Attachment E – Notice of Intent

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

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. New Applicator B. [X] Change of Information: WDID# 5C54NP00003

C. ☐ Change of ownership or responsibility: WDID# _____

II. DISCHARGER INFORMATION

A. Name			
Kaweah Delta Water Conservation District			
B. Mailing Address			
2975 North Farmersville Boulevard			
C. City	D. County	E. State	F. Zip
Farmersville	Tulare	CA	93223
G. Contact Person	H. E-mail address	I. Title	J. Phone
Shane Smith	ssmith@kdwcd.com	Projects/Admin Manager	(559) 747-5601

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	

RECEIVED
FEB 24 2014
DIVISION OF WATER QUALITY

IV. RECEIVING WATER INFORMATION

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

1. [X] Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.
   Name of the conveyance system: Kaweah Delta Water Conservation District
2. [ ] 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: _____
3. [X] Directly to river, lake, creek, stream, bay, ocean, etc.
   Name of water body: Kaweah and St. John Rivers

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: ____

Mare's Tail, Willows, Tules, and Parrot Feather

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients

AquaMaster: glyphosate
N-phosphonmethyl

C. Period of Application: Start Date July End Date February

D. Types of Adjuvants Used: Activator 90

VI. AQUATIC PESTICIDE APPLICATION PLAN

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents?
[X] 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 [X] 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: Mark Larsen

B. Signature: _____ **Date:** 2/11/14

C. Title: General Manager - KDWCD

XI. FOR STATE WATER BOARD STAFF USE ONLY

WDID:	**Date NOI Received:**	**Date NOI Processed:**
Case Handler's Initial:	**Fee Amount Received:** $	**Check #:**
☐ **Lyris List Notification of Posting of APAP**	**Date** _____	**Confirmation Sent** _____

BSK Associates
Engineers & Laboratories

UPDATED AQUATIC PESTICIDE APPLICATION PLAN (APAP)

KAWEAH DELTA WATER CONSERVATION DISTRICT
TULARE AND KINGS COUNTIES, CALIFORNIA

BSK E13-091-01F

PREPARED FOR:

KAWEAH DELTA WATER CONSERVATION DISTRICT
2975 NORTH FARMERSVILLE BOULEVARD
FARMERSVILLE, CALIFORNIA 93223

FEBRUARY 6, 2014

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BSK

UPDATED AQUATIC PESTICIDE APPLICATION PLAN (APAP)
KAWEAH DELTA WATER CONSERVATION DISTRICT
TULARE AND KINGS COUNTIES, CALIFORNIA

1.0 INTRODUCTION

This updated Aquatic Pesticide Application Plan (APAP) has been prepared by BSK Associates Inc. (BSK) at the request of the Kaweah Delta Water Conservation District (District). The objective of the updated APAP is to document compliance with the requirements of the *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 Water Quality Order 2013-0002-DWQ* (General Permit), which became effective December 1, 2013. It is intended that the APAP, along with the attached Monitoring and Reporting Plan (MRP) (Appendix A), will be submitted to the California Regional Water Quality Control Board (CRWQCB) and be subsequently implemented by the District as approved.

The objectives of the APAP are as follows:

- Document compliance with the requirements of the General Permit as documented in Water Quality Order No. 2013-0002-DWQ;
- Support the development, implementation, and effectiveness evaluation of Best Management Procedures (BMPs);
- Demonstrate the return of water quality and protection of beneficial uses of the receiving waters following completion of the District's pesticide/herbicide management;
- Identify and characterize aquatic pesticide and adjuvant application procedures conducted by the district; and
- Assure that the APAP provides for monitoring of projects that are representative of all pesticides and application methods used by the District.

The 2013 General Permit requires that the following items be incorporated into the APAP:

1) Description of the water system to which algaecides and aquatic herbicides are being applied.
2) Description of the treatment area in the water system.
3) Description of the types of weed(s) and algae that are being controlled and why.
4) Algaecides and aquatic herbicides products or types of algaecides and aquatic herbicides expected to be used and if known their degradation byproducts, the method in which they are applied, and if applicable, the adjuvant and surfactants used.

5) Discussion of the factors influencing the decision to select algaecide and aquatic herbicide applications for algae and weed control.

6) If applicable, list the gates or control structures to be used to control the extent of receiving waters potentially affected by algaecide and aquatic herbicide application and provide an inspection schedule of those gates or control structures to ensure they are not leaking.

