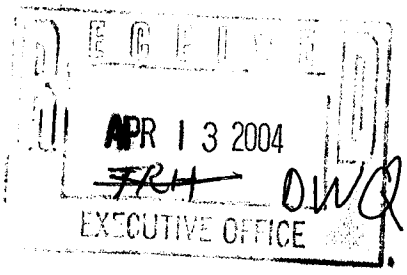
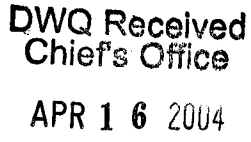
CT 2092



CH2MHILL

2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833
Tel (916) 920-0300
Fax (916) 920-8463

April 5, 2004



Celeste Cantú, Executive Director
California Environmental Protection Agency
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Subject: Aquatic Herbicide NPDES Permit - Application for Categorical Exception for Acrolein - Byron-Bethany Irrigation District

Dear Ms. Cantú:

This submittal comprises the formal application of the Byron-Bethany Irrigation District (BBID or District) for a seasonal Categorical Exception to the State Implementation Plan (SIP) for the California Toxics Rule (CTR). The seasonal Categorical Exception sought is for use of acrolein in the BBID canal system.

Attachments to this submittal include the following:

- Attachment 1 - Application Information
- Attachment 2 - Draft Negative Declaration
- Attachment 3 - Water Quality Monitoring Plan

As indicated in the District's letter of March 10, 2004, in order to provide SWRCB staff with sufficient time to review the District's application for a Categorical Exception, the District is submitting all components of its application package, except for the Notice of Determination (NOD), to you for advance review. The public comment period for the District's CEQA documentation extends through April 15, 2004. The Board of Directors is holding a public meeting on April 16, 2004 to consider adoption of the NOD. If the NOD is adopted by the BBID Board of Directors, it will be filed with the State Clearinghouse and appropriate counties and a copy will then be submitted to the SWRCB on April 19th, which is in excess of 30 days prior to the regularly scheduled May 20th SWRCB meeting.

The District requests that the State Water Resources Control Board amend its April 7, 2004 *Draft Statewide General National Pollutant Discharge Elimination System Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States* to include BBID in Attachment E, which lists public entities with SIP Section 5.3 Categorical Exceptions. It is requested that this amendment be made in sufficient time to include BBID in the permit that will be considered at the SWRCB's May 20th meeting.

Should you have any questions, please contact me at (916) 286-0303 or Rick Gilmore at (925) 634-3534.

Sincerely,

Summer Bundy

Summer Bundy
Water Resources Engineer
CH2M HILL/SAC

for

Rick Gilmore
General Manager
Byron-Bethany Irrigation District

Enclosures: As noted above.

c: Phil Isorena/SWRCB
Rudy Schnagl/RWQCB-5S
Greg Eldridge/CH2M HILL
Rick Gilmore/BBID

ATTACHMENT 1

Application Information

ATTACHMENT 1

Application Information

A. Profile of Discharger (Permittee)

Byron-Bethany Irrigation District
ATTN: Mr. Rick Gilmore, General Manager
P.O. Box 160
Byron, CA 94514
Tel (925) 634-3534
Fax (925) 516-1239

NPDES Permit No.: To be determined following the SWRCB's adoption of the general NPDES permit.

B. Specific Waterbodies

The seasonal Categorical Exception is being sought for the BBID Canal System, which is shown in Figure 1-1 of Attachment 2. BBID has developed an Aquatic Pesticide Application Plan (APAP), which is included in Section 2 of Attachment 2. The APAP includes:

- program oversight and license requirements
- an application schedule
- an applicator education program
- specific water management measures to prevent the release of acrolein from treated canals to sensitive habitat
- public noticing requirements
- reporting requirements
- project monitoring

Implementation of the APAP will prevent discharges to the creeks adjacent to the canals, which include Kellogg Creek and Mountain House Creek.

C. SIP Provision

The specific SIP provision for which this seasonal Categorical Exception is being sought is the acrolein receiving water limitation specified in the California Toxics Rule (CTR).

D. Formal Request

BBID hereby formally requests that it be granted a seasonal Categorical Exception for the application of acrolein to its canal system in accordance with its Aquatic

Pesticides Application Plan. The season for which the exemption is being sought extends from April through September, which is the irrigation season. The Categorical Exception is necessary because the SWRCB has interpreted the receiving water limitations specified in the CTR to apply to irrigation canals, as well as natural waterbodies. Acrolein is only effective at aquatic weed and algae control when it is applied to canals at toxic concentrations. Therefore, in order for the District to be in compliance with SWRCB water quality policy, the District must obtain a Categorical Exception if it is to use acrolein for its weed control activities.

E. Supporting Technical Documentation

The District's Negative Declaration, included as Attachment 2, contains in-depth technical information regarding the District's operations, acrolein use practices, beneficial uses, habitat and listed species, acrolein toxicological profile, and potential environmental effects.

The District's proposed Water Quality Monitoring Plan, included as Attachment 3, specifies a water quality study and a long-term water quality monitoring plan. The WQMP includes sampling procedures, monitoring frequency, retention of records, data collection requirements, device calibration and maintenance requirements, sample parameters, sample timing, and reporting. The WQMP was designed to comply with the requirements of the Monitoring and Reporting Program specified in the April draft general NPDES permit.

F. Compliance Plan

The compliance plan is comprised of the District's Notice of Intent (to be submitted once the SWRCB adopts the general permit), the Aquatic Pesticides Application Plan, and the Water Quality Monitoring Plan.

G. Documentation - Protection of Beneficial Uses

Please see Attachment 2, Negative Declaration.

H. Public Interest

The use of aquatic pesticides by control agencies is necessary to management resources and maintain beneficial uses, and to ensure the proper operation of agricultural irrigation water distribution systems. The District provides irrigation water to over 12,300 acres of irrigable farmland in the southern Sacramento-San Joaquin Delta. The irrigation canals for which this exception is being sought were constructed for the purpose of providing agricultural irrigation water. California Water Code Sections 22075-22078 et seq. provide that an irrigation district may treat water for the beneficial use of water users in its service area.

I. Anti-degradation Evaluation

The primary beneficial use of irrigation canals is agricultural water supply (AGR). Other beneficial uses of the District's canals are incidental to the conveyance of water for irrigation supply. Implementation of the APAP will prevent discharges to the

ATTACHMENT 2

Draft Negative Declaration

Form A

Notice of Completion & Environmental Document Transmittal

SCH # _____

Mail to: State Clearinghouse, PO Box 3044, Sacramento, CA 95812-3044 916/445-0613

Project Title: Application of the Aquatic Herbicide Acrolein in Conformance with Aquatic Pesticides Application Plan (APAP)

Lead Agency: Byron-Bethany Irrigation District
Contact Person: Rick Gilmore
Mailing Address: P.O. Box 160
Phone: (925) 634-3534
City: Byron Zip: 94514
County: Alameda, Contra Costa, San Joaquin

Project Location:

County: Alameda, Contra Costa, San Joaquin
City/Nearest Community: Byron, Brentwood, Tracy
Cross Streets: various
Zip Code: 94514
Total Acres: 19,000
Assessor's Parcel No.
Section: Twp. Range: Base:
Within 2 Miles: State Hwy #: 4
Waterways: Kellogg, Mountain House, Frisk, Brushy Creeks, Sac-SJ Delta
Airports: Byron Airport
Railways: UP
Schools:

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☒ Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other

RECEIVED
MAR 16 2004
STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational
☐ Recreational
☐ Water Facilities: Type MGD
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type Watts
☐ Waste Treatment: Type
☐ Hazardous Waste: Type
☒ Other:

Funding (approx.): Federal $ N/A State $ N/A Total $ N/A

Project Issues Discussed in Document:

☐ Aesthetic/Visual
☒ Agricultural Land
☐ Air Quality
☐ Archeological/Historical
☐ Coastal Zone
☐ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☐ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☐ Geologic/Seismic
☐ Minerals
☐ Noise
☐ Population/Housing Balance
☒ Public Services/Facilities
☐ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☐ Sewer Capacity
☐ Soil Erosion/Compaction/Grading
☐ Solid Waste
☒ Toxic/Hazardous
☐ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Wildlife
☐ Growth Inducing
☐ Landuse
☐ Cumulative Effects
☐ Other

Present Land Use/Zoning/General Plan Designation:

Agricultural

Project Description:

BBID proposes to apply Magnacide® H Herbicide, an aquatic herbicide containing the active ingredient acrolein, to control algae and aquatic weeds in canals within its service area. The project includes the application of acrolein to canals, in conformance with an Aquatic Pesticides Application Plan (APAP).

Reviewing Agencies Checkl

Form A, continued

L Y
S = Document sent by lead agency
X = Document sent by SCH
✓ = Suggested distribution

✓ **Resources Agency**
✓ Boating & Waterways
____ Coastal Commission
____ Coastal Conservancy
____ Colorado River Board
____ Conservation
✓ Fish & Game
____ Forestry & Fire Protection
____ Office of Historic Preservation
____ Parks & Recreation
____ Reclamation Board
____ S.F. Bay Conservation & Development Commission
✓ Water Resources (DWR)

Business, Transportation & Housing
____ Aeronautics
____ California Highway Patrol
____ CALTRANS District #_____
____ Department of Transportation Planning (headquarters)
____ Housing & Community Development

✓ **Food & Agriculture**

Health & Welfare
____ Health Services _____

State & Consumer Services
____ General Services
____ OLA (Schools)

Environmental Protection Agency
____ Air Resources Board
____ California Waste Management Board
____ SWRCB: Clean Water Grants
✓ SWRCB: Delta Unit
✓ SWRCB: Water Quality
____ SWRCB: Water Rights
✓ Regional WQCB # 5 (Sacramento)

Youth & Adult Corrections
____ Corrections

Independent Commissions & Offices
____ Energy Commission
____ Native American Heritage Commission
____ Public Utilities Commission
____ Santa Monica Mountains Conservancy
____ State Lands Commission
____ Tahoe Regional Planning Agency

____ Other _____

Public Review Period (to be filled in by lead agency)

Starting Date March 16, 2004 Ending Date April 15, 2004

Signature [signature] Date 3/15/04

Lead Agency (Complete if applicable):

Consulting Firm: CH2M HILL
Address: 2485 Natomas Park Drive, Suite 600
City/State/Zip: Sacramento, CA 95816
Contact: Summer Bundy
Phone: (916) 286-0303

Applicant: Byron-Bethany Irrigation District
Address: P.O. Box 160
City/State/Zip: Byron, CA 94514
Phone: (925) 634-3534

For SCH Use Only:

Date Received at SCH _____
Date Review Starts _____
Date to Agencies _____
Date to SCH _____
Clearance Date _____
Notes:

Notice of Intent

Re: Byron-Bethany Irrigation District/Application of the Aquatic Herbicide Acrolein in Conformance with an Aquatic Pesticide Application Plan

To Whom It May Concern:

Byron-Bethany Irrigation District (BBID) has prepared a Draft Negative Declaration addressing the potential environmental consequences of applying Magnacide® H, an aquatic herbicide containing the active ingredient acrolein, to control algae and aquatic weeds in canals within BBID's service area.

The application of the herbicide may result in the discharge of acrolein to waters of the United States pursuant to the provisions of an applicable general National Pollution Discharge Elimination System (NPDES) permit. Compliance with the general NPDES permit will be accomplished through conformance with an Aquatic Pesticides Application Plan (APAP). Specific measures are included in the APAP to prevent the discharge of acrolein from treated canals to sensitive habitat.

BBID has determined that it should obtain a categorical exception to conduct its algae and aquatic weed control activities. The State Water Resources Control Board (SWRCB) requires that agencies applying for the categorical exception submit a technical report and evidence that an environmental analysis has been completed under the California Environmental Quality Act (CEQA).

BBID is therefore completing an environmental impact assessment in accordance with the requirements of CEQA, as amended. BBID is the lead agency for purposes of CEQA compliance. Other responsible agencies have permitting authority over the project and will use this analysis to comply with CEQA, as needed. BBID is distributing the Draft Negative Declaration to interested public and regulatory authorities for review and comment.

As concluded in the Draft Negative Declaration, the proposed project will not have a significant effect on the environment because measures will be taken to avoid, reduce, or otherwise minimize potential adverse effects.

BBID will receive public/agency comments on the Draft Negative Declaration for a 30-day period beginning March 16, 2004, and ending April 15, 2004. Written comments should be submitted to the following address:

Byron-Bethany Irrigation District
P.O. Box 160
Byron, CA 94514
Rick Gilmore, General Manager

In addition, BBID will hold a public meeting on Friday, April 16, 2004, at 3944 Main Street, Byron, CA, to consider certification of the Negative Declaration. The public is invited to attend this meeting.

We appreciate your time and effort to review the subject Draft Negative Declaration. Your input to this project will be considered as part of future decisions to be made by BBID.

Rick Gilmore, General Manager
Byron-Bethany Irrigation District

3/15/04
Date

Enclosures: Draft Negative Declaration
Initial Study

Draft Negative Declaration

Application of Aquatic Herbicide (Acrolein) in District Water Conveyance Canals for Control of Aquatic Weeds

The Byron-Bethany Irrigation District (BBID or District) is proposing to adopt a Negative Declaration in compliance with the requirements of the California Environmental Quality Act, as amended (CEQA), addressing the controlled application of an aquatic herbicide in District water conveyance canals.

Project Description

BBID proposes to apply Magnacide® H Herbicide, an aquatic herbicide containing the active ingredient acrolein, to control algae and aquatic weeds in canals within its service area. The application of herbicide may result in the discharge of acrolein to waters of the United States pursuant to the provisions of an applicable general National Pollution Discharge Elimination System (NPDES) permit. Compliance with the NPDES permit will be accomplished through conformance with an Applied Pesticide Application Plan (APAP). Specific measures are included in the APAP to prevent the discharge of acrolein from treated canals to sensitive habitat.

BBID has determined that it should obtain a categorical exception to conduct its algae and aquatic weed control activities. The State Water Resources Control Board (SWRCB) requires that agencies applying for the categorical exception submit a technical report and evidence that an environmental analysis has been completed under CEQA.

BBID is therefore completing an environmental impact assessment in accordance with CEQA requirements. BBID is the lead agency for purposes of CEQA compliance. Other responsible agencies have permitting authority over the project and will use this analysis to comply with CEQA, as needed.

Location

BBID is a public agency established for the purpose of providing water to lands within southeast Contra Costa, northeast Alameda, and western San Joaquin counties, California. The project is located within the District canals, as delineated on Figure 1-1.

Specifically, the proposed project is treatment of the District's conveyance system with Magnacide® H at two locations: Pump Station 1-North (1-N) and Pump Station 1-South (1-S). The District contains 18.5 miles of earthen canals and 8.5 miles of cement-lined canals.

Findings

BBID has prepared an APAP to provide guidance in the controlled use of acrolein, an aquatic herbicide, in its water conveyance canals.

The APAP defines appropriate measures to be taken for the use of the herbicide that will prevent potential release or discharge to the environment. These measures are consistent with the manufacturer's instructions for the safe use and handling of the product. The APAP also includes implementation of a Water Quality Monitoring Plan, which includes chemical water quality monitoring and observational monitoring to measure and document the effective of the water quality control measures.

Application of the herbicide in the District's water conveyance canals, consistent with provisions in the APAP, can be performed without exposing non-target environmental resources to the herbicide.

Notification of application to interested agencies and water users will be performed in accordance with District procedures. Monitoring of herbicide concentrations in the canals will be performed to ensure the elimination of the herbicide from the conveyance system prior to returning the system to full operations.

It has been determined that the project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION has been prepared. No mitigation measures are required.

The attached Initial Study supports this determination.

Contents

Tables

Figures

Appendices

Attachments to Appendix A

Acronyms and Abbreviations

1-N	Pump Station 1-North
1-S	Pump Station 1-South
APAP	Aquatic Pesticides Application Plan
BBID	Byron-Bethany Irrigation District
BMP	Best Management Practice
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CTR	California Toxics Rule
District	Byron-Bethany Irrigation District
DMC	Delta Mendota Canal
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FWS	U.S. Fish and Wildlife Service
LOEL	Lowest Observed Effect Level
MRP	Monitoring and Reporting Program
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTR	National Toxics Rule
PCA	Pest Control Advisor
ppm	parts per million
QAC	Qualified Applicator's Certificate
QAL	Qualified Applicator's License
RWQCB	Regional Water Quality Control Board
SIP	Statewide Implementation Plan
SWRCB	State Water Resources Control Board
USGS	U.S. Geological Survey
WQO	Water Quality Objective

INITIAL STUDY

Byron-Bethany Irrigation District
Application of the Aquatic Herbicide Acrolein

effective for control of algae and weeds in BBID irrigation canals. One of the primary advantages of acrolein compared to other aquatic herbicides is that it rapidly dissipates from water by volatilization and degradation without leaving toxic residues (Eisler, 2000). Mechanical removal or physical treatment are not cost-effective canal maintenance techniques for the District. BBID has therefore selected acrolein as the most adequate and cost-effective herbicide for ensuring canal functionality and control.

1.2 Background

1.2.1 Location

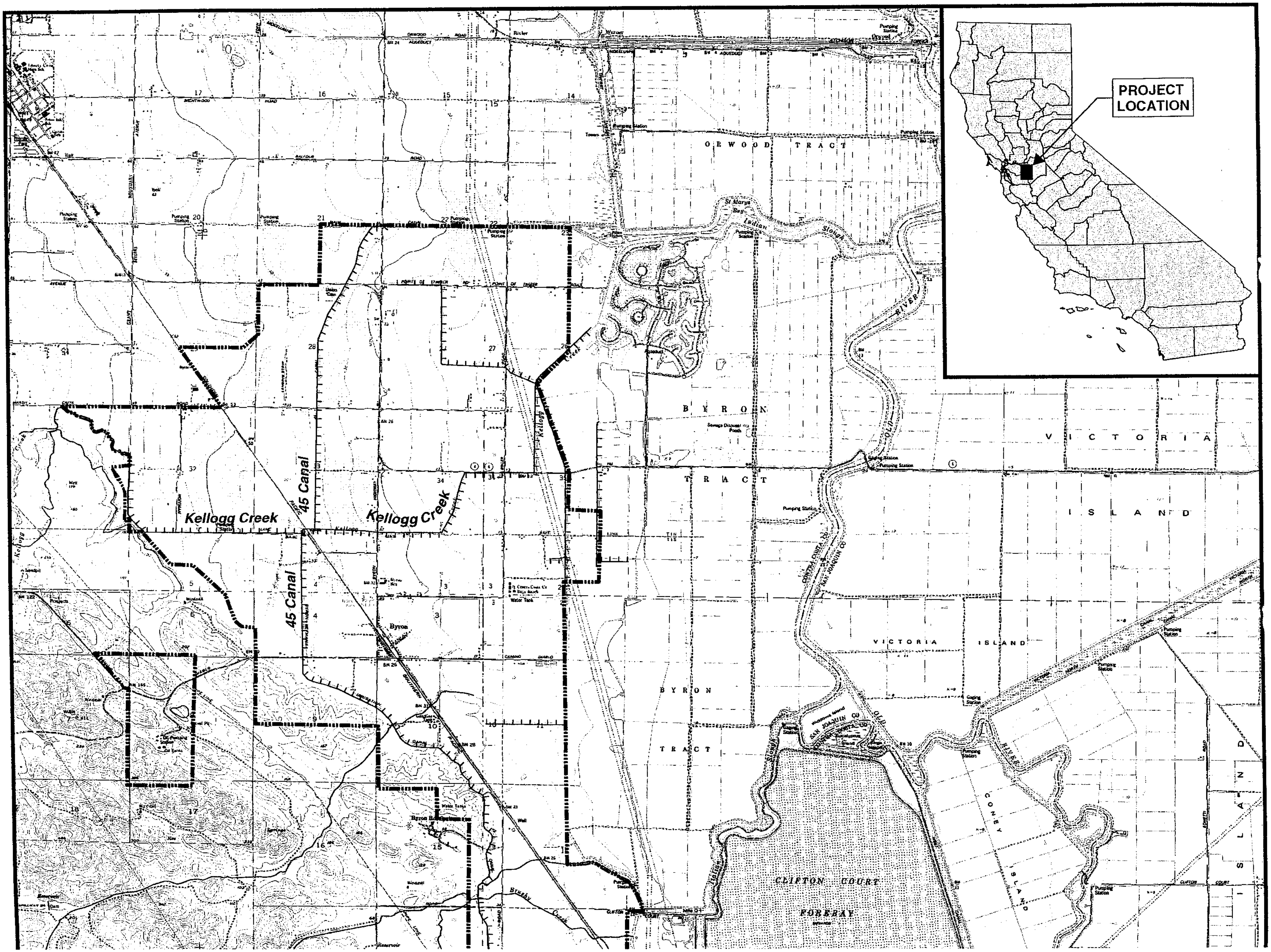
The BBID service area is divided into two service divisions. The northern and central portion (Byron Division) of the district is located in Contra Costa County; the southern portion (Bethany Division) is located in both Alameda and San Joaquin Counties. Figure 1-1 shows the District's location and major water conveyance and delivery features. BBID currently encompasses approximately 19,000 acres, of which 12,300 are irrigable acres.

1.2.2 Scope of Environmental Assessment

BBID owns, operates, and maintains approximately 27 miles of canals (including 18.5 miles of earthen canals and 8.5 miles of cement-lined canals) that convey water from BBID's two intakes along the California Aqueduct to water users within the District's service area. BBID treats its conveyance system with Magnacide® H Herbicide at two locations: Pump Station 1-North (1-N) and Pump Station 1-South (1-S).

The scope of the environmental assessment includes the evaluation of potential environmental impacts that could be reasonably anticipated to result from the application of acrolein pursuant to an APAP. The key surface waters, which are discussed in detail in Section 3 (Affected Environment) and Appendix A (Biological Reconnaissance Survey), in the project area include:

- BBID's canal system, the "Target Treatment Area"
- Kellogg Creek downstream of the radial gate
- Mountain House Creek downstream of the 120 Spillway



PROJECT LOCATION
ORWOOD TRACT
BYRON TRACT
VICTORIA ISLAND
CONEY ISLAND
CLIFTON COURT FOREBAY
Kellogg Creek
45 Canal
Indian Slough
OLD RIVER
Byron

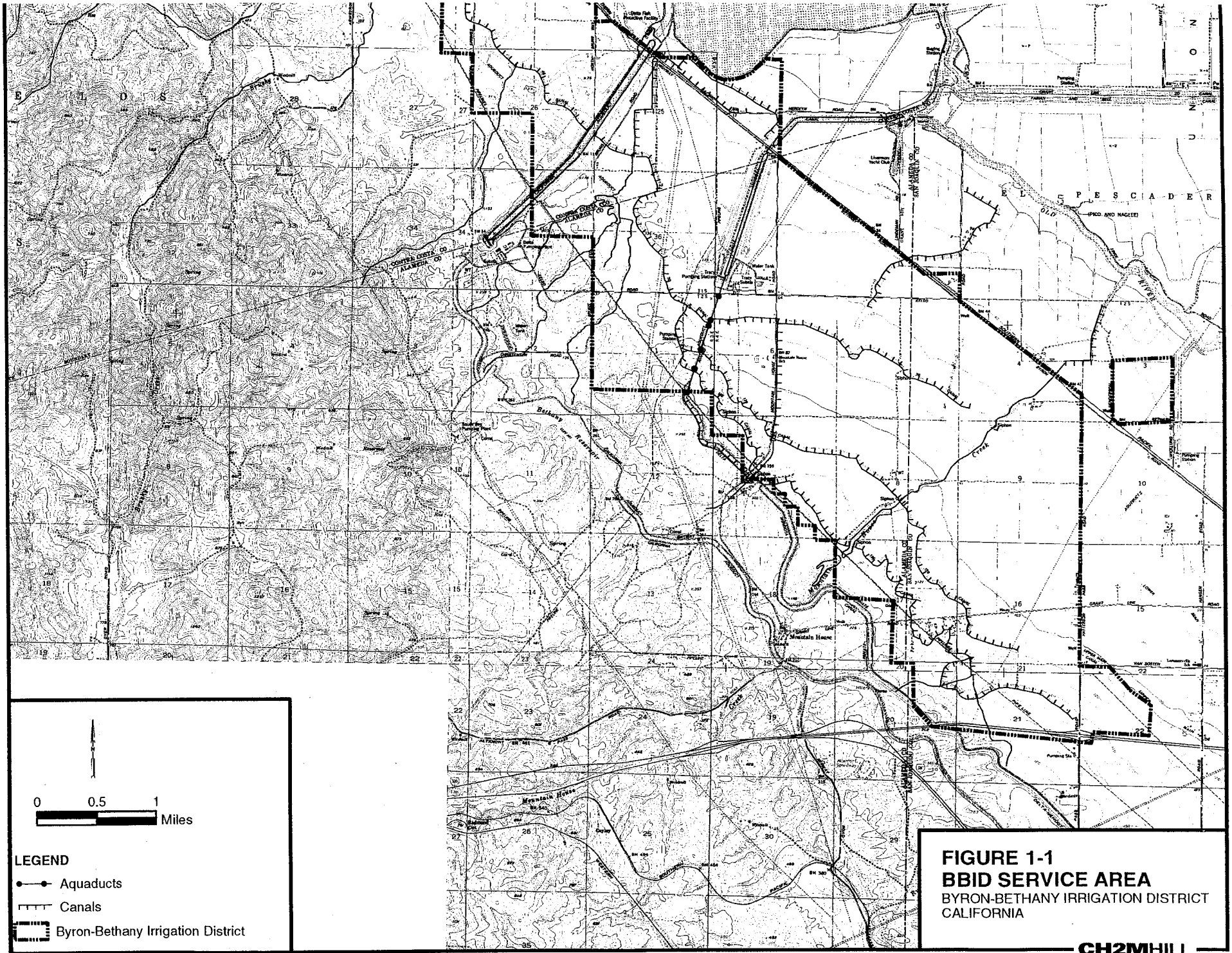


FIGURE 1-1
BBID SERVICE AREA
BYRON-BETHANY IRRIGATION DISTRICT
CALIFORNIA

CH2MHILL

SAC\\Zion\Publications\WATER\W022004007SAC_BBID\DocDesign\Figure 1-1.pdf 02/25/2004 10:27:40

1.2.3 Permits and Approvals for Proposed Project

1.2.3.1 NPDES Permit

BBID has determined that its acrolein application practices are regulated by a State Water Resources Control Board (SWRCB) general NPDES permit and that a categorical exception should be obtained to conduct its algae and aquatic weed control activities.

The discharge to waters of the United States of aquatic pesticides applied for aquatic weed and pest control is regulated by NPDES provisions of the Clean Water Act (Headwaters, Inc. vs. Talent Irrigation District).

