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Agricultural & Environmental
Scientists & Engineers

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LETTER OF TRANSMITTAL

To: Russell Norman
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Date: November 20, 2013

From: ☐ Mike Blankinship ☐ Sheri Backer
X Stephen Burkholder ☐_____

Project: **SIP Exception Request for Merced Irrigation District (MID) Negative Declaration**

We are transmitting the following:

Item #	*Quantity*	*Description*
1	1	MID Negative Declaration Document
2	1	Notice of Determination
3	1	SIP Information Sheet
4	1	State Clearinghouse Acknowledgement Letter
5	1	CDFW County Filing Fee Receipt

For Your:

X Review
X Approval
X Information
X Files

Sent By:

☐ Regular U.S. Mail
☐ Federal Express
☐ Courier
X Other: Email

Comments:

Russell,

Enclosed, find the documents necessary to apply for a SIP Section 5.3 Exception for MID's use of copper and acrolein. Please consider this submission a formal request by MID for inclusion in Attachment G 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.

AQUATIC PESTICIDE APPLICATION PROGRAM FOR THE MERCED IRRIGATION DISTRICT

CEQA INITIAL STUDY

Prepared for
Merced Irrigation District
744 W. 20th Street
P.O. Box 2288 (95344)
Merced, CA 95340

December 23, 2003

URS
URS Corporation
500 12th Street, Suite 200
Oakland, California 94607

26814421

Table of Contents

Tables

Figures

Acronyms

BMPs	Best Management Practices
CAC	County Agricultural Commissioner
CEQA	California Environmental Quality Act
cfs	Cubic Feet Per Second
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society

DDT	Dichlorodiphenyltrichloroethane
DFG	California Department of Fish and Game
DPR	California Department of Pesticide Regulation
EC	Electrical Conductivity
ID	Irrigation District
NPDES	National Pollutant Discharge Elimination System
ppm	Part(S) Per Million
Reclamation	Bureau of Reclamation
SWRCB	California State Water Resources Control Board
USFWS	U.S. Fish and Wildlife Service
WQOs	Water Quality Objectives

1 BACKGROUND

Project Title:	**Aquatic Pesticides Application Program**
Application Number:	Not applicable
Project Location:	Regional Location: San Joaquin Valley in Central California District: Merced Irrigation District is located in Merced County, and its sphere of influence covers 544 square miles, plus an additional 15.5 square miles for the proposed El Nido Irrigation District consolidation. The District owns and operates Lake McClure behind Exchequer Dam on the Merced River. Water from Lake McClure is released down the Merced River and diverted into a mostly manmade canal system in two locations. The first is the North Side Canal located just upstream from Merced Falls Dam and the second is the Main Canal located just upstream from Crocker Huffman Diversion Dam. Water from these two canals flows through an irrigation system consisting of manmade canals (earthen-lined and concrete-lined), underground pipelines, manmade earthen-lined regulating reservoirs, and sections of natural creeks. Small removable dams in the natural creeks are used to recover, store and divert irrigation water into manmade canals and pipelines for delivery to agricultural land. There are approximately 815 miles in the District's irrigation conveyance system. There are bypass systems with control gates into the Merced River, Bear Creek, Black Rascal Creek, Owens Creek, Miles Creek, Duck Slough, Deadman Creek, Canal Creek, Dutchman Creek, Chowchilla River and other natural channels and manmade drains. The irrigation system utilizes several recovery ponds created within the canal system to balance out fluctuating flows. The ponds minimize the potential for bypass of water into natural channels. The District maintains irrigation wells and booster pumps to deliver irrigation water to high ground parcels. Irrigation wells also serve as a supplemental irrigation water supply during times of drought.
Assessor Parcel No.(s):	Not applicable
Project Sponsor's Name and Address:	Ross Rogers, General Manager Merced Irrigation District 744 West 20th Street P.O. Box 2288 Merced, California 95344-0288
General Plan Designation:	Merced ID: Agriculture (Merced County); Agricultural Exclusive (160-acre minimum), Public Domain, or Public Sites (Mariposa County)
Zoning Designation:	Merced ID: A-1, A-2 and A-R (Merced County), AE, PD, or PS (Mariposa County)
Project Description:	The proposed project is the continuation of an aquatic pesticide application program by Merced Irrigation District since 1972. The program was previously regulated in 2002 and 2003 under the State Water Resources Control Board (SWRCB) Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Aquatic Pesticides (Water Quality Order No. 2001-12-DWQ, General Permit No. CAG990003). The proposed project would occur under a new General Permit in 2004 and is expected to be equivalent to the current program. The proposed project would be implemented for a period of approximately 5 years, or for the term of the new General Permit. Merced Irrigation District applies aquatic pesticides to its irrigation conveyance system to control weeds and algae that interfere with irrigation conveyance and clog waterways and irrigation machinery. To conserve water and maximize the efficiency of irrigation, many landowners currently use sprinkler, drip or microirrigation systems. These systems require irrigation water to be clean and free of vegetative debris that will clog machinery.

Surrounding Land Uses:	Merced ID: Land use in the identified portion of the Merced River watershed is primarily open space (foothill pasture) within the upper reaches and agriculture in the lower reaches. A few rural communities are located within the watershed, with the largest being the town of Livingston.

2 PROJECT DESCRIPTION

This section describes a proposed aquatic pesticide application program for the Merced Irrigation District (District). The District has been applying aquatic pesticides since 1972. The program was previously regulated in 2002 and 2003 under the State Water Resources Control Board (SWRCB) Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Aquatic Pesticides (Water Quality Order No. 2001-12-DWQ, General Permit No. CAG990003). The proposed project would occur under a new General Permit and is expected to be equivalent to the current program. The proposed project would be implemented for a period of approximately 5 years, or for the term of the new General Permit. The No Project condition assumes that no control measures will be implemented to manage aquatic plants and algae in District irrigation facilities, and this condition is likely to result in clogged irrigation equipment and economic losses.

2.1 PROJECT OBJECTIVES

The Merced Irrigation District applies aquatic pesticides to its irrigation conveyance system to control weeds and algae that interfere with irrigation conveyance and clog waterways and irrigation machinery. Some of the most problematic weeds include American pondweed, yellow primrose, parrot's feather, and curly moss. To conserve water and maximize the efficiency of irrigation, many landowners currently use sprinkler, drip or microirrigation systems. These systems require irrigation water to be clean and free of vegetative debris that will clog machinery.

2.2 PROJECT CHARACTERISTICS

2.2.1 Project Location

2.2.1.1 Regional Location

The proposed project is located in the San Joaquin Valley (Figure 2-1) in Central California. The project area and vicinity are characterized by the San Joaquin River and its tributaries located in Fresno, Madera, Mariposa, Merced, San Joaquin, Stanislaus and Tuolumne counties. The major cities in the valley are Modesto, Merced and Fresno.

2.2.1.2 District Location

Merced Irrigation District (Figure 2-2) is located in Merced County, and its sphere of influence covers 544 square miles, plus an additional 15.5 square miles for the proposed El Nido Irrigation District consolidation (Figure 2-3). The District owns and operates Lake McClure behind Exchequer Dam on the Merced River. Water from Lake McClure is released down the Merced River and diverted into a mostly manmade canal system in two locations. The first is the North Side Canal located just upstream from Merced Falls Dam and the second is the Main Canal located just upstream from Crocker Huffman Diversion Dam. Water from these two canals flows through an irrigation system consisting of manmade canals (earthen-lined and concrete-lined), underground pipelines, manmade earthen-lined regulating reservoirs, and sections of natural creeks. Small removable dams in the natural creeks are used to recover, store and divert irrigation water into manmade canals and pipelines for delivery to agricultural land. There are

approximately 815 miles in the District's irrigation conveyance system. There are bypass systems with control gates into the Merced River, Bear Creek, Black Rascal Creek, Owens Creek, Miles Creek, Duck Slough, Deadman Creek, Canal Creek, Dutchman Creek, Chowchilla River and other natural channels and manmade drains. The irrigation system utilizes several recovery ponds created within the canal system to balance out fluctuating flows. The ponds minimize the potential for bypass of water into natural channels. The District maintains irrigation wells and booster pumps to deliver irrigation water to high ground parcels. Irrigation wells also serve as a supplemental irrigation water supply during times of drought.

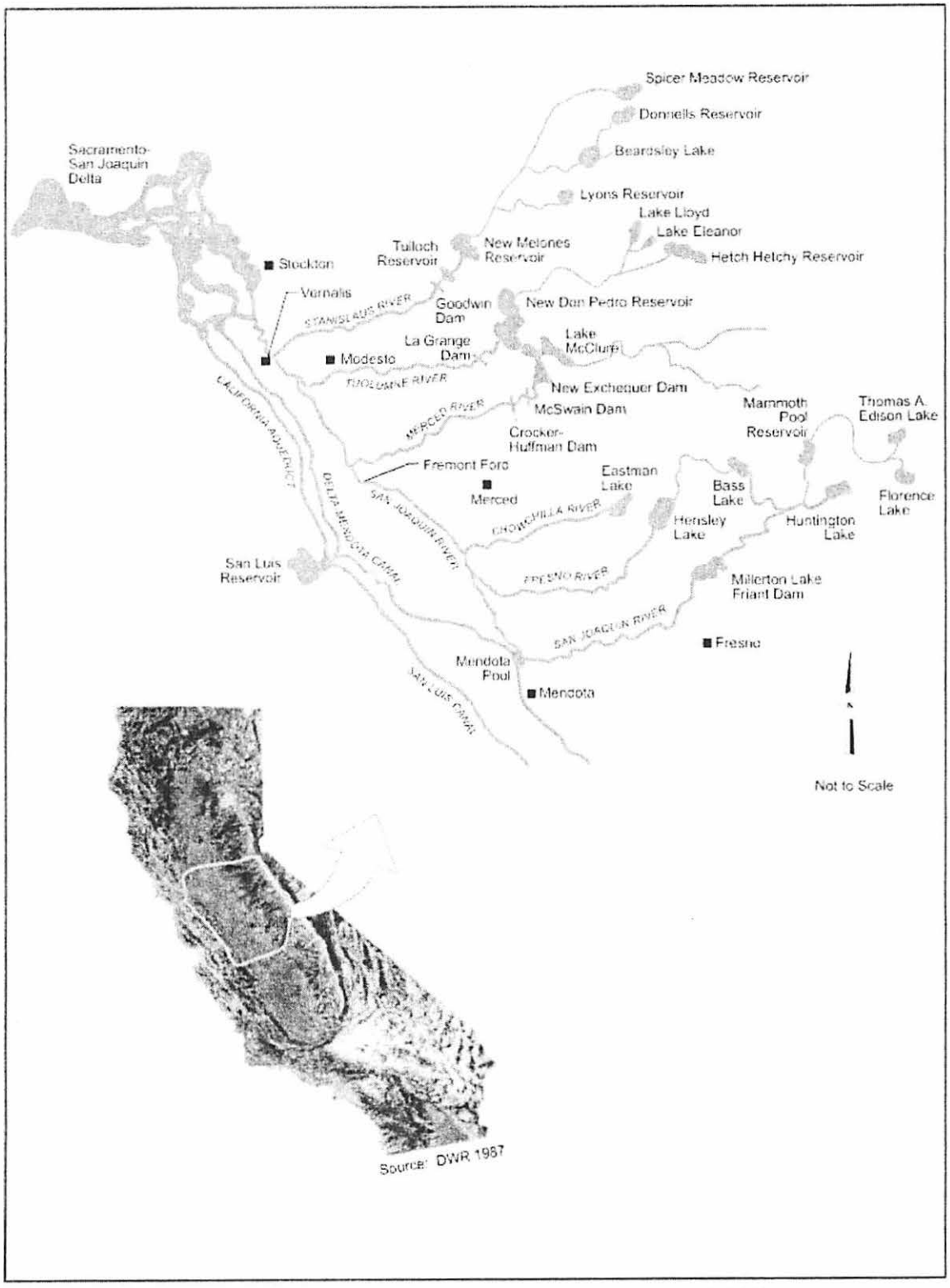

Figure 2-1. Map of San Joaquin Valley project area and vicinity

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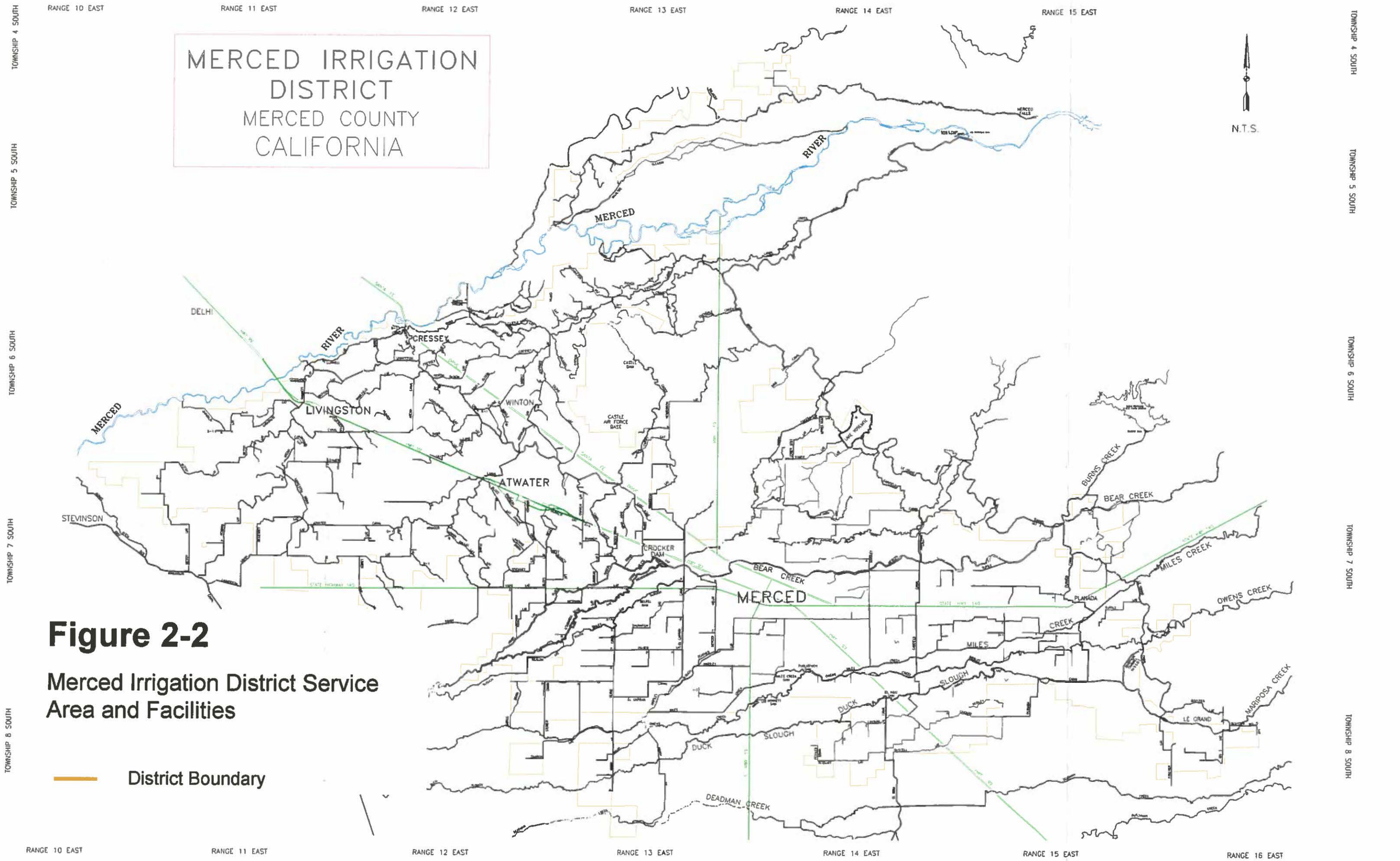

Figure 2-2

Merced Irrigation District Service Area and Facilities

District Boundary

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

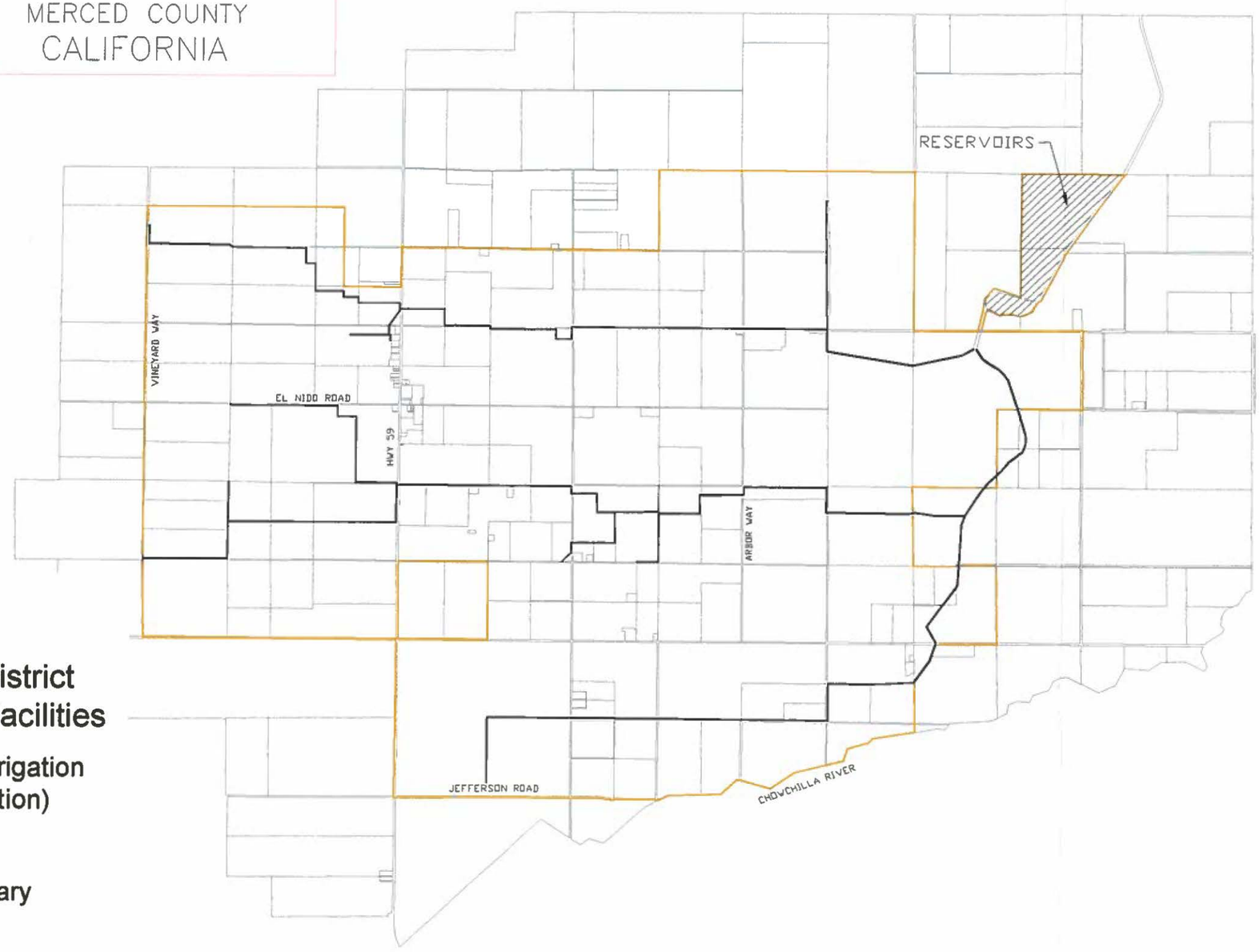

Figure 2-3

Merced Irrigation District Service Area and Facilities

(Proposed El Nido Irrigation District Consolidation)

District Boundary

2.2.2 Project Features

2.2.2.1 Proposed Pesticide Application

All pesticides applied to surface water by the District are registered for use in California as aquatic pesticides. Before a pesticide can be used for a specific type of application in California, the Department of Pesticide Regulation (DPR) evaluates it thoroughly during the registration process to ensure that no unacceptable risk to human health or the environment exists. For a pesticide to be evaluated for registration, the applicant must submit data on the product's toxicology, fate and transport characteristics, hazards to nontarget organisms, effects on fish and wildlife, degree of worker exposure and chemistry. The California DPR sometimes denies registration to products approved by the United States Environmental Protection Agency based on stricter requirements, or may impose use restrictions and mitigation measures beyond those listed on labels.

