

GENERAL NPDES PERMIT FOR RESIDUAL  
AQUATIC PESTICIDE DISCHARGES FROM  
ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

ORDER NO. 2013-0002-DWQ  
NPDES NO. CAG990005

**RECEIVED**

**AUG 01 2014**

Attachment E – Notice of Intent

WATER QUALITY ORDER NO. 2013-0002-DWQ  
GENERAL PERMIT NO. CAG990005

DIVISION OF WATER QUALITY

STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
(NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF  
THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item	A. <input checked="" type="checkbox"/> New Applicator	B. <input type="checkbox"/> Change of Information: WDID# _____
	C. <input type="checkbox"/> Change of ownership or responsibility: WDID# _____	

II. DISCHARGER INFORMATION

A. Name <b>Madera County Resource Management Agency, Flood Control and Water Conservation</b>			
B. Mailing Address <b>2037 W. Cleveland Ave.</b>			
C. City <b>Madera</b>	D. County <b>Madera</b>	E. State <b>CA</b>	F. Zip <b>93637</b>
G. Contact Person <b>Cristina Knudsen</b>	H. E-mail address <b>cristina.knudsen@madera-county.com</b>	I. Title <b>Senior Engineer</b>	J. Phone <b>(559) 675-7817</b>

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

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

**IV. RECEIVING WATER INFORMATION**

A. Algaecide and aquatic herbicides are used to treat (check all that apply):

- Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.  
Name of the conveyance system: \_\_\_\_\_
- Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger.  
Owner's name: \_\_\_\_\_  
Name of the conveyance system: \_\_\_\_\_
- Directly to river, lake, creek, stream, bay, ocean, etc.  
Name of water body: **Ash Slough, Berenda Sough, Chowchilla River, and Fresno River**

B. Regional Water Quality Control Board(s) where treatment areas are located  
(REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region **5**  
(List all regions where algaecide and aquatic herbicide application is proposed.)

**V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION**

A. Target Organisms: \_\_\_\_\_ **Arundo Donax**

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients  
**Cornerstone® (Glyphosate) and other aquatic approved formulations.**

C. Period of Application: Start Date **August 1st** End Date **November 15th**

D. Types of Adjuvants Used: **Quest®, Drift Retardant 38\_F, NIS Spret, and Mark it Blue**

**VI. AQUATIC PESTICIDE APPLICATION PLAN**

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents?  
 Yes  No

If not, when will it be prepared? \_\_\_\_\_

**VII. NOTIFICATION**

Have potentially affected public and governmental agencies been notified?  Yes  No

**VIII. FEE**

Have you included payment of the filing fee (for first-time enrollees only) with this submittal?  
 YES  NO  NA

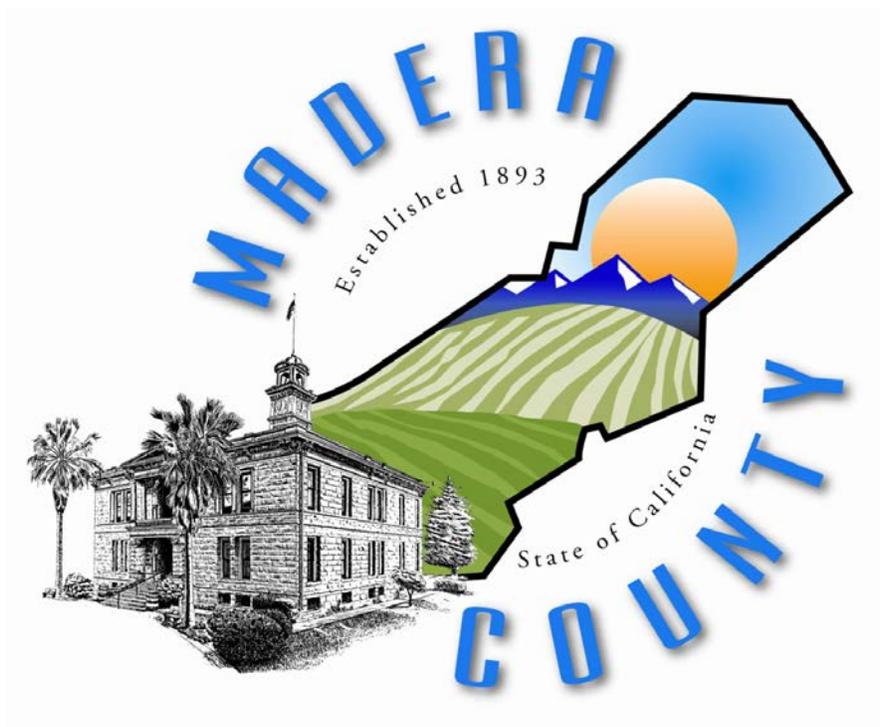
**IX. CERTIFICATION**

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the General Permit, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: Cristina Knudsen  
 B. Signature: *Cristina Knudsen* Date: 8/1/14  
 C. Title: Senior Engineer

**XI. FOR STATE WATER BOARD STAFF USE ONLY**

WDID:	Date NOI Received:	Date NOI Processed:
Case Handler's Initial:	Fee Amount Received: \$	Check #:
<input type="checkbox"/> Lyris List Notification of Posting of APAP	Date _____	Confirmation Sent _____



# Aquatic Pesticides Application Plan (APAP)

## Water Quality Order No. 2013-0002 DWQ

Madera County Engineering Department  
2037 W Cleveland Avenue  
Madera, CA 93637  
(559) 675 - 7817 Office  
(559) 675 - 7639 Fax

August 1, 2014

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## **Introduction**

The Madera County Flood Control and Water Conservation Agency (FCWCA) has prepared this Aquatic Pesticides Application Plan (APAP) in accordance with Water Quality Order No. 2013-0002 DWQ (Order) for the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for the Residual Aquatic Pesticide Discharges to Water of the United States from Algae and Aquatic Weed Control Applications (General Permit # CAG990005).