7) If the discharger has been granted a short-term or seasonal exception under the State Water Board Policy for Implementation of Toxics Standards for Inlands Surface Waters, Enclosed Bays, and Estuaries of California (Policy) section 5.3 from meeting acrolein and coppers receiving water limitation, provide the beginning and ending dates of the exceptions period, and justification for the needed time for the exception. If algaecide and aquatic herbicide applications occur outside of the exception period, describe plans to ensure that receiving water criteria are not exceeded because the Dischargers must comply with the acrolein and copper receiving water limitations for all applications that occur outside of the exception period.

8) Description of the monitoring program.

9) Description of the procedures used to prevent sample contamination from persons, equipment, and vehicles associated with algaecide and aquatic herbicide applications.

10) Description of BMPs to be implemented. The BMPs shall include, at a minimum:

    a. Measures to prevent algaecide and aquatic herbicide spill and for spill containment during the event of a spill;

    b. Measures to insure that only an appropriate rate of application consistent with product label requirements is applied for the targeted weeds or algae;

    c. The Discharger's plan in educating staff and algaecide and aquatic herbicide applicators on how to avoid any potential adverse effects from the algaecide and aquatic herbicide applications;

    d. Discussion on planning and coordination with nearby farmers and agencies with water rights diversion so that beneficial uses of the water are not impacted during the treatment period; and

    e. A description of measures that will be used for preventing fish kill when algaecides and aquatic herbicides will be used for algae and aquatic weed controls.

11) Examination of possible alternatives. Dischargers should examine the alternatives to algaecide and aquatic herbicide use to reduce the need for applying algaecides and herbicides. Such methods include:

    a. Evaluating the following management options, in which the impact to water quality, impact to non-target organisms including plants, algaecide

and aquatic herbicide resistance, feasibility, and cost effectiveness should be considered:

i. No Action;

ii. Prevention;

iii. Mechanical or physical methods;

iv. Cultural methods;

v. Biological control agents; and

vi. Algaecides and aquatic herbicides.

If there are no alternatives to algaecides and aquatic herbicides, Dischargers shall use the minimum amount of algaecides and aquatic herbicides that is necessary to have an effective control program and is consistent with the algaecide and aquatic herbicide product label requirements.

b. Using the least intrusive method of algaecide and aquatic herbicide application; and

c. Applying a decision matrix concept to the choice of the most appropriate formulation.

These items are addressed in the APAP with the exception of Item 7, as the District does not use nor plans to use acrolein and/or copper containing products and therefore does not maintain a short term or seasonal exception.

2.0 SITE DESCRIPTION AND HISTORY

The District is located in Tulare and Kings Counties in Central California as depicted on Figure 1, Vicinity Map. The District's upstream and eastward boundary extends to the confluence of Dry Creek, within one mile below Terminus Dam, and the downstream boundary extends westward to the Hanford and Corcoran area, as depicted on Figure 2, District Boundary Map.

The District encompasses portions of the Kaweah and St. John's Rivers, and various streams associated with them. The principal water supply for the District is the Kaweah River. The District is responsible for delivering water to multiple private ditch companies for irrigation, and providing flood water management to the local area.

In order to manage flood water flows and to maintain the operability of various diversion structures, the District has found it necessary to conduct a stream bank and an in-stream aquatic vegetation control program across various waterways within its eastern portion, depicted as the "detail area" on Figure 2. The approximate extent of the District waterways typically requiring the aquatic vegetative control is depicted on Figure 3. Results of previous water sampling conducted as part of the existing program indicates that the herbicides applied have not spread from the application areas; therefore, the use of gates and control structures is not necessary to prevent the encroachment of herbicides into other waterways operated by the District.

Since the initiation of the aquatic herbicide application program, the District has not observed adverse impacts to beneficial uses of these water resources, nor to terrestrial or aquatic life within or proximate to these streams. No fish kills or similar impact on amphibians or other animal life have been observed.

3.0 CHARACTERIZATION OF PROBLEMATIC AQUATIC VEGETATION

The problematic types of aquatic vegetation have primarily been willows, mare's tail, tules, and parrot feather. Willows, mare's tail, and tules are indigenous vegetation occurring across various waterways within the eastern portion of the District. Willows and mare's tail can be partially submerged. Willows, in particular, cause obstruction to flow especially when they trap and accumulate floating debris and sediment build-up. Such restrictions to water flow have aggravated upstream flooding impacts during periods of high runoff. Tules are normally partially submerged, and can also restrict stream flow.