On February 10, 2004, the SWRCB released a draft general NPDES permit applicable to discharges of aquatic pesticides to waters of the United States for a 30-day public review period. The permit is scheduled for adoption by the SWRCB as early as its March 18 meeting. The draft permit imposes requirements on any discharge of aquatic pesticides from public entities to waters of the United States in accordance with the SWRCB's *State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) (SWRCB, 2000).

The U.S. Environmental Protection Agency (USEPA) established numeric water quality criteria for Priority Pollutants, including acrolein, in the National Toxics Rule (NTR) and the California Toxics Rule (CTR). The SWRCB adopted the SIP to implement the CTR and applicable provisions of the NTR (SWRCB, 2000). The SIP established implementation provisions for: (1) chronic toxicity control, (2) priority pollutant criteria promulgated by the USEPA through the NTR and CTR, and (3) priority pollutant objectives established by Regional Water Quality Control Boards (RWQCBs) in their Basin Plans.

Under the SIP, discharges of priority pollutants are subject to water-quality based effluent limitations. Section 5.3 of the SIP allows for "categorical exceptions" from its requirements for resource or pest management (e.g., vector or weed control, pest eradication, or fishery management) conducted by public entities to fulfill statutory requirements. The California Water Code Sections 22075-22078 et seq. provide that an irrigation district may treat water for the beneficial use of water users in its service area.

Acrolein is a priority pollutant, and water quality criteria for acrolein are established in the CTR (USEPA, 2000). If an agency's use of acrolein (or other priority pollutants) may result in an exceedance of Water Quality Objectives (WQOs) in receiving waters, the agency must have been granted a categorical exception to exceed discharge limitations for the chemicals. The SWRCB requires that agencies applying for the categorical exception submit a technical report and evidence that an environmental analysis has been completed under CEQA.

SECTION 2

Description of Proposed Project

BBID proposes to apply Magnacide® H Herbicide, an aquatic herbicide containing the active ingredient acrolein, to control algae and aquatic weeds in canals within its service area. The application of herbicide may result in the discharge of acrolein to waters of the United States pursuant to the provisions of an applicable general NPDES permit. Compliance with the NPDES permit will be accomplished through conformance with an APAP, which is described below.

The APAP includes:

- program oversight and license requirements
- an application schedule
- an applicator education program
- specific water management measures to prevent the release of acrolein from treated canals to sensitive habitat
- public noticing requirements
- reporting requirements
- project monitoring

Table 2-1 specifies the details of each of these project components in greater detail.

TABLE 2-1
Aquatic Pesticides Application Plan

Component	Provisions
Canal Maintenance Program Oversight and License Requirements	BBID's canal maintenance program includes the use of acrolein to control algae and aquatic weeds. The canal maintenance program is overseen by the General Manager and is implemented by the Operations Supervisor. The General Manager holds a valid Agricultural Pest Control Adviser (PCA) license and a Qualified Applicator's License (QAL), and the Superintendent holds a valid Qualified Applicator's Certificate (QAC).
Application Schedule	Application of acrolein typically can begin as early as March and as late as May, and extend through the end of irrigation season, typically September. Applications typically occur every 14 to 21 days, depending on the presence of algae and/or aquatic weeds. The General Manager determines when an application is to occur. This determination is based on canal conditions.

TABLE 2-1
Aquatic Pesticides Application Plan

Component	Provisions
Application Practices	Applications are conducted consistent with the manufacturer's Application and Safety Manual (Baker Petrolite, 2001), including the product registration label. The rate and duration of dosage are determined based on the application guidance within the manual, and are dependent on weed conditions, flow, and water temperature. Applications are not to exceed 15 parts per million (ppm) Magnacide® H, as specified in the product manual (Baker Petrolite, 2001). Applications are made consistent with the instructions specified in the product manual. These instructions include provisions for record keeping; equipment inspection; personal protective equipment; care and placement of the nitrogen tank and the product tank; valve testing, opening, and closure; hose connection; application monitoring; and shutdown procedures.
Application Locations	BBID treats its conveyance system with the herbicide Magnacide® H at two locations: Pump Station 1-N and Pump Station 1-S.
Applicator Education Program	Annually, prior to the beginning of the irrigation season, BBID will conduct a Worker Environmental Awareness Education Program. Educational materials will be provided to all District staff engaged in the application of acrolein. A pamphlet/pocket guide will be prepared that will include pictures and descriptions of listed species, and a bulleted list of the appropriate procedures to follow in the unlikely event that listed species are observed within the canal system. These materials will be posted in an area visible to staff involved in the treatment process. Standard procedures will specify that, in the unlikely event that listed species are observed within the canal, the applicators will contact the General Manager and suspend application activities and the California Department of Fish and Game will be contacted to determine the appropriate next steps.
Water Management	**General:** During the application event, the canals are managed to prevent release of acrolein to Kellogg Creek and Mountain House Creek. Water levels in the canals are lowered specifically for the purpose of minimizing any risk of release of acrolein to the creeks, and the canals are held in a lower water condition for 24 hours. Normal canal operations are resumed 24 hours after the application of the herbicide, and diligent care is taken to prevent the release of canal water to the creeks. Lowering canal water levels ensures that no treated water is released from BBID canals for at least 24 hours following treatment. Within the retention period specified by the acrolein label instructions, all treated water within the canals is diverted by BBID customers. The swift degradation of acrolein during this period, along with dilution, ensures that herbicide potency dramatically decreases following treatment. **Byron Division:** In order to understand water delivery operations in the Byron Division, it is critical to understand the operations at the juncture of 45 Canal and Kellogg Creek. Pump Station 1-N supplies 45 Canal, the conveyance system for the Byron Division. 45 Canal flows north from 1-N to a radial gate located at the intersection of 45 Canal and Kellogg Creek. Kellogg Creek has four distinct channel sections, which are discussed in Section 3 and shown on Figure 3-1. These reaches are: (1) Reach 1: west of BBID, (2) Reach 2: from the BBID boundary to Pump Station 4, (3) Reach 3: from Pump Station 4 to 45 Canal, and (4) Reach 4: from the 45 Canal to Discovery Bay. • Reach 1 is located in the foothills to the west of BBID. This reach was not evaluated because it falls outside the project area. • Portions of reaches 2, 3, and 4 were included in the Biological Survey (Appendix A). Within these reaches, the creek bank is a modified and maintained channel; engineered uniform side slopes and a flat bottom are maintained by the District.

TABLE 2-1
Aquatic Pesticides Application Plan

Component	Provisions
Water Management (continued)	Reach 2 is an infrequently maintained section of channel that contains some riparian vegetation along the channel levee. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom. The terminus of this reach is Pump Station 4. • Reach 3 is a flat, highly maintained section of the channel, approximately one-mile in length, which long ago was modified from its natural state and incorporated into the District's irrigation delivery system. This reach begins at Pump Station 4. The reach contains a few landscaped trees along the outside levee and no in-channel vegetation. The terminus of this reach is 45 Canal. A radial gate is located in Kellogg Creek immediately downstream of the perpendicular crossing of 45 Canal and Kellogg Creek. As irrigation water from the 45 Canal south of Kellogg Creek flows into Reach 3, the radial gate prevents irrigation water from flowing downstream into Reach 4 and allows the District to bifurcate irrigation flows between the northern extension of 45 Canal and Reach 3. As irrigation water ponds against the radial gate, the water surface elevation in Reach 3 rises, allowing water to 1) flow north into the continuation of 45 Canal and 2) flow upstream (west) into Reach 3. As water flows upstream into Reach 3, it ponds against a concrete weir located in Kellogg Creek at Pump Station 4. The impounded irrigation water is then conveyed via Pump Station 4 to District customers. During the winter months when irrigation water is not being delivered, the radial gate in Kellogg Creek is kept open to allow any potential storm flows to pass into Reach 4. • Reach 4, which begins directly downstream of the radial gate, is channelized but is less maintained than Reach 3. One day prior to the application event, diversions into 45 Canal are reduced to about 30 cubic feet per second (cfs) to 50 cfs. This flow rate is adjusted as necessary to ensure that a minimum of 12-inches of freeboard is maintained at the radial gate to prevent spill to Reaches 2 and 4 of Kellogg Creek. Acrolein is applied at 1-N while canal flows remain in the 30 to 50 cfs range. The system (45 Canal and Reach 3 of Kellogg Creek) is held in this low water condition for one day, and no release is made to Kellogg Creek for a minimum of 24 hours. During this time, water users at the end of the canal system may divert water for on-farm use. After the one-day holding time, water deliveries and canal operations resume normal operations. **Bethany Division:** Pump Station 1-S supplies three main canals in the Bethany Division: 70 Canal, 120 Canal, and 155 Canal. These canals flow in a generally southern direction from 1-S. 70 Canal terminates at Gate 20 and does not spill to any natural creek or drainage. 120 Canal terminates south of Grant Line Road and includes the 120 Spillway, which discharges to Mountain House Creek. 155 Canal terminates near Mountain House Parkway, and does not spill to any natural creek or drainage. One day prior to the application event at 1-S, diversions into 70 Canal are reduced to about 30 to 50 cfs. This flow rate is adjusted as necessary to ensure that a minimum of 12-inches of freeboard is maintained at the 120 Spillway. Acrolein is applied at Pump Station 1-S while flows range from about 30 to 50 cfs. The system is held in this low water condition for one day, and no release is made to Mountain House Creek. During this time, water users along the canal system may divert water for on-farm use. After the one-day holding time, water deliveries and canal operations resume normal operations.

TABLE 2-1
Aquatic Pesticides Application Plan

Component	Provisions
Public Notice Requirements	**Drinking Water Providers:** Acrolein-treated water does not discharge in the vicinity of any municipal drinking water intakes; therefore, no drinking water providers are informed of the District's applications. **Water Users:** The District notifies water users at the upstream end of the Byron Division prior to each acrolein application, which allows water users to adjust their irrigation schedules to ensure that the herbicide remains in the canal to serve its treatment purpose. Additionally, the District notifies organic growers within the District prior to each acrolein application to allow the water users to adjust their irrigation schedules to protect their organic certifications. Consistent with the requirements of the general NPDES permit, the District will make an annual announcement of its plans to use acrolein and will provide a phone number that water users may call to obtain additional information regarding specific herbicide applications.
Reporting Requirements	The California Department of Fish and Game (CDFG) is notified of District's intent to use acrolein on an annual basis. Twenty-four (24) hours prior to each application, the District provides written notice to the County Agricultural Commissioner and CDFG, as required by the pesticide use label. Pursuant to the requirements of the general NPDES permit, the District will submit an annual report to the RWQCB that will include the following types of information: a summary of compliance or violation of the General NPDES Permit, identification of Best Management Practices (BMPs) or additional measures necessary to control the discharge of acrolein, pesticide use summaries, and monitoring results. Reports are to be submitted annually by March 1. The District also intends to comply with the additional reporting required by the Standard Provisions and Reporting portion of the General NPDES Permit. These include 24-hour reporting of noncompliance and reporting of anticipated noncompliance. It should be noted that the District does not anticipate noncompliance.
Project Monitoring	The Monitoring and Reporting Program (MRP) required under the general NPDES permit specifies receiving water monitoring requirements. Monitoring is to include background monitoring, event monitoring, and post-event monitoring. The District has entered into a contract with a consulting firm for the preparation of a Water Quality Monitoring Plan (WQMP). The Scope of Work for these services is included as Appendix XXX The WQMP will specify the monitoring frequency, monitoring stations, quality assurance/quality control measures, and the monitoring parameters. The monitoring program will include visual, physical, and chemical monitoring. The WQMP will be include two phases: the Initial (Study) Phase and the Long-Term Phase. During the Initial Phase, studies will be conducted to determine the proper timing of downstream sample collection and to establish the breakdown curves for acrolein within the canal systems. Monitoring will be conducted for the first application event of each irrigation season, and 20 percent of application events thereafter. Observational/visual monitoring will include procedures for the District operators to inspect the canal systems at Reaches 2 and 4 of Kellogg Creek and the 120 Spillway during and following an application event. This will provide the information necessary to adjust flow rates as necessary to ensure that a minimum of 12-inches of freeboard is provided at the radial gate and at the 120 Spillway. In addition, will also provide the opportunity to document the effectiveness of the water management measures. The frequency and duration of observational monitoring will be determined based on the results of the Initial Phase of the WQMP. The program will be implemented by the District or its designated representatives. Results of the water quality monitoring activities will be reported to the RWQCB on an annual basis.

SECTION 3

Affected Environment

The following discussion describes the existing environmental conditions for the environmental resources that could potentially be affected by the proposed project. The topics presented include those listed in Section 4, Environmental Checklist Form, which are associated with a potential less-than-significant impact. Those topics that are associated with no impact have been eliminated from further consideration.

3.1 Water Resources

3.1.1 General Setting

Rolling hills and numerous swales direct natural flow to four primary drainages within BBID: Kellogg, Frisk, Brushy, and Mountain House creeks. These drainages flow northeast towards the San Joaquin Delta and have been highly modified as a result of past agricultural and cattle ranching practices. These creeks have been largely channelized and no longer follow their original courses. Upstream (west) of BBID, the creeks have been modified in various locations to create stock ponds.

A reconnaissance survey of the District land and canals was conducted during a period of significant rainfall. Despite the precipitation, there was little water in the creeks. Kellogg Creek had no water flow and only small shallow pockets of standing water. Shallow water flows in Brushy Creek and Mountain House Creek were present. Flow in Mountain House Creek is primarily attributed to seepage from the California Aqueduct and the Delta Mendota Canal (DMC), while flow in Brushy Creek is predominantly stormwater runoff from Vasco Road (Gilmore, 2004).

3.1.2 Receiving Waters Outside the Target Treatment Area

There are two natural drainages that may receive operational spills from District water delivery operations. These are Kellogg Creek, located in the northern part of the District (Byron Division), and Mountain House Creek, located in the southern part of the District (Bethany Division). During acrolein applications, measures are taken to prevent the spill of acrolein to Kellogg and Mountain House creeks.

3.1.2.1 Kellogg Creek

Kellogg Creek has four distinct channel sections, which are shown on Figure 3-1. These reaches are:

- Reach 1: west of BBID
- Reach 2: from the BBID boundary to Pump Station 4
- Reach 3: from Pump Station 4 to 45 Canal
- Reach 4: from the 45 Canal to Discovery Bay

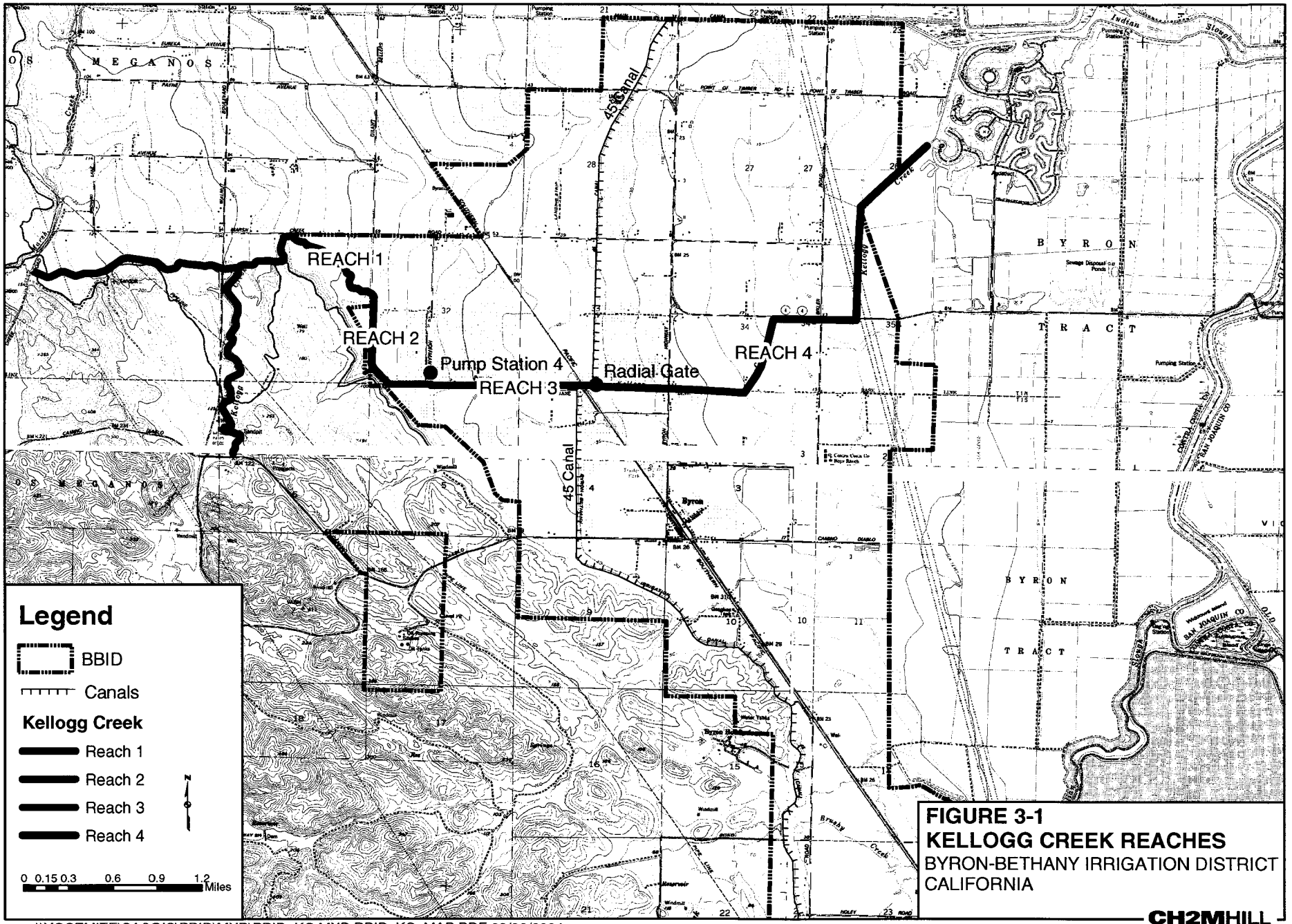


FIGURE 3-1
KELLOGG CREEK REACHES
BYRON-BETHANY IRRIGATION DISTRICT
CALIFORNIA

CH2MHILL

sac \\YOSEMITE\SACGIS\BBID\MXD\BBID_KC.MXD BBID_KC_MAP.PDF 03/03/2004

Reach 1 is located in the foothills to the west of BBID. This reach was not evaluated because it falls outside the project area.

Portions of reaches 2, 3, and 4 were included in the Biological Survey (Appendix A). Within these reaches, the creek bank is a designed and maintained channel; engineered uniform side slopes and a flat bottom are maintained by the District. Reach 2 is an infrequently maintained section of channel that contains some riparian vegetation along the channel levee. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom. The terminus of this reach is Pump Station 4.

Reach 3 is a flat, highly maintained section of the channel, approximately one-mile in length, which long ago was modified from its natural state and incorporated into the District's irrigation delivery system. This reach begins at Pump Station 4. The reach contains a few landscaped trees along the outside levee and no in-channel vegetation. The terminus of this reach is 45 Canal. A radial gate is located in Kellogg Creek immediately downstream of the perpendicular crossing of 45 Canal and Kellogg Creek. As irrigation water from the 45 Canal south of Kellogg Creek flows into Reach 3, the radial gate prevents irrigation water from flowing downstream into Reach 4 and allows the District to bifurcate irrigation flows between the northern extension of 45 Canal and Reach 3. As irrigation water ponds against the radial gate, the water surface elevation in Reach 3 rises, allowing water to (1) flow north into the continuation of 45 Canal and (2) flow upstream (west) into Reach 3. As water flows upstream into Reach 3, it ponds against a concrete weir located in Kellogg Creek at Pump Station 4. The impounded irrigation water is then conveyed via Pump Station 4 to District customers. During the winter months when irrigation water is not being delivered, the radial gate in Kellogg Creek is kept open to allow any potential storm flows to pass into Reach 4.

Reach 4, which begins directly downstream of the radial gate, is channelized but is less maintained than Reach 3. The channel is narrow (approximately 10 to 15 feet wide) and the banks are vegetated with dense black berry (*Rubus vitifolius*), small patches of willow (*Salix* sp.), and a variety of non-native plants. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom.

Although the Biological Survey was conducted in February, following a storm event, surveyed locations in Kellogg Creek lacked flow. District staff report that Reaches 2 and 4 are dry throughout the summer months when the canal system is in use.

3.1.2.2 Mountain House Creek

Mountain House Creek originates in the foothills east of the BBID service area boundary and flows in a westerly direction. The BBID canal system passes underneath the creek. However, a spillway can divert stormwater runoff and irrigation overflow into the creek. The creek is impounded just east of the DMC. Flow in the creek is perennial, primarily as a result of seepage from the California Aqueduct and the DMC. Residential development has recently been constructed near the lower reach of Mountain House Creek. Currently, in this reach, the creek is highly channelized.

3.1.3 Target Treatment Area

The Target Treatment Area is the area that the District treats for control of algae and aquatic weeds. The Target Treatment Area encompasses the District's canal system.

Byron Division: The Target Treatment Area within the Byron Division includes 45 Canal and Reach 3 of Kellogg Creek.

Bethany Division: The Target Treatment Area within the Bethany Division includes 70 Canal, 120 Canal, and 155 Canal.

3.2 Water Quality

3.2.1 Water Quality Standards

3.2.1.1 Beneficial Uses

Kellogg Creek and Mountain House Creek are located within the Sacramento-San Joaquin Delta Hydrologic Region. Many individual creeks in the Sacramento and San Joaquin River basins do not have unique designated beneficial uses. Rather, all of the waterbodies within a given hydrologic unit are given the same set of designated beneficial uses. The *Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins* (RWQCB, 1998) states that beneficial uses vary throughout the Delta, and that if necessary, site-specific determinations of beneficial uses can be made. The waterbodies within the Sacramento-San Joaquin Delta Hydrologic Region, including Kellogg and Mountain House creeks, have the following designated beneficial uses (RWQCB, 1998):

- Municipal Water Supply (MUN)
- Agriculture, Irrigation, and Stock Watering (AGR)
- Industry, Process (IND)
- Contact and Non-Contact Recreation (REC-I and REC-II)
- Warmwater Fisheries Habitat (WARM)
- Coldwater Fisheries Habitat (COLD)
- Migration (MIGR)
- Spawning (SPN)
- Wildlife Habitat (WILD)
- Navigation (NAV)

3.2.1.2 Receiving Water Limits

The general NPDES permit specifies receiving water limits for acrolein. The limits are summarized in Table 3-1. The general NPDES permit requires that an application event not result in the exceedance of water quality limits (namely, California Toxics Rule standards): (1) outside of the Target Treatment Area at any time, or (2) either within or outside of the Target Treatment Area anytime after the conclusion of application event. For acrolein application within the District, the conclusion of an application event is considered to be 24 hours following the application of the herbicide.

TABLE 3-1
Receiving Water Limitations for Acrolein-Based Aquatic Herbicide Application

Beneficial Use Designation	Limitation (micrograms per liter)	Reference
WARM and COLD	21	USEPA National Ambient Water Quality Criteria for Freshwater Aquatic Lie Protection, Lowest Observed Effect Level (LOEL)
MUN	320	CTR
Other than WARM, COLD, or MUN	780	CTR

Source: SWRCB, 2004 (General Permit).

Since Kellogg Creek and Mountain House Creek are designated WARM and COLD, the receiving water limitation of 21 micrograms per liter applies.

The addition of aquatic herbicides to irrigation water may exceed the CTR standard for a short time period within the canal to which it is applied; however, because BBID keeps treated water within its systems and takes measures to prevent releases of treated water, follows the labeling instructions pursuant to FIFRA, and operates with an applicable NPDES permit, the potential for any environmental impact from an exceedance of the CTR is remote. BBID intends to apply for an NPDES permit from SWRCB. Lowering canal water levels ensures that no treated water is released from BBID canals for at least 24 hours following treatment. Within the retention period specified by the acrolein label instructions, all treated water within the canals is diverted by BBID customers and used as irrigation supply water. Applications of acrolein will be made consistent with an APAP, which includes measures to prevent the release of treated water to Kellogg Creek and Mountain House Creek, and includes chemical water quality monitoring and observational monitoring to measure and document the effectiveness of water quality control measures.

3.3 Biological Resources

Biological resources in the project area are documented in Appendix A; the following discussion is a summary of the information contained in the technical appendix.

The creeks, swales, canals, and ditches provide habitat for amphibian species such as the Pacific treefrog (*Hyla regilla*). This species could be heard at several locations during the reconnaissance visit. Perennial water sources such as stockponds likely support the non-native bullfrog (*Rana catesbeiana*). This species is abundant in the Delta Region and is considered to have a negative impact on native species such as California red-legged frog. Western fence lizard (*Sceloporus occidentalis*) is likely to be common in the project area, as are other reptile species such as the Pacific gopher snake (*Pituophis melanoleucus catenifer*).

Observed bird species such as mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), western scrub-jay (*Aphelocoma coerulescens*), American robin (*Turdus migratorius*), and Northern mocking bird (*Mimus polyglottos*) are common in residential and otherwise disturbed areas. Black phoebes (*Sayornis nigricans*) are typically associated with waterbodies and were observed hawking insects over the canals and creeks. Killdeer

(*Charadrius vociferus*), greater yellowlegs (*Tringa melanoleuca*), great egrets (*Ardea alba*), and western meadowlarks (*Sturnella neglecta*) were observed foraging in adjacent grassland areas. Other migratory species such as ring-necked duck (*Aythya collaris*) and double-crested cormorants (*Phalacrocorax auritus*) were observed in the California Aqueduct.

BBID uses rodenticides along the canals to prevent burrowing in their levees. Small mammals such as California ground squirrel (*Spermophilus beecheyi*) are difficult to control and signs of their burrowing activity were evident throughout the area. Ground squirrels and other small mammals provide prey for raptor species such as red-tailed hawks (*Buteo jamiacensis*), which were seen circling over grassland and agricultural fields. American kestrels (*Falco sparverius*) were observed perched on road-side utility lines. A northern harrier (*Circus cyaneus*) was seen foraging in a low flight above Brushy Creek and the surrounding grassland.

Coyotes (*Canis latrans*) are likely common in the area, traveling between the Delta and the Altamont Hills. Muddy canal and creek bottoms were filled with common raccoon (*Procyon lotor*) tracks and a striped skunk (*Mephitis mephitis*) road kill was observed.

Some special-status species remain in limited numbers in developed areas but the majority of potentially significant habitat exists in non-native grasslands.

The California Natural Diversity Database (CNDDB) and U.S. Fish and Wildlife Service (FWS) county and quadrangle-specific species lists were used to search for federal and state special-status plant and wildlife species known to occur in the general vicinity (CNDDB, 2004; FWS, 2004). The CNDDB and FWS list searches were based on U.S. Geological Survey (USGS) topographical quadrangles (Midway, Clifton Court Forebay, Byron Hotsprings, Brentwood, and Woodward Island) in which BBID is located. Lands within BBID include documented habitat for a variety of special-status wildlife species. These include: fairy shrimp, the California tiger salamander, burrowing owl, San Joaquin kit fox, California red-legged frog, western pond turtle, and the curved-foot hygrotus diving beetle. The beetle is the only species reported in the CNDDB records as having been observed within the canal system.