The intent of this APAP is to provide detailed information of the use of aquatic pesticides in County flood facilities including the Ash Slough, Berenda Slough, Chowchilla River and Fresno River to control the growth of aquatic weeds, focusing on eradicating *Arundo donax* (Arundo). *Arundo donax* is an extremely invasive plant which has adversely impacted floodway channel capacity, created fire risk and choked out native vegetation. The FCWCA has developed an Arundo Eradication Program which involves an herbicide application followed months later by mulching.

This APAP provides a description of the facilities where herbicides will be applied, a description of the targeted weed(s), a list of aquatic herbicides used, and other pertinent information as described in Section 5 of the Order. This APAP is intended to be a living document that is revisited and updated on an annual basis to maintain compliance with General Permit # CAG990005 and any amendments.

Inquiries about the County FCWCA's Aquatic Pesticide Application Plan can be directed to:

Madera County Flood Control and Water Conservation Agency  
2037 W. Cleveland Avenue  
Madera, CA 93637  
(559) 675-7817  
Attention: Cristina Knudsen, Senior Engineer

### **1. Description of Water System**

The Madera County Flood Control and Water Conservation Agency (FCWCA) was formed in 1969 by the Madera County Flood Control Act 4525 to be responsible for flood control planning in the County. FCWCA is responsible for maintaining approximately 75 miles of levees on the Fresno and Chowchilla River systems. The Fresno River basin drains much of the central part of the County. The Chowchilla River basin drains a narrow portion of the northwestern foothill region. Both of these rivers ultimately discharge to the San Joaquin River in the Valley Floor. However, water from both of these rivers reaches the San Joaquin River only in very wet years.

Madera County maintains approximately 75 miles of combined channel length from the Ash Slough, Berenda Slough, Fresno River, and Chowchilla River. A description of each channel is provided below. Location maps are provided in Exhibit A.

### **1.1 Ash Slough**

The County maintains approximately 20 miles of the Ash Slough. This 20 mile section starts at Road 23 ½ and ends at Road 6 flowing southwest. The slough has an average width of 360 feet and runs by the north edge of the City of Chowchilla.

### **1.2 Berenda Slough**

The County maintains approximately 18 miles of the Berenda Slough. This 18 mile section starts at Road 23 ½ and ends at Hayes Road flowing southwest. The slough has an average width of 219 feet and is about 1 mile south of the City of Chowchilla.

### **1.3 Fresno River**

The County maintains approximately 23 miles of the Fresno River. This 23 mile section starts at Road 33 and ends at Road 10 ½ flowing southwest and then west. The river has an average width of 350 feet and runs through the north side of the City of Madera.

### **1.4 Chowchilla River**

The County maintains approximately 16 miles of the Chowchilla River. This 16 mile section starts at Road 23 ½ and ends at Hemlock Road flowing southwest. The river has an average width of 173 feet and is about 2 miles north of the City of Chowchilla.

## **2. Description of the Treatment Area**

As previously mentioned, the FCWCA maintains approximately 75 miles of floodway channels. The FCWCA is focusing Arundo Eradication in approximately eight (8) continuous miles of the Ash Slough, eight (8) continuous miles in the Berenda Slough, and spot treating areas within 10 miles of the Fresno River.

The Department of Water Resources awarded the County, along with three other agencies belonging to the Madera Regional Group, grant funding through the Proposition 84 Integrated Regional Water Management Implementation Grant. Grant funding will be used to eradicate Arundo in the Ash Slough and Berenda Slough. In an effort to achieve an Arundo kill rate of 90 percent, each project spans a three-year duration through grant funding. The project areas will be sprayed with herbicide once during the calendar year, and then later mulched. Following the three-year eradication program, the County plans to continue eradication efforts to prevent re-growth.

The project timelines for the focused Arundo eradication project are as follows:

- a. **Ash Slough** – This project began in the summer of 2012 and now is in its third year of eradication. The project scope consists of herbicide application within five (5) miles immediately north of Highway 152 in the City of Chowchilla. This work effort will begin in August 2014.
- b. **Berenda Slough/South Ash Slough** – The first year of work will begin in August 2014. The project consists of herbicide application within eight (8) miles of the Berenda Slough starting at Road 23-½ and ending at the start of the project levee. The lower section of the Ash Slough will also be sprayed with herbicide starting at Highway 152 and working three (3) miles southwest to the project levee.

- c. **Fresno River** – This project will begin in the Summer of 2014 and consists of approximately 10 miles of spot treating Arundo. The project scope includes the area between Road 20 and the Santa Fe Railroad tracks just east of the City of Madera.

After grant funding has ended, the County plans to continue eradicating Arundo in an attempt to protect channels from reinfestation.

### **3. Description of Invasive Plants to be Controlled**

The County plans to target its eradication efforts on Arundo. Arundo is a tall, bamboo-like perennial grass that can reach heights up to thirty feet, growing in many-stemmed, cane-like clumps, spread from horizontal rootstocks below the soil (rhizomes), and often forms large colonies many feet across.