Merced Irrigation District regularly applies the following aquatic herbicides and algaecides to water distribution facilities and proposes to continue use of these under the new General Permit:

Magnacide H (acrolein)

Rodeo/Aquamaster (glyphosate)

Copper Sulfate (copper sulfate pentahydrate)

Nautique (copper carbonate)

Sonar (fluridone)

Magnacide H (acrolein)
Canals are monitored for aquatic weed growth and stage of growth by Distribution System Operators and the Pest Control Advisor. Reported clogging of grower's irrigation systems because of aquatic weeds and algae affecting water quality and flow restrictions are also considered prior to a Magnacide H application. A grappling hook is used to take samples of the aquatic weeds in the canal system to determine the stage of growth of the aquatic weeds. This process takes place throughout the irrigation season. When American and Sago pond weed reaches a length of 12 to 16 inches long or less and/or when algae begins to break loose floating down the canal system, an application of Magnacide H is scheduled. Frequency of treatment varies throughout the season because it is on an as-needed basis. Usually, copper applications and Magnacide applications are alternated on a 2- to 4-week rotation. Bypass gates from the treated canals to natural channels are locked closed prior to any Magnacide H applications.

Magnacide H is applied using medical grade nitrogen to meter it through a special closed pressure injection system into larger canals at locations that allow for complete mixing of the material with the irrigation water, usually at check structures. The material is hauled to the job site on a California Highway Patrol certified 2-ton flat bed truck. Two Qualified Aquatic Applicators, which have had manufacture's safety training, with proper safety equipment are present to set up and breakdown the application apparatus. One Qualified Aquatic Applicator remains at the site to monitor the application. Flows in the canals typically range between 100 to 500 cubic feet per second.

Applications are usually applied over shorter periods to short reaches of the canals for more control over the application. The affected, treated section of the canal system, including a short overlap of applications, is computed based on irrigation water flow in the canal to determine the next downstream application location. The Magnacide H treated water block typically is distributed from the larger canal into the smaller lateral canal system, and then irrigated out on agricultural land.

Table 2-1
Water Bodies Treated with Magnacide H

Treated Water Bodies	Estimated Total Length Treated	Estimated Total Surface Area Treated	Estimated Typical Range of Flow Rates
Unlined canals	325 miles	1,200 acres	40–470 cfs
Lined canals	80 miles	120 acres	40–65 cfs
Reservoirs		49 acres	5–20 cfs

Application concentrations range from 3.15 to 9.81 parts per million (ppm). Application rates range from 0.3 to 0.9 gallon per cubic feet per second (cfs).

Determination of Magnacide H applications is made in terms of rates (ppm and gallons per cfs) based on site-specific information, such as flow, temperature and weed condition. Weed condition is standardized in the label's application guide as follows:

Table 2-2
Weed Growth Condition Chart for Temperatures above 60°F

Condition Code	Magnacide H gallon/cfs (Dosage)
A. Little algae and pondweed Less than 6 inches long	0.17
B. Algae (nonfloating) and Pondweed less than 12 inches long	0.25
C. Algae (some floating) and Pondweed 12 to 24 inches long	0.50
D. Algae (some floating) and Mature pondweed (over 24 inches)	1.0
E. Choked Condition	1.5

The Condition Codes are used to describe the general treatment level. Each treatment requires that an application rate be determined. The rate (gallons/hour) to be applied to a canal depends on the condition dosage, temperature factor, canal rate of flow and contact time. Equations and/or rate tables in the label instructions are used to determine the rate at the time of treatment. The resulting concentration (in ppm) is a function of the dosage and application time, and is another indicator of general treatment levels. Label instructions indicate that 15 ppm should not be exceeded by any combination of dosage and application time.

RANGE 10 EAST | RANGE 11 EAST | RANGE 12 EAST | RANGE 13 EAST | RANGE 14 EAST | RANGE 15 EAST

TOWNSHIP 4 SOUTH | TOWNSHIP 5 SOUTH | TOWNSHIP 6 SOUTH | TOWNSHIP 7 SOUTH | TOWNSHIP 8 SOUTH

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

N.T.S.

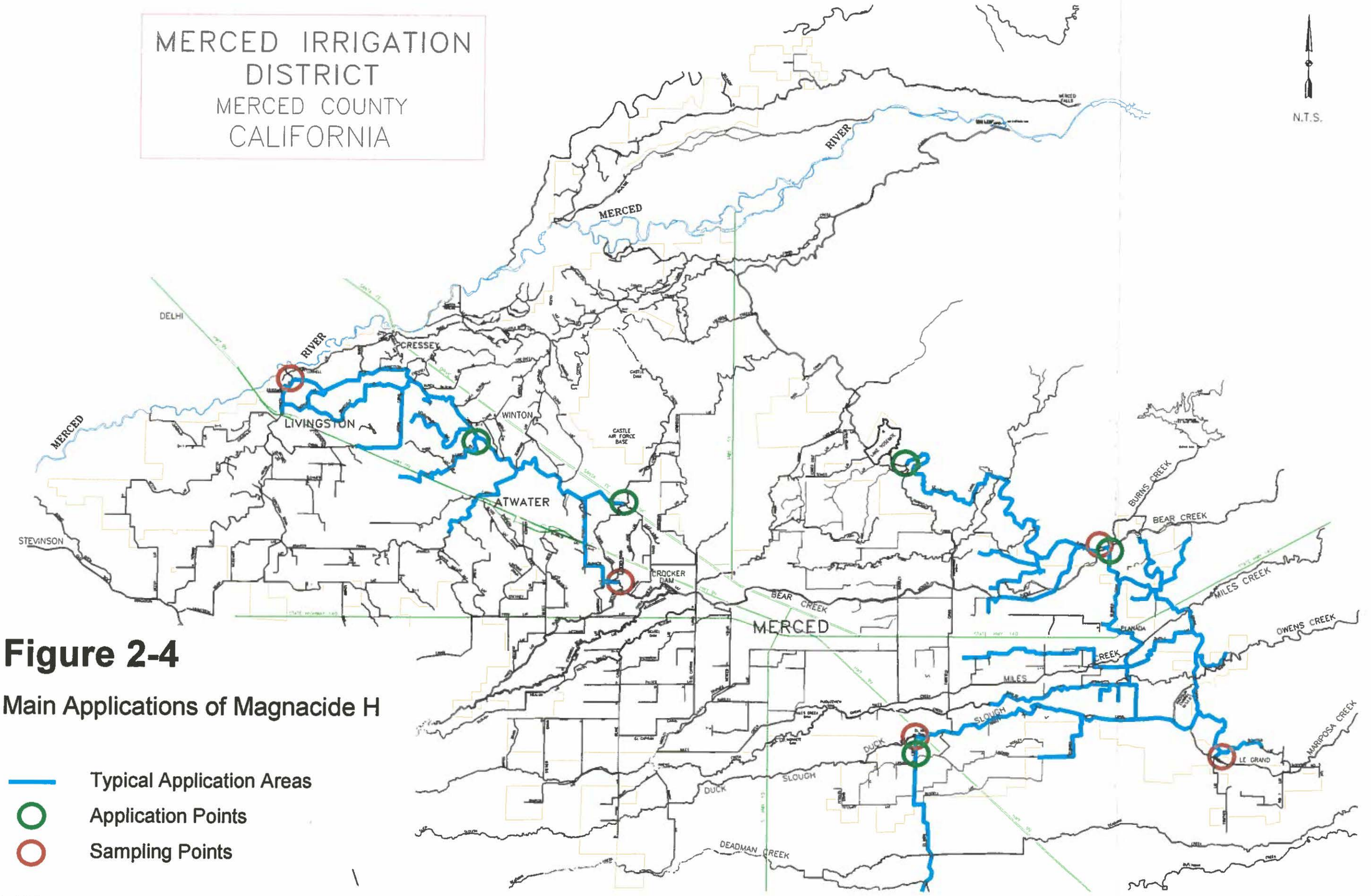

Figure 2-4

Main Applications of Magnacide H

- Typical Application Areas
- Application Points
- Sampling Points

RANGE 10 EAST | RANGE 11 EAST | RANGE 12 EAST | RANGE 13 EAST | RANGE 14 EAST | RANGE 15 EAST | RANGE 16 EAST

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

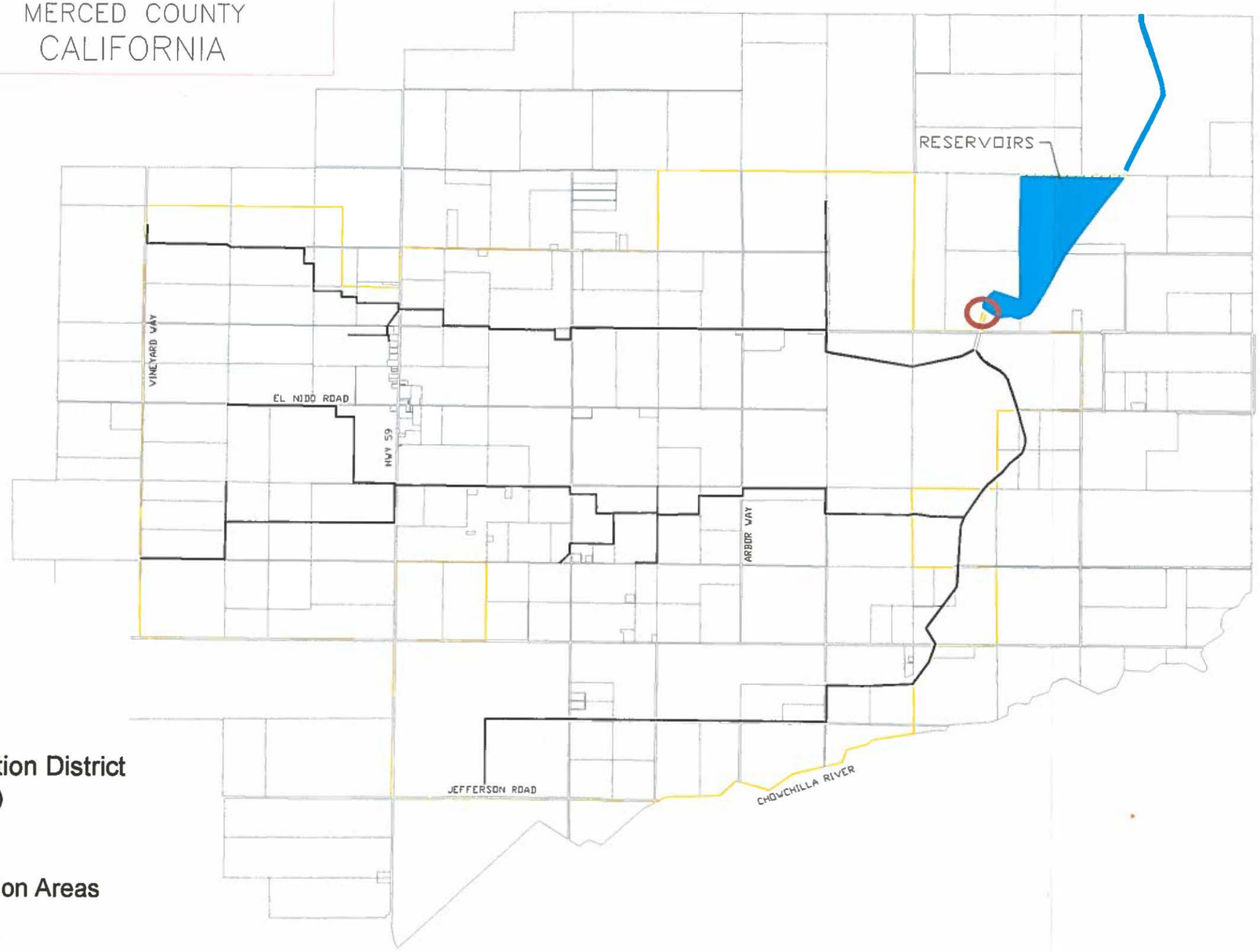

Figure 2-5

Main Applications of Magnacide H

(Proposed El Nido Irrigation District Consolidation)

Typical Application Areas

Sampling Points

Rodeo/Aquamaster (glyphosate)

Rodeo/Aquamaster is used for emerged aquatic weeds and terrestrial weeds on canals, drains and natural channels. Mechanical removal is the primary method for removal of emerged aquatic weed growth within the drains and natural channels throughout the irrigation water delivery system. The majority of Rodeo/Aquamaster is used on terrestrial weeds located on the water's edge and higher on the banks of manmade irrigation canals. Water's edge applications normally require less than 1 foot of overspray on the waterside. Drains and creeks are typically sprayed September through December. Water's edge spraying along manmade canals typically occurs March through October, within the delivery system. Applications are recommended as necessary to control noxious aquatic and terrestrial weeds. Applications typically occur on a system wide rotation.

Rodeo/Aquamaster is mixed with a surfactant registered for aquatic applications. Currently the District uses Western Farm Service Excel 90. Rodeo/Aquamaster is applied by trained Qualified Aquatic Applicators using several methods; for example, a flatbed truck equipped with a conventional tank mix spray rig applying the material by handgun or spray boom, a flatbed truck equipped with an injection mixed spray rig applying the material by handgun or spray boom, or with a backpack sprayer for difficult to access areas with the Qualified Aquatic Applicators walking the canal bank.

Table 2-3
Water Bodies Treated with Rodeo/Aquamaster

Treated Water Bodies	Estimated Total Length Treated	Estimated Total Area Treated	Estimated Typical Range of Flow Rates	Applied To Vegetation in Water?
Unlined canals	620 miles	1,900 acres	5–1,800 cfs	No
Lined canals	108 miles	216 acres	5–65 cfs	No
Reservoirs		49 acres	5–20 cfs	No
Creek beds	16 miles	64 acres	10–300 cfs	Yes
Drains	12 miles	40 acres	5–100 cfs	Yes

Application concentrations range from 0.75 to 1.5 percent. Application rates range from 2 quarts on annual species to 6 quarts on woody perennial species, per acre.

RANGE 10 EAST | RANGE 11 EAST | RANGE 12 EAST | RANGE 13 EAST | RANGE 14 EAST | RANGE 15 EAST

TOWNSHIP 4 SOUTH | TOWNSHIP 5 SOUTH | TOWNSHIP 6 SOUTH | TOWNSHIP 7 SOUTH | TOWNSHIP 8 SOUTH

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

N.T.S.

