section 5.3 Exception for GCID's use of copper and acrolein. Please consider this submission a formal request by GCID for inclusion in Attachment E of the aquatic pesticide permit. At the earliest possible time, we would appreciate the SWRCB's consideration.

Please call our office with any questions. Thank You.

Use of Acrolein and Copper-Containing Herbicides To Control Aquatic Weeds In Water Conveyances

California Environmental Quality Act Initial Study And Mitigated Negative Declaration

February 15, 2006

Glenn-Colusa Irrigation District
P.O. Box 150
344 East Laurel Street
Willows, CA 95988
Contact: William F. Menke
530.934.3287

Use of Acrolein and Copper-Containing Herbicides To Control Aquatic Weeds In Water Conveyances

CEQA Initial Study & Mitigated Negative Declaration

Table of Contents

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1.0 PROJECT DESCRIPTION

1.1 Introduction

The Glenn-Colusa Irrigation District (herein referred to as the "District") is located in Glenn and Colusa counties and lies west of the Sacramento River. It runs roughly north-south parallel to Interstate 5 and the topography is essentially flat. The city of Williams is located near the southern boundary, and the city of Willows is located in the northern portion of the District. Numerous creeks drain from the hills to the west. Refer to **Figures 1 and 2**.

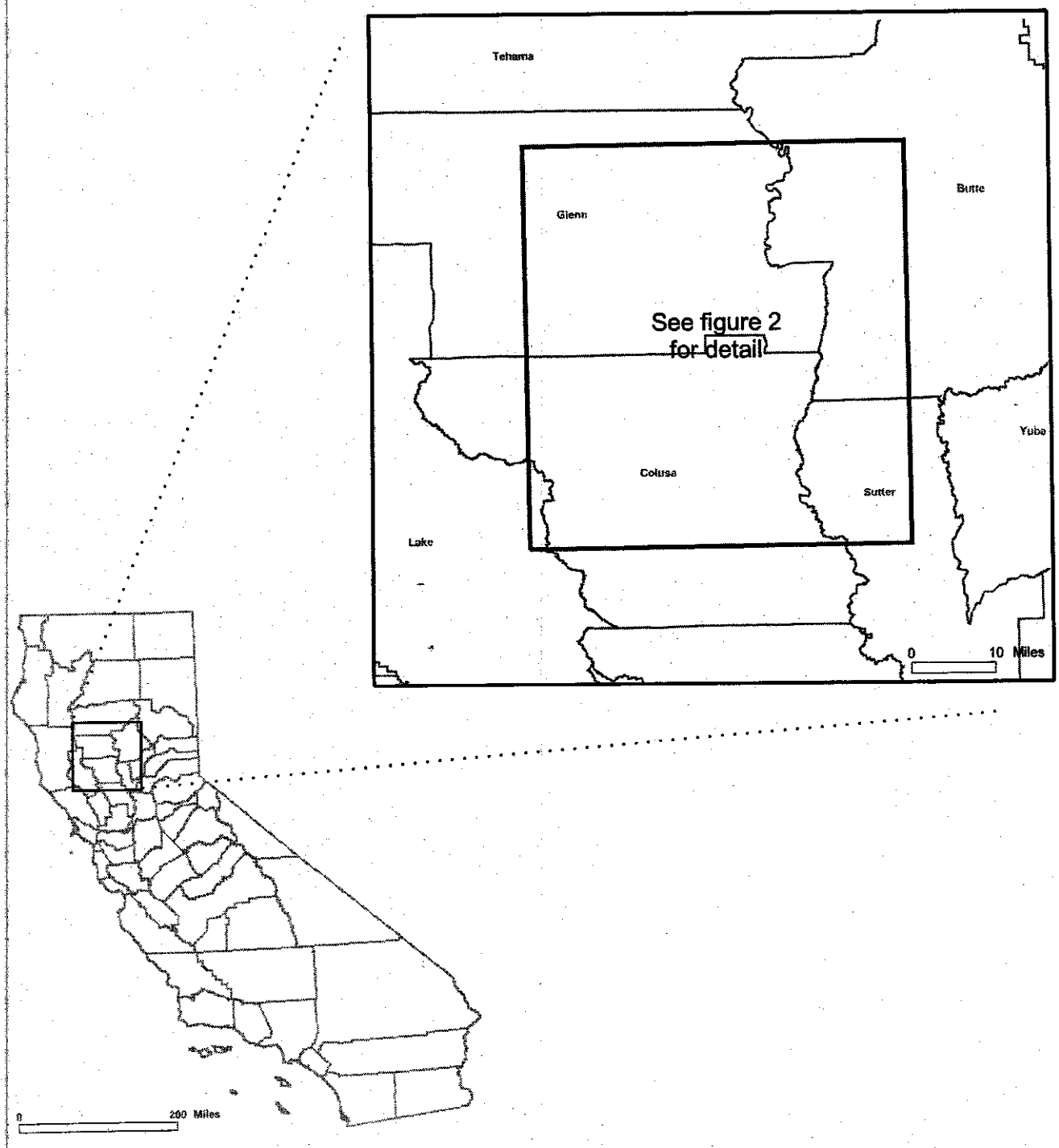
During 2003, the District delivered irrigation water to approximately 141,000 acres of agricultural crops. The irrigation water was conveyed from the District's pumping plant on the Sacramento River near Hamilton City through a 65-mile long main canal to a 900–mile network of smaller canals, laterals, and drains (hereafter referred to as "conveyances"). Approximately 1,000,000 acre-feet of water were delivered in 2003.

In addition to agricultural water delivery, the District provides year-round water to three adjacent National Wildlife Refuges. These refuges consist of permanent ponds, seasonal wetlands, millet fields, and uplands that provide wintering habitat and resting areas for ducks, geese and shorebirds. The wetlands produce waterfowl food and the upland areas provide habitat for geese, upland birds, and other wildlife species. Up to 105,000 acre-feet (AF) of water is supplied to the Delevan, Colusa, and Sacramento wildlife refuges.

The District employs a staff of water operators who release water from District conveyances into grower's fields by manually operating gates and valves. The water operators ensure that enough water is flowing in the laterals to meet demand. Gates and valves in the delivery system are maintained by the District, and can only be adjusted by District water operators. Growers are not permitted to make adjustments.

Once irrigation water is used, it drains from the fields within the District to the south and/or the east. The Colusa Basin Drain and several other irrigation districts receive the District's drainage. The Colusa Basin Drain flows into the Sacramento River at Knight's Landing, about 30 miles south of its confluence with the Main Canal. Existing beneficial uses of the Colusa Basin Drain are agriculture (irrigation and stock watering), recreation, freshwater habitat (warm and cold), migration, spawning, and wildlife (RWQCB, 1998).

To maintain acceptable rates of flow in its conveyances, the District uses acrolein and/or copper-containing aquatic herbicides to treat algae and several types of submersed aquatic weeds. Acrolein, a restricted use pesticide (RUP), is typically preferred because it is highly efficacious and targets the range of weeds that may be present in the lateral system. Copper-containing herbicides may also be used to treat laterals depending on the weed species present.



Glenn Colusa Irrigation District

Project Location Map

Legend

Project Detail Area

County Boundaries

N

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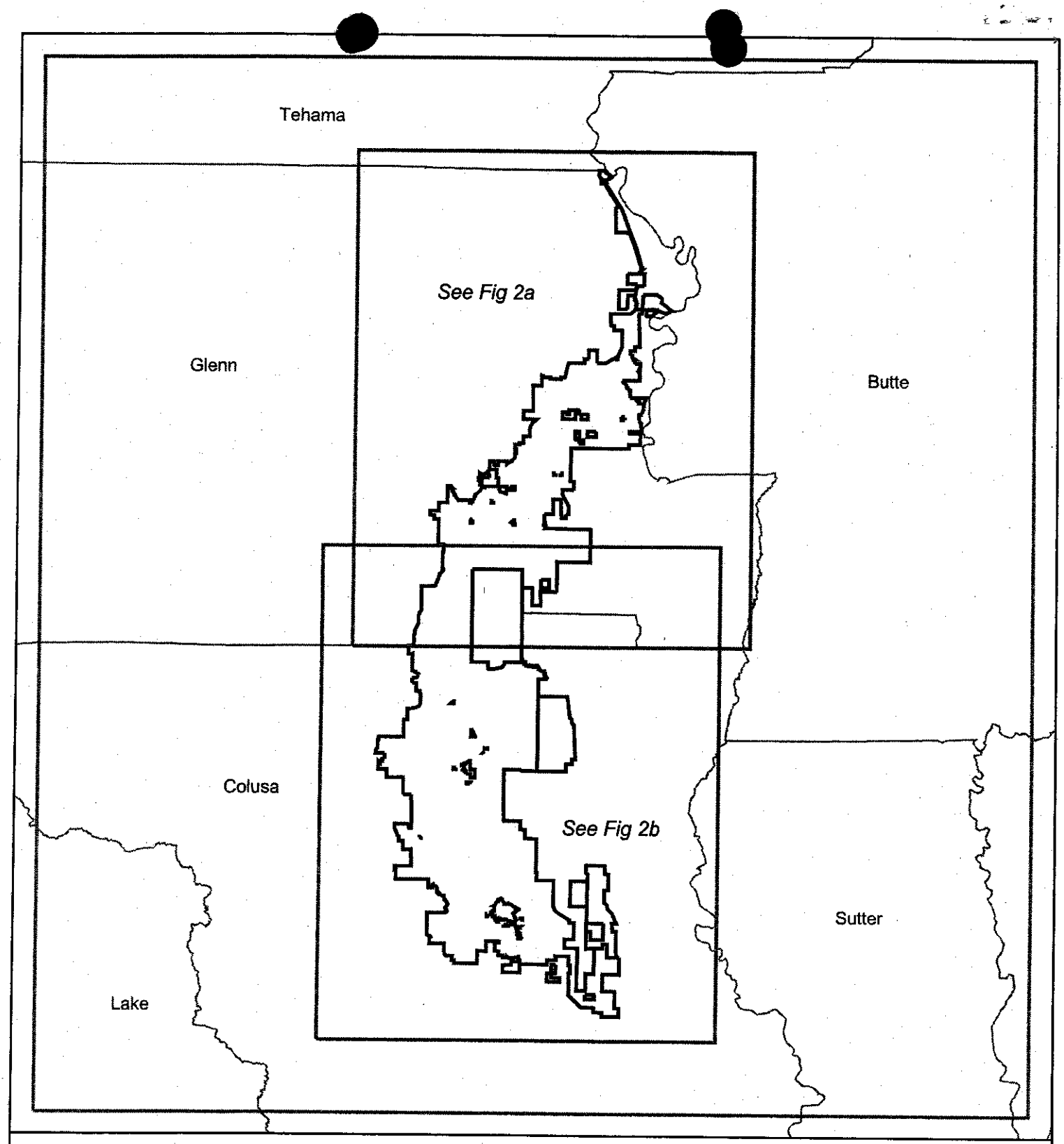
Figure 1



Glenn Colusa Irrigation District

Project Location Map

Legend

GCID Boundary

Detail Area

County Border

Scale
1 : 500,000

N

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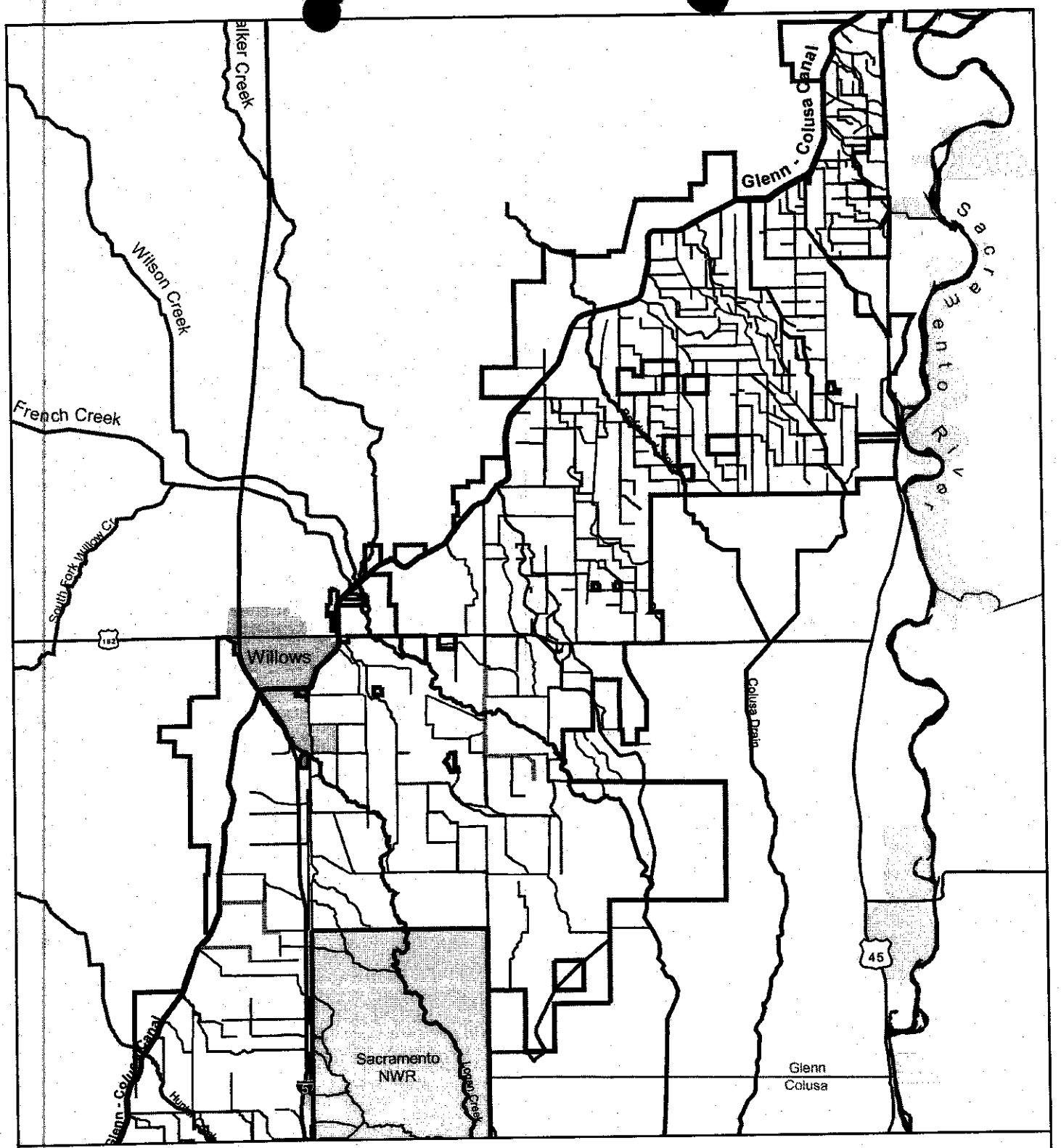
Figure
2a



Glenn Colusa Irrigation District

Project Detail Map

Figure 2b

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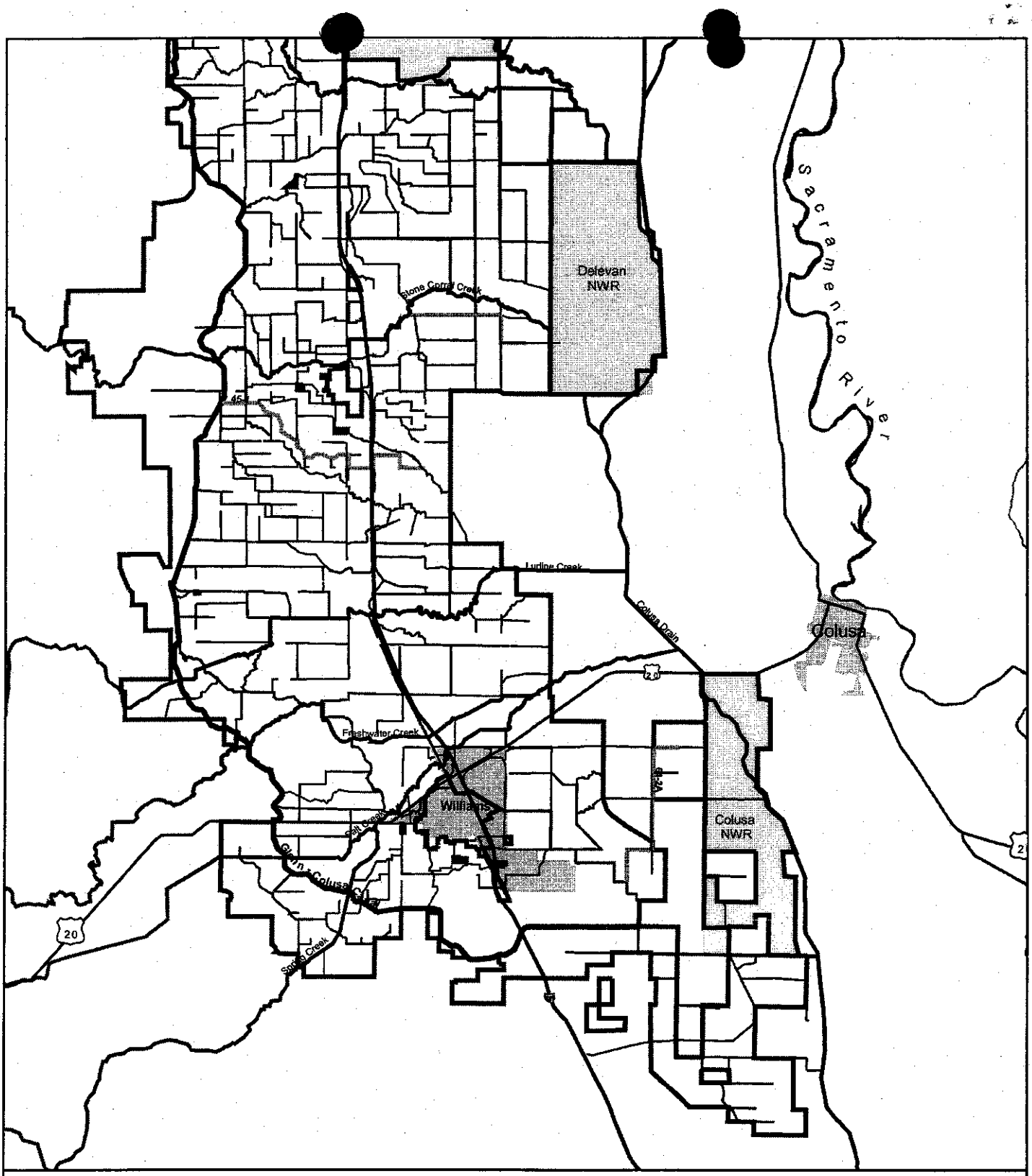

Glenn Colusa Irrigation District

Project Detail Map

Figure 2c

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Depending on weed presence, aquatic pesticides containing copper and acrolein may be applied up to three (3) times per year at different locations depending on need between the months of May and September. Some years, neither of these aquatic herbicides are used. Applications are made in main laterals just downstream of the turnout from the main canal. A treatment at that single location is typically enough to treat the entire lateral system (including sub lateral branches). In some instances a sub lateral may need to be treated separately. The District makes no aquatic pesticide applications to the Colusa Basin Drain or to the northern-most lateral drains that go directly to the Sacramento River.

1.2 Regulatory Setting

On May 20, 2004, The State Water Resources Control Board (SWRCB) adopted the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States, CAG 990005 (hereafter referred to as the "Permit"). The Permit requires compliance with the following:

- The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries in California (aka the State Implementation Plan, or SIP) (SWRCB, 2005)
- The California Toxics Rule (CTR) (CTR, 2000)
- Applicable Regional Water Quality Control Board (RWQCB) Basin Plan Water Quality Objectives (WQOs). (RWQCB-NC, 1993)

The SIP assigns effluent limitations for CTR priority pollutants, including aquatic pesticides containing copper. Further, the SIP prohibits discharges of priority pollutants in excess of applicable water quality criteria outside the mixing zone[1].

Through the Permit, the SWQCB may, after compliance with the California Environmental Quality Act (CEQA), allow short-term or seasonal exceptions from meeting the priority pollutant criteria/objectives if determined to be necessary to implement control measures either:

1. for resource or pest management (i.e., vector or weed control, pest eradication, or fishery management) conducted by public entities or mutual water companies[2] to fulfill statutory requirements, including, but not limited to, those in the California Fish and Game, Food and Agriculture, Health and Safety, and Harbors and Navigation codes; or

2. regarding drinking water conducted to fulfill statutory requirements under the federal Safe Drinking Water Act or the California Health and Safety Code. Such categorical exceptions may also be granted for draining water supply reservoirs, canals, and

[1] Mixing Zone is defined in the SIP as "a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall waterbody."

[2] Mutual Water Company is defined in the Public Utilities Code, section 2725 as: "any private corporation or association organized for the purpose of delivering water to its stockholders and members at cost, including use of works for conserving, treating and reclaiming water".

pipelines for maintenance, for draining municipal storm water conveyances for cleaning or maintenance, or for draining water treatment facilities for cleaning or maintenance.

The District has concluded that they meet one or more of the aforementioned criteria for gaining a SIP exception.

Permittees who elect to use a SIP exception must satisfactorily complete several steps, including preparation and submission of a California Environmental Quality Act (CEQA) document. This document must be submitted to the SWRCB for the permittee to be placed on Attachment E of the Permit and subsequently be afforded coverage.

The SWRCB has suggested that the Permit may be re-opened for additional CEQA document submission as needed.

1.3 Required Approvals

To obtain approval of an exception under Section 5.3 of the SIP to the CTR criterion for acrolein and copper-containing herbicides, the District will submit the following documents to the SWRCB and RWQCB for acceptance:

a. A detailed description of the proposed action, including the proposed method of completing the action;
b. A time schedule;
c. A discharge and receiving water quality monitoring plan (before project initiation, during project implementation, and after project completion, with the appropriate quality assurance and quality control procedures);
d. CEQA documentation;
e. Contingency plans (to the extent applicable);
f. Identification of alternate water supply (if needed and to the extent applicable);
g. Residual waste disposal plans (to the extent applicable); and
h. Upon completion of the project, the discharger shall provide certification by a qualified biologist that the receiving water beneficial uses have been restored.

1.4 Required Notifications

1.4.1 California Department of Fish and Game

Twenty four (24) hours prior to application of acrolein, the District informs the California Department of Fish and Game (CDFG) via phone.

1.4.2 Glenn and Colusa County Agricultural Commissioners

Prior to the start of every season, the District obtains a Restricted Materials permit from each County Agricultural Commissioner's office (CAC). Consistent with local requirements of the Glenn and Colusa County Departments of Agriculture, the

District submits a Notice of Intent (NOI) to the each CAC at the beginning of the season which describes the site(s) likely to be treated and the pesticides to be applied.

1.5 Standard Operating Procedures

Water leaving the District goes either to the Sacramento River, the Colusa Basin Drain, a neighboring wildlife refuge, or to a neighboring irrigation or reclamation district for reuse. No conveyances that drain directly into the Sacramento River are treated with aquatic pesticides. The Colusa Basin Drain flows into the Sacramento River at Knight's Landing, about 30 miles south of its confluence with the Main Canal. Laterals are typically treated 0 to 3 times per year depending on need.

The District implements an Integrated Pest Management (IPM) program for aquatic weed control. The IPM program involves the scouting of aquatic weed locations and densities, establishment of thresholds above which control is needed, and making applications of aquatic pesticides on an "as-needed" basis to achieve the aquatic weed control necessary to convey water.

Prior to application, the following tasks are accomplished:

1. A written recommendation is prepared by a DPR-licensed Pest Control Advisor (PCA). A PCA undergoes 40 hours of training every 2 years on issues including health and safety and prevention of exposure to sensitive receptors. The written recommendation prepared by the PCA must evaluate proximity of occupied buildings and people, health and environmental hazards and restrictions, and a certification that alternatives and mitigation measures that substantially lessen any significant adverse impact on the environment have been considered, and if feasible, adopted. Refer to **Appendix E**.

2. All District personnel and their contractors review and strictly adhere to the aquatic pesticide product label that has clear and specific warnings that alert users to hazards that may exist. An example of a specific product label is included in **Appendix A**. Applicators must either have a Qualified Applicator Certificate (QAC) with the aquatic designation or work under the supervision of a staff member that has a QAC.

3. All District personnel and their contractors review and consult the aquatic pesticide Material Safety Data Sheet (MSDS) in **Appendix A**, and the DPR Worker Health and Safety Branch Pesticide Safety Information Series (PSIS) in **Appendix B**. The PSIS and the MSDS have specific information that describes precautions to be taken during the use of the aquatic pesticide. In addition, the District obtains annual training on the use of acrolein as described in the Magnacide H Herbicide Application and Safety Manual.

4. The condition of the lateral(s) being treated is field evaluated to ensure that the application is necessary, feasible, and can be conducted safely and according to label. This evaluation considers target weed species, level of infestation, water and flow conditions, alternate control methods, and amount of chemical to be applied.

5. After field evaluation, notices are sent to the County Agricultural Commissioner (CAC) and the California Department of Fish and Game (CDFG). Growers are also given the opportunity to postpone water deliveries in case of sensitivities, such as pastures with lactating cows or organic crops. Growers are instructed not to make adjustments to the

turnout gates during the hold period prescribed by the label.

6. The day before an application the water operator will seal all emergency spill structures with boards and plastic. Emergency spills are overflows that allow excess water in the lateral to spill into the drain system. The applicator inspects all seals immediately prior to application and faulty seals are repaired.

7. Water treated with acrolein is only used for irrigation of fields (crop bearing, fallow, or pasture) where the treated water remains on the field, or is held for the label-prescribed period before being released to fish bearing waters or will drain to them.

During and after application, the District accomplishes the following:

1. Inspections of the conveyance continues for up to 6 days following the treatment to ensure that if water is not discharged to a field, the label-prescribed hold time is met before water is released from the conveyance. Occasionally, small leaks (< 1 gallon per minute) may develop at gates or check structures and are controlled with sand bags, temporary dikes, pumps, or by lowering the level of treated water below the elevation of the leak. All these actions effectively prevent the release of water treated with aquatic herbicide from leaving a conveyance prior to holding time expiration.

2.0 INITIAL STUDY

This document was prepared in a manner consistent with Section 21064.5 of the California Public Resources Code and Article 6 of the State CEQA Guidelines (14 California Code of Regulations).

This Initial Study, Environmental Checklist, and evaluation of potential environmental effects were completed in accordance with Section 15063(d) of the *State CEQA Guidelines* to determine if the proposed Project could have any potentially significant effect on the physical environment, and if so, what mitigation measures would be imposed to reduce such impacts to less-than-significant levels.

An explanation is provided for all determinations, including the citation of sources as listed in Section 5. A "No Impact" or a "Less-than-Significant Impact" determination indicates that the proposed Project would not have a significant effect on the physical environment for that specific environmental category.

Mitigation measures will be implemented to reduce the potentially significant impacts to a less-than-significant levels. No other environmental categories for this evaluation were found to be potentially affected in a significant manner by the proposed Project.

2.1 CEQA Initial Study & Environmental Check List Form

1. Project Title: Use of Acrolein and Copper-Containing Aquatic Pesticides to Control Aquatic Weeds in Water Conveyances

2. Lead Agency Name and Address: Glenn-Colusa Irrigation District
P.O. Box 150

344 East Laurel Street
Willows, California 95988

3. Contact Person & Phone Number: William F. Menke, Assistant Manager
530.934.8881

4. Project Location: Glenn and Colusa Counties, California

5. Project Sponsor's Name and Address: See #2. above

6. General Plan Land Use Designation: Agriculture/Residential/Commercial/Industrial

7. Zoning: Agriculture/Residential/Commercial/Industrial

8. Description of Project: See Section 1.5

9. Surrounding Land Uses and Setting: Agriculture

10. Other Agencies Whose Approval is Required: As Listed in Section 1

2.2 Environmental Factors Potentially Affected

The environmental factor checked below would be potentially affected by the proposed Project, involving at least one impact that is a 'Potentially Significant Impact" as indicated by the checklist on the following pages:

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☒ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☒ Mandatory Findings of Significance	

2.3 Determination (To be completed by lead agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect because appropriate mitigation measures are in place. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An EIR is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

William F. Menke
Signature

February 16, 2006
Date

William F. Menke
Printed Name

Glenn-Colusa Irrigation District
For

3.0 EVALUATION OF ENVIRONMENTAL IMPACTS

3.1 Aesthetics

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
	Would the Project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	Substantially degrade the existing visual character or quality of the site and its surrounding?	☐	☐	☐	☒
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion

Items a) & b): ***No Impact.*** No designated scenic vistas or state scenic highways overlook any of the project sites, therefore no impact would occur.

Item c): ***No Impact.*** The project involves the application of aquatic pesticides to conveyances in the District to control a variety of aquatic weeds. These weeds are typically at or below the water surface. Upon control, the removal of these weeds would be unnoticed and as a result not degrade the visual character of the project site.

Item d): ***No Impact.*** The project is done during the daylight hours, therefore no light sources are needed and no light or glare is produced.

3.2 Agriculture Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Discussion

Items a) through c): ***No Impact.*** On the contrary, the project accomplishes objectives that maintain and enhance agricultural land use.

3.3 Air Quality

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal and state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion

Items a) & b): ***No Impact.*** The project requires the use of pick-up trucks for purposes of transporting aquatic pesticides to locations where they are needed. Pick-up trucks are also used for purposes of site reconnaissance before, during, and after application of aquatic pesticides. Short-term vehicle emissions will be generated during aquatic pesticide application; however, they will be minor and last only from April to October. To minimize impacts, all equipment will be properly tuned and muffled and unnecessary idling will be minimized.

The District is located in the Northern Sacramento Valley Air Basin (NVSAB), which includes the following counties: Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba. The application of aquatic pesticides does not conflict with the NSVAB 2003 Air Quality Attainment Plan, violate any air quality standards, or contribute to an existing or projected violation available from the Glenn County and Colusa County Air Pollution Control Districts.

Item c): ***No Impact.*** Glenn and Colusa County are designated as attainment areas by their respective Air Pollution Control Districts for PM_{10} or ozone.

Items d) & e): ***No Impact.*** Aquatic pesticides are applied by District personnel or their contractors in agricultural areas rarely frequented by people. Applications are not made near, schools, playgrounds, health care facilities, day care facilities, and athletic facilities, thereby eliminating exposure to these sensitive receptors and creating no impact.