The Arundo species found within the project area does not appear to produce a viable seed, and seedlings are not seen in the field. This plant species propagates through vegetative reproduction from either underground rhizomes extending from a colony or from plant fragments (primarily rhizomes) carried downstream, primarily during flood events, to become rooted and form new clones. When established within stream channels, Arundo can quickly reduce channel capacity, increase hydraulic roughness, and increase the risk of flood. The plant's shallow roots encourage mobility in high flow events. Dislodged Arundo pieces can move downstream, often plugging culverts or creating debris blockages at bridge crossings. Upon settling, Arundo will rapidly colonize at its new downstream location. In this manner, entire streams systems have been invaded in a relatively short time period. The outstanding growth trait of this plant is its ability to survive and grow at almost any time under a wide variety of environmental conditions.

### **4. Herbicide Descriptions and Method of Application**

Herbicides can be toxic to people and wildlife, if not handled properly. However, the safe use of herbicides is a critical method for vegetation management, especially to control invasive and exotic plants. All herbicide applications conducted by the County occur in accordance with Federal, State, and local regulations.

Aquatic herbicide formulations, such as those utilized in the FCWCA program, must be combined with a suitable surfactant to facilitate uptake and translocation of the herbicide down into the rhizomes. An inert marker dye or colorant is also added to the tank mix to assist the applicator at achieving full coverage and assuring that over-application and drift are not occurring.

#### **4.1 Herbicide to be Used**

The aquatic formulation of glyphosate (as known as Cornerstone®, Aquamaster® or other registered product) will be used. Glyphosate is a foliar-applied, systemic herbicide used to control vegetation near water bodies and several immersed weeds. In plants, glyphosate inhibits an enzyme needed to synthesize an intermediate product in the biosyntheses of the aromatic amino acids, essential for protein synthesis and to

produce many secondary plant products such as growth promoters, growth inhibitors, phenolics, and lignin.

Glyphosate is ionized under typical environmental conditions of pHs ranging from five (5) to nine (9). Glyphosate and its salts are readily soluble in water with a solubility of about 12,000 mg/L. Interactions with soil and sediment are primarily ionic, rather than hydrophobic and pH dependent. Laboratory and field studies indicate that glyphosate is strongly and reversibly adsorbed by soil, sediment, and suspended sediment.

Glyphosate is deactivated through soil adsorption. Due to its nature to adhere strongly to particles, Glyphosate does not readily leach to waters, and its potential movement to groundwater is unlikely.

In the soil environment, glyphosate is resistant to chemical degradation, is stable to sunlight, is relatively non-leachable, and has a low tendency to run-off (except as adsorbed to colloidal matter). It is relatively immobile in most soil environment as a result of its strong adsorption to soil particles. Glyphosate is rapidly and strongly adsorbed to sediment, which appears to be the major sink for glyphosate in aquatic systems. Degradation occurs by microbial activity in soil. The median half-life of glyphosate in soil has been widely studied with literature reporting a range between 2 and 197 days. A typical field half-life of 47 days has been suggested.

In water, the median half-life of glyphosate varies from a few days to 91 days. The photolytic half-life of glyphosate in de-ionized water exposed outdoors to sunlight was approximately 5 weeks at 100 ppm and 3 weeks at 2,000 ppm. Its hydrolysis half life is greater than 35 days. Glyphosate is also stable to photodegradation under visible light but photolyzes when exposed to UV radiation. Glyphosate loss from water occurs mainly through sediment adsorption and microbial degradation. The rate of microbial degradation in water is generally slower because there are fewer microorganisms in water than in most soils.

In summary, the use of glyphosate combined with a surfactant to treat infestations of non-native *Arundo* would result in less than significant impacts on water quality due to the rapid degradation rate and controlled application of herbicides only on target plants during dry, no-flow channel conditions.

#### **4.2 Method of Application**

All herbicide applications are made according to the manufacturer's label and in accordance with regulations of the USEPA, California Environmental Protection Agency, California Department of Pesticide Regulation, California Division of Occupational Safety and Health and the local Agricultural Commissioner. Precautions on the product label to prevent fish kill or other impacts to wildlife will be followed. The primary method that will be used to apply the herbicide will be foliar herbicide application.

This application technique involves spraying herbicide directly to the foliage of the plant. The application will be carried out with a backpack sprayer or a spray rig carrying several gallons of diluted herbicide. The sprayer tank is kept pressurized through the use of generator in the case of the spray rig or through hand pumping a lever on the backpack sprayer. When using this method wind conditions are always

monitored and applications will cease if wind gusts exceed 5-10 mph. To ensure that sufficient uptake into the target plants occurs, it is necessary to completely and thoroughly cover the leaf area. In many cases the biomass of the targeted plant will first be cut and/or removed and the re-growth will be treated sometime later. This method minimizes the amount of herbicide used. The foliar spray method tends to be ineffective on plants that have leaves with thick waxy cuticles.

To be most effective, glyphosate should be applied during a perennial weed's flowering or fruiting stage. On annual species, it will be most effective when applied during active plant growth. If a rain event occurs within 4 to 6 hours of application, the effectiveness of glyphosate is reduced. Therefore, as mentioned in *Section 10.2 Aquatic Pesticide Applications*, herbicides shall be applied directly to plants when there is no forecast for rainfall within 48 hours.

## **5. Factors Influencing Decision of Using Herbicide for Weed Control**

A more detailed evaluation of alternative control methods is presented in Section 11. The only feasible control method for removal and the eradication of Arundo is the application of herbicide (glyphosate). Mechanical extraction is costly and causes disturbance of soil which would require regulatory approval including obtaining an US Army Corp of Engineers 404 Permit, and a 401 permit from the Regional Water Quality Control Board. Follow-up work after mechanical clearing of Arundo stands would be by herbicide of re-sprouts, so the method does not eliminate the use of herbicide. There is no approved (or pending) bio-control agent.