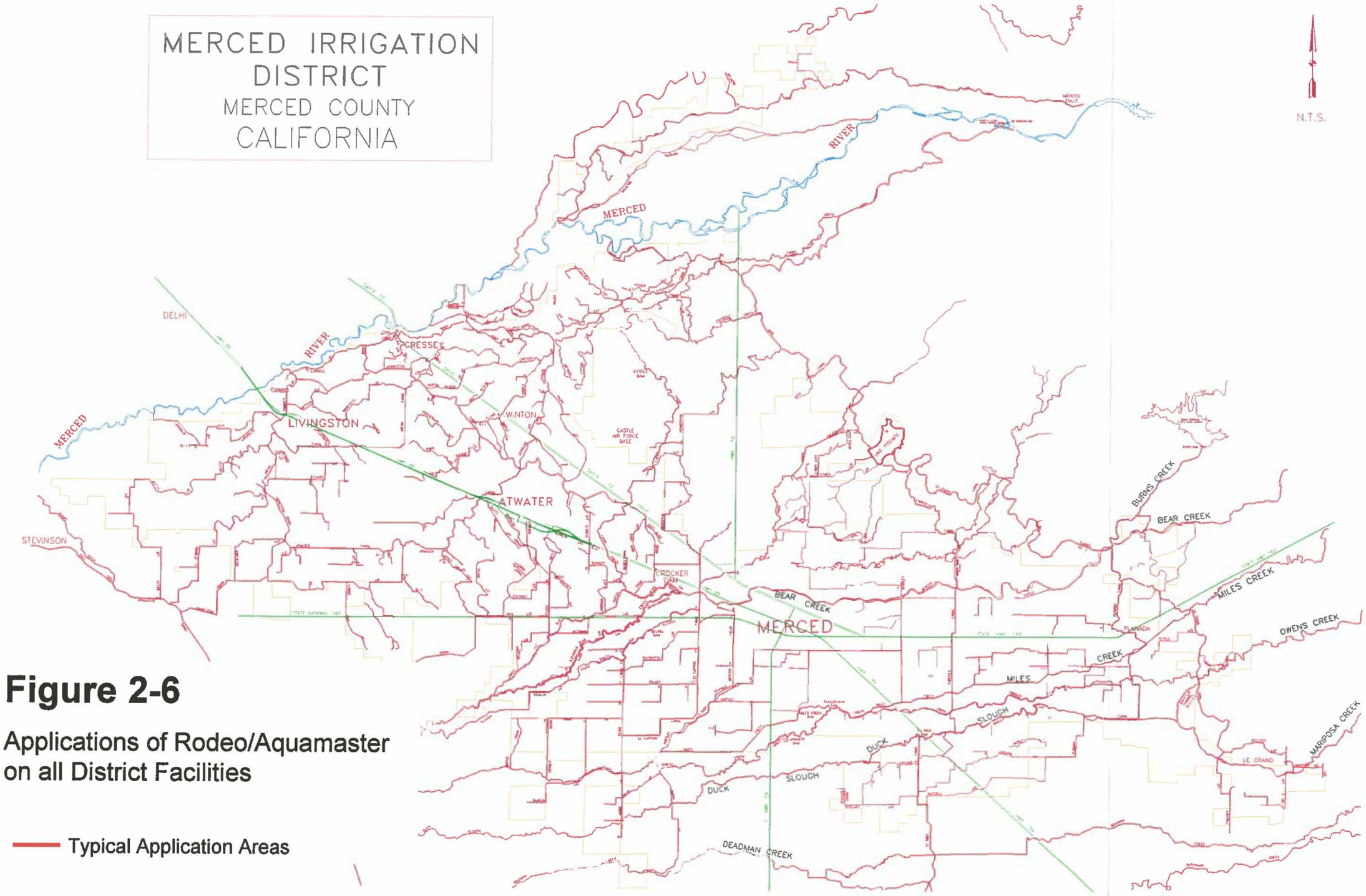

Figure 2-6

Applications of Rodeo/Aquamaster on all District Facilities

Typical Application Areas

RANGE 10 EAST | RANGE 11 EAST | RANGE 12 EAST | RANGE 13 EAST | RANGE 14 EAST | RANGE 15 EAST | RANGE 16 EAST

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

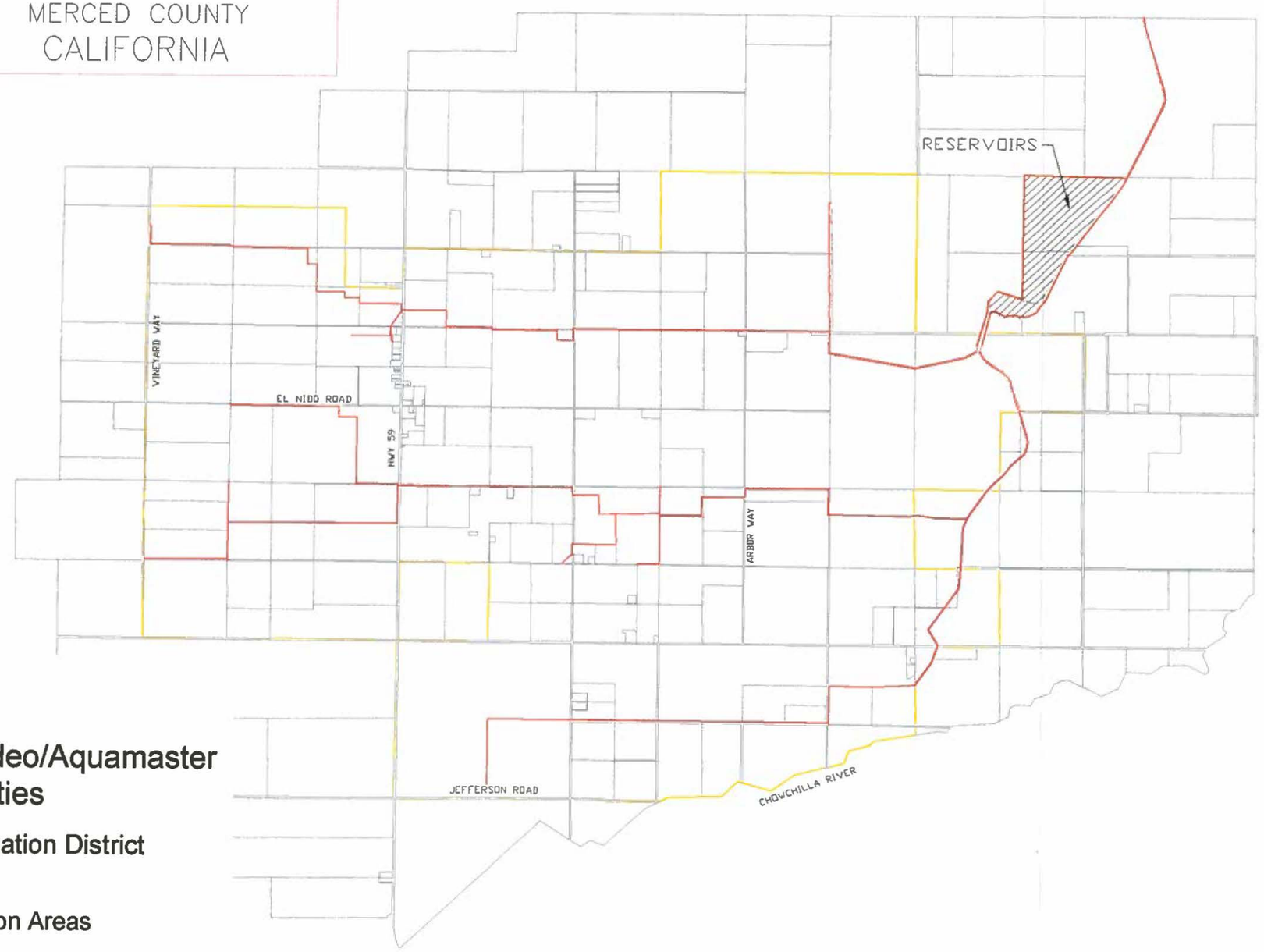

Figure 2-7

Applications of Rodeo/Aquamaster on all District Facilities

(Proposed El Nido Irrigation District Consolidation)

— Typical Application Areas

Copper Sulfate

Copper sulfate is used for algae control during the irrigation season (March 1 through October 31) and also during storm water season (November through March) in a limited number of canals. Canals are monitored for aquatic weed growth and stage of growth by Distribution System Operators and the Pest Control Advisor. Reported clogging of grower's irrigation systems because of algae affecting water quality and flow restrictions are considered prior to a copper sulfate application. An application of copper sulfate is scheduled when algae begins to break loose, floating down the canal system. This process takes place throughout the irrigation season. Frequency of treatment varies throughout the season because it is on an as-needed basis. Usually, copper sulfate applications and Magnacide applications are alternated on a 2- to 4-week rotation. Bypass gates from the treated canals to natural channels are locked closed prior to any copper sulfate application.

Copper sulfate granules are applied by trained Qualified Aquatic Applicators down stream from check structures in medium to large canals. These locations allow for complete mixing of the material with the irrigation water. The applicators travel to the application sites in pickup trucks or flat bed trucks. Flows in the treated canals range between 20 to 500 cubic feet per second.

Applications are usually applied to short reaches of the canals for more control over the application. The affected, treated section of the canal system, including a short overlap of applications, is computed based on irrigation water flow in the canal to determine the next downstream application location. The copper sulfate treated water block typically is distributed from the larger canal into the smaller laterals then irrigated out on agricultural land. Some limited direct application of copper sulfate to small dead-end canals occurs.

Table 2-4
Water Bodies Treated with Copper Sulfate

Treated Water Bodies	Total Length Treated	Total Area Treated	Typical Flow Rates
Unlined canals	245 miles	880 acres	3–300 cfs
Lined canals	80 miles	120 acres	2–65 cfs
Reservoirs		49 acres	5–20 cfs

Application rate is 1 pound/cfs, water flow.

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

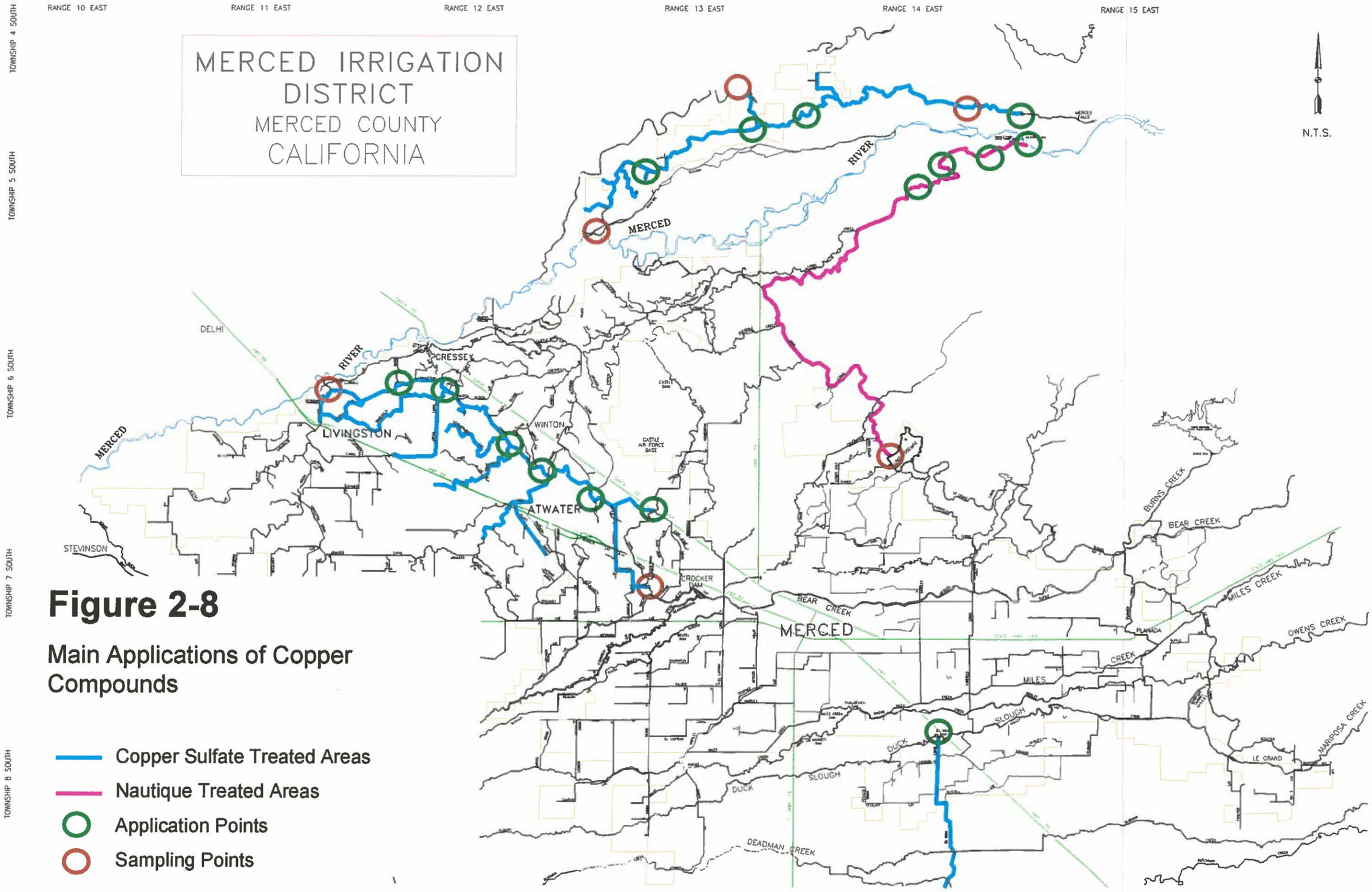

Figure 2-8

Main Applications of Copper Compounds

- Copper Sulfate Treated Areas
- Nautique Treated Areas
- Application Points
- Sampling Points

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

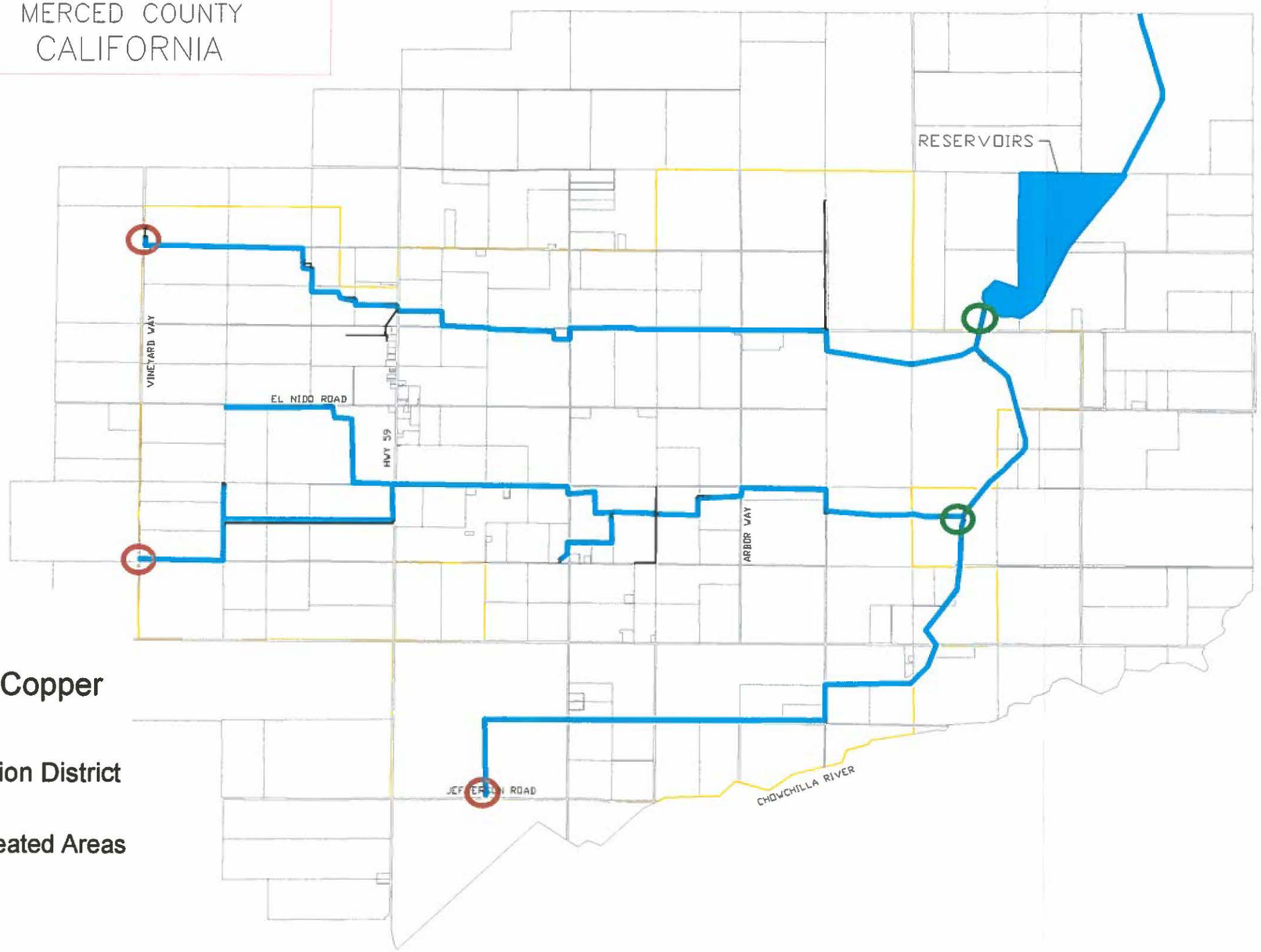

Figure 2-9

Main Applications of Copper Compounds

(Proposed El Nido Irrigation District Consolidation)

- Copper Sulfate Treated Areas
- Application Points
- Sampling Points

Nautique (copper carbonate)
Nautique, a copper active aquatic herbicide, is used for aquatic weed and algae control just prior to and during the irrigation season (March 1 through October 31). Canals are monitored for aquatic weed and algae growth by Distribution System Operators and the Pest Control Advisor. Reported clogging of grower's irrigation systems because of algae affecting water quality and restricting the flow is considered prior to a Nautique application. A grappling hook is used to take samples of the aquatic weeds in the canal system to determine the stage of growth of the aquatic weeds prior to an application. An application of Nautique is scheduled when algae begins to break loose, floating down the canal system. This process takes place throughout the irrigation season. Frequency of application varies throughout the season because applications are scheduled on an as-needed basis. Bypass gates from the treated canals to natural channels are locked closed prior to any Nautique application. Nautique has been used for aquatic weed and algae control in the Main Canal just prior to the start of irrigation season. Nautique is also injected into ponds for algae control. All water in ponds is held until the active ingredient in Nautique has settled out.

Nautique is applied from a bridge crossing the target canal by metered gravity fed drip into flowing water to allow complete mixing. The material is hauled to the application site in a pickup truck and set up by a trained Qualified Applicator. Flows treated range between 5 to 30 cubic feet per second.

Table 2-5
Water Bodies Treated with Nautique

Treated Water Bodies	Total Length Treated	Total Area Treated	Typical Flow Rates	Designated Beneficial Uses
Unlined canals	236 miles	860 acres	2–300 cfs	N/A
Lined canals	80 miles	120 acres	4–65 cfs	N/A
Reservoirs		49 acres	5–20 cfs	N/A

Application rate is 1 quart/cfs/hour.

See Figure 2-8 the Location map for main applications of Copper sulfate and Nautique (pg. 16)
See Figure 2-9 the Location map for main applications of Copper sulfate and Nautique (pg. 17) (Proposed El Nido I.D. Consolidation)

Sonar (fluridone)
Sonar AS & SRP are used immediately following the irrigation season (November through January) in large canals that pond water where aquatic weeds can winter over. Sonar is also used in one dead-end regulating reservoir. Visual observation and the use of a grappling hook to take samples of the aquatic weeds in the canal system are the methods employed to determine species and stage of aquatic growth prior to recommendation of an application. Water flow, temperature, turbidity and destination are noted and maintained throughout the application. Application of Sonar in the canal system is at very low flows.

Sonar is applied by trained Qualified Aquatic Applicators using two methods: 1) granular Sonar, slow release pellets are mechanically broadcast evenly through the wetted bottom of the target canal using an all terrain vehicle equipped with a blower type broadcaster, and/or 2) liquid Sonar is applied by a timer controlled peristaltic injection pump, housed in a locked, metal box, by hose

into flowing water to allow for complete mixing over a 6 week application period. The applicator travels to the application site by pickup truck. Flow in the target canal ranges between 5 to 30 cubic feet per second.