Parrot feather is a floating exotic plant, which has become prevalent in various waterways during the past decade and has caused flow restrictions at diversion structures. This plant has been commonly used in aquariums, and District staff suspects it may have been introduced inadvertently into the District's waterways through the unauthorized discharge of aquarium water. The persistence and regeneration traits of parrot feather limit the options for controlling it. Even a small fragment of this plant, if disrupted from a mass, has been shown to readily translate, reestablish, and regenerate itself at a downstream location.

4.0 CONTROL TOLERANCES FOR PROBLEMATIC AQUATIC VEGETATION

Due to the individual growth patterns and physical characteristic of the problematic aquatic vegetation, control tolerances have been assigned to each individual plant to maximize cost effectiveness and application efficiency. The control tolerances were developed to help identify the maximum amount of allowable growth prior to the pesticide application. Willows and tules are sprayed when the height of the growth cluster equals or exceeds 3 feet. Mare's tail is sprayed when the height of the growth cluster equals or exceeds 1 foot. Parrot feather is sprayed when the radius of the growth cluster equals or exceeds 5 feet.

5.0 AQUATIC PESTICIDE AND ADJUVANT CHARACTERISTICS

During the past decade, the District has employed an aquatic herbicide product under the trade name AquaMaster. This product is applied to unsubmerged (i.e. emerged) portions of all four types of problematic vegetation. Where possible, herbicide application for vegetation control is accomplished outside the active flow portion of the channel. However, with general weed control that occurs along the banks, there is potential for some overspray.

According to its manufacturer, Monsanto Company, AquaMaster is an aquatic herbicide used to control emerged weeds, grasses, and brush in and around many types of surface water. It is a water-soluble liquid formulation of the active ingredient, glyphosate, and N- (phosphonomethyl) glycine, in the form of its isopropylamine salt. Glyphosate is also the active ingredient for the

terrestrial herbicide, Roundup, which has a surfactant not found in AquaMaster. AquaMaster inhibits an enzyme that is essential for plant growth. This enzyme is found only in plants and does not occur in humans or other animals.

The United States Environmental Protection Agency (U.S. EPA) has placed glyphosate in Category E (evidence of non-carcinogenicity for humans), based on its review of the manufacturer's toxicological database. Category E is the most favorable carcinogen rating given. The District is not aware of any less toxic or otherwise adverse method for aquatic vegetation control, based upon its various trials of alternatives over the past decades.

The adjuvant used by the District is Activator 90. According to its manufacturer, Loveland Industries Inc, Activator 90 is an adjuvant that is a non-ionic wetter which lowers the surface tension of the spray solution increasing the wetting and spreading of pesticides on the target plant. Activator 90 is an emulsified concentrate containing 750 grams per liter (g/l) alkylphenyl hydroxypolyoxyethylene and 150 g/l natural fatty acids. Activator 90 has a "built in" anti-foam/defoamer and does not contain volatile solvents.

6.0 APPLICATION METHODS OF AQUATIC PESTICIDE AND ADJUVANT

Application of AquaMaster/Activator 90 is scheduled predominantly in the late summer and fall during low stream flow and just before the leaves change. This way, the herbicide translocates to the roots as the vegetation is entering dormancy, when the herbicide is more effective for the dose. The reduced vegetation decreases the amount of sediment buildup and the amount of mechanical cleaning required.

AquaMaster/Activator 90 is applied directly to the targeted foliage of weeds and brush. The active ingredient slowly moves throughout the plant, stopping growth and destroying the roots. Visual effects, such as yellowing and browning of the vegetation will appear several days after treatment.

When AquaMaster contacts water, it is absorbed onto soil particles in the water or onto the sediment. The active ingredient is degraded over time by microorganisms causing AquaMaster to lose its herbicidal qualities. AquaMaster has no herbicidal soil activity. Grasses will re-emerge from seed and hold the slopes and banks together. Roots from treated weeds and grasses will continue to hold soil integrity until vegetation re-appears.

Concentrations and application rates have been monitored to provide the most effective and efficient application of AquaMaster/Activator 90. These efforts have resulted in lower concentrations of AquaMaster at 1.5% and Activator 90 at 0.2%, thereby by creating the most effective and efficient application rate of 35 gallon per acre (gal/acre).

7.0 DESCRIPTION OF MONITORING AREAS

Three aquatic herbicide monitoring areas have been selected by the District to be representative of the diversity of use (i.e. full range of problematic types of vegetation), receiving water types (i.e. essentially natural channels versus manmade channels), rates of herbicide applications or concentrations (i.e. bank spray versus spot spray), and project size (i.e. high and low stream flows). The climatic conditions are not significantly variable across the District. Each of these monitoring areas is in close proximity to a stream flow gauging station.