3.4 Biological Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion

Items a) & b): **Potentially Significant Unless Mitigation Incorporated.** A list of current special status species was compiled from the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB), and the U.S. Fish and Wildlife Service (USFWS), Sacramento Office. Once this list was compiled, a preliminary assessment of the project area was performed to characterize the actual habitats present on-site and the likelihood of special status species occurrence.

A summary of the listed species, their designation, and whether or not they were considered for evaluation of potential impact is presented in **Table 1.** Species habitat and rationale for removal from further consideration is presented in **Appendix C.** Physical, chemical and toxicological data on copper and acrolein is presented in **Appendix D.**

With two (2) exceptions, no special status species has habitat in or near, or is otherwise exposed to aquatic pesticides used for the project.

The two (2) species that may be at risk are the northwestern pond turtle and the giant garter snake because they could move from natural water bodies and enter treated canals. The estimated exposure of the northwestern pond turtle and giant garter snake due to exposure to copper-containing herbicides or acrolein at typical application rates would diminish to concentrations not estimated to pose a risk after approximately 3.5 days. Assumptions used to estimate exposure and toxicity are included in **Appendix C and D.**

BIO-1: Mitigation for potential exposure of northwestern pond turtle and giant garter snake will be to have qualified personnel survey for these species and their habitat on the day **prior** to an aquatic pesticide application. The distance to be surveyed will be the distance treated water would travel in approximately 3.5 days.

If a northwestern pond turtle or a giant garter snake is found, the application will be temporarily postponed and the conveyance surveyed again. Once found to be void of northwestern pond turtle and giant garter snake over the distances specified, the conveyance can be treated.

Item c): ***No Impact.*** The project takes place in the District's conveyances and, therefore, will not impact any upland habitat or wetlands. However, the assessment of risk for species that live in these areas was considered. Risks to these species are adequately mitigated with **BIO-1.**

Item d): ***No Impact.*** Water for the District is diverted from the Sacramento River at the Glenn-Colusa Irrigation District pumping station near Hamilton City. Before entering the District's conveyance system, the water passes through a flat-plate fish screen, built to prevent migrating salmon from entering the canal system. Due to the presence of this screen, project activities will not adversely influence movement of any native resident or migratory fish.

Items e) and f): ***No Impact.*** The project does not conflict with, and has no impact to any local policies or ordinances protecting biological resources.

Table 1. Species and Habitat Summary

Common Name	Scientific Name	Status	Habitat	Habitat is not Present in Project Area; Species Eliminated from Further Consideration	Habitat is Present in Project Area; Species Eliminated from Further Consideration for Reasons Given (see numbered notes)	Potential Risk is Present from Project Activities
AMPHIBIAN						
California tiger salamander	*Ambystoma californiense*	FPT, SCSC	Herbaceous wetland, temporary pool; Grassland/herbaceous , Savanna, Woodland - Hardwood; Benthic, Burrowing in or using soil		X (1)	
California red-legged frog	*Rana aurora draytonii*	FT, SCSC	Quiet permanent water of streams, marshes, or (less often) ponds and other quiet bodies of water.		X (2)	
western spadefoot toad	*Spea (=Scaphiopus) hammondii*	FSC, SCSC	Lowlands to foothills; grasslands, open chaparral, pine-oak woodlands. Prefers shortgrass plains, sandy or gravelly soil. Fossorial. Breeds in temporary rain pools and slow-moving streams		X (3)	
BIRD						
tricolored blackbird	*Agelaius tricolor*	FSC, SCSC	Fresh-water marshes of cattails, tule, bulrushes and sedges; Cropland/hedgerow, Grassland/herbaceous		X (4)	
golden eagle	*Aquila chrysaetos*	SCSC, SFP	Rolling Foothills, Sage-Juniper Flats, Desert		X (4)	
great egret	*Ardea alba*		Marshes, swampy woods, tidal estuaries, lagoons, mangroves, streams, lakes, and ponds; also fields and meadows		X(5)	
great blue heron	*Ardea herodias*		Estuarine, Freshwater Marsh, Riverine		X(5)	
burrowing owl	*Athene cunicularia*	FSC, SCSC	Agriculture/Rangeland, Grassland		X (4)	
western burrowing owl	*Athene cunicularia hypugaea*	FSC	See Burrowing Owl		X (4)	
oak titmouse	*Baeolophus inornatus*		Forest, Woodland; hardwood and mixed, Shrubland/chaparral, Suburban/orchard	X		

Aleutian Canada goose	*Branta canadensis leucopareia*	FD	Open Water, Pasture/Grainfields (winter only)	X		
ferruginous hawk	*Buteo regalis*	FSC, SCSC	Open country, primarily prairies, plains and badlands; sagebrush, saltbush-greasewood shrubland, periphery of pinyon-juniper and other woodland, desert (winter only)	X		
Swainson's hawk	*Buteo swainsoni*	ST	Cropland/hedgerow, desert, grassland/herbaceous, savanna, woodland - mixed		X (4)	
Lawrence's goldfinch	*Carduelis lawrencei*	FSC	Oak woodland, chaparral, riparian woodland, pinyon-juniper association, and weedy areas in arid regions but usually near water	X		
Vaux's swift	*Chaetura vauxi*	FSC, SCSC	Found in mature forests but also forages and migrates over open country	X		
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FC, SE	Open woodland (especially where undergrowth is thick), parks, deciduous riparian woodland; requires patches of at least 10 hectares (25 acres) of dense riparian forest with a canopy cover of at least 50 percent in both the understory and overstory	X		
white-tailed kite	*Elanus leucurus*	FSC, SFP	Savanna, open woodland, marshes, partially cleared lands and cultivated fields, mostly in lowland situations		X (4)	
willow flycatcher	*Empidonax traillii*	SE	Strongly tied to brushy areas of willow, thickets, open second growth with brush, swamps, wetlands, streamsides, and open woodland	X		
little willow flycatcher	*Empidonax traillii brewsteri*	SE	See Willow Flycatcher	X		
American peregrine falcon	*Falco peregrinus anatum*	FD, SE, SFP	Herbaceous wetland, lagoon, river mouth/tidal river, tidal flat/shore, bare rock/talus/scree, cliff, shrubland/chaparral, urban/edificarian, woodland		X (4)	

greater sandhill crane	*Grus canadensis tabida*	ST, SFP	Herbaceous wetland, Riparian; Cropland/hedgerow, grassland/herbaceous (winter only)	X		
bald eagle	*Haliaeetus leucocephalus*	FT, SE, SFP	Coastal areas, bays, rivers, lakes, or other bodies of water (winter only)	X		
loggerhead shrike	*Lanius ludovicianus*	FSC, SCSC	Open country with scattered trees and shrubs, savanna, desert scrub, and, occasionally, open woodland		X (4)	
California black rail	*Laterallus jamaicensis coturniculus*	FSC, ST, SFP	Saltwater marsh, freshwater marsh		X (6)	
Lewis' woodpecker	*Melanerpes lewis*	FSC	Open forest and woodland, often logged or burned, including oak, coniferous forest, riparian woodland and orchards		X (4)	
long-billed curlew	*Numenius americanus*	FSC, SCSC	Prairies and grassy meadows, generally near water (winter only)	X		
osprey	*Pandion haliaetus*	SCSC	Primarily along rivers, lakes, reservoirs, and seacoasts,		X (5)	
Nuttall's woodpecker	*Picoides nuttallii*		Riparian; Forest - hardwood, shrubland/chaparral, woodland - hardwood		X (4)	
white-faced ibis	*Plegadis chihi*	FSC, SCSC	Marshes, swamps, ponds and rivers, mostly in freshwater habitats; in the Central Valley of California, ibises preferentially selected foraging sites close to emergent vegetation		X (7)	
bank swallow	*Riparia riparia*	FSC, ST	Riparian and other lowland habitats; requires vertical banks/cliffs with fine soils		X (8)	
rufous hummingbird	*Selasphorus rufus*	FSC	Alpine, forest - conifer, grassland/herbaceous, shrubland/chaparral, suburban/orchard, woodland - conifer, woodland - mixed (winter only)	X		
northern spotted owl	*Strix occidentalis caurina*	FT	Typical habitat characteristics include moderate to high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees;	X		

FISH						
green sturgeon	*Acipenser medirostris*	FC, SCSC	Most often in marine waters; estuaries, lower reaches of large rivers, salt or brackish water off river mouths; adults feed on bottom invertebrates and small fish	X		
delta smelt	*Hypomesus transpacificus*	FT, ST	Open waters of bays, tidal rivers, channels, and sloughs; breeds in medium to large rivers	X		
river lamprey	*Lampetra ayresi*	FSC, SCSC	San Joaquin-Sacramento Delta and northward, including the Sacramento River	X		
Pacific lamprey	*Lampetra tridentata*	FSC	Estuaries, rivers and creeks with fine gravel substrate	X		
steelhead - Central Valley	*Oncorhynchus mykiss irideus*	FT	Sacramento and San Joaquin Rivers and Tributaries	X		
Chinook salmon - fall-run	*Oncorhynchus tshawytscha*	FC, SCSC	Most spawning occurs in gravel riffles in main streams	X		
chinook salmon winter run	*Oncorhynchus tshawytscha winter run*	FE, SE	Sacramento River and Tributaries	X		
Sacramento splittail	*Pogonichthys macrolepidotus*	FSC, SCSC	Lakes, slow-moving rivers with vegetated floodplain, tidal estuarine marsh	X		
longfin smelt	*Spirinchus thaleichthys*	FSC, SCSC	Coastal waters near shore, bays, estuaries, and rivers, and landlocked in some lakes	X		
MAMMAL						
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	FSC, SCSC	See Pacific western big-eared bat		X(4)	
Pacific western big-eared bat	*Corynorhinus townsendii townsendii*	FSC, SCSC	In CA; solitary males and small groups of females are known to hibernate in buildings, limestone caves, lava tubes, and human-made structures in coastal lowlands, cultivated valleys, and nearby hills covered with mixed vegetation		X(4)	
Marysville Heermann's kangaroo rat	Dipodomys californicus eximius	FSC, SCSC	Friable Soils in grass-forb stages of chaparral, known only from Sutter Buttes area	X		

Greater western mastiff bat	*Eumops perotis californicus*	FSC, SCSC	Open, semi-arid to arid habitats including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels	X		
small-footed myotis bat	*Myotis ciliolabrum*	FSC	Generally inhabits desert, badland, and semiarid habitats	X		
long-legged myotis bat	*Myotis volans*	FSC	Primarily in montane coniferous forests; also riparian habitats; roosts in abandoned buildings, rock crevices, under bark, etc.in some areas hollow trees are the most common nursery sites, but buildings and rock crevices are also used		X(4)	
Yuma myotic bat	*Myotis yumanensis*	FSC	Found in a wide variety of upland and lowland habitats, including riparian, desert scrub, moist woodlands and forests, but usually found near open water; flys low; nursery colonies usually are in buildings, caves and mines, and under bridges		X(8)	
San Joaquin pocket mouse	*Perognathus inornatus inornatus*	FSC	Friable soils in grasslands, oak savanna	X		
REPTILE						
northwestern pond turtle	*Clemmys marmorata marmorata*	FSC, SCSC	Permanent and intermittent waters of rivers, creeks, small lakes and ponds, marshes, irrigation ditches, and reservoirs			X
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	SCSC	Occurs in open, dry, treeless areas, including grassland and saltbush scrub.	X		
giant garter snake	*Thamnophis gigas*	FT, ST	Prefers freshwater marsh and low gradient streams, has adapted to drainage canals and irrigation ditches			X
INVERTEBRATE						
Antioch Dunes anthicid beetle	*Anthicus antiochensis*	FSC	Sand dunes; species only known to occur in Antioch, CA	X		
Sacramento anthicid beetle	*Anthicus sacramento*	FSC	Sand dunes and sandbars within riparian areas of the Sacramento-San Joaquin Delta	X		

Conservancy fairy shrimp	*Branchinecta conservatio*	FE	Large turbid pools, endemic to central valley in California	X		
vernal pool fairy shrimp	*Branchinecta lynchi*	FT	Vernal pools	X		
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	Riparian		X(9)	
vernal pool tadpole shrimp	*Lepidurus packardi*	FE	Vernal pools	X		
California linderiella fairy shrimp	*Linderiella occidentalis*	FSC	Vernal pools	X		
PLANT						
bent-flowered fiddleneck	*Amsinckia lunaris*	FSC, CNPS-2	Grassland, woodland	X		
Ferris's milk-vetch	*Astragalus tener var. ferrisiae*	FSC, CNPS-2	Grassland	X		
heartscale	*Atriplex cordulata*	FSC, CNPS-2	Alkali scrub or grassland	X		
brittlescale	*Atriplex depressa*	FSC, CNPS-2	Alkali scrub or grassland, Vernal pools	X		
San Joaquin saltbush	*Atriplex joaquiniana*	FSC, CNPS-2	Alkali scrub, grasslands	X		
vernal pool smallscale	*Atriplex persistens*	FSC, CNPS-2	Vernal pools	X		
fox sedge	*Carex vulpinoidea*	CNPS-1	Freshwater wetlands		X(10)	
pink creamsacs	*Castilleja rubicundula ssp. rubicundula*	FSC, CNPS-2	Chaparral, grassland (on Serpentinite soil)	X		
Hoover's spurge	*Chamaesyce hooveri*	FT, CNPS-2	Vernal pools	X		
palmate-bracted bird's-beak	*Cordylanthus palmatus*	FE, SE, CNPS-2	Alkali scrub or grassland	X		
recurved larkspur	*Delphinium recurvatum*	FSC, CNPS-2	Alkali scrub or grassland	X		
dwarf downingia	*Downingia pusilla*	CNPS-1	Grassland, vernal pools	X		
four-angled spikerush	*Eleocharis quadrangulata*	CNPS-1	Freshwater marsh, lake and pond margins		X(10)	
round-leaved filaree	*Erodium macrophyllum*	CNPS-1	Grassland, woodland	X		
adobe-lily	*Fritillaria pluriflora*	FSC, CNPS-2	Foothill woodland, grassland	X		
rose-mallow	*Hibiscus lasiocarpus*	CNPS-1	Freshwater marsh		X(11)	
Red Bluff dwarf rush	*Juncus leiospermus var. leiospermus*	FSC, CNPS-2	Chaparral, grassland, foothill woodland	X		

Coulter's goldfields	*Lasthenia glabrata ssp. coulteri*	CNPS-2	Grassland, playas, vernal Pools	X		
Colusa layia	*Layia septentrionalis*	FSC, CNPS-2	Chaparral, grassland, oak woodland	X		
Heckard's pepper-grass	*Lepidium latipes var. heckardii*	FSC, CNPS-2	Grassland, vernal pools	X		
Butte County meadowfoam	*Limnanthes floccosa ssp. californica*	FE, SE, CNPS-2	Grassland, vernal pools	X		
little mousetail	*Myosurus minimus ssp.apus*	FSC	Vernal pools	X		
Baker's navarretia	*Navarretia leucocephala ssp. bakeri*	FSC	Grassland, coniferous forest, oak woodland, vernal pools	X		
Colusa grass	*Neostapfia colusana*	FT, SE, CNPS-2	Playas, vernal pools	X		
hairy orcutt grass	*Orcuttia pilosa*	FE, SE, CNPS-2	Vernal pools	X		
Ahart's paronychia	*Paronychia ahartii*	FSC, CNPS-2	Grassland, oak woodland, vernal pools	X		
Wright's trichocoronis	*Trichocoronis wrightii var. wrightii*	CNPS-1	Mud flats of vernal lakes, drying river beds, alkali meadows	X		
caper-fruited tropidocarpum	*Tropidocarpum capparideum*	FSC, CNPS-3	Grassland	X		
Greene's tuctoria (Orcutt grass)	*Tuctoria greenei*	FE	Vernal pools	X		
Columbian watermeal	*Wolffia brasiliensis*	CNPS-1	Quiet water of marshes, ponds, sloughs, streams and other fresh water bodies		X(12)	

Table 1 Numbered Notes:

(1) Species not present in water during application due to aestivation (summer-time dormancy).
(2) Species not present in project area according to U.S. Fish and Wildlife Service Recovery Plan for the Red-Legged Frog (see bibliography in **Appendix C**).
(3) This is a terrestrial species that is known to enter water only during part of its' reproductive cycle. This period of time does not coincide with the application period of aquatic pesticides.
(4) Species not likely to have any exposure as its' target prey base consists of terrestrial species.
(5) The dissipation of copper-containing herbicide or acrolein, limited uptake in fish, along with a time-dependent bioconcentration factor for copper in aquatic invertebrates (see **Appendix C and D**) will limit dietary exposure to an insignificant level.
(6) Species is not likely to be found outside of National Wildlife Refuge habitat areas. Aquatic pesticides have significantly dissipated/degraded in treated water prior to water entering habitat areas. After dissipation/degradation, aquatic pesticide concentrations are not expected to pose a risk.
(7) Species known to forage in irrigated fields. Aquatic pesticides have significantly dissipated/degraded in treated water prior to entering irrigated fields. After dissipation/degradation, aquatic pesticide concentrations are not expected to pose a risk.
(8) These species forage for emergent aquatic insects over water. These insects may bioaccumulate copper. But, given the large amount of potential foraging area, the emergent aquatic insects from treated canals would likely only contribute an insignificant percentage of the total diet. Therefore, no risk due to copper exposure is anticipated.
(9) The habitat of the valley elderberry longhorn beetle is limited exclusively to elderberry bushes (*Sambucus* spp.). Elderberry bushes are terrestrial species. Accordingly, irrigation water containing aquatic pesticides is unlikely to come into contact with these plants. Therefore, no risk is present to elderberry bushes or valley elderberry longhorn beetles.
(10) According to The CalFlora Database, no reported occurrences of these species exist within any of the counties in the project area.
(11) Rose-mallow is not an emergent plant and therefore does not grow in standing water but may grow on moist banks of canals or ditches. Its' exposure to canal water containing aquatic pesticides is indirect, if any. Exposure will only occur through root uptake of soil water. Aquatic pesticide concentration in root zone water is not expected to be sufficient to cause risk.
(12) Columbian watermeal occurs in quiet, slow-moving waterways, such as ponds and sloughs. Given the characteristics of its microhabitat, this species is not likely to be found in the fast moving waters of District conveyances, and therefore is not expected to be at risk.

Table 1 Status Codes:

FE = Federally Listed as Endangered
FT = Federally Listed as Threatened
FPE = Federally Proposed Endangered
FPT = Federally Proposed Threatened
FPD = Federally Proposed Delisted
FSC = Federally Listed Species of Concern
FC = Federally Listed Candidate Species
FD = Federally Delisted
SCSC = State Listed Species of Concern
SE = State Listed as Endangered
SFP = State Listed as Fully Protected
ST = State Listed as Threatened
SR = State Listed as Rare
SCE = State Candidate Endangered
SCT = State Candidate Threatened
CNPS-1 = California Native Plant Society Listed, Rare, Threatened, or Endangered in CA only
CNPS-2 = California Native Plant Society Listed Rare, Threatened, or Endangered
CNPS-3 = California Native Plant Society Listed Presumed Extinct in CA

3.5 Cultural Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

Discussion

Items a) through d): ***No Impact.*** The project is confined to the District's conveyances. No known historical or archaeological resource, unique paleontological resource, unique geologic feature, or human remains in or out of formal cemeteries will be impacted.

3.6 Geology and Soils

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic-related ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Discussion

Items a) through e): ***No Impact.*** The project consists of applying aquatic pesticides to conveyances within the jurisdiction of the District. The project does not include any new structures, ground disturbances, or other elements that could expose persons or property to geological hazards. There would be no risk of landslide or erosion of topsoil. The Project would not require a septic or other wastewater system, as workers would use existing facilities in the operation areas of the reservoirs.

3.7 Hazards and Hazardous Materials

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion

Items a & b): **Less Than Significant Impact.** The project would involve handling aquatic herbicides which are regulated hazardous materials and may have the signal word "Danger" on the product label. Acute exposure to humans can cause eye, skin, and respiratory irritation, and can be harmful if swallowed. Refer to the representative product labels and MSDS presented in **Appendix A.** Details on the District's use of acrolein and copper-containing aquatic herbicides are presented in the Hydrology and Water Quality section. Use of this material would create a potential for spills that could affect worker safety and the environment. The spills could occur potentially at the District facility, at the point of application, or during transport.

The District handles, stores, transports aquatic pesticides and disposes of containers in accordance with federal, state, and county requirements and manufacturer's recommendations. This approach is supplemented by the following components of the District's aquatic weed management program:

1. District personnel and their contractors that make aquatic pesticide applications are under the direct supervision of a QAC ("aquatic" category designation). Expertise and training used by these personnel result in mitigating potentially significant impacts.

2. A written recommendation is prepared by a DPR-licensed Pest Control Advisor (PCA). A PCA undergoes 40 hours of training every 2 years on issues including health and safety and prevention of exposure to sensitive receptors. The written recommendation prepared by the PCA must evaluate proximity of occupied buildings and people, health and environmental hazards and restrictions, and a certification that alternatives and mitigation measures that substantially lessen any significant adverse impact on the environment have been considered and if feasible, adopted. Refer to **Appendix E.**

3. All District personnel and their contractors review and strictly adhere to the aquatic pesticide product label that has clear and specific warnings that alert users to hazards that may exist. An example of a specific product label is included in **Appendix A.**

4. All District personnel and their contractors review and consult the aquatic pesticide Material Safety Data Sheet (MSDS) in **Appendix A**, and the DPR Worker Health and Safety Branch Pesticide Safety Information Series (PSIS) in **Appendix B.** The PSIS and the MSDS have specific information that describes precautions to be taken during the use of the aquatic pesticide. District personnel's familiarity with the DPR PSIS series mitigates potentially significant impacts. For example, to mitigate potential risks as a result of the signal word "Danger" on some copper-containing or acrolein-based aquatic herbicides, the District uses the PSIS series that describes the personal protective equipment (PPE) needed for the safe handling of aquatic herbicides, including goggles, disposable coveralls, gloves and respirators. In addition, the District

obtains annual training on the use of acrolein as described in the Magnacide H Herbicide Application and Safety Manual.

5. The condition of the lateral(s) being treated is field evaluated to ensure that the application is necessary, feasible and can be conducted safely and according to label. This evaluation considers target weed species, level of infestation, water and flow conditions, alternate control methods, and amount of chemical to be applied.

6. After field evaluation, notice is given to the County Agricultural Commissioner (CAC) and the California Department of Fish and Game (CDFG). Growers are also given the opportunity to postpone water deliveries in case of sensitivities, such as pastures with lactating cows or organic crops. Growers are reminded not to make adjustments to the turnout gates during the hold period prescribed by the label

7. The day before an application the water operator will seal all emergency spill structures with boards and plastic. Emergency spills are overflows that allow excess water in the lateral to spill into the drain system. The applicator inspects all seals prior to application and faulty seals are repaired upon detection.

8. During and after the start of application, the District inspects the treated lateral for up to 6 days following treatment to ensure that the label-prescribed hold time is met before water is released. Water treated with acrolein is only used for irrigation of fields (crop bearing, fallow, or pasture) where the treated water remains on the field, or held for the label-prescribed period before being released or drained to fish bearing waters.

9. Occasionally, small leaks (< 1 gallon per minute) may develop at gates or check structures and are controlled with sand bags, temporary dikes, pumps, or lowering the level of treated water below the elevation of the leak. All these actions effectively prevent the release of water treated with aquatic herbicide from leaving the conveyance prior holding time expiration.

10. The location at which the aquatic pesticide is introduced into the conveyance is continuously staffed until the application is complete. District staff performing conveyance inspections are in continual radio contact with staff at the head of the conveyance where the aquatic pesticide is being introduced into the conveyance. In the event that a spill or leak is discovered, addition of aquatic pesticide stops and water delivery to the conveyance is reduced to create freeboard to lessen subsequent leakage. Not until the leak is fixed does aquatic pesticide application resume.

Item c): ***No Impact.*** No known, existing or proposed schools are located within ¼ mile of locations were applications are made.

Item d): ***No Impact.*** The project sites are not listed on any hazardous waste site lists compiled in Government Code Section *65962.5.*

Items e) & f): ***No Impact.*** Only one airport is located within a 2-mile range of the project: the Willows-Glenn County Airport. The use of this airport during project activity will not create a safety hazard for project participants

Item g): ***No Impact.*** The proposed Project would not impact emergency evacuation routes because public roadways are not be affected by the Project.

Item h): ***No Impact.*** The project will not increase fire hazards at the project sites. Truck access and parking near application sites is done in such a manner so as to minimize muffler contact with dry grass.

3.8 Hydrology and Water Quality

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

General Discussion

The District implements an Integrated Pest Management (IPM) program for aquatic weed control. The IPM program involves the scouting of aquatic weed locations and densities, establishment of thresholds above which control is needed, and making applications of aquatic pesticides on an "as-needed" basis to achieve the aquatic weed control necessary to convey water.

Depending on weed presence, aquatic pesticides containing copper and acrolein may be applied up to three (3) times per year at different locations depending on need between the months of May and September. Some years, neither of these aquatic herbicides are used.

Typically, aquatic pesticide applications are made in main laterals just downstream of the turnout from the main canal. A treatment at that single location is typically enough to treat the entire lateral system (including sub lateral branches). In some instances a sub lateral may need to be treated separately. The District makes no aquatic pesticide applications to the Colusa Basin Drain or to the northern-most lateral drains that go directly to the Sacramento River (Laterals 10-1, 10-2, 10-3, 11-4, and 12-3).

Aquatic pesticide applications are done over a short duration (typically less than approximately 6 hours per location) and not all conveyances are treated at the same time, for the same length of time, or treated every year. Depending on weed presence, some conveyances may not get treated at all while others may require multiple treatments the same season. Once water is treated with aquatic pesticides, it is either held for the time required on the product label or delivered to a grower's field. Not until the label hold time is reached is treated water released to natural watercourses or to a wildlife refuge. Copper-based and acrolein-based pesticides will be discussed for checklist item a.) above. All other checklist items will be discussed together at the end of this section.

Prior to aquatic pesticide applications, the following tasks are accomplished:

1. A written recommendation is prepared by a DPR-licensed Pest Control Advisor (PCA). A PCA undergoes 40 hours of training every 2 years on issues including health and safety and prevention of exposure to sensitive receptors. The written recommendation prepared by the PCA must evaluate proximity of occupied buildings and people, health and environmental hazards and restrictions, and a certification that alternatives and mitigation measures that substantially lessen any significant adverse impact on the environment have been considered and if feasible, adopted. Refer to **Appendix E.**

2. All District personnel and their contractors review and strictly adhere to the aquatic pesticide product label that has clear and specific warnings that alert users to hazards that may exist. An example of a specific product label is included in **Appendix A**.

3. All District personnel and their contractors review and consult the aquatic pesticide Material Safety Data Sheet (MSDS) in **Appendix A**, and the DPR Worker Health and Safety Branch Pesticide Safety Information Series (PSIS) in **Appendix B**. The PSIS and the MSDS have specific information that describes precautions to be taken during the use of the aquatic pesticide. In addition, the District obtains annual training on the use of acrolein as described in the Magnacide H Herbicide Application and Safety Manual available at http://www.epa.gov/espp/effects/magnacide-safety-manual.pdf.

4. The condition of the lateral(s) being treated is field evaluated to ensure that the application is necessary, feasible and can be conducted safely and according to label. This evaluation considers target weed species, level of infestation, water and flow conditions, alternate control methods, and amount of chemical to be applied.

5. After field evaluation, notices are sent to the County Agricultural Commissioner (CAC) and the California Department of Fish and Game (CDFG). Growers are also given the opportunity to postpone water deliveries in case of sensitivities, such as pastures with lactating cows or organic crops. Growers are reminded not to make adjustments to the turnout gates during the product label hold time.

6. The day before an application the water operator will seal all emergency spill structures with boards and plastic. Emergency spills are overflows that allow excess water in the lateral to spill into the drain system. The applicator inspects all seals immediately prior to application and faulty seals are repaired prior to the start of the application.

7. During and after the start of application, the District inspects the treated lateral for up to 6 days following treatment to ensure that the label-prescribed hold time is met before water is released. If leaks develop the emergency spills will be shored up with sand bags or a temporary dike. A pump will be used to move water back into the treated lateral and preventing it from flowing into the untreated conveyance.

8. The location at which the aquatic pesticide is introduced into the conveyance is continuously staffed until the application is complete. District staff who are performing a conveyance inspection are in continuous radio contact with staff at the head of the conveyance where the aquatic pesticide is being introduced into the system. In the event that a spill or leak is discovered, the addition of aquatic pesticide stops and water delivery to the conveyance is reduced to create freeboard which will lessen subsequent leakage. Not until the leak is fixed does aquatic pesticide application resume.

Overview of Aquatic Pesticide Use

Depending on weed presence, aquatic pesticides containing copper and acrolein may be applied up to three (3) times per year at different locations depending on need between the months of May and September. Some years, neither of these aquatic herbicides are applied.

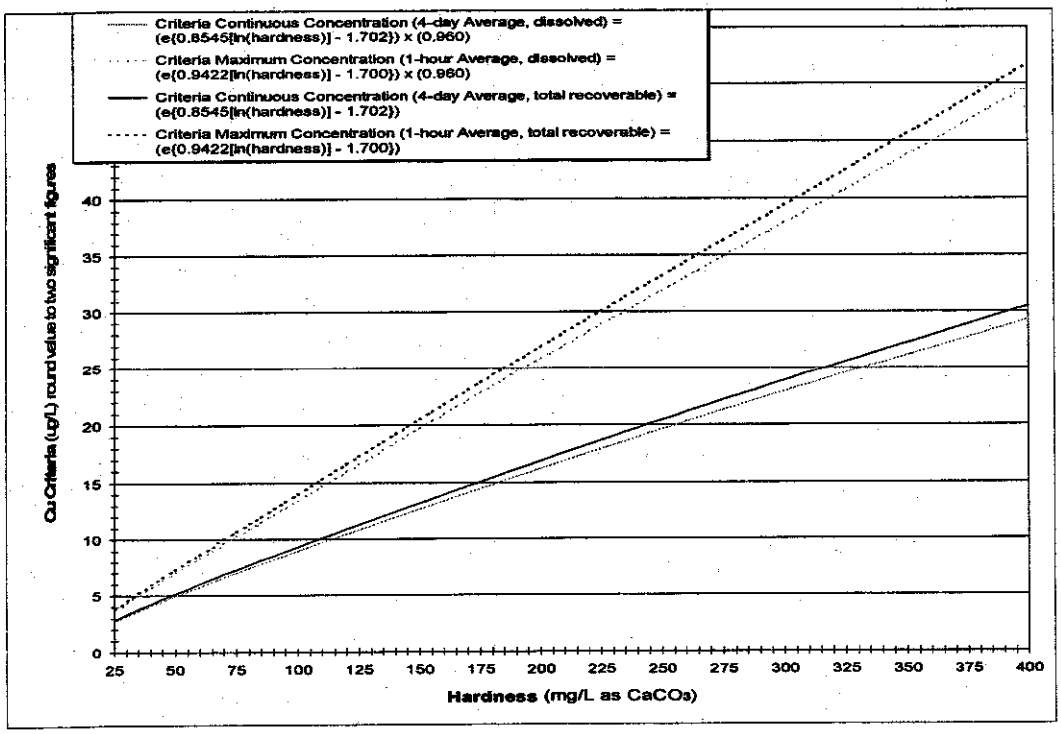
Applications are made in main laterals just downstream of the turnout from the main canal. A treatment at that single location is typically enough to treat the entire lateral system (including sub lateral branches). In some instances a sub lateral may need to be treated separately. The District makes no aquatic pesticide applications to the Colusa Basin Drain or to the northern-most lateral drains that go directly to the Sacramento River (Laterals 10-1, 10-2, 10-3, 11-4, and 12-3).