Scheduled water samples are collected and analyzed in order to maintain the proper application rate and the location of treated water in the target area, as recommended by the product representative. Sonar is not used in the canal system every season.

Table 2-5
Water Bodies Treated with Sonar

Treated Water Bodies	Total Length Treated	Total Area Treated	Typical Flow Rates	Designated Beneficial Uses
Unlined canals	118 miles	84 acres	15–30 cfs	N/A
Pond, unlined canals		49 acres	Static	N/A

The application concentration is maintained at 20 parts per billion for 60 days.

RANGE 10 EAST | RANGE 11 EAST | RANGE 12 EAST | RANGE 13 EAST | RANGE 14 EAST | RANGE 15 EAST

TOWNSHIP 4 SOUTH | TOWNSHIP 5 SOUTH | TOWNSHIP 6 SOUTH | TOWNSHIP 7 SOUTH | TOWNSHIP 8 SOUTH

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

N.T.S.

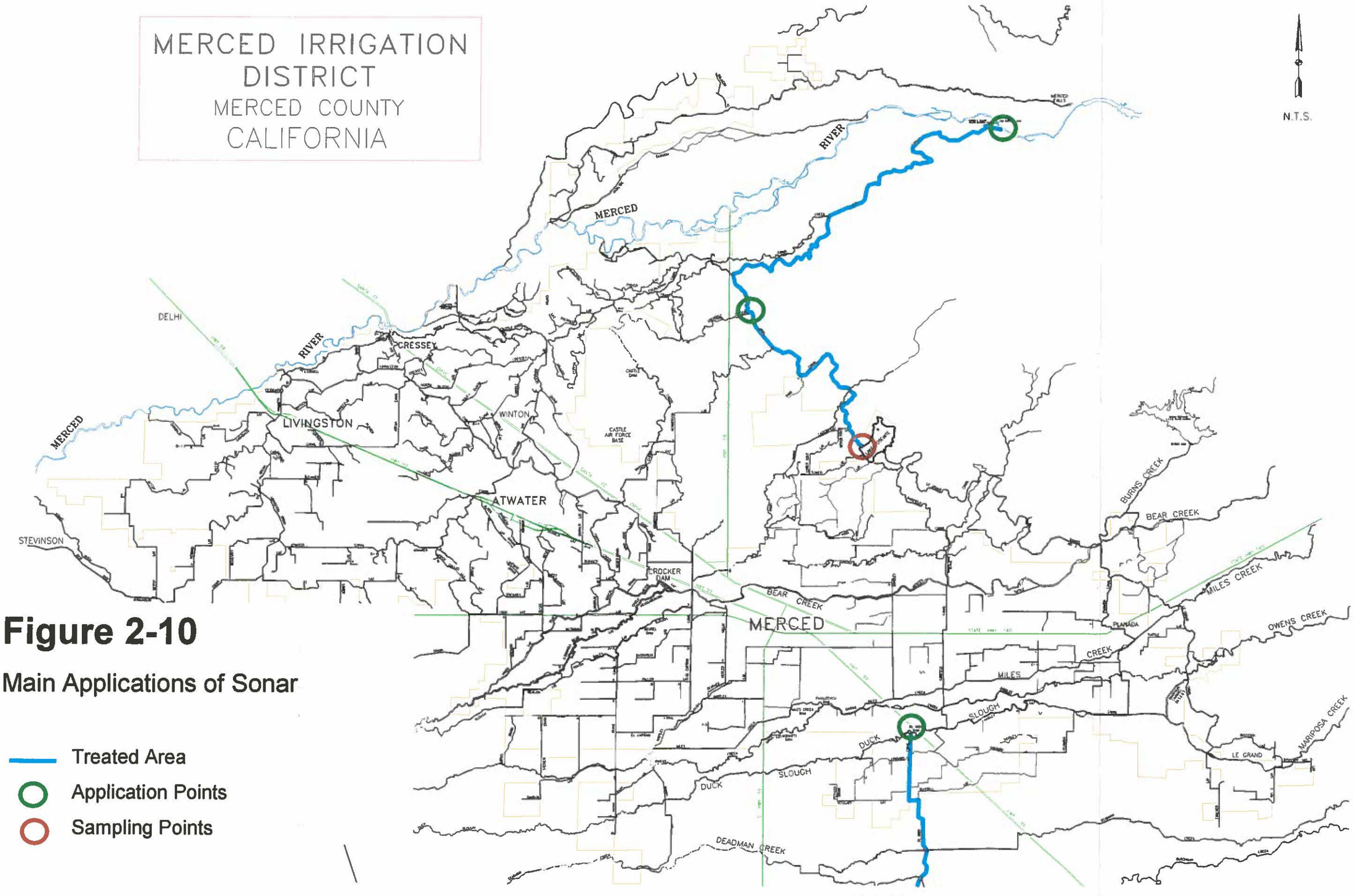

Figure 2-10

Main Applications of Sonar

- Treated Area
- Application Points
- Sampling Points

RANGE 10 EAST | RANGE 11 EAST | RANGE 12 EAST | RANGE 13 EAST | RANGE 14 EAST | RANGE 15 EAST | RANGE 16 EAST

MERCED IRRIGATION DISTRICT
MERCED COUNTY
CALIFORNIA

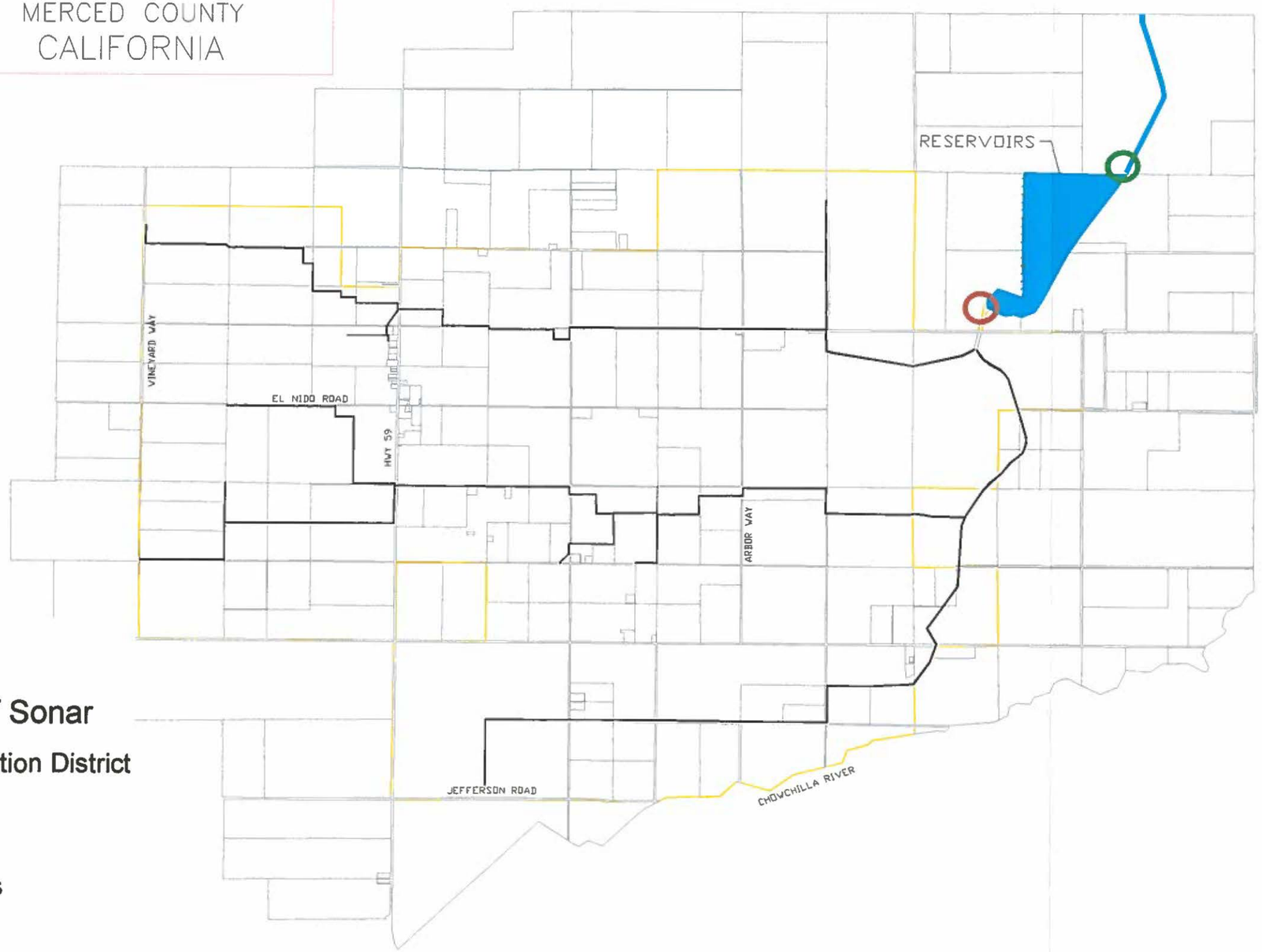

Figure 2-11

Main Applications of Sonar

(Proposed El Nido Irrigation District Consolidation)

- Treated Area
- Application Points
- Sampling Points

3 ENVIRONMENTAL SETTING

The environmental setting for the proposed project is described herein, focusing on biological and hydrologic resources contained within the District (project area) and vicinity that could be affected by the use of the proposed materials in the District's facilities.

3.1 BIOLOGICAL RESOURCES

This section describes the environmental setting for biological resources in the proposed project vicinity. The proposed project is located in the San Joaquin Valley in Central California. This area overlaps a mix of habitat types defined by the California Department of Fish and Game's (DFG) Wildlife Habitat Relationship System. These habitat types include natural habitat types, such as riverine, annual grasslands, valley foothill riparian and valley oak woodland. Agricultural development of the San Joaquin Valley over the past century has resulted in the conversion of natural habitat types into developed habitat types, such as irrigated hayfields, irrigated grain and seed crops, dryland grain and seed crops, evergreen orchards, deciduous orchards, rice, vineyard, pasture and urban (DFG 2002).

3.1.1 Environmental Setting

Most of the uplands within the project area have been converted to commercial agricultural production supplied by irrigation water. These converted habitat types can support a wide variety of wildlife species, depending upon specific regional characteristics (adjacent habitat types) and management practices. For example, irrigated hayfield habitat usually consists of a monoculture field of alfalfa or grass hay types that rotate back to bare ground directly after harvest. Alfalfa usually exists unplowed for approximately 3 years and is typically followed by a cereal grain crop, tomatoes or potatoes for 1 to 4 years followed by another alfalfa crop. This habitat type can provide high quality seasonal resources for Botta's pocket gopher (*Thomomys bottae*), mourning dove (*Zenaida macroura*), gray fox *(Urocyon cinereoargenteus)*, gopher snake (*Pituophis melanoleucus*), California king snake (*Lampropeltis gentulus californiae*), American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), sandhill crane (*Grus Canadensis*) and San Joaquin pocket mouse (*Perognathus inornatus inoratus*). However, where harvesting is constant in the irrigated hayfield, reproduction value for ground-nesting species is reduced to zero (DFG 2002).

Similarly, wildlife occurring in deciduous orchard habitat (consisting of single-species crops, such as almond, apple, apricot, cherry, fig, nectarine, peach, pear, pecan, pistachio, prune and walnut) will vary based upon the tree type, pruning methods and harvest timing. Generally, orchards provide habitat for species that forage on cultivated nuts and fruit and utilize cover from adjacent habitat types. Typical wildlife found in deciduous orchards are the American crow (*Corvus brachyrhynchos*), northern flicker (*Colaptes auratus*), California ground squirrel (*Spermophilus beecheyi*), western scrub jay (*Aphelocoma californica*), black-tailed hare (*Lepus californicus*) and Virginia opossum (*Didelphis virginiana*).

Riparian forest habitats in the project area are characterized by willow (*Salix spp.*), cottonwood (*Populus fremontii*), alder (*Alnus rhombifolia*) and Oregon ash (*Fraxinus latifolia*). Valley oak (*Quercus lobata*) is common above the active river floodplains. Forests along river and stream corridors provide cover for a number of common animal species, such as raccoons (*Procyon lotor*), bobcats (*Lynx rufus*), black-tailed deer (*Odocoileus hemionus*), mink (*Mustela vison*),

bullfrogs (*Rana catesbeiana*), red-tailed hawks (*Buteo jamaicensis*), red-shouldered hawks (*Buteo lineatus*), belted kingfishers (*Ceryle alcyon*) and black phoebes (*Sayornis nigricans*). The nearshore waters of creeks and streams within riparian habitats provide invertebrate forage for avian species including the black-necked stilt (*Himantopus mexicanus*), common merganser (*Mergus merganser americanus*), mallard (*Anas platyrhnchos*), great blue heron (*Ardea herodias*), black rail (*Laterallus jamaicensis*), snowy egret (*Egretta thula*), common snipe (*Gallinago gallinago*) and killdeer (*Charadrius vociferus*).

3.1.2 Special-Status Species

Table 3-1 presents the special-status species that are known to occur in the project area vicinity (CNDDB 2003). These species are listed, proposed or candidates under the federal or California Endangered Species Acts or designated as "species of concern" by the U.S. Fish and Wildlife Service (USFWS) or the DFG, or included on the California Native Plant Society (CNPS) inventory of rare, threatened or endangered plants (CNPS 2001).

Table 3-1
Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
AMPHIBIANS				
Ambystoma californiense California tiger salamander	Proposed Threatened	--	SC	No
Spea (=Scaphiopus) hammondii western spadefoot	Species of Concern	--	SC	No
Rana aurora draytonii California red-legged frog	Threatened	--	SC	No
Rana boylii Foothill yellow-legged frog	Species of Concern	--	SC	No
BIRDS				
Botaurus lentiginosus American bittern	Migratory Nongame Birds of Management Concern	--	--	No
Egretta thula snowy egret	Species of Concern	--	--	No
Branta canadensis leucopareia Aleutian Canada goose	Species of Concern	--	--	No
Circus cyaneus northern harrier	--	--	SC	No
Haliaeetus leucocephalus Bald Eagle	--	Endangered	--	No
Buteo swainsoni Swainson's hawk	Species of Concern	Threatened	--	No
Falco mexicanus prairie falcon	--	--	SC	No
Accipiter cooperii Cooper's Hawk	Species of Concern	--	--	No
Accipiter striatus Sharp-shinned hawk	Species of Concern	--	--	No

Table 3-1 (continued)

Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
Elanus leucurus White-tailed Kite	Protected	--	--	No
Lanius ludovicianus Loggerhead Shrike	Species of Concern	--	--	No
Coturnicops noveboracensis Yellow rail	--	--	SC	No
Riparia riparia Bank Swallow	Threatened	--	--	No
Dendroica petechia brewsteri California Yellow Warbler	Species of Concern	--	--	No
Empidonax traillii brewsteri Willow Flycatcher	Endangered	--	--	No
Laterallus jamaicensis coturniculus California black rail	Species of Concern	Threatened	--	No
Charadrius montanus mountain plover	--	--	SC	No
Coccyzus americanus occidentalis western yellow-billed cuckoo	Candidate	Endangered	--	No
Athene cunicularia burrowing owl	Species of Concern	--	SC	No
Eremophila alpestris actia California horned lark	--	--	SC	No
Icteria virens yellow-breasted chat	--	--	SC	No
Agelaius tricolor tricolored blackbird	Species of Concern	--	SC	Yes
FISH				
Oncorhynchus tshawytscha Central Valley Fall-Run Chinook Salmon	Candidate	--	--	No
Oncorhynchus mykiss Central Valley Steelhead	Threatened	--	SC	No
Lampetra ayresi river lamprey	Species of Concern	--	SC	No
Lampetra tridentata Pacific lamprey	Species of Concern	--	SC	No
Lampetra hubbsi Kern brook lamprey	Species of Concern	--	SC	Yes
Lavinia symmetricus ssp. *2* San Joaquin roach	--	--	SC	No
Mylopharodon conocephalus hardhead	--	--	SC	Yes
Pogonichthys macrolepidotus Sacramento splittail	--	--	SC	No

Table 3-1 (continued)

Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
MAMMALS				
Myotis yumanensis Yuma myotis	Species of Concern	--	--	No
Corynorhinus townsendii townsendii Townsend's western big-eared bat	Species of Concern	--	SC	No
Antrozous pallidus pallid bat	--	--	SC	No
Eumops perotis californicus western mastiff bat	Species of Concern	--	SC	No
Sylvilagus bachmani riparius riparian brush rabbit	Endangered	Endangered	--	No
Ammospermophilus nelsoni San Joaquin antelope squirrel	Species of Concern	Threatened	--	No
Perognathus inornatus inornatus San Joaquin pocket mouse	Species of Concern	--	--	No
Dipodomys heermanni dixoni Merced kangaroo rat	Species of Concern	--	--	No
Dipodomys ingens giant kangaroo rat	Endangered	Endangered	--	No
Neotoma fuscipes riparia riparian (=San Joaquin Valley) woodrat	Endangered	--	SC	No
Vulpes macrotis mutica San Joaquin kit fox	Endangered	Threatened	--	No
REPTILES				
Emys (=Clemmys) marmorata western pond turtle	Species of Concern	--	SC FP	Yes
Anniella pulchra pulchra silvery legless lizard	Species of Concern	--	SC	No
Gambelia sila blunt-nosed leopard lizard	Endangered	Endangered	--	No
Phrynosoma coronatum (frontale) Coast (California) horned lizard	Species of Concern	--	SC	No
Masticophis flagellum ruddocki San Joaquin whipsnake	Species of Concern	--	SC	No
Thamnophis gigas giant garter snake	Threatened	Threatened	--	Yes
INVERTEBRATES				
Branchinecta conservatio Conservancy fairy shrimp	Endangered	--	--	No
Branchinecta longiantenna longhorn fairy shrimp	Endangered	--	--	No
Branchinecta lynchi vernal pool fairy shrimp	Threatened	--	--	No
Branchinecta mesovallensis midvalley fairy shrimp	Species of Concern	--	--	No

Table 3-1 (continued)

Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
Linderiella occidentalis California linderiella	Species of Concern	--	--	No
Lepidurus packardi vernal pool tadpole shrimp	Endangered	--	--	No
Desmocerus californicus dimorphus valley elderberry longhorn beetle	Threatened	--	--	No
Lytta moesta Moestan blister beetle	Species of Concern	--	--	No
Lytta molesta molestan blister beetle	Species of Concern	--	--	No
Eucerceris ruficeps redheaded sphecid wasp	--	--	--	No
PLANTS				
Eryngium racemosum Delta button-celery	Species of Concern	Endangered	1B/2-3-3	No
Eryngium spinosepalum spiny-sepaled button-celery	Species of Concern	--	1B/3-2-3	No
Lilaeopsis masonii Mason's lilaeopsis	Species of Concern	Rare	1B/2-3-3	No
Lomatium observatorium Mt. Hamilton lomatium	Species of Concern	--	1B/3-2-3	No
Aster lentus Suisun Marsh aster	Species of Concern	--	1B/2-2-3	No
Blepharizonia plumosa ssp. *Plumosa* big tarplant	Species of Concern	--	1B/3-3-3	No
Calycadenia hooveri Hoover's calycadenia	Species of Concern	--	1B/2-1-3	No
Cirsium fontinale var. *campylon* Mt. Hamilton thistle	Species of Concern	--	1B/2-2-3	No
Cirsium crassicaule slough thistle	Species of Concern	--	1B/3-3-3	No
Coreopsis hamiltonii Mt. Hamilton coreopsis	Species of Concern	--	1B/3-2-3	No
Madia radiata showy madia	Species of Concern	--	1B/2-3-3	No
Pseudobahia bahiifolia Hartweg's golden sunburst	Endangered	Endangered	1B/2-3-3	No
Senecio aphanactis rayless ragwort	--	--	2/3-2-1	No
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	--	--	2/3-3-1	No
Amsinckia grandiflora large-flowered fiddleneck	Endangered	Endangered	1B/3-3-3	No
Plagiobothrys uncinatus hooked popcorn-flower	Species of Concern	--	1B/2-2-3	No

Table 3-1 (continued)

Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
Streptanthus insignis ssp. *Lyonii* Arburua Ranch jewel-flower	Species of Concern	--	1B/3-2-3	No
Tropidocarpum capparideum caper-fruited tropidocarpum	Species of Concern	--	1A/ *	No
Campanula sharsmithiae Sharsmith's harebell	Species of Concern	--	1B/3-2-3	No
Downingia pusilla dwarf downingia	--	--	2/1-2-1	No
Legenere limosa legenere	Species of Concern	--	1B/2-3-3	No
Atriplex cordulata heartscale	Species of Concern	--	1B/2-2-3	No
Atriplex coronata var. *notatior* San Jacinto Valley crownscale	Endangered	--	1B/3-3-3	No
Atriplex joaquiniana San Joaquin saltbush	Species of Concern	--	1B/2-2-3	No
Atriplex vallicola Lost Hills crownscale	Species of Concern	--	1B/2-2-3	No
Atriplex depressa brittlescale	Species of Concern	--	1B/2-2-3	No
Atriplex minuscula lesser saltscale	Species of Concern	--	1B/3-3-3	No
Atriplex persistens vernal pool smallscale	Species of Concern	--	1B/2-2-3	No
Atriplex subtilis subtle orache	Species of Concern	--	1B/2-2-3	No
Chamaesyce hooveri Hoover's spurge	Threatened	--	1B/3-2-3	No
Astragalus tener var. *tener* alkali milk-vetch	Species of Concern	--	1B/3-2-3	No
Lathyrus jepsonii var. *jepsonii* Delta tule pea	Species of Concern	--	1B/2-2-3	No
Lotus rubriflorus red-flowered lotus	Species of Concern	--	1B/3-3-3	No
Erodium macrophyllum round-leaved filaree	--	--	2/2-3-1	No
Phacelia ciliata var. *opaca* Merced phacelia	Species of Concern	--	1B/3-1-3	No
Phacelia phacelioides Mt. Diablo phacelia	Species of Concern	--	1B/3-2-3	No
Monardella leucocephala Merced monardella	Species of Concern	--	1A/ *	No
Scutellaria galericulata marsh skullcap	--	--	2/2-2-1	No
Scutellaria lateriflora blue skullcap	--	--	2/3-2-1	No

Table 3-1 (continued)

Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
Hesperolinon sp. *nov.* "*serpentinum*" Napa western flax	Species of Concern	--	1B/3-2-3	No
Hibiscus lasiocarpus rose-mallow	--	--	2/2-2-1	No
Malacothamnus hallii Hall's bush mallow	Species of Concern	--	1B/3-2-3	No
Clarkia rostrata beaked clarkia	Species of Concern	--	1B/2-1-3	No
Eschscholzia rhombipetala diamond-petaled California poppy	Species of Concern	--	1B/3-3-3	No
Navarretia nigelliformis ssp. *Radians* shining navarretia	--	--	1B/2-2-3	No
Navarretia prostrata prostrate navarretia	Species of Concern	--	1B/2-3-3	No
Navarretia myersii ssp. *Myersii* pincushion navarretia	Species of Concern	--	1B/3-3-3	No
Delphinium californicum ssp. *Interius* Hospital Canyon larkspur	Species of Concern	--	1B/3-2-3	No
Delphinium recurvatum recurved larkspur	Species of Concern	--	1B/2-2-3	No
Castilleja campestris ssp. *Succulenta* succulent owl's-clover	Threatened	Endangered	1B/2-2-3	No
Cordylanthus mollis ssp. *Hispidus* hispid bird's-beak	Species of Concern	--	1B/2-3-3	No
Cordylanthus palmatus palmate-bracted bird's-beak	Endangered	Endangered	1B/3-3-3	No
Gratiola *heterosepala* Boggs Lake hedge-hyssop	Species of Concern	Endangered	1B/1-2-2	No
Limosella subulata Delta mudwort	--	--	2/2-3-1	No
Sagittaria sanfordii Sanford's arrowhead	Species of Concern	--	1B/2-2-3	Yes
Carex comosa bristly sedge	--	--	2/3-3-1	No
Eleocharis quadrangulata four-angled spikerush	--	--	2/3-2-1	No
Allium sharsmithiae Sharsmith's onion	Species of Concern	--	1B/2-1-3	No
Fritillaria falcata talus fritillary	Species of Concern	--	1B/3-2-3	No
Agrostis hendersonii Henderson's bent grass	Species of Concern	--	3/3-2-2	No
Neostapfia colusana Colusa grass	Threatened	Endangered	1B/2-3-3	No
Orcuttia pilosa hairy orcutt grass	Endangered	Endangered	1B/2-3-3	No

Table 3-1 (continued)

Special-Status Species Known to Occur in the Project Area[1]

Scientific Name/Common Name	Federal Status[2]	State Status[2]	DFG[3]/ CNPS/ R-E-D[4]	Potential to Utilize Aquatic Habitat Associated With Water Conveyance Facilities
Orcuttia inaequalis San Joaquin Valley orcutt grass	Threatened	Endangered	1B/2-3-3	No
Tuctoria greenei Greene's tuctoria	Endangered	Rare	1B/2-3-3	No
Potamogeton filiformis slender-leaved pondweed	--	--	2/3-2-1	Yes

Notes:
[1] Occurrences documented in the California Natural Diversity Data Base (CNDDB) for San Joaquin, Stanislaus and Merced counties (DFG 2003).
[2] Federal and state status designations as published in DFG (2003).
[3] DFG status abbreviations:
SC – species of special concern
FP – fully protected species under the California Fish and Game Code (no take allowed)
[4] California Native Plant Society (CNPS) and R-E-D status abbreviations:
1A – List 1A (plants presumed extinct)
1B –List 1B (plants rare or threatened in California and elsewhere)
2 – List 2 (plants rare or threatened in California but more common elsewhere)
3 – List 3 (plants that require additional information)
4 – List 4 (plants of limited distribution)
R-E-D indicates level of rarity, endangerment and distribution: a 3 in each category indicates a species that has a high level of rarity, endangerment or limited distribution, while a 1 in each category indicates a lower level of rarity, endangerment or a more widespread distribution. The CNPS does not provide R-E-D codes for species presumed to be extinct (List 1A).

Application of the proposed aquatic pesticides to irrigation conveyance systems would potentially affect eight special-status species that utilize aquatic habitats associated with these facilities:

- Tricolored blackbird (*Agelaius tricolor*)
- Kern brook lamprey (*Lampetra hubbsi*)
- Hardhead *(Mylopharodon conocephalus)*
- Northwestern pond turtle (*Emys* [=*Clemmys*] *marmorata marmorata*)
- Giant garter snake (*Thamnophis gigas*)
- Sanford's arrowhead (*Sagittaria sanfordii*)
- Slender-leaved pondweed (*Potamogeton filiformis*)

Special-status terrestrial species that could be affected by the proposed project are those that utilize the water conveyance systems for foraging, movement or breeding. Potential effects could include direct exposure to various chemical compounds or indirect effects associated with physical disturbance and/or disruption of food web dynamics. The eight special-status species potentially affected by the proposed project are described below:

- **Tricolored blackbird.** The tricolored blackbird is nearly endemic to California. This species historically nested throughout the Central Valley and along the coast from Sonoma County to Mexico. California's population of tricolored blackbirds has been reduced by an estimated 64 percent from its historic numbers due to the loss of freshwater wetland habitat, human disturbance and competition for nesting space with red-winged blackbirds (San Francisco Estuary Project 1992).

This species nests in dense colonies in thick stands of cattails or tules, and in other areas with a permanent water source (San Francisco Estuary Project 1992). Tricolored blackbirds have also been observed nesting in riparian vegetation, such as willows, thistles, blackberry and wild rose plants when freshwater emergent vegetation is not available. Nesting season occurs between March 1 and August 30. Nest sites are generally in close proximity to foraging areas, which often include flooded rice fields, pond margins, and other grassy sites (San Francisco Estuary Project 1992).

- **Kern brook lamprey.** This nonparasitic, nonanadromous lamprey occurs in the southern San Joaquin drainage and in the Kings River. It takes the name Kern from the location of its original discovery, Friant-Kern Canal. Like the other species of lamprey, ammocetes of this species are filter feeders. However, adults do not feed, they simply metamorphose, spawn and die. The ammocete usually remains buried in the soft substrate of backwater pools or low-flow areas in the rivers it lives in, with only its mouth exposed for filter feeding. After some number of years the ammocetes metamorphose into the adult form, and probably require coarse gravel/rubble substrate for spawning.
- **Hardhead.** The hardhead is a freshwater fish native to California with a distribution limited to the Sacramento-San Joaquin and Russian river systems. Usually found in water systems with clear, deep pools with sand-gravel-boulder bottoms and slow water velocity. Spawning occurs as early as May and June in the valley and may extend to August in the foothill regions of the upper San Joaquin River. Spawning substrate may include sand, gravel and decomposed granite areas. Juvenile hardhead inhabit both shallow regions and deeper lakes and reservoirs, and may also be found in various temperature gradients such as Millerton Lake. Juvenile hardhead feed on plankton and cladocerans and on insects and small snails. They also take filamentous algae in the intermittent pools of upper San Joaquin River, particularly in the fall months. Hardhead reach maturity at the end of their second year (UC Berkeley 2003).
- **Western pond turtle** (DFG species of concern). The western pond turtle is a freshwater turtle with a carapace that measures 4 to 8 inches in diameter when fully grown. Typically associated with calm waters such as streams, pools, and irrigation canals with vegetated banks containing basking areas with downed logs or large rocks. Food consists mainly of animal matter such as aquatic invertebrates, small amphibians and fish, but can also include aquatic plants. When disturbed, the western pond turtle usually retreats into the nearest waterway. Females lay 5 to 11 eggs between May and August, in buried nests in sunny, sandy areas near water. Hatching time is approximately 73 to 80 days. Juveniles will remain in the nest until the following spring. (DFG 2002)
- **Giant garter snake.** The giant garter snake is considered one of the largest garter snakes, reaching lengths of approximately 63 inches and weighing up to 1.5 pounds. The giant garter snake typically inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams and adjacent uplands in the Central Valley. Merced Irrigation District's footprint is not in its historic habitat area. Its food consists primarily of small fish, amphibians and amphibian larvae. The giant garter snake dens in small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period. Giant garter snakes typically select burrows with sunny exposure along south- and west-facing slopes. When disturbed, the giant

garter snake usually retreats into the nearest waterway. Its breeding season extends through March and April, and females give birth to live young from late July through early September (USFWS 2003; DFG 2002).

Giant garter snakes are historically known from the central and western portions of the San Joaquin Valley. An aquatic garter snake (*T. couchii* or *T. gigas*) has never been collected from the eastern San Joaquin Valley, between the Sierra Nevada foothills and the marshes on the valley floor (Hansen 1980). It has been suggested that the ranges of these two species were once divided by extensive riparian forests that occurred along the river corridors of streams that flowed from the foothills of the Sierra Nevada mountains to the San Joaquin River (Hansen 1980; USFWS 1999). Between the foothills of the Sierra and the marshes and sloughs that typified the habitats of the bottomlands of the San Joaquin Valley, river corridors were shaded by dense riparian forests. These shaded river corridors lacked suitable basking sites for aquatic garter snakes, and prey items may also have been less abundant than in sloughs and marshes of the bottomland regions. This type of riparian habitat is not suitable for giant garter snakes (Brode 1988). Consequently, habitats suitable for aquatic garter snakes (including the giant garter snake) appear to be absent from the eastern portions of San Joaquin, Stanislaus and Merced counties.

- **Sanford's arrowhead.** Sanford's arrowhead is included on CNPS List 1B and it is designated a species of concern by the USFWS. This perennial herb in the water plantain family (*Alismataceae*) is widely distributed in California from Del Norte County on the north coast to Ventura and Orange counties in Southern California. However, this species is now extirpated from Southern California and many parts of the Central Valley. Typical habitat is shallow freshwater marsh at elevations between 0 and 2,000 feet and many of the existing occurrences of Sanford's arrowhead are documented from irrigation channels and drainage ditches. This species blooms from May to October.
- **Slender-leaved pondweed.** Slender-leaved pondweed is included on CNPS List 2. This perennial herb in the pondweed family (*Potamogetonaceae*) is widely distributed in the northern hemisphere, but is rare in California. Slender-leaved pondweed has submersed stems and leaves less than 6 inches long and less than 0.12 inch wide. This pondweed species typically occupies the shallow-water zones of lakes and drainage channels in the San Joaquin Valley, Sierra Nevada, San Francisco Bay and Modoc Plateau regions of California (DFG 2003).

3.2 HYDROLOGY AND WATER QUALITY

This section describes the environmental setting for water resources in the proposed project vicinity. The San Joaquin River Basin is contained within the southern portion of the Central Valley of California. The basin extends approximately 250 miles north to south, encompasses about 32,000 square miles, and is bounded by the Sierra Nevada mountains on the east and the Diablo Range on the west. Extensive water supply, hydroelectric and flood-control efforts during the past century have resulted in the construction of dams and reservoirs that now control the flow on nearly all major streams in the San Joaquin River Basin. The primary sources of surface water to the San Joaquin River Basin are rivers that drain the western slope of the Sierra Nevada. Each of these rivers, the San Joaquin, Merced, Tuolumne, Stanislaus, Calaveras, Mokelumne and Cosumnes drain large areas of high-elevation watershed that supply snowmelt runoff during the late spring and early summer months.

3.2.1 Surface Water Hydrology

3.2.1.1 San Joaquin River

The San Joaquin River originates in the Sierra Nevada at an elevation above 10,000 feet and flows into the San Joaquin Valley at Friant Dam. Along the valley floor, the San Joaquin River receives additional flow from the Merced, Tuolumne and Stanislaus rivers. Flows in the upper San Joaquin River are regulated by the Central Valley Project's Friant Dam, which was completed in 1941 to store and divert water to the Madera and Friant-Kern canals for irrigation and municipal and industrial water supplies in the eastern portion of the San Joaquin Valley. Releases from Friant Dam are generally limited to those required to satisfy downstream water rights. Millerton Lake, formed by Friant Dam, has a capacity of 520,000 acre-feet.

The lower San Joaquin River is the section of river from the confluence with the Merced River (below Fremont Ford) to Vernalis, which is generally considered the southern limit of the Sacramento-San Joaquin River Delta (Delta). It is characterized by the combination of flows from tributary streams, major rivers, groundwater accretions and agricultural drainwater. The drainage area of the San Joaquin River above Vernalis is approximately 13,356 square miles. However, little water is contributed from the upper San Joaquin River, except during flood events. Therefore, flows in the lower San Joaquin River are primarily governed by the tributary inflows from the Merced, Tuolumne and Stanislaus rivers.

3.2.1.2 Merced River

The Merced River drains an area of approximately 1,273 square miles east of the San Joaquin River and produces an average unimpaired runoff of approximately 1 million acre-feet. The major water supply reservoir on the river is Lake McClure, with a capacity of 1,024,000 acre-feet. It is formed by New Exchequer Dam, completed in 1967, which regulates releases to the lower Merced River. New Exchequer Dam is owned and operated by the Merced Irrigation District for power production, irrigation and flood control.

3.2.1.3 Tuolumne River

The Tuolumne River drains a watershed of approximately 1,540 square miles and produces an average annual unimpaired runoff of approximately 1.8 million acre-feet. Flows in the lower portion of the Tuolumne River are controlled primarily by the operation of New Don Pedro Dam, which was constructed in 1971 jointly by the Turlock Irrigation District and Modesto Irrigation District with participation by the City and County of San Francisco. The 2.03-million-acre-foot reservoir stores water for irrigation, hydroelectric generation, fish and wildlife enhancement, recreation and flood-control purposes.

3.2.1.4 Stanislaus River

The Stanislaus River drains a watershed of approximately 900 square miles and produces an average unimpaired runoff of approximately 1.056 million acre-feet. Flows in the lower Stanislaus River are controlled by releases from the New Melones Reservoir, which has a capacity of 2.4 million acre-feet, and is operated by the Bureau of Reclamation (Reclamation) as part of the Central Valley Project. The main water diversion point on the Stanislaus River is Goodwin Dam, which provides for delivery to Oakdale and South San Joaquin Irrigation Districts.

3.2.2 Surface Water Quality in the San Joaquin River Basin

Surface water quality in the San Joaquin River Basin is affected by several factors, including natural runoff, agricultural return flows, biostimulation, construction, logging, grazing, operations of flow-regulating facilities, urbanization and recreation. In addition, irrigated crops grown in the western portion of the San Joaquin Valley have accelerated the leaching of minerals from soils, altering water quality conditions in the San Joaquin River system.