The following characterizes habitat conditions in the area:

- Habitat for fairy shrimp may be found in vernal pools in lands outside the canals.
- Tiger salamanders are active during the winter rainy season and may use BBID canals to cross portions of their grassland habitat; however, they are typically underground during the late spring and summer irrigation season.
- Burrowing owls and the San Joaquin kit fox may use the creeks and canal systems as movement corridors, but breeding habitat is not supported.
- California red-legged frogs and western pond turtles, typically associated with perennial deep water habitats, have been recorded in local stock ponds adjacent to Kellogg, Brushy, and Mountain House creeks. It is not likely that these species would be found in the shallow water of downstream habitat in Kellogg and Mountain House creeks. Kellogg Creek is ephemeral and is likely dry during the irrigation season. It is unlikely that the downstream portions of Kellogg Creek provide habitat for aquatic species such as the red-legged frog during the spring and summer months.

- The curved-foot hygrotus diving beetle has been known to occur in BBID canals and the surrounding creeks and stock ponds; however, the canal system is not considered high-quality habitat for this invertebrate species.

Frisk and Bushy creeks and surrounding uplands provide potential habitat for special-status species. BBID canals pass over Frisk and Brushy creeks and do not include spill structures that would allow canal water to enter these drainages.

BBID canals do include spill points into Kellogg and Mountain House creeks. Kellogg Creek is ephemeral and carries little if no water during the irrigation season. Due to past modification and ephemeral flows, Kellogg Creek is not expected to provide habitat for common and special-status species downstream of the spill location. 120 Canal includes a spill point to Mountain House Creek. Mountain House Creek is less ephemeral and provides better quality habitat primarily due to leakage from the California Aqueduct and the DMC.

Overall, the BBID canals provide limited habitat for special-status plant and wildlife species, particularly during the spring and summer seasons. Vegetation control has been effective in keeping the canal beds free of significant rooted vegetation. The ephemeral flow and channel maintenance is not conducive to aquatic species and local special-status species. Therefore, it is unlikely that special-status species would be found in the canal channels during spring and summer months.

SECTION 4

Environmental Checklist Form

1. **Project title:**

   Application of the Aquatic Herbicide Acrolein in Conformance with Aquatic Pesticide Application Plan

2. **Lead agency name and address:**

   Byron-Bethany Irrigation District
   3944 Main Street
   Byron, CA 94514

3. **Contact person and phone number:**

   Rick Gilmore
   General Manager
   925-634-3534

4. **Project location:** Byron-Bethany Irrigation District, southeast Contra Costa, northeast Alameda, and western San Joaquin counties, CA

5. **Project sponsor's name and address:**

   Byron-Bethany Irrigation District
   3944 Main Street
   Byron, CA 94514

6. **General plan designation:**

   Agricultural

7. **Zoning:** Agricultural, Low-density residential, and public recreational

8. **Description of project:** (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

   The Byron-Bethany Irrigation District (BBID or District) is a multi-county special district formed under the provisions of the California Water Code, Section 20500 et seq. It is a public agency established for the purpose of providing water to the lands within portions of Alameda, Contra Costa, and San Joaquin counties.

   BBID proposes to apply Magnacide® H Herbicide, an aquatic herbicide containing the active ingredient acrolein, to control algae and aquatic weeds in canals within its service area. The application of herbicide may result in the discharge of acrolein to waters of the United States pursuant to the provisions of an applicable general National Pollution Discharge Elimination System (NPDES) permit. Compliance with the NPDES permit will be accomplished through conformance with an Aquatic Pesticides Application Plan (APAP).

   Specifically, the proposed project is treatment of the conveyance system with the herbicide Magnacide® H at two locations: Pump Station 1-North (1-N) and Pump Station 1-South (1-S). The District contains 18.5 miles of earthen canals and 8.5 miles of cement-lined canals.

   Application of acrolein can begin as early as March and as late as May, and extend through the end of irrigation season, September. Applications occur every 14 to 21 days, depending on the presence of algae and/or aquatic weeds.

   [Refer to Section 2 for further details.]

9. Surrounding land uses and setting: Briefly describe the project's surroundings:

BBID currently encompasses approximately 19,000 acres, of which 12,300 are irrigable acres. Existing land uses and zoning designations for the proposed site and vicinity include agricultural, low-density residential, and public recreational uses. Principal land uses in the region are row and field crops, pastures, and vineyards, although housing and industrial land uses are becoming more common. Recent residential development in the Mountain House subdivision in the Bethany Division.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

County agricultural commissioners for Alameda, Contra Costa, and San Joaquin counties

California Regional Water Quality Control Board (RWQCB) (Central Valley Region)

State Water Resources Control Board (SWRCB)

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

☐ I find that although the project could have a significant effect on the environment, there will not be a significant effect 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 project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

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

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

Signature — Date: 3/15/04

Signature — Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a. Earlier Analysis Used. Identify and state where they are available for review.

   b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

   a. the significance criteria or threshold, if any, used to evaluate each question; and

   b. the mitigation measure identified, if any, to reduce the impact to less than significance

ISSUES:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I. AESTHETICS – Would the proposed project:				
a) Have a substantial adverse effect on a scenic vista? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in physical changes to the landscape altering a recognized scenic vista or area of unique or outstanding visual character. **Findings**: The proposed project will not obstruct any scenic vista or area of unique or outstanding visual character. The project does not entail the construction of any new facilities that would change the physical character of the area.	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in physical changes to the landscape altering a recognized scenic resource within a state scenic highway. **Findings**: The proposed project will not damage scenic resources such as trees, rock outcroppings, and historic buildings within a state scenic highway. The project does not entail the construction of any new facilities that would change the physical character of the area.	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in physical changes to the landscape altering the existing visual character or quality of the site and its surroundings. **Findings**: The proposed project will not change the visual quality or character of the project site or its surroundings. The project does not entail the construction of any new facilities that would change the physical character of the area.	☐	☐	☐	☑
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would introduce a new source of substantial light and glare that would alter existing day or nighttime views. **Findings**: The proposed project will not produce new sources of light and glare that would alter existing day or nighttime views. No new sources of light or glare would be established with implementation of the proposed project.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
II. AGRICULTURE RESOURCES				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the proposed project:				
a) **Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?** **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would convert important farmlands to urban uses. **Findings**: The proposed project will not convert land from open space use/agricultural use to another use. No land use changes are proposed. The proposed activity is consistent and supportive of existing agricultural land uses.	☐	☐	☐	☑
b) **Conflict with existing zoning for agricultural use, or a Williamson Act contract?** **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in a conflict with existing zoning for agricultural use or a Williamson Act contract. **Findings**: The proposed project will have no effect on existing land uses and would not require an amendment to existing zoning. No land use changes are proposed. The proposed activity is consistent and supportive of existing agricultural land uses.	☐	☐	☐	☑
c) **Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?** **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would involve other changes in the existing environment, which could result in the conversion of Farmland to a non-agricultural use. **Findings**: The proposed project will not involve changes in the existing environment which could cause conversion of Farmland to non-agricultural use. No land use changes are proposed. The proposed activity is consistent and supportive of existing agricultural land uses.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
III. AIR QUALITY				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the proposed project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a significant adverse impact if air quality emissions from the project would exceed applicable air quality standards.				
Findings: The proposed project will not conflict with or obstruct implementation of an air quality plan, including that of the Bay Area Air Quality Management District Clean Air Plan. The proposed project would not increase the emission of a pollutant addressed in an applicable air quality plan.				
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a significant adverse impact if it would violate any air quality standard or contribute to an existing or projected air quality violation.				
Findings: The proposed project is not expected to violate any air quality standard. Although acrolein is designated as a Toxic Air Contaminant by the California Air Resources Board, there is no listed air quality standard for acrolein. The proposed project would not increase the emission of any pollutant for which an air quality standard has been adopted.				
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a significant adverse impact if it would violate any air quality standard or contribute to an existing or projected air quality violation.				
Findings: No air quality standard has been established for acrolein. The proposed project would not increase the emission of any pollutant for which the project region is in non-attainment.				
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a significant adverse impact if it would expose sensitive receptors to substantial pollutant concentrations.				
Findings: The proposed project will not expose sensitive receptors to substantial air pollutant concentrations. The proposed project would not increase the emission of any pollutant within the vicinity of sensitive receptors.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a significant adverse impact if it would create objectionable odors that would affect a substantial number of people.				
Findings: Operation of the proposed project has no potential to create odors that may be objectionable to a significant number of receptors. The proposed project is not in the vicinity of a significant number of receptors or other sensitive receptors.				
IV. BIOLOGICAL RESOURCES – Would the proposed project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑	☐
Threshold of Significance: The proposed project would have a substantial adverse effect if it would cause the loss of designated species either directly or through habitat modifications.				
Findings: Lands within BBID include documented habitat for a variety of special-status wildlife species. These include: fairy shrimp, the California tiger salamander, burrowing owl, San Joaquin kit fox, California red-legged frog, western pond turtle, and the curved-foot hygrotus diving beetle. The beetle is the only species reported in the California Natural Diversity Database (CNDDB) records as having been observed within the canal system. The following summarizes the findings with respect to sensitive species and habitats:				
• Habitat for fairy shrimp may be found in vernal pools in lands outside the canals and would not be affected by acrolein application.				
• Tiger salamanders are active during the winter rainy season and may use BBID canals to cross portions of their grassland habitat; however, they are typically underground during the late spring and summer irrigation season and would not be affected by acrolein application.				
• Burrowing owls and the San Joaquin kit fox likely use the creeks and canal systems as movement corridors; however, it is not expected that these terrestrial species would be adversely affected by regular use of acrolein.				
• California red-legged frogs and western pond turtles, typically associated with perennial deep water habitats, have been recorded in local stock ponds adjacent to Kellogg, Brushy, and Mountain House creeks. It is not likely that these species would be found in the shallow water of downstream habitat in Kellogg and Mountain House creeks. The additional precaution of closing gates from the canal to Brushy Creek during canal operation prevents the release of acrolein into potential habitat. Kellogg Creek is ephemeral and is likely dry during the irrigation season. It is unlikely that the downstream portions of Kellogg Creek provide				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
habitat for aquatic species such as the red-legged frog during the spring and summer application period. Water quality monitoring and observational monitoring will be implemented to measure and document the effectiveness of water quality control measures. • The curved-foot hygrotus diving beetle has been known to occur in BBID canals and the surrounding creeks and stock ponds; however, the canal system is not considered high-quality habitat for this invertebrate species. • It is unlikely that the BBID canal system itself provides significant habitat for special-status plant and wildlife species, particularly during the season of acrolein application. Therefore, the proposed project will not impact any species identified as a candidate, sensitive, or special-status species in the project vicinity.				
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 California Department of Fish and Game or U.S. Fish and Wildlife Service? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would diminish the habitat value of riparian habitat or other state or federal recognized sensitive natural communities through physical modification to such areas. **Findings:** The proposed project area does not include sensitive natural communities identified in any local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (FWS). California red-legged frogs and western pond turtles, typically associated with perennial deep water habitats, have been recorded in local stock ponds adjacent to Kellogg, Brushy, and Mountain House creeks. It is not likely that these species would be found in the shallow water of downstream habitat in Kellogg and Mountain House creeks. The additional precaution of closing gates from the canal to Brushy Creek during canal operation prevents the release of acrolein into potential habitat. Kellogg Creek is ephemeral and is likely dry during the irrigation season. It is unlikely that the downstream portions of Kellogg Creek provide habitat for aquatic species such as the red-legged frog during the spring and summer when the canals are treated with acrolein. Because the potential for any environmental impact from an exceedance of the California Toxics Rule (CTR) is remote, the impact is therefore considered less than significant.	☐	☐	☑	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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? **Threshold of Significance:** The proposed project would have a substantial adverse effect on federally protected wetlands if the project would directly remove, fill, or cause hydrologic interruption such that wetland functions and/or values were reduced or diminished. **Findings:** The application of aquatic herbicides will not adversely affect existing wetlands. The proposed project does not include the removal, filling, discharge to, or hydrological interruption of any wetlands.	☐	☐	☐	☑
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? **Threshold of Significance:** The proposed project would have a significant adverse effect if it would interfere with the movement of fish and wildlife through migration corridors by removing, obstructing, or physically changing corridors so as to diminish use. Additionally, the project would have a significant adverse effect if it would obstruct or diminish the quantity or quality of native nursery habitat. **Findings:** The application of aquatic herbicides would not affect the movement of any wildlife species, nor will it affect 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? **Threshold of Significance:** The proposed project would have a significant adverse impact if it would conflict with local policies or ordinances protecting biological resources. **Findings:** The proposed project is located within the boundary of the San Joaquin County Habitat Conservation; however, the proposed project does not conflict with any provisions contained within the Habitat Conservation Plan (HCP). The HCP is focused on maintenance of the habitat value of open space. The continued delivery of water to agricultural lands supports the maintenance of open space.	☐	☐	☐	☑
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local or regional habitat conservation plan? **Threshold of Significance:** The proposed project would have a significant adverse impact if it would hinder the implementation of an adopted Habitat Conservation Plan. **Findings:** The application of aquatic herbicides is not expected to conflict with provisions of adopted applicable conservation plans.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES – Would the proposed project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would directly alter or change the context of the project area such that the scientific, cultural, or social value of a historical resource within the project area is diminished. **Findings:** The proposed project would not affect the scientific, cultural, or social value of a historic resource within the project area. The proposed project does not include the alteration of any scientific, cultural, or historical resources.	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would directly alter or change the context of the project area such that the scientific, cultural, or social value of an archaeological resource is diminished. **Findings:** The proposed project is not expected to directly alter or change the context of the project's area. The scientific, cultural, or social value of an archeological resource will not be affected by the application of aquatic herbicides.	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in physical changes to the landscape, directly affecting or changing the context within which a paleontological resource or unique geologic feature exists, thereby diminishing its value. **Findings:** The application of aquatic pesticides will not affect any paleontological resource or unique geologic feature. The proposed project does not include the alternation of any scientific, cultural, or historical resources.	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside of formal cemeteries? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in physical changes to the landscape causing the potential to disturb human remains, including those interred outside of formal cemeteries. **Findings:** The application of aquatic pesticides would not result in physical changes to the landscape which would cause the potential to disturb human remains. The proposed project does not include any activity that could result in the potential to disturb human remains.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS – Would the proposed project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would expose people or structures to geological hazards or related hazards, such as ruptures of a known earthquake fault, strong seismic shaking, seismic related ground failure (e.g., liquefaction), landslides, soil erosion or loss of topsoil, unstable geologic unit, expansive soils, or soils incapable of supporting septic systems.				
Findings: The application of aquatic herbicides has no effect on geological features, and therefore will not expose people or structures to geological hazards or related hazards as a result of seismic activities.				
ii) Strong seismic ground shaking?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would result in strong seismic ground shaking.				
Findings: Refer to Response VI.a)i) above.				
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would result in seismic-related ground failure, including liquefaction.				
Findings: Refer to Response VI.a)i) above.				
iv) Landslides?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would result in landslides.				
Findings: Refer to Response VI.a)i) above.				
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would result in substantial soil erosion or the loss of topsoil.				
Findings: Refer to Response VI.a)i) above.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would be located on a geologic unit or soil that is unstable or would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. **Findings**: Refer to Response VI.a)i) above.	☐	☐	☐	☑
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? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would be located on expansive soil, creating substantial risks to life or property. **Findings**: The proposed project does not entail the construction of any building and has no effect on expansive soil. The proposed project would not cause a substantial adverse effect 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 waste water? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would be located on soils that are incapable of adequately supporting septic tanks or alternative wastewater disposal systems. **Findings**: The proposed project does not include the construction of septic tanks or any facility that may need to support the disposal of sewage. The application of aquatic pesticides will not require the use of septic tanks or alternative wastewater disposal systems.	☐	☐	☐	☑
VII. HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would expose the public and environment to hazardous materials. **Findings:** The proposed project may create a less than significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; however, such hazards are unlikely. Aquatic herbicides are safely transported: chemical transport vehicles are inspected regularly and a driver with a hazardous materials endorsement on his driver's license is used, as needed; Department of Transportation regulations are followed; and BBID has an excellent record due to training and efforts toward safety. BBID also has an excellent record regarding safe herbicide use: only applicators	☐	☐	☑	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
holding a valid Qualified Applicator's Certificate apply the aquatic herbicides, herbicide labels are followed, applicable laws and regulations are followed, and Pest Control Recommendations are used. BBID does not dispose of hazardous materials, but does properly return herbicide containers to the manufacturer as specified by the label instructions.				
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? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would expose the public and environment to hazardous materials. **Findings**: The proposed project may impact the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; however, the risk of such a hazard is less than significant. Refer to Response VII.a) above. BBID's past history of safety has been excellent in the proper storage, proper transport, and proper application of aquatic herbicides.	☐	☐	☑	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would expose the public and environment to hazardous materials. **Findings**: The proposed project does not include the use or handling of hazardous materials within one-quarter mile of an existing or proposed school.	☐	☐	☐	☑
d) Be located on a site, which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would be located on a recognized hazardous materials site and would cause the public or environment to come in contact with such materials. **Findings:** The proposed project is not located on a site which is listed as a hazardous materials site pursuant to Government Code Section 65962.5. The application of aquatic herbicides to irrigation water will not be located on a site that is included on a hazardous materials site list, and as a result, it would not expose the public or the environment to hazardous materials.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would result in a safety hazard for people residing or working in a project area that is within two miles of an airport. **Findings:** A portion of the proposed project area is located approximately one-quarter mile away from a landing strip. The project would not result in a safety hazard for people residing or working in the project area because the project is confined to irrigation canals which do not affect airplane operations.	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would result in a safety hazard for people residing or working in a project area that is within the vicinity of a private airstrip. **Findings**: Refer to Response 7.e).	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would impede emergency response or evacuation plans. **Findings:** The proposed project would not impede the implementation of emergency response or evacuation plans.	☐	☐	☐	☑
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? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would expose people or structures to risk of loss, injury, or death due to wildland fires. **Findings:** The proposed project will not 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 because the use of aquatic herbicides does not involve the use of fire.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY – Would the proposed project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☑	☐
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would cause conditions exceeding Central Valley Regional Water Quality Control Board water quality standards established in the applicable Basin Plan. **Findings:** The proposed project may result in an exceedance of the CTR standard for a short time period within the canal to which it is applied; however, because BBID keeps treated water within its systems and takes measures to prevent releases of treated water, follows the labeling instructions pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and operates with an applicable NPDES permit, the potential for any environmental impact from an exceedance of the CTR is remote and therefore considered less than significant. BBID intends to apply for an NPDES Permit from SWRCB. Lowering canal water levels ensures that no treated water is released from BBID canals for at least 24 hours following treatment. Within the retention period specified by the acrolein label instructions, all treated water within the canals is diverted by BBID customers and used as irrigation supply water. Treated water is not released to fish bearing waters. These water management measures ensure that the District complies with the herbicide label requirement that treated canal water only be used for irrigation of field crops where treated water remains on the field or held for six days prior to discharge to a fish-bearing waters. Chemical water quality monitoring and observational monitoring will be implemented to measure and document the effectiveness of water quality control measures.				
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would severely degrade or deplete an aquifer or interfered with groundwater recharge. **Findings**: The proposed project will not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. The proposed project will have no effect on water levels in pre-existing wells because it will not alter groundwater hydrology.				
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would cause accelerated erosion or siltation of waterbodies in the project vicinity.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Findings: The proposed project will not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site. The addition of the herbicides to irrigation water does not cause 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 which would result in flooding on- or off-site? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would cause or increase the severity of flooding on or off site. **Findings**: The proposed project will not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river. The application also will not substantially increase the rate or amount of surface runoff in a manner which would result in the alteration course of a stream or river. The application will not substantially increase the rate or amount of surface runoff. Treated systems are earthen ditches or concrete-lined channels and are not part of any stream or river. Aquatic herbicide application does not alter runoff. Applications are usually performed during dry summer months and, therefore, do not contribute to flooding.	☐	☐	☐	☑
e) Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would create or contribute runoff that results in exceeding the capacity of existing or planned stormwater drainage systems, or provides substantial additional sources of polluted runoff. **Findings**: The application of aquatic herbicides to irrigation water will not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. The systems treated are earthen ditches or concrete-lined irrigation channels and are not part of any stormwater drainage system. Treated water is not allowed to run off as or into stormwater drainage. Treated water is retained after application and eventually used within the BBID canal system.	☐	☐	☐	☑
f) Otherwise substantially degrade water quality? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it would degrade water quality to the degree that it impairs its beneficial use. **Findings**: The application of aquatic herbicides to irrigation water will not otherwise substantially degrade water quality. Aquatic herbicides are added to the irrigation system in order to maintain agricultural water delivery systems to convey high quality water for agricultural purposes. Aquatic herbicides also eliminate odor and clarity issues associated with excessive algae growth.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would place housing within a 100-year flood plain.				
Findings: The proposed project will not result in housing being constructed within a 100-year flood plain. The application of aquatic herbicides does not involve construction of housing structures.				
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would place structures within a 100-year flood hazard area, which would impede or redirect flood flows.				
Findings: The proposed project will not place within a 100-year flood hazard area structures which would impede or redirect flood flows. The application of aquatic herbicides does not involve construction of housing structures. No flood flows will be impeded or redirected, as the application typically occurs during dry summer months.				
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?	☐	☐	☐	☑
Threshold of Significance: The proposed project would cause a substantial adverse effect if it would expose people or structures to a significant risk of loss of property, injury, or death as a result of flooding or failure of a levee or dam.				
Findings: The proposed project will not 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. The application of aquatic herbicides could not cause flooding or the failure of a levee or dam.				
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it would expose people, structures, or land to inundation by seiche, tsunami, or mudflow as a result of changes to hydrological conditions.				
Findings: The project will not expose people, structures, or land to hazards such as seiches, tsunamis, or mudflows. Application of aquatic herbicides could not contribute to the kinds of seismic activities that would cause tsunamis or contribute to mudflows because of the relatively level ground on which these systems exist.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
IX. LAND USE AND PLANNING – Would the proposed project:				
a) Physically divide an established community? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would physically divide a community by a permanent barrier, such as a freeway, canal, or railroad, by which pedestrian or vehicle access to community features and services would be substantially impaired. **Findings**: The proposed project would not affect the physical arrangement or continuity of the local community. No new canals will be constructed as a part of this project.	☐	☐	☐	☑
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? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would conflict with the Alameda, Contra Costa, or San Joaquin County General Plans objectives and policies or Zoning Ordinances adopted for the purpose of avoiding or mitigating an environmental effect. **Findings**: The proposed project will not 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 plans, specific plans, 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? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would conflict with an applicable habitat conservation plan or natural community conservation plan. **Findings**: Refer to Response IV.f) above.	☐	☐	☐	☑
X. MINERAL RESOURCES – Would the proposed project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? **Threshold of Significance:** The proposed project would have a substantial adverse effect if significant mineral resources identified by the California Department of Conservation would be precluded from extraction. **Findings**: The project would not affect known mineral resources in the project area. Continued existence of the project canals and ditches will not affect the availability of mineral resources.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if locally important mineral resources would be precluded from extraction. The adverse effect may occur as a result of physical barrier to the mineral resource area or the creation of a conflicting land use between the project and the mineral resource area.				
Findings: The project would not affect locally-important mineral resources in the project area. No physical barriers will be constructed as a result of adding aquatic herbicides to irrigation canals.				
XI. NOISE – Would the proposed project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if construction or operation of the project would result in noise levels that would exceed applicable Alameda, Contra Costa, or San Joaquin County noise standards for various land uses.				
Findings: The application of aquatic herbicides to irrigation water will not 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. The introduction of these chemicals to irrigation canals involves small pumps that do not violate noise standards.				
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if construction or operation of the project would result in the generation of vibration or groundborne noise levels capable of damaging sensitive structures, interfering with land uses, or exposing people to excessive ground-borne vibration or ground-borne noise levels.				
Findings: The application of aquatic herbicides will not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels. The introduction of aquatic herbicides to irrigation water involves small pumps that do not create excessive ground-borne vibration or ground-borne noise levels.				
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if operation of the project would result in a permanent increase in ambient noise levels.				
Findings: The proposed project will not result in a substantial permanent increase in ambient noise levels above levels existing without the project because treating irrigation canals with herbicides involves small pumps that do not violate noise standards.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
Threshold of Significance: The project would have a substantial adverse effect if it would result in a temporary or periodic increase in ambient noise levels in the project vicinity.				
Findings: Refer to Response XI.a) above.				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it was located within two miles of a public airport or public use airport and would expose people residing or working in the project area to excessive noise levels.				
Findings: The proposed project will not expose people residing or working in the project area to excessive noise levels. Chemicals are added to irrigation channels in agricultural land using small pumps that do not violate noise standards.				
XII. POPULATION AND HOUSING - Would the proposed project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it would induce unplanned population growth in the Alameda, Contra Costa, or San Joaquin County General Plans areas (greater than that projected by the Plan). The adverse effect would result in increased demand on public infrastructure, public services, housing, circulation or other resources identified in the Plans.				
Findings: The proposed project will not induce substantial population growth in an area, either directly or indirectly. The use of aquatic herbicides is designed to help sustain agriculture by maintaining existing agricultural water delivery systems, and sustaining agriculture inhibits substantial population growth in those areas.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? **Threshold of Significance:** The proposed project would have a substantial adverse effect if physical construction and operation of the facility would require substantial numbers of existing housing to be displaced or require replacement housing to be constructed elsewhere. **Findings**: The project will not displace existing housing, nor would it require replacement housing to be constructed in another location.	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would displace substantial numbers of people and necessitate the construction of replacement housing elsewhere. **Findings**: The proposed project will not displace people.	☐	☐	☐	☑
XIII. PUBLIC SERVICES				
a) Would the proposed project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would create an increased need for new fire protection facilities and services, or would require construction of such services and associated facilities, potentially causing other significant environmental impacts to occur. **Findings:** The application of aquatic herbicides would not create an increased need for new fire protection services and therefore would not require the construction or operation of new fire protection facilities.	☐	☐	☐	☑
Police protection? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would create an increased need for new police protection facilities and services, or would require construction of such services and associated facilities, potentially causing other significant environmental impacts to occur. **Findings:** The project would not create an increased need for new police protection facilities; therefore, it would not require the construction or operation of new police protection facilities.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Schools? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would create an increased need for new school facilities and services, or would require construction of such services and associated facilities, potentially causing other significant environmental impacts to occur. **Findings:** The project would not require the construction or operation of new school facilities.	☐	☐	☐	☑
Parks? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would create an increased need for new park facilities and services, or would require construction of such services and associated facilities, potentially causing other significant environmental impacts to occur. **Findings:** The project would not create an increased need for new park facilities and therefore would not require the construction or operation of new park facilities.	☐	☐	☐	☑
Other public facilities? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would create an increased need for new governmental facilities and services, and other public services or facilities, or would require construction of such services and associated facilities, potentially causing other significant environmental impacts to occur. **Findings:** The project would not create the need for new government facilities and services; therefore, it would not require the construction or operation of other new facilities.	☐	☐	☐	☑
XIV. RECREATION a) **Would the proposed project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?** **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would create an increased need for new recreation facilities and services, or would require construction of such services and associated facilities, potentially causing other significant environmental impacts to occur. **Findings:** The project would not increase the demand for recreation facilities.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Does the proposed project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it included recreation facilities or would require the construction or expansion of such facilities, potentially causing other significant environmental impacts to occur.				
Findings: The proposed project does not include the construction or operation of new recreation facilities, nor does it include or require the expansion of existing recreation facilities.				
XV. TRANSPORTATION/TRAFFIC – Would the proposed project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it would cause an increase in traffic beyond the capacity of existing transportation systems.				
Findings: The proposed project does not entail actions that would increase traffic levels. The application of aquatic herbicides to irrigation water will not cause an increase in traffic. The use of aquatic herbicides is designed to sustain agriculture by maintaining agricultural water delivery systems. Agricultural areas have low populations and therefore reduced traffic.				
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it would cause an exceedance of a level of service standard.				
Findings: The proposed project does not entail actions that would increase traffic levels. The application of aquatic herbicides does not result in an exceedance of a level of service standard.				
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?	☐	☐	☐	☑
Threshold of Significance: The proposed project would have a substantial adverse effect if it would result in changes to air traffic patterns that could result in substantial safety risks.				
Findings: The proposed project does not entail the use or alteration of air traffic. The project will not alter air traffic patterns. No increased air safety risks would occur by applying aquatic herbicides.				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? **Threshold of Significance:** The proposed project would have a substantial adverse effect if construction or operation would result in hazardous design features being created on existing or planned roadways. An adverse effect would also result from incompatible roadway uses, inadequate emergency access, inadequate parking capacity, or inability to implement adopted alternative transportation programs. **Findings**: The proposed project does not include any traffic design features. The proposed project would not result in increased roadway hazards.	☐	☐	☐	☑
e) Result in inadequate emergency access? **Threshold of Significance:** The proposed project would have a substantial adverse effect if construction or operation would result in inadequate emergency access. **Findings**: The proposed project does not entail any construction or operation that would impact any emergency access. The project would not result in changes to existing emergency access.	☐	☐	☐	☑
f) Result in inadequate parking capacity? **Threshold of Significance:** The proposed project would have a substantial adverse effect if construction or operation would result in inadequate parking capacity. **Findings**: The proposed project does not include any actions related to parking demand or parking capacity. The project would not result in changes to parking demand or capacity.	☐	☐	☐	☑
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? **Threshold of Significance:** The proposed project would have a substantial adverse effect if construction or operation would conflict with adopted policies, plans, or programs that support alternative transportation modes. **Findings**: The proposed project does not entail the construction or operation of any facilities. The project would not conflict with adopted policies, plans, or programs that support alternative transportation modes.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
XVI. UTILITIES AND SERVICE SYSTEMS – Would the proposed project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? **Threshold of Significance:** The proposed project would have a substantial adverse effect if construction or operation would result in wastewater discharges exceeding waste discharge requirements (WDRs) established by the RWQCB. **Findings**: The proposed project does not include the discharge of any wastes that are subject to wastewater treatment requirements. The proposed project does not entail the discharge of any regulated pollutant to a wastewater treatment facility. The application of aquatic herbicides to irrigation water will not exceed wastewater treatment requirements of the RWQCB because the irrigation water to which the herbicide is applied will not be released from the District and treated in a wastewater treatment facility.	☐	☐	☐	☑
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? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would require or result in the construction, operation, or expansion of a water or wastewater treatment facility, which could cause significant environmental impacts. **Findings**: The proposed project does not include the consumptive use of water supplies. The proposed project will not result in the generation of any wastewater. Therefore, the project will not create a demand for the construction and operation of upgraded or expanded wastewater treatment facilities. Refer to Response XVI.a) above.	☐	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would require or result in new or expanded storm water drainage facilities, the construction and operation of which could cause significant environmental impacts. **Findings**: The proposed project does not include the alternation of any drainage patterns, nor does it include activities that would increase stormwater drainage. The proposed project will not require construction of new stormwater drainage to comply with flood control agency requirements. No significant adverse environmental effects related to existing stormwater drainage facilities would occur. Water treated with herbicide will not be directed into a stormwater drainage facility.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? **Threshold of Significance:** The proposed project would have a substantial adverse effect if new or expanded water supply entitlements would be needed that would cause other significant adverse environmental effects. **Findings**: The proposed project does not include the consumptive use of water supplies. The project does not require additional water rights.	☐	☐	☐	☑
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would result in a determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. **Findings**: Refer to Response XVI.b) above.	☐	☐	☐	☑
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? **Threshold of Significance:** The proposed project would have a substantial adverse effect if its solid waste disposal needs would cause the capacity of a landfill to be reached sooner than it would without the project. **Findings**: The proposed project includes the disposal of empty herbicide containers. The containers are returned to the product manufacturer, consistent with the instructions specified in the Magnacide ® H application and safety manual.	☐	☐	☐	☑
g) Comply with federal, state, and local statutes and regulations related to solid waste? **Threshold of Significance:** The proposed project would have a substantial adverse effect if it would not comply with federal, state, and local statutes and regulations related to solid waste. **Findings**: The proposed project includes the disposal of pesticide containers in accordance with the applicable regulations and statutes.	☐	☐	☐	☑
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the proposed project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate 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? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if it has the potential to degrade the quality	☐	☐	☑	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
of the environment, reduce habitat value so that impacts to fish and wildlife (as described above) would occur, or would eliminate important historic or prehistoric resources. **Findings:** The proposed project may have the potential to degrade the quality of the environment in the channels outside BBID's systems, But this potential is less than significant. Deliveries are not made outside a treated canal system on treatment day. The treated water is also retained and used within the BBID service area as the herbicide degrades and becomes more diluted over the subsequent five days. BBID employees are notified of treatments so they can take appropriate steps to keep treated water in the system. Structures where water can exit a BBID system are locked as required. CDFG is notified of treatments with a Notice of Intent (NOI) 24 hours in advance. Herbicide label directions are strictly followed, and canal personnel are on duty seven days per week. Growers are notified of treatments so they may account for this schedule in their irrigation plans and understand why certain deliveries of water will have to be curtailed on treatment days. BBID is acquiring an NPDES permit. Chemical water quality monitoring and observational monitoring will be implemented to measure and document the effectiveness of water quality control measures. The project will not cause a fish or wildlife population to drop below self-sustaining levels, nor will it threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal. BBID canals provide limited habitat for special-status plant and wildlife species, particularly during the spring and summer seasons. Vegetation control has been effective in keeping the canal beds free of significant rooted vegetation. The ephemeral flow and channel maintenance is not conducive to aquatic species and local special-status species. Therefore, it is unlikely that special-status species would be found in the canal channels during spring and summer months when acrolein is applied.				
b) Does the proposed project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? **Threshold of Significance:** The proposed project would cause a substantial adverse effect if its incremental effects would contribute to considerable environmental changes when considered in combination with other projects in the area. **Findings:** The proposed project will not act in a cumulative manner with other past, current, or foreseeable future projects to cause a significant adverse effect on the environment. The proposed project incorporates measures to avoid the discharge of herbicide to the environment which could result in cumulative effects to other environmental resources. BBID's system is an isolated system. No other projects or activities of the District will act in a cumulative manner with the proposed project.	☐	☐	☐	☑