Copper Discussion

Item a): **Potentially Significant Unless Mitigation Incorporated.** As presented in Section 1.2, the existing interim emergency NPDES permit used by the District has expired. The District intends to obtain coverage under the new 2004 general permit that requires compliance with the SIP and the CTR.

Applications of copper-based aquatic pesticides according to label direction typically require concentrations of copper between 500 and 2,000 µg/L. Water quality criteria for copper as described in the CTR and by the Central Valley RWQCB (RWQCB 2003) are hardness-dependent. Refer to **Figure 3.** District water varies in hardness between approximately 65 and 300 mg/L as calcium carbonate ($CaCO_3$).

Figure 3. Cu Criteria Dependence on Hardness



Based on the relation of copper criteria to hardness, the applicable water quality criteria for copper in District conveyances have the following ranges:

Continuous Dissolved Concentration (4 day Average):	6-23 µg/L
Continuous Total Concentration (4 day Average)	7-24 µg/L
Maximum Dissolved Concentration (1 Hour Average)	9–38 µg/L
Maximum Total Concentration (1 Hour Average)	9–39 µg/L

These water quality criteria are exceeded at and downstream of the point of aquatic pesticide introduction into the conveyance. Accordingly, because label application rates exceed the CTR water quality criteria, the District is obtaining a SIP exception.

Copper-containing aquatic pesticide treatments are made to moving water. As such, the combination of dilution and uptake occur. Copper-containing aquatic pesticides applied in District conveyances rapidly dissipate and/or become permanently insoluble shortly after application (CDFA 2002; Trumbo 1997, 1998; WA DOE 2004). When copper is applied according to label direction, its half-life is between 3 and 30 hours due to a combination of precipitation, absorption by biota, adsorption by particulate matter, and complexation with organic matter.

Given a starting concentration of 1000 µg/L and a half-life of 30 hours, copper can reasonably be expected to dissipate according **to Table 2** below:

Table 2. Anticipated Rate of Copper Dissipation

Time (Hours)	Concentration (ug/L)
0	1000
30	500
60	250
90	125

Using a half-life of 30 hours, only a short-term (less than 14 days) CTR copper water quality criteria exceedance will occur in District canals.

Assuming typical label rate starting concentrations and the aforementioned half-life, the risk to species shown in **Table 1** from copper was estimated. Species exposure was conservatively assumed to occur immediately after introduction of copper into the conveyance. With the exception of the giant garter snake and the northwestern pond turtle, the concentration of copper in the District's conveyances does not pose a risk. This is consistent with the fact that District personnel have not reported adverse impacts to aquatic, avian, terrestrial, or benthic organisms as a result of using copper-based aquatic pesticides.

In spite of significant evidence that suggests that when used according to label directions by qualified personnel, impacts of copper-containing aquatic pesticides have no significant impact, the District will implement the following mitigation measures to continue operating without a significant impact and reduce any future potentially significant impacts to less than a significant level: These mitigation measures are:

HWQ-1. As required by the SIP and the SWRCB general permit for the application of aquatic pesticides, the District will prepare and execute an Aquatic Pesticide Application Plan (APAP). The APAP will call for surfacewater sampling and analysis before, during, and after project completion to assess the impact, if any, that the project may have on beneficial uses of water. Additionally, consistent with SIP exception requirements, the District will arrange for a qualified biologist to assess receiving water beneficial uses.

BIO-1. See Biological Resources Section. District staff will implement mitigation measure **BIO-1** to address potential risks to the northwest pond turtle and the giant garter snake. With this mitigation, a less than significant impact exists to these species. By regularly monitoring and reporting the presence/absence of these species in its conveyances, the District will be able to identify problems with water quality and take corrective action if necessary.

Acrolein Discussion

Application of acrolein according to label direction typically results in a concentration of approximately 15,000 µg/L in conveyance water. Water treated with acrolein is only used for irrigation of fields (crop bearing, fallow, or pasture) where the treated water remains on the field, or held for 6 days before being released to fish bearing waters.

Water quality criteria for acrolein as described in the CTR and by the Central Valley RWQCB (RWQCB 2003) are 320 µg/L and 110 µg/L, respectively. The CTR value is based on human health (carcinogenic risk) and the RWQCB value is based on a taste and odor threshold. These water quality criteria are exceeded at and downstream of the point of aquatic pesticide introduction into the conveyance. Accordingly, because label application rates exceed the CTR water quality criteria, the District is obtaining a SIP exception.

Like copper, all acrolein applications are made to moving water exposed to sunlight during the summer months. As such, the combination of dilution, evaporation, and degradation due to exposure to water and sunlight result in relatively fast rates of degradation. Numerous references in scientific literature report half-lives ranging from 9-26 hours (Nordone 1996, Turner 2003, WHO 2002). Given a starting concentration of 5,000 µg/L and a half-life of 9 hours, acrolein can reasonably be expected to dissipate according to **Table 3** below:

Table 3. Anticipated Rate of Acrolein Dissipation

Time (Hours)	Concentration (ug/L)
0	15000
14	5000
35	1000
80	38

Using a half-life of 9 hours, only a short-term (less than 3 days) CTR acrolein water quality criteria exceedance will occur in District canals.

The risk to species shown in **Table 1** from acrolein was estimated. With the exception of the giant garter snake and the northwestern pond turtle, the concentration of acrolein in the District's conveyances does not pose a risk. This is consistent with the fact that District personnel have not reported adverse impacts to aquatic, avian, terrestrial or benthic organisms as a result of using acrolein-based aquatic pesticides.

In spite of significant evidence that suggests that when used according to label directions by qualified personnel, impacts of acrolein-containing aquatic pesticides have no significant impact, the District will implement the following mitigation measures to continue operating without a significant impact and reduce any future potentially significant impacts to less than a significant level: This mitigation measure is:

HWQ-1. Same as HWQ-1 described above.

BIO-1. Same as BIO-1 described above.

Item b): ***No Impact.*** The project would not involve any construction activities or require the use of groundwater and therefore there is no impact on groundwater recharge or supplies.

Items c), d), & e): ***No Impact.*** The project will not involve construction of any structures that would alter drainage patterns or increase storm water runoff. The Project would not increase erosion or siltation on- or off-site. In fact, the project will maintain and enhance stormwater conveyance and therefore decrease erosion and siltation. No streambeds would be altered. No increase in drainage capacity of local storm sewers would be required.

Item f): See response to item a). Copper and acrolein are not listed by CDPR as known or suspected groundwater contaminants under Title 3, CCR Sec. 6800a. Copper is cationic and as a result, binds tightly to soil and sediment that exist in the unlined canals used by the District. Acrolein is volatile and degrades rapidly in a canal environment. Refer to **Appendix C and D** for details on the physical properties and environmental fate of these chemicals.

Prior to use of both of these chemicals, the District obtains written recommendations from a DPR-licensed Pest Control Advisor (PCA) who receives required training under CDPR's Groundwater Protection Regulations. All applications are made by QALs, or District staff under a QAL's supervision. Storage, handling, mixing and loading of copper and acrolein are done away from direct conduits to groundwater such as French drains and wells.

According to the Department of Water Resources (DWR 2004), no pesticides have been detected in groundwater in Colusa subbasin. As a result of the aforementioned facts, groundwater quality is not expected to be impacted.

Items g), h), i), & j): ***No Impact.*** Since the project would involve no new construction, no housing or other structures would be placed within a designated 100-year floodplain. The project would not alter the floodplain or have the potential to redirect flood flows. The Project would not be subject to tsunami or inundation due to mudflows. Nor would the Project expose personnel to a substantial risk due to seiche waves or from flooding as a result of a catastrophic dam failure. In fact, the District's use of aquatic pesticides allows for the conveyance of stormwater and as a result, directs flood flows away from property.

3.9 Land Use Planning

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion

Item a): ***No Impact.*** The project will be implemented within the District's existing conveyances. Nearby housing, if any, is rural and will not be affected. The proposed Project would not result in any division of an established community.

Item b): ***No Impact.*** The project will not create any new land uses or alter any existing uses and would not conflict with any applicable land use plan, policy or agency regulation.

Item c): ***No Impact.*** Refer to Section 3.4, item f). No known plan conflicts with the project.

3.10 Mineral Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan other land use plan?	☐	☐	☐	☒

Discussion

Items a) & b): ***No Impact.*** The project involves the addition of aquatic pesticides to the District's conveyances and has no impact on the availability of any known mineral resource recovery site.

3.11 Noise

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion

Items a) through d): ***No Impact.*** Project activity occurs in rural and agricultural areas. Typical sources of noise that occur in these areas that are unrelated to the project include tractors, generators, large groundwater and irrigation pumps and heavy trucks. The District uses pick-up trucks during the application of aquatic pesticides, which creates temporary, incidental noise that is inconsequential and therefore will have no impact.

Items e) & f): ***No Impact.*** The Willows Glenn County Airport is the only airport within 2 miles of the project. The use of this airport during project activity will not create a safety hazard for project participants.

3.12 Population and Housing

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

Items a) through c): ***No Impact.*** No new homes, roads or other infrastructure will be required. No displacement of existing homes or people will occur.

3.13 Public Services

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion

Item a): ***No Impact.*** The project will not alter or require the construction of new schools, parks, or other public facilities, nor will it increase the need for police and fire services beyond existing conditions.

3.14 Recreation

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse effect on the environment?	☐	☐	☐	☒

Discussion

Items a) & b): ***No Impact.*** The project takes place in the District's conveyances. District policy strictly prohibits playing in and fishing in conveyances. Treatment of aquatic weeds improves the ability of the District to deliver water to the Sacramento, Delevan, and Colusa wildlife refuges and this enhances recreation.

3.15 Transportation/Traffic

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

Discussion

Items a) & b): ***No Impact.*** The project involves the use of light to medium duty trucks that will not cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the county roads in the project area.

Item c): ***No Impact.*** The project has no influence on air traffic.

Items d) through g): ***No Impact.*** The project does not involve changes in road design or encourage incompatible road or highway uses. Further, the project does not impact emergency access or parking. Lastly, the project does not impact or conflict with adopted policies, plans, or programs supporting alternative transportation.

3.16 Utilities and Service Systems

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the Project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

Items a) & b), and e) through g): ***No Impact.*** The project does not discharge to a wastewater treatment plant and does not generate any solid waste. All containers used to store and transport aquatic pesticides are returned to the vendor for reuse.

Item c): ***No Impact.*** The project will maintain and enhance existing storm drainage capacity in the District's facilities. In fact, if the project was not completed, stormwater conveyance may be diminished and could result in flooding and subsequent loss of, or damage to, property.

Item d): ***No Impact.*** The project involves the treatment of aquatic weeds in conveyances used to transport convey wildlife and irrigation water and has no known influence on the entitlements or resources utilized by the District.

3.17 Mandatory Findings of Significance

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Item a): **Potentially Significant Unless Mitigation Incorporated.** The project involves the use of copper-containing and acrolein-based aquatic pesticides introduced into the District's conveyances at concentrations that temporarily exceed CTR water quality objectives. Significant evidence suggests that when used according to label directions by qualified personnel, CTR exceedence is short-term and impacts of these aquatic pesticides are less than significant.

However, the District will implement mitigation (**BIO-1 and HWQ-1**) to reduce any future potential impacts to less than a significant level.

Although copper and acrolein are hazardous materials, under the standard operating procedures used District personnel and their contractors, less than a significant impact exists.

Item b): **Less Than Significant Impact.** The cumulative impacts of continued application of copper-based pesticides is not known. Specifically, the extent to which copper accumulates and is bioavailable, if at all, is not clear. Acrolein is known to degrade rapidly and not accumulate. Mitigation has been incorporated into the project (**BIO-1 and HWQ-1**). This mitigation reduces the impact to a less than a significant.

Item c): **Less Than Significant Impact.** As a result of implementation of District standard procedures as described in the Hazards and Hazardous Materials section, any hazard/hazardous material impacts to the human beings is reduced to a less than a significant level.

4.0 LIST OF MITIGATION MEASURES

4.1 Biological Resources

BIO-1: Mitigation for potential exposure of northwestern pond turtle and giant garter snake will be to have qualified personnel survey for these species and their habitat on the day **prior** to an aquatic pesticide application. The distance to be surveyed will be the distance treated water would travel in approximately 3.5 days.

If a northwestern pond turtle or a giant garter snake is found, the application will be temporarily postponed and the conveyance surveyed again. Once found to be void of northwestern pond turtles and giant garter snakes, the conveyance can be treated.

With this mitigation, a less than significant impact exists to these species. By regularly monitoring and reporting the presence/absence of these species in its conveyances, the District will be able to identify problems with water quality and take corrective action if necessary.

4.2 Hydrology & Water Quality

HWQ-1. As required by the SIP and the SWRCB general permit for the application of aquatic pesticides, the District will prepare and an Aquatic Pesticide Application Plan (APAP). The APAP will call for surfacewater sampling and analysis before, during, and after project completion to assess the impact, if any, that the project may have on beneficial uses of water. Additionally, consistent with SIP exception requirements, the District will arrange for a qualified biologist to assess receiving water beneficial uses.

5.0 REFERENCES

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6.0 PERSONS AND AGENCIES CONTACTED

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2.) Cathy Johnson, USFWS
3.) Mike Wolder, USFWS
4.) Erin Mustain, SWRCB

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4.) Joseph P. Sullivan, Certified Wildlife Biologist, Ardea Consulting
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Appendix A

RESTRICTED USE PESTICIDE
DUE TO A HIGH ACUTE TOXICITY
For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

BAKER HUGHES

Baker Petrolite

MAGNACIDE® H HERBICIDE (Acrolein, Inhibited)

CONTENTS UNDER PRESSURE

EPA Reg. No. 10707-9 EPA Est. 10707-CA-005

ACTIVE INGREDIENT	BY WEIGHT
Acrolein	95%
INERT INGREDIENTS	5%
TOTAL	100%

This product contains the toxic inert ingredient hydroquinone.
(MAGNACIDE® H Herbicide contains 8.7 pounds of active ingredient per gallon.)

DANGER POISON

KEEP OUT OF REACH OF CHILDREN

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

EXTREMELY FLAMMABLE AND IRRITATING VAPOR AND LIQUID. POISONOUS BY INHALATION, SKIN CONTACT OR SWALLOWING. DO NOT BREATHE VAPOR. CORROSIVE. CAUSES EYE AND SKIN DAMAGE. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. KEEP AWAY FROM FIRE, SPARKS AND HEATED SURFACES.

When putting up and breaking down application equipment, a full-face air purifying respirator with organic vapor (OV) cartridges jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH) and butyl rubber gloves must be worn. For visual inspection during treatment, shielded splash goggles must be worn. If spilled on clothing, gloves, or shoes, remove them immediately and wash the body with soap and water before reuse. Use with adequate ventilation.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Keep out of lakes, streams or ponds. Fish, shrimp and oysters will be killed at application rates recommended. Do not apply where they are important resources. Do not apply to water drainage areas where runoff or flooding will contaminate ponds, lakes, streams, tidal marshes and estuaries. Do not contaminate water by cleaning of equipment or disposal of wastes. Notify your State Fish and Game Agency before applying this product. Use only as specified.

PHYSICAL AND CHEMICAL HAZARDS

DANGER: Extremely flammable. Contains under pressure. Keep away from fire, sparks and heated surfaces. Do not puncture or incinerate container. Aqueous, the active ingredient in MAGNACIDE® H Herbicide, is highly reactive chemically and readily forms polymers. If alkaline bases are contacted and dissolved or strong acids are brought in contact with MAGNACIDE® H Herbicide in a closed system, the Herbicide can polymerize with sufficient violence to rupture the container. Do not apply with equipment used for acids and staples. Contamination of MAGNACIDE® H Herbicide with any foreign matter must be avoided.

A supply of sodium metabisulfite (solid salt) should be readily available for deactivating spilled MAGNACIDE® H Herbicide. All spills should be sacrificed and deactivated before disposal. See the MAGNACIDE® H Herbicide Application and Safety Manual for additional information.

FIRST AID

If inhaled:
- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.
- Call a poison control center or doctor for further treatment advice.

If on skin or clothing:
- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

If in eyes:
- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

If swallowed:
- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by the poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

Have the product container, label or application manual with you when calling a poison control center or doctor, or going for treatment. CALL A PHYSICIAN IMMEDIATELY IN ALL CASES OF SUSPECTED POISONING.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

WARNING SIGNS AND SYMPTOMS: Liquid MAGNACIDE® H Herbicide is absorbed by the skin and is particularly irritating in any fashion and to the eye. The vapors act principally on the mucous membranes of the eyes and respiratory tract. Because of the extreme lachrymatory warning effect, the concentration tolerable by man is far below the minimum lethal concentration.[1]

TREATMENT: Treat exposed area as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons exposed to MAGNACIDE® H Herbicide vapors have a delayed reaction and experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to MAGNACIDE® H Herbicide under observation for 24 hours following exposure.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. MAGNACIDE® H Herbicide is a water soluble material for the control of submersed and floating weeds and algae in irrigation canals. This material must be applied in accordance with directions in the MAGNACIDE® H Herbicide Application and Safety Manual by a certified applicator or under a certified applicator's supervision. Do not permit dairy animals to drink treated water. Do not use where owners will then take potential overuse of drinking water. Water treated with MAGNACIDE® H Herbicide must be used for irrigation of fields, other crop bearing, fallow or pasture, where the treated water remains on the field OR held for 5 days before being released into fish bearing waters or where it will drain into them.

STORAGE AND DISPOSAL
STORAGE OF MAGNACIDE® H HERBICIDE TANKS

All containers of MAGNACIDE® H Herbicide should be stored in a secured, well-ventilated area, away from all other chemicals. No alkalies or oxidizing materials should be near. Any electrical equipment should be Class 1 - Division 2 and properly grounded. Do not reuse empty containers. Return empty containers to Baker Petrolite Corporation.

DISPOSAL

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

NOTICE OF WARRANTY

BAKER PETROLITE CORPORATION MAKES NO WARRANTY OF MERCHANTABILITY FITNESS FOR ANY PURPOSE, OR OTHERWISE, EXPRESSED OR IMPLIED concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label.

NET WEIGHTS

Cylinder-370 lbs. Skid Tank-2450 lbs.

Acrolein, Inhibited, 6.1, (3), UN 1092, PG I, Toxic-Inhalation Hazard, Zone A, Marine Pollutant, RQ

RC-0001

MANUFACTURED BY: BAKER PETROLITE CORPORATION 12645 W. Airport Blvd., Sugar Land, TX 77478 Customer Care: 800-872-1816

Specimen MAGNACIDE H® Herbicide Label

MATHESON TRI-GAS®

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: ACROLEIN, INHIBITED

TRADE NAMES/SYNONYMS:
ACRALDEHYDE; ACRYLALDEHYDE; ACRYLIC ALDEHYDE; ALLYL ALDEHYDE; 2-PROPENAL; PROP-2-EN-1-AL; 2-PROPEN-1-AL; ETHYLENE ALDEHYDE; AQUALIN; MAGNACIDE; PROPENAL; ACROLEIN; RCRA P003; STCC 4906410; UN 1092; C3H4O; MAT00330; RTECS AS1050000

CHEMICAL FAMILY: aldehydes, aliphatic

CREATION DATE: Jan 24 1989
REVISION DATE: Sep 18 2003

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: ACROLEIN, INHIBITED
CAS NUMBER: 107-02-8
PERCENTAGE: >99.0

COMPONENT: HYDROQUINONE
CAS NUMBER: 123-31-9
PERCENTAGE: <0.1

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=3 REACTIVITY=3

EMERGENCY OVERVIEW:
COLOR: colorless to yellow
PHYSICAL FORM: volatile liquid
ODOR: pungent odor
MAJOR HEALTH HAZARDS: potentially fatal if inhaled or swallowed, harmful on contact with the skin,

respiratory tract burns, skin burns, eye burns, mucous membrane burns, tears
PHYSICAL HAZARDS: May explode when heated. Flammable liquid and vapor. Vapor may cause flash fire.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation (possibly severe), tearing, nausea, vomiting, diarrhea, difficulty breathing, asthma, headache, drowsiness, symptoms of drunkenness, fainting, bluish skin color, lung damage, death
LONG TERM EXPOSURE: lung damage
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation (possibly severe), blisters
LONG TERM EXPOSURE: rash
EYE CONTACT:
SHORT TERM EXPOSURE: burns, tearing, eye damage
LONG TERM EXPOSURE: same as effects reported in short term exposure
INGESTION:
SHORT TERM EXPOSURE: same as effects reported in other routes of exposure, burns, digestive disorders, dizziness, coma, death
LONG TERM EXPOSURE: tumors

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. For ingestion, consider gastric lavage and activated charcoal slurry.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Vapor/air mixtures are explosive. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam, alcohol resistant foam

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Do not get water inside container. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Water may be ineffective.

FLASH POINT: -15 F (-26 C) (CC)
LOWER FLAMMABLE LIMIT: 2.8%
UPPER FLAMMABLE LIMIT: 31.0%
AUTOIGNITION: 428 F (220 C)
FLAMMABILITY CLASS (OSHA): IB

6. ACCIDENTAL RELEASE MEASURES

AIR RELEASE:
Reduce vapors with water spray.

SOIL RELEASE:
Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Dike for later disposal. Add dilute acid.

WATER RELEASE:
Cover with absorbent sheets, spill-control pads or pillows. Add a reducing agent. Absorb with activated carbon. Collect spilled material using mechanical equipment.

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Flood with water. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Keep separated from

incompatible substances. Store in a cool, dry place. Store in a well-ventilated area. Avoid contact with light. Store outside or in a detached building. Store with flammable liquids. Monitor inhibitor content. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30). May form explosive peroxides. Store in a tightly closed container. Avoid contact with light. Store in a cool, dry place. Monitor inhibitor content. Do not evaporate or distill to dryness.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
ACROLEIN, INHIBITED:
ACROLEIN:
0.1 ppm (0.25 mg/m3) OSHA TWA
0.3 ppm (0.8 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
0.1 ppm ACGIH ceiling (skin)
0.1 ppm (0.25 mg/m3) NIOSH recommended TWA 10 hour(s)
0.3 ppm (0.8 mg/m3) NIOSH recommended STEL

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
2 ppm
Any supplied-air respirator operated in a continuous-flow mode.
Any powered, air-purifying respirator with organic vapor cartridge(s).
Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Escape -
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: colorless to yellow
PHYSICAL FORM: volatile liquid
ODOR: pungent odor
MOLECULAR WEIGHT: 56.06
MOLECULAR FORMULA: C-H2-C-H-C-H-O
BOILING POINT: 126-129 F (52-54 C)
FREEZING POINT: -125 F (-87 C)
VAPOR PRESSURE: 210 mmHg @ 20 C
VAPOR DENSITY (air=1): 1.94
SPECIFIC GRAVITY (water=1): 0.8410
WATER SOLUBILITY: 20.6% @ 20 C
PH: Not available
VOLATILITY: 100%
ODOR THRESHOLD: 1.5 ppm
EVAPORATION RATE: Not available
VISCOSITY: 0.35 cP @ 20 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: alcohol, ether, acetone

10. STABILITY AND REACTIVITY

REACTIVITY: Polymerizes with evolution of heat. Avoid contact with air, light, water or storage and use above room temperature.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Minimize contact with material. Keep out of water supplies and sewers.

INCOMPATIBILITIES: acids, bases, amines, combustible materials, metal salts, oxidizing materials

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: oxides of carbon

POLYMERIZATION: May polymerize. Avoid contact with air, light or storage and use above room temperature.

11. TOXICOLOGICAL INFORMATION

ACROLEIN, INHIBITED:
IRRITATION DATA:
500 ppb/12 minute(s) eyes-human; 5 mg open skin-rabbit severe; 2 mg/24 hour(s) skin-rabbit severe; 1 mg eyes-rabbit severe; 50 ug/24 hour(s) eyes-rabbit severe; 1 percent skin-human
TOXICITY DATA:
8 ppm/4 hour(s) inhalation-rat LC50; 200 mg/kg skin-rabbit LD50; 26 mg/kg oral-rat LD50
CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Inadequate Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen
LOCAL EFFECTS:
Corrosive: inhalation, skin, eye, ingestion
ACUTE TOXICITY LEVEL:
Highly Toxic: inhalation, dermal absorption, ingestion
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 14.0 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (Pimephales promelas)

INVERTEBRATE TOXICITY: 93 ug/L 48 hour(s) EC50 (Immobilization) Water flea (Daphnia magna)

ALGAL TOXICITY: 1700 ug/L 48 hour(s) (Population Growth) Cryptomonad (Chilomonas paramecium)

OTHER TOXICITY: 7 ug/L 96 week(s) LC50 (Mortality) Clawed toad (Xenopus laevis)

FATE AND TRANSPORT:
BIOCONCENTRATION: 344 ug/L 1-28 hour(s) BCF (Residue) Bluegill (Lepomis macrochirus) 13.1 ug/L

ENVIRONMENTAL SUMMARY: Highly toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): P003. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Acrolein, stabilized
ID NUMBER: UN1092
HAZARD CLASS OR DIVISION: 6.1

PACKING GROUP: I
LABELING REQUIREMENTS: 6.1; 3
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Acrolein, stabilized
UN NUMBER: UN1092
CLASS: 6.1; 3
PACKING GROUP/RISK GROUP: I

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
ACROLEIN, INHIBITED: 1 LBS RQ
HYDROQUINONE: 100 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
ACROLEIN, INHIBITED: 500 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
ACROLEIN, INHIBITED: 1 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):
ACROLEIN, INHIBITED

OSHA PROCESS SAFETY (29CFR1910.119):
ACROLEIN, INHIBITED: 150 LBS TQ

STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: Not determined.

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

MATHESON TRI-GAS, INC. MAKES NO EXPRESS OR IMPLIED WARRANTIES, GUARANTEES OR REPRESENTATIONS REGARDING THE PRODUCT OR THE INFORMATION HEREIN, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE. MATHESON TRI-GAS, INC. SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE, WHETHER COMPENSATORY, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE, RESULTING FROM ANY PUBLICATION, USE OR RELIANCE UPON THE INFORMATION HEREIN.

CUTRINE®-PLUS

ALGAECIDE/HERBICIDE

Pat. No. 3,930,834 **EPA Reg. No. 8959-10** **EPA Est. No. 42291-GA-1**

FOR USE IN LAKES – POTABLE WATER RESERVOIRS FARMS, FISH AND INDUSTRIAL PONDS, FISH HATCHERIES AND RACEWAYS, CROP AND NON-CROP IRRIGATION CONVEYANCE SYSTEMS, DITCHES, CANALS AND LATERALS

ACTIVE INGREDIENTS:	
COPPER AS ELEMENTAL	*9.0%
INERT INGREDIENTS:	91.0%
TOTAL	100.0%

CUTRINE-PLUS contains 0.909 lbs. of elemental copper per gallon.
*From mixed Copper-Ethanolamine complexes

KEEP OUT OF REACH OF CHILDREN
DANGER

STATEMENT OF PRACTICAL TREATMENT
FIRST AID

If in eyes: Call a physician. Hold eyelids open and flush with a steady gentle stream of water for 15 minutes.

If on skin: Wash with plenty of soap and water. Get medical attention.

If swallowed: Drink promptly a large quantity of milk, egg white, gelatin solution, or, if these are not available, large quantities of water. Avoid alcohol. Get medical attention. Do not induce vomiting or give anything by mouth to an unconscious person.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

See Additional Precautions Below

MANUFACTURED BY:

applied biochemists

MILWAUKEE, WI 53022
1-800-558-5106

GENERAL INFORMATION

CUTRINE-PLUS, under field conditions, is effective in controlling a broad range of algae including: Chara, Spirogyra, Cladophora, Vaucheria, Ulothrix, Microcystis and Oscillatoria. **CUTRINE-PLUS** has also been proven effective in controlling the rooted aquatic plant, **Hydrilla verticillata.** The ethanolamines in **CUTRINE-PLUS** prevent the precipitation of copper with carbonates and bicarbonates in the water. Waters treated with **CUTRINE-PLUS** may be used for swimming, fishing, drinking, livestock watering or irrigating turf, ornamental plants or crops immediately after treatment.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

SURFACE SPRAY/INJECTION

ALGAECIDE APPLICATION

For effective control, proper chemical concentration should be maintained for a minimum of three hours contact time. The application rates in the chart are based on static or minimal flow situations. Where significant dilution or loss of water from unregulated inflows or outflows occur (raceways) within a three hour period, chemical may have to be metered in.

- Identify the algae growth present as one of the following types: Planktonic (suspended), Filamentous (mat forming), or Chara/Nitella.
- Determine the surface acreage (1 acre=43,560 sq. ft.) and average depth of infested area.
- Refer to the chart below to determine gallons of **CUTRINE-PLUS** to apply per surface acre.

Application Rates
Gallons Per Surface Acre

ALGAE TYPE	PPM COPPER	DEPTH IN FEET 1	2	3	4
Planktonic	0.2	0.6	1.2	1.8	2.4
Filamentous	0.2	0.6	1.2	1.8	2.4
Chara/Nitella	0.4	1.2	2.4	3.6	4.8

- **For planktonic algae (suspended) algae and free-floating filamentous algae mats, application rates should be based upon treating only the upper 3 to 4 feet of water where algae is growing. Under conditions of heavy infestation, treat only 1/3 to 1/2 of the water body at a time to avoid fish suffocation caused by oxygen depletion from decaying algae.**
- Before applying, dilute the required amount of **CUTRINE-PLUS** with enough water to ensure even distribution with the type of equipment being used. For most effective results, apply under calm and sunny conditions when water temperature is at least 60°F. Break up floating algae mats before spraying or while application is being made. Use hand or power sprayer adjusted to rain-sized droplets. Spray shoreline areas first to avoid trapping fish.