Water quality in the San Joaquin River varies considerably along the stream's length. In the reaches above Millerton Lake, water quality is generally excellent. However, several reaches of the river below Friant Dam are often dry due to groundwater percolation. From Salt Slough to Fremont Ford most of the flow in the river is derived from water deliveries to the wildlife refuges and irrigation return flows and discharges (e.g., Grassland Bypass Project) carried by Salt and Mud Sloughs. This reach of the San Joaquin River typically has the poorest water quality of any reach of the river.

As the San Joaquin River progresses downstream from Fremont Ford, water quality generally improves at successive confluences, specifically at those with the Merced, Tuolumne and Stanislaus rivers. In the relatively long reach between the Merced and Tuolumne rivers; however, mineral concentrations tend to increase due to agricultural drainwater return flows, other wastewaters and groundwater discharging into the river (DWR 1965 as cited in Reclamation 2000).

Section 303(d) of the Clean Water Act requires states to identify and include on the 303(d) list water bodies that are threatened or are not meeting water quality standards despite controls on point source discharges. Pollutants listed for water bodies within the San Joaquin River Basin and downstream of aquatic pesticide treatment areas are shown in Table 3-2.

Table 3-2
Impaired Water Bodies and Listed Pollutants

Water Body	Pollutant/Stressor	Potential Source
Bear Creek	Mercury	Resource Extraction
Merced River	Chlorpyrifos	Agriculture
	Diazinon	Agriculture
	Group A Pesticides	Agriculture
San Joaquin River (Bear Creek to Mud Slough)	Boron	Agriculture
	Chlorpyrifos	Agriculture
	DDT	Agriculture
San Joaquin River (Merced River to South Delta Boundary	Diazinon	Agriculture
	EC	Agriculture
	Group A Pesticides	Agriculture
	Mercury	Resource Extraction
	Unknown Toxicity	Source Unknown
	Boron	Agriculture
	Chlorpyrifos	Agriculture
	DDT	Agriculture

Table 3-2 (continued)
Impaired Water Bodies and Listed Pollutants

San Joaquin River (Mud Slough to Merced River)	Diazinon	Agriculture
	EC	Agriculture
	Group A Pesticides	Agriculture
	Mercury	Resource Extraction
	Unknown Toxicity	Source Unknown
	Boron	Agriculture
	Chlorpyrifos	Agriculture
	DDT	Agriculture
	Diazinon	Agriculture
	EC	Agriculture
	Group A Pesticides	Agriculture
	Mercury	Resource Extraction
	Selenium	Agriculture

Source: Central Valley Regional Water Quality Control Board 2002 Clean Water Act Section 303(d) list of water quality limited segments. Approved by U.S. Environmental Protection Agency in July 2003.

EC = electrical conductivity,

DDT = dichlorodiphenyltrichloroethane

3.2.3 Merced Irrigation District Facilities

The Merced Irrigation District's water conveyance facilities are described in Section 2.2.1.2 of this Initial Study. Water leaving Merced Irrigation District is discharged into the Merced River, Bear Creek, Black Rascal Creek, Owens Creek, Miles Creek, Mariposa Creek, Duck Slough, Deadman Creek, Canal Creek, Dutchman Creek and Chowchilla River. Portions of all of the creeks listed above are also used as irrigation conveyance facilities and most of those creeks would normally be dry from May through October without the irrigation water flows. Water bodies that are treated with pesticides or may be affected by pesticides are listed in Section 2.2.2.1.

4 AGENCIES WHOSE APPROVAL IS REQUIRED (RESPONSIBLE, TRUSTEE AND AGENCIES WITH JURISDICTION)

Application of aquatic pesticides by public entities is currently regulated in 2002 and 2003 under the SWRCB Statewide General NPDES Permit for Discharges of Aquatic Pesticides (Water Quality Order No. 2001-12-DWQ, General Permit No. CAG990003). Dischargers eligible for coverage under this General Permit are public entities that conduct resource or pest management control measures, including local, state and federal agencies responsible for control of algae, aquatic weeds and other organisms that adversely impact operation and use of drinking water reservoirs, water conveyance facilities, irrigation canals and natural water bodies. This permit is set to expire in January 2004,and the proposed pesticide application program would occur under a new General Permit. The SWRCB requires California Environmental Quality Act (CEQA) documentation to be complete before a discharger can be covered under the new General Permit.

In addition to compliance with the General Permit, the aquatic pesticide programs are also regulated under a Memorandum of Understanding that involves the U.S. Environmental Protection Agency, Department of Pesticide Regulation (DPR) and County Agriculture Commission (CAC). Under this Memorandum of Understanding, the DPR and the CAC work together to regulate pesticide use throughout California. Irrigation districts must obtain State of California Qualified Applicator Certificates from DPR for all applicator personnel applying restricted chemicals. Districts are also required to obtain an annual permit from the CAC and must submit a written Notice of Intent to the CAC and the County 24 hours before applying a restricted pesticide. In addition, irrigation districts are required to file Notice of Intent forms with the DFG annually. Each CAC is required to inspect 5 percent of its cases. Monthly use reports must be submitted to the CAC and must include monthly totals for chemical use. The CAC forwards these forms to the DPR, which manages a database of chemical applications. The General Permit supplements these existing regulatory programs with additional requirements that are regulated and managed by the SWRCB and the Regional Water Quality Control Board.

5 CONSISTENCY WITH EXISTING GENERAL PLAN, ZONING AND OTHER APPLICABLE LAND USE CONTROLS

Land use in the Merced River watershed is primarily open space (foothill pasture) within the upper reaches and agriculture in the lower reaches. A few rural communities are located within the watershed with the largest being the town of Livingston.

The proposed project directly affects the District's water conveyance and storage facilities, thereby indirectly affecting the beneficiaries of the water, primarily agricultural land uses, and adjacent water and land habitats within the watershed of the Merced River. To the extent that water resources and habitats could be affected by the application of aquatic pesticides, local general plan policies are of interest.

Each county and city in California is required by Section 65300 of the California Government Code to have a comprehensive, long-term general plan for the physical development of the county or city. Mandatory elements of the general plan that have bearing on the proposed project are land use, agriculture, fish and wildlife habitat, water resources and conservation. This section summarizes key goals and policies contained in the existing general plans for the Merced and Mariposa counties in which the proposed project is located. Since the proposed project does not involve urban development, the key issue is whether the application of aquatic pesticides to District conveyance and storage facilities is consistent with county policies for resource conservation and the support of agriculture.

The goals and policies of each county relevant to the proposed project are summarized in Table 5-1.

Table 5-1
County General Plan Policy Summary

County	Goals and Objectives
Merced	• Appropriately designate rural areas to meet the agricultural, grazing, wildlife habitat, recreational, natural resource and other open space needs of the county. • Protect rare and endangered species from urban development and recognize them in rural areas. • Protect surface and groundwater resources from contamination, evaporation and inefficient use. • Support measures to protect and improve water quality.
Mariposa	• Agricultural lands shall be retained for working landscape purposes through the life of the General Plan. • Cooperate and assist in the preservation of agricultural lands land use designation. • Support efforts by private organizations to utilize voluntary conservation easements as a means of preserving Agriculture/Working Landscape and Natural/Cultural/Scenic Resource lands. • Maintain viability of agriculture lands when historic parcels are discovered. • Allow agriculture lands conversion on lands designated for County growth.

Sources: Merced County 1990, Mariposa County 2002

The proposed project is consistent with the policies above. Because land uses would not be physically altered, local zoning and related land use controls are not an issue. Furthermore, it would not directly or indirectly result in the following actions:

- 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 nonagricultural use.
- Conflict with existing zoning for agricultural use or a Williamson Act contract.
- Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use.

6 ENVIRONMENTAL REVIEW CHECKLIST

The following environmental review uses the Environmental Checklist Form contained in the CEQA Guidelines, Appendix G, October 26, 1998. A brief explanation or reference for all answers follows each environmental question. Additional information for other issues not on the checklist is provided as appropriate. The evaluation of environmental impacts takes account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, and indirect as well as direct impacts. No construction impacts occur, but operational impacts are considered.

6.1 AESTHETICS

Would the project:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 surroundings?				✓
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				✓

Discussion:

a. The proposed project consists of the application of aquatic pesticides to the irrigation water conveyance system and does not include any actions at scenic vistas. Therefore, the proposed project would not have any impact on scenic vistas.

b. The application of aquatic pesticides to irrigation conveyance systems does not affect any scenic views, vistas or scenic highways.

c. The application of aquatic pesticides would remove aquatic vegetation from irrigation conveyance systems, including encroaching vegetation on canal banks. This removal would allow the water to flow more freely, and as such, would be more pleasing in visual character. This impact, while beneficial, is not significant.

d. The application of aquatic pesticides would occur during daylight hours and would not create a new source of substantial light or glare or affect nighttime views in the area.

6.2 AGRICULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 nonagricultural 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 nonagricultural use?				✓

Discussion:

a. The proposed project consists of the application of aquatic pesticides to the irrigation conveyance system and does not include any alterations to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

b. The application of aquatic pesticides to irrigation conveyance systems does not conflict with any zoning of lands for agricultural use or Williamson Act contracts because no change in land use occurs.

c. The application of aquatic pesticides to irrigation conveyance systems occurs primarily on lands that are currently in agricultural use and would not result in the conversion of the lands to nonagricultural uses.

6.3 AIR QUALITY

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 "nonattainment" under an applicable federal or state ambient air quality standard (including releasing emissions that 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:

a. Air quality in the San Joaquin Valley is not dominated by emissions from one large urban area. Instead, a number of moderately sized urban areas are located throughout the valley. On-road vehicles are the largest contributor to carbon monoxide emissions as well as a large contributor to nitrogen oxide. PM_{10} emissions primarily result from paved and unpaved roads, agricultural operations and waste burning.

   Both the state and federal governments have established health-based Ambient Air Quality Standards for the following six air pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide and lead. The State of California has also established standards for hydrogen sulfide, sulfates and visibility-reducing particles.

   The pesticides that would be used are all registered for use in California as aquatic pesticides. The DPR evaluates the pesticide, including fate and transport characteristics of the pesticide in water, soil and air, to ensure that no unacceptable risk to the environment occurs when used as instructed. The application of aquatic pesticides would be temporary in nature and would not affect any of the pollutants measured for air quality in the San Joaquin Valley; therefore, no conflict or obstruction of the applicable air quality plan would occur.

b. All the aquatic pesticides except Rodeo and Aquamaster are applied directly into the water and would not be airborne; therefore, no impacts would occur to air quality standards. The application of Rodeo or Aquamaster to canal banks is typically applied by spray rig equipped with a spray boom or with a backpack sprayer. BMPs for Rodeo or Aquamaster application include applying Rodeo only when wind speeds are between 2 to 10 mph, and the application equipment is set up to produce a large droplet size to avoid pesticide drift. Thus, with the use of BMPs for the application of Rodeo or Aquamaster, impacts on air quality due to the application of aquatic pesticides would not be significant.

c. Because all the aquatic pesticides except Rodeo or Aquamaster are applied directly into the water, no increases in airborne pollutants would occur. Again, the application of Rodeo or Aquamaster would follow BMPs and would not result in a net cumulative increase of air pollutants.

d. The irrigation conveyance systems treated with aquatic pesticides are typically located in undeveloped areas away from population centers or sensitive land uses such as residential, community care and schools. Thus, sensitive receptors would not be exposed to substantial concentrations of the chemicals. Some of these materials could be very toxic if inhaled at high concentrations (especially Magnacide H).

e. Aquatic pesticide application is designed to remove existing vegetation that clogs irrigation water conveyance systems. The accumulation of this vegetation can often create smells that may be objectionable. However, these irrigation conveyance systems are typically located in rural areas away from substantial numbers of people. Removal of this vegetation would be beneficial or help to minimize some objectionable odors. Magnacide H does have an objectionable odor at the point of application, but this odor is temporary, typically lasting 1 to 3 hours from start to end of application. In addition, the odor would generally not be detectable at distances over approximately 100 yards from the point of application.

6.4 BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 DFG or USFWS?			✓	
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the DFG or USFWS?			✓	
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:

a. Table 3-1 identifies special-status species that potentially utilize aquatic habitats associated with water conveyance facilities in Merced Irrigation District. Application of aquatic pesticides could adversely affect eight special-status species if these species are present in conveyance facilities where the treatments are applied. Potential effects for wildlife species could include loss of foraging or breeding habitat due to removal of aquatic vegetation, disturbance of nesting or breeding habitat during application of the treatments, or mortality and/or reduced survival of individuals caused by exposure to toxic concentrations of chemicals associated with the treatments. Potential effects for special-status plants could include mortality of plant populations and the loss of habitat. The two special-status plant species that could be present would be extremely vulnerable to the proposed applications, but these species are unlikely to occur in most of the water conveyance facilities proposed for treatment.

Under the proposed project, pesticide application procedures in Merced Irrigation District would be essentially equivalent to practices that have occurred for the past 2 years during which time water quality monitoring has been conducted and BMPs implemented as required by the existing General Permit (existing conditions). Merced Irrigation District complies with label instructions and does not release treated water from irrigation facilities while the pesticide remains in the water. When applying herbicides directly to the water, Merced Irrigation District uses the practice of closing all gates at potential release points during and after application to ensure that streams or wetlands are not affected.

When Rodeo/Aquamaster is applied to drains that discharge to natural water bodies, there is no mechanism to control flow out of the drains. However, it can be demonstrated that the active ingredient (glyphosate) is not mobile or highly toxic and; therefore, unlikely to impact the environment.

All reported bioaccumulation factor values for glyphosate in aquatic organisms are well below 100 (Ebasco 1993; Heyden 1991; Wang et al. 1994). The Hazardous Waste Identification Rule (USEPA 1999) identifies compounds that are recognized as having a low, medium or high potential for bioaccumulation. For bioaccumulation in aquatic systems, rankings were determined using bioaccumulation factors in fish or log K_{ow} (octanol-water partitioning coefficient) values for organic compounds. Bioaccumulation potential is defined as follows:

Bioaccumulation potential	**Bioaccumulation Factor (BAF)**	**log K_{ow}**
High	BAF >= 10,000	log K_{ow} >= 4.0
Medium	10,000 > BAF >= 100	4.0 > log K_{ow} >= 2.0
Low	BAF < 100	log K_{ow} < 2.0

The highest bioaccumulation factor of 65.5 was reported for tilapia in fresh water (Wang et al. 1994). Other studies report much lower bioaccumulation factors in the range of 0.03 to 1.6 for fish (Ebasco 1993). Most studies report rapid elimination and depuration from aquatic organisms after exposure stops (Ebasco 1993). Therefore, bioaccumulation of glyphosate is considered to be low and food-web transfer is not considered to be a significant exposure route. Little or no data exist on bioaccumulation of surfactants and other herbicide mixture additives.

Glyphosate is a nonselective herbicide, meaning that it kills all vascular plants indiscriminately, rather than selectively affecting certain types of plants, such as grasses or broad-leaf herbs. Plants vary in their sensitivity to glyphosate exposure, mostly by variation in how easily it is absorbed and internally transported by plant tissues. Its action is systemic, meaning that it is transported within plant tissues from surfaces it contacts to affect remote parts of the plant, such as roots and rhizomes. Despite its high toxicity to plants, it is relatively low in toxicity to animals due to its chemical nature and the physiological basis for its activity. Glyphosate is chemically similar to certain types of amino acids (components of proteins) found in plants, but not in animals. When glyphosate interacts with the physiological processes of manufacturing proteins in plants, it profoundly disrupts all protein synthesis. Proteins are essential to all physiological processes in plants and; thus, glyphosate

exposure is generally highly lethal to plants. Glyphosate does not poison protein synthesis in animals, because it does not act as an analogue of amino acids metabolized in animals. Glyphosate does have other effects on animals; however, and so do some of the additives included with it in spray mixes. Glyphosate is an acid, like amino acids, but is most commonly used in salt form (isopropylamine salt), which is soluble in water. Its chemical name is N-(phosphonomethyl) glycine. The overall effect of glyphosate solutions depends on both the active ingredient and the surfactant. The only formulations of glyphosate currently approved for use in aquatic habitats omit surfactants. Certain surfactants approved for use in aquatic habitats must be added to aquatic-approved glyphosate formulations.

One ecologically significant feature of glyphosate is that it is strongly adsorbed by organic matter and fine sediment, such as clay or silt. Sediment films on plant surfaces strongly interfere with uptake and activity of glyphosate. In its chemically bound, adsorbed state glyphosate is chemically intact, but physiologically inactive. Actual decomposition of glyphosate in the soil or sediment is distinct from its inactivation by adsorption. Glyphosate also desorbs (releases) from soil particles, but its strong affinity for fine mineral and organic particles maintains the predominantly bound, inactivated form (EXTOXNET; Ebasco 1993; Giesy et al. 2000).

The primary breakdown product of glyphosate is aminophosphoric acid (AMPA), which is generally reported to be nontoxic to animals (EXTOXNET; Ebasco 1993). Glyphosate is decomposed by microbial activity in the soil. The reported rates of glyphosate decomposition and persistence in soil vary a great deal: most studies suggest rapid decomposition, while others detect persistence in the soil for more than a year (Ebasco 1993). Rates of decomposition by soil microbes vary with factors such as temperature, oxygen and pH. Glyphosate may be used as a food substrate by bacteria and can stimulate bacterial activity. It has been found to kill or inhibit the growth of some soil fungi in pure cultures; however, little is known about how glyphosate affects the microflora in realistic soil environments where important interactions, such as soil adsorption can occur (Ebasco 1993).

Laboratory tests of glyphosate generally indicate it to be nontoxic or low in toxicity to mammals and birds, particularly at the concentrations or doses that occur in field conditions (EXTOXNET). Most information about glyphosate toxicity to mammals comes from experiments on rats, mice, rabbits and some on dogs. Little information is available on toxicity of glyphosate or its breakdown products on most wildlife species. Toxic effects of glyphosate are usually achieved in laboratory animals at very high doses (hundreds or many thousands of times the exposure expected from concentrations and doses applied in field conditions) comparable to portions of animal diets, are often required to generate acute effects (EXTOXNET; Ebasco 1993; Giesy 2000).

Three patented surfactants are approved for use with glyphosate in aquatic environments. They are known by trade names LI-700, Agridex and R-11. Toxic effects of spray mixes of glyphosate are due primarily to surfactants rather than the active herbicide. These surfactants are nonionic, meaning they do not dissociate into electrically charged particles in water, as salts do. They contain nonylphenol polyethoxylante (NPE) ingredients, which are made from nonylphenol.