Application of glyphosate has the best track record for controlling Arundo at the scale of this project. According to Team Arundo del Norte, a forum of local, state, and federal organizations dedicated to the control of Arundo in Central and Northern California, the use of herbicide is recommended for the highest success in eradicating it. Several watersheds in Southern California (i.e. Santa Ana, Santa Margarita, Santa Clara,) have utilized herbicide application as the primary control method. The watersheds have restored riparian habitat, improved water quality (amount, biological function, and temperature), and normalized fluvial flow regimes.

## **6. Gates and Control Structures**

There are numerous gates and control structures located in the four channels. Gates and control structures are inspected frequently during the year.

## **7. Projects with SIP Exception**

The project does not have a SIP exception.

## **8. Monitoring Program**

The objective of the monitoring program is to conduct water quality monitoring sufficient to achieve compliance with National Pollutant Discharge Elimination System (NPDES) State-wide General Permit requirements. The County plans to only conduct pesticide (herbicide) spraying operations during dry channel conditions, and therefore no monitoring work will be conducted. However, in the unlikely event the County plans to

spray during flowing water or non-flowing water (standing water) conditions, the following Monitoring program shall be followed.

Monitoring locations for non-flowing water will be identified, as applicable. Monitoring locations for flowing water will be approximately 200 feet upstream of the treatment area and approximately 1000 feet downstream of the treatment area. Intermediate monitoring locations are to be identified during application of herbicide as to note areas requiring a greater or more concentrated amount of herbicide.

The pesticide application log provided in Exhibit C will be kept by the applicator for each aquatic pesticide application.

The log will contain a minimum of the following criteria:

- a. Date and start/stop time
- b. Location
- c. Name of applicator
- d. List of gates or control structures in the treatment area that may discharge to surface waters, if applicable.
- e. Time of gate or control structure closure/reopening, if applicable
- f. Water temperature
- g. Flow or level of water body (where applicable)
- h. Aquatic pesticide application rate and concentration
- i. Visual monitoring assessment
- j. Certification that the applicator followed the APAP

Samples shall be collected from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non-flowing water, where applicable) per year, except for glyphosate.

In the event that there are less than six application events in a year, samples shall be collected during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water, where applicable). If the results from six consecutive sampling events show concentrations that are less than the receiving water limitation/trigger for an active ingredient in an environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting. If the yearly sampling event shows exceedance of the receiving water limitation/trigger for an active ingredient in an environmental setting, then sampling shall return to six application events for that active ingredient in each environmental setting.

For glyphosate, collect samples from one application event from each environmental setting (flowing water and non-flowing water) per year. A set of three samples will be collected for each representative location.

- Background Monitoring – Background samples shall be collected upstream at the time of the application event, or they may be collected at the treatment area, just prior (up to 24-hours in advance of application) to the application event.

- Event Monitoring – Event monitoring samples shall be collected immediately downstream of the treatment area in flowing waters or adjacent to the treatment area in non-flowing waters, immediately after the application event or shortly after application, but after sufficient time has elapsed such that treated water will have entered the adjacent or downstream area.
- Post-Event Monitoring – Post-event monitoring samples shall be collected within the treatment area within one week after application.

A minimum of the following records shall be kept for each representative sample:

- a. Date and time
- b. Exact place
- c. Name(s) of individual(s) who performed the sampling
- d. Date the analysis was performed
- e. Names(s) of individual(s) who performed the analysis
- f. Analytical techniques or methods used
- g. Results of each analysis

These records are organized in Exhibit C.

## **9. Sample Contamination Prevention**

The Fresno River, Chowchilla River, Ash Slough, and Berenda Slough are scheduled to be free of any flowing or non-flowing water (dry channel condition) when the herbicide will be applied. In the unlikely event that there is either flowing or non-flowing water, water samples shall be collected in a manner to prevent possible contamination. Samplers shall avoid close proximity to herbicide application equipment, containers, related vehicles, and protective equipment.

Samples will be collected by Madera County staff or biological consultants. Sampling equipment will be thoroughly cleaned before and after each sampling trip, including between samples. Decontamination shall be performed with a detergent that does not leave a residue on sampling equipment, then triple-rinsed with uncontaminated water. The rinse water shall be disposed of away from sampling location.

## **10. Best Management Practices**

The following Best Management Practices (BMPs) will be implemented prior to and during herbicide application events. The purpose of these BMPs is to avoid and minimize impacts on the environment. These measures shall be implemented at all herbicide treatment sites and verified by County Staff.

### **10.1 Herbicide Spill Prevention and Containment**

Herbicides shall be applied by or under the direct supervision of trained, certified or licensed applicators. Herbicides shall be mixed and loaded prior to arriving at the application site(s).

In the event of an aquatic pesticide spill, the Applicator will prevent the contaminated water from reaching adjacent water bodies, wherever feasible. The Use of absorbent granules and pads will be deployed, as needed. Madera County staff will routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained. Applicators will report spills as required by County policy and in a manner consistent with local, state, and federal requirements.

### **10.2 Aquatic Pesticide Applications**

All pesticide applicators must either be licensed by the Department of Pesticide Regulation (DPR) with a valid Qualified Applicator Certificate (QAC) or work under the supervision of someone who is licensed. Qualified applicators will ensure that all equipment is regularly maintained, that application rates are within product label specifications and regulatory requirements, and that only the targeted plants (i.e. Arundo) are treated.