CUTRINE-PLUS Granular Algaecide may be used as an alternative in low volume flow situations, spot treatments or treatment of bottom-growing algae in deep water.

HERBICIDE APPLICATION (For Hydrilla Control)

CUTRINE-PLUS:

Control of Hydrilla verticillata can be obtained from copper concentrations of 0.4 to 1.0 ppm resulting from CUTRINE-PLUS treatment. Choose the application rate based upon stage and density of Hydrilla growth and respective water depth from the chart below.

Application Rates
Gallons/Surface Acre*

Growth/Stage Relative Density	PPM Copper	DEPTH IN FEET 1	2	3	4	5	6
Early Season Low Density	0.4 0.5	1.2 1.5	2.4 3.0	3.6 4.5	4.8 6.0	6.0 7.5	7.2 9.0
	---0.6---	---1.8---	---3.6---	---5.4---	---7.2---	---9.0---	---10.8---
Mid-Season Moderate Density	0.7	2.1	4.2	6.3	8.4	10.5	12.6
	---0.8---	---2.4---	---4.8---	---7.3---	---9.6---	---12.0---	---14.4---
Late Season/ High Density	0.9 1.0	2.7 3.0	5.4 6.0	8.1 9.0	10.8 12.0	13.5 15.0	16.2 18.0

* Application rates for depths greater than six feet may be obtained by adding the rates given for the appropriate combination of depths. Application rates should not result in excess of 1.0 ppm copper concentration within treated water.

CUTRINE®-PLUS: REWARD®-TANK MIX

On waters where enforcement of use restrictions for recreational, domestic and irrigation uses are acceptable, the following mixture can be used as an alternative Hydrilla control method.

Tank mix 3 gallons of **CUTRINE-PLUS** with 2 gallons of **REWARD®**. Apply mixture at the rate of 5½ gallons per surface acre. Dilute with at least 9 parts water and apply as a surface spray or underwater injection. Observe all cautions and restrictions on the labels of both products used in this mixture.

*REWARD® is a trademark of Zeneca Group Company

PERMITS:

Some states may require permits for the application of this product to public waters. Check with your local authorities.

DRIP SYSTEM APPLICATION

FOR USE IN POTABLE WATER AND IRRIGATION CONVEYANCE SYSTEMS

- **CUTRINE®-PLUS** should be applied as soon as algae or Hydrilla begins to interfere noticeably with normal delivery of water (clogging of lateral headgates, suction screens, weed screens and siphon tubes). Delaying treatment could perpetuate the problem causing massing and compacting of plants. Heavy infestations and low flow conditions increasing water flow rate during application may be necessary.
- Prior to treatment it is important to accurately determine water flow rates. In the absence of weirs, orifices, or similar devices which give accurate water flow measurements, volume of flow may be estimated by the following formula:

Average Width (feet) x Average Depth (feet) x Velocity* (feet/second) x 0.9 = Cubic Feed per Second (C.F.S.)

*Velocity is the time it takes a floating object to travel a given distance. Dividing the distance traveled (feet) by the time (seconds) will yield velocity (feet/second). This measurement should be repeated at least three times at the intended application site and then averaged.

- After accurately determining the water flow rate in C.F.S. or gallons/minute, find the corresponding **CUTRINE-PLUS** drip rate on the chart below.

WATER FLOW RATE		CUTRINE-PLUS DRIP RATE*		
C.F.S.	Gal/Min	Qts/Hr.	Ml/Min.	FL.Oz./Min.
1	450	1	16	0.5
2	900	2	32	1.1
3	1350	3	47	1.6
4	1800	4	63	2.1
5	2250	5	79	2.7

- Calculate the amount of **CUTRINE-PLUS** needed to maintain the drip rate for a period of 3 hours by multiplying Qts./Hr. x 3; ml/Min. x 180; or Fl. Oz./Min. x 180. Dosage will maintain 1.0 ppm Copper concentration in the treated water for the 3 hour period. Introduction of the chemical should be made in the channel at weirs or other turbulence-creating structures to promote the dispersion of chemical.
- Pour the required amount of **CUTRINE-PLUS** into a drum or tank equipped with a brass needle valve and constructed to maintain a constant drip rate. Use a stop watch and appropriate measuring container to set the desired drip rate. Readjust accordingly if flow rate changes during the 3 hour treatment period.
- Distance of control obtained down the waterway will vary depending upon density of vegetation growth. Periodic maintenance treatments may be required to maintain seasonal control.

GENERAL TREATMENT NOTES

The following suggestions apply to the use of **CUTRINE-PLUS** as an algaecide or herbicide in all approved use sites.

For optimum effectiveness...

- Apply early in the day under calm, sunny conditions when water temperatures are at least 60°F.
- Treat when growth first begins to appear or create a nuisance, if possible.
- Apply in a manner that will ensure even distribution of the chemical within the treatment area.
- Re-treat areas if re-growth begins to appear and seasonal control is desired. Allow one to two weeks between consecutive treatments.
- Allow seven to ten days to observe the effects of treatment (bleaching and breaking apart of plant material).

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE. Causes irreversible eye damage and skin burns. Do not get in eyes, on skin, or on clothing. Wears goggles or face shield and rubber gloves when handling this product. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

STORAGE & DISPOSAL:

Keep container closed when not in use. Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional office for guidance. CONTAINER DISPOSAL: Reseal container and offer for recondition or triple rinse (or equivalent) and offer for recycling, reconditioning or disposal in approved landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Consult Federal, State or local authorities for approved alternative procedures.

ENVIRONMENTAL HAZARDS:

This product may be toxic to trout and other species of fish. Fish toxicity is dependent upon the hardness of water. Do not use in water containing trout if the carbonate hardness of water does not exceed 50 ppm.

NOTICE

Neither the manufacturer nor the seller makes any warranty, expressed or implied concerning the use of this product other than indicated on the label. Buyer assumes risk of use of this material when such use is contrary to label instructions. Read and follow the label directions carefully.

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Plants

Columbian Watermeal (*Wolffia brasiliensis*)
Columbian watermeal is a floating aquatic plant in the Lemnaceae family. The habitat for this native California species consists of slow-moving or still water habitats such as ponds, marsh, sloughs, and streams (Hickman 1993). Given the characteristics of its microhabitat, this species is not likely to be found in the fast moving waters of District conveyances, and therefore is not expected to be at risk.

Fox Sedge (*Carex vulpinoidea*)
Fox sedge is a native California monocot in the family Cyperaceae (CalFlora 2005). The habitat for this species consists of freshwater marsh and riparian areas. No reported occurrences of this species have been made in Glenn or Colusa counties (CalFlora 2005, CNDDB 2005); therefore it has been dismissed from further consideration.

Four-angled Spikerush (*Eleocharis quadrangulata*)
Four-angled spikerush is a native monocot in the Cyperaceae family (CalFlora 2005). This plant is native to California, and can be found in freshwater marsh, and the margins of freshwater lakes and ponds (Hickman 1993). No reported occurrences of this species have been made in Glenn or Colusa counties (CalFlora 2005, CNDDB 2005); therefore it has been dismissed from further consideration.

Rose-Mallow (*Hibiscus lasiocarpus*)
Rose-mallow is a rhizomatous dicot in the Malvaceae family (CalFlora 2005). This native California species can be found in freshwater marsh habitat, but has also been known to grow on moist banks of rivers, streams, canals and ditches (CNDDB 2005). Potential habitat for this species is present in the project area. However, its potential exposure to canal water, if any, is through root uptake of soil water, which is not expected to be sufficient to cause risk.

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This concentration could lead to a dietary concentration of 36.02 mg/kg/day that would not exceed the TRV of 46.97 mg/kg/day (see Appendix B). The risk of applying copper to irrigation ditches for the control of aquatic weeds is **insignificant.**

Nuttalls' Woodpecker (*Picoides nuttallii*)
Nuttalls' woodpecker occur primarily in oak woodlands, and are also found in riparian woodlands, but rarely in coniferous forests (Lowther 2000). In riparian areas, they are commonly found in areas with willows and sycamores (Jenkins 1979 in Lowther 2000). In Yuba County, CA, they are found at 300 to 600 m elevation and associated most often with blue oak and interior live oak, also with California black oak, gray pine, California buckeye, and valley oak (Lowther 2000). They feed on trees such as oaks, and cottonwoods and willows of riparian habitats (Short 1971 in Lowther 2000). They feed on insects and other arthropods (Lowther 2000). Since they feed on terrestrial insects in trees, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

White-Faced Ibis (*Plegadis chihi*)
White-faced ibis nests in the midst of an extensive, tall (2.2 m), dense common cattail stand at the edge of a sizable opening and in approximately 45 cm of water (Goossen *et al.* 1995). In Kings County, California, white-faced ibises were observed nesting in Baltic rush, summer tamarisk, cattail, and hardstem bulrush (Ivey and Severson 1984). White-faced ibises commonly forage in shallowly flooded wetlands of short, emergent plants. Dominant plants in feeding areas are sedges and spikerushes as well as salt-tolerant glassworts, desert saltgrass, and greasewood. Nearby irrigated crops, particularly alfalfa, barley, and native hay meadows can be important feeding sites (Bray and Klebenow 1988). During the early summer, ibises were observed in alfalfa fields 86% of the time and 100% of the time in the late summer. White-faced ibises feed mostly on aquatic and moist-soil insects, crustaceans, and earthworms (Ryder and Manry 1994), including insects (11 orders), earthworms, leeches, snails, spiders (Petersen 1953 in Ryder and Manry 1994), as well as small fish, frogs, crayfish, snails, small bivalves (Belknap 1957 in Ryder and Manry 1994, Taylor *et al.* 1989, Bray and Klebenow 1988). The foraging habitat for white-faced ibis indicates that they will not feed directly from irrigation canals, and the concentrations of herbicides in irrigation water that reaches agricultural fields where they will forage is low, so the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

Bank Swallow (*Riparia riparia*)
Bank swallows breed along ocean coasts, rivers, streams, lakes, reservoirs, and wetlands (Cramp *et al.* 1988 in Garrison 1999, Turner and Rose 1989 in Garrison 1999, American Ornithologists' Union 1998 in Garrison 1999). They require vertical banks, cliffs, and bluffs in alluvial, friable soils for nesting. Bank swallows forage while flying and consume flying or jumping insects and occasionally eat terrestrial and aquatic insects or larvae (Garrison 1999). They feed over lakes, ponds, rivers and streams, meadows, fields, pastures, and bogs. They occasionally feed over forests and woodlands (Stoner 1936 in Garrison 1999, Gross 1942 in Garrison 1999, Turner and Rose 1989 in Garrison 1999). During the breeding season, they generally forage within 200 m of their nests for feeding the nestlings (Mead 1979 in Garrison 1999, Turner 1980 in Garrison 1999). The only area where bank swallows might nest is along the Sacramento River. They generally forage within 200 m of nesting areas while they have young in June and July (Garrison 1999). Bank swallows could feed on emergent insects from the main canal near the Sacramento River which is not treated for control of aquatic weeds and where treated lateral canals are near the river. The comparative quality and quantity of foraging habitat immediately along the river is much greater than that along the treated lateral canals. It is unlikely for bank swallows to gather the majority of their prey from treated irrigation ditches, so the risk to bank swallows from treating irrigation ditches with herbicides for the control of aquatic weeds would be **insignificant.**

Fish

The Glenn-Colusa Irrigation District maintains fish screens at their pumping station on the Sacramento River, so it is not possible for fish to enter the irrigation canals from the Sacramento River. Therefore, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

peregrine falcons feed almost exclusively on birds and mammals, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant**.

Loggerhead Shrike (*Lanius ludovicianus*)
Loggerhead shrikes breed in open country with short vegetation, including pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands (Yosef 1994 in Yosef 1996). They feed in open habitats characterized by well-spaced, often spiny, shrubs and low trees, usually interspersed with short grasses, forbs, and bare ground, including scrub lands, steppes, deserts, savannas, prairies, agricultural lands (particularly pastures and meadows with hedges or shrubs), and some suburban areas (Yosef 1996). They focus on arthropods, amphibians, small to medium-sized reptiles, small mammals and birds (Yosef 1996). Insects generally make the majority of the diet (up to 68%, Bent 1950 in Yosef 1996). Vertebrates are favored in the winter (Graber *et al.* 1973 in Yosef 1996, Kridelbaugh 1982 in Yosef 1996). Since insects such as beetles and grasshoppers are the major insect prey (Kridelbaugh 1982 in Yosef 1996), the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant**.

California Black Rail (*Laterallus jamaicensis coturniculus*)
Black rails nest in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation (Eddleman *et al.* 1988 in Eddleman *et al* 1994). Most breeding areas are vegetated by fine-stemmed emergent plants, rushes, grasses, and sedges (Todd 1977 in Eddleman *et al* 1994). They select sites with shallow, stable water level, gently sloping shorelines, and vegetation dominated by fine-stemmed bulrush (*Scirpus* spp.) or grasses (Repking and Ohmart 1977 in Eddleman *et al* 1994). These patches of habitat are most likely in the Sacramento National Wildlife Refuge. They feed on aquatic and terrestrial invertebrates and seeds, presumably along edges of emergent vegetation (Eddleman *et al* 1994) which again would be within the wildlife refuge. Their habitat requirements are met within the wildlife refuge, and would not be readily met outside the refuge. When irrigation canals are treated with herbicides, the canals that feed into the wildlife refuge are blocked off, so no treated water enters the refuge. Since suitable habitat would not be treated, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant**.

Lewis' Woodpecker (*Melanerpes lewis*)
Important aspects of Lewis' woodpeckers include an open canopy, a brush understory offering ground cover, dead or downed woody material, available perches, and abundant insects (Bock 1970 in Tobalske 1997). One of the major habitats is open riparian woodland dominated by cottonwood and logged or burned pine forest. Breeding birds are also found in oak woodland, nut and fruit orchards, piñon pine-juniper woodland, a variety of pine and fir forests, and agricultural areas including farm- and ranchland (Bock 1970 in Tobalske 1997, Raphael and White 1984 in Tobalske 1997, Siddle and Davidson 1991 in Tobalske 1997, Linder 1994 in Tobalske 1997, Tashiro-Vierling 1994 in Tobalske 1997, Viering 1997 in Tobalske 1997, Saab and Dudley 1996 in Tobalske 1997). They feed in the air, on tree trunks and branches, in bushes, and on the ground. They eat free-living (not wood-boring) insects, acorns or other nuts, and fruit (Tobalske 1997). Their terrestrial diets indicate the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant**.

Osprey (*Pandion haliaetus*)
Osprey feed along rivers, marshes, reservoirs, and natural ponds and lakes, where individuals feed in both shallow littoral zones as well as deeper water (Poole *et al.* 2002). They do not favor foraging in water with thick emergent and submerged vegetation (Postupalsky and Stackpole 1974 in Poole *et al.* 2002, Prevost 1977 in Poole *et al.* 2002). Live fish constitute 99% of prey (Poole *et al.* 2002). It is possible for osprey to forage over irrigation canals treated with herbicides and consume fish from those canals. The TRV for acrolein (see Appendix B) for birds is 0.91 mg/kg/day. A water concentration of acrolein of 10 ppm would indicate the osprey could be exposed to 1.31 mg/kg/day if it fed entirely from treated irrigation canals, and this exposure exceeds the TRV. However, after only 12 hours post-application, water concentrations would decrease to 3.54 ppm leading to a dietary exposure of 0.46 mg/kg/day—less than the TRV. Considering the short duration of exposures exceeding the TRV and the potential for foraging in other habitats (untreated canals and other open water), the risk posed by treating irrigation canals with acrolein for the control of aquatic weeds is **insignificant**. For the osprey, an average water copper concentration of 1 ppm was used to represent the exposure possible during the first day following application after applying a half-life of approximately 20 hours.

Rowe 1987 in Haug *et al.* 1993). The terrestrial nature of their foraging habitats and prey base indicate that exposure to herbicides applied to irrigations canals will be **insignificant.**

Western Burrowing Owl (*Athene cunicularia hypogaea*)
See Burrowing Owl

Swainson's Hawk (*Buteo swainsoni*)
Swainson's hawks forage in open stands of grass-dominated vegetation, sparse shrublands, and small, open woodlands. They have adapted well to foraging in agricultural areas (e.g., wheat and alfalfa), but cannot forage in most perennial crops or in annual crops that grow much higher than native grasses (Bechard 1982 in England et al. 1997, Estep 1989 in England et al. 1997, Woodbridge 1991 in England et al. 1997). In Central Valley, CA, they forage in row, grain, and hay crop agriculture, particularly during and after harvest, when prey are both numerous and conspicuous. The also are attracted to flood irrigation, primarily in alfalfa fields, when prey take refuge on field margins, and to field burning, which forces prey to evacuate (J.A. Estep per. comm. in England et al. 1997). During breeding season, Swainson's hawks mainly feed on vertebrates, including mammals, birds, and reptiles (Schmutz et al. 1980 in England et al. 1997, Bednarz 1988 in England et al. 1997). Invertebrates (especially grasshoppers and dragonflies) are commonly eaten at other times (McAtee 1935 in England et al. 1997, Sherrod 1978 in England et al. 1997, Jaramillo 1993 in England et al. 1997). Swainson's hawks do not prey on species likely to be exposed to herbicides in irrigation canals, so the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*)
Yellow-billed cuckoos prefer breeding in open woodland with clearings and low, dense, scrubby vegetation. They are often associated with watercourses. They are generally absent from heavily forested areas and large urban areas (Eaton 1988 in Hughes 1999). In arid regions, nesting habitat is restricted to river bottoms, ponds, swampy areas, and damp thickets with relatively high humidity (Gaines and Laymon 1984 in Hughes 1999). They are also found in orchards adjacent to river bottoms (Laymon 1980 in Hughes 1999, Walters 1983 in Hughes 1999). Yellow-billed cuckoos prefer breeding in open woodland with clearings and low, dense, scrubby vegetation. They are also found in orchard adjacent to river bottoms (Laymon 1980 in Hughes 1999, Walters 1983 in Hughes 1999). Yellow-billed cuckoos forage in open areas, woodland, orchards, and adjacent streams. Foraging habitat encompasses open areas, woodland, orchards, and adjacent streams (Laymon 1980 in Hughes 1999). Yellow-billed cuckoos eat primarily large insects such as caterpillars, katydids, cicadas, grasshoppers, and crickets (Nolan and Thompson 1975 in Hughes 1999; Laymon 1980 in Hughes 1999). They occasionally eat small frogs, arboreal lizards (Voous 1955 in Hughes 1999; Hamilton and Hamilton 1965 in Hughes 1999), birds eggs and young birds (Beal 1898 in Hughes 1999). Fruit are eaten rarely during the summer (Bent 1940 in Hughes 1999). Since they primarily feed in trees, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

White-Tailed Kite (*Elanus leucurus*)
White-tailed kites inhabit low elevation grassland, agricultural, wetland, oak-woodland, or savannah habitats. Riparian areas adjacent to open areas are also used. Lightly grazed or ungrazed fields generally support larger prey populations, and are therefore preferred. Intensively cultivated areas are also used (Dunk 1995). Nests in trees (Stendell 1972 in Dunk 1995). They prefer to forage in ungrazed grasslands (Bammann 1975 in Dunk 1995). Wetlands dominated by grasses, and fence rows and irrigation ditches with residual vegetation adjacent to grazed lands (Bammann 1975 in Dunk 1995). They primarily eat small mammals (Dunk 1995). Because they prey mostly on small mammals, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

American Peregrine Falcon (*Falco peregrinus anatum*)
The habitat of peregrine falcons generally includes cliffs, for nesting, with open areas of air and generally open landscapes for foraging. In addition to natural habitats peregrine falcons also use urban, human-built environments such as towers, buildings, etc.). Most prey is captured in the air while in flight, but they also capture prey from the surface of water or the ground. The most common prey include birds, from song birds to small geese, occasionally mammals, and rarely amphibians, fish, and insects (White *et al.* 2002). Since

Great Egret (*Ardea alba*)
Great egrets use similar habitat to that of the great blue heron. They forage in open areas, such as along the edges of lakes, large marshes, and shallow coastal lagoons and estuaries. They also forage along rivers in wooded areas (Kaufman 1996). Great egrets forage in freshwater, marine, and estuarine wetlands, shallow water of ponds, and regularly use uplands habitats (Palmer 1962 in NatureServe 2004; McCrimmon et al. 2001). They forage in water up to about 28 cm (Powell 1987 in McCrimmon et al. 2001). Great egrets use similar habitat to that of the great blue heron. They forage in open areas, such as along the edges of lakes, large marshes, and shallow coastal lagoons and estuaries. They also forage along rivers in wooded areas (Kaufman 1996). Great egrets forage in freshwater, marine, and estuarine wetlands, shallow water of ponds, and regularly use uplands habitats (Palmer 1962 in NatureServe 2001; McCrimmon 2001). They forage in water up to about 28 cm (Powell 1987 in McCrimmon and others 2001). In the Sacramento Valley, they commonly forage in rice fields. Great egrets eat mostly fish. Aside from fish, they also eat crustaceans, frogs, salamanders, snakes, and aquatic insects. In open fields, they might eat grasshoppers, and rodents (Kaufman 1996). Great egrets feed their nestlings many small fish during each feeding bout (Mock 1985). The potential exists for great egrets to feed on prey exposed to herbicides in irrigation canals. The TRV for acrolein (see Appendix B) for birds is 0.91 mg/kg/day. A water concentration of acrolein of 10 ppm would indicate a dietary exposure of 1.55 mg/kg/day for great egrets, which exceeds the TRV. However, after only 12 hours post-application, water concentrations would decrease to 3.54 ppm leading to a dietary exposure of 0.54 mg/kg/day—less than the TRV. Considering the short duration of exposures exceeding the TRV and the potential for foraging in other habitats (*e.g.* irrigated crop fields), the risk posed by treating irrigation canals with acrolein for the control of aquatic weeds **is insignificant**. For the great egret, an average water copper concentration of 1 ppm was used to represent the exposure possible during the first day following application after applying a half-life of approximately 20 hours. This concentration would lead to an exposure via the diet of 40.95 mg/kg/day that would not exceed the TRV of 46.97 mg/kg/day (see Appendix B). The risk of applying copper to irrigation ditches for the control of aquatic weeds is **insignificant.**

Great Blue Heron (*Ardea herodias*)
Great blue herons can travel long distances from a nesting colony to a feeding area, up to 34.1 km from the nesting colony (Peifer 1979). Because they can range so widely, the nesting colony with its large nest trees does not need to be adjacent to sufficient foraging habitat for all nesting adults and great blue herons can forage in water bodies that do not have adjacent nest trees. They forage in any kind of calm, shallow freshwater (Kaufman 1996) as well as in grasslands, marshes, and along riverbanks. Great blue herons consume a variety of prey, including fish, insects, mammals, amphibians, and crustaceans. Fish are the predominant prey (Butler 1992). The potential exists for great blue herons to feed on prey exposed to herbicides in canals. The TRV for acrolein (see Appendix B) for birds is 0.91 mg/kg/day. A water concentration of acrolein of 10 ppm would indicate a dietary exposure of 1.1 mg/kg/day for great blue herons, which exceeds the TRV. However, after only 12 hours post-application, water concentrations would decrease to 3.54 ppm leading to a dietary exposure of 0.39 mg/kg/day—less than the TRV. Considering the short duration of exposures exceeding the TRV and the potential for foraging in other habitats (*e.g.* irrigated crop fields), the risk posed by treating irrigation canals with acrolein for the control of aquatic weeds is **insignificant**. For the great blue heron, an average water copper concentration of 1 ppm was used to represent the exposure possible during the first day following application after applying a half-life of approximately 20 hours. This concentration could lead to a dietary concentration of 15.2 mg/kg/day that would not exceed the TRV of 46.97 mg/kg/day (see Appendix B). The risk of applying copper to irrigation ditches for the control of aquatic weeds is **insignificant.**

Burrowing Owl (*Athene cunicularia*)
Burrowing owls inhabit dry, open, shortgrass, treeless plains, and are often associated with burrowing mammals. They can also be found at golf courses, cemeteries, road allowances within cities, airports, vacant lots in residential areas and university campuses, and fairgrounds. The presence of a nest burrow seems to be a critical requirement for western burrowing owls (Thomsen 1971 in Haug *et al.* 1993, Martin 1973 in Haug *et al.* 1993, Zarn 1974 in Haug *et al.* 1993, Wedgwood 1978 in Haug *et al.* 1993, Haug 1985 in Haug *et al.* 1993). They typically forage in shortgrass, mowed, or overgrazed pastures; golf courses and airports (Thomsen 1971 in Haug *et al.* 1993). They are opportunistic feeders, eating primarily arthropods, small mammals, and birds. Amphibians and reptiles constitute a minor component to the diet and possibly only in Florida (Wesemann and

Primarily in montane coniferous forests, in the south most often at 2000-3000 m; also riparian and desert (Baja California) habitats. May change habitats seasonally. Uses caves and mines as hibernacula, but winter habits are poorly known. Roosts in abandoned buildings, rock crevices, under bark, etc. In summer, apparently does not use caves as daytime roost site. In some areas hollow trees are the most common nursery sites, but buildings and rock crevices are also used (NatureServe 2004). Feeds primarily on moths. Also consumes a wide variety of invertebrates: fleas, termites, lacewings, wasps, small beetles, etc. (Warner and Czaplewski 1984 in NatureServe 2004). Follows prey for relatively long distances around, through, over forest canopy, forest clearings, and over water. In New Mexico, forages primarily in open areas, feeds mainly on small moths (Black 1974 in NatureServe 2004). The diet of long-legged myotis consists of mostly terrestrial insects, so the exposure to herbicides introduced to irrigation canals for control of aquatic weeds would **not be significant.**

Yuma Myotis Bat (*Myotis yumanensis*)
Yuma myotis bats inhabit deserts, coniferous and mixed forests, grassland/herbaceous areas, shrubland/chaparral, suburban/orchard, urban, and coniferous and mixed woodlands. They are more closely associated with water than most other North American bats, but are also found in a wide variety of upland and lowland habitats, including riparian, desert scrub, moist woodlands and forests Nursery colonies usually are in buildings, caves and mines, and under bridges. Yuma myotis bats are insectivorous, with small moths believed to be the primary food source in some areas; dipterans and ground beetles are other common prey items. They often feed over ponds and streams, flying just above the water surface (NatureServe 2004). The quantity of foraging habitat along the treated lateral canals compared to other terrestrial and untreated canals and other aquatic habitats is small. It is unlikely for Yuma myotis bats to gather the majority of their prey from treated irrigation ditches, so the risk to Yuma myotis bats from treating irrigation ditches with herbicides for the control of aquatic weeds **would not be significant.**

Birds

Tricolored Blackbird (*Agelaius tricolor*)
Breeding habitat of tricolored blackbirds includes large marshes (Payne 1969 in Beedy and Hamilton 1999). Nesting colonies are generally in emergent aquatic vegetation, but may also be found in trees along streams, weed patches, and grain and alfalfa fields, mustard, safflower, thistle, along an irrigation ditch, or in trees along a river (Orians 1960, 1961). In the Central Valley of California, breeding colonies were described where nests were placed in cattail-bulrush in dry and irrigated pasture; cattail in dry grassland, along a creek, rice and wheat fields, or dry and irrigated pasture; and in blackberry in dry grassland and along a creek (Crase and DeHaven 1977). Tricolored blackbirds forage in cultivated row crops, orchards, vineyards, and heavily grazed rangelands, but these are considered low-quality forage habitats. High quality forage areas included irrigated pastureland, lightly grazed rangeland, dry seasonal pools, mowed alfalfa fields, feedlots, and dairies (Beedy and Hamilton 1997 in Beedy and Hamilton 1999). In the Central Valley of California, nestling tricolored blackbirds were fed 86% animal matter on a volumetric basis, 11.2% plant matter, and 2.7% grit. The animal matter was primarily insects (79% of total diet) with the majority being beetles (61% of total diet). Plant matter was split evenly between cultivated grains such as oats, wheat and miscellaneous plant matter (Crase and DeHaven 1977). Since tricolored blackbirds are unlikely to feed directly from the treated canals, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant**.

Golden Eagle (*Aquila chrysaetos*)
Golden eagles breed in open and semiopen habitats from near sea level to 3,630 m (Poole and Bromely 1988 in Kochert *et al.* 2002, G.R. Craig pers. comm. in Kochert *et al.* 2002) including shrublands, grasslands, woodland-brushland, and coniferous forests (Kochert 1986 in Kochert *et al.* 2002). They also breed in farmland and riparian habitats (Kochert 1972 in Kochert *et al.* 2002, Menkens and Anderson 1987 in Kochert *et al.* 2002). In central California, they forage in open grassland habitat (Hunt *et al.* 1999 in Kochert *et al.* 2002). Golden eagles feed mainly on mammals (80-90% of prey items), secondarily on birds, and less often on reptiles, and fish during the nesting season (Olendorff 1976 in Kochert *et al.* 2002). Because their prey base is almost entirely terrestrial-based, the risk posed by treating irrigation canals for the control of aquatic weeds is **insignificant.**

California red-legged frogs occur in dense, shrubby riparian vegetation associated with deep (< 0.7 m), still or slow-moving water (Jennings 1988 in Jennings and Hayes 1994, Hayes and Jennings 1988 in Jennings and Hayes 1994). The shrubby riparian vegetation that structurally seems to be most suitable for California red-legged frogs is that provided by arroyo willow (*Salix lasiolepis*), and cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.) also provide suitable habitat (Jennings 1988 in Jennings and Hayes 1994). Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergents (pers. observ. in Jennings and Hayes 1994). Postmetamorphs have a highly variable animal food diet (Hayes and Tennant 1986 in Jennings and Hayes 1994). Frogs and small mammals may contribute significantly to the diet of adults and subadults (Arnold and Halliday 1986 in Jennings and Hayes 1994, Hayes and Tennant 1986 in Jennings and Hayes 1994). The movement ecology of California red-legged frogs is not well understood (Jennings and Hayes 1994). The only exposure that California red-legged frogs could have to herbicides in irrigation canals would be to enter the canals shortly after treatment from nearby aquatic habitats. District canals conveying water are not densely vegetated nor do they contain dense submerged vegetation, therefore suitable habitat for the red-legged frog is not likely present. Accordingly, exposure of red-legged frogs to aquatic herbicides is expected to be **insignificant.**

California Tiger Salamander (*Ambystoma californiense*)
California tiger salamanders are restricted to the Central Valley of California and to lower elevations to the west. Some populations have been extirpated due to urbanization and conversion of native grasslands and wetlands to agriculture (Fisher and Shaffer 1996 in Petranka 1998). They breed in fish-free, seasonally ephemeral ponds. Juveniles and adults are fossorial and are rarely seen other than during the winter breeding season. Breeding migrations occur from November to March (Storer 1925 in Petranka 1998). They commonly use California ground squirrel (*Spermophilus beecheyi*) or valley pocket gopher (*Thomomys bottae*) burrows for summer aestivation. During the summer when herbicide applications will be made, adults will be underground aestivating, and irrigation canals would be not suitable habitat for developing tadpoles, so exposure to herbicides introduced to irrigation canals is **unlikely.**

Western Spadefoot Toad (*Spea* (=*Scaphiopus*) *hammondii*)
Western spadefoot toads are almost completely terrestrial, entering water only to breed (see Dimmitt and Ruibal 1980 in Jennings and Hayes 1994). Western spadefoots become surface active following relatively warm (> 10.0-12.8°C) rains in late winter-spring and fall, emerging from burrows in loose soil to a depth of at least 1 m (Stebbins 1972 in Jennings and Hayes 1994, A. McCready, pers. comm. in Jennings and Hayes 1994), but surface activity may occur in any month between October and April if enough rain has fallen (Morey and Guinn 1992 in Jennings and Hayes 1994, S. Morey, pers. comm. in Jennings and Hayes 1994). Since western spadefoot toads are not likely to enter water during the season when aquatic weeds will need to be controlled in irrigation canals, it is **not likely** that they would be exposed to herbicides introduced to irrigation canals for the control of aquatic weeds.