These three monitoring areas are depicted on Figure 3, and may be summarized as follows:

- Area 1 represents a bank application setting with relatively high stream flow during the application period;
- Area 2 represents a bank application setting with relatively low stream flow during the application period; and
- Area 3 represents a spot-spray application setting with relatively low stream flow during the application period.

The characteristics of each area are summarized below:

- Area 1 is along Dry Creek, immediately upstream of its confluence with the Kaweah River. Flow releases from Terminus Dam to the Kaweah River at this area can typically range from 700 to 1,200 cubic feet per second (cfs) during the irrigation season, which typically extends from May through August. In late spring, flow releases can range as high as 2,000 cfs, matching upstream inflows to Lake Kaweah. Dry Creek's primary period of significant flow into the Kaweah River is during winter and spring, when it can typically range from 50 to 1,000 cfs. During periods of high flow in the Kaweah River, a backwater condition can develop in Dry Creek. For rain events during the fall, runoff is typically consumed in soil moisture and evapotranspiration. During the summer, Dry Creek has no flow;
- Area 2 is on the Kaweah River, at the controlled diversion to St. John's River and the Kaweah River, near McKay's Point. The Kaweah River flow influent to this area can range from 500 to 2,000 cfs, but generally ranges between 700 and 1,200 cfs during the irrigation season, which typically extends from May through August. At other times, flows in both streams are essentially non-existent, except for subterranean groundwater inflow, resulting in stream flows, which can range up to 5 to 10 cfs in each river; and
- Area 3 is on the Kaweah River, at the controlled diversion to Consolidated People's Ditch. During the irrigation season, flows in the Kaweah River immediately upstream of this diversion can range from 350 to 1,400 cfs, and the diverted flow to Consolidated People's Ditch can range from 150 to 400 cfs. At other times, flows in the Kaweah River immediately upstream of this diversion can range from 250 to 1,400 cfs, and the diverted flow to Consolidated People's

Ditch, primarily for flood control and seepage/recharge, can range from 50 to 360 cfs.

8.0 CONTROL METHODS AND LIMITATIONS

Prior to the last decade, the District employed non-herbicide techniques for control of the willows, mare's tail, and tules; specifically, mechanical removal and burning. This management practice generally required that large tracklayer tractor equipment enter the streambed to essentially rake the vegetation into piles outside the active streambed, which would then be burned. However, this practice became more restricted and impractical with the advent of Section 404 of the Clean Water Act.

When mechanical removal was attempted for parrot feather, the District found that it was not only manpower intensive, but also that the physical removal process would unavoidably worsen the situation, as plant material would be translocated and spread even more broadly to downstream areas. There is no practical way to capture these small filaments of plant materials, which spread the problem downstream. Additionally, the past practice of mechanical removal was observed to have some adverse impact, through the disturbance of streambed sediments and inducement of some turbidity.

Another practice employed was to burn these types of vegetation in place, when stream flows were low, using a propane torch-type burner. However, the burning of piles of vegetation may have had a minor adverse impact on air quality.

The District also conducted some tests using a copper sulfate-based herbicide, but it was found to not be cost effective, because the flowing water conditions required use of too much product to achieve adequate concentrations for control.

The current and more efficient program began approximately in 1999 and consists of the following:

Ditch bank spraying: At the onset of the program, 70 gal/acre of the herbicide solution was being applied by the district. Equipment with better mixing, application, and metering controls was purchased. Adjuvants were also used to increase effectiveness of the herbicides. Simultaneously, the application rates and concentrations were monitored for best effect with minimum rate and concentration. These efforts resulted in a lower concentration of AquaMaster and Activator 90, thereby reducing the application rate to 35 gal/acre.

Aquatic spraying: At the onset of the program, mechanical cleaning was the primary means of vegetation control. Spraying was primarily used to prepare for the mechanical cleaning. Higher herbicide concentrations were directly applied to large/mature growth. After the vegetation died, it was removed by mechanical means. The sediment buildups around the vegetation were also mechanically removed or leveled. Mechanical cleaning had significant physical impact on the streambed and banks. Because of the physical impacts and the labor costs, mechanical cleaning occurred on a 1 to 3 or 1 to 4 year cycle. Eventually, spraying was used as the primary means of

vegetation control. A baseline condition was established and then annual spraying of the upper reaches was scheduled to keep the growth small, to reduce chemical usage, and reduce amount of dead, degrading vegetation. Spraying was scheduled predominantly in the fall just before the plant leaves change color. This way, the herbicide translocates to the roots as the vegetation is entering dormancy, when the herbicide is more effective for the dose. The reduced growth decreases the amount of sediment buildup and the amount of mechanical cleaning required.