The herbicide treatment on Arundo shall be scheduled when the plant is most susceptible to the uptake of herbicides into the roots (Fall). Herbicides shall be applied directly to plants when there is no forecast for rainfall within 48 hours. This will avoid run-off of herbicide, as well as ensure proper dry times. Drift will be avoided by calibrating spray nozzles to control droplet size and by applying herbicides only when local winds do not exceed 10 miles per hour. If at any time during herbicide application, drift is noticed to be occurring, application will immediately cease until ideal conditions allow the continuation of the application.

### **10.3 Landowner and Agency Notification**

Farmers/Landowners and agencies will be notified at the start of each season. Work is being conducted on lands held by farming operators, so coordination is on-going. Water agencies are also active partners in the program, so they are also aware of the work this is occurring.

### **10.4 Fish Kill Prevention**

The herbicide program consists of spraying non-native vegetation (i.e. Arundo), where there is a possibility that minor drift onto standing water could occur, but at levels that would be extremely unlikely to trigger a fish kill. This program is not making direct applications to water (such as algaecides). The County plans to only conduct spraying operations during dry channel conditions. Typically for a majority of the year, the channels remain dry and are considered an unsuitable fish habitat. Fish kills within the rivers and sloughs are unlikely.

## **11. Examination of Alternatives**

A number of criteria were used in the evaluation of control methods, including efficacy at controlling Arundo, human health and safety, damage to the riparian habitat and/or other aspects of the environment, impacts on water quality, etc. Non-chemical methods have been incorporated into the Arundo removal and the eradication; but of those methods that were evaluated, they were found to have significant limitations, and are not part of the current Arundo eradication plan. The entire set of possible control methods that were

evaluated are discussed below, starting with the methods that were selected and incorporated into the plans.

### **11.1 No Action**

Given the extreme impacts associated with the Arundo infestation (high water use, flow constraint, flooding, habitat degradation, etc.) taking no action causes more habitat and water impacts than implementing the program. Therefore, this option is considered unfeasible.