Mammals

Pacific Western (Townsend's) Big-Eared Bat (*Corynorhinus* (*Plecotus*) *townsendii townsendii*)
Townsend's big-eared bats live in a variety of communities, including coastal conifer and broad-leaf forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Throughout most of its geographic range, it is most common in mesic sites (Kunz and Martin 1982 in Williams 1986). Known roosting sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other human-made structures (Dalquest 1947 in Williams 1986, Graham 1966 in Williams 1986, Pearson et al. 1952 in Williams 1986). Both sexes hibernate in buildings, caves, and mine tunnels, either singly (males) or in small groups (Pearson et al., 1952 in Williams 1986). They feed on various flying insects near the foliage of trees and shrubs and may feed primarily on moths (Barbour and Davis 1969 in NatureServe 2004). Since the feeding habits do not focus on emergent insects or other aquatic prey items, the risk to big-eared bats from treatment of irrigation canals with herbicides would **not be significant.**

Long-Legged Myotis Bat (*Myotis volans*)

Approach

A Habitat Assessment of the Glenn-Colusa Irrigation District project site was conducted by Ardea Consulting and Blankinship & Associates, Inc. personnel to characterize the habitats present on-site and the likelihood of special status species occurring on the project site.

A list of these special species was compiled using a records search of the California Natural Diversity Database (CNDDB), and current species information from the U.S. Fish and Wildlife Service, Sacramento Office website. Location specific species data is available from both of these sources, and organized geographically into 7.5 minute U.S.G.S. quads. The CNDDB database was queried using the boundary map for the District, and selecting all 12 quads that intersect with the District's boundaries. In addition, a buffer area made up of the outlying quads adjacent to the original 12 quads was selected for the query, resulting in a total of 28 quads. This approach was used to identify species that might be located in the surrounding areas, but not necessarily reported to CNDDB as a sighting event within the District boundaries.

The approach used for the internet query of the U.S. Fish and Wildlife Service local office website, was somewhat different given that their data is not organized geographically based on reported occurrences of species. The quads selected in this query were the quads that represented the largest overall percentage of the District's area. This approach was appropriate for this database due to the fact that the geographical designation provided by the website is conservative in nature and includes all species in the selected area and surrounding areas.

Habitat requirements of each of the species were reviewed to determine whether habitat existed within the project area that would meet that species' needs. The breeding or foraging habitat of animals and the habitat requirements of plant species likely to occur in the project area are fully described in below.

Reptiles

Northwestern Pond Turtle (*Clemmys marmorata marmorata*
The northwestern pond turtle is primarily riparian, most often living in sloughs, streams (both permanent and intermittent), and large rivers, although some may inhabit impoundments, irrigation ditches, and other artificial water bodies. In streams, pools are preferred over shallow reaches (Bury 1972 in Ernst *et al.* 1994). Habitats may be either rocky or mud bottomed, but usually contain some aquatic vegetation and basking sites (Ernst *et al.* 1994). Western pond turtles are opportunistic feeders and eat a variety of food items including carrion, aquatic invertebrates, insects and worms (Larsen 1997). Their habitat requirements and feeding habits indicate northwestern pond turtles may be exposed to pulses of herbicide-treated water. Refer to **Appendix D.**

Giant Garter Snake (*Thamnophis gigas*)
Giant garter snakes occur in streams and sloughs, usually with mud bottom (Stebbins 1985 in NatureServe 2004). One of the most aquatic of garter snakes; usually in areas of freshwater marsh and low-gradient streams with emergent vegetation, also drainage canals and irrigation ditches (California Department of Fish and Game 1990 in NatureServe 2004) and ponds and small lakes (USFWS 1993 in NatureServe 2004). Usually in areas of permanent water, sometimes in areas of temporary water such as irrigation/drainage canals and (less often) rice fields (Biosystems Analysis, Inc. 1989 in NatureServe 2004, USFWS 1993 in NatureServe 2004). Adult and immature snakes eat small mammals, invertebrates, and fish (NatureServe 2004). Their habitat requirements and feeding habits indicate giant garter snakes may be exposed to pulses of herbicide-treated water. Refer to **Appendix D.**

Amphibians

California Red-legged Frog (*Rana aurora draytonii*)

Appendix C

(Species Descriptions)

WHAT MUST MY EMPLOYER DO TO PROTECT ME WHEN I USE A MEP?

If you handle MEPs, your employer must make sure you have

- Clean coveralls (this is one or two pieces of clothing that covers your body, except your head, hands and feet). Your employer must make sure that you start each work day with clean coveralls.
- Clean, chemical resistant clothes that cover your body, including your hands and feet.
- A clean, pesticide-free place to store your own clothes while you work with these pesticides.
- Clean towels, soap and clean water at the place where you mix and load the pesticides. This is both for washing everyday, and in an emergency.
- A closed system for mixing and loading, so that you are never exposed to the pesticide.
- The right kind of respirator. (Ask your supervisor for the N-5 safety leaflet, for more information on respirators.)
- A place with clean towels, soap and water where you can change clothes and wash at the end of your work day.

ARE THERE ANY SPECIAL RULES I SHOULD KNOW?

If you use certain kinds of equipment to protect yourself at work, you may not have to wear full body personal protective equipment (PPE). Ask your supervisor for a copy of the N-3 safety leaflet, for more information about the equipment. There is also more information in the table below that explains the substitutions.

>> If you don't get all the information you need in your training, or from your supervisor, you should call your County Agricultural Commissioner, or the Department of Pesticide Regulation (DPR) for more information. You can find the Commissioner's number in your local white pages phone directory. DPR numbers are:

- Anaheim (714) 279-7690
- Fresno (559) 445-5401
- Sacramento (916) 324-4100

PERSONAL PROTECTIVE EQUIPMENT YOU NEED WHEN USING CLOSED SYSTEMS, ENCLOSED CABS, OR WATER-SOLUBLE PACKAGING

If you use	You may use[1]	Instead of this
Closed system for pesticides with "Danger" or "Warning" [2,3]	Coveralls, chemical-resistant gloves, chemical-resistant apron eye protection	PPE required on the pesticide labeling
Closed system for pesticides with "Caution" [2,3]	Work clothing (shirt, pants, shoes) eye protection	PPE required on the pesticide labeling
Enclosed cab	Work clothing and respiratory protection required on the label	PPE required on the pesticide labeling
Enclosed cab acceptable for respiratory protection	Work clothing	PPE required on the pesticide labeling

1 For any substitution, all PPE required by the label must be available on site in case of an emergency.

2 If the closed system is not under pressure, you do not need to wear eye protection.

3 Using pesticides in water-soluble packages is considered the same as mixing with a closed system. However, transfer from mix tank to application tank must be made with a closed system.

Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA
DEPARTMENT OF
PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

N
No.10

Safety Rules for Minimal Exposure Pesticides (MEPs) in Non-Agricultural Settings

Pesticides can get into your body many different ways. They can make you sick by moving into your body through your skin or eyes, or through your lungs as you breathe.

WHAT ARE THE "MINIMAL EXPOSURE PESTICIDES"?

Some pesticides are called "Minimal Exposure Pesticides," or MEPs, because it's important to make sure that your body is exposed as little as possible. The pesticides are on this list because they can hurt you in ways you might not notice right away. If you are exposed to them, they could be doing damage in your body, causing problems you might not notice until much later. If you work with pesticides in non-farm settings, these are the two MEPS you might use.

1. Buctril

USE: Kills broadleaf weeds in ornamental turf. Also used in landscape maintenance and rights-of-way.

DANGER: If you are a pregnant woman and are exposed to even a little of this pesticide, it can harm both you and your unborn child.

2. Metasystox-R and Inject-A-Cide

USE: Kills insects and mites in landscape maintenance and rights-of-way.

DANGER: These pesticides can affect your nervous system. If you are exposed to too much of them, you may start vomiting right away, get a headache, feel sick to your stomach, or your vision may be blurred. If you are a man and are exposed to even a little of these pesticides, it might hurt your ability to have children.

It's important to make sure that your body is exposed as little as possible to MEPs.

HS-1759
Revised September 2003

SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT

In 1986, a law called the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) was passed. Proposition 65 requires California to make a list of chemicals that cause cancer, birth defects, or other reproductive harm. The Proposition 65 list contains many different chemicals, including dyes, solvents, pesticides, drugs, and food additives. If a pesticide is on the Proposition 65 list, your supervisor must warn you if you could be exposed to enough pesticide to result in a significant health risk. Your supervisor may also choose to warn you if a pesticide on the Proposition 65 list has been sprayed, even if health problems are not likely. Your employer is required to keep information on each pesticide application and allow you to look at it. If you are not sure of the record location, ask your supervisor. *The following table lists pesticides that are on the Proposition 65 list and that might be used in California.*

CURRENTLY REGISTERED PESTICIDES ON THE PROPOSITION 65 LIST

PESTICIDES KNOWN TO THE STATE TO CAUSE CANCER

Arsenic acid
Arsenic pentoxide
Arsenic trioxide
Cacodylic acid
Captan
Chlorothalonil
Chromic acid
Creosote
Daminozide
DDVP (dichlorvos)
Diuron
p-Dichlorobenzene
1,3-Dichloropropene
Dioctyl phthalate
Ethylene oxide
Ethylene glycol monomethyl ether
Fenoxycarb
Folpet
Formaldehyde (gas)
Iprodione
Lindane
Mancozeb
Maneb
Metam Sodium
Metiram
Oxadiazon
Pentachlorophenol
Propargite
Pronamide (propyzamide)
Propylene oxide
Sodium dichromate
Terrazole
Thiodicarb
Vinclozolin

PESTICIDES KNOWN TO THE STATE TO CAUSE BIRTH DEFECTS OR REPRODUCTIVE HARM

Amitraz
Arsenic pentoxide
Arsenic trioxide
Bromoxynil octanoate
Chlorsulfuron
Diclofop methyl
Disodium cyano-dithioimidocarbonate
EPTC (ethyl dipropyl-thiocarbamate)
Ethylene oxide
Ethylene glcyol monomethyl ether
Fenoxaprop ethyl
Fluazifop butyl
Fluvalinate
Hydramethylnon
Linuron
Metam sodium
Metiram
Methyl bromide (as a structural fumigant)
Myclobutanil
Nitrapyrin
Oxadiazon
Oxydemeton-methyl
Potassium dimethyldithiocarbamate
Propargite
Resmethrin
Sodium dimethyldithiocarbamate
Streptomycin sulfate
Thiophanate methyl
Triadimefon
Tributyltin methacrylate
Triforine
Vinclozolin
Warfarin

>> If you don't get all the information you need in your training, or from your supervisor, you should call your County Agricultural Commissioner, or the Department of Pesticide Regulation (DPR) for more information. You can find the Commissioner's number in your local white pages phone directory. DPR numbers are:

- Anaheim (714) 279-7690
- Fresno (559) 243-8111
- Sacramento (916) 324-4100

How can I tell which pesticides are more dangerous?

Most pesticide labels have a signal word in large print on the front of the label. This word tells you about the acute health effect of the pesticide. If a pesticide can hurt you or make you sick right away, that's called an acute effect. If it takes months or years of exposure to a pesticide before you get sick, that's called a chronic effect.

These are the words that tell about acute effects

- **DANGER** means the pesticide is extremely harmful
- **WARNING** means less harmful, but still dangerous
- **CAUTION** means much slightly harmful, but still can make you sick

If the label does not have one of these words, it means that the pesticide is unlikely to harm you. However, **always** handle pesticides carefully.

WHAT ELSE DOES THE LABEL TELL ME?

- If the pesticide can severely hurt your eyes or skin, the label will say something like "Corrosive, causes eye and skin damage."
- If the pesticide can make you very sick, the label will have a skull-and-crossbones symbol and the word "**POISON**."

- Words like "**FATAL**" or "may be fatal if swallowed, inhaled, or absorbed through the skin," mean the pesticide can make you very sick or even kill you.
- Some pesticide labels tell you about other health problems that might not show up until long after use, such as cancer (may take years) or dangers to unborn babies.

ARE THERE ANY EXTRA RULES FOR VERY DANGEROUS PESTICIDES?

Yes, there is a group of pesticides, called Minimal Exposure Pesticides (MEPs) that California has extra rules for because they could be especially dangerous to you.

These are the pesticides on this list

- Buctril
- Metasystox-R

See the N-10 safety leaflet or more information about these pesticides.

Other handouts mentioned in this document should be part of your training. They are free and are available from your supervisor and your local agricultural commissioner's office.

SUMMARY OF RECORDS YOUR EMPLOYER MUST KEEP

Information	Location
Training papers	Employer's office site
Written training program	Employer's office site
Respirator program procedures	Employer's office site
Accident response plan (fumigants)	Work site
Pesticide label	Work site
Pesticide Safety Information Series	Employer's office site
Material Safety Data Sheet	Employer's office site
Storage area posting[1]	Storage area
Emergency medical care notice	Work site
Doctor's report for respirator use	Employer's office site
Pesticide use records	Employer's office site

1 Required only for pesticides with the Signal word "DANGER" or "WARNING"

These records are kept at:

_____

_____

_____

If you get sick or hurt **BECAUSE OF YOUR JOB**, you have the right to file for worker's compensation. Workers' compensation will pay for your medical bills, and sometimes, lost pay.

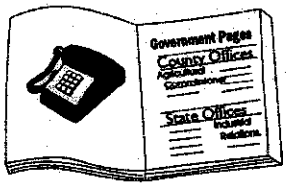
Your supervisor must explain your rights to you. If you need more help in understanding your rights, call or go to your local county agricultural commissioner's office, local legal aid, and worker's rights office, union or the Department of Pesticide Regulation (DPR).

The DPR offices are:

- Anaheim (714) 279-7690
- Fresno (559) 243-8111
- Sacramento (916) 324-4100

WHO DO I TELL ABOUT DANGERS AT WORK?

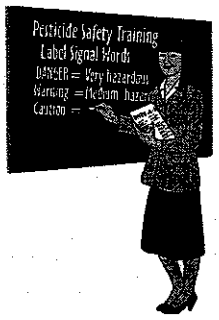
Pesticides are only one kind of danger at your work. If you have a complaint about a pesticide safety problem, you should call the county agricultural commissioner.



Other health and safety complaints (bathrooms, drinking water, etc.) should be filed with the California Department of Industrial Relations-Cal/OSHA office. You can find the telephone numbers in the government pages of the telephone book.

What training should I get?

- You must be trained in a way that you understand **before** you begin working with pesticides, and anytime you work with new pesticides.



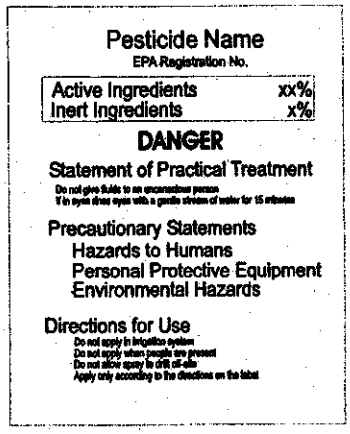
- You must also be given training each year to remind you how to work with pesticides safely.
- You must be told the ways a pesticide can hurt you and how to safely use each pesticide you work with. (Ask your supervisor for the N-1 safety leaflet to learn more about training.)
- You must get extra training if you have to use a respirator (ask your supervisor for the N-5 safety leaflet).

All the information in your training must also be written down. You will be given a paper to sign to show you have been trained. But only do that when you have finished the training and you understand what you heard.

WHAT CAN A PESTICIDE LABEL TELL ME?

Some of the most important things listed on the label are

- what chemicals are in the pesticide,
- first aid and health warnings,
- protective equipment you need,
- and directions for applying the pesticide.


Pesticide Name
EPA Registration No.
Active Ingredients xx%
Inert Ingredients x%
DANGER
Statement of Practical Treatment
Precautionary Statements
Hazards to Humans
Personal Protective Equipment
Environmental Hazards
Directions for Use

All pesticides are poisonous. If a pesticide gets in or on you, it can hurt you or make you sick.

The pesticide label tells you how to safely mix and apply the pesticide. **The label must be at the place where you mix or apply the pesticide.** You must read and follow **ALL** directions on the label. There may also be product bulletins or other extra label information that you must read and follow.

If you have to move pesticides from one place to another, or dispose of empty pesticide containers, there are special rules your supervisor must tell you about. Ask for the N-2 safety leaflet for more information.

Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

PSI No. 8

Safety Rules for Pesticide Handlers in Non-Agricultural Settings

This leaflet, the pesticide label, and your training, tell you about pesticide dangers at work. Your supervisor must know and help you learn about the pesticides you will use, how to safely use them, and how to protect yourself. Pesticides are chemicals that are used to kill insects, weeds, germs and plant diseases. **Fertilizers are not pesticides.**

Your employer must make plans for emergency medical care before you start working with pesticides. If you think that pesticides made you sick or hurt you at work, he must make sure that you are taken to the doctor right away. You do not have to pay for medical care if you get sick or hurt from pesticides at work.

Emergency medical care is available at

_____

_____

_____

WHAT ARE MY RIGHTS?

You have the right to know the following about pesticides that have been used where you work

- when and where the pesticide was applied
- name of the pesticide
- the EPA registration number

When you are trained your supervisor must tell you where all this information is kept. You have the right to look at Material Safety Data Sheets (MSDS) and records for all pesticides used where you work. The MSDS tells you about the pesticide and its dangers.

If you think that pesticides have made you sick at work, your supervisor must make sure that you are taken to the doctor immediately.

EMPLOYERS: This is the hazard communication leaflet. Fill in the blank lines in this leaflet and display this handout at the employees' work site.

HS-1749
Revised September 2004

When you come home from work, do not hug or touch your family until you have changed out of your work clothes. Shower and wash your hair. This is to protect your family from pesticides.

BEFORE YOU WASH YOUR CLOTHES

- You cannot get all the pesticide off of leather items such as watchbands, belts and boots. You must throw them away if they have pesticides on them. If you wear them again and sweat, the pesticide can get in your body through your skin.
- If you have pesticide powder or granules on your clothes, shake them off before you leave work. Pay special attention to your cuffs and pockets.
- Keep all clothes with pesticides on them (including underwear) in closed plastic bags. Until you are ready to wash the clothes, keep the bags outside the house. Make sure children and pets cannot get to the bags.
- Tell the person that does the laundry at home that your clothes have pesticides on them. Explain how to wash them.

WHEN YOU WASH YOUR CLOTHES

- Do not mix clothes with pesticides on them with your family's laundry. They must not be washed together, or pesticide can get on your family's clothes and make them sick.
- Try to dump the clothes straight from the plastic bag into the washer, without touching the laundry.
- If you have to touch the pesticide work clothes, wear rubber gloves. Then wash the gloves, take them off, and throw them away. Then wash your hands and arms.
- Put only a few things in the washer at one time. This helps get them clean.
- Use the longest cycle, and **LOTS** of **HOT** water. Cold water will not do a good job taking out pesticides.
- Use a strong detergent. You can use bleach if you want, but it does not help take out pesticides.

AFTER YOU WASH YOUR CLOTHES

- Before you use the washing machine again, clean it by running it with no clothes - only hot water and detergent.
- Dry your clothes on a line, outside if you can. The sun will help get rid of any pesticides that are left.
- If you dry the clothes in a dryer, run it until the clothes are completely dry. Then run the empty dryer for 10 minutes.

WHAT IF I SPILL PESTICIDE ON MY CLOTHES?

If the spilled pesticide is full strength, not diluted with water, take the clothes off right away. Do not try to clean them. Instead, you must throw them away. Follow the state and local rules for doing this. (Ask your supervisor about how to do this.)

WHAT ABOUT CLEANING PERSONAL PROTECTIVE EQUIPMENT (PPE)?

It is your employer's job to clean coveralls and other PPE. Your supervisor may train you how to clean your PPE at work. Never take PPE home to clean it.

Your supervisor must make sure that you change out of coveralls and wash at the end of the workday. You should not take the coveralls home.

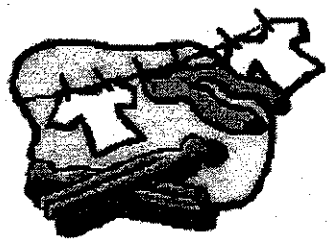
If you do not go to your employer's headquarters at the end of your workday, you must

- take off your coveralls at work;
- put them in a container (a plastic bag is good) and put it outside your home; return them to your employer for washing.

>>

If you don't get all the information you need in your training, or from your supervisor, you should call your County Agricultural Commissioner, or the Department of Pesticide Regulation (DPR) for more information. You can find the Commissioner's number in your local white pages phone directory. DPR numbers are:

- Anaheim (714) 279-7690
- Fresno (559) 445-5401
- Sacramento (916) 324-4100



Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

PSI No. 7

Washing Pesticide Work Clothing

If you work with pesticides, your work clothes can get pesticides on them. This can happen even if you wear coveralls or other personal protective equipment (PPE) over your own clothes.

It is your supervisor's job to clean your PPE. This sheet tells you how to clean your own work clothes. If you don't wash your clothes, the pesticides on them can make you sick. And if your dirty clothes are mixed with your family's clothes at home, your family could get sick, too. Follow these directions to protect yourself and your family from pesticides.

WEAR CLEAN WORK CLOTHES EVERY DAY

Wash clothes that have pesticides on them as soon as you can. The longer you wait, the harder it is to wash the pesticide off. And, if you keep wearing the clothes and get more pesticide on them, you could get sick because pesticides can get into your body through your skin.

WASHING PESTICIDE WORK CLOTHING

- Wear rubber gloves.
- Keep separate from other clothes.
- Use a pre-soak cycle or run through the wash cycle twice.
- Use the highest water level.
- Wash a full cycle, in very hot water.
- Use strong detergent.
- If possible, dry the clothes outside on a line.
- Clean the washing machine by running a cycle with no clothes.

HS-1748
Revised September 2003

On the outside of the respirator it must say that it is approved by the National Institute for Occupational Safety and Health (NIOSH).

CAN ANYONE USE A RESPIRATOR?

Breathing through a respirator can be very hard for some people. People with problems such as high blood pressure, heart disease, lung disease or a perforated eardrum may not be able to use respirators. If you are using a pesticide and are supposed to use a respirator, your supervisor must ask you if you have any of these health problems. If you do, you must get a doctor's permission to use a respirator. If you have told your supervisor that you might have a health problem, the doctor must examine you. The doctor then must give his report to your supervisor. Your supervisor must follow the doctor's written orders about whether or not you can wear a respirator.

IF I HAVE A MUSTACHE OR A BEARD, CAN I WEAR A RESPIRATOR?

- If you have a beard, a bushy mustache, or long sideburns, a regular respirator won't protect you because the mustache, beard or sideburns keep it from making a tight seal on your face. You need to use a special respirator
- If your supervisor doesn't have one of these special respirators, you cannot do the work.

HOW CAN I TELL IF MY RESPIRATOR IS WORKING?

Most respirators do not really clean the air. What they do is stop most harmful chemicals from getting into your lungs. They do this with special filters. But these filters stop working after a while. Then the pesticide will pass through and you will breathe it in. If you notice a smell or taste, if your eyes or throat burn, or if it gets hard for you to breathe, leave the area **RIGHT AWAY**. Go to a safe area that contains no pesticides. Then take off your respirator and look at it carefully. Is it torn or worn out? If there are no cracks or other problems you can see, you may need to change the filter.

Because many pesticides do not have a smell or cause irritation, your supervisor must replace the filter often.

THE FILTER MUST BE REPLACED

- when directions on the pesticide label say so, *or*
- when the respirator maker says it should be replaced, *or*
- when you first notice smell, taste or irritation, *or*
- at the end of each workday.

Follow the rule that replaces the filter soonest.

REMEMBER: Respirators only protect you from breathing chemicals. Most of the time when pesticides are used, protecting your skin is also important.

WHO TAKES CARE OF THE RESPIRATOR?

When respirators are broken, your supervisor must fix them. If they cannot be fixed, your supervisor must get new ones.

Respirators should be cleaned and inspected regularly by a person who is trained to do this job. Do not use someone else's respirator without cleaning and disinfecting it first. If the other person has a cold or the flu, you can get sick, too. It's best if each worker has his own respirator. Or you can use respirators that can be thrown away after they are used.

Respirators should be stored so the face piece does not become bent. They need to be protected from dust, sunlight, and big changes in temperature. Water or certain chemicals can also damage them. Hard plastic containers with lids are good storage containers for respirators. Store respirators and all personal protective equipment away from pesticides.

>> If you don't get all the information you need in your training, or from your supervisor, you should call your County Agricultural Commissioner, or the Department of Pesticide Regulation (DPR) for more information. You can find the Commissioner's number in your local white pages phone directory. DPR numbers are:

- Anaheim (714) 279-7690
- Fresno (559) 445-5401
- Sacramento (916) 324-4100

Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

PSI No. 5

Protecting Yourself From Breathing Pesticides in Non-Agricultural Settings

Sometimes, pesticide spray can stay in the air that you breathe.

One way to protect yourself is to wear a breathing mask called a respirator, like the one in the picture below.

WHEN SHOULD I WEAR A RESPIRATOR?

You **must** wear a respirator anytime the pesticide label requires one. You **may** need to wear a respirator if the pesticide label says, "Avoid breathing vapor or mist."

Your supervisor must give you a respirator when it is needed. You must wear it.

WHAT TRAINING DO I NEED?

Before you use a respirator for the first time, you must be trained how to use it safely. After that, you must get the training again every year. Training must tell you when you need to wear a respirator and show you how to safely wear it. You must also be told about what the respirator can't protect you against.

HOW DO I GET THE RIGHT RESPIRATOR?

There are different kinds of respirators that will protect you from different dangers. When using pesticides that could irritate your eyes, wear a full-face respirator to protect your eyes and lungs. Some fumigant labels require you to wear a self-contained breathing apparatus (SCBA). The pesticide label or your supervisor will tell you what kind of respirator to wear.

It is also very important that the respirator fits your face. Respirators come in different sizes. You must know how to check your respirator fit. While you are checking how your respirator fits and getting used to it, wear it in an area where there are no pesticides. Your supervisor or someone he hires will make sure it fits your face.

You must wear a respirator anytime the pesticide label requires one.

HS-1746
Revised September 2003

might be dangerous, depending on the pesticide. Never use salt water or mustard to make people throw up. Some old labels may still recommend those things, but they are not safe.

WHAT SHOULD I DO IF I GET SICK FROM PESTICIDES?

- **Stop work RIGHT AWAY.** You must stop working with the pesticide. You must also stop any more pesticide from getting in your body. Read below to find out how to do this.
- **GET HELP.** Tell someone at your workplace what happened.
- Ask to be taken to a doctor or hospital

HOW CAN PESTICIDES GET INTO MY BODY?

There are four ways

- breathing dust, mist or vapor,
- getting on your skin
- getting in your eyes, *or*
- swallowing the pesticide.

To stop a person from breathing in pesticides

Take sick people where the air is clean. In open areas, go at least 100 feet away. If there is a wind, make sure it is blowing the pesticide away from you.

Pesticides on your skin

Most often, pesticides get in your body through your skin. Some pesticides move very fast through your skin. Others move slowly. Many pesticides can move through your clothes, even if they are waterproof. That is why it is important to get rid of any pesticide that gets on your skin or clothing right away.

To get pesticides off of your skin

- Take off all clothes that have pesticides on them.
- Shower with soap and clean under your nails.
- Wash your hair.
- If you don't have a shower or soap, use any clean water.
- Get dressed only in clean clothes. Do not put the clothes with pesticides on them back on. If you do, more pesticides can get into you body. (Be sure to wash any clothes that have pesticides on them separately and completely before wearing them again. See the N-7 safety leaflet for information on how to do this safely.)

To get pesticides out of your eyes

- Rinse with plenty of water. Keep rinsing for at least 15 minutes. Rinsing in a shower is okay, but **DO NOT** use a hard spray.
- Otherwise, pour water over your eyes or use a gentle flow from a faucet or hose.
- Blink while you are rinsing.
- **DO NOT** force anybody's eyes open.

WHAT DO I NEED TO TELL THE DOCTOR?

Be ready to tell the doctor or nurse exactly what happened. Warn the doctor or nurse that the person might be sick from pesticides. That way they can protect themselves. Tell the doctor what you know about what happened with the pesticide to make the person sick. If you know, tell him the age of the sick people, and what pesticide was involved. Bring information about the pesticide to show the doctor. Copy the exact name of the pesticide from the label, and the active ingredient and EPA registration number. If you can't do this and have no other choice, bring the clean empty pesticide container (with the label still on it) or an unused, sealed container.

REMEMBER: People in the hospital can also get sick or hurt if a container with pesticides is dropped and broken.

>>

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- Fresno (559) 445-5401
- Sacramento (916) 324-4100

Always tell your supervisor if someone gets sick or hurt at work.