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Does the proposed project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

Threshold of Significance: The proposed project would have substantial adverse effects if it would indirectly or directly impact human beings through environmental effects, as described in this checklist.

Findings: The application of aquatic herbicides to irrigation water could cause substantial adverse effects on human beings, either directly or indirectly. Because the District notifies all local water treatment plants and follows precise treatment schedules of acrolein, the local treatment plants avoid taking water which has been treated by the aquatic herbicide. BBID also follows all manufacturers labeling and FIFRA requirements, and a monitoring plan has been developed (see Section 5.)

SECTION 5

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SECTION 6

List of Preparers

Summer Bundy, Project Manager

Jeanne Brantigan, Water Resources and Water Quality

John Cleckler, Biological Resources and Habitat Assessment

Christine Arenal, Toxicology and Ecosystem Risks

Harry Ohlendorf, Toxicology and Ecosystem Risks

Richard Hunn, Senior Review

APPENDIX A

Biological Reconnaissance Survey of the Byron-Bethany Irrigation District Canal System and Receiving Waters Spill Points

Biological Reconnaissance Survey of the Byron-Bethany Irrigation District Canal System and Receiving Waters Spill Points

PREPARED FOR: Byron-Bethany Irrigation District

PREPARED BY: John Cleckler/CH2M HILL

DATE: March 3, 2004

Introduction

A reconnaissance-level survey was conducted on February 17, 2004, to characterize the distribution and relative abundance of general and sensitive biological resources within the Byron-Bethany Irrigation District (BBID or District). The primary focus was to characterize the area's habitat and potential species residing in the canal system and receiving waters that are potentially influenced by acrolein-treated waters. This included canal channels, spill point locations, and downstream areas of Kellogg and Mountain House creeks. Emphasis was placed on areas that are located below the high water mark. Observations of surrounding upland areas are anecdotal and provide information about the overall habitat within BBID. The survey focused on identifying potential special-status species habitat, wetlands, and wildlife movement corridors.

Project Description

BBID encompasses approximately 19,000 acres within portions of Alameda, Contra Costa, and San Joaquin counties. BBID manages approximately 27 miles of canals to provide water for approximately 12,300 irrigable acres. BBID is divided into two services divisions, the Bethany and Byron divisions. The Byron Division extends from the California Aqueduct north to approximately 2 miles south of the City of Brentwood (Attachment A, Figure 1). The Bethany Division extends along the eastern base of the Altamont Hills from Highway 580 north to the California Aqueduct. BBID is located on the Midway, Clifton Court Forebay, Byron Hotsprings, Brentwood, and Woodward Island U.S. Geological Survey (USGS) topographic quadrangles.

The irrigation district is dominated by agricultural lands and escalating residential development. The canals are primarily located adjacent to the agricultural fields that they serve, including orchards, vineyards, and row crops. Adjacent open land or ruderal[1] fields are used for grazing. Important habitat features that occur within the District include creeks, vernal pools, wetlands, reservoirs, and stock ponds.

[1] Ruderal: growing where the natural vegetational cover has been disturbed by humans.

Of BBID's 27 miles of canals, 8.5 miles are concrete lined while the remaining 18.5 miles are maintained earthen channels. Canal inundation and water delivery is scheduled to coincide with seasonal irrigation needs; therefore, operation typically starts by March and extends into September. The canal system crosses several natural drainages including Kellogg, Frisk, Brushy, and Mountain House creeks. Flow in the canals is siphoned under Frisk, Brushy, and Mountain House creeks. The canals include structures (spill points) that allow canal water to flow into the various creeks during high flow periods. For example, gates have been installed in the canal walls at Brushy Creek to allow flood water that overtops into the canal to flow back out into Brushy Creek during the winter. The canal also includes spill points into Kellogg and Mountain House creeks. During the off-season, Kellogg Creek and Mountain House Creek spill points are opened to prevent rainwater from accumulating in the canal system. The spill points are closed prior to irrigation season, when the canals are inundated. During canal use, spill into these two drainages is limited to events when canal capacity is exceeded.

During periods of extended inundation, algal blooms and pond weeds accumulate in the canals and create delivery system service problems. BBID has been controlling in-channel growth with the application of a herbicide, acrolein, since 1986. Before that time, it was controlled by mechanical means. Prior to each herbicide application event, canal water levels are dropped to minimize potential spill into Kellogg and Mountain House creeks. Water levels are typically raised one day following application.

Methods

Prior to the reconnaissance survey, relevant information from database and literature searches was compiled. The California Natural Diversity Database (CNDDB) and U.S. Fish and Wildlife Service (FWS) county and quadrangle-specific species lists were used to search for federal and state special-status plant and wildlife species known to occur in the general vicinity (CNDDB, 2004; FWS, 2004). The CNDDB and FWS list searches were based on the USGS topographical quadrangles (Midway, Clifton Court Forebay, Byron Hotsprings, Brentwood, and Woodward Island) in which BBID is located.

The reconnaissance survey was conducted on February 17, 2004. Activities conducted during the survey included driving the levee roads of representative sections of the canal system and foot surveys of the Brushy Creek canal crossing and the spill locations at Kellogg and Mountain House creeks.

Results and Discussion

Database and Literature Search

The database and literature searches resulted in a list of special-status plant and wildlife species previously identified and/or potentially occurring in the vicinity of the proposed project.[2] The list is included as a table in Attachment B. The table also includes habitat typically associated with each species, critical seasonal periods associated with the species' natural history, and general comments.

[2] The usefulness of the CNDDB and FWS references depends upon the number of previous surveys performed in the area, and whether special-status species observations have been properly reported to the CNDDB database. Therefore, these references are only used as an indicator of the species that could potentially occur and are not intended to provide an exhaustive list.

Reconnaissance Survey

The reconnaissance survey was performed during the late winter/early spring, which is not an optimal time for assessing the biological character of a given area. Blooming annuals were not present during the survey and overall wildlife activity was low. The following results must be considered with these limitations. A general assessment was made regarding the biological resources in BBID and the potential for plant and wildlife species associated with the general vicinity to occur. Background information from the literature search and database search results were instrumental in understanding the area's resource potential.

General Setting

BBID's general setting is typical of the San Joaquin Valley-Delta region. The area experiences a dry Mediterranean climate moderated by fog and strong winds. The landscape has been highly modified by a long history of farming and cattle ranching. The majority of the surrounding land is in agricultural production. Remaining open lands are characterized as non-native grasslands and are used for cattle grazing. Some of these areas have retained their natural topography and continue to support habitat features such as swales and vernal pools. These areas provide important habitat for a variety of common and special-status species, and at some locations have been preserved as mitigation banks (e.g., Brushy Creek Conservation Bank). Agricultural fields and open land is quickly being converted to residential development. Large housing communities such as the Mountain House development are spreading northwest into BBID from the City of Tracy.

BBID abuts the Altamont Hills and Diablo Range to the west. This region of the Coastal Range is primarily undeveloped and is dominated by large expanses of non-native grassland that provide important habitat for a range of special-status species, including various fairy shrimp species, California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana aurora draytonii*), and golden eagle (*Aquilla chrysaetos*).

Rolling hills and numerous swales direct surface water flow to four primary drainages within BBID: Kellogg, Frisk, Brushy, and Mountain House creeks. (Frisk and Brushy creeks were not considered potential receiving waters during the acrolein application period.) These drainages flow northeast towards the San Joaquin Delta and have been highly modified as a result of past agricultural and cattle ranching practices. Kellogg and Mountain House creeks have been channelized and no longer follow their original courses. Upstream (west) of BBID, the creeks have been modified in various locations to create stock ponds.

The reconnaissance survey was conducted during a period of significant rainfall. Despite the precipitation, there was little water in the creeks. Kellogg Creek had no water flow and only small shallow pockets of standing water. Shallow water flows in Brushy Creek and Mountain House Creek were present. Flow in Mountain House Creek is primarily attributed to seepage from the California Aqueduct and Delta Mendota Canal (DMC), while flow in Brushy Creek is primarily stormwater runoff from Vasco Road (Gilmore, 2004).

Vegetative Communities

At the time of the survey, the canals were primarily dry and vegetation-free. Rooted vegetation was limited to non-native grasses in the earthen channel of the Kellogg Creek portion of the canal system. Aquatic species such as algae and pond weeds develop in the inundated canals during the spring and summer. In order to minimize irrigation delivery issues, BBID continues a long practice of vegetation management in the canal system.

Kellogg Creek. Kellogg Creek has four distinct channel sections, which are shown on Attachment A, Figure 2. These reaches are:

- Reach 1: west of BBID
- Reach 2: from the BBID boundary to Pump Station 4
- Reach 3: from Pump Station 4 to 45 Canal
- Reach 4: from the 45 Canal to Discovery Bay

Reach 1 is located in the foothills to the west of BBID. This reach was not evaluated because it falls outside the project area.

Portions of reaches 2, 3, and 4 were included in the Biological Survey (Appendix A). Within these reaches, the creek bank is a modified and maintained channel; engineered uniform side slopes and a flat bottom are maintained by the District. In addition, within this reach, vegetation control is performed.

Reach 2 is an infrequently maintained section of channel that contains some riparian vegetation along the channel levee. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom. The terminus of this reach is Pump Station 4.

Reach 3 is a flat, highly maintained section of the channel, approximately one-mile in length, which long ago was modified from its natural state and incorporated into the District's irrigation delivery system. This reach begins at Pump Station 4. The reach contains a few landscaped trees along the outside levee and no in-channel vegetation. The terminus of this reach is 45 Canal. A radial gate is located in Kellogg Creek immediately downstream of the perpendicular crossing of 45 Canal and Kellogg Creek. As irrigation water from the 45 Canal south of Kellogg Creek flows into Reach 3, the radial gate prevents irrigation water from flowing downstream into Reach 4 and allows the District to bifurcate irrigation flows between the northern extension of 45 Canal and Reach 3. As irrigation water ponds against the radial gate, the water surface elevation in Reach 3 rises, allowing water to 1) flow north into the continuation of 45 Canal and 2) flow upstream (west) into Reach 3. As water flows upstream into Reach 3, it ponds against a concrete weir located in Kellogg Creek at Pump Station 4. The impounded irrigation water is then conveyed via Pump Station 4 to District customers. During the winter months when irrigation water is not being delivered, the radial gate in Kellogg Creek is kept open to allow any potential storm flows to pass into Reach 4.

Reach 4, which begins directly downstream of the radial gate, is channelized but is less maintained than Reach 3. The channel is narrow (approximately 10 to 15 feet wide) and the banks are vegetated with dense black berry (*Rubus vitifolius*), small patches of willow (*Salix* sp.), and a variety of non-native plants. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom.

Although the Biological Survey was conducted in February, following a storm event, surveyed locations in Kellogg Creek lacked flow. District staff report that Reaches 2 and 4 are dry throughout the summer months when the canal system is in use.

Brushy Creek. Brushy Creek is narrow and shallow but less influenced by channel modification. In the vicinity of the BBID canal crossing, Brushy Creek winds through the natural swales of a non-native grassland area used for cattle grazing. The creek is choked

with cattails (*Typha* sp.) and includes several branches and backwater areas. The surrounding area includes vernal pools, which provide likely breeding habitat for fairy shrimp species and California tiger salamander. At the canal intersection, Brushy Creek has been diverted under the canal. However, Brushy Creek can overtop its banks following heavy winter rains. To prevent flood waters from spilling into and accumulating in the canal, gates are located on either side of the canal to allow Brushy Creek to flow in a perpendicular course from one side of the canal and out the other. These gates are closed in the spring and summer when the canal is inundated and Brushy Creek flows are down.

Mountain House Creek. Mountain House Creek is located at the bottom of a deep and wide channel. Vegetation has been subjected to long-term cattle grazing but cattails grow along the stream margins and occasional willows are located within the channel. The BBID canal system passes underneath the creek. However, a spillway diverts off-season runoff and irrigation overflow into the creek. A creek restoration effort is currently underway immediately downstream of the BBID crossing. Restoration is adjacent to a new residential development and will include public access trails along with riparian vegetation planting.

Wildlife

Despite significant habitat modification and agricultural and residential development, the general area provides habitat for a wide range of common wildlife species.

The creeks, swales, canals, and ditches provide habitat for amphibian species such as Pacific treefrog (*Hyla regilla*). This species could be heard at several locations during the reconnaissance visit. Perennial water sources such as stockponds likely support the non-native bullfrog (*Rana catesbeiana*). This species is abundant in the Delta Region and is considered to have a negative impact on native species such as California red-legged frog. Western fence lizard (*Sceloporus occidentalis*) is likely to be common in the area, as are other reptile species such as Pacific gopher snake (*Pituophis melanoleucus catenifer*).

Observed bird species such as mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), western scrub-jay (*Aphelocoma coerulescens*), American robin (*Turdus migratorius*), and Northern mocking bird (*Mimus polyglottos*) are common in residential and otherwise disturbed areas. Black phoebes (*Sayornis nigricans*) are typically associated with waterbodies and were observed hawking insects over the canals and creeks. Killdeer (*Charadrius vociferus*), greater yellowlegs (*Tringa melanoleuca*), great egrets (*Ardea alba*), and western meadowlarks (*Sturnella neglecta*) were observed foraging in adjacent grassland areas. Other migratory species such as ring-necked duck (*Aythya collaris*) and double-crested cormorants (*Phalacrocorax auritus*) were observed in the intake channel of the California Aqueduct.

BBID uses rodenticides along the canals to prevent burrowing in levees. Small mammals such as California ground squirrel (*Spermophilus beecheyi*) are difficult to control and signs of their burrowing activity were evident throughout the area. Ground squirrels and other small mammals provide prey for raptor species such as red-tailed hawks (*Buteo jamiacensis*) which were seen circling over grassland and agricultural fields. American kestrels (*Falco sparverius*) were observed perched on road-side utility lines. A northern harrier (*Circus cyaneus*) was seen foraging in a low flight above Brushy Creek and the surrounding grassland.

Coyotes (*Canis latrans*) are likely common in the area, traveling between the Delta and the Altamont Hills. Muddy canal and creek bottoms were filled with common raccoon (*Procyon lotor*) tracks and a striped skunk (*Mephitis mephitis*) road kill was observed.

A list of wildlife species observed or otherwise detected during the reconnaissance visit is included in Attachment C. The list is the result of one day of observation and does not adequately represent the wildlife species that utilize the surrounding habitat throughout the year.

Special-Status Species

Lands within the area include documented habitat for a variety of special-status wildlife species. Vernal pools provide habitat for special-status fairy shrimp and also provide important breeding habitat for California tiger salamanders that occupy burrows and other cover sites in the surrounding grassland areas adjacent to the canals. Tiger salamanders are active during the winter rainy season and likely crawl through the BBID canals that bisect portions of their grassland habitat. However, they are typically underground during the BBID late spring and summer irrigation season and would not be adversely affected by acrolein application.

Burrowing owls have also been observed in the grassland areas and also use ground squirrel burrows in modified areas such as the canal levees. San Joaquin kit fox (*Vulpes macrotis mutica*) likely use the creeks and canal systems as movement corridors. However, it is unlikely that these terrestrial species would be adversely affected by the regulated use of acrolein.

California red-legged frogs and western pond turtles (*Clemmys marmorata*) have been recorded in local stock ponds adjacent to Kellogg, Brushy, and Mountain House creeks. Both species are typically associated with perennial water habitats with deep water refugia. It is not likely that these species would be found in the shallow water of downstream habitat in Kellogg and Mountain House creeks. Red-legged frogs and turtles may use these portions of the creeks as movement corridors between habitats.

The BBID canal system itself is not likely to provide significant habitat for special-status plant and wildlife species. The ephemeral inundation of the canal system and the distribution of water through pumps, gates, and siphons are not conducive to aquatic species. The curved-foot hygrotus diving beetle (*Hygrotus curvipes*), a state species of concern, is the only species reported in the CNDDB records as having been observed within the canal system. This species is also found in the surrounding creeks and stock ponds. Although this species has been known to occur in the BBID canals, the canals are not considered high-quality habitat for this invertebrate species.

Stock ponds and in-stream pools located along Kellogg, Brushy, and Mountain House creeks upstream of the BBID canal crossings are known to provide habitat for special-status species such as California red-legged frogs and western pond turtle. Gates connecting the canal to Brushy Creek are closed during canal operation preventing the release of acrolein into downstream creek habitat. Kellogg Creek is ephemeral and is likely dry during the irrigation season. It is unlikely that the downstream portions of Kellogg Creek provide habitat for aquatic species or special-status species such as California red-legged frog during the spring and summer.

The California Aqueduct and Mendota Canal leakage is responsible for maintaining Mountain House Creek as a perennial drainage. Spring and summer flows are likely low volume but perennial enough to support wetland and riparian vegetation and potential habitat for California red-legged frog.

Conclusions

BBID is a historical agricultural area further developed by encroaching residential development. Areas not converted to crops or homes and business are used for cattle grazing. Native plant and wildlife species can be found throughout the area. Some special-status species remain in limited numbers in developed areas but the majority of potentially significant habitat exists in non-native grasslands.

- The BBID canals provide limited habitat. Vegetation control has been effective in keeping the canal beds free of significant rooted vegetation. The canals only hold water during the spring and summer irrigation season. The ephemeral flow and channel maintenance is not conducive to aquatic species and local special-status species. Therefore, it is unlikely that special-status species would be found in the canal channels during acrolein application periods. They are therefore unlikely to be adversely affected.
- BBID canals pass under Frisk and Brushy creeks. Although these creeks and surrounding uplands provide potential habitat for special-status species, the canal crossings do not include spill structures that would allow canal water to enter the drainages during periods of acrolein application. Therefore, species that occur in Frisk and Brushy creeks are unlikely to be adversely affected by acrolein application.
- Reaches 1 and 2 are located upstream of the proposed project area; therefore, the proposed project will not adversely affect habitat or special status species located in Reaches 1 or 2.
- During the irrigation season, Reach 3 is incorporated into the BBID irrigation delivery system. Due to past modification and existing canal maintenance, Reach 3 is not expected to provide habitat for common and special-status species.
- 45 Canal includes a spill point to Kellogg Creek. Kellogg Creek is ephemeral and carries little if no water during the irrigation season. Due to past modification and ephemeral flows, Kellogg Creek is not expected to provide habitat for common and special-status species in Reach 4, located downstream of the spill location. As a result, accidental spill of acrolein-treated water is not likely to have a significant adverse impact on common or special-status species. The proposed project includes measures to prevent the spill of acrolein into this drainage, therefore, use of acrolein in the BBID canals is not likely to have significant adverse effects on common or special-status species.
- 120 Canal includes a spill point (the 120 Spillway) to Mountain House Creek. Mountain House Creek is less ephemeral and provides better quality habitat primarily due to leakage from the California Aqueduct and the DMC. Ongoing restoration may increase the habitat immediately downstream of the spill point. Spill of acrolein-treated water into this drainage may adversely affect common and special-status plant and wildlife species associated with this limited stretch of habitat. The proposed project includes measures to prevent the spill of acrolein into this drainage, therefore, use of acrolein in the BBID canals is not likely to have a significant adverse effects on common or special-status species.