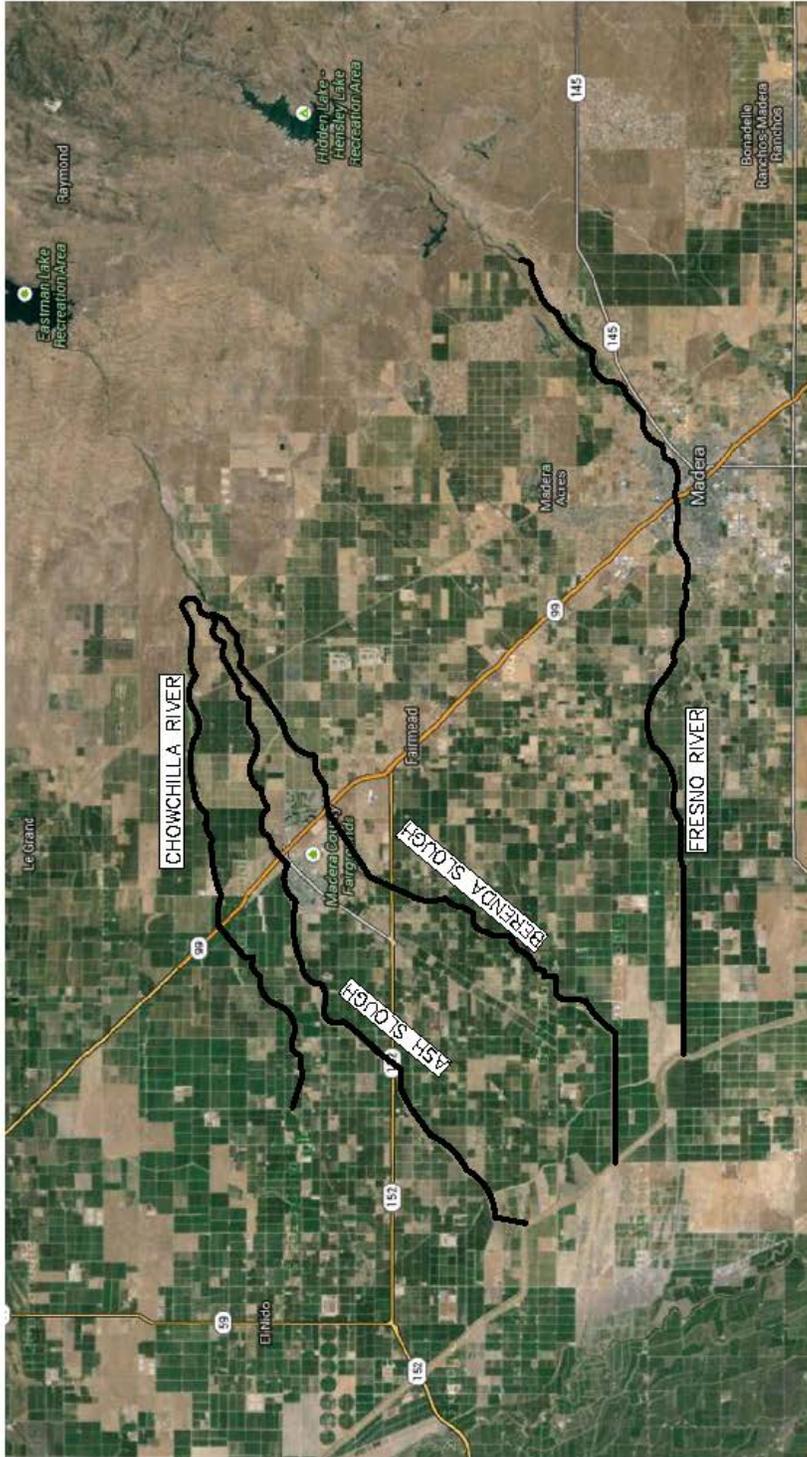
### **11.2 Manual Methods**

Minor infestations can be controlled by manual methods. Hand pulling is effective with new plants less than six feet (2 m) in height, but care must be taken that all rhizome material is removed. This may be most effective in loose soils and after rains have made the substrate workable. Plants can be dug up using hand tools (pick-ax, mattock, and shovel), especially in combination with cutting of stems near the base with pruning shears, machete, or chainsaw. For larger infestations these methods are impractical. Stems and roots should be removed, burned, or chipped on site to avoid re-rooting. For larger infestations on accessible terrain, heavier tools (rotary brush-cutter, chainsaw, or tractor-mounted mower) may facilitate above ground biomass reduction. This however does not control or kill the plant, as rhizomes are still intact belowground. Rhizome removal/extraction could then occur (by grubbing or grading) but this disturbs the soil, increasing the risk of erosion. Such methods may be of limited use on complex or sensitive terrain. Scraping Arundo stands with a toothed blade can also push biomass (above ground cane and below ground rhizomes) into piles. These piles may then be burned. These methods cause more soil disturbance and trigger sediment removal and air quality permit requirements.

### **11.3 Biological Control**

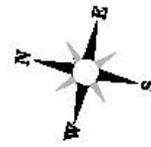
There are no approved bio-control agents for Arundo. Those that are being studied are years away from approval. Bio-control agents being studied also seem to have limited effect, merely reducing stand vigor and density. They are unlikely to significantly reduce distribution of the plant or significantly reduce impacts caused by the plant. Not a feasible option.

**Exhibit A**  
**Location Map**



**NOTES:**

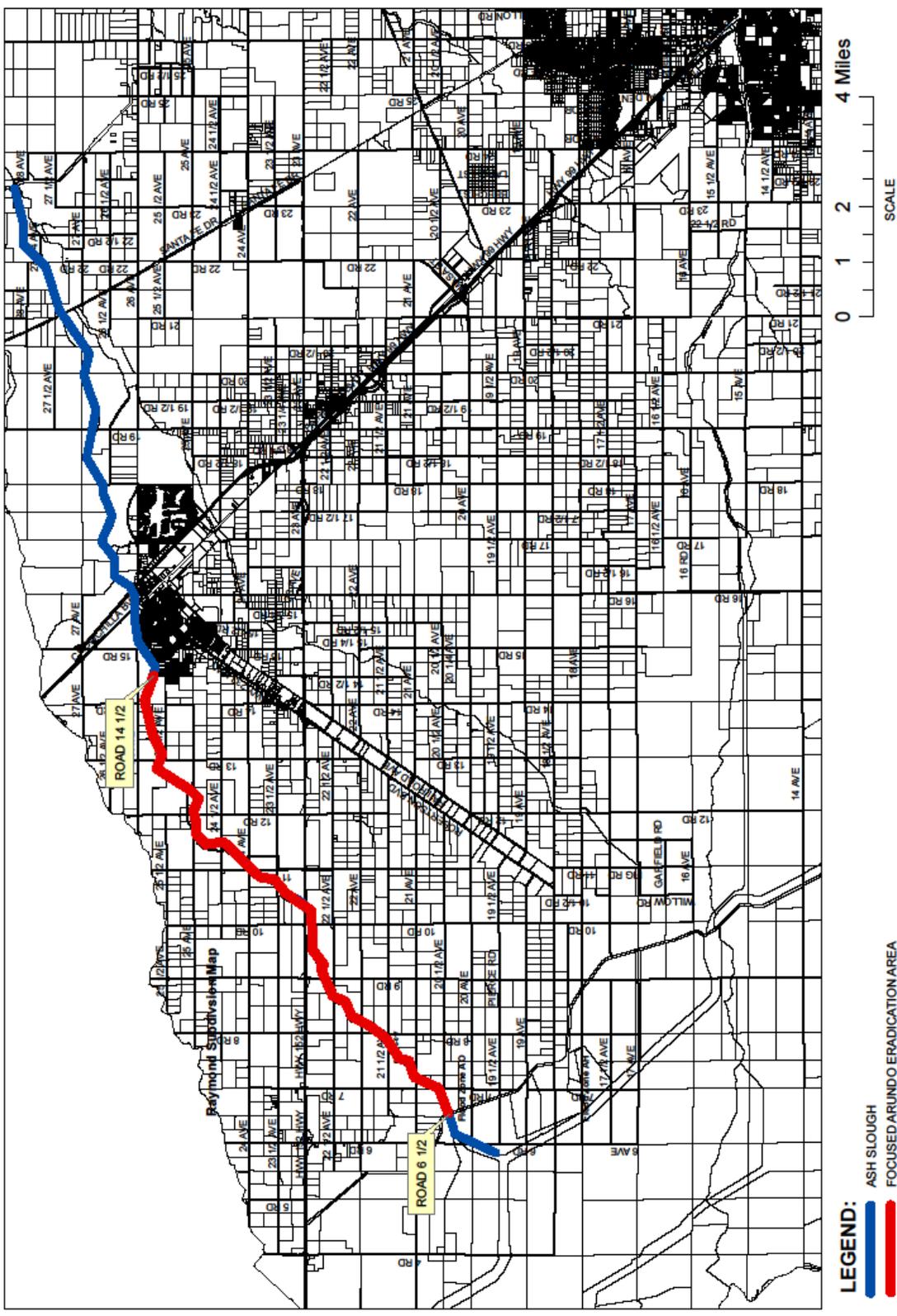
BERENDA SLOUGH:	18 MI
ASH SLOUGH:	20 MI
FRESNO RIVER:	23 MI
CHOWCHILLA RIVER:	16 MI
<b>TOTAL:</b>	<b>77 MI</b>