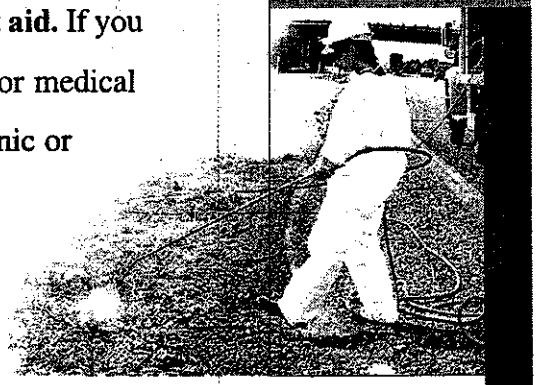
Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA
DEPARTMENT OF
PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

First Aid

NO. 4



HOW DO I GET READY FOR AN EMERGENCY?

If you have a pesticide label, know what the label says about first aid. If you work with pesticides, your supervisor must arrange ahead of time for medical care in case of an emergency. You should know the name of this clinic or hospital and where it is. If you don't know, ask your supervisor before an emergency happens. Never let sick or hurt people drive themselves to a doctor. They could have an accident on the road.

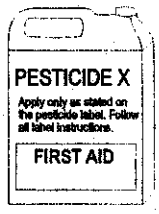
WHAT SHOULD I DO IF SOMEONE COLLAPSES WHILE THEY ARE USING PESTICIDES?

- First, get the person away from the pesticides, if you can do this without hurting yourself. Remember, the sick person might have pesticides on them that could get on you.
- Then get help **RIGHT AWAY**. If you have a phone, **call 911**.
- Try to stop pesticides from getting in the person's body. You can find out how later in this handout.
- If the person is not breathing and you know how, give CPR (cardiopulmonary resuscitation). The 911-rescue team will take the CPR over when they arrive.

REMEMBER: Tell the rescue workers about the pesticides. Also, remember that pesticides may not be the problem. It could, for instance, be a heart attack.

WHAT SHOULD I DO IF SOMEONE SWALLOWS A PESTICIDE?

- **Get help RIGHT AWAY**. If you have a phone, **call 911**, or the free phone number for the poison control center, 1-800-876-4766.
- If people are sleepy or unconcious from poisoning and you don't have a phone, **TAKE THEM TO A DOCTOR OR HOSPITAL RIGHT AWAY. DO NOT** give them anything to eat or drink. **DO NOT** try to make them throw up.
- If the person is awake and alert, follow the first aid instructions on the label. These directions will tell you what will be helpful or dangerous. For instance, making the person throw up, or giving them milk or water to drink could be helpful or it



CALL 911

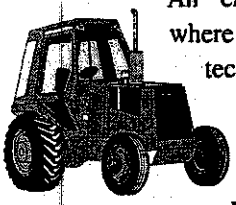
Call 911, or the free phone number for the poison control center, 1-800-876-4766.

HS-1745
Revised September 2003

Who takes care of a closed system?

Your supervisor must make sure the system is regularly cleaned. He must make sure it is always working like it should. If it is not, it will not protect you. You have the right to wait until it is fixed before you work with the pesticide.

2. ENCLOSED CABS



An "enclosed cab" is a place where you can sit and be protected while pesticides are being applied around you. It can be a closed cab on a tractor. Or it might be a truck or car with the windows and doors closed. All of these would keep you from touching anything outside that has pesticide on it. Pesticide applicators can protect themselves by using enclosed cabs.

There are two types of enclosed cabs:

- Cabs that have only the doors and windows to protect you. There is nothing to clean the outside air that comes in so you are not protected from breathing in pesticides.
- Enclosed cabs that also have air filters, that can keep you from breathing pesticides.

3. WATER-SOLUBLE PACKAGING

Water-soluble packaging is a special pesticide container or package. Both the package and the pesticide dissolve when you put the package in water. Using pesticides in water-soluble packaging protects you the same as mixing with a closed system. Never cut open this kind of package, even if you only want to use part of it. This puts you in great danger of getting the pesticide on you and becoming sick or hurt.

>>

If you don't get all the information you need in your training, or from your supervisor, you should call your County Agricultural Commissioner, or the Department of Pesticide Regulation (DPR) for more information. You can find the Commissioner's number in your local white pages phone directory. DPR numbers are:

- Anaheim (714) 279-7690
- Fresno (559) 445-5401
- Sacramento (916) 324-4100

PERSONAL PROTECTIVE EQUIPMENT YOU NEED WHEN USING CLOSED SYSTEMS, ENCLOSED CABS, OR WATER-SOLUBLE PACKAGING

If you use	You may use[1]	Instead of this
Closed system for pesticides with "Danger" or "Warning" [2,3]	Coveralls, chemical-resistant gloves, chemical-resistant apron eye protection	PPE required on the pesticide labeling
Closed system for pesticides with "Caution" [2,3]	Work clothing (shirt, pants, shoes) eye protection	PPE required on the pesticide labeling
Enclosed cab	Work clothing and respiratory protection required on the label	PPE required on the pesticide labeling
Enclosed cab acceptable for respiratory protection	Work clothing	PPE required on the pesticide labeling

1 For any substitution, all PPE required by the label must be available on site in case of an emergency.

2 If the closed system is not under pressure, you do not need to wear eye protection.

3 Using pesticides in water-soluble packages is considered the same as mixing with a closed system. However, transfer from mix tank to application tank must be made with a closed system.

Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

PSI No. 3

Closed Systems, Enclosed Cabs, Water-Soluble Packaging in Non-Agricultural Settings

If you hand-pour or mix a dangerous pesticide, you are at great risk of getting hurt or sick unless you follow all the safety rules. Your supervisor must make sure you know these rules before you use the pesticides.

There are many ways to protect yourself while mixing and applying pesticides. You must follow label directions. You must wear the right kind of clothes and other personal protective equipment (PPE). There are also special kinds of equipment and pesticide packages that can help keep you safe.

Here are three kinds of extra protection from dangerous pesticides

1. CLOSED SYSTEMS

A "closed system" is a machine that takes the pesticide out of its container for you and then rinses the container. It also moves the pesticide into the application tank and then rinses the hoses. If you run the machine properly, it keeps the pesticide away from your body.

When should I use a closed system?

You must use one if:

- you mix any Minimal Exposure Pesticide (Buctril, Metasystox-R).
- the label requires it.

If I use a closed system, do I still need to wear personal protective equipment (PPE)?

You should wear eye protection, even when you are using a closed system. But sometimes you can wear different PPE. Pesticide labels and California laws list what PPE you need for certain pesticides. There is a chart on the back page of this sheet that lists the kinds of PPE you can wear when using a closed system. Even if you don't have to wear the PPE, your supervisor must make sure that the right kind of PPE is at the place where you mix pesticides in case of an emergency.

If you are mixing or loading the contents of a single original container of one gallon or less a day, you do not have to use a closed system.

HS-1744
Revised September 2003

The label will tell you the right way to store the pesticide. Read and follow these directions. If you have to store pesticides in the same place as fertilizers, keep them apart. Pesticides and fertilizers can react with each other and start a fire.

Do not store pesticides near food, animal feed or personal protective equipment. They can become contaminated with pesticide, and make people or animals sick.

MOVING PESTICIDES SAFELY

Accidents can happen even when you are moving pesticides a short distance. If there is a problem, it can make you or others sick, or contaminate the environment.

What do I need to know about moving pesticides?

Follow these rules

- Never carry pesticides inside your car, van, or truck cab. Pesticides can cause injury or death if they spill on you or your passengers. Dangerous fumes may be released. Spills on seat covers are very hard to get out. The pesticide may make people sick days or weeks later if it is not cleaned up properly.
- Close containers tightly.
- Vehicles make turns, and sudden starts and stops. To prevent spills, make sure the pesticides are secured in an upright position.
- Make sure all the pesticide containers have a label.
- If the pesticide has been put in another container, you must label this container. The label has to have the name of the pesticide, its signal word (Danger, Warning, Caution), and the name and address of the person responsible for the container and the pesticide.
- Never let your vehicle out of your sight when you are moving pesticides in an open bed truck. You are responsible if children or adults are accidentally poisoned by unattended pesticides.

What do I do with empty pesticide containers?

Empty pesticide containers are not really "empty." They still have small amounts of pesticide – even after they have been rinsed out. Never toss them into streams, ponds, fields, or vacant buildings. Be sure to keep track of every pesticide container you used for the job. Never allow children to play with them, or allow other persons to use them for anything else. You must rinse the empty containers properly. Then they must be disposed of the right way. Ask your supervisor about how to dispose of containers. Your county agricultural commissioner can tell you how to dispose of empty pesticide **bags**. All empty bags and containers must be kept locked up until they are disposed of.

How do I rinse the containers?

Most containers must be rinsed as soon as they are emptied. If you are using a closed mix/load system, the machine will do the rinsing. Otherwise you can use one of these methods.

Method #1

1. Wear all the required personal protective equipment (PPE).
2. Fill the pesticide container about 1/4 full with water.
3. Close it tightly and shake it.
4. Pour all of this rinse water into the mix tank so it will be applied with the pesticide.
5. Repeat steps 2, 3 and 4 at least two more times.

Method #2
(for equipment that has a rinsing unit)

1. Wear all the required PPE
2. Put the opening of the container over the nozzle of the machine so the liquid will drain into the tank.
3. Turn the nozzle on and rinse until clean.

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- Anaheim (714) 279-7690
- Fresno (559) 445-5401
- Sacramento (916) 324-4100

ARE THERE OTHER RULES?

There may be, depending on the pesticide. If you are moving the pesticide, it is your job to know all the rules. You or your supervisor should call the California Highway Patrol, Motor Carrier Safety Unit, if you are moving more pesticides than you will use in a few days. The Highway Patrol telephone number can be found in the Government Pages of your telephone book. You can also ask the County Agricultural Commissioner's office for the number.

Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA
DEPARTMENT OF
PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

Storing, Moving and Disposing of Pesticides in Non-Agricultural Settings

N
No. 2

If you follow the directions in this leaflet, you can help prevent accidents with pesticides. Since pesticides are poisonous, they must be stored or disposed of with caution and concern for others, especially children. Every year children are poisoned from eating or drinking pesticides that someone did not put away or throw out correctly.

THESE ARE THE THREE MOST IMPORTANT THINGS TO REMEMBER

- Keep pesticides in their original containers.
- Never put pesticides in containers used for food, drink, or household products.
- **DO NOT** take home any pesticide used at work.

STORAGE

No job is really finished until the pesticides, containers, and equipment have been put away properly. Get into the habit of storing all of your materials safely before you clean up and go home, or move on to the next job. While you are cleaning up and putting away the pesticides, containers, and equipment, you should wear all the personal protective equipment you used on the job. Consider wearing gloves and other protective equipment, even if they weren't required on the label. Spills and accidents often occur while pesticides are being put away.

How should pesticides be stored?

Pesticides and their empty containers must be kept either in a locked area, or under the control of a person who can keep others away. If the pesticides are not locked up and are next to a road or an area where there are other people, the person in charge of the pesticides must be able to see the pesticide at all times.

Here are some acceptable ways to store pesticides

- A locked, fenced area.
- A storage compartment that can be locked.
- A truck or trailer with locked side racks. (The tops of the racks should be at least six feet above the ground.)

Never put pesticides in containers used for food, drink, or household products.

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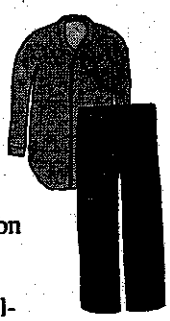
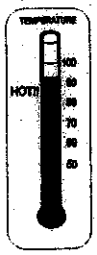
- You must wear a respirator anytime the pesticide label requires one, or if you are mixing, loading or applying most pesticides on California's list of Minimal Exposure Pesticides. Ask your supervisor for a copy of the N-10 safety leaflet for more information on Minimal Exposure Pesticides.

Protecting your body



- Your employer must give you clean coveralls (or a long-sleeved shirt and long pants) every day that you work with pesticides with either the word **DANGER** or **WARNING** on the label.
- If you need to use chemical-resistant clothes, your employer must give you a clean chemical-resistant suit that covers your body, an apron (if called for on the label), and protection for your feet and head.



- When it's hot outside, wearing chemical-resistant clothing can make you so hot that you can get very sick. If the pesticide label says you must wear a chemical-resistant suit, then you must not work in temperatures above 80°F (27°C) during the day or 85°F (29°C) at night.
- You must use a closed system if you mix or load liquid pesticides with the word, **DANGER**, on the label or pesticides on California's minimal exposure list. Ask your supervisor for a copy of the N-3 safety leaflet that has more information on closed systems.
- Your employer must also give you a place to change clothes and wash up at the end of the day if you regularly work with pesticides that have the signal word DANGER or WARNING on the label.

HOW DO I LEARN ABOUT WORKING SAFELY WITH PESTICIDES?

California law requires that you be trained before you handle pesticides.

For each pesticide (or group of pesticides that are alike chemically), your training must include all of these things

Health effects

- how pesticides can make you sick
- how you may feel or look if you get pesticides in or on you
- how pesticides can get in your body
- how to prevent a heat-related illness, how you may feel or look if you get sick from the heat, and first aid for this illness
- ways to clean yourself if you get pesticides on you

What to do in an emergency

- emergency first aid
- how and where to get emergency medical care

Personal Protective Equipment (PPE)

- why you need to wear PPE
- how to take care of the PPE
- what PPE can and cannot protect you against

Pesticide safety

- the meaning of safety statements on the pesticide label
- safety rules for handling pesticides
- why you should not take pesticides or pesticide containers home
- pesticide dangers to the environment

Your rights as an employee and where you can find more information about pesticides

Job safety information, safety leaflets and Material Safety Data Sheets (MSDS). The MSDS tells you about the pesticide and its dangers.

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If you don't get all the information you need in your training, or from your supervisor, you should call your County Agricultural Commissioner, or the Department of Pesticide Regulation (DPR) for more information. You can find the Commissioner's number in your local white pages phone directory. DPR numbers are:

- Anaheim (714) 279-7690
- Fresno (559) 445-5401
- Sacramento (916) 324-4100

If the label doesn't have one of these words, it means that the pesticide is unlikely to harm you. However, you should handle every pesticide carefully.

You must use pesticides according to the directions on the label. If you can't read the label, ask your supervisor to tell you what it says. For some pesticides, California has stricter rules than those on the label. Your supervisor must know these rules and tell you about them.

WHAT SAFETY RULES DO I NEED TO FOLLOW?

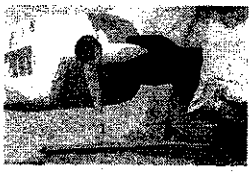
1. Read and follow the label directions.
2. Be especially careful with pesticides before they are mixed with water.
3. Wear the right kind of protection.

First, read the label

Then look at the application situation. If you are applying the pesticide indoors, the pesticide or its vapors can be moved through the building by the air conditioning or heating system. You must look at all the conditions and decide if it's safe before you apply a pesticide. If you don't think it's safe, talk to your supervisor before applying the pesticide.

Be especially careful with pesticides before they are mixed with water

Moving pesticide containers before the pesticide is mixed with water, **and hand-pouring pesticides from their containers, are the most dangerous parts of working with pesticides.** Pesticides that are mixed with water and are in the application equipment may be less dangerous, but can still hurt you. When working with these or any pesticide, you should always try to avoid getting pesticide on yourself.



Wearing the right kind of protection

Protecting your eyes.

- You must wear eye protection when you mix, load or apply pesticides; or clean or repair equipment that was used for pesticides.
- Eye protection can be safety glasses (with brow and temple protection), goggles, a face shield, or a full-face mask. Pilots can use a visor for eye protection. Regular eyeglasses and sunglasses **DO NOT** provide enough protection. Pesticides can easily get under these glasses and into your eyes. The pesticide label will tell you what kind of eye protection to wear.

Always read the label before applying a pesticide. If you can't read it, ask your supervisor to tell you what it says.

Protecting your hands.

- You must wear gloves when you mix, load or apply pesticides; clean or repair equipment that was used for pesticides; during all hand applications, and anytime the label says so. If the label does not say what type of glove you need, you must use gloves made of chemical-resistant material like rubber or neoprene. Never wear fabric-lined gloves unless the label specifically says you may.
- Your supervisor must give you clean or new gloves every day you mix or load pesticides, repair or clean pesticide equipment, or apply pesticides with hand-held equipment. You must wear them.
- In a few cases, a pesticide label may tell you not to wear gloves. If it does, do not wear them.

Protecting your lungs.

- You must wear a respirator while using pesticides that are harmful if you breathe them. This includes fumigants, powders, dusts, and some liquids. Ask your supervisor for a copy of the N-5 safety leaflet for more information about respirators.

Pesticide Safety Information

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
1001 I Street,
Sacramento,
California 95814

PSI No. 1

Working Safely With Pesticides in Non-Agricultural Settings

Workers who handle pesticides must be trained in ways they can protect themselves. If you handle pesticides in an industrial/institutional setting or work for a structural pest control business, landscape and maintenance firm, rights-of-way maintenance company, or similar business, this leaflet will tell you how to work safely with pesticides.

WHY SHOULD I WORRY ABOUT PESTICIDES?

Pesticides can get into your body many different ways. If they do, they can have both acute and chronic effects on your health. If a pesticide can hurt you or make you sick right away, that's called an *acute* effect. If you have to be exposed to a pesticide for a long time (months or years) before it makes you sick, that's called a *chronic* effect. **Pesticides can make you sick by moving into your body through your skin, mouth or eyes, or through your lungs as you breathe.**

Keeping pesticides off your hands is often the hardest part of working safely with pesticides. Once a pesticide gets on your hands, it can get in your eyes if you rub them, or in your mouth if you touch your food. Always wash your hands before eating, drinking, smoking or going to the bathroom.

WHAT CAN A PESTICIDE LABEL TELL ME?

Most labels have a special word in capital letters on the front of the label. It tells you what the acute health hazard is.

The words you might see are:

- **DANGER,** which means the pesticide is extremely harmful.
- **WARNING,** which means moderately harmful.
- **CAUTION,** which means slightly harmful, but still can make you sick.

Handle means to mix, load, or apply pesticides; repair or clean equipment that was used for pesticides; or handle unrinsed pesticide containers.

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Appendix B

AB CUTRINE PLUS

SECTION VI - HEALTH HAZARD DATA

Acute Health Hazards: $LD_{50(RAT)}$ = 1930mg/Kg: CORROSIVE TO SKIN
Chronic Health Hazards: NONE KNOWN
Signs & Symptoms of Exposure: CONTACT WITH SKIN AND EYES, VAPORS OR MISTS MAY CAUSE IRRITATION WITH PAIN, COUGHING AND DISCOMFORT TO EYES, NOSE, THROAT AND CHEST.

Medical Conditions Generally Aggravated by Exposure: MAY CAUSE SKIN SENSITIZATION.

Chemical Listed as Carcinogen or Potential Carcinogen by:

National Toxicology Program:	Yes:	No: ✓
I.A.R.C. Monographs:	Yes:	No: ✓
O.S.H.A.	Yes:	No: ✓

Emergency & First Aid Procedures: FOR PRINCIPLE ROUTE OF ENTRY, SEE APPROPRIATE EMERGENCY PROCEDURES BELOW.
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

Route of Entry:
- Inhalation: REMOVE TO FRESH AIR. ADMINISTER OXYGEN IF NECESSARY.
- Eyes: FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.
- Skin: FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. WASH CLOTHES THOROUGHLY BEFORE REUSE.
- Ingestion: IF INGESTED, GET IMMEDIATE MEDICAL ATTENTION.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: SOAK UP WITH APPROPRIATE ABSORBENT THAT DOES NOT CONTAIN CLAYS. GROUND CORNCOB IS THE IDEAL ABSORBENT. DO NOT FLUSH INTO SANITARY SEWERS.

Waste Disposal Methods: INCINERATE IN A FURNACE. MORE THAN 5 (FIVE) GALLONS, CONTACT LOCAL AUTHORITIES FOR DIRECTIONS.

SECTION VIII - SPECIAL PROTECTION AND CONTROL MEASURES

Respiratory Protection (Specify Type): NOT REQUIRED

Ventilation - Local Exhaust: ACCEPTABLE; Special Exhaust:: NOT REQUIRED
Mechanical Exhaust: ACCEPTABLE; Other Exhaust: NOT REQUIRED

Protective Equipment - Gloves: RUBBER; Eye Protection: SPLASH GOGGLES OR FACE SHIELD

Other Protective Equipment: EYEWASH AND SAFETY SHOWER SHOULD BE AVAILABLE WITHIN THE IMMEDIATE WORKING AREA.

Work or Hygienic Practices: USE SAFE CHEMICAL HANDLING PROCEDURES SUITABLE FOR THE HAZARDS PRESENTED BY THIS MATERIAL.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage: STORE AT TEMPERATURES BETWEEN 32°F AND 100°F. DO NOT STORE IN DIRECT SUNLIGHT

Other Precautions: DO NOT CONTAMINATE WATER, FOOD OR FEED BY STORAGE, DISPOSAL OR CLEANING OF EQUIPMENT. STORE IN A COOL, DRY PLACE.

KEEP OUT OF REACH OF CHILDREN

DJK Date of Last Revision: 11/30/99

Material Safety Data Sheet

EMERGENCY

FOR CHEMICAL EMERGENCY: SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CALL
CHEMTREC - DAY or NIGHT - (800) 424-9300

Product Name: **AB CUTRINE PLUS**

SECTION I - GENERAL INFORMATION

Manufacturer's Name: APPLIED BIOCHEMISTS
W175 N11163 Stonewood Drive
Suite 234
Germantown, WI 53022-4799
(800) 558-5106

Trade Name & Synonyms:	**AB CUTRINE PLUS**
Chemical Name & Synonyms:	CHELATED ELEMENTAL COPPER
Generic Description:	COPPER - ALGICIDE
Formula:	PROPRIETARY
D.O.T. Proper Shipping Name:	CORROSIVE LIQUID NOS (Copper Triethanolamine Complexes)
D.O.T. Hazard Class:	EIGHT
U.N. or N.A. Identification #:	UN 1760, PG III
D.O.T. Emergency Response Guide (1996 ed.):	154

Hazardous Mat'ls ID System Values (HMIS):	Health -2	Flammability -0	Reactivity -1	Personal Protection -B
Nat'l Fire Protection Assn. (NFPA 704M):	Health -1	Flammability -0	Reactivity -1	Specific Hazard:

SECTION II - HAZARDOUS INGREDIENTS

Hazardous Component(s)	CAS#	PEL	TLV
Copper Carbonate	12069-69-1	1 mg/m^3	1 mg/m^3
Monoethanolamine	141-43-5	3 ppm	3 ppm
Triethanolamine	102-71-6	NOT ESTABLISHED	NOT ESTABLISHED

Ingredients listed in this section have been determined to be hazardous as defined in 29 CFR 1910.1200. Materials determined to be health hazards are listed if they comprise 1% or more of the composition. Materials identified as carcinogens are listed if they comprise 0.1% or more of the composition. Information on proprietary materials is available as provided in 29 CFR 1910.1200 (i) (1).

SECTION III - PHYSICAL DATA

Boiling Point (F):	212°F	Specific Gravity (water = 1):	1.1 - 1.2
Vapor Pressure (mm Hg):	NOT DETERMINED	% Volatile (by Volume):	NOT DETERMINED
Vapor Density (air = 1):	> 1	Evaporation Rate:(Ether = 1)	< 1
Melting Point (F):	NOT APPLICABLE	pH:	10.0-11.0
Solubility in Water:	MISCIBLE IN WATER		
Appearance & Odor:	BLUE VISCOUS LIQUID. SLIGHT AMINE ODOR.		

SECTION IV - FIRE & EXPLOSION DATA

Flash Point :	NOT DETERMINED Method: TAG CLOSED CUP
Extinguishing Media:	CO_2, H_2O, DRY CHEMICAL. POLYMER FOAM FOR LARGE FIRES
Special Fire Fighting Procedures:	USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire & Explosion Hazards:	NONE

SECTION V - REACTIVITY DATA

Stability -	_____Unstable __X__Stable
Conditions to Avoid:	AVOID CONTACT WITH STRONG ACIDS AND NITRATES.
Incompatibility (Materials to Avoid):	STRONG ACIDS AND NITRITES.
Hazardous Decomposition Products:	OXIDES OF NITROGEN
Hazardous Polymerization:	_____Will Occur __X__Will Not Occur
Conditions to Avoid:	CONTACT WITH STRONG ACIDS AND NITRITES.

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Appendix D

(Copper, Acrolein, and Species-Specific Ecological Toxicity Data)

Toxic Reference Values
To estimate risk, a Toxic Reference Value (TRV) is used. The TRV can be considered a No Observed Adverse Effect Level (NOAEL), or the concentration at which no observable adverse effect is observed on the subject organism.

The U.S. EPA (1989) suggests applying a 20X safety factor to median toxicity values for aquatic threatened or endangered species and a 10X safety factor for terrestrial threatened or endangered species. In this analysis, we applied these safety factors to all species regardless of their designation. Therefore, species listed as California species of special concern received similar consideration in the analyses as federally threatened or endangered species.

Copper
Since no published TRVs for copper are available for reptiles such as turtles and snakes, the approach used here was to select the most sensitive available TRV from either birds or mammals, and apply a safety factor of 10X. The published TRV for mammals of 12.0 mg copper/kg diet is lower than that for birds of 46.97 mg copper/kg diet (EPA 1999), and applying the 10x safety factor provides a derived reptilian TRV of 1.20 mg copper/kg diet.

Use of standard water and food uptake factors (multiplier needed to convert copper concentration in a food resource into water concentration), an estimate of the concentration of copper in each food resource (aquatic invertebrates, fish, plants, etc) was calculated. The methodology for estimating this value is contained in EPA's 1993 Wildlife Factors Handbook (http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=2799). Once these food source concentrations were estimated, the estimated body weight and metabolic rate were used to determine the caloric intake for each day. The proportion for each dietary component was then used to sum the amount eaten and drank in a day. From this, the amount of copper consumed per kg of body weight per day was calculated and compared to the TRV to assess the extent of risk.

A water concentration of 0.15 mg /L copper will lead to concentrations in dietary components that will equal the dietary TRV for reptiles of approximately 1.2 mg copper/kg body weight/day. Assuming a half life of approximately 1.25 days for moving water (Wa DOE 2004) and a starting concentration of 1 ppm copper, the concentration of copper will drop below 0.15 mg/L of copper in approximately 3.5 days.

Acrolein
Because acrolein is either skin absorbed or inhaled and exhibits a relatively short half life (9 hours), exposure assessment using food uptake as described above for copper is not appropriate. Instead, lethal concentration values than kill 50% of a test population (LC50) were considered for a variety of species. Specifically, the lowest of the following 96-hour freshwater LC50 values was used: rainbow trout (70 ug/L); fathead minnow (38 ug/L); pond snail (274 ug/L); and bluegill (63 ug/L). Given a maximum label rate concentration of 15 ppm acrolein for a starting concentration, it will take approximately 3.5 days for the concentration of acrolein to drop below 38 ug/L.

Exposure Assessment
For terrestrial wildlife species, we used the procedures suggested in the U.S. EPA's Wildlife Exposure Factors Handbook (1993). These procedures entailed determining the dietary habits of each species from published literature, determining food intake levels using body weights and metabolic rates, and herbicide uptake values for each dietary component. We used uptake rates or equations to calculate uptake rates published by the U.S. EPA (1999). For fish, exposure to contaminated water was the primary route considered and dietary exposure. For terrestrial plants, exposure only to drift from above-water applications was considered.

The procedures used here to assess dietary exposure are possibly overly conservative for acrolein because the uptake of the herbicides into dietary components is assumed to reach steady state concentrations instantaneously and toxic impacts are also assumed to occur immediately upon

exposure. For copper exposure to aquatic invertebrates we were able to calculate a bioconcentration factor (BCF) adjusted for dissipation through time. Rodgers *et al.* (1992 in Washington Department of Ecology 2004) provides the body burdens and water concentrations in mollusks following an application of Komeen® (0.4 ppm Cu) to Guntersville Reservoir in Alabama. They report that the concentration in water returns to its pretreatment concentration of 0.015 ppm by 21 hours post-treatment. The body burden of mollusks increased to 82.667 mg/kg from a pretreatment level of 37.867 mg/kg—a change of 44.8 mg/kg. Using an average concentration of 0.2 ppm for this period, a 21-hr BCF is 224. Since this work was done with Komeen rather than copper sulfate and using mollusks to represent all aquatic invertebrates, we applied a 10X safety factor to arrive a BCF for our exposure assessments of 2240 for aquatic invertebrates. Uptake of copper for all other dietary items used the more conservative approach of instantaneous uptake.

Risk Assessment

To determine whether adverse effects were likely, the anticipated exposure was compared to the TRV. Whenever the exposure estimate exceeded the TRV, we concluded a potential risk was present. For terrestrial animals, exposure to drinking the treated water, consuming treated sediments, and consuming exposed prey items or vegetation were included in the exposure estimate. For fish, only exposure to treated water was considered. The only herbicide with available dietary toxicity data for fish was copper.

ACROLEIN

Persistence:

Hydrolysis – $t_{1/2}$ = 3.5 days at pH 5; 1.5 days at pH 7; 4 hours at pH 10 (Tomlin 2002)
$t_{1/2}$ = 3.8 days at pH 5; 1.5 days at pH 7; 19 hours at pH 9 (Turner and Erickson 2003)
Photodegradation in air – stable (WHO 1991)
Photodegradation on soil – $t_{1/2}$ =
Aerobic sediment metabolism – $t_{1/2}$ = 7.6 hr (WHO 2002)
Anaerobic sediment metabolism – $t_{1/2}$ = 10 days (WHO 2002)
Terrestrial Field Dissipation – $t_{1/2}$ in air < 3 hrs (Eisler 1994)
Reactivity-based $t_{1/2}$ in soil = 30 and 100 hours (WHO 2002)
Aquatic Field Dissipation – $t_{1/2}$ = 3 to 7 hours in irrigation canals at pH 7.1 to 7.5 and 16 to 24°C (WHO 1991)
$t_{1/2}$ = 7.3 – 10.2 hrs in irrigation canals (WHO 2002)
Reactivity in surface water $t_{1/2}$ = 30 – 100 hours (WHO 2002)
$t_{1/2}$ = 50 hours at pH 6.6 and 38 hours at pH 8.6 (Eisler 1994)

Physical Properties

Water Solubility:

208 g/kg at 20°C (Tomlin 2002)
206 g/L at 20°C (WHO 1991)
206-208 g/L (Eisler 1994)
206-270 g/L (WHO 2002)

Volatility:

29 kPa at 20°C and 59 kPa at 38°C (Tomlin 2002)
29.3 kPa at 20°C (WHO 1991)
215-220 mm Hg at 20°C (Eisler 1994)
29.3-36.5 kPa at at 20°C (WHO 2002)

Octanol/Water Partitioning Coefficient (K_{ow})

logP = 1.08 (Tomlin 2002)
logP = 0.9 (WHO 1991)
logP = 0.01 (Eisler 1994)
logP = -1.1-1.02 (WHO 2002)
(K_{ow} > 100 indicates EPA may require Fish Bioaccumulation Test)

Bioaccumulation

WHO 1991
Because of its high water solubility and low K_{ow}, it would not be expected to bioaccumulate.