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ATTACHMENT A

BBID Service Area and Kellogg Creek Reaches

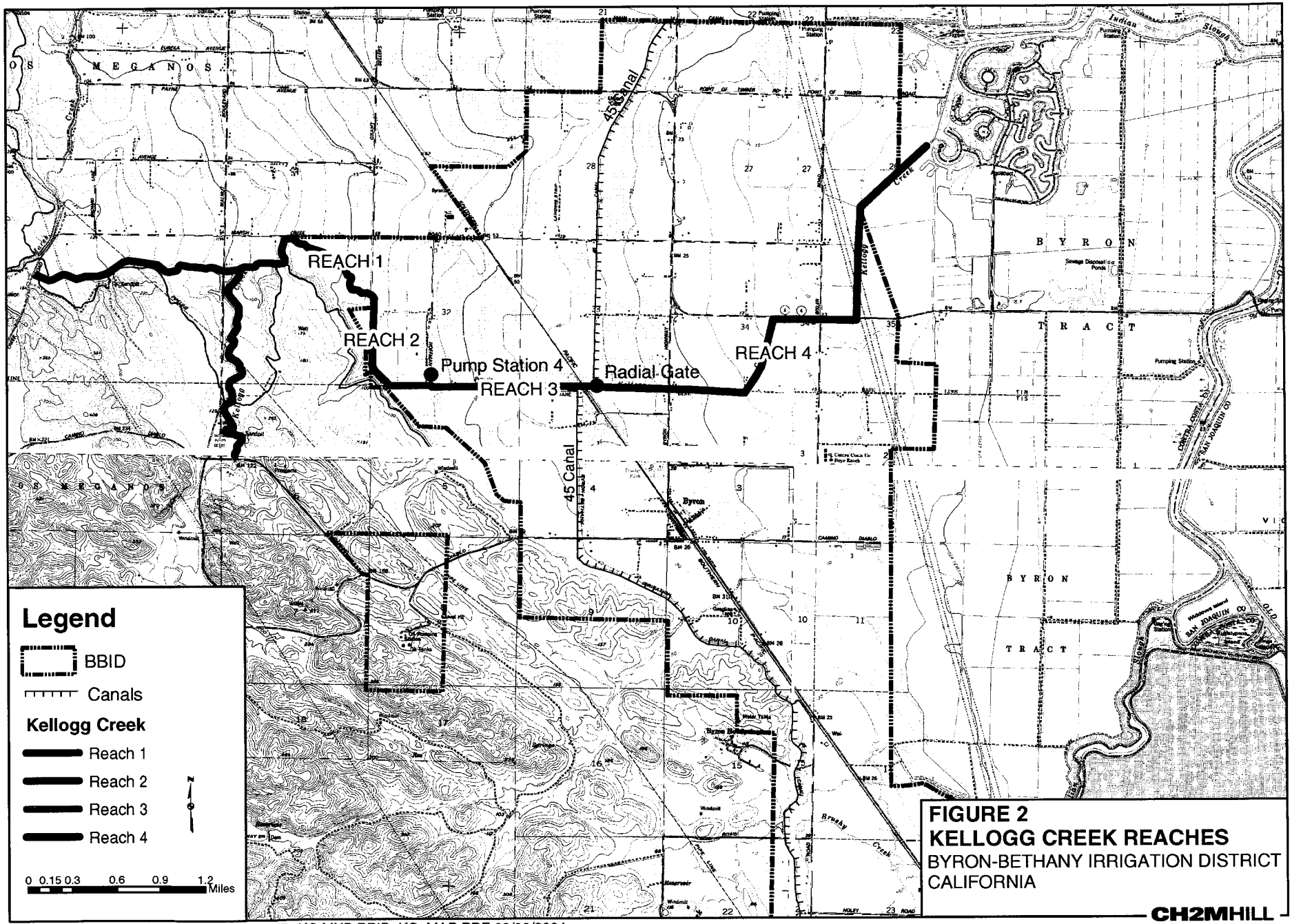

FIGURE 2
KELLOGG CREEK REACHES
BYRON-BETHANY IRRIGATION DISTRICT
CALIFORNIA

CH2MHILL

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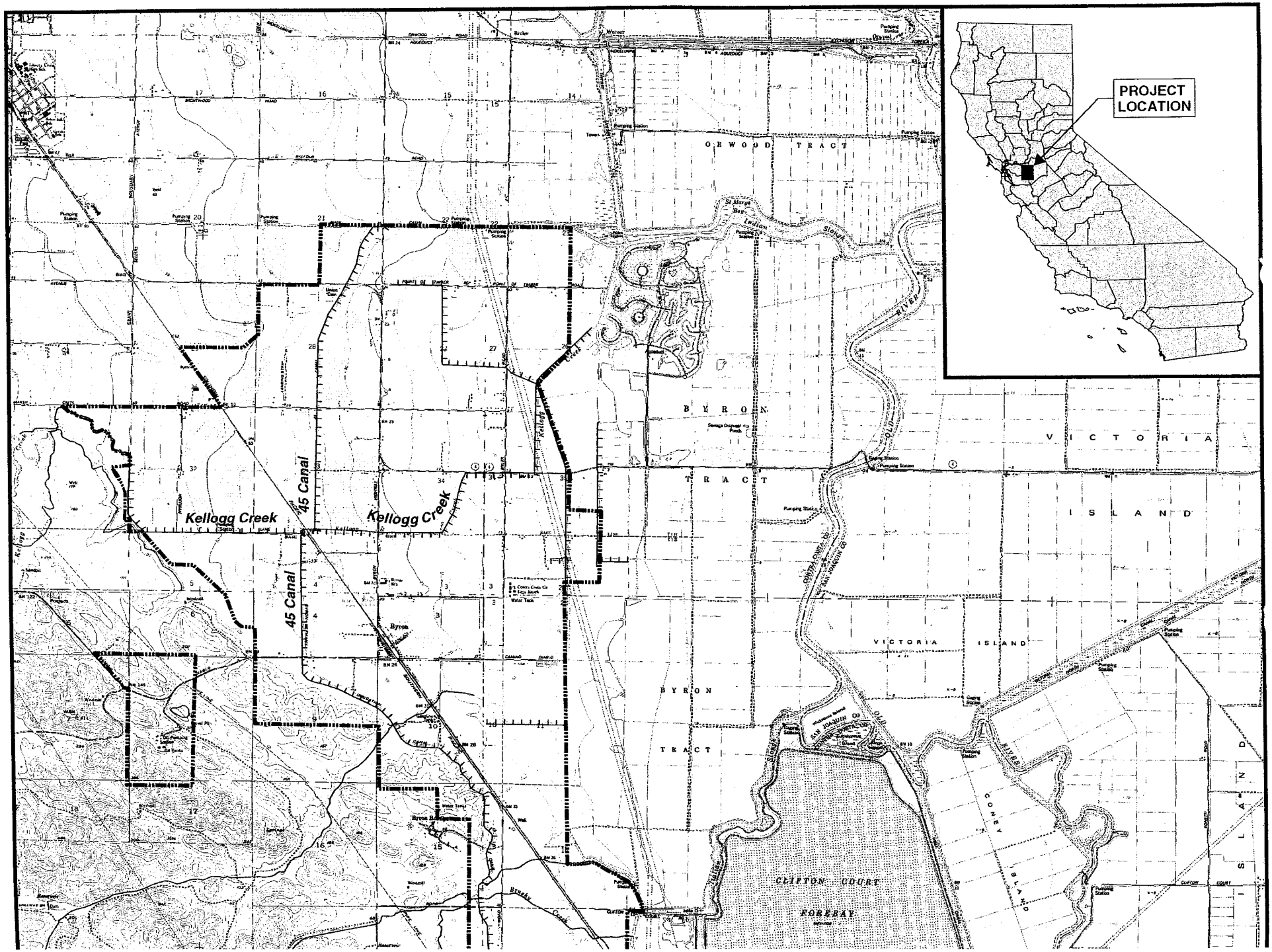
PROJECT LOCATION
OLIVEWOOD TRACT
BYRON TRACT
VICTORIA ISLAND
Kellogg Creek
Kellogg Creek
45 Canal
45 Canal
Byron
CLIFTON COURT FOREBAY
CONEY ISLAND
SAN JOAQUIN CO.
CONTRA COSTA CO.

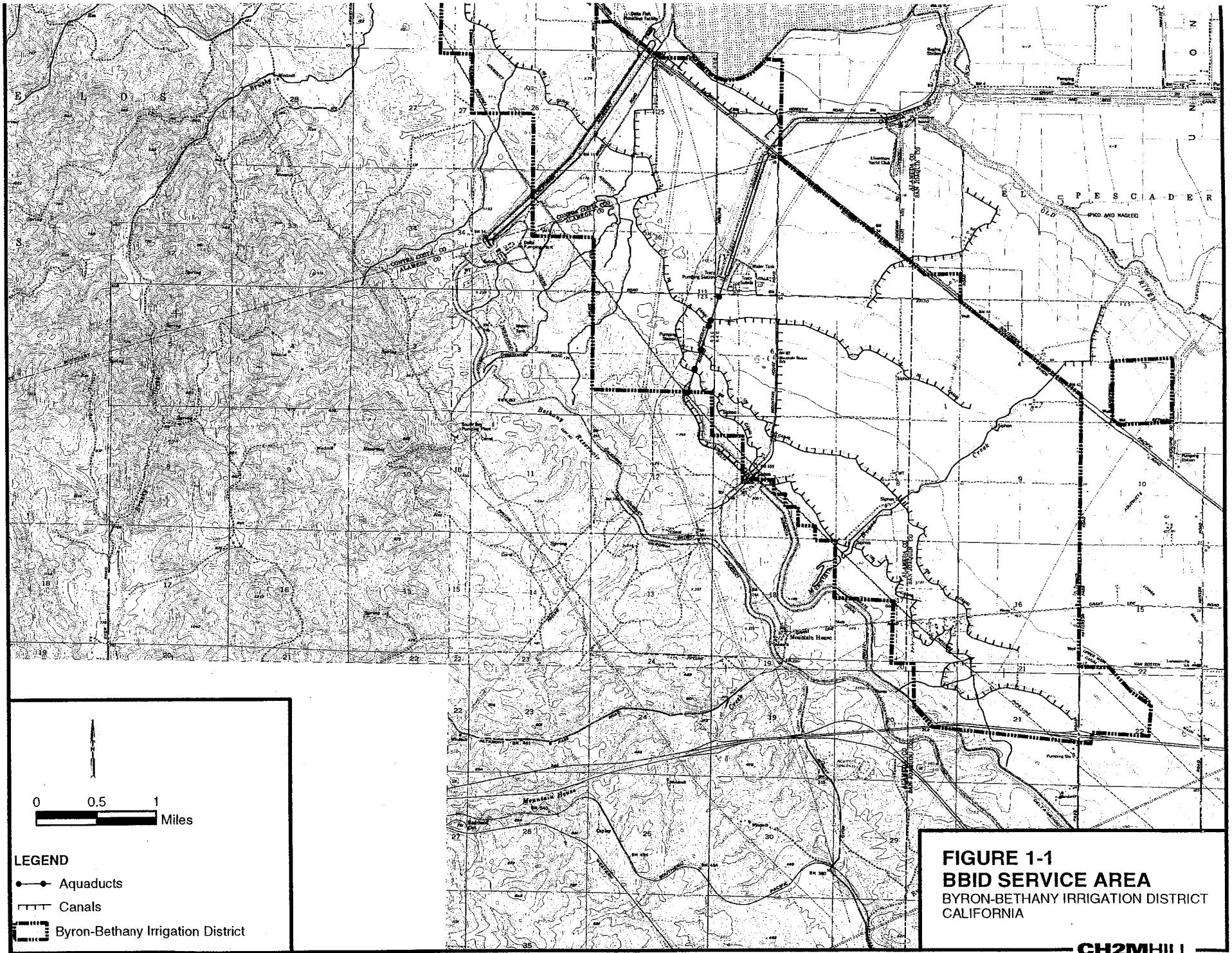

FIGURE 1-1
BBID SERVICE AREA
BYRON-BETHANY IRRIGATION DISTRICT
CALIFORNIA

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ATTACHMENT B

Special-Status Species Potentially Occurring in the Byron-Bethany Irrigation District Vicinity

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Plants			
Large-flowered fiddleneck	*Amsinckia grandiflora*	FE, 1b	Typically associated with woodland and grassland habitats.
Suisun Marsh aster	*Aster lentus*	FSC, 1b	Endemic to California. Typically associated with marshy areas along tidal streams.
Alkali milk-vetch	*Astragalus tener* var. *tener*	FSC, 1b	Associated with vernal pools, alkali flats, and low areas in grassland habitats.
Heartscale	*Atriplex cordulata*	FSC, 1b	Endemic to California. Typically associated with alkaline areas within chenopod scrub, meadows, and grassland habitats.
Brittlescale	*Atriplex depressa*	FSC, 1b	Endemic to California. Typically associated with alkaline areas of chenopod scrub, meadows, vernal pools, and grassland habitats.
San Joaquin spearscale (=saltbush)	*Atriplex joaquiniana*	FSC, 1b	Endemic to California. Typically associated with alkaline areas of chenopod scrub, meadows, and grassland habitats. **CNDDB records include observations within BBID.**
Big tarplant	*Blepharizonia plumosa* ssp. *plumosa*	FSC, 1b	Typically associated with grassland habitats. Often found on slopes and recently burned areas.
Livermore tarplant	*Deinandra bacigalupii*	FSC, 1b	Typically associated with alkaline meadows and seeps.
Recurved larkspur	*Delphinium recurvatum*	FSC, 1b	Typically associated with alkaline soils in chenopod scrub, cismontane woodland, and grassland communities. **CNDDB records include observations within BBID.**
Mount Diablo buckwheat	*Eriogonum truncatum*	CNPS	Found on exposed clay and sandy soils in chaparral, coastal scrub, and grassland habitats.
Round-leaved filaree	*Erodium macrophyllum*	CNPS	Typically associated with clay soils in woodland and grassland habitats.
Delta button-celery	*Eryngium racemosum*	FSC, CE, 1b	Endemic to California. Herbaceous biennial. Blooms June to September. Typically found in seasonally moist floodplains on heavy clay soils.
Diamond-petaled California poppy	*Eschscholzia rhombipetala*	FSC, 1b	Typically associated with alkaline and clay soils in grassland habitats.
Diablo helianthella (=rock-rose)	*Helianthella castanea*	FSC, 1b	Associated with a variety of habitats including upland forest, chaparral, woodland, riparian, and grassland communities.
Rose mallow	*Hibiscus lasiocarpus*	CNPS	Typically associated with freshwater marshes in the Delta.
Contra Costa goldfields	*Lasthenia conjugens*	FE, 1b	Associated with vernal pools, swales, and depressions in grassland and woodland habitats.
Delta tule-pea	*Lathyrus jepsonii* var. *jepsonii*	FSC, 1b	Endemic to California. Typically associated with freshwater and brackish marshes of the Delta.
Mason's lilaeopsis	*Lilaeopsis masonii*	FSC, 1b	Endemic to California. Typically associated with freshwater and brackish marshes, and riparian habitat. Usually grows in muddy or silty soils.
Delta mudwort	*Limosella subulata*	CNPS	Typically associated with muddy banks of riparian and freshwater and brackish marsh habitats in the Delta.

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Showy madia	*Madia radiata*	FSC, 1b	Typically associated with clay soil in grassland, cismontane woodland, and chenopod scrub habitats.
Little mousetail	*Myosurus minimus* ssp. *apus*	FSC	Typically associated with vernal pool habitat.
Marsh skullcap	*Scutellaria galericulata*	CNPS	Typically associated with marshes and wet areas in lower montane coniferous forest, meadow, and seep habitat.
Rayless ragwort	*Senecio aphanactis*	CNPS	Associated with alkaline flats within cismontane woodlands and coastal scrub.
Showy Indian clover	*Trifolium amoenum*	FE, 1b	Typically associated with grassland and coastal bluff scrub habitat. Often grows in disturbed areas such as roadsides. Also found on serpentine soils.
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	FSC, CNPS	Typically associated with alkaline areas in grassland habitat. **CNDDB records include observations within BBID.**
Invertebrates			
Longhorn fairy shrimp	*Branchinecta longiantenna*	FE	Endemic to the east foothills of the Central Coast Mountains. Found in vernal pools on sandstone depressions or grassland swales.
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	Endemic to California. Found in vernal pools. **CNDDB records include observations within BBID.**
Midvalley fairyshrimp	*Branchinecta mesovallensis*	FSC	Endemic to vernal pools in the Central Valley. **CNDDB records include observations within BBID.**
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE	Found in vernal pools and swales in grassland habitat.
California linderiella fairy shrimp	*Linderiella occidentalis*	FSC	Vernal pools in grassland habitat.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	Endemic to the Central Valley. Found on host plant, blue elderberry (*Sambucus mexicana*), typically in riparian habitat.
Antioch Dunes anthicid beetle	*Anthicus antiochensis*	FSC	Endemic to the Antioch Dunes
Sacramento anthicid beetle	*Anthicus sacramento*	FSC	Endemic to sand dune areas in the Delta. Typically found in willow or bamboo vegetation.
Molestan blister beetle	*Lytta molesta*	FSC	Endemic to Central California.
Curved-foot hygrotus diving beetle	*Hygrotus curvipes*	FSC	Endemic to Alameda and Contra Costa counties. Highly aquatic. **CNDDB records include observations within BBID.**
Yellow-banded andrenid bee	*Perdita hirticeps luteocincta*	FSC	Endemic to the Antioch Dunes.
Fishes			
River lamprey	*Lampetra ayresi*	FSC, CSC	Found in the Lower Sacramento, San Joaquin, and Russian rivers as well as coastal streams north of San Francisco.

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Pacific lamprey	*Lampetra tridentata*	FSC	Parasitic. Anadromous. Found in the Sacramento-San Joaquin river system and Pacific coastal waters. Juveniles migrate from the sea between July and September to winter in freshwater until March. Spawn from April to July. The adults usually die after spawning. The eggs hatch and young burrow in mud for 5 to 6 years before migrating out to sea.
Green sturgeon	*Acipenser medirostris*	FC, CSC	Spawn in the Sacramento and Klamath rivers.
Longfin smelt	*Spirinchus thaleichthys*	FSC, CSC	Often associated with estuaries but can be found in fresh to saltwater habitats.
Delta smelt	*Hypomesus transpacificus*	FT, CT	Endemic to the Delta.
Sacramento splittail	*Pogonichthys macrolepidotus*	FT, CSC	Endemic to the Delta where they are associated with areas of slow moving water.
Central Valley steelhead	*Oncorhynchus mykiss*	FT	Found in the Sacramento and San Joaquin rivers and their tributaries.
Central Valley spring-run chinook salmon	*Oncorhynchus tshawytscha*	FT, ST	Found in the Sacramento and San Joaquin rivers and their tributaries.
Central Valley fall/late fall-run chinook salmon	*Oncorhynchus tshawytscha*	FC, CSC	Found in the Sacramento and San Joaquin rivers and their tributaries.
Winter-run chinook salmon	*Oncorhynchus tshawytscha*	FE, CE	Spawn in the Sacramento River.
Amphibians			
California tiger salamander	*Ambystoma californiense*	FPT, CSC	(Santa Barbara and Sonoma County populations emergency listed as federally endangered). Associated with grassland or open woodland areas of central California. In winter, tiger salamanders take upland refuge in mammal burrows or crevices. Following substantial fall and winter rains, they migrate to nearby ponds and vernal pools for breeding. **CNDDB records include observations within BBID.**
California red-legged frog	*Rana aurora draytonii*	FT, CSC	Range includes all valley drainages emptying into the Sacramento River from Shasta County south, as well as coastal drainages from Point Arena south into northwestern Baja California. Currently, the largest occupied habitat is found in Monterey, San Luis Obispo, and Santa Barbara counties. Typically associated with dense riparian areas with sufficient deep pool cover or slow moving water. Require aquatic habitat for breeding and utilize upland habitat for dispersal and cover. Typically begin breeding with the onset of large rainfall events from November through April. Egg masses are deposited on emergent vegetation in still water areas such as stock ponds, wetlands, or idle stream channel pools. Tadpoles typically metamorphose between July and September. Tadpoles feed on algae, detritus, and invertebrates, while metamorphs eat a variety of invertebrates and small vertebrates. Much of the adult diet includes tree frogs and small mammals which they typically capture at night. **CNDDB records include observations within BBID.**

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Foothill yellow-legged frog	*Rana boylii*	FSC, CSC	Found in partially shaded rocky-bottom streams in a variety of habitats.
Western spadefoot toad	*Spea hammondii*	FSC, CSC	Found in valley and foothill grasslands with vernal pool breeding habitat.
Reptiles			
Western pond turtle	*Clemmys marmorata*	CSC, FSC	Highly aquatic and is typically associated with riparian habitat including streams, rivers, sloughs, ponds, and artificial water bodies. Deep pools, basking sites, and aquatic vegetation are important components to their preferred habitat. Breeding season is typically between April to August. Female turtles lay eggs in an excavated chamber in upland habitat as much as 100 meters away from the water. Hatchlings typically emerge in late summer or fall but have also been known to over-winter in the nest and emerge in following spring. Adult turtles hibernate in the winter by burying themselves in muddy bottoms underwater or in upland soil and vegetative litter. Omnivorous, diet includes plant material, insects, crustaceans, fish, amphibians, and carrion. **CNDDB records include observations within BBID.**
Silvery legless lizard	*Anniella pulchra pulchra*	FSC, CSC	Associated with sandy or loose soils with sparse vegetation and high moisture.
California horned lizard	*Phrynosoma coronatum frontale*	FSC, CSC	Endemic to California and is found Shasta County south to Los Angeles. Associated with a variety of habitat types but are most often found in dry shrubby open areas with gravel and sandy soils. Forage on a variety of insect prey put primarily subsist on ants and beetles. Breeding likely occurs in the spring with hatchlings typically emerging in July and August. Most active from March to October. Retreat to small mammal burrows or burrow into lose soil for extended periods of inactivity.
Giant garter snake	*Thamnophis gigas*	FT, CT	Endemic to the Central Valley. Found in freshwater marsh habitats and low gradient streams. Also found in irrigation ditches and flooded fields. Highly aquatic.
San Joaquin coachwhip (=whipsnake)	*Masticophis flagellum ruddocki*	FSC, CSC	Found in open grassland and saltbush scrub habitat.
Alameda whipsnake	*Masticophis lateralis euryxanthus*	FT, CT	Endemic to the valley and foothill hardwood habitat in the Coast Range from Monterey to San Francisco.
Birds			
White-faced ibis (rookery)	*Plegadis chihi*	FSC, CSC	Rookery sites are typically located in shallow freshwater marshes.
White-tailed kite	*Elanus leucurus*	FSC	Often found in grassland and agricultural areas. Nests are typically located in riparian areas. Breeding occurs between February and May. **CNDDB records include observations within BBID.**

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Golden eagle	*Aquilla chrysaetos*	CSC	Found throughout North America and Mexico. More common in southern part of the state. Found in a variety of rugged open areas with available nesting sites. Build or reuse large stick nests located on cliff ledges, large trees, or other platforms. Breeding season typically begins in January and extends into August. In most areas the golden eagle is a local migrant though birds within the northern range may migrate south and east.
Bald eagle (nesting and wintering)	*Haliaeetus leucocephalus*	FT, CE	Nest and winter in a wide range of habitats typically within one mile of water. Often roost communally in winter.
Swainson's hawk (nesting)	*Buteo Swainsoni*	FSC, ST	Typically nest in tall riparian trees. Often forage in agricultural fields.
Ferruginous hawk (wintering)	*Buteo regalis*	FSC, CSC	Found in open grassland, sagebrush flats, desert scrub, and forested habitats. Rely heavily on rabbit prey.
American peregrine falcon (nesting)	*Falco peregrinus anatum*	FD, CE	Nest typically on high cliffs near wetlands or other waterbody habitat.
California black rail	*Laterallus jamaicensis coturniculus*	FSC, CT	Associated with pickleweed dominated salt marshes. Also found in fresh water and brackish marshes.
Greater sandhill crane (nesting and wintering)	*Grus canadensis tabida*	ST	Winter in open fields of the Central Valley. California nest sites in the northeastern portion of the state.
Mountain plover	*Charadrius montanus*	FPT, CSC	Breeds elsewhere but winters in central and southern California. Associated with open habitats with low growing vegetation where they primarily forage on a variety of insects. They generally arrive in California in October and leave in the early spring.
Long-billed curlew (nesting)	*Numenius americanus*	FSC, CSC	Nest sites are often located in grasslands and wet meadows. Typically found on gravelly soil and gently rolling hills.
Marbled godwit	*Limosa fedoa*	FSC	Typically nest near grassy marsh habitats. Winter along coast, mudflats, and shallow water habitats.
Western burrowing owl	*Athene cunicularia hypugaea*	FSC CSC	Associated with open prairies and grassland communities. In California, often associated with ground squirrel activity centers. Utilize mammal burrows for nesting and cover. Breeding season typically begins in late March. **CNDDB records include observations within BBID.**
Vaux's swift (nesting)	*Chaetura vauxi*	FSC, CSC	Typically nest in tree cavities in coniferous forest habitat. Often forages near lakes and rivers.
Rufous hummingbird (nesting)	*Selasphorus rufus*	FSC	Typically nests in dense vegetation and coniferous trees with abundant nearby nectar sources.
Allen's hummingbird	*Selasphorus sasin*	FSC	Winters in Mexico. Summers along the Pacific Coast states. Found in a range of habitats.
Costa's hummingbird	*Calypte costae*	FSC	Typically found in arid desert, chaparral, forest, and scrub habitat. Nests located in trees or shrubs. Breeding between January and May.
Lewis' woodpecker	*Melanerpes lewis*	FSC	Most common in southeastern San Joaquin County. Typically found in open woodland habitat. Often in burned or logged areas.

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Little willow flycatcher	*Empidonax traillii brewsteri*	FSC, CE	Nest sites are typically found in dense riparian vegetation.
Loggerhead shrike (nesting)	*Lanius ludovicianus*	FSC, CSC	Nest in a variety of wooded to open habitats. Numerous in the BBID. **Observed during February 17, 2004 reconnaissance visit.**
California horned lark	*Eremophila alpestris actia*	CSC	Associated with open grass lands or meadows, primarily in coastal areas. **CNDDB records include observations within BBID.**
Bank swallow (nesting)	*Riparia riparia*	FSC, ST	Nesting colonies typically located in steep banks and cliffs in riparian habitat.
Bell's sage sparrow (nesting)	*Amphispiza belli belli*	FSC, CSC	Typically nest in dense chaparral in Coastal sage scrub communities dominated by chamise.
California thrasher	*Toxostoma redivivum*	FSC	Typically found in foothill chaparral habitat.
Tricolored blackbird	*Agelaius tricolor*	FSC, CSC	Nest in colonies associated with fresh-water marsh thickets of cattails, tule, bulrushes and sedges. Typically nests in April-June.
Lawrence's goldfinch (nesting)	*Carduelis lawrencei*	FSC	Nest sites typically associated with open woodland and chaparral areas near water.
Mammals			
Pacific western big-eared bat	*Corynorhinus (=Plecotus) townsendii townsendii*	FSC, CSC	Found throughout western North America. Typical associated with arid western desert scrub and pine forest habitat. Maternity colonies in mines, caves, or buildings. Hibernate in caves and abandoned mines.
Greater western mastiff-bat	*Eumops perotis californicus*	FSC, CSC	Found in three distinct populations in the southern US, Cuba, and South America. Typically associated with arid, rocky areas in proximity to a water body. Small colonies of approximately 100 individuals roost in high cliffs, rock crevices, and buildings. Male and female bats share the same roost locations. These roost areas are presumed to be used year round. Largest bat species in the US. Breeding likely begins in early spring. Young are typically born in June to August.
Small-footed myotis bat	*Myotis ciliolabrum*	FSC	Ranges from southwestern Canada to central Mexico. Rear young in rock-face cracks and under rocks. Found hibernating in caves and mines.
Long-legged myotis bat	*Myotis volans*	FSC	Most widely distributed bat species in western US. Associated with a variety of wooded habitats Maternity roosts beneath bark and in other cavities. Forage over water and open areas.