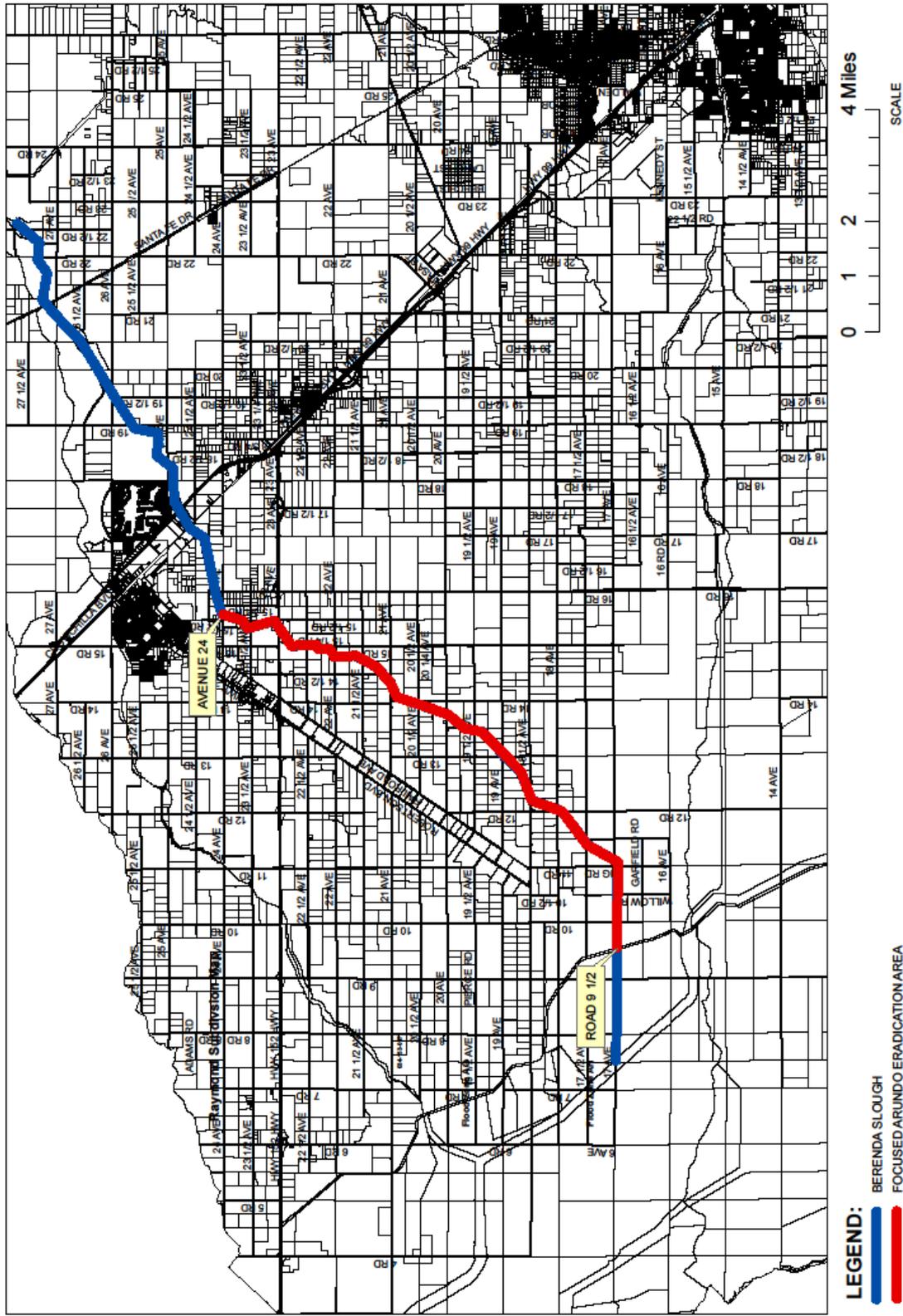
<b>FLOOD CONTROL FACILITIES</b>	APPRAISED BY:	DATE:	SHEET:	OF:
	DGLE	1	1	1
<b>MADERA COUNTY RESOURCE MANAGEMENT AGENCY</b>	DESIGNED BY:	SCALE:		
	VTT	1"=3 MI		
PROJECT DATE:		7/22/13		
DRAWING NO.:				