Rodeo/Aquamaster is classified as practically nontoxic to aquatic invertebrates, exhibiting an LC_{50} of 930 mg/L, which represents the concentration that has been found to result in lethal effects to 50 percent of the test organisms (USDA/FS 1997). Giesy et al. (2000) reviewed the data available on glyphosate toxicity to fish. Acute toxicity LC_{50} values for glyphosate tested as isopropylamine salt ranged from 97 to greater than 1,000 mg/L, and NOEC values ranged from <97 to 1,000 mg/L. Data compiled by Ebasco (1993) on 1-day acute toxicity tests indicate EC 50 (concentration resulting in adverse effects to 50 percent of the test organisms) values ranging from 12.8 to 240 mg/L.

Acute toxicity of X-77, R-11, ad LI-700 to fish can be moderate. Threshold LC_{50} for an anadromous salmonid fish tested (Atlantic salmon, *Salmo salar*) was as low as 0.13 parts per million, and young fish or eggs are generally found to be more sensitive than adults. Despite the low threshold for concentrations of surfactant causing significant mortality, actual concentrations to which fish are likely to be exposed in actual estuarine environments are orders of magnitude lower. Research in Willapa Bay found that the highest average maximum concentrations of surfactant in water dispersed from sprayed estuarine mud with the first flooding tide – the highest concentration for exposure, a "worst-case scenario" for fish swimming into freshly sprayed sites – was 16 parts per billion (Paveglio et al. 1996).

Effects of glyphosate on birds have been tested on mallard ducks (dabbling ducks that ingest wetland sediment along with seeds, insects and vegetation) and bobwhite quail. As with mammals, very high dietary concentrations of glyphosate (a 4,640 mg/kg dietary concentration) resulted in no adverse reactions such as weight loss or mortality (Ebasco 1993). Little or no data is available on toxicity of surfactants to birds.

Ebasco (1993) compiled data on glyphosate toxicity to mammals commonly used in laboratory tests and found that LD 50 values (the dose resulting in lethal effects to 50 percent of test organisms) ranged between 3,800 mg/kg body weight. Glyphosate is considered to be practically nontoxic to mammals. The toxicity of the aquatic-approved surfactants to mammals is reported to be very low: greater than 5 grams per kilogram body weight oral dosage of Agri-dex and LI-700 is the threshold for LC_{50}, the level at which 50 percent mortality occurs in laboratory rat tests. [The corresponding LC_{50} for R-11 is reported to be 2 to 4 grams per kilogram body weight (USDA/FS 1997).]

No impacts to special-status species are known to have occurred due to pesticide use by Merced Irrigation District and are not expected to occur in the future. Therefore, the proposed treatments are not likely to have a substantial adverse impact, either directly or through habitat modifications, on the special-status species identified in Table 3-1. In addition, the Merced Irrigation District will also implement awareness training for personnel that apply the pesticides to further reduce any less-than-significant potential impacts to special-status species. District personnel will receive training prior to the application of aquatic pesticides that will summarize the special-status species issues associated with water conveyance facilities in Merced Irrigation District and the sensitivity of aquatic resources that receive discharges from these conveyance facilities

b. The water conveyance facilities proposed for treatment with aquatic pesticides have very limited riparian habitat because the facilities are typically lined with concrete and maintained to reduce obstructions to water flow. Therefore, the proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the DFG or USFWS. Merced Irrigation District implements operational procedures that prevent treated water from entering most natural streams (See 6.8, a), wetlands or other natural aquatic habitats.

c. As described for item "b" above, the proposed project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption or other means.

d. The proposed project would not 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. Merced Irrigation District implements operational procedures that prevent treated water from entering natural streams, wetlands or other natural aquatic habitats that support native resident or migratory fish and wildlife species.

e. The proposed project does not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. Merced Irrigation District's aquatic pesticide program complies with the local policies and ordinances intended to protect biological resources.

f. The proposed project does not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional or state habitat conservation plan.

6.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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:

a. The application of aquatic pesticides is typically in irrigation water conveyances that are primarily manmade. Although some of these structures may be more than 50 years old, the application does not involve any physical disturbance of them so no impacts would occur to historical resources.

b. Application of the aquatic pesticides does not involve any physical disturbance of the irrigation water conveyance system, so no impacts would occur to archeological resources.

c. The aquatic pesticide application does not involve any digging or other physical disturbance of the irrigation water conveyance system.

d. Application of aquatic pesticides is typically in irrigation water conveyances that are primarily manmade. Again, the application would not involve any digging or physical disturbances, so it would not disturb human remains.

6.6 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less-Than-Significant w/ Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture 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 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:

a. Application of the aquatic pesticides does not involve any physical disturbance of the irrigation water conveyance system, so no impacts would occur from rupture of a known earthquake fault, strong ground shaking, ground failure or landslides as a result of the proposed project.

b. Application of the aquatic pesticides does not involve any digging or other physical disturbance of the irrigation water conveyance system, so no soil erosion or loss of topsoil would occur. Use of aquatic pesticides reduces the need to implement mechanical cleaning measures. As a result, the use of aquatic pesticides can be a benefit by reducing the digging or other physical disturbance associated with mechanical cleaning methods.

c. The proposed project does not involve any digging or other physical disturbance of the irrigation water conveyance system, and the affected canals and reservoirs have been in place for many years. Application of the aquatic pesticides would not result in on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

d. The proposed project includes canals and reservoirs that have been in place for many years and does not include any construction. Thus, no activities on expansive soils could be a risk to life or property.

e. The proposed project does not include the need for septic tanks or other wastewater disposal systems.

6.7 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 ¼ mile of an existing or proposed school?				✓
d. Be located on a site that 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?				✓

Would the project:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporation	Less-Than-Significant Impact	No Impact
e. Be located within an airport land use plan or, where such a plan has not been adopted. within 2 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. Be 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:

a. The pesticides that would be used are all registered for use in California as aquatic pesticides. The DPR evaluates the pesticide to ensure that no unacceptable risk occurs to the environment. Although Magnacide H is an acutely toxic and hazardous material, standard practices will be used to ensure that risks to human health and the environment are avoided or minimized. Because the pesticides have been approved for use as aquatic pesticides, Department of Transportation (DOT) requirements will be followed during transport, and BMPs are required during application, no significant hazard would occur to the public or the environment in their routine transport, use or disposal. In addition, no significant spills, impacts or injuries are known to have occurred during past use of these pesticides by Mereced Irrigation District.

b. BMPs are required with the use of any of these pesticides. All personnel applying the restricted aquatic herbicides must be trained and licensed. However, the possibility exists that an accidental spill of the pesticides that would be hazardous could occur. It is unlikely that trained personnel would cause an accidental spill. Therefore, a spill is considered an infrequent/rare event and a less-than-significant impact. A spill would most likely affect primarily the personnel applying or handling the material rather than the environment or the community.

c. The application of these aquatic pesticides would occur in undeveloped locations and would not be within ¼ mile of a school. During the application there is a Qualified Applicator at the site who would prevent access during the brief, temporary periods when the materials are applied and active. Magnacide H will not be applied when children are present outdoors.

d. The irrigation water conveyance systems that receive the aquatic pesticides are not hazardous materials sites. All release points for the irrigation water would be closed prior to treatment with Magnacide H, and the treated water would be either applied to selected agricultural crops or held according to the required time on the pesticide label. BMPs for the application of Rodeo/Aquamaster include starting downstream and spraying upstream to avoid concentrations of the pesticide in water. Rodeo/Aquamaster applied on land is quickly adsorbed into the soil.

e. The application of these aquatic pesticides does not involve any land use changes, construction of buildings, or use of equipment that would interfere with operations of any public airport. It does not create habitat that would attract birds and would not contribute to any bird aircraft strike hazard.

f. The application of these aquatic pesticides would not affect any private airstrip for the same reasons identified in item "e" above.

g. The proposed project involves application of aquatic pesticides to irrigation water conveyance systems that are located in undeveloped or rural areas. As such, no construction or obstruction of roads would impair or physically interfere with any emergency response or evacuation plans.

h. The irrigation water conveyance systems are primarily located in agricultural areas and are not adjacent to or mixed with wildlands where wildfires could occur.

6.8 HYDROLOGY AND WATER

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?			✓	
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that a net deficit would occur in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that 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 that would result in substantial on- or off-site erosion or siltation?				✓
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 that would result in on- or off-site flooding?				✓

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
e. Create or contribute runoff water that 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 within a 100-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 structures that would impede or redirect flood flows within a 100-year flood hazard area?				✓
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. Inundate seiche, tsunami or mudflow?				✓

Discussion:

a. Most treated waters in irrigation facilities do not have officially designated beneficial uses as listed in the Water Quality Control Plan (Basin Plan), prepared by the California Regional Water Quality Control Board, Central Valley Region (1998). Portions of Bear Creek, Black Rascal Creek, Owens Creek, Miles Creek, Mariposa Creek, Duck Slough, Deadman Creek and Canal Creek are used as irrigation conveyance facilities and most of those creeks would normally be dry from May through October without the irrigation water flows. In general, potential impacts to water quality would only occur if treated water is released to a water body that has designated beneficial uses. No waste discharge requirements exist for application of aquatic pesticides.

During application of pesticides, precautions are taken to prevent the release of treated water to natural water bodies with designated beneficial uses. Table 6-1 identifies beneficial uses of water bodies treated with each pesticide, and water bodies that may potentially receive treated water if a release occurs.

Table 6-1
Beneficial Uses of Potentially Affected Water Bodies

Potentially Affected Water Bodies	Treated Directly? [Yes] or [No]	Number of Potential Release Locations	Estimate Range of Flow Rates	Designated Beneficial Uses
Merced River	No	10	1 - 150 C.F.S.	MUN, AGR, PROC, IND, POW,REC-1, REC-2, WARM, COLD, MGR, SPWN & WILD
Lake Yosemite	No	1	1 - 1,000 C.F.S.	REC-1, REC-2, WARM, COLD & WILD
Chowchilla River	No	1	1 - 40 C.F.S.	AGR, PROC, REC-1, REC-2, WARM & WILD
Bear Creek	No	11	1 - 600 C.F.S.	N/A
Black Rascal Creek	No	12	1 - 350 C.F.S.	N/A
Owens Creek	No	4	1 - 25 C.F.S.	N/A
Miles Creek	No	4	1 - 20 C.F.S.	N/A
Mariposa Creek	No	9	1 - 100 C.F.S.	N/A
Duck Slough	No	3	1 - 100 C.F.S.	N/A
Deadman Creek	No	2	1 - 50 C.F.S.	N/A
Dutchman Creek	No	1	1 - 100 C.F.S.	N/A
Canal Creek	No	7	1 - 20 C.F.S.	N/A

Merced Irrigation District complies with label instructions and does not release treated water from irrigation facilities while the pesticide remains in the water. When applying herbicides directly to the water, Merced Irrigation District uses the practice of closing all gates at potential bypass points during and after application to ensure that beneficial uses are not impacted. No impacts to water quality are known to have occurred due to pesticide use by Merced Irrigation District and are not expected to occur in the future.

Magnacide H

Magnacide H is applied only to irrigation canals with no designated beneficial uses. When Magnicide H is applied to irrigation canals, the main concern would be impacts to water quality due to release of the treated water from the canals. During all applications, bypass gates are kept closed until Magnacide H is no longer in the system.

Rodeo/Aquamaster

Generally, Rodeo is applied only to banks of irrigation facilities and drains with no designated beneficial uses. Rodeo is generally not applied directly to the water but is applied to vegetation growing along the banks of irrigation canals and drains. However, in some cases, Rodeo is applied to vegetation growing in water, or some overlap occurs onto the water surface when the pesticide is applied to vegetation growing on the banks. Glyphosate, the active compound in Rodeo, is quickly immobilized by adsorption to soil/sediment particles and organic matter, and remains immobilized until degradation occurs. Therefore, glyphosate is not expected to be transported significantly in water.

Copper Compounds

Copper Sulfate is applied only to irrigation canals and flow recovery ponds with no designated beneficial uses. When Copper Sulfate is applied to irrigation canals, the main concern would be impacts to water quality due to release of the treated water from the canals. During all applications, bypass gates are kept closed until Copper Sulfate is no longer in the system. Nautique is used in canals outside the irrigation season when there is mainly ponded water with little to no flow. Nautique has dissipated from the treated canals prior to irrigation water being delivered through the canal system.

The dissolved copper ion (the most toxic and bioavailable form) generally does not remain in the water column at high concentrations, but copper can form hydroxide and sulfide compounds, precipitate out of solution, adsorb to sediment particles, and accumulate in sediments with repeated applications. Half-lives of copper compounds used for algae control range from about 2 to 6 days, depending on factors such as hardness and alkalinity. [The half-life represents the amount of time it takes for the copper concentration in the water column to decrease to half of the initial concentration (Murray-Gulde et al. 2002)]

Water Quality Monitoring

During the irrigation seasons of 2002 and 2003, water quality samples were collected at discharge locations before the gates were opened and water was released to water bodies with designated beneficial uses. Pesticide application projects selected for water quality monitoring are representative of typical application procedures conducted by Merced Irrigation District. Individual sampling locations were chosen to represent worst case conditions (i.e., those potential release points where pesticide concentration is expected to be highest). If existing monitoring data indicated that water quality objectives (WQO) exceedances have occurred in the past, potentially significant impacts to water quality might be expected to occur in the future.

If pesticides (active ingredients) were detected near discharge points water was held in the irrigation system until no pesticides (active ingredients) were detected in water quality samples collected at discharge points then an additional hold time of 12 hours was implemented before the discharge points were allowed to be opened. Therefore, no impacts to water quality are believed to have occurred as a result of pesticide application by Merced Irrigation District. The projects selected for monitoring are representative of typical pesticide application projects, sampling locations represented the worst-case scenarios, and standardized BMPs were implemented consistently for all pesticide application projects. Therefore, no significant impacts to water quality are expected to occur in the future, assuming that equivalent practices will be used.

In comparison to No Project conditions, water quality would not be significantly impacted because existing monitoring data indicates that pesticide applications will not result in exceedances of applicable WQOs. Under the proposed project, pesticide application procedures would be essentially equivalent to practices that have occurred for the past 2 years during which time monitoring has been conducted and BMPs implemented as required by the existing General Permit (existing conditions). Therefore, no change to water quality is expected as compared to existing conditions.

b. The proposed project will not alter groundwater recharge or supplies.
c. The proposed project will not alter existing drainage patterns or stream or river courses.
d. The proposed project will not alter existing drainage patterns or stream or river courses because existing facilities are not being structurally modified.
e. The proposed project will not affect quantity or quality of surface water runoff.
f. Potential effects to water quality are discussed under item "a".
g. The proposed project will not create housing or change delineation of flood hazard areas.
h. The proposed project will not involve creation of new structures.
i. The proposed project will have no effect on the integrity of any levee or dam, and will have no effect on flood flows.
j. The proposed project will have no effect on water flows.

6.9 LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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:

a. The proposed project does not involve any construction, and as such, would not divide an established community.
b. The objective of the proposed project is to control weeds and algae that interfere with irrigation conveyance. Agricultural land uses are all part of the counties' land use goals and objectives (see Section 5). The proposed project would not change the land use in the county.
c. The irrigation water conveyance systems are primarily located in agricultural areas with agricultural land uses. The application of aquatic pesticides to control weeds and algae would not be in conflict with habitat conservation plans or natural community conservation plans.

6.10 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 or other land use plan?				✓

Discussion:

a. Because the application of aquatic pesticides would be to existing irrigation water conveyance systems and no change in land use or stream flow would occur, no loss of known mineral resources would occur from excavation/construction activity or erosion.

b. The proposed project would not involve any change in land use as specified by any local general plan, specific plan or other land use plan.

6.11 NOISE

Would the project:	Potentially Significant Impact	Less-Than-Significant w/ Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				✓
b. Expose persons to or generate excessive groundborne vibration or groundborne noise levels?				✓
c. Substantially permanently increase ambient noise levels in the project vicinity above levels existing without the project?				✓
d. Substantially temporarily or periodically increase ambient noise levels in the project vicinity above levels existing without the project?				✓
e. Be located within an airport land use plan or, where such a plan has not been adopted, within 2 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. Be within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

Discussion:

a. The application of aquatic pesticides would occur in remote locations in agricultural areas. Existing noise from pumps or tractors may occur in the vicinity of the application site, but the application activity would not cause discernable increases over this background level. Consequently, the proposed project would not generate noise levels in excess of established standards.
b. No groundborne vibration or groundborne noise would be generated by the proposed project because application of the pesticides is either by backpack sprayer or is applied directly to the water without the use of noisy equipment.
c. The application of the aquatic pesticides is a periodic event that occurs on an as-needed basis or as a preventative measure at the beginning of the irrigation season.
d. The application of the aquatic pesticides is a temporary event, but because the irrigation water conveyance systems are primarily located in agricultural areas, existing background noise from pumping or tractor use could occur. No increase in ambient noise would occur as a result of the proposed project.
e. The application of these aquatic pesticides does not involve land use changes, construction of buildings, or use of equipment that would interfere with operations of any public airport.
f. The application of these aquatic pesticides would not affect any private airstrip for the same reasons identified in item "e" above.

6.12 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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, necessitating the construction of replacement housing elsewhere?				✓
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓

Discussion:

a. The proposed project does not expand water supply or conveyance systems to serve urban development. The application of aquatic pesticides is to control weeds and algae primarily for agricultural irrigation purposes. Therefore, it would not induce substantial population growth.
b. No building or other construction activities would be part of the proposed project, so no displacement of existing housing or construction of replacement housing would occur.
c. The proposed project would not involve any changes in land use or construction that would displace substantial numbers of people.

6.13 PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less-Than-Significant w/ Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. 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, to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
Fire protection?				✓
Police protection?				✓
Schools?				✓
Parks?				✓
Other public facilities?				✓

Discussion:

a. No building or other construction activities would be part of the proposed project, so no alteration of existing government facilities or need for new government facilities would occur. With no new development being proposed, no impacts would occur to the response times or other performance objectives for fire protection, police protection, schools, parks or other public facilities.

6.14 RECREATION

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. 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. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				✓

Discussion:

a. No increase in population growth would occur as a result of the proposed project. Therefore, no increase in the use of existing recreational facilities would occur.

b. The proposed project includes the application of aquatic pesticides to irrigation water conveyance systems and would not include the need for construction of or expansion of recreational facilities.