Eisler 1994
After 28 days exposure to 13 ppb acrolein, the whole-fish bioconcentration factor in bluegill sunfish (*Lepomis macrochirus*) was 344.

WHO 2002
In the study cited by Eisler, some of the radioactivity measure in the fish tissues may have been in the form of metabolites and not acrolein. An updated BCF is 0.6 along with a log K_{ow} of -0.01.

U.S. EPA 2003
An estimated bioconcentration factor of 3 suggests the potential for bioconcentration in aquatic organisms is low.

Sublethal Effects

WHO 1991
Laboratory rats exposed to acrolein via inhalation at concentrations of 10 to 5000 mg/m^3 for 1 minute showed an increase in blood pressure. The heart rate was increased at concentrations from 50 to 500 mg/m^3. In an acute oral toxicity test with rats, 11.2 mg/kg decreased reflexes, resulted in body sag, caused poor body tone, caused lethargy and stupor, caused tremors, and led to respiratory distress. Acrolein depresses pulmonary host defenses.

Eisler 1994
Most terrestrial crop plants can tolerate acrolein in irrigation water at concentrations up to 25 ppm, and some can tolerate 70-80 ppm.

Folmar 1976
Rainbow trout (*Oncorhynchus mykiss*) fry showed strong avoidance to acrolein at a concentration of 0.1 ppm but not 0.001 or 0.01 ppm in the laboratory.

Folmar 1978
Mayfly nymphs (*Ephemerella walkeri*) showed no avoidance to acrolein at concentrations of 0.001 to 0.1 ppm in the laboratory.

Metabolites

Turner and Erickson 2003
No toxicity data were available for the major hydration product of acrolein, 3-hydroxypropanal.

COPPER

Persistence:	Hydrolysis – Not Available Photodegradation in water – Not Available Photodegradation on soil – Not Available Aerobic soil metabolism – Not Available Anaerobic aquatic metabolism – Not Available Terrestrial Field Dissipation – Not Available

Physical Properties

Water Solubility:	Copper Sulfate: 230.5 g/kg (25°C) (Tomlin 2002) ?
Volatility:	Not Volatile (Tomlin 2002) ?
Octanol/Water Partitioning Coefficient (K_{ow})	Not Available (K_{ow} > 100 indicates EPA may require Fish Bioaccumulation Test)

Bioaccumulation

Edwards *et al.* 1998
The uptake of copper in common nettle (*Urtica dioica*) and earthworms (*Eisenia fetida*) from a contaminated dredge spoil was measured. In the aerial portions of the common nettle, the biological absorption coefficient (concentration in plant tissue ÷ concentration in soil) was 0.072 to 0.265. In root tissue, the biological absorption coefficient was 0.075 to 0.303. To determine the uptake of copper in earthworms, contaminated soil was brought into the laboratory and earthworms introduced for 28 days. Soil copper levels were 16 times higher in the contaminated soil than in control soil, but the concentrations in the earthworms only differed by 2.6 times. The earthworms did absorb copper from the contaminated soils, but not to an extent reflecting the level of contamination.

Gintenreiter *et al.* 1993
Copper concentrations in the tissues of the gypsy moth (*Lymantria dispar*) increased from earlier to later developmental stages, but the trend was not smooth. Fourth instars showed a decrease when compared to 3rd instars, and adults had lower concentrations than pupae. Concentration factors were 2 to 5. Copper concentrations were passed from one generation to the next.

Gomot and Pihan 1997
Bioconcentration of copper was evaluated in two subspecies of land snails, *Helix aspersa aspersa* and *Helix aspersa maxima*. These snails showed a tendency to accumulate copper in excess of the amount available from its diet. The subspecies exhibited different bioconcentration factors for different tissues. For the foot, *H. a. aspersa* had factors ranging from 2.3 to 13.2, whereas *H. a. maxima* had factors ranging from 1.7 to 10.2. For the viscera, *H. a. aspersa* had factors ranging from 2.1 to 9.1, whereas *H. a. maxima* had factors ranging from 1.9 to 9.0. Differences in the bioconcentration factor appear to be more related to the other components of the diet, not the copper concentration in the diet.

Gomot de Vaufleury and Pihan 2000
Copper concentrations were measured in terrestrial snails (*Helix aspersa*). Differences were demonstrated among laboratory and field values. However, no soil or vegetation samples for the laboratory and field sites were analyzed for copper, so it is not possible to determine whether copper was accumulated at rates above background or whether they reflect some fraction of background levels.

Han *et al.* 1996
Shellfish accumulated copper in natural and aquaculture ponds in Taiwan. The sediments in the aquaculture ponds were finer grain and contained 4X concentrations of copper. Five mollusks were collected, but only purple clams (*Hiatula diphos*) and hard clams (*Meretrix lusoria*) were collected from both environments. The relative accumulation in each environment did not show a consistent pattern for both species indicating that the concentration in the shellfish was not controlled only by total copper concentrations in the sediments.

Haritonidis and Malea 1999
Copper concentrations in green algae (*Ulva rigida*) (2.2 ± 0.2 µg/g dry weight) collected from Thermaikos Gulf, Greece were less than seawater concentrations (1.5 ± 0.08 µg/L) and sediment (2.7 ± 0.5 µg/g dry weight). This suggests that copper will not bioconcentrate in algae.

Harrahy and Clements 1997
Bioaccumulation factors were calculated for the benthic invertebrate, *Chironomus tentans,* to be 16.63 and 12.99 during two uptake tests. Depuration was rapid. Copper concentrations were similar to

background within four days. The authors caution that the bioaccumulation factors presented may be related to bioavailability that is driven by sediment characteristics.

Hendriks *et al.* 1998
Bioaccumulation ratios were determined for zebra mussels (*Dreissena polymorpha*) from the Rhine-Meuse Delta in the Netherlands. For copper, the ratio between mussels and suspended solids was 0.31 indicating tissue concentrations did not exceed environmental concentrations and that copper had not bioaccumulated

Janssen and Hogervorst 1993
Concentration factors were calculated for nine arthropod species inhabiting the forest litter layer in a clean reference site and a polluted site in The Netherlands: pseudoscorpion (*Neobisium muscorum*), harvestman (*Paroligolophus agrestis*), carabids (*Notiophilus biguttatus* and *Calathus melanocephalus*), mites (*Pergamasus crassipes*, *P. robustus*, and *Platynothrus peltifer*), dipluran (*Campodea staphylinus*), and collembolan (*Orchesella cincta*). Copper concentration factors for the eight species ranged from 0.85 – 4.08 in the reference site versus 0.40 – 1.62 in the polluted site. Copper was concentrated more when copper leaf litter concentrations were lower.

Khan *et al.* 1989
Bioconcentration factors in grass shrimp (*Palaemonetes pugio*) were determined for two populations, one from an industrialized site and another from a relatively pristine site. Levels of copper measured in shrimp from the industrialized site were greater than from the pristine site, but the industrialized site showed a concentration factor of 0.07, whereas the pristine site showed a concentration factor of 1.1 when compared to sediment concentrations.

Marinussen *et al* 1997a
Earthworms (*Dendrobaena veneta*) were exposed to soils containing various levels of copper. Earthworm tissue concentrations increased proportionally to the soil copper concentrations up to 150 ppm. Above 150 ppm in the soils, tissue concentrations leveled off at about 60 ppm.

Marinussen *et al* 1997b
Soil, containing 815 ± 117 ppm Cu, was collected from a contaminated site in The Netherlands. Earthworms (*Dendrobaena veneta*) were introduced to the soil in the laboratory. Earthworms appeared to reach equilibrium with the soil exhibiting tissue concentrations of *c.* 60 ppm through 56 days of exposure. At 112 days exposure, the tissue concentrations increased to *c.* 120 ppm. The authors did not have an explanation for this anomaly. After being transferred to uncontaminated soil, the earthworms eliminated the copper according to a two-compartment model with the half-life times being, $t_{1/2\text{-}1} = 0.36$ d and $t_{1/2\text{-}2} = 37$ d.

Morgan and Morgan 1990
Earthworms (*Lumbricus rubellus*) were collected from an uncontaminated site and four metalliferous mine sites. Copper concentrations in soil and in tissues were measured. The worms were held under clean conditions to allow eliminate soil from their alimentary canal. The concentrations of copper in earthworm tissues reflected the concentrations in the soil. The authors conclude that there was no evidence that copper was sequestered in earthworms.

Morgan and Morgan 1999
Copper concentrations in earthworm (*Aporrectodea caliginosa* and *Lumbricus rubellus*) tissue were lower than in their ingesta. This suggests that copper does not bioaccumulate in earthworms.

Neuhauser *et al.* 1995
Overall, copper did not bioconcentrate in earthworm in contaminated soil, but showed a slight tendency to bioconcentrate when soil copper concentrations were low.

Pyatt *et al.* 1997
Appreciable concentrations (0.3 – 4.6%) of copper were measured in all tissues of the freshwater snail (*Lymnaea stagnalis*), whereas no measurable quantities of copper were found in food or water. The authors conclude that bioaccumulation occurred.

Svendsen and Weeks 1997a,b
There is an inverse relationship between the bioconcentration factors and soil concentrations under laboratory conditions for the earthworm *Eisenia andrei* and under field conditions for the earthworm *Lumbricus rubellus*. Bioconcentration factors ranged from 4.0 using control soil and 0.30 using soil amended with 339 ppm Cu under laboratory conditions. Bioconcentration factors in the field ranged from 4.1 under control conditions to 0.4 when the soil plots contained 231 ppm Cu.

Fish Dietary Toxicity

Berntssen *et al.* 1999
Laboratory tests were conducted to determine the effects of dietary copper on Atlantic salmon (*Salmo salar*). Dietary concentrations were 0, 35, and 700 mg Cu/kg diet for an experiment lasting 28 days. Addition of the copper supplemented diet did not cause an increase in the water concentrations of copper. Dietary exposure significantly increased intestinal cell proliferation and apoptosis (degeneration of cells into membrane-bound particles that are then phagocytosed by other cells). The copper exposed groups did not grow during the trial.

Lundebye *et al.* 1999
Laboratory tests were conducted to determine the effects of dietary copper on Atlantic salmon (*Salmo salar*). Dietary concentrations were 0, 35, and 700 mg Cu/kg diet for an experiment lasting 28 days, and 5, 35, 500, 700, 900, and 1750 mg Cu/kg diet in an experiment lasting 12 weeks. Mean weights of fish used in the tests were 72 and 0.9 g in the first and second experiments, respectively. No mortality was observed in the first experiment, and only 2% died in the second experiment. Food consumption was not altered in either experiment at any dietary concentration. Cells of the intestinal lining were damaged in fish at both dietary concentrations in the first experiment. Growth of fish in the second experiment was reduced at dietary concentrations ≥900 mg/kg after 10 weeks and at dietary concentrations ≥700 mg/kg after 12 weeks.

Miller *et al.* 1993
When rainbow trout (*Oncorhynchus mykiss*) were exposed in the laboratory simultaneously to dietary Cu concentrations of up to 684 µg/g dry weight and water concentrations of up to 127 µg/L, no overt signs of toxicity were noted. Fish were fed to satiation three times daily. Dietary exposure was the principal source of tissue Cu, but as water concentrations were increased, uptake from water increased. However, exposure to waterborne Cu was more effective at inducing tolerance to subsequent exposure to toxic concentrations of Cu.

Handy 1993
Rainbow trout (*Oncorhynchus mykiss*) were fed commercial trout chow with and without 10 mg Cu/kg dry weight for 28 days. The water concentrations of Cu remained below 1 ppb. Fish were hand-fed to satiation daily. No outward signs of toxicity were noted and a single mortality occurred in the Cu-treated fish on day 6 of treatment. Despite some regurgitation of diet pellets, no body weight

loss was noted. Dietary copper increased tissue concentrations at day 28 to 2.52, 72.66, and 0.636 µg Cu/g weight in the gills, liver and muscle. Concentration in the kidneys were not elevated.

Murai *et al.* 1981
Channel catfish were provided diets containing supplemental copper at concentrations of 0, 2, 4, 8, 16, and 32 mg/kg for 16 weeks. At the end of 4 weeks, average weight gain had been reduced in the group receiving 32 mg/kg in the diet. After 16 weeks, average weight gain was reduced in the group receiving 16 mg/kg also. Weight gain/diet consumed was reduced for catfish receiving ≥ 8 mg/kg dietary Cu after 16 weeks. Packed cell volume in the blood and hemoglobin were not adversely affected, but the number of erythrocytes was reduced in the group receiving 16 mg/kg.

Mount *et al.* 1994
Rainbow trout (*Oncorhynchus mykiss*) were fed brine shrimp (*Artemia* sp.) enriched with Cu, Cd, Pb, and Zn alone or as a mixture along with As for 60 days. The water contained 12 µg/L Cu, 1.1 µg/L Cd, 3.2 µg/L Pb, and 50 µg/L Zn. Cu concentrations in the shrimp were 20, 40, and 80 µg/g fresh weight when trout were exposed to Cu alone. Survival of trout was decreased in the medium and high Cu treatments with 69 and 72% survival, respectively. Weight and length of trout were not impacted by feeding on brine shrimp containing Cu. Cu concentrations in whole fish were elevated as compared to controls either in clean water or metal-containing water, but the Cu concentrations did not differ among dietary treatment levels. No detrimental impacts were observed in the exposures to multiple metals via the diet. In that exposure scenario, concentrations in the diet were 0.5, 1, 1.5 and 2X the low concentrations from the first scenario.

Farag *et al.* 1994
Rainbow trout were fed invertebrates collected from the Clark Fork River, Montana and from an uncontaminated reference site for 21 days. Juvenile fish received invertebrates containing 1.54 As, 0.10 Cd, 18.57 Cu, 0.86 Pb, 32.09 Zn (all µg/g wet weight). Adult fish received invertebrates containing 3.20 As, 0.24 Cd, 26.13 Cu, 1.77 Pb, 68.99 Zn (all µg/g wet weight). Water was either standard laboratory water or contained metal concentrations based on the U.S. EPA's water-quality criteria with concentrations of 2.2 µg Cd/L, 24 µg Cu/L, 6.4 µg Pb/l and 100 µg Zn/L. Mortality of juveniles was significantly greater in tanks with metal-treated water regardless of whether the dietary invertebrates contained metals. Mortality was slightly increased in juveniles in laboratory water that received invertebrates with metals. No differences in growth were observed in any treatment. No mortality was observed in adult trials. Exposure to metals either in the water or via diet caused scale loss in adults. Juveniles were too small to evaluate scale loss. Physiological condition of fish fed invertebrates containing metals was compromised.

Woodward *et al.* 1995
Rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) were held in standard laboratory water or contained metal concentrations based on 50% the U.S. EPA's water-quality criteria with concentrations of 1.1 µg/L Cd, 12 µg/L Cu, 3.2 µg/L Pb, and 50 µg/L Zn from hatching to 88 days of age. Three diets were provided that comprised of benthic invertebrates collected from three locations on the Clark Fork River, Montana. Fish received pelleted invertebrates containing 6.5 As, no Cd, 87 Cu, 6.9 Pb, and 616 Zn (all mg/g dry weight); 19 As, no Cd, 178 Cu, 15 Pb, and 650 Zn (all mg/g dry weight); or 19 As, 0.26 Cd, 174 Cu, 15 Pb, and 648 Zn (all mg/g dry weight). Survival was not affected for either species by any combination of water or diet. Growth of brown trout was reduced in the groups receiving the diets with higher metals concentration and by exposure to metal-containing water from day 26 onward in the test. In rainbow trout, no effects were seen on growth at day 18, but by day 53, growth was reduced in fish exposed to higher metal concentrations in diet or water. However, the rainbow trout exposed to diets with higher metals concentrations had similar

growth patterns regardless of whether they were also exposed to metals-containing water. Also, the growth of the rainbow trout exposed to treated water and the diet with low metal concentrations recovered by day 88 and were no longer significantly different from fish in untreated water.

Draves and Fox 1998
In a reach of the Montreal River in northern Ontario contaminated from gold mine tailings, water concentrations were significantly higher for Cu, Cd, and Pb, but not for Zn. Juvenile yellow perch (*Perca flavescens*), a benthic feeding species, had significantly less food in their stomachs in the contaminated reach than perch in an uncontaminated reach. However, body weights of juvenile perch did not differ between the contaminated and uncontaminated reaches. Within the contaminated reach, Cu body burdens were significantly negatively correlated with body weight. Concentrations of Cu in Chironomidae, Hemiptera, Cladocera, Odonata, and Amphipoda were compared between reaches. Concentrations in Chironomidae, Hemiptera, Cladocera, and Amphipoda were greater in the contaminated reach, but Cu concentrations were greater in Odonata in the uncontaminated reach.

Sublethal Effects

Folmar 1976
Rainbow trout (*Oncorhynchus mykiss*) fry showed strong avoidance to copper ($CuSO_4 \cdot 5H_2O$) at concentrations of 0.0001 to 0.01 ppm in the laboratory.

Folmar 1978
Mayfly nymphs (*Ephemerella walkeri*) showed strong avoidance to copper ($CuSO_4 \cdot 5H_2O$) at a concentration of 0.1 ppm but not 0.001 or 0.01 ppm in the laboratory.

ACROLEIN

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
24-hr Aquatic Plant Toxicity—Photosynthesis inhibition (N.R.)	*Enteromorpha intestinalis*	Algae	Freshwater Algae	EC_{50}	1.8 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
24-hr Aquatic Plant Toxicity—Photosynthesis inhibition (N.R.)	*Cladophora glomerata*	Algae	Freshwater Algae	EC_{50}	1.0 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
24-hr Aquatic Plant Toxicity—Photosynthesis inhibition (N.R.)	*Anabaena*	Algae	Freshwater Algae	EC_{50}	0.69 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
5-day Aquatic Plant Toxicity (95.03%)	*Selenastrum capricornutum*	Green Algae	Freshwater Algae	EC_{50}	0.05 ppm (0.045-0.055)	N.A.	N.R.	0.03 ppm	EPA Pesticide Ecotoxicity Database
5-day Aquatic Plant Toxicity (95.03%)	*Anabaena flos-aquae*	Bluegreen Algae	Freshwater Algae	EC_{50}	0.036 ppm (0.036-0.040)	N.A.	3.6	0.012 ppm	EPA Pesticide Ecotoxicity Database
5-day Aquatic Plant Toxicity (95.03%)	*Navicula pelliculosa*	Diatom	Freshwater Algae	EC_{50}	0.047 ppm (0.043-0.052)	N.A.	N.R.	0.025 ppm	EPA Pesticide Ecotoxicity Database
14-day Aquatic Plant Toxicity (95.03%)	*Lemna gibba*	Duckweed	Aquatic Plant	EC_{50}	0.075 ppm (0.067-0.083)	N.A.	3.5	N.R.	EPA Pesticide Ecotoxicity Database
96-hr Acute Aquatic Toxicity (N.R.)	*Xenopus laevis*	African Clawed Frog, tadpoles	Amphibian	LC_{50}	0.007 ppm (0.006-0.008)	N.A.	N.R.	N.R.	Eisler 1994
Acute Oral Toxicity (N.R.)	*Mus* sp.	Mouse	Mammal	LD_{50}	28 mg/kg (N.R.)	Very Highly Toxic	N.A.	N.R.	Eisler 1994
Acute Oral Toxicity (N.R.)	N.R.	Mouse	Mammal	LD_{50}	18 mg/kg (N.R.)	Very Highly Toxic	N.A.	N.R.	U.S. EPA 2003

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
Acute Oral Toxicity (N.R.)	Wistar	Laboratory Rat	Mammal	LD_{50}	46 mg/kg (39-56)	Very Highly Toxic	N.A.	N.R.	WHO 1991
Acute Oral Toxicity (N.R.)	Sprague-Dawley	Laboratory Rat	Mammal	LD_{50}	29 mg/kg (N.R.)	Very Highly Toxic	N.A.	N.R.	U.S. EPA 2003
Acute Oral Toxicity (97%)	N.R.	Laboratory Rat	Mammal	LD_{50}	10.3 mg/kg (males) 11.8 mg/kg (females) (N.R.)	Very Highly Toxic	N.A.	N.R.	U.S. EPA 2003
10-minute Acute Inhalation Toxicity (N.R.)	Wistar	Laboratory Rat	Mammal	LD_{50}	750 mg/m^3 (N.R.)	Highly Toxic	N.A.	N.R.	WHO 1991
30-minute Acute Inhalation Toxicity (N.R.)	Sprague-Dawley	Laboratory Rat	Mammal	LD_{50}	95-217 mg/m^3 (N.R.)	Very Highly Toxic	N.A.	N.R.	WHO 1991
1-hour Acute Inhalation Toxicity (N.R.)	Sprague-Dawley	Laboratory Rat	Mammal	LD_{50}	65 mg/m^3 (60-68)	Very Highly Toxic	N.A.	N.R.	WHO 1991
4-hour Acute Inhalation Toxicity (N.R.)	Sprague-Dawley	Laboratory Rat	Mammal	LD_{50}	20.8 mg/m^3 (17.5-24.8)	Very Highly Toxic	N.A.	N.R.	WHO 1991
24-hr Drinking Water Toxicity (N.R.)	*Bos* sp.	Cow	Mammal	LD_{50}	N.R.	N.A.c	N.A.	60 ppm	Eisler 1994
Acute Dermal Toxicity (N.R.)	New Zealand White	Rabbit	Mammal	LD_{50}	231 mg/kg (N.R.)	N.A.c	N.A.	60 ppm	U.S. EPA 2003
Acute Oral Toxicity (92%)	*Colinus virginianus*	Northern Bobwhite	Bird	LD_{50}	19 mg/kg (16-22)	Highly Toxic	N.A.	N.R.	EPA Pesticide Ecotoxicity Database
Acute Oral Toxicity (92%)	*Anas platyrhynchos*	Mallard	Bird	LD_{50}	9.1 mg/kg (6.3-13.1)	Very Highly Toxic	N.A.	N.R.	Eisler 1994; EPA Pesticide Ecotoxicity Database

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
Acute Oral Toxicity (95.09%)	*Anas platyrhynchos*	Mallard	Bird	LD_{50}	28 mg/kg (18-38)	Highly Toxic	N.A.	< 14.7 mg/kg	EPA Pesticide Ecotoxicity Database
Acute Inhalation Toxicity (N.R.)	*Gallus* sp.	Domestic Chicken	Bird	LOEC	50 mg/L (N.A.)	N.A.	N.A.	< 50 mg/L	Eisler 1994
Acute Oral Toxicity (N.R.)	*Phasianus colchicus*	Ring-necked Pheasant	Bird	LD_{50}	> 100 mg/kg (N.R.)	Moderately Toxic	N.A.	N.R.	WHO 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Daphnia magna*	Water flea	Freshwater Crustacea	LC_{50}	0.057 ppm (17.6-32.6)	Very Highly Toxic	N.R.	N.R.	WHO 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Daphnia magna*	Water flea	Freshwater Crustacea	LC_{50}	0.083 ppm (17.6-32.6)	Very Highly Toxic	N.R.	N.R.	WHO 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Daphnia magna*	Water flea	Freshwater Crustacea	EC_{50}	0.093 ppm (N.R.)	Very Highly Toxic	N.R.	N.A.	WHO 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Daphnia magna*	Water flea	Freshwater Crustacea	EC_{50}	0.051 ppm (0.043-0.062)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
48-hr Freshwater Acute Toxicity (N.R.)	*Daphnia magna*	Water flea	Freshwater Crustacea	LC_{50}	0.057-0.080 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
Freshwater Acute Toxicity (N.R.)	*Daphnia magna*	Water flea	Freshwater Crustacea	MATC	17-34 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
Freshwater Acute Toxicity (96.4%)	*Daphnia magna*	Water flea	Freshwater Crustacea	LC_{50}	< 0.031 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Turner and Erickson 2003
48-hr Freshwater Acute Toxicity (N.R.)	*Physa* sp.	Snail	Freshwater Mollusk	100% mortality	25 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
48-hr Freshwater Acute Toxicity (N.R.)	*Bulinus truncatus*	Snail	Freshwater Mollusk	100% mortality	20-25 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
3-hr Freshwater Acute Toxicity (N.R.)	*Biomphalaria glabrata*	Snail eggs	Freshwater Mollusk	100% mortality	10 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
24-hr Freshwater Acute Toxicity (N.R.)	*Biomphalaria glabrata*	Snail eggs	Freshwater Mollusk	10% mortality	1.25 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
24-hr Freshwater Acute Toxicity (N.R.)	*Biomphalaria glabrata*	Snail adults	Freshwater Mollusk	98% mortality	10 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
24-hr Freshwater Acute Toxicity (N.R.)	*Biomphalaria glabrata*	Snail adults	Freshwater Mollusk	35% mortality	2.5 ppm (N.R.)	N.A.	N.R.	N.R.	WHO 1991
96-hr Freshwater Acute Toxicity (N.R.)	*Aplexa hypnorum*	Snail	Freshwater Mollusk	< 50% mortality	0.151 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Australorbis glabratus*	Snail adults	Freshwater Mollusk	0% mortality	1.250 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Australorbis glabratus*	Snail embryos	Freshwater Mollusk	10% mortality	1.250 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Australorbis glabratus*	Snail adults	Freshwater Mollusk	35% mortality	2.500 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Australorbis glabratus*	Snail embryos	Freshwater Mollusk	40% mortality	2.500 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Australorbis glabratus*	Snail adults	Freshwater Mollusk	90% mortality	10.000 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Australorbis glabratus*	Snail embryos	Freshwater Mollusk	100% mortality	10.000 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
Freshwater Acute Toxicity (96.4%)	*Lepomis macrochirus*	Bluegill Sunfish	Freshwater Fish	LC_{50}	0.022 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Turner and Erickson 2003

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
96-hr Freshwater Acute Toxicity (N.R.)	*Lepomis macrochirus*	Bluegill Sunfish	Freshwater Fish	LC_{50}	0.09 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	WHO 1991
96-hr Freshwater Acute Toxicity (N.R.)	*Lepomis macrochirus*	Bluegill Sunfish	Freshwater Fish	LC_5	0.033 ppm (0.027-0.040)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Lepomis macrochirus*	Bluegill Sunfish	Freshwater Fish	LC_{50}	0.079 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
96-hr Freshwater Acute Toxicity (N.R.)	*Lepomis macrochirus*	Bluegill Sunfish	Freshwater Fish	LC_{50}	0.090-0.100 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Micropterus salmoides*	Largemouth Bass	Freshwater Fish	LC_{50}	0.183 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1994
96-hr Freshwater Acute Toxicity (N.R.)	*Micropterus salmoides*	Largemouth Bass	Freshwater Fish	LC_{50}	0.160 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1994
96-hr Freshwater Acute Toxicity (Formulation)	*Micropterus salmoides*	Largemouth Bass	Freshwater Fish	LC_{50}	< 0.160 ppm (N.R.)	Highly Toxic	N.R.	N.R.	EPA Pesticide Ecotoxicity Database
24-hr Freshwater Acute Toxicity (N.R.)	*Pimephales promelas*	Fathead Minnow	Freshwater Fish	LC_{50}	0.150 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1994
48-hr Freshwater Acute Toxicity (N.R.)	*Pimephales promelas*	Fathead Minnow	Freshwater Fish	LC_{50}	0.115 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1994
48-hr Freshwater Acute Toxicity (Formulation)	*Pimephales promelas*	Fathead Minnow	Freshwater Fish	LC_{50}	< 0.115 ppm (N.R.)	Highly Toxic	N.R.	N.R.	EPA Pesticide Ecotoxicity Database
96-hr Freshwater Acute Toxicity (N.R.)	*Pimephales promelas*	Fathead Minnow	Freshwater Fish	LC_{50}	0.014 ppm (0.008-0.025)	Very Highly Toxic	N.R.	N.R.	Eisler 1994

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
Freshwater Acute Toxicity (N.R.)	*Pimephales promelas*	Fathead Minnow	Freshwater Fish	MATC	0.011-0.042 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994
144-hr Freshwater Acute Toxicity (N.R.)	*Pimephales promelas*	Fathead Minnow	Freshwater Fish	LC_{50}	0.084 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	WHO 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Rasbora heteromorpha*	Harlequin Fish	Freshwater Fish	LC_{50}	0.06 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	WHO 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Rasbora heteromorpha*	Harlequin Fish	Freshwater Fish	LC_{50}	0.130 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1991
48-hr Freshwater Acute Toxicity (N.R.)	*Leuciscus idus melanotus*	Golden Orfe	Freshwater Fish	LC_{50}	0.06 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	WHO 1991
24-hr Freshwater Acute Toxicity (N.R.)	*Carassius auratus*	Goldfish	Freshwater Fish	LC_{50}	< 0.08 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	WHO 1991
96-hr Freshwater Acute Toxicity (N.R.)	*Catostomus commersoni*	White Sucker	Freshwater Fish	LC_{50}	0.014 ppm (0.008-0.025)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
48-hr Freshwater Acute Toxicity (N.R.)	*Fundulus similis*	Longnose Killifish	Freshwater Fish	LC_{50}	0.240 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Gambusia affinis*	Western Mosquitofish	Freshwater Fish	LC_{50}	0.149 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Eisler 1994
48-hr Freshwater Acute Toxicity (N.R.)	*Gambusia affinis*	Western Mosquitofish	Freshwater Fish	LC_{50}	0.061 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
Freshwater Acute Toxicity (96.4%.)	*Oncorhynchus mykiss*	Rainbow Trout	Freshwater Fish	LC_{50}	< 0.031 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Turner and Erickson 2003