TABLE 1
Special-Status Species Potentially Occurring in the BBID Vicinity

Common Name	Scientific Name	Status Federal/State	Critical Seasonal Periods and Comments
Yuma myotis bat	*Myotis yumanensis*	FSC	Found throughout much of the western states from British Columbia to Baja California and east to Colorado and Mexico. Widespread in California, excluding the southeastern deserts areas. Associated with a variety of habitats but are most common in open forests and woodland habitats near water. Forage almost exclusively over water. Daytime summer roost sites are typically located in buildings, mines, caves, or crevices. Night roosts are generally located in more open locations. Males roost separately from females who congregate in large maternal colonies. Maternal colonies can number in the thousands. These roosts are warm and are often shared with other bat species. Yuma myotis mate in the fall and give birth in late May to July.
Fringed myotis bat	*Myotis thysanodes*	FSC	Found across the western US typically in grassland and savanna habitats. Highly migratory. Roosts in caves, mine tunnels, rock crevices and old buildings. Winter habitat is largely unknown.
San Joaquin pocket mouse	*Perognathus inornatus*	FSC	Typically associated with grassland and blue oak savannas. **CNDDB records include observations within BBID.**
Riparian (San Joaquin Valley) woodrat	*Neotoma fuscipes riparia*	FE, CSC	Endemic to the riparian habitat along the San Joaquin, Stanislaus, and Tuolumne rivers.
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	FSC, CSC	Associated with forest and chaparral habitat.
Riparian brush rabbit	*Sylvilagus bachmani riparius*	FE, CE	Endemic to the riparian habitat on the San Joaquin River in Northern Stanislaus County.
San Joaquin kit fox	*Vulpes macrotis mutica*	FE, CT	Primarily associated with the grassland, woodland, and scrub communities of the Central Valley. Utilize underground or artificial burrows for cover and natal dens. Den locations are frequently moved. Natal den preparation often begins in September. Mating typically takes place in December to March. Pups are born in February to March. Young then disperse in August to September.

Key to Status Codes:

Federal
FE = Federal Endangered
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FT = Federal Threatened
FSC = Federal Species of Concern
FC = Federal Candidate Species

State
CE = State Endangered
CT = State Threatened
CSC = California Species of Special Concern
CNPS = California Native Plant Society Listed

Other
1b = Plants, rare, threatened or endangered in California and elsewhere and are rare throughout their range. According to CNPS, all of the plants constituting List 1b meet the definitions of Sec. 1901
FP = Fully Protected
R = Rare

ATTACHMENT C

Wildlife Species Observed During Byron-Bethany Irrigation District Biological Reconnaissance Visit

TABLE 1
Wildlife Species Observed During Byron Bethany Irrigation District Biological Reconnaissance Visit (February 17, 2004)

Common Name	Scientific Name	Sign
Amphibians		
Pacific chorus frog		Throughout the canals and creeks
Birds		
Double crested cormorant	*Phalacrocorax auritus*	California Aqueduct
Great egret	*Ardea alba*	Observed in open grasslands and along canals
Ring-necked duck	*Aythya collaris*	California Aqueduct
Red-tailed hawk	*Buteo jamiacensis*	Observed throughout
Northern harrier	*Circus cyaneus*	Observed over open grasslands
Red-shouldered hawk	*Buteo lineatus*	Orchard
American kestrel	*Falco sparverius*	Perched on road-side utility lines, particularly near grasslands
Killdeer	*Charadrius vociferus*	Along canal levee roads
Greater yellowlegs	*Tringa melanoleuca*	Along canal levee roads
Mourning dove	*Zenaida macroura*	Observed throughout
Rock dove	*Columba livia*	Observed throughout
Black phoebe	*Sayornis nigricans*	Along canals
Loggerhead shrike	*Lanius ludovicianus*	Observed throughout. Numerous.
American crow	*Corvus brachyrhynchos*	Observed throughout
Western scrub-jay	*Aphelocoma californica*	Observed throughout
American robin	*Turdus migratorius*	Observed throughout
Northern mocking bird	*Mimus polyglottos*	Orchard
Western meadowlark	*Sturnella neglecta*	Observed throughout
Mammals		
Striped skunk	*Mephitus mephitus*	Road kill
Raccoon	*Procyon lotor*	Numerous tracks throughout canals
California ground squirrel	*Spermophilus beecheyi*	Observed throughout, particularly in levee berms and grasslands
Cow	*Bos taurus*	Open grasslands

APPENDIX B

Scope of Work for the Development of the Water Quality Monitoring Plan

APPENDIX B

Scope of Work—Aquatic Herbicides Monitoring Plan

Project Understanding

The existing aquatic herbicide general permit is due to expire on January 31, 2004, and will not be extended. The State Water Resources Control Board (SWRCB) released a new general National Pollutant Discharge Elimination System (NPDES) Permit for a 30-day public review period starting on February 10. The permit is scheduled for adoption by the SWRCB as early as its March 18 meeting. Among other requirements, the general NPDES permit requires the development and submittal of a Water Quality Monitoring Plan (WQMP).

This Task Order includes the development of a WQMP, as described below.

Scope of Work

Task 5—Develop Monitoring Plan

The draft NPDES general permit dated February 10, 2004, specifies monitoring requirements. CH2M HILL will prepare a WQMP, which will be comprised of the following three components:

- **Part 1:** Monitoring sites, frequency, and parameters
- **Part 2:** Monitoring procedures, records retention, monitoring forms, identification of labs in the vicinity of BBID that perform acrolein analysis
- **Part 3:** Quality Assurance/Quality Control (QA/QC) Plan

CH2M HILL will prepare and submit one administrative draft of the WQMP for District review. Upon receipt of the comments, CH2M HILL will revise the report and submit eight bound copies and one electronic copy on CD-ROM of the WQMP.

Deliverables:

1. Draft WQMP—March 30, 2004
2. Final WQMP—April 10, 2004

APPENDIX C

Toxicological Profile for Acrolein in Aquatic Systems

Toxicological Profile for Acrolein in Aquatic Systems

PREPARED FOR: Byron-Bethany Irrigation District

PREPARED BY: Christine Arenal/CH2M HILL
Harry Ohlendorf/CH2M HILL

DATE: February 20, 2004

1.0 Introduction

Acrolein is an aldehyde that is ubiquitous in the environment and is produced by both natural and anthropogenic sources (Eisler, 2002). Natural sources include metabolic processes in soils (e.g., formation of humic substances) and metabolic degradation of spermine and spermidine, glycerol, allyl formate, allyl alcohol, and cyclophosphamide (Eisler, 2002; USEPA, 1980; Ghilarducci and Tjeerdema, 1995). Incomplete combustion of coal, wood, gasoline, plastics, and fats, as well as tobacco smoke and industrial emissions, are the major sources of atmospheric acrolein. Additionally, acrolein has been found in many foods, and processing of these foods may increase the acrolein content.

Acrolein was discovered in 1843 and has been used in a wide variety of commercial applications since 1947 (Eisler, 2002). It is produced by the catalytic oxidation of propylene and is used in the production of many chemicals and reagents such as acrylic acid and DL-methionine (an essential amino acid used to supplement cattle and poultry feed) (Eisler, 2002; Ghilarducci and Tjeerdema, 1995). The copolymers of acrolein are used in photography, in textile treatment, in the paper industry, as builders in laundry and dishwasher detergents, and as coatings for aluminum and steel panels (USEPA, 1980). Since 1960, acrolein has been used as an herbicide to control submerged aquatic weeds in irrigation systems (USEPA, 1980; Eisler, 2002).

Industrial exposure to manufactured acrolein is unlikely; however, acrolein from nonmanufactured sources is pervasive (USEPA,1980). Acrolein enters the aquatic environment by its use as an aquatic herbicide, from the chlorination of organic compounds in wastewater and drinking water treatment, and from industrial discharge (USEPA, 1980). Although acrolein has low toxicity to terrestrial plants, at the recommended treatment concentrations for aquatic weed control (1 to 15 mg/L or 1,000 to 15,000 µg/L) it kills fish and other aquatic organisms (Eisler, 2002). Additionally, product application instructions for acrolein as the herbicide Magnacide® H indicate that canal waters should only be used for irrigation of fields (crop-bearing, fallow, or pasture) where the treated water remains on the field or will be held for 6 days before discharge to fish-bearing receiving waters (Baker Petrolite, 2001).

Information regarding the environmental chemistry and the aquatic toxicity of acrolein is summarized in the following sections. Greater details on the toxicology of this chemical are presented in reviews by Smith (1962), USEPA (1980), Beauchamp et al. (1985), Agency for Toxic Substances and Disease Registry (ATSDR) (1990), and Eisler (1994, 2002).

2.0 Environmental Chemistry

The environmental chemistry, including chemical properties, persistence, and metabolism of acrolein are presented below.

2.1 Chemical Properties

Acrolein is a flammable liquid that has a pungent, irritating odor. It is the simplest member of the class of unsaturated aldehydes and is an unstable compound that undergoes polymerization to the plastic solid disacryl in the presence of alkali or strong acid or when exposed to sunlight (USEPA, 1980). Acrolein is soluble in water and in many organic solvents (e.g., acetone, ethanol, ether) (Eisler, 2002). It is a highly reactive molecule due to the presence of a vinyl group and an aldehyde group on such a small molecule (USEPA, 1980). Because acrolein is extremely volatile, flammable, and explosive, elaborate and specific conditions are prescribed for its storage and use. Specific chemical properties such as molecular weight, boiling point, melting point, solubility, log K_{ow}, and vapor pressure are provided in Eisler (2002) and in the manufacturer's application and safety manual (Baker Petrolite, 2001).

2.2 Persistence

One of the primary advantages of acrolein compared to other aquatic herbicides is that it rapidly dissipates from water by volatilization and degradation without leaving phytotoxic residues (Eisler, 2002). In buffered solution, an equilibrium between dissipating acrolein and degradation products was reached following dissipation of 92 percent of the acrolein, whereas the dissipating reaction was apparently continued to completion in natural waters (USEPA, 1980). Initially, acrolein reacts by reversible hydrolysis to produce an equilibrium mixture of beta-hydroxypropionaldehyde and acrolein (92 and 8 percent, respectively at pH 5.0). In natural waters, the acrolein is degraded to carboxylic acid via microbial pathways and beta-hydroxypropionaldehyde is biotransformed in about 17.4 days. Therefore, microbial degradation is an important pathway in the transformation of acrolein in aquatic systems.

Acrolein has a half-time persistence of 83 hours at pH 8.6 and 50 hours at pH 6.6 in freshwater, though degradation is more rapid when application concentrations are less than 3,000 μg/L (e.g., 2.9 to 11.3 hours at an initial nominal concentration of 20 μg/L or 27.1 to 27.8 hours at 101 μg/L) (Eisler, 2002). Additionally, acrolein has been found to have similar daily decay rate constants (0.14 to 0.21) regardless of time-concentration regimes that vary from 100 μg/L for 48 hours to 15,000μg/L for several hours. In one case, 80 percent of acrolein applied at 125 μg/L was lost after 48 hours when measured 65 km from the application point. However, very high initial concentrations (50,000 to 160,000 μg/L) took 192 hours (8 days) to reach 57 to 80 percent degradation. Thus, high concentrations may reduce the rate of hydrolysis.

2.3 Metabolism

Acrolein undergoes rapid decomposition, especially in sunlight, when it is added to water as an herbicide. It also reacts with amines, alcohols, and mercaptans of aquatic plants resulting in the destruction of cell structure and plant death (Eisler, 2002). The biochemical

and toxic effects of acrolein are generally considered to be caused by its reaction with critical protein and nonprotein sulfhydryl groups (USEPA 1980; Eisler, 2002). This reaction is rapid and essentially irreversible, resulting in the formation of a stable thiol ether. In mammals, acrolein is rapidly converted to saturated alcohol compounds with beta-propionaldehyde being the primary breakdown product. Several compounds mitigate or block the toxic effects of acrolein. For example, sulfhydryl compounds reduced the effects of acrolein on excitation-contraction uncoupling in skeletal muscles of frogs and cysteine reduced the cytotoxic effects of acrolein on tumor cells in mice (Eisler, 2002).

3.0 Toxicity to Aquatic Organisms

Acrolein (as Magnacide® H) applied at the prescribed rate (1,000 to 15,000 μg/L) for control of aquatic vegetation is lethal or harmful to almost all aquatic vertebrates and invertebrates tested in short-term studies. A compilation of studies from Eisler (1994) is presented in Table 1. Of these, frog tadpoles (*Xenopus laevis*) had a 96-hours median lethal concentration (LC_{50}) of 7 μg/L and were the most sensitive group of aquatic organisms tested. Reduced survival was observed in the represented fish species at concentrations of 14 to 62 μg/L and crustaceans died or were immobilized at 34 to 80 μg/L. Other aquatic organisms tended to be less sensitive (e.g., approximate LC_{50} value of >150 μg/L for insects, LC_{100} value of 1,250 μg/L for trematodes), but these effects concentrations were still below the application rate of 15,000 μg/L. Generally, aquatic vertebrates are more sensitive than invertebrates and young fish are more sensitive than older fish (Eisler, 2002).

Acute and chronic criteria developed by USEPA (1980) for the protection of aquatic life were 68 and 21 μg/L, respectively. However, more recent studies (Holcombe et al., 1987) indicate that frogs (chronic effects at 7 μg/L) and some fish (e.g., white sucker, chronic effects at 14 μg/L) are more sensitive than those species evaluated in USEPA (1980). Additionally, USEPA (1980) criteria developed for the protection of human health have been revised in the recent National Recommended Water Quality Criteria: 2002 (USEPA, 2002). USEPA (1980), as well as California Toxics Rule (CTR) criteria (USEPA, 2000) indicate a concentration of 320 μg/L for protection of human health from the toxic properties of acrolein ingested through contaminated aquatic organisms and water and a concentration of 780 μg/L for protection from ingestion of aquatic organisms alone. These values have been reduced to 190 and 290 μg/L, respectively, in USEPA (2002).

Birds and mammals may be exposed to acrolein during application of the herbicide Magnacide® H primarily through ingestion of contaminated water or through ingestion of prey (e.g., aquatic invertebrates, fish, and frogs). Although acrolein was found to accumulate in whole-body fish tissue (bioconcentration factor of 344) when bluegill were exposed to 13 μg/L acrolein over a 28-day period (Table 1), studies using acute exposure indicated no accumulation. Nordone et al. (1998) exposed bluegill and northern crayfish to 20 and 101 μg/L acrolein, respectively, for 7 days. Under static conditions, bluegill and crayfish metabolized acrolein so rapidly that neither it nor its major metabolites (acrylic acid, allyl alcohol) were detected in the edible tissues within 24 hours after dosing. Therefore, fish and macroinvertebrates are not likely to accumulate acrolein at the application regime subscribed for aquatic weed control. Therefore, birds and mammals are not likely to accumulate acrolein or be exposed to high concentrations through their diet.

Additionally, birds and mammals are very tolerant to acrolein compared to aquatic organisms. For birds, adverse effects were observed at an acute oral dose of 9,100 µg/kg body weight (Hudson et al., 1984). This is approximately 16,950 µg/L in drinking water assuming a body weight of 1 kg and a water consumption rate of 0.059 L/day for the mallard test species. Chronic exposure (104 weeks) to concentrations of 625,000 µg/L acrolein in drinking water did not reduce survival in laboratory rats (Lijinsky and Reuber, 1987), though some deaths were reported for rats exposed to 80,000 µg/L for 3 days (ATSDR, 1990). Pregnant rabbits experienced miscarriages after 13 days exposure to 9,000 µg/L acrolein in the drinking water (ATSDR, 1990) suggesting that reproductive endpoints may be more sensitive than survival. However, the applicability of this study to herbicidal use of acrolein is uncertain because acrolein is not expected to persist for more than 6 days when applied at manufacturer indicated rate.

Summary

- Acrolein (as Magnacide® H) applied at the prescribed rate (1,000 to 15,000 µg/L) for control of aquatic vegetation is lethal or harmful to almost all aquatic vertebrates and invertebrates tested in short-term studies.
- Generally, aquatic vertebrates are more sensitive than invertebrates and young fish are more sensitive than older fish.
- Fish and macroinvertebrates are not likely to accumulate acrolein at the application regime subscribed for aquatic weed control, so birds and mammals are not likely to accumulate acrolein or be exposed to high concentrations through their diet.
- Birds and mammals have very high acute toxicity values for acrolein with no adverse effects observed for birds at 16,950 µg/L acrolein in drinking water and a few deaths at 80,000 µg/L for mammals.
- Miscarriages were observed in rabbits exposed to 9,000 µg/L acrolein in drinking water for 13 days. The applicability of this study to herbicidal use of acrolein is uncertain because acrolein is not expected to persist for more than 6 days when applied at manufacturer indicated rate.

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ATTACHMENT 3

Water Quality Monitoring Plan

Water Quality Monitoring Plan

Aquatic Pesticides NPDES Permit

Prepared for

Byron-Bethany Irrigation District

April 2004

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

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SECTION 1

Introduction

The Byron-Bethany Irrigation District (BBID or District) is a multi-county special district formed under the provisions of the California Water Code, Section 20500 et seq. It is a public agency established for the purpose of providing water to lands within portions of Alameda, Contra Costa, and San Joaquin counties.

BBID owns, operates, and maintains approximately 27 miles of canals (including 18.5 miles of earthen canals and 8.5 miles of cement-lined canals) that convey water from BBID's two intakes along the California Aqueduct to water users within the District's service area. The service area is divided into two service divisions. The northern and central portion (Byron Division) of the district is located in Contra Costa County; the southern portion (Bethany Division) is located in both Alameda and San Joaquin Counties. BBID currently encompasses approximately 19,000 acres, of which 12,300 are irrigable acres.

During periods of extended inundation, algal blooms and pond weeds accumulate in the canals and create delivery system service problems. BBID has been controlling in-channel growth with the application of Magnacide® H, an aquatic herbicide containing the active ingredient acrolein, since 1986.

BBID has developed an Aquatic Pesticides Application Plan (APAP), included in Attachment A, that contains specific water management and herbicide application practices (BMPs) to prevent the release of acrolein to these creeks. These BMPs are routinely and consistently implemented as part of the District's use of acrolein. There are only two locations along the BBID canal system at which irrigation deliveries are able to spill to natural creeks:

- 45 Canal Radial Gate, located at the intersection of Kellogg Creek and 45 Canal
- 120 Spillway, located at the intersection of Mountain House Creek and 120 Canal

Impending regulatory requirements imposed on the use of aquatic herbicides, which are described below, include the implementation of a water quality monitoring program designed to measure the effectiveness of water management measures. This Water Quality Monitoring Plan (WQMP) was developed to comply with the regulatory requirements. The WQMP includes two phases: a Study Phase and a Long-Term Phase.

1.1 Background

1.1.1 Regulatory Setting

1.1.1.1 NPDES Permit

The discharge to waters of the United States of aquatic pesticides applied for aquatic weed and pest control is regulated by National Pollutant Discharge Elimination System (NPDES) provisions of the Clean Water Act (Headwaters, Inc. vs. Talent Irrigation District). BBID has determined that its acrolein application practices are regulated by a State Water Resources

Control Board (SWRCB) general NPDES permit and that a "categorical exception" should be obtained to conduct its algae and aquatic weed control activities.

On April 7, 2004, the SWRCB released a draft general NPDES permit applicable to discharges of aquatic pesticides to waters of the United States for a 30-day public review period. The SWRCB will consider adoption of this permit at its May 20, 2004 meeting. The draft permit imposes requirements on any discharge of aquatic pesticides from public entities to waters of the United States in accordance with the SWRCB's *State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) (SWRCB, 2000). Compliance with an APAP and implementation of water quality monitoring are both required conditions of the general NPDES permit.

1.1.1.2 Categorical Exception

The U.S. Environmental Protection Agency (USEPA) established numeric water quality criteria for Priority Pollutants, including acrolein, in the National Toxics Rule (NTR) and the California Toxics Rule (CTR). The SWRCB adopted the SIP to implement the CTR and applicable provisions of the NTR (SWRCB, 2000). The SIP established implementation provisions for: (1) chronic toxicity control, (2) priority pollutant criteria promulgated by the USEPA through the NTR and CTR, and (3) priority pollutant objectives established by Regional Water Quality Control Boards (RWQCBs) in their Basin Plans.

Under the SIP, discharges of priority pollutants are subject to water-quality based effluent limitations. Section 5.3 of the SIP allows for "categorical exceptions" from its requirements for resource or pest management (e.g., vector or weed control, pest eradication, or fishery management) conducted by public entities to fulfill statutory requirements. The California Water Code Sections 22075-22078 et seq. provide that an irrigation district may treat water for the beneficial use of water users in its service area.

Acrolein is a priority pollutant, and water quality criteria for acrolein are established in the CTR (USEPA, 2000). If an agency's use of acrolein (or other priority pollutants) may result in an exceedance of Water Quality Objectives (WQOs) in receiving waters, the agency must have been granted a categorical exception to exceed discharge limitations for the chemicals.

Irrigation canals may be considered receiving waters; therefore, the District has determined that it should seek regulatory coverage by obtaining a categorical exception. The application for categorical exception does not extend to Kellogg Creek or Mountain House Creek.

1.1.1.3 Water Quality Criteria / Receiving Water Limits

The general NPDES permit specifies receiving water limits for acrolein. The limits are summarized in Table 1-1. The general NPDES permit requires that an application event not result in the exceedance of water quality limits: (1) outside of the Target Treatment Area at any time, or (2) either within or outside of the Target Treatment Area anytime after the conclusion of application event. For acrolein application within the District, the conclusion of an application event is considered to be 24 hours following the application of the herbicide[1].

[1] The February draft general NPDES permit allows the conclusion of the application event to occur up to seven (7) days after the initial application.

TABLE 1-1
Receiving Water Limitations for Acrolein-Based Aquatic Herbicide Application

Beneficial Use Designation	Limitation (micrograms per liter)	Reference
WARM and COLD	21	USEPA National Ambient Water Quality Criteria for Freshwater Aquatic Lie Protection, Lowest Observed Effect Level (LOEL)
MUN	320	CTR
Other than WARM, COLD, or MUN	780	CTR

Source: SWRCB, 2004 (General Permit).

Since Kellogg Creek and Mountain House Creek are designated WARM and COLD, the receiving water limitation of 21 micrograms per liter applies.

1.1.1.4 Monitoring Plan Requirements

The draft general NPDES permit released in April 2004 contains a Monitoring and Reporting Program (MRP) that describes the monitoring requirements to be implemented as a condition of permit compliance. The MRP contains provisions specifying sampling procedures, monitoring frequency, retention of records, data to be contained in field records, device calibration and maintenance, sample parameters, sample timing, and reporting. The requirements vary for different pesticides.

The MRP calls for three types of receiving water monitoring (part B): (1) background monitoring, (2) event monitoring, and (3) post-event monitoring. This WQMP addresses this requirement.

1.1.2 BBID Acrolein Application Practices

1.1.2.1 Herbicide Use

Application of acrolein typically can begin as early as March and as late as May, and extend through the end of irrigation season, typically September. Applications occur every 14 to 21 days, depending on the presence of algae and/or aquatic weeds. The General Manager evaluates canal conditions and determines when an application is to occur. Applications are conducted consistent with the manufacturer's Application and Safety Manual (Baker Petrolite, 2001), including the product registration label. The rate and duration of dosage are determined based on the application guidance within the manual, and are dependent on weed conditions, flow, and water temperature. Applications are not to exceed 15 parts per million (ppm) Magnacide® H, as specified in the product manual (Baker Petrolite, 2001).

Magnacide H® Herbicide is forced from a container using nitrogen gas. The herbicide is introduced directly into the canals over a period of 4 to 6 hours to form a wave of treated water. Concentrations in the range of 1 to 15 parts per million (ppm) are required to control aquatic weeds. As Magnacide H® proceeds down the canal, it moves like a chemical wave of acute toxicity to aquatic plants.

The amount of herbicide required is primarily determined by the amount of water flow and weed density in the canal, although velocity, water temperature, and water quality must also be considered. Prior to each application, the operator fills out a "Magnacide H® Application Record", an example of which is included as Attachment B. Since Magnacide H® is added over a time interval, a wave of treated water is formed that moves downstream, temporarily bathing the weeds in herbicide. After the application is stopped and the treated water within the canal has been diverted for on-farm use, the concentration of herbicide in the canal drops to zero. Flow is maintained in the canal throughout the application periods of application and diversion to farms. The Magnacide® H passes through the canal and out to the fields in a continuous flow that is completely finished within 21 hours.

1.1.2.2 Water Management

General.

BBID treats its conveyance system with Magnacide® H at two locations: Pump Station 1-N and Pump Station 1-S. Pump Station 1-N supplies 45 Canal (Byron Division), and Pump Station 1-S supplies 120 Canal (Bethany Division). During the application event, the canals are managed to prevent release of acrolein to Kellogg Creek and Mountain House Creek. In other words, during acrolein application events, the BBID system is a closed system and all acrolein is contained within the canals or diverted by water users for on-farm use. Water levels in the canals are lowered specifically for the purpose of minimizing any risk of release of acrolein to the creeks, and the canals are held in a lower water condition for 24 hours. Normal canal operations are resumed 24 hours after the application of the herbicide, and diligent care is taken to prevent the release of canal water to the creeks. Lowering canal water levels ensures that no treated water is released from BBID canals. Within the retention period specified by the acrolein label instructions, all treated water within the canals is diverted by BBID customers.

Byron Division.

In order to understand water delivery operations in the Byron Division, it is critical to understand the operations at the juncture of 45 Canal and Kellogg Creek. Pump Station 1-N supplies 45 Canal, the conveyance system for the Byron Division. 45 Canal flows north from 1-N to a radial gate located at the intersection of 45 Canal and Kellogg Creek.