**Exhibit B**  
**Treatment Area Maps**

# MADERA COUNTY - ASH SLOUGH ARUNDO ERADICATION PROJECT SITE MAP

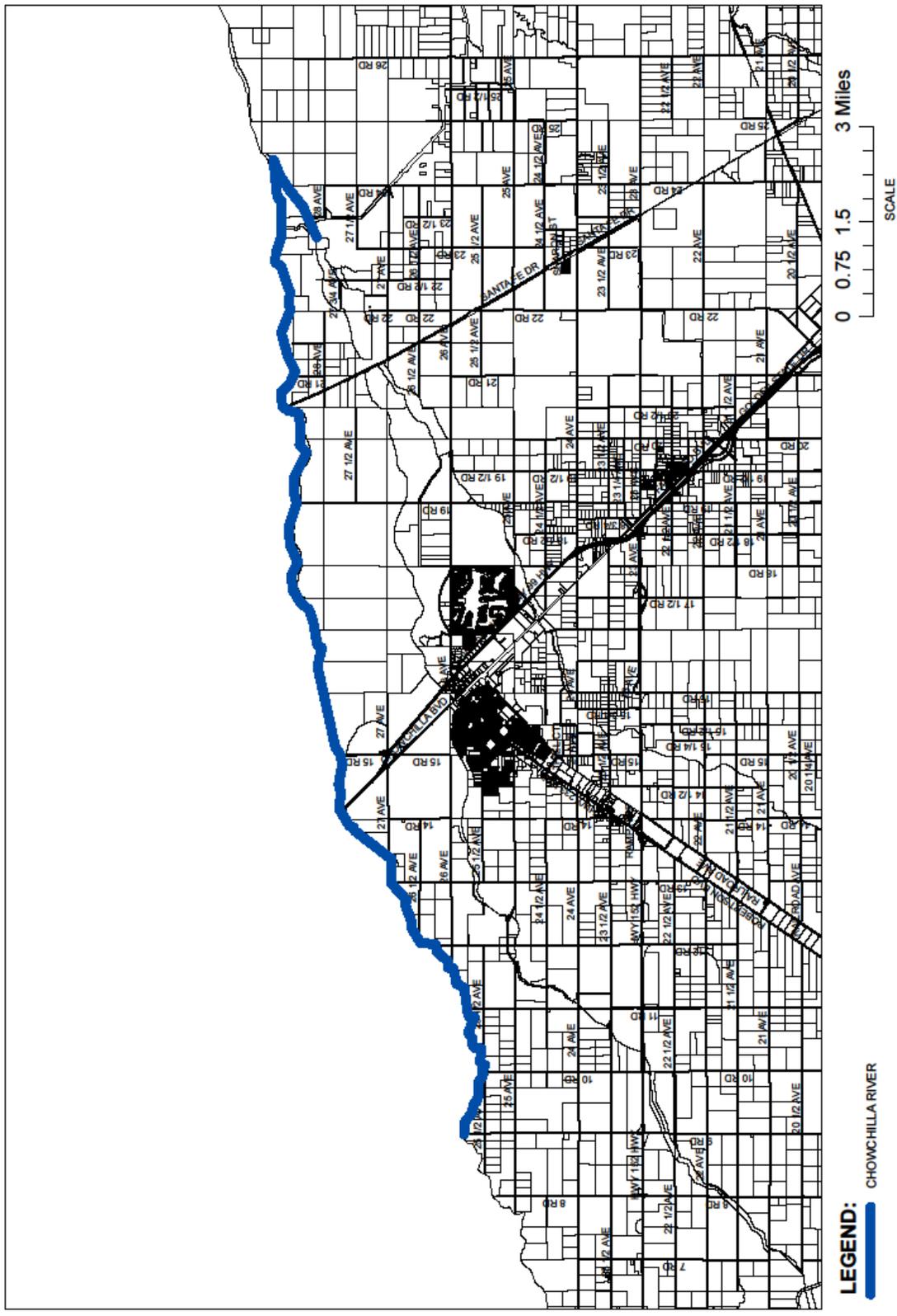


# MADERA COUNTY - BERENDA SLOUGH ARUNDO ERADICATION PROJECT SITE MAP





# MADERA COUNTY - CHOWCHILLA RIVER ARUNDO ERADICATION PROJECT SITE MAP



**Exhibit C**  
**Application Log and Sampling Form**



## Aquatic Pesticide Application Log

To be Completed for Every Pesticide Application

### General Information

Date:

Location:

Personnel:

### Treatment Information

Start time:

Stop Time:

Targeted Weed(s):

Vegetative Growth Stage:

Water Body Type:

Weather:

Gates or Control Structures:

Time of closure/reopening:

Water Flow (cfs):

Air Temperature (°F):

Water Temperature (°F):

Pesticide #1 Used:

Rate of Concentration:

Application Method:

Adjuvant #1 Used:

Rate of Concentration:

Application Method:

Adjuvant #2 Used:

Rate of Concentration:

Application Method:

I certify that the APAP has been followed.

Print Name

Sign Here



## Aquatic Pesticide Field Monitoring & Sampling Form

### Background Monitoring

Sample ID:	Date:	Time:
Site Description:		
Aquatic Pesticide Applied:	Approx. Water Speed (ft/s):	
Sheen:    Yes        No		
Color:    None        Brown        Green        Other:		
Weather (Fog, Rain, Wind, etc.):	Temperature (°C):	
Electrical Conductivity (mho/cm)	Turbidity (NTU)	
Dissolved Oxygen (mg/L):	pH:	

### Event Monitoring

Sample ID:	Date:	Time:
Site Description:		
Aquatic Pesticide Applied:	Approx. Water Speed (ft/s):	
Sheen:    Yes        No		
Color:    None        Brown        Green        Other:		
Weather (Fog, Rain, Wind, etc.):	Temperature (°C):	
Electrical Conductivity (mho/cm)	Turbidity (NTU)	
Dissolved Oxygen (mg/L):	pH:	

### Post-Event Monitoring within Treatment Area

Sample ID:	Date:	Time:
Site Description:		
Aquatic Pesticide Applied:	Approx. Water Speed (ft/s):	
Sheen:    Yes        No		
Color:    None        Brown        Green        Other:		
Weather (Fog, Rain, Wind, etc.):	Temperature (°C):	
Electrical Conductivity (mho/cm)	Turbidity (NTU)	
Dissolved Oxygen (mg/L):	pH:	

### Post-Event Monitoring Downstream

Sample ID:	Date:	Time:
Site Description:		
Aquatic Pesticide Applied:	Approx. Water Speed (ft/s):	
Sheen:    Yes        No		
Color:    None        Brown        Green        Other:		
Weather (Fog, Rain, Wind, etc.):	Temperature (°C):	
Electrical Conductivity (mho/cm)	Turbidity (NTU)	
Dissolved Oxygen (mg/L):	pH:	