6.15 TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. Cause an increase in traffic that 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 results 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:

a. No increase in population growth would occur as a result of the proposed project. Therefore, no increase in existing traffic load or capacity would occur. Merced Irrigation District would use four (4) vehicles on county roads primarily during non-commute hours.
b. Because no increase in traffic would occur, no exceedence of service standard levels for designated roads or highways would occur as a result of the proposed project.
c. No change in air traffic would be associated with the proposed project.
d. The proposed project would occur in agricultural areas and would involve the periodic application of aquatic pesticides. No changes in design features of roads would be a part of the proposed project. The applicators of the aquatic pesticides utilize four (4) vehicles and would be careful to avoid any encounters with farm equipment.
e. The application of aquatic pesticides would occur in agricultural areas and, as such, would not interfere with emergency access.
f. No parking would be required with the periodic application of aquatic pesticides because this event would be temporary, and transportation to and from the irrigation water conveyance systems would involve temporary parking primarily on District property.
g. No conflict would occur with programs supporting alternative transportation because the Proposed project would involve periodic trips to the irrigation water conveyance systems to apply the pesticides.

6.16 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
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 stormwater 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 that 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:

a. All release points for the irrigation water would be closed prior to treatment, and the treated water would be either applied to agricultural fields or held according to the required time on the pesticide label. BMPs for the application of Rodeo/Aquamaster include starting downstream and spraying upstream to avoid concentrations of the pesticide in water. No wastewater would be generated by the proposed project.

b. Because the treated irrigation water would be either applied to selected agricultural crops or held in place according to the required time on the pesticide label, no wastewater would be generated nor would construction of water or wastewater facilities be needed.

c. The treated irrigation water would be either applied to selected agricultural crops or held in place according to the required time on the pesticide label. Therefore, construction of new stormwater facilities would not be needed.

d. No additional water supplies would be needed to apply the aquatic pesticides to the irrigation water conveyance systems.

e. No wastewater would be generated by the proposed project. Therefore, a wastewater treatment provider would not be required.
f. No solid waste would be generated in the application of aquatic pesticides to the irrigation water conveyance systems; therefore, no landfill would be needed.
g. No solid waste would be generated in the application of aquatic pesticides to the irrigation water conveyance systems.

6.17 MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less-Than-Significant w/Mitigation Incorporation	Less-Than-Significant Impact	No Impact
a. 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. 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. Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?				✓

Discussion:

a. The proposed project would not result in increased use of aquatic pesticides compared to historical usage and is not expected to result in increased concentrations of these chemicals in the treated water conveyance facilities. The temporary applications of pesticides to irrigation system facilities does not require any physical alteration or construction of any facilities at the point of application or elsewhere. Aquatic species and their habitats would only be affected temporarily during pesticide application. Merced Irrigation District does not release treated water from irrigation facilities while the pesticide remains active. Therefore, the proposed project would not 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.

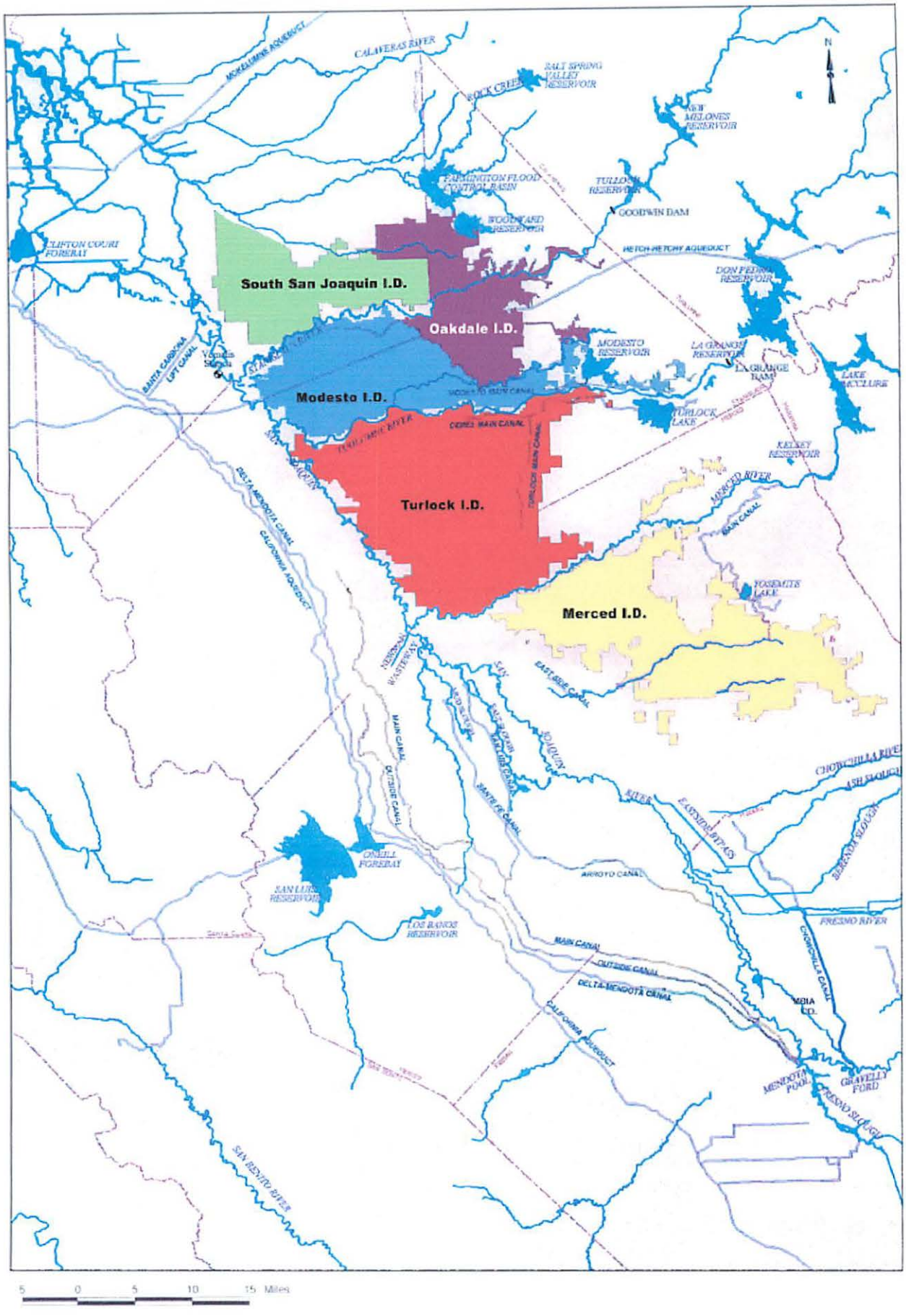

Figure 6-1 Cumulative Analysis Study Area

7 LIST OF PREPARERS

The following personnel were directly involved in the preparation of this Initial Study:

Robert Acker	Project Manager (Director of Facilities and Planning)
Ross Rogers	General Manager
Ted Selb	Assistant General Manager, Water Resources

Technical and support personnel from URS Corporation who were involved in document preparation are listed in Table 7-1.

Table 7-1
List of Technical and Support Personnel

Preparers	Degree(s)/Years of Experience	Experience and Expertise	Role in Preparation
URS			
Hootkins, S.	MUP, Urban and Regional Planning BA, Human Biology 30 years	CEQA Compliance	Project Manager, Senior Environmental Planner
Hunt, L.	MS, Environmental Engineering BS, Environmental Systems Engineering 8 years	Hydrology and Water Quality, Permitting, Monitoring	Environmental Risk Assessor
Leach, S.	MA, Vegetation Ecology BS, Physical Geography 11 years	Biological Resources	Lead, Biological Resources
Weinberg, D.	BA, Biological Sciences 12 years	Biological Resources	Biological Resources
Davidson, S.	BS, Forest Management Science 20 years	Other Impacts	Resource Planner
Dillon, R.	MA, Medieval History and Literature BA, History 20 years	Technical Editing, Report Production	Technical Editor
Goss, F.	23 years	Report Production	Graphic Artist

8 SUPPORTING INFORMATION SOURCES AND REFERENCES

Brode, J. M. 1988. Natural history of the giant garter snake (*Thamnophis couchii gigas*). In H.F. De Lisle, P.R. Brown, B. Kaufman, and B.M. McGurty eds. *Proceedings of the Conference on California Herpetology*. Southwestern Herpetologists Society.

Bureau of Reclamation (Reclamation). 2000. Central Valley Project Improvement Act Programmatic Environmental Impact Statement. Draft. July.

California Department of Fish and Game (DFG). 2002. California Interagency Wildlife Task Group: CWHR Version 8.0. Natural Heritage Division, Sacramento, CA.

California Department of Fish and Game (DFG). 2003. Search results from the California Natural Diversity Database. Natural Heritage Division, Sacramento, CA.

California Environmental Quality Act Guidelines. Appendix G. 1998. Environmental Checklist Form. October 26.

California Native Plant Society (CNPS). 2001. Inventory of Rare and Endangered Plants of California (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. Sacramento, CA.

California Regional Water Quality Control Board, Central Valley Region. 1998. Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins.

California Regional Water Quality Control Board, Central Valley Region. 2002. Clean Water Act Section 303(d) list of water quality limited segments. Approved by U.S. Environmental Protection Agency in July 2003.

Ebasco. 1993. Final Report, Element I: Integrated Weed Management Alternative for Managing Noxious Emergent Plants. Prepared for Washington State Department of Ecology. Ebasco Environmental, a division of Ebasco Services Incorporated.

EXTOXNET. Website: http://ace.orst.edu/info/extoxnet.

Giesy, J.P., S. Dobson, and K.R. Solomon. 2000. Ecotoxicological risk assessment for roundup herbicide. *Review of Environmental Contamination and Toxicology* 167:35-120.

Hansen, R. W. 1980. Western aquatic garter snakes in central California: an ecological and evolutionary perspective. Masters Thesis, California State University, Fresno. May.

Heydens, W.F. 1991. Rodeo® herbicide use to control Spartina: impact of glyphosate on marine and terrestrial organisms. Monsanto Agricultural Company, St. Louis, MO.Merced County. 1990. Merced County Year 2000 General Plan.

Murray-Gulde, C.L., J.E. Heatley, A.L. Schwartzman, and J.H. Rodgers, Jr. 2002. Algicidal effectiveness of Clearigate, Cutrine-Plus, and copper sulfate and margins of safety associated with their use. *Archives of Environmental Contamination and Toxicology* 43:19-27.

NatureServe. 2003. San Joaquin roach life history. (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=LAVINIA+SYMMETRICUS+SSP+1). Web site accessed November 5, 2003.

Paveglio, F.L., K.M. Kilbride, C.E. Grue, C.A. Simenstad, and K.L. Fresh. 1996. Use of Rodeo® and X-77® Spreader to control smooth cordgrass I (*Spartina alterniflora*) in a southwestern Washington estuary. II. Environmental fate. *Environmental Toxicology and Chemistry* 15.

San Francisco Estuary Project. 1992. Prepared under USEPA Cooperative Agreement CE-009519-01-0 by the U.S. Fish and Wildlife Service. Sacramento, California. January.

UC Berkeley. 2003. Hardhead life history. (http://elib.cs.berkeley.edu/kopec/tr9/html/sp-hardhead.html). Web site accessed November 5, 2003.

U.S. Department of Agriculture, Forest Serivce. 1997. Glyphosate Herbicide Information Profile. February.

U.S. Environmental Protection Agency (USEPA). 1999. Hazardous Waste Identification Rule, Finite Source, Multimedia, Multipathway, Multireceptor Risk Assessment (3MRA) Technical Background Document for HWIR99. Office of Solid Waste, Washington, DC. Draft. June 22.

U.S. Fish and Wildlife Service (USFWS). 1999. Draft Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). Region 1.

U.S. Fish and Wildlife Service (USFWS). 2003. Special-status species life histories. Sacramento Field Office. http://www.sacramento.fws.gov.

Wang, Y.S., C.G. Jaw, and Y.L. Chen. 1994. Accumulation of 2,4-D and glyphosate in fish and water hyacinth. *Water, Air, and Soil Pollution* 74(3/4):397-403.

9 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

None of the environmental factors listed below would be potentially affected by the proposed project as indicated by the checklist on the preceding pages in Section 6.

☐ 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	

10 DETERMINATION

On the basis of the information available to it in the record and the boxes checked in Section 6 of this Initial Study, Merced Irrigation District finds:

☒ 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, a significant effect would not occur in this case because revisions in the project have been made by or agreed to by the project proponent. 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 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 (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT 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 ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

This disposition constitutes the official action of the Merced Irrigation District.

Ross Rogers, General Manager
Merced Irrigation District

December 23, 2003
Date

Aquatic Pesticide Application Program for the Irrigation District

SCH Number: 2003121131

Document Type: NOD - Notice of Determination

Project Lead Agency: Merced Irrigation District

Project Description

The proposed project is the continuation of an aquatic pesticide application program by Merced Irrigation District since 1972. The program was previously regulated in 2002 and 2003 under the State Water Resources Control Board (SWRCB) Statewide General National Pollutant Discharge Elimination System (PDES) Permit for Discharge of Aquatic Pesticides (Water Quality Order No. 2001-12-DWQ, General Permit No. CAG990003). The proposed program would be implemented for a period of approximately 5 years, or for the term of the new General Permit.

Contact Information

Primary Contact:
Robert Acker
Merced Irrigation District
209 722.5761
744 W. 20th Street
Merced, CA 95340

Project Location

County: Merced
City: Merced
Region:
Cross Streets:
Latitude/Longitude:
Parcel No:
Township:
Range:
Section:
Base:
Other Location Info:

Determinations

This is to advise that the ☒ Lead Agency ☐ Responsible Agency Merced Irrigation District has approved the project described above on 1/30/2004 and has made the following determinations regarding the project described above.

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.

Final EIR Available at: Merced Irrigation District 744 W. 20th Street Merced, CA 95340

Date Received: 2/2/2004

CEQAnet HOME | NEW SEARCH

State Implementation Plan (SIP) Section 5.3 Exception Information Sheet

Aquatic Pesticide Application Program for the Merced Irrigation District

November 20, 2013

1. **Description of the Proposed Action.** The proposed action is the application of aquatic herbicides, including acrolein- and copper-containing aquatic herbicides, to irrigation canals for the purposes of controlling aquatic vegetation and algae. For a more detailed description, see the District's Initial Study (IS) dated December 23, 2003.

2. **Method of Completing the Action.** The action (the application of aquatic herbicides, including acrolein- and copper-containing aquatic herbicides) will be completed according to the pesticide manufacturer's product label directions. Refer to the aforementioned IS.

3. **Schedule.** The schedule for the action will be according to Integrated Pest Management (IPM) principles. For example, the application of aquatic herbicides 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 November.

4. **Discharge and Receiving Water Quality Monitoring Plan.** The District has prepared and will use its 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 990005). 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.

5. **Contingency Plans.** The District will maintain its ability to use other herbicides and/or manual removal of aquatic vegetation and aquatic herbicides that do not contain acrolein or copper. Alternative aquatic weed and algae control methods are not always as cost-effective, easy to apply, or efficacious as acrolein or copper. Refer to the aforementioned IS for a discussion of the use of acrolein- and copper-containing aquatic herbicides.

6. **CEQA Documentation and Notification.** The State Clearinghouse will notify potentially affected public and governmental agencies of the project. The project is described in the District's aforementioned IS.

7. **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.

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Jan Boel
Acting Deputy Director

RECEIVED
JAN 26 2004
MERCED IRRIGATION DISTRICT

January 21, 2004

Robert Acken
Merced Irrigation District
744 W. 20th Street
Merced, CA 95340

Subject: Aquatic Pesticide Application Program for the Irrigation District
SCH#: 2003121131

Dear Robert Acken:

The State Clearinghouse submitted the above named Negative Declaration to selected state agencies for review. The review period closed on January 20, 2004, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

cc: CENTRAL FILE

Document Details Report
State Clearinghouse Data Base

SCH#	2003121131
Project Title	Aquatic Pesticide Application Program for the Irrigation District
Lead Agency	Merced Irrigation District

Type	Neg Negative Declaration
Description	The proposed project is the continuation of an aquatic pesticide application program by Merced Irrigation District since 1972. The program was previously regulated in 2002 and 2003 under the State Water Resources Control Board (SWRCB) Statewide General National Pollutant Discharge Elimination System (PDES) Permit for Discharge of Aquatic Pesticides (Water Quality Order No. 2001-12-DWQ, General Permit No. CAG990003). The proposed program would be implemented for a period of approximately 5 years, or for the term of the new General Permit.

Lead Agency Contact

Name	Robert Acken		
Agency	Merced Irrigation District		
Phone	209 722.5761	*Fax*	
email			
Address	744 W. 20th Street		
City	Merced	*State* CA	*Zip* 95340

Project Location

County	Merced			
City	Merced			
Region				
Cross Streets				
Parcel No.				
Township		*Range*	*Section*	*Base*

Proximity to:

Highways	
Airports	
Railways	
Waterways	San Joaquin and Merced Rivers
Schools	
Land Use	Open Space, Agricultural Land; Urban/Developed and Agricultural land uses

Project Issues	Vegetation; Water Quality; Wetland/Riparian; Wildlife; Cumulative Effects
Reviewing Agencies	Resources Agency; Department of Boating and Waterways; Department of Fish and Game, Region 4; Department of Parks and Recreation; Reclamation Board; Department of Water Resources; Native American Heritage Commission; State Water Resources Control Board, Division of Water Quality; Regional Water Quality Control Bd., Region 5 (Fresno); Caltrans, District 10; State Lands Commission

Date Received	12/22/2003	*Start of Review*	12/22/2003	*End of Review*	01/20/2004

No response to comments
made by the State of California Clearinghouse and Planning Unit
was required.

STATE OF CALIFORNIA - THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

ENVIRONMENTAL FILING FEE CASH RECEIPT

Receipt # 200400017

Lead Agency: MERCED IRRIGATION DISTRICT Date: 01/30/200-

County Agency of Filing: _____ Document No: 20040001

Project Title: AQUATIC PESTICIDE APPLICATION PROGRAM FOR THE MERCED IRRIGATION DIST.

Project Applicant Name: ROSS ROGERS Phone Number: _____

Project Applicant: LOCAL PUBLIC AGENCY

CO ADMIN FEE DFG NO EFFECT DET (FORM ATTACHED)	$	1 00
Total Received	$	2 00

Signature and title of person receiving payment: _____