Kellogg Creek has four distinct channel sections. These reaches are: (1) Reach 1: west of BBID, (2) Reach 2: from the BBID boundary to Pump Station 4, (3) Reach 3: from Pump Station 4 to 45 Canal, and (4) Reach 4: from the 45 Canal to Discovery Bay.

Reach 1 is located in the foothills to the west of BBID. This reach was not evaluated because it falls outside the project area.

Portions of reaches 2, 3, and 4 were included in the Biological Survey prepared for the CEQA documentation Within these reaches, the creek bank is a modified and maintained channel; engineered uniform side slopes and a flat bottom are maintained by the District.

Reach 2 is an infrequently maintained section of channel that contains some riparian vegetation along the channel levee. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom. The terminus of this reach is Pump Station 4.

SECTION 2

Study Phase

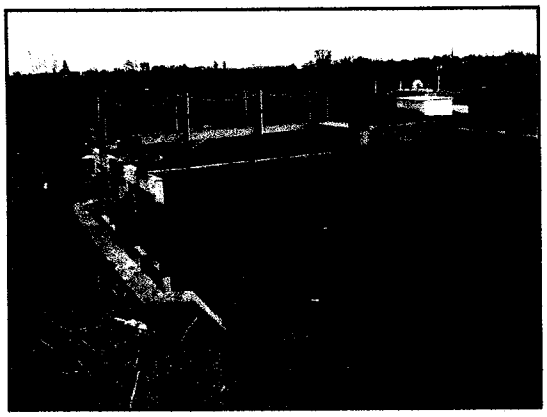
BBID has not previously performed detailed water quality studies in conjunction with its acrolein use. Therefore, in order to determine the appropriate timing of monitoring events, this monitoring plan includes two phases. The Study Phase will take place during the 2004 irrigation season. Based on the results of the Study Phase, refinements will be made to the Long-Term Phase described herein, and the Long-Term Phase will be conducted for irrigation seasons 2005 through 2009.

2.1 Key Locations

Table 2-1 lists the key water quality monitoring locations and explains the basis for their selection. Figures 2-1 and 2-2 show the Byron Division and Bethany Division sampling locations, respectively.

TABLE 2-1
Key Water Quality Monitoring Locations

Station ID	Station Name (location)	Basis for Selection
Background Samples		
AQ	California Aqueduct	The California Aqueduct is the source water for both the Byron and Bethany Divisions.
Byron Division		
BYR	Byron Division/45 Canal (45 Canal upstream of the Radial Gate)	The 45 Canal Radial Gate is the only location within the Byron Division at which improper water management could result in the spill of acrolein to a natural waterbody.
KLG	Kellogg Creek (Kellogg Creek downstream of the Radial Gate)	Kellogg Creek is a natural waterbody. The District's water management measures should prevent the release of acrolein to Kellogg Creek.
Bethany Division		
BTH	Bethany Division/120 Spillway (120 Canal and the 120 Spillway)	The 120 Spillway is the only location within the Bethany Division at which improper water management could result in the spill of acrolein to a natural waterbody.
MTN	Mountain House Creek (Mountain House Creek downstream of the 120 Spillway)	Mountain House Creek is a natural waterbody. The District's water management measures should prevent the release of acrolein to Mountain House Creek.



Sampling Station BYR
45 Canal Immediately Upstream of the Radial Gate

Sampling Station KLG
Kellogg Creek Downstream of the Radial Gate

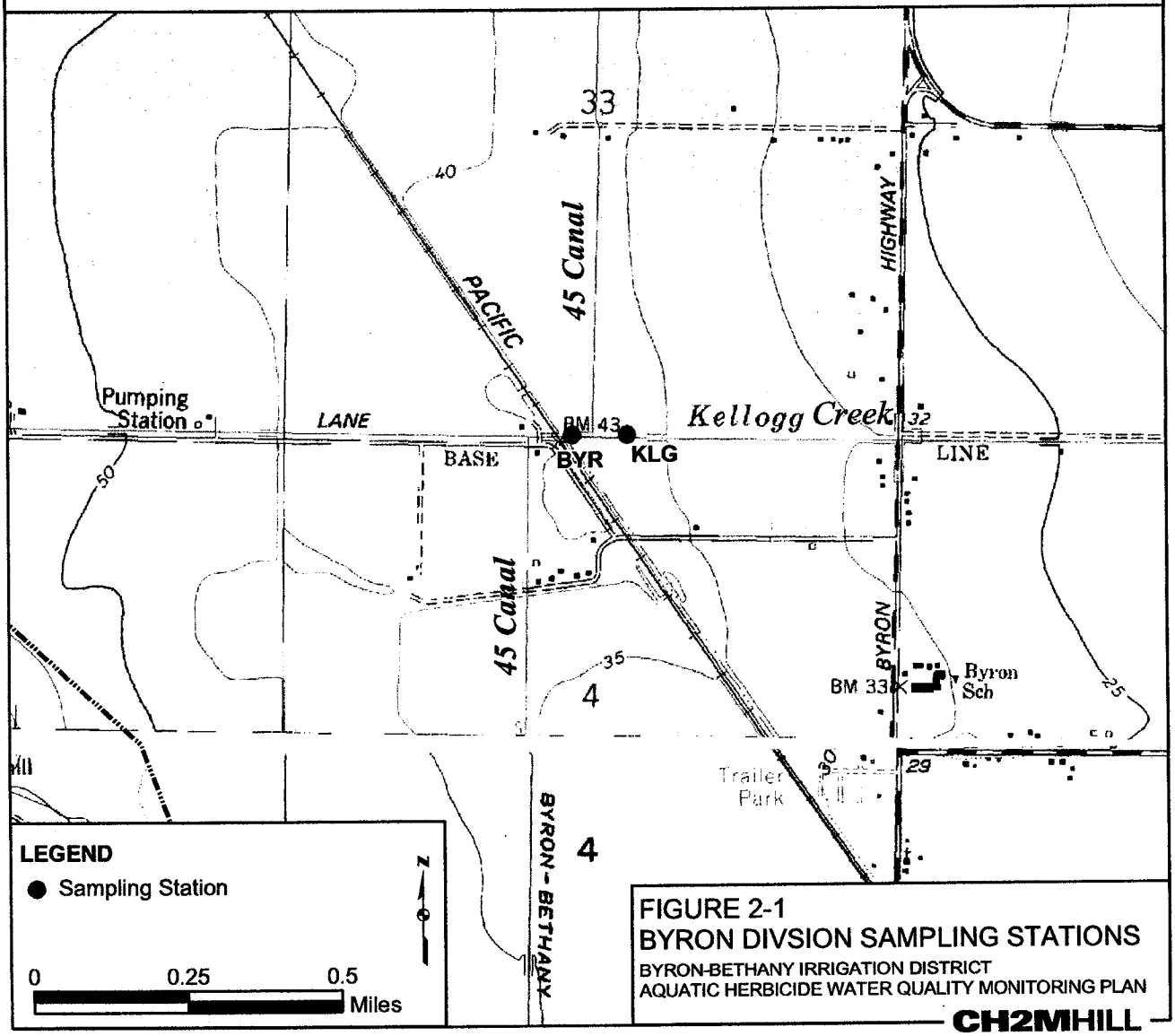
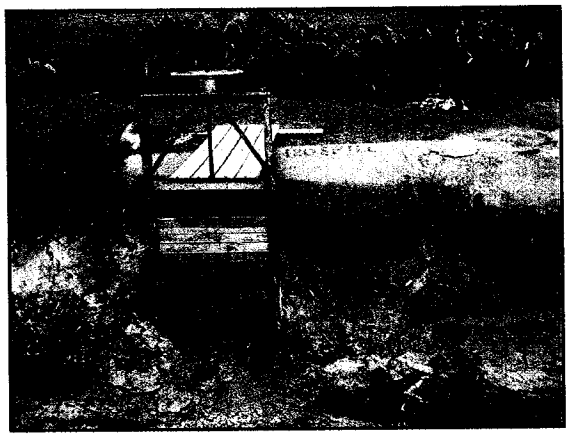


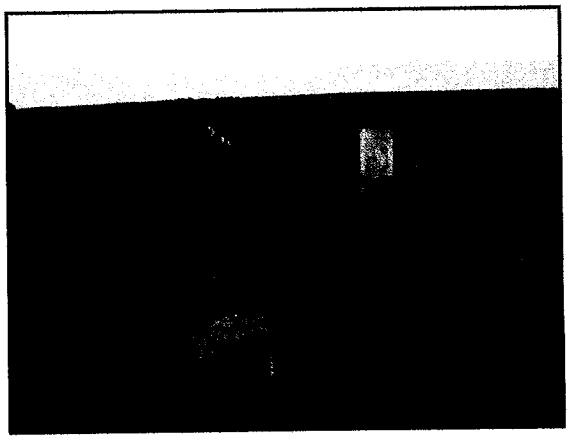
FIGURE 2-1
BYRON DIVSION SAMPLING STATIONS
BYRON-BETHANY IRRIGATION DISTRICT
AQUATIC HERBICIDE WATER QUALITY MONITORING PLAN

CH2MHILL

W022004007SAC/314462/041000023 (FIGURE 2-1)



Sampling Station BTH
120 Spillway



Sampling Station MTN
Mountain House Creek Downstream of the 120 Spillway

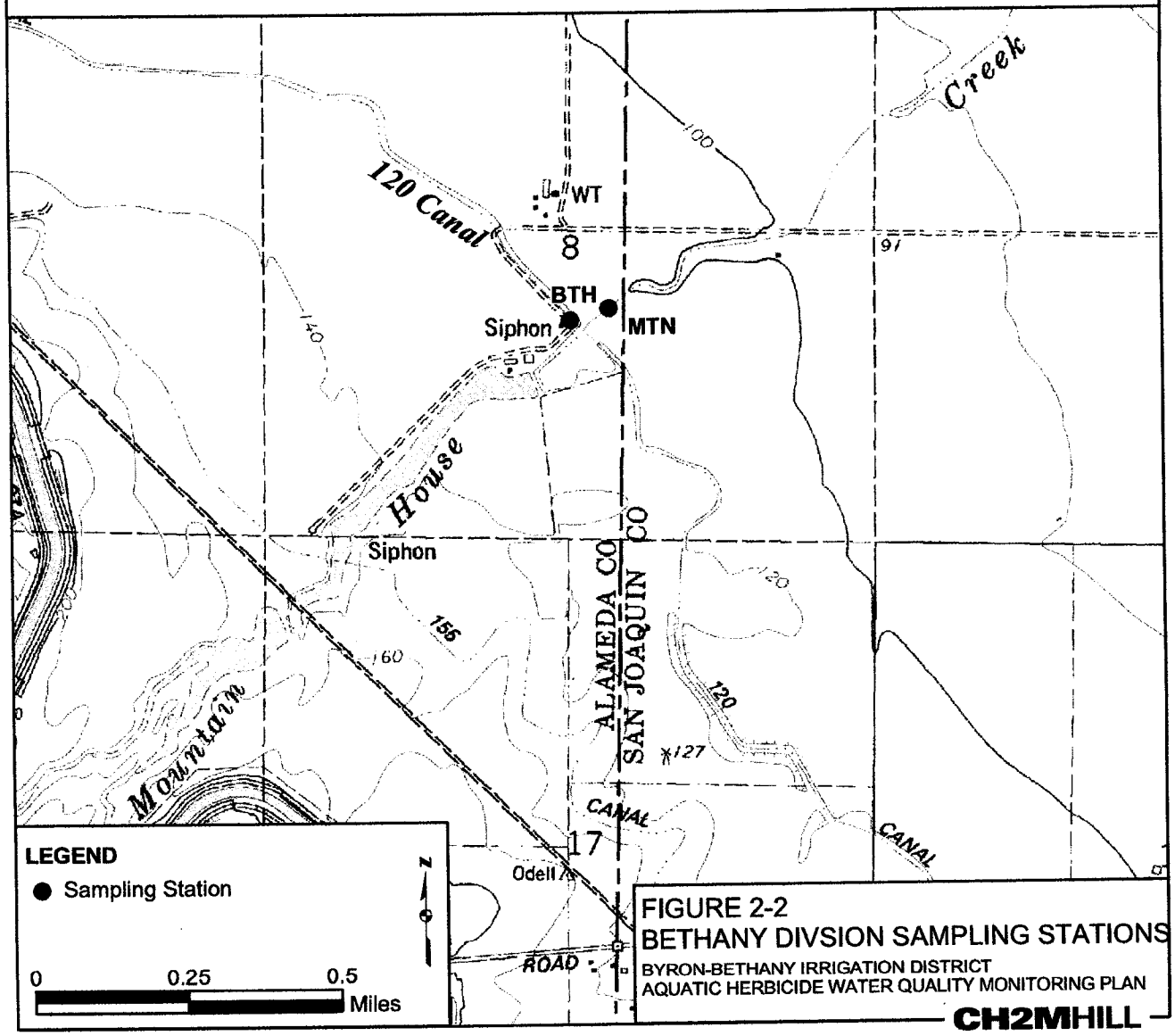


FIGURE 2-2
BETHANY DIVSION SAMPLING STATIONS
BYRON-BETHANY IRRIGATION DISTRICT
AQUATIC HERBICIDE WATER QUALITY MONITORING PLAN

CH2MHILL

W022004007SAC/314462/041000024 (FIGURE 2-2)

2.2 Study Phase Objectives

This Study Phase of the WQMP was designed to meet the following objectives:

- Characterize the fate and transport of acrolein within the BBID canal system.
  - How long do toxic concentrations persist at BYR and BTH following the end of a treatment event?
- Determine the concentration of acrolein at key locations immediately following the return to normal canal operations.
  - Assuming that a condition of 3-inches of freeboard at the radial gate represents a risk of spill to Kellogg Creek, and that a condition of 3-inches of freeboard at the 120 Spillway represents a risk of spill to Mountain House Creek, what is the concentration of acrolein at BYR and BTH following the resumption of normal canal operations and when there is 3-inches of freeboard?

2.2 Study Design

2.2.1 Concentration and Flow Characterization

Figure 2-3 depicts a theoretical representation of concentration vs. time and flow vs. time. The blue line represents a theoretical concentration curve at spill point. The solid pink line shows water management practices at the spill point that result in a resumption of normal canal operations after the acrolein has either degraded or been diverted by water users for on-farm use. Ideally, the District's water management practices resemble the pink line. The purpose of the water quality study is to approximate the persistence of acrolein with the canal systems.

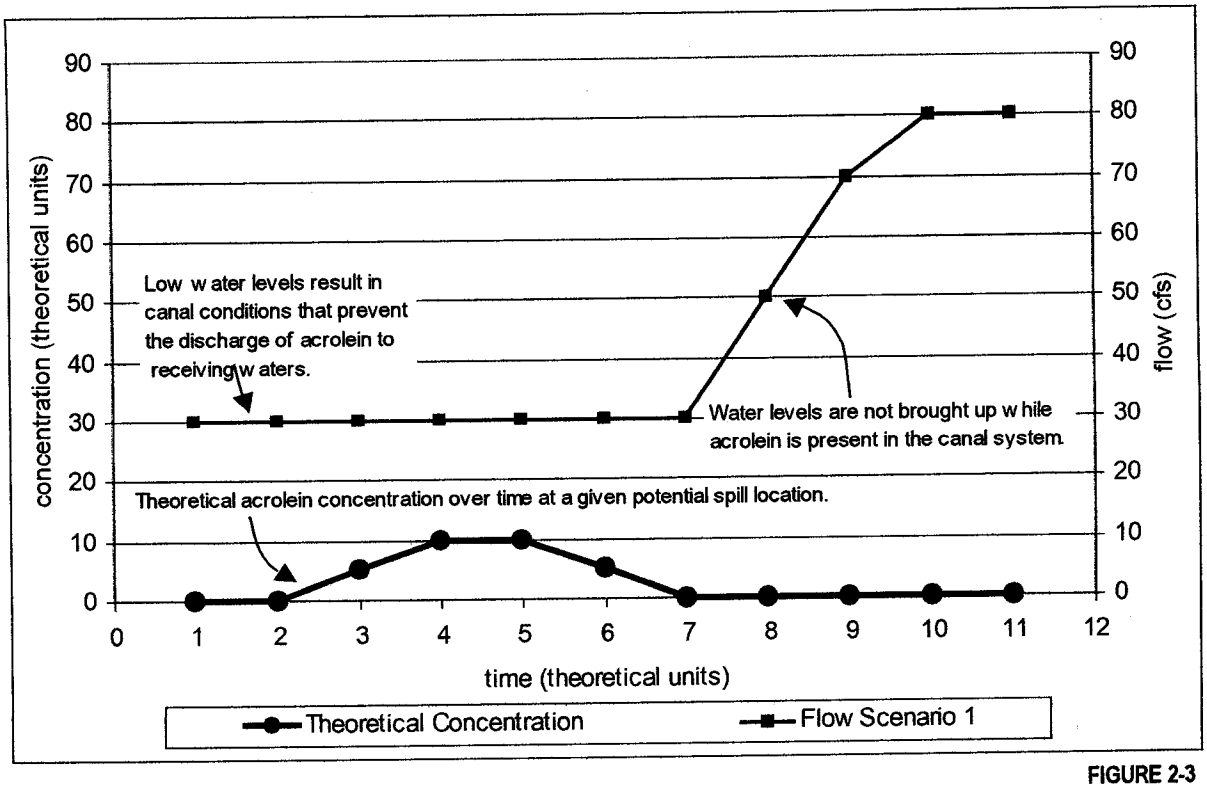


FIGURE 2-3
Theoretical Representation of Concentration vs. Time and Flow vs. Time

2.2.2 Tracer-Dye Study

Tracer-dye studies involve injecting an inert dye at some location in the canal and measuring the resulting presence of dye, at downstream locations to determine the time of travel. Time of travel refers to the time of movement of water or waterborne materials from one point in a stream to another.

A tracer-dye study will be performed on both 45 Canal and 120 Canal. The tracer-dye study will be performed to characterize the travel time of a pulse of contaminant from Pump Station 1-N to the radial gate (BYR) and from Pump Station 1-S to the 120 Spillway (BTH). The dye study will be performed under the low water condition that is used during a treatment. The dye study is needed because the canal dimensions and surface roughness are not uniform. Estimates of time of travel based on canal geometry and slope are likely to be in error.

Strictly visual observations of color will be used to indicate start of the plume and end; the time of travel and duration of the plume. The field data sheet to be used during the dye study is included as Attachment C.

- **Byron Division:** Powdered FWT Red Dye will be added directly to 45 Canal at Pump Station 1-N. The dye will be added at a constant rate for a period of 15 minutes, creating a plume of red dye that will travel downstream in the canal. The rate of pumping at Pump Station 1-N will be recorded. Field staff will be located at the radial gate and will record the travel time of the plume by visual observation.

- **Bethany Division:** Powdered FWT Red Dye will be added directly to 70 Canal (which supplies 120 Canal) at Pump Station 1-S. The dye will be added at a constant rate for a period of 15 minutes, creating a plume of red dye that will travel downstream in the canal. The rate of pumping at Pump Station 1-S will be recorded. Field staff will be located at the 120 Spillway and will record the travel time of the plume.

2.2.3 Water Quality Sampling Study

During the first acrolein application event of the season, a water quality sampling study will be performed. The purpose of the water quality sampling study is determine the concentration of acrolein over time at locations BYR and BTH. This will provide the District with information regarding the fate and transport of acrolein with the canal systems. Samples will be taken in accordance with the procedures specified in Section 5.

Table 2-2 lists the events for the water quality study to characterize acrolein applications in the Byron Division, and Table 2-3 lists the sample events for the water quality study to characterize acrolein applications in the Bethany Division. The results of the dye study will be used to determine the time at which the acrolein wave can be expected to reach BYR and BTH (time T3, which is unique to each canal system).

The first event occurs at time T1, when the canal level is lowered, and includes a water quality sample of the background location AQ. The second event, T2, does not include sampling, and occurs when acrolein treatment begins. The third event, T3, occurs at the travel time that was determined in the dye study, and does not include sampling. The fourth event, T4, occurs three (3) hours after T#, and represents the peak concentration that would occur at the potential spill point. At time T4, a sample is to be collected within the canal (BYR and BTH) and within the creeks (KLG and MTN). If no flow or evidence of spill is present within Kellogg or Mountain House Creeks, then no sample need be taken the creek locations. The fifth event, time T5, occurs when normal pumping operations begin, and no sampling included. The sixth and final event, T6, occurs when the freeboard at BYR and KLG is reduced to 3-inches. A sample is to be collected at BYR and BTH and time T6.

TABLE 2-2
Byron Division Water Quality Study Sampling Events

Time	Event	Required Sampling Station
T1	Canal level is lowered	AQ
T2	Acrolein treatment begins (treatment time is 6 hours)	none
T3 [a]	Acrolein wave reaches the radial gate (BYR)	none
T4	T3 + 3 hours (represents the peak concentration)	BYR, KLG[b]
T5	Normal pumping begins at Pump Station 1-N (T5 + 24 hours)	none
T6	Freeboard at the radial gate (BYR) reduced to 3"(T5 + T3)	BYR

[a] This time is determined based on the dye study

[b] Typically there is no flow in Kellogg Creek below the radial gate during the irrigation season. If no flow or evidence of spill is present within Kellogg Creek, then no sample need be taken at KLG.

TABLE 2-3
Bethany Division Water Quality Study Sampling Events

Time	Event	Required Sampling Station
T1	Canal level is lowered	AQ
T2	Acrolein treatment begins (treatment time is 6 hours)	none
T3 [a]	Acrolein wave reaches the 120 Spillway (BYR)	none
T4	T3 + 3 hours (represents the peak concentration)	BTH. MTN[b]
T5	Normal pumping begins at Pump Station 1-S (T5 + 24 hours)	none
T6	Freeboard at the 120 Spillway (BTH) reduced to 3"	BTH

[a] This time is determined based on the dye study.

[b] Mountain House Creek typically has flow. However, if no flow is present within Mountain House Creek, then no sample need be taken at MTN.

SECTION 3

Sampling Design

3.1 Sampling Objectives

This WQMP was designed to meet the following objectives:

- Comply with the requirements of the general NPDES permit Monitoring and Reporting Program
- Provide sufficient monitoring data to assess compliance with water quality limitations contained in the general NPDES permit.

3.2 Assumptions

3.2.1 Monitoring Types

The MRP calls for three types of receiving water monitoring (part B): (1) background monitoring, (2) event monitoring, and (3) post-event monitoring. This WQMP addresses this requirement. The following describes the assumed purpose of each type of monitoring:

- **Background Monitoring:** Background samples are to be collected upstream at the time of the application event, or they may be collected at the treatment area just prior to the application event (up to 24-hours in advance). The purpose of background monitoring is to characterize the quality of the source water. In the case of BBID, the source water is the intake channel of the California Aqueduct. Background samples are to be taken before the application of acrolein commences.
- **Event Monitoring:** In flowing waters, such as a canal, event samples are to be collected immediately downstream of the treatment area, immediately after the application event or shortly after the application event, but after sufficient time has elapsed such that treated water could have entered the downstream area. The purpose of event monitoring is to characterize the quality of the receiving waters (i.e., Kellogg Creek and Mountain House Creek) during the time when acrolein concentrations within the canal exceed water quality limitations and the canal has discharged to the receiving water. If visual monitoring confirms that no spill occurs (i.e., all acrolein is contained within the BBID canal system), then no analytical testing for event monitoring is required. Visual monitoring for each canal system provides sufficient information upon which to make a determination regarding the occurrence of spill.
- **Post-Event Monitoring:** Post event samples are to be collected within the treatment area and immediately downstream of the treatment area one week after the application event. The purpose of post-event monitoring is to characterize the quality of the canal water within one-week of the resumption of normal canal operations. It is during normal canal operations that spill to Kellogg Creek and/or Mountain House Creek could occur. The post-event monitoring is to occur when there is 3″ of freeboard at the Radial Gate (BYR) and the 120 Spillway (BTH). It is anticipated that this will occur on the day following the acrolein treatment.

TABLE 4-1
Monitoring Parameters

Sample Type	Constituent/ Parameter	Sample Method	Laboratory Method	Frequency
Visual	1. Site description 2. Appearance of waterway 3. Weather conditions	Visual Observation	Not applicable	Every application event, at both the Byron Division sites and at the Bethany Division sites.
Physical	1. Temperature[a]	Field Measurement	Not applicable	Every application event; alternating between the Byron Division site and the Bethany Division sites.
	2. Turbidity[a]	Field Measurement	Not applicable	
	3. Electrical conductivity/salinity[a]	Field Measurement	Not applicable	
Chemical	1. Acrolein (active ingredient)	Grab[b]	Per USEPA guidelines (Method 8260)	Every application event; alternating between the Byron Division site and the Bethany Division sites.
	2. Nonylphenol or other surfactant[c]	Grab[b]	Per USEPA guidelines	
	3. pH[a]	Field Measurement	Not applicable	
	4. Dissolved Oxygen[a]	Field Measurement	Not applicable	
	5. 3-Hydroxypropanal	Grab[b]	Per USEPA guidelines	

[a] These parameters are determined by field measurements using the Horiba U-10 water quality checker as discussed in Section 5.

[b] Grab samples shall be collected at three feet below the surface, or mid-depth if the canal or creek is less than six feet deep.

[c] BBID does not use surfactants in its application of acrolein. If the Central Valley Regional Water Quality Control Board formally approves, the District's sampling and analysis will not include monitoring for surfactants.

If visual monitoring indicates that a spill has occurred to Kellogg Creek or Mountain House Creek, then event monitoring is required, as described below. In the Byron Division, if there is flow in Kellogg Creek, then it is likely that a spill has occurred and event monitoring is required. In the Bethany Division, if the wet water mark on the side of the concrete-lined canal at the 120 Spillway is level with the top of the corrugated iron pipe, then spill to Mountain House Creek has likely occurred and event monitoring is required. Figure 4-1 shows the canal and the corrugated iron pipe at which the BTH visual monitoring is to occur.

4.1.3.2 Physical and Chemical Monitoring

The purpose of the water quality monitoring is not to verify treatment concentrations, but rather to insure that spill does not occur and that the acrolein is completely diluted and diverted from the canal prior to the resumption of normal irrigation delivery operations.

Tables 4-2 and 4-3 show the sampling events for stations within the Byron Division and Bethany Division, respectively. The first sample, taken at time T2, is a background sample that will be used to characterize the quality of the source water. The second sample, taken at time T3, is the event sample. Event samples need only be taken if visual monitoring indicated a spill. The third sample, taken at time T5, is a post-event sample that will be used

to verify that the pulse of acrolein has been completely removed from the canal through dilution and diversion.