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
96-hr Freshwater Acute Toxicity (N.R.)	*Oncorhynchus mykiss*	Rainbow Trout	Freshwater Fish	LC_{50}	0.016 ppm (0.014-0.019)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
96-hr Freshwater Acute Toxicity (N.R.)	*Oncorhynchus mykiss*	Rainbow Trout	Freshwater Fish	LC_{50}	0.029 ppm (0.022-0.037)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
24-hr Freshwater Acute Toxicity (N.R.)	*Oncorhynchus tshawytscha*	Chinook Salmon	Freshwater Fish	LC_{50}	0.080 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
96-hr Freshwater Acute Toxicity (N.R.)	*Oncorhynchus kisutch*	Coho Salmon	Freshwater Fish	LC_{50}	0.068 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	WHO 1991
24-hr Freshwater Acute Toxicity (N.R.)	*Salmo trutta*	Brown Trout	Freshwater Fish	LC_{50}	0.046 ppm (215-293)	Very Highly Toxic	N.R.	N.R.	Eisler 1994
48-hr Acute Toxicology (N.R.)	*Tanytarsus dissimilis*	Midge	Insect	< 50% mortality	0.151 ppm (N.R.)	N.A.	N.R.	N.R.	Eisler 1994

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Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
Aquatic Plant Toxicity – Frond Count ($CuSO_4$)	*Lemna minor*	Duckweed	Aquatic Plant	EC_{50}	0.8 ppm (0.7 – 0.9)	N.A.	N.R.	N.R.	Bishop and Perry 1981
Aquatic Plant Toxicity – Dry Weight ($CuSO_4$)	*Lemna minor*	Duckweed	Aquatic Plant	EC_{50}	0.8 ppm (0.4 – 1.2)	N.A.	N.R.	N.R.	Bishop and Perry 1981
Aquatic Plant Toxicity – Root Length ($CuSO_4$)	*Lemna minor*	Duckweed	Aquatic Plant	EC_{50}	0.6 ppm (0.3 – 0.8)	N.A.	N.R.	N.R.	Bishop and Perry 1981
Aquatic Plant Toxicity – Growth Rate ($CuSO_4$)	*Lemna minor*	Duckweed	Aquatic Plant	EC_{50}	1.2 ppm (1.1 – 1.3)	N.A.	N.R.	N.R.	Bishop and Perry 1981
2-day Contact toxicity (Copper Sulfate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	0.00198 mg/L (N.R.)	N.A.	N.R.	N.R.	Callahan *et al.* 1994
2-day Contact toxicity (Copper Chloride	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	0.000596 mg/L (N.R.)	N.A.	N.R.	N.R.	Callahan *et al.* 1994
2-day Contact toxicity (Copper Nitrate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	0.000429 mg/L (N.R.)	N.A.	N.R.	N.R.	Callahan *et al.* 1994
2-day Contact toxicity (Copper Sulfate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	638 mg/L (N.R.)	N.A.	N.R.	N.R.	Callahan *et al.* 1994
14-day Soil toxicity (Copper Nitrate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	0.000353 mg/kg (N.R.)	N.A.	N.R.	N.R.	Callahan *et al.* 1994
14-day Soil toxicity (Copper Sulfate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	0.000522 mg/kg (N.R.)	N.A.	N.R.	N.R.	Callahan *et al.* 1994
Freshwater Acute Toxicity ($Cu(NO_3)2 \cdot 3H_2O$)	*Ceriodaphnia dubia*	Ceriodaphnia	Freshwater Crustacea	LC_{50}	*c.* 1.1 ppm (N.R.)	Moderately Toxic	N.R.	*c.* 0.1 ppm	Cowgill and Milazzo 1991
3-Brood Toxicity Test ($Cu(NO_3)2 \cdot 3H_2O$)	*Ceriodaphnia dubia*	Ceriodaphnia	Freshwater Crustacea	LC_{50}	*c.* 0.2 ppm (N.R.)	Highly Toxic	N.R.	N.R.	Cowgill and Milazzo 1991
Sediment Acute Toxicity ($CuSO_4$)	*Chironomus tentans*	Midge (2nd Instar)	Aquatic Insect	LC_{50}	1.170 ppm (N.A.)	N.A.	N.A.	N.R.	Dobbs *et al.* 1994 in EPA 2003
Filter Paper Acute Toxicity (Copper Sulfate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	26.0 $\mu g/cm^2$ (17.1 – 34.9)	N.A.	N.R.	N.R.	Edwards and Bater 1992

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
Artificial Soil Acute Toxicity (Copper Sulfate)	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	1104.9 ppm (727.6 – 1482.2)	N.A.	N.R.	N.R.	Edwards and Bater 1992
Freshwater Acute Toxicity (Copper Sulfate)	*Anguilla rostrata*	American Eel	Freshwater Fish	LC_{50}	3.20 ppm (2.17 – 13.35)	Moderately Toxic	N.R.	N.R.	Hinton and Eversole 1979
Freshwater Acute Toxicity (Copper form N.R.) (24 hr static)	*Brachionus calyciflorus*	Rotifer	Freshwater Crustacea	LC_{50}	0.026 ± 0.0026 ppm (N.R.)	Very Highly Toxic	N.R.	N.R.	Janssen *et al.* 1994
Chronic Life Cycle (Copper form N.R.)	*Brachionus calyciflorus*	Rotifer	Freshwater Crustacea	LOEC	0.005 ppm[1] (N.A.)	N.A.	N.A.	0.0025 ppm	Janssen *et al.* 1994
48-hr Freshwater Acute Toxicity ($Cu(NO_3)_2 \cdot 3H_2O$)	*Gambusia affinis*	Mosquitofish	Freshwater Fish	LC_{50}	0.140 ppm (0.11 – 0.16)	Highly Toxic	1.47	N.R.	Joshi and Rege 1980
96-hr Freshwater Acute Toxicity ($Cu(NO_3)_2 \cdot 3H_2O$)	*Gambusia affinis*	Mosquitofish	Freshwater Fish	LC_{50}	0.093 ppm (0.08 – 0.15)	Very Highly Toxic	1.56	N.R.	Joshi and Rege 1980
48-hr Freshwater Acute Toxicity ($CuSO_4 \cdot 5H_2O$)	*Gambusia affinis*	Mosquitofish	Freshwater Fish	LC_{50}	0.460 ppm (0.25 – 0.83)	Highly Toxic	1.82	N.R.	Joshi and Rege 1980
96-hr Freshwater Acute Toxicity ($CuSO_4 \cdot 5H_2O$)	*Gambusia affinis*	Mosquitofish	Freshwater Fish	LC_{50}	0.20 ppm (0.11 – 0.33)	Highly Toxic	1.70	N.R.	Joshi and Rege 1980
96-hr Freshwater Acute Toxicity (Cutrine Formulation)	*Salmo trutta*	Brown Trout	Freshwater Fish Fingerlings	LC_{50}	0.198 ppm (0.11 – 0.33)	Highly Toxic	1.70	N.R.	Simonin and Skea 1977
Sediment Acute Toxicity ($CuSO_4$)	*Tubifex tubifex*	Tubifex	Freshwater Worm	LC_{50} (Dry wt.)	> 1000 ppm (N.A.)	N.A.	N.A.	500 ppm	Meller *et al.* 1998
Sediment Acute Toxicity ($CuSO_4$)	*Limnodrilus hoffmeisteri*	Limnodrilus	Freshwater Worm	LC_{50} (Dry wt.)	516 ppm (458 – 581)	N.A.	N.R.	250 ppm	Meller *et al.* 1998
Earthworm Reproduction ($CuCl_2 \cdot H_2O$)	*Enchytraeus crypticus*	Earthworm	Terrestrial Worm	EC_{50}	477 ppm (345 – 658)	N.A.	N.R.	N.R.	Posthuma *et al.* 1997

Test	Scientific Name	Common Name	Category	Test Result	Value (C.I.)	Toxicity Class	Slope	NOEL	Information Source
Freshwater Acute Toxicity ($CuCl_2$)	*Balanus amphitrite*	Acorn Barnacle (nauplii)	Freshwater Crustacea	LC_{50}	0.480 ppm (0.310 – 0.740)	Highly Toxic	N.R.	N.R.	Sasikumar *et al.* 1995
Freshwater Acute Toxicity ($CuCl_2$)	*Artemia* sp.	Brine Shrimp	Freshwater Crustacea	LC_{50}	1.280 ppm (1.01 – 1.560)	Highly Toxic	N.R.	N.R.	Sasikumar *et al.* 1995
14-day Acute Toxicity [$Cu(NO_3)_2 \cdot 3H_2O$]	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	683 µg/g (570 – 812)	N.A.	N.R.	N.R.	Spurgeon *et al.* 1994
56-day Toxicity [$Cu(NO_3)_2 \cdot 3H_2O$]	*Eisenia fetida*	Earthworm	Oligochaeta	LC_{50}	555 µg/g (460 – 678)	N.A.	N.R.	210 µg/g	Spurgeon *et al.* 1994
56-day Cocoon Production [$Cu(NO_3)_2 \cdot 3H_2O$]	*Eisenia fetida*	Earthworm	Oligochaeta	EC_{50}	53.3 µg/g (32.5 – 186)	N.A.	N.R.	32 µg/g	Spurgeon *et al.* 1994

[1] No criteria for LOEC provided.

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Appendix E

(DPR PCA Recommendation Form)

Pest Control Recommendation

1. Operator of the Property.			2.Recommendation Expiration Date
Address	City	County	
3. Location to be Treated			
4. Commodity to be Treated			5. Acres or Units to be Treated
6. Method of Application: ☐ Air ☐ Ground ☐ Fumigation ☐ Other _____			7. Pest(s) to be Controlled

8. Name of Pesticide(s)	Rate per Acre or Unit	Dilution Rate	Volume per Acre or Unit

9. Hazards and/or Restrictions:
☐ 1. Highly toxic to bees.
☐ 2. Toxic to birds, fish and wildlife.
☐ 3. Do not apply when irrigation or run-off is likely to occur.
☐ 4. Do not apply near desirable plants.
☐ 5. Do not allow to drift onto humans, animals, or desirable plants.
☐ 6. Keep out of lakes, streams, and ponds.
☐ 7. Birds feeding on treated area may be killed.
☐ 8. Do not apply when foliage is wet (dew, rain, etc.).
☐ 9. May cause allergic reaction to some people.
☐10. This product is corrosive and reacts with certain materials (see label).
☐11. Closed system required.
☐12. Restricted use pesticide (California and/or EPA).
☐13. Hazardous area involved (see map and warnings)
☐14. Other (see attachment)

10. Schedule, Time or Conditions

11. Surrounding Crop Hazards

12. Proximity of Occupied Dwellings, People, Pets, or Livestock

13. Non-Pesticide Pest Control, Warnings and Other Remarks

14. Criteria Used for Determining Need for Pest Control Treatment:
☐ Sweep Net Counts ☐ Leaf or Fruit Counts ☐ Preventative
☐ Field Observation ☐ Pheromone or Other Trap ☐ Soil Sampling
☐ Other

15. Crop and Site Restrictions:
☐ 1. Worker reentry interval _____ days.
☐ 2. Do not use within _____ days of harvest/slaughter.
☐ 3. Posting required? ☐ Yes ☐ No
☐ 4. Do not irrigate for at least _____ days after application.
☐ 6. Do not feed treated foliage or straw to livestock.
☐ 7. Plantback restrictions (see label)
☐ 8. Other (see attachment)

16. I certify that I have considered alternatives and mitigation measures that would substantially lessen any significant impact on the environment, and have adopted those feasible.

Adviser Signature Date

Adviser License Number

Employer

Employer's Address

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Appendix F

(Response to Comments)

Project Memo

To: Erin Mustain, SWRCB
From: Sara Castellanos, Blankinship & Associates
Date: February 15, 2006
RE: GCID Initial Study/Mitigated Negative Declaration Response to Comments

Erin:

Thank you for your prompt and detailed response to the Draft Initial Study/Mitigated Negative Declaration (IS/MND) for Glenn-Colusa Irrigation District (GCID) sent to our office dated January 31, 2006. We have reviewed and responded to your comments regarding suggested changes and clarifications to the draft document. Our responses are in red text and are included in this memo.

After your review of the enclosed responses, please call our office if you have further comments or questions

Thank you.

1) *Page 4 and 9:* Specify in the introduction the type of copper used, i.e., copper sulfate pentahydrate in granular/flake form. Also, note that acrolein is a "restricted use" pesticide (RUP).

   The type of copper used can not be specified. However, throughout the document, reference to the type of aquatic herbicide used has been changed to "copper-containing".

   Consistent with the District's Integrated Pest Management (IPM) approach, the District wishes to maintain the flexibility in selection of specific type of copper-containing herbicide (i.e., chelated, copper carbonate, copper sulfate) that is appropriate for the different type(s) of aquatic weed(s) being encountered.

   Comment noted on acrolein and text will be added.

2) *Page 9, Paragraph 2:* The permit was adopted on May 20, 2004. I am not sure what the date of June 4, 2004 is in reference to.

   Change noted and made (Note: June 4, 2004 was the day the final permit document was released and made available for use).

3) *Page 9, 1st Bullet:* The SIP year should be changed from 2000 to 2005. The State Water Board adopted a revision to the SIP on February 24, 2005. The revision is available at: http://www.waterboards.ca.gov/iswp/docs/final.pdf.

   Change noted and made.

4) *Page 9, Paragraph 3:* In accordance with the revision to the SIP, add the language in bold to the following sentence: "The SIP does, however, allow exceptions if determined to be necessary to implement control measures either for resource or pest management conducted by public entities or mutual water companies to fulfill statutory requirements...."

   Change noted and text updated to reflect revised SIP language.

5) Page 10, Section 1.4.2: Indicate that twenty-four hours prior to application, the applicator must submit a Notice of Intent (NOI) to the CAC, which describes the site to be treated and the pesticides to be applied (See attached enclosure 2a for the "Restricted Materials and Permitting" section of "Regulating Pesticides: A Guide to Pesticide Regulation in California," October 2001).

   Prior to the start of every season, the District obtains a Restricted Materials permit from the County Agricultural Commissioners (CAC). Consistent with local requirements of the Glenn and Colusa County Departments of Agriculture, the District submits a Notice of Intent (NOI) to the CAC at the beginning of the season which describes the site(s) likely to be treated and the pesticides to be applied that season.

6) *Page 11, #4:* I suggest including PSIS N-1 through N-5, N-7, N-8, N-10 in the Appendix and make note of its location. I am including hard copy attachments with my comments as a convenience. Also, throughout my comments I will specify when a reference to the PSIS appears in case you wish to add reference to the new appendix (enclosure 2a).

Change noted and made. PSIS will be included in new Appendix B. In addition, PSIS are posted on the GCID employee bulletin board.

7) Page 11: Add a task stating that applicators must have a Qualified Applicator Certificate (QAC) or work under someone who is certified and that the certificate must have the category "aquatic" designated.

Change noted and made.

8) Page 18: There is no discussion of toxicity or the Toxicity Reference Value, which is covered in Appendix B.

In order to avoid excessive detail in the body of the text, the discussion of exposure and toxicity, including TRVs is presented in Appendix C and D.

9) *Page 32, Items a) & b):* Copper and acrolein have the EPA signal word "Danger." This is an appropriate location to describe its use and discuss its applicability to the project.

Acrolein has the signal word Danger, but copper-containing pesticides have signal words that are product specific, not active ingredient specific.

The use of acrolein and copper-containing pesticides is described in the Water Quality and Hydrology section and a reference to this section has been added to the text on page 33.

10) Page 32, #1: Indicate that the QAC needs an "aquatic" designation and also if you disregard comment 7, then this is the first time you use QAC so you should spell it out.

Change noted and made.

11) *Page 32, #4*: If the PSIS documents will be included in the Appendix, make note of its location here.

Comment noted. PSIS will be included in the appendix.

12) *Page 33, #7, last sentence:* In regards to the use of the word "immediately," avoid temporal generalization. I suggest stating that within a set amount of time (e.g. 1 hour) the seals will be inspected.

Comment noted. Item #7 now reads:

The day before an application the water operator will seal all emergency spill structures with boards and plastic. Emergency spills are overflows that allow excess water in the lateral to spill into the drain system. The applicator inspects all seals prior to application and faulty seals are repaired upon detection.

13) *Page 33:* Add k to address groundwater issues. Access potential groundwater impact. Indicate whether canals are lined. If they are not, address ground water quality issues (see enclosure 2b for the DWR Division of Planning & Local Assistance document on the Sacramento Valley Basin, Colusa Subbasin).

Additional items cannot be added to the CEQA format. The intent is to address water quality impact which can be done in item f.

The following text will be added to item f of the Hydrology and Water Quality Section:

Copper and acrolein are not listed by CDPR as known or suspected groundwater contaminants under Title 3, CCR Sec. 6800a. Copper is cationic and as a result, binds tightly to soil and sediment that exist in the unlined canals used by the District. Acrolein is volatile and degrades rapidly in a canal environment. Refer to Appendix C and D for details on the physical properties and environmental fate of these chemicals.

Prior to use of both of these chemicals, the District obtains written recommendations from a DPR-licensed Pest Control Advisor (PCA) who receives required training under CDPR's Groundwater Protection Regulations. All applications are made by QALs, or District staff under a QAL's supervision. Storage, handling, mixing and loading of copper and acrolein are done away from direct conduits to groundwater such as French drains and wells.

According to the Department of Water Resources (DWR 2004), no pesticides have been detected in groundwater in Colusa subbasin. As a result of the aforementioned facts, groundwater quality is not expected to be impacted.

14) *Page 36, #3:* If the PSIS documents will be included in the Appendix, make note of its location here. Also, indicate that the Magnacide H Herbicide Application and Safety Manual is available at http://www.epa.gov/espp/effects/magnacide-safety-manual.pdf or include as an attachment.

Change noted and made. PSIS and the Magnacide Safety Manual will be included in the appendix

15) Page 41, add item k: Indicate whether canals are lined. If not, address groundwater quality issues. (enclosure 2b).

See Item # 13.

16) Page 44, Items a) through d): This paragraph is awkward. I had to read it three times to understand that tractors, generators, large groundwater and irrigation pumps were not part of Glenn-Colusa ID's project.

Comment noted. Text will be changed.

17) *Page 54, 5th Reference:* The SIP year should be changed from 2000 to 2005. The State Water Board adopted a revision to the SIP on February 24, 2005.

Comment noted. Text will be changed.

Additional Documentation

State Implementation Plan (SIP) Section 5.3 Exception Information Sheet

Use of Copper and Acrolein To Control Aquatic Weeds In Water Conveyances

Glenn Colusa Irrigation District

February 16, 2006

1. **Notification.** The Glenn Colusa Irrigation District (District) will notify potentially effected public and governmental agencies of the project. The project is described in the District's Initial Study/Mitigated Negative Declaration (IS/MND) dated February 16, 2006.
2. **Description of the Proposed Action.** The proposed action is the application of acrolein- and copper-containing aquatic herbicides to irrigation canals for the purposes of controlling aquatic weeds, including algae. For a more detailed description, see the District's aforementioned IS/MND.
3. **Method of Completing the Action.** The action (the application of acrolein- and copper-containing aquatic pesticides) will be completed according to the pesticide manufacturer's product label directions. Refer to the aforementioned IS/MND.
4. **Schedule.** The schedule for the action will be according to Integrated Pest Management (IPM) principles. For example, the application of aquatic pesticides will be done at times and frequencies when the concentration of algae and/or weeds equals or exceeds thresholds established by the District. This typically takes place annually between March and October.
5. **Discharge and Receiving Water Quality Monitoring Plan.** The District has prepared and will use an Aquatic Pesticide Application Plan (APAP) as required in the Statewide General NPDES Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control In Waters of the United States (No. CAG 99005). The APAP describes in detail the requirements for sampling, analysis, and reporting before, during, and after the project. Further, the APAP contains a Quality Assurance Project Plan (QAPP) that describes in detail the quality assurance and quality control procedures used for the project.
6. **Contingency Plans.** The SIP exception is required because there are no known effective alternatives to acrolein and copper. Alternative aquatic weed and algae control methods are being tested but no adequately effective alternative is known at this time. Refer to the aforementioned IS/MND for a discussion of the use of acrolein- and copper-containing aquatic herbicides.
7. **Identification of Alternate Water Supply.** No alternative water supply exists for the District.
8. **Residual Waste Disposal Plans.** The District's use of acrolein and copper to control aquatic weeds does not create residual waste.
9. **Certification by a Qualified Biologist.** At the annual completion of the project, the District will provide certification by a qualified biologist that the receiving water beneficial uses have been maintained. Pre- and post-project certification will take into account natural variations in project site conditions and the influence these conditions have on beneficial uses.

GLENN-COLUSA IRRIGATION DISTRICT
RESOLUTION NO. 06-03

Adopting a CEQA Mitigated Negative Declaration for Use of Acrolein and Copper To Control Aquatic Weeds

The Board of Directors of Glenn-Colusa Irrigation District states as follows:

1.) WHEREAS, the Glenn-Colusa Irrigation District (herein referred to as GCID) proposes to apply acrolein and/or copper to the water conveyances under its jurisdiction in order to control a variety of aquatic weeds and algae for purposes of maintaining adequate water conveyance capacity (the "Project");

2.) WHEREAS, pursuant to the California Environmental Quality Act (CEQA) Guidelines (Cal. Code Reg., tit. 14, §§ 15000-15387.), GCID has prepared a CEQA Initial Study and Mitigated Negative Declaration for the Project, dated January 10, 2006;

3.) WHEREAS, the GCID Initial Study concluded that with the implementation of mitigation measures described in the Initial Study, the project will not have a significant effect on the environment;

4.) WHEREAS, GCID therefore has proposed to adopt a CEQA Mitigated Negative Declaration for the Project;

5.) WHEREAS, pursuant to CEQA Guidelines, GCID has circulated for public review and comment a Notice of Intent to Adopt the Mitigated Negative Declaration and the Initial Study;

6.) WHEREAS, the GCID has not received any public comments concerning the Mitigated Negative Declaration and the Initial Study;

7.) WHEREAS, GCID's General Manager has recommended that the GCID Board of Directors adopt the Mitigated Negative Declaration and authorize the filing of a CEQA Notice of Determination;

NOW, THEREFORE BE IT RESOLVED by the Board of Directors of the GCID as follows:

1.) **Mitigated Negative Declaration.** GCID hereby adopts this Mitigated Negative Declaration for the Project pursuant to CEQA.

2.) **Findings.** The Board has reviewed the proposed project, Initial Study, Mitigated Negative Declaration, public comments received, and other information provided by GCID staff. On the basis of this information and the whole record before GCID, the Board hereby finds and determines as follows:

a. The Initial Study and Mitigated Negative Declaration reflect GCID's independent judgment and analysis;

b. Although the project could have a significant effect on the environment, without mitigation, there will not be a significant effect because GCID has put appropriate mitigation measures in place; and

c. There is no substantial evidence, in light of the whole record in front of GCID, that the Project may have a significant effect on the environment.

3.) **Location and Custodian of Documents.** The Mitigated Negative Declaration, the Initial Study, Notice of Intent to Adopt the Initial Study are on file and available for public review at the GCID office located at 344 E. Laurel Street, Willows, California. GCID's General Manager, at this address, is the custodian of these documents,which constitute the record of proceedings upon which the decision in this matter is based.

4.) **Project Approval.** The GCID Board hereby approves the Project and authorizes the General Manager to proceed with Project implementation in accordance with CEQA policies and requirements.

5.) **Notice of Determination.** GCID's Board hereby authorizes and directs the General Manager to prepare, sign and file a CEQA Notice of Determination with the Glenn and Colusa County Clerks and the State Clearinghouse within 5 days from the date of this Mitigated Negative Declaration, and to file a Certificate of Fee Exemption for payment of a California Department of Fish and Game fee for review of the Mitigated Negative Declaration in accordance with Fish and Game Code section 711.4.

PASSED AND ADOPTED by the Board of Directors of the Glenn-Colusa Irrigation District, at a meeting held on February 16, 2006 by unanimous vote.

* * *

I hereby certify that I am the Secretary of the Glenn-Colusa Irrigation District and that the foregoing resolution was duly adopted by the Board of Directors of said District at a regular meeting thereof duly held on February 16, 2006, at which meeting a quorum of said Board of Directors was at all time present and acting.

IN WITNESS WHEREOF, I have set my hand and the seal of the District this 16th day of February, 2006.

O. L. "Van" Tenney, Secretary
Board of Directors
Glenn-Colusa Irrigation District

Notice of Determination Form C

To X Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk County of Glenn
526 West Sycamore St.
Willows, CA 95988

From: (Public Agency) Glenn-Colusa Irrigation District
344 East Laurel Street
Willows, CA 95988

Subject:
Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

Project Title
Adopt a Mitigated Negative Declaration for the Glenn-Colusa Irrigation District for the Use of Copper and Acrolein to Control Aquatic Weeds In Irrigation Canals and Ditches.

State Clearinghouse Number (if Submitted to Clearinghouse)	Lead Agency Contact Person	Area Code/Telephone/Extension
SCH # 2006012045	0. L."Van" Tenney	(530) 934-8881

Project Location (include county)

Glenn and Colusa Counties

Project Description:
To Adopt a Mitigated Negative Declaration for the Glenn-Colusa Irrigation District for the Use of Copper and Acrolein to Control Aquatic Weeds In Irrigation Canals and Ditches.

This is to advise that the Glenn-Colusa Irrigation District has approved the above described project on
☒Lead Agency ☐Responsible Agency

02/16/06 and has made the following determinations regarding the above described project:
(Date)

1. The project [☐will ☒will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA
3. Mitigation measures [☒ were ☐were not] made a condition of the approval of the project.
4. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
5. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final Negative Declaration with comments and responses and record of project approval is available to the General Public at:

344 East Laurel St. Willows Ca. 95988

C E Tenney February 16, 2006 General Manager
Signature (Public Agency) *Date* *Title*

Date received for filing at OPR: _____

Notice of Determination Form C

To X Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk County of Colusa
546 Jay St.
Colusa, CA 95932

From: (Public Agency) Glenn-Colusa Irrigation District
344 East Laurel Street
Willows, CA 95988

Subject:

Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

Project Title

Adopt a Mitigated Negative Declaration for the Glenn-Colusa Irrigation District for the Use of Copper and Acrolein to Control Aquatic Weeds In Irrigation Canals and Ditches.

State Clearinghouse Number (if Submitted to Clearinghouse)	Lead Agency Contact Person	Area Code/Telephone/Extension
SCH # 2006012045	0. L."Van" Tenney	(530) 934-8881

Project Location (include county)

Glenn and Colusa Counties

Project Description:

To Adopt a Mitigated Negative Declaration for the Glenn-Colusa Irrigation District for the Use of Copper and Acrolein to Control Aquatic Weeds In Irrigation Canals and Ditches.

This is to advise that the Glenn-Colusa Irrigation District (☒Lead Agency ☐Responsible Agency) has approved the above described project on 02/16/06 (Date) and has made the following determinations regarding the above described project:

1. The project [☐will ☒will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA
3. Mitigation measures [☒ were ☐were not] made a condition of the approval of the project.
4. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
5. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final Negative Declaration with comments and responses and record of project approval is available to the General Public at:

344 East Laurel St. Willows Ca. 95988

(Signature (Public Agency)) February 16, 2006 (Date) General Manager (Title)

Date received for filing at OPR:

CERTIFICATE OF FEE EXEMPTION

NAME & ADDRESS OF PROJECT PROPONENT: Glenn-Colusa Irrigation District
P. O. Box 150
Willows, California 95988

PROJECT DESCRIPTION:
To Adopt a Mitigated Negative Declaration for the Glenn-Colusa Irigation District for the Use of Copper and Acrolein to Control Aquatic Weeds In Irrigation Cannals and Ditches.

ENVIRONMENTAL IMPACT STUDY:

GCID has conducted an initial study to determine if the project may have a significant effect on the environment. In making the study, GCID staff prepared a written determination using the District's CEQA Guidelines Environmental Checklist form.

☒ The initial study conducted by GCID evaluated the potential for adverse environmental impact and found no evidence that the proposed project will result in changes to the resources listed below: (14 C.C.R. 753.5(d)

a. Riparian land, rivers, streams, watercourses, and wetlands under state and federal jurisdiction

b. Native and non-native plant life and the soil required to sustain habitat for fish and wildlife;

c. Rare and unique plant life and ecological communities dependent on plant life; and

d. Listed threatened and endangered plants and animals and the habitat in which they are believed to reside.

e. All species of plants or animals as listed as protected or identified for special management in the Fish & Game Code, the Public Resources Code, the Water Code, or regulations adopted thereunder.

f. All marine and terrestrial species subject to the jurisdiction of the Department of Fish & Game and the ecological communities in which they reside.

9. All air and water resources the degradation of which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that air and water.

☐ GCID has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in 14 C.C.R. §753.5(d)

☒ In addition, GCID has considered the following items to determine whether the project is or is not de minimis:

a. Department of Fish and Game has not concluded that the project is subject to the filing fee.

b. Habitat types present on the project site.

c. Habitat types adjacent to the project site.

d. Cumulative impacts of this and similar projects on existing fish or wildlife habitat.

e. Project impacts on the natural and biological resources of the community.

FINDING OF NO ADVERSE IMPACT:

When considering the record as a whole, there is no evidence before GCID that the proposed project will have a potential for adverse effect on wildlife resources defined as all wild animals, birds, plants, fish, amphibians, and related ecological communities including the habitat on which the wildlife depends for its continued viability. (Fish & Game Code §711.2)

Dated: 1/10/2006

GLENN-COLUSA IRRIGATION DISTRICT

By _____

CHIEF PLANNING OFFICIAL

Dated: 1/10/2006

By _____

Distribution:

Once signed by the Chief Planning Official, GCID retains original as part of the Environmental Record. File two copies of certificate with the County Clerk along with the Notice of Approval or Notice of Preparation.

02/16/2006 02:30P

RECEIPT # 57403

Vince T Minto Clerk-Recorder
Glenn County, CA
526 West Sycamore Street
Willows, CA 95988

FROM : GLENN-COLUSA IRRIGATION DIST
BY : SALVES

REC. NO.: 2006EIR013 # Pgs : 4
DOC TYPE: (NOD) NOTICE OF DETERMINATION
FEE: 25.00

TOTAL FEE ----------) 25.00
AMOUNT (Check) RECEIVED ---) 25.00
Check # ----) 5329
GLENN-COLUSA IRRIGATION DIST

CHANGE --------) 0.00

1 Check Received
*** RECEIPT ***

Recorders Office
County Of
COLUSA
KATHLEEN MORAN
Recorder

Work Order # 20060216000

1 R82 NOTICE OF DETERM	25.00
TOTAL	25.00
CHECK	25.00-
TOTAL TENDERED	25.00-
CHANGE	.00

02:06PM 16-Feb-2006 20060216000077
linda COUNTER

Thank You

Gracias

Requested By:
GLENN COLUSA IRRIGATION DISTRICT