FIGURE 4-1
120 Spillway Visual Monitoring Location

TABLE 4-2
Byron Division Sampling Events

Time	Event	Required Sampling Station	Sampling Type
T1	Canal level is lowered	none	--
T2	Acrolein is applied	AQ	Background
T3	Acrolein wave reaches the radial gate (BYR). Kellogg Creek is examined for spill.	KLG [a]	Event
T4	Normal pumping begins at Pump Station 1-N	none	--
T5	Freeboard at the radial gate (BYR) reduced to 3" or less	BYR	Post-Event

[a] If visual monitoring confirms that no spill occurs (i.e., all water is contained within the BBID canal system), then no analytical testing for event monitoring is required.

TABLE 4-3
Bethany Division Sampling Events

Time	Event	Required Sampling Station	Sampling Type
T1	Canal level is lowered	none	--
T2	Acrolein is applied	AQ	Background
T3	Acrolein wave reaches the radial gate (BTH). Mountain House Creek is examined for spill.	MTN [a]	Event
T4	Normal pumping begins at Pump Station 1-S	none	--
T5	Freeboard at the120 Spillway (BTH) reduced to 3" or less	BTH	Post-Event

[a] If visual monitoring confirms that no spill occurs (i.e., all water is contained within the BBID canal system), then no analytical testing for event monitoring is required.

SECTION 5

Sampling and Monitoring Procedures

5.1 Surface Water Sampling

Surface water samples will be collected so as not to cause cross-contamination[1]. Measure and record pH, temperature, specific conductance, and dissolved oxygen (when required) at each surface water sampling point. The location where surface water or sediment samples are collected will be permanently marked (e.g., flagged stake in canal or creek bank). The locations have been previously recorded on a project map (see Figures 2-1 and 2-2).

The sample collection sequence will be as follows: (1) if the sample can be taken without disturbing the canal or creek bottom, obtain any background samples first, then the farthest downstream sample, and then move upstream toward the source or discharge point, (2) if sampling water only and the canal or creek bottom must be disturbed, start at the most downstream point and proceed upstream.

Samples shall be taken from the active, flowing portion of the canal or creek. Surface water samples will be collected by filling directly into a laboratory certified clean container that does not contain any preservatives with the inlet line located just below the surface.

The following data shall be collected at each station in addition to those in Section 7: (1) the width, depth, and flow rate of the drainage channel, (2) surface-water conditions (e.g., floating oil or debris, gassing), (3) the location of any discharge or intake pipes or tributaries, and (4) instrument calibration.

Samples will be collected in bottles provided by the laboratory for the specific parameter being analyzed.

5.2 Sample Custody

Sample custody requirements include procedures to ensure the custody and integrity of the samples, beginning at the time of sampling and continuing through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal.

The following minimum information concerning the sample shall be documented on the chain of custody (CoC) form:

- Unique sample identification
- Date and time of sample collection
- Sample matrix (e.g., water)
- Source of sample (including name, location, and sample type)

---

[1] Special care will be taken during the collection of the background sample (AQ) to ensure that field samplers do not handle acrolein application equipment prior to collection of the samples.

- Designation of matrix spike/matrix spike duplicate (MS/MSD)
- Preservative used
- Analyses required
- Name of collector(s)
- Custody transfer signatures and dates and times of sample transfer from the field to transporters and to the laboratory or laboratories
- Any comments to identify special conditions or requests

All samples shall be uniquely identified, labeled, and documented in the field at the time of collection in accordance with Section 7.

Samples collected in the field shall be transported to the laboratory as expeditiously as possible; the samples shall be packed in ice or chemical refrigerant to keep them cool during collection and transportation. Generally, electronic CoCs will be prepared prior to initiating field efforts. A copy of the signed CoC that is sent to the lab will be kept in the project file.

If an electronic CoC is not an option, a handwritten CoC must be used. Blank CoCs are provided by the lab, along with the sample containers, and the forms are in triplicate. Once the CoC is completed, the bottom form is to be torn off and filed in the field office. The other two copies of the CoC is to be sent to the lab, accompanying the samples. A photocopy of the top of the CoC should be made if the retained page is illegible.

Upon receipt by the laboratory, the sample custodian shall check and certify, by completing logbook entries, that the seals on coolers, boxes, or bottles are intact.

The coolers used to transport the samples to the laboratory will be prepared as follows:

1. Remove all previous labels used on the cooler.
2. Seal all drain plugs with tape (inside and outside).
3. Double-bag all ice in resealable plastic bags and seal.

The samples will be packed into the coolers using the following procedure:

1. Wrap glass jars with bubble wrap to prevent or minimize breakage.
2. Place the CoC form in the resealable plastic bag and tape it to the underside of the cooler lid.
3. Place ice on top of and between the samples.

Coolers will be packed with ice in resealable plastic bags to prevent melting ice from soaking the samples. Sample documentation will be enclosed in sealed plastic bags taped to the underside of the cooler lid. Coolers will be secured with packing tape and custody seals as described below.

1. Tape the cooler lid with strapping tape, encircling the cooler several times.
2. Place CoC seals on two sides of the lid (one in front and one on the side).
3. Place "This Side Up" arrows on the sides of the cooler.

The coolers will then be delivered to the appropriate laboratory by the sampling team the day of sample collection.

5.3 Field Measurements and Instrument Calibration

5.3.1 Water Quality/Physical Parameters

Field measurements are made during the surface water sampling process to provide additional data for characterizing water quality. The field measurements shall be made as follows:

- Rinse the instrument sample container with the sample water prior to filling
- Probes within the sample container shall make the appropriate measurements.
- All field measurements shall be recorded in the field logbook with the sample location, time and date of measurement, and the sampler's name.

The following subsections provide some specific requirements for field measurement including the number of places to which the result should be recorded and the acceptability criteria for repeatable or stable measurements. These same parameters will be measured "in-stream" for any surface water samples collected.

5.3.1.1 Dissolved Oxygen

Dissolved oxygen readings will be made by inserting the probe directly within the flowing water just downstream from the point to be sampled. Record the reading to the nearest 0.01 mg/L. Consecutive readings are considered as stable if they are within 0.1 mg/L or 10 percent of each other (whichever is greater).

5.3.1.2 Conductivity

Electrical conductivity readings will be made by inserting the probe directly within the flowing water just downstream from the point to be sampled. Record the reading to the nearest 1 µmhos/cm. Consecutive readings are considered as stable if they are within 5 µmhos/cm or 3 percent of each other (whichever is greater).

5.3.1.3 pH

Hydrogen ion activity (pH) readings will be made by inserting the probe directly within the flowing water just downstream from the point to be sampled. Record the reading to the nearest 0.01 pH unit. Consecutive readings are considered as stable if they are within 0.1 pH units of one another.

5.3.1.4 Temperature

Temperature readings will be made by inserting the probe directly within the flowing water just downstream from the point to be sampled. Record the reading to the nearest 0.1° C. Consecutive readings are considered as stable if they are within 0.2°C of one another.

5.3.1.5 Turbidity

Turbidity readings will be made by inserting the probe directly within the flowing water just downstream from the point to be sampled. Record the reading to the nearest 1 NTU. Consecutive readings are considered as stable if they are within 5 NTU of one another.

5.4 Equipment Calibration and Quality Control

A "Horiba U-20-series" meter, or equivalent, will be used to measure the pH, conductivity, temperature, turbidity, and dissolved oxygen. This instrument uses one standard solution for a single point calibration of pH, conductivity, turbidity, and dissolved oxygen. A beaker provided for calibration is filled with a standard solution, the probes are then immersed in this solution, and the calibration button pushed. All instrument calibration results will be recorded in a bound field notebook.

The operational performance of the field instruments can be assessed during use by the stability of the measurements observed. Widely fluctuating results or results that seem out of normal range indicate that the probe may not be functioning properly. If this condition is noted, it is recommended that the instrument be re-calibrated. If an instrument will not recalibrate correctly, then the instrument should be sent back to the supplier for servicing and a backup instrument employed for ongoing readings.

SECTION 6

Quality Assurance/Quality Control Program

6.1 Field Quality Control Samples

6.1.1 Field Duplicates

A field duplicate sample is a second sample collected at the same location as the original sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicate samples by laboratory personnel performing the analysis. Specific locations are designated for collection of field duplicate samples prior to the beginning of sample collection. One field duplicate should be collected for every ten field samples.

6.2 Laboratory Requirements

Analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", promulgated by USEPA (Title 40 Code of Federal Regulations part 136).

The laboratory to be used is McCampbell Analytical, Inc., located in Pacheco, California. The contact information and directions to the laboratory are included as Attachment E.

SECTION 7

Reporting and Records Retention

7.1 Reporting

7.1.1 General NPDES Permit Reporting

7.1.1.1 Annual Reports

In compliance with the general NPDES permit, annual reports shall be filed with the Central Valley Regional Water Quality Control Board. The reports shall summarize the water quality results for the January 1 through December 31 time period, and shall be submitted to the CVRWQCB by March 1 of each year.

7.1.1.2 Noncompliance Reporting

The general NPDES permit specifies that the District shall report any noncompliance that may endanger health or the environment. Any information will be provided within 24 hours from the time the District becomes aware of the circumstances. A written submission is also to be provided within five days of the time the District becomes aware of the circumstances. The written submission will contain a description of the noncompliance and its cause, the period of noncompliance (exact dates and times), and if the noncompliance has not been corrected, the anticipated time it expected to continue and steps taken or planned to reduce, eliminate, and prevent reoccurrence of noncompliance. The following occurrences is considered to be instances of noncompliance: any bypass (spill to Kellogg Creek or Mountain House Creek) which exceeds receiving water limitations

7.2 Records Retention

Records of all monitoring information, including all calibration and maintenance records and copies of all reports submitted pursuant to requirements of the general NPDES permit. Records shall be maintained for a minimum of three years from the date of the sampling, measurement, or report. This period may be extended during the course of any unresolved litigation regarding the District's use of acrolein or when requested by the Executive Officer of the CVRWQCB.

7.3 Record Keeping

Field records sufficient to recreate all sampling and measurement activities. The requirements listed in this section apply to all measuring and sampling activities. Requirements specific to individual activities are listed in the section that addresses each activity. The information shall be recorded with indelible ink in a permanently bound notebook with sequentially numbered pages.

The following additional information shall be recorded for all sampling activities: (1) sample type and sampling method, (2) the identity of each sample and depth(s), where applicable, from which it was collected, (3) the amount of each sample, (4) sample description (e.g., color, odor, clarity), (5) identification of sampling devices, and (6) identification of conditions that might affect the representativeness of a sample (e.g., refueling operations, damaged casing).

Deviations/Notes: Information relating to all field activities: field conditions, sampling events, equipment calibration; field measurements, shall be recorded in a hardbound field notebook or on appropriate field forms as described below:

7.3.1 Field Logbooks

Bound and numbered logbooks will be used to record all sampling information. Information in the logbooks will include, at a minimum, the following:

- Name and title of the recorder, and date and time of entry
- General description of weather conditions
- Personnel involved with the activities
- Photographic log, if appropriate
- Sampling location and description
- Location of duplicate and QC samples, date and time of collection, parameters to be analyzed; sample identification (ID) numbers
- Time of sampling
- Depth to water from elevation mark on the casing
- Measured field parameters and field instrument calibration information
- Names of visitors, their associations, and purpose of visit
- Unusual activities such as departures from planned procedures
- References to important telephone calls

All logs will be completed, signed, and dated by the recorder. All logs will be written with waterproof ink. Corrections will be made by crossing out the error with a single horizontal line, initialing the correction, and entering the correct information. Crossed-out information shall be readable. The corrections should be initialed and dated. Daily entries will signed by the field recorder at the end of each day's activities.

The site logbook is the primary repository for information about actual site conditions. Because of this, it is an important link in the data quality and analytical chain. The logbook should be used to record any details that may be relevant to the analysis or integrity of the samples. Any unusual field conditions should also be noted such as heavy rain or problems with instrument calibration. At the completion of a sampling exercise, the logbook should be returned to the project file. The logbook is always kept as a permanent part of the file. Whenever, the information contained in the logbook is relevant to the samples being analyzed, that information should be copied and made available to the laboratory performing the analysis.

7.3.2 Surface Water Sampling Field Data Sheet

Surface water Sampling Field data sheets are used to track in stream field measurements on purge water, and sampling activities. The form is formatted to list all required information during sampling activities. The header and tabular information to be recorded, serve as a reminder to the field technicians to assure that all necessary information is taken. A blank Sampling Field Data Form is included as Attachment D-1.

7.3.3 Chain of Custody (CoC) forms and Custody Seals

As described in Section 5, chain of custody forms shall be provided in each sample cooler being delivered to the laboratory. An example completed CoC form is provided as Attachment D-2. In addition, each cooler is sealed with custody seals as described in Section 5. The CoC procedures discussed in those sections, provides a documented trial of each sample from the time it is generated to the time it reaches the analytical laboratory.

At the analytical laboratory, a sample receiving logbook is used by laboratory staff to document the condition of custody seals and upon arrival. Deviations from acceptable conditions (i.e., elevated temperature blanks or holding time violations) are also noted on the original CoC forms. Information on the CoC forms is considered during the analytical data validation process. The completed CoC forms are also incorporated into the laboratory report deliverables and so, become a permanent part of the file records for those samples.

ATTACHMENT A

Aquatic Pesticide Application Plan

ATTACHMENT A

Aquatic Pesticides Application Plan (APAP)

BBID applies Magnacide H® in accordance with its APAP. The APAP includes:

- program oversight and license requirements
- an application schedule
- an applicator education program
- specific water management measures to prevent the release of acrolein from treated canals to sensitive habitat
- public noticing requirements
- reporting requirements
- project monitoring

The practices specified in the APAP were developed to prevent the release of acrolein to Kellogg Creek and Mountain House Creek.

TABLE A-1
Aquatic Pesticides Application Plan

Component	Provisions
Canal Maintenance Program Oversight and License Requirements	BBID's canal maintenance program includes the use of acrolein to control algae and aquatic weeds. The canal maintenance program is overseen by the General Manager and is implemented by the Operations Supervisor. The General Manager holds a valid Agricultural Pest Control Adviser (PCA) license and a Qualified Applicator's License (QAL), and the Superintendent holds a valid Qualified Applicator's Certificate (QAC).
Application Schedule	Application of acrolein typically can begin as early as March and as late as May, and extend through the end of irrigation season, typically September. Applications typically occur every 14 to 21 days, depending on the presence of algae and/or aquatic weeds. The General Manager determines when an application is to occur. This determination is based on canal conditions.
Application Practices	Applications are conducted consistent with the manufacturer's Application and Safety Manual (Baker Petrolite, 2001), including the product registration label. The rate and duration of dosage are determined based on the application guidance within the manual, and are dependent on weed conditions, flow, and water temperature. Applications are not to exceed 15 parts per million (ppm) Magnacide H®, as specified in the product manual (Baker Petrolite, 2001). Applications are made consistent with the instructions specified in the product manual. These instructions include provisions for record keeping; equipment inspection; personal protective equipment; care and placement of the nitrogen tank and the product tank; valve testing, opening, and closure; hose connection; application monitoring; and shutdown procedures.
Application Locations	BBID treats its conveyance system with the herbicide Magnacide H® at two locations: Pump Station 1-N and Pump Station 1-S.

TABLE A-1
Aquatic Pesticides Application Plan

Component	Provisions
Applicator Education Program	Annually, prior to the beginning of the irrigation season, BBID will conduct a Worker Environmental Awareness Education Program. Educational materials will be provided to all District staff engaged in the application of acrolein. A pamphlet/pocket guide will be prepared that will include pictures and descriptions of listed species, and a bulleted list of the appropriate procedures to follow in the unlikely event that listed species are observed within the canal system. These materials will be posted in an area visible to staff involved in the treatment process. Standard procedures will specify that, in the unlikely event that listed species are observed within the canal, the applicators will contact the General Manager and suspend application activities and the California Department of Fish and Game will be contacted to determine the appropriate next steps.
Water Management	**General:** During the application event, the canals are managed to prevent release of acrolein to Kellogg Creek and Mountain House Creek. Water levels in the canals are lowered specifically for the purpose of minimizing any risk of release of acrolein to the creeks, and the canals are held in a lower water condition for 24 hours. Normal canal operations are resumed 24 hours after the application of the herbicide, and diligent care is taken to prevent the release of canal water to the creeks. Lowering canal water levels ensures that no treated water is released from BBID canals for at least 24 hours following treatment. Within the retention period specified by the acrolein label instructions, all treated water within the canals is diverted by BBID customers. The swift degradation of acrolein during this period, along with dilution, ensures that herbicide potency dramatically decreases following treatment. **Byron Division:** In order to understand water delivery operations in the Byron Division, it is critical to understand the operations at the juncture of 45 Canal and Kellogg Creek. Pump Station 1-N supplies 45 Canal, the conveyance system for the Byron Division. 45 Canal flows north from 1-N to a radial gate located at the intersection of 45 Canal and Kellogg Creek. Kellogg Creek has four distinct channel sections. These reaches are: (1) Reach 1: west of BBID, (2) Reach 2: from the BBID boundary to Pump Station 4, (3) Reach 3: from Pump Station 4 to 45 Canal, and (4) Reach 4: from the 45 Canal to Discovery Bay. • Reach 1 is located in the foothills to the west of BBID. This reach was not evaluated because it falls outside the project area. • Portions of Reaches 2, 3, and 4 were included in a Biological Survey prepared as part of the environmental evaluation for the application of acrolein. Within these reaches, the creek bank is a modified and maintained channel; engineered uniform side slopes and a flat bottom are maintained by the District. • Reach 2 is an infrequently maintained section of channel that contains some riparian vegetation along the channel levee. Low ephemeral flows limit the establishment of significant wetland and emergent vegetation in the creek bottom. The terminus of this reach is Pump Station 4.

TABLE A-1
Aquatic Pesticides Application Plan

Component	Provisions
Water Management (continued)	• Reach 3 is a flat, highly maintained section of the channel, approximately one-mile in length, which long ago was modified from its natural state and incorporated into the District's irrigation delivery system. This reach begins at Pump Station 4. The reach contains a few landscaped trees along the outside levee and no in-channel vegetation. The terminus of this reach is 45 Canal. A radial gate is located in Kellogg Creek immediately downstream of the perpendicular crossing of 45 Canal and Kellogg Creek. As irrigation water from the 45 Canal south of Kellogg Creek flows into Reach 3, the radial gate prevents irrigation water from flowing downstream into Reach 4 and allows the District to bifurcate irrigation flows between the northern extension of 45 Canal and Reach 3. As irrigation water ponds against the radial gate, the water surface elevation in Reach 3 rises, allowing water to 1) flow north into the continuation of 45 Canal and 2) flow upstream (west) into Reach 3. As water flows upstream into Reach 3, it ponds against a concrete weir located in Kellogg Creek at Pump Station 4. The impounded irrigation water is then conveyed via Pump Station 4 to District customers. During the winter months when irrigation water is not being delivered, the radial gate in Kellogg Creek is kept open to allow any potential storm flows to pass into Reach 4. • Reach 4, which begins directly downstream of the radial gate, is channelized but is less maintained than Reach 3. One day prior to the application event, diversions into 45 Canal are reduced to about 30 cubic feet per second (cfs) to 50 cfs. This flow rate is adjusted as necessary to ensure that a minimum of 12-inches of freeboard is maintained at the radial gate to prevent spill to Reaches 2 and 4 of Kellogg Creek. Acrolein is applied at 1-N while canal flows remain in the 30 to 50 cfs range. The system (45 Canal and Reach 3 of Kellogg Creek) is held in this low water condition for one day, and no release is made to Kellogg Creek for a minimum of 24 hours. During this time, water users at the end of the canal system may divert water for on-farm use. After the one-day holding time, water deliveries and canal operations resume normal operations. **Bethany Division:** Pump Station 1-S supplies three main canals in the Bethany Division: 70 Canal, 120 Canal, and 155 Canal. These canals flow in a generally southern direction from 1-S. 70 Canal terminates at Gate 20 and does not spill to any natural creek or drainage. 120 Canal terminates south of Grant Line Road and includes the 120 Spillway, which discharges to Mountain House Creek. 155 Canal terminates near Mountain House Parkway, and does not spill to any natural creek or drainage. One day prior to the application event at 1-S, diversions into 70 Canal are reduced to about 30 to 50 cfs. This flow rate is adjusted as necessary to ensure that a minimum of 12-inches of freeboard is maintained at the 120 Spillway. Acrolein is applied at Pump Station 1-S while flows range from about 30 to 50 cfs. The system is held in this low water condition for one day, and no release is made to Mountain House Creek. During this time, water users along the canal system may divert water for on-farm use. After the one-day holding time, water deliveries and canal operations resume normal operations.

TABLE A-1
Aquatic Pesticides Application Plan

Component	Provisions
Public Notice Requirements	**Drinking Water Providers:** Acrolein-treated water does not discharge in the vicinity of any municipal drinking water intakes; therefore, no drinking water providers are informed of the District's applications. **Water Users:** The District notifies water users at the upstream end of the Byron Division prior to each acrolein application, which allows water users to adjust their irrigation schedules to ensure that the herbicide remains in the canal to serve its treatment purpose. Additionally, the District notifies organic growers within the District prior to each acrolein application to allow the water users to adjust their irrigation schedules to protect their organic certifications. Consistent with the requirements of the general NPDES permit, the District will make an annual announcement of its plans to use acrolein and will provide a phone number that water users may call to obtain additional information regarding specific herbicide applications.
Reporting Requirements	The California Department of Fish and Game (CDFG) is notified of District's intent to use acrolein on an annual basis. Twenty-four (24) hours prior to each application, the District provides written notice to the County Agricultural Commissioner and CDFG, as required by the pesticide use label. Pursuant to the requirements of the general NPDES permit, the District will submit an annual report to the RWQCB that will include the following types of information: a summary of compliance or violation of the General NPDES Permit, identification of Best Management Practices (BMPs) or additional measures necessary to control the discharge of acrolein, pesticide use summaries, and monitoring results. Reports are to be submitted annually by March 1. The District also intends to comply with the additional reporting required by the Standard Provisions and Reporting portion of the General NPDES Permit. These include 24-hour reporting of noncompliance and reporting of anticipated noncompliance. It should be noted that the District does not anticipate noncompliance.
Project Monitoring	This report describes the project monitoring.

ATTACHMENT B

Acrolein Application Record

BBID MAGNACIDE H APPLICATION RECORD

DATE OF APPLICATION	
IRRIGATION DISTRICT	
LOCATION OF APPLICATION	

OPERATORS NAME	
CERTIFIED APPLICATOR'S NAME (if different from operator)	
LICENSE NUMBER	

Aquatic weed(s) present:	
Weed growth condition: A, B, C, etc.	
Application Concentration	**gal/cfs**
Flow rate in canal	**cfs**
Treatment time:	**hours**
Water Temperature:	**F**
Container Number	**gal**
Start contents	**gal**
Quantity Used: (GPH x hours) (actual)	**gal**
Quantity remaining:	**gal**
Time started:	
Time ended:	
Time (actual)	**hrs**

Gallons per hour: (calculated)	
Gallons per hour: (actual)	
Orifice size:	**0.0 inches**
Pressure setting:	**p.s.i.g.**
Application concentration: (gal/cfs x 1884) / (time (min.)) NOT TO EXCEED 15 ppm	**=ppm**

Cylinder	=	52.4 gal
2450 skid	=	347.0 gal
2300 skid	=	325.8 gal
2500 skid	=	354.1 gal
3000 skid	=	424.9 gal

ATTACHMENT C

Dye Study Field Log

DYE STUDY FIELD LOG

BYRON DIVISION		
DATE: _____		
FLOW RATE: _____		
AMOUNT OF DYE ADDED: _____		
FIELD STAFF: _____		
_____		
EVENT	**LOCATION**	**TIME**
START DYE INJECTION	PUMP STATION 1-N	
STOP DYE INJECTION	PUMP STATION 1-N	
PLUME ARRIVES	BYR	
PLUME ARRIVES	PUMP STATION 4	
NO EVIDENCE OF PLUME	BYR	
NO EVIDENCE OF PLUME	PUMP STATION 4	

BETHANY DIVISION		
DATE: _____		
FLOW RATE: _____		
AMOUNT OF DYE ADDED: _____		
FIELD STAFF: _____		
_____		
EVENT	**LOCATION**	**TIME**
START DYE INJECTION	PUMP STATION 1-S	
STOP DYE INJECTION	PUMP STATION 1-S	
PLUME ARRIVES	BTH	
PLUME ARRIVES	MTN	
NO EVIDENCE OF PLUME	BTH	
NO EVIDENCE OF PLUME	MTN	

ATTACHMENT D

Sample Forms

CH2M HILL

Sheet __ of __

Surface Water Sampling Log

Project Information

Project Name: BBID Aquatic Herbicide NPDES Water Quality Monitoring

Project # :

By:

Date:

Location (circle): AQ BYR KLG BTH MTN

Sampling Data Log

Date/Time	Sample ID	pH	COND. (ms/cm)	TEMP (C)	Turbidity (NTU)	DO (mg/L)	FLOW	Observations

Visual Monitoring (note the freeboard conditions and whether there is any spill to Kellogg Creek or Mountain House Creek):

Other Observations and Comments (note any unique circumstances; instruments used; calibration information):

McCampbell Analytical, Inc.
CHAIN OF CUSTODY RECORD

110 Second Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622

Project/Contact Information	
Project #	
Project Name	BBID Aquatic Herbicide NPDES Water Quality Monitoring
Report Copy to	Summer Bundy/CH2M HILL/SAC
Company Name/Contact	CH2M HILL/SAC, Summer Bundy Phone 916-286-0303

THIS AREA FOR LAB USE ONLY		
Lab #	Pg 1	of 1
Lab PM	Custody Review	
Log In	LIMS Verification	
pH	Cust Seals Y N Ice Y N	
QC Level 1 2 3		
Cooler Temperature		

Requested Analysis: Acorlein, Surfactants, 3-hydroxypropanal

Sampling Date	Start Time	Type: Comp	Type: Grab	Matrix: Water	Matrix: Soil	Matrix: Air	Client Sample ID (9 Characters Max)	LAB QC	Total Number of Containers	Acorlein	Surfactants	3-hydroxypropanal	Preservative	Alternate Description	Lab ID

Sampled By	Relinquished By
Received By	Relinquished By
Received By	Relinquished By
Received By	Date/Time
Special Instructions	

W022004007SAC/314462/041000019 (Attachment D2.xls)

ATTACHMENT E

Laboratory Information

ATTACHMENT E

Laboratory Information

McCampbell Analytical, Inc.

110 Second Avenue South, #D7
Pacheco, CA 94553-5560
Telephone : 925-798-1620
Fax : 925-798-1622
Contact: Angela Rydelius

Directions:

From Byron:

- Take CA-4W (toward Oakland)
- Take the exit toward Pacheco
- Turn right onto Pacheco Blvd.
- Turn left onto Center Ave.
- Turn right onto Berry Dr.
- Turn left onto 2nd Ave. S.
- End at 110 2nd Ave S., Pacheco CA