For this program, the proposed water quality analytical method for assessing the presence of herbicides in stream water is U.S. EPA Method 547. Briefly, the method involves injecting the water sample into a high performance liquid chromatography (HPLC) system equipped with a post column reactor and a fluorescence detector. The limit of quantitation of this method has been found to be well below the acute and chronic toxicity reference values (TRVs) for aquatic and terrestrial wildlife for glyphosate.

The decomposition/degradation of the sprayed vegetation can, under certain conditions, lead to reduced dissolved oxygen (DO) levels in the water. Normally this is a concern for standing bodies of water and slow-moving reaches of streams and rivers, where heavy growths have been sprayed. However, reductions in DO are not considered to be a concern because of the vegetation control management practices. Specifically, spraying is conducted in early vegetation dormancy to 1) reduce quantity and cost of applied chemicals, and 2) reduce dead mass that might break free and restrict flow at diversion structures. Further many applications are at small, localized spots rather than large areas of growth.

9.0 EVALUATION OF EFFECTIVENESS OF BMPS

The District employs the following BMPs to eliminate or reduce the discharge of pollutants and minimize the real extent and duration of impacts caused by the application of AquaMaster herbicide to aquatic vegetation in the District's channels. Only properly trained personnel conduct the application program, with application activities conducted in accordance with the manufacturers label instructions and the oversight of the Tulare County Agricultural Commissioner.

- The District conducts its control program during periods of lowest stream flow levels;
- Herbicide product applications are systematically conducted each year, as different areas are treated in a documented sequence, and the applied quantities are carefully measured and recorded;
- Spraying will be scheduled predominantly in the fall just before the plant leaves change color. This way, the herbicide translocates to the roots as the vegetation enters dormancy, when the herbicide is more effective for the dose. The reduced growth decreases the amount of sediment buildup and the amount of mechanical cleaning required;

- At least 15 days prior to application the District will post to their website the intent to apply the herbicide, name of the herbicide, purpose of use, the dates that the herbicide will be applied, the approximate locations of application, and contact information for additional information;
- The District employs different types of specially-designed application equipment, which minimize the quantity of product applied, as well as the amount of overspray. The direct spray equipment minimizes the flow time at an individual point of application. The first piece of equipment has a spray boom that allows treatment of banks from the levee surface, resulting in a parallel spray pattern and uniform application. The second piece of equipment allows access into the channel with low-pressure, rubber-tired equipment and also allows uniform treatment of banks or channel vegetation with an innovative oscillating spray head. The low pressure, rubber tires do not significantly disrupt bottom sediments or result in significant siltation. This equipment also has a platform and spray hose for personnel to conduct individual spot spraying to areas where limited applications are adequate. The third piece of equipment utilizes an ARGO amphibious vehicle with a hand sprayer and a 60 gallon tank on the back. The ARGO is only used in low flow situations and generally is always in contact with soil;
- Both types of application equipment are designed to directly measure the quantity of product applied at each treatment area;
- The District monitors daily weather conditions, to avoid scheduling application during periods of rain, high winds or dusty conditions; and
- District personnel conduct post-treatment assessments of the application areas to verify the adequacy of treatment and the absence of any adverse effects. These inspections are normally scheduled about a week after the application and continue periodically thereafter; and
- Results of previous water sampling conducted as part of the existing program indicates that the herbicides applied have not resulted in fish kills within the waterways; therefore, the collection of samples for bioassay analysis is not necessary to prevent the fish kills within the waterways operated by the District.

10.0 EVALUATION OF ALTERNATIVES

The evaluations of alternative for each of the methods indicated in the General Permit are presented below:

10.1 No Action

As stated earlier the problematic vegetation may cause obstruction to flow especially when they trap and accumulate floating debris and as sediment build-ups behind the stocks. Such restrictions to water flow may aggravate upstream flooding during periods of high runoff, which may cause property damage, damage to control structures, and a danger to public health and

safety. This alternative is not anticipated to improve water quality as the current product used to control vegetation has not been detected in water samples collected from streams during the last 8 years of operation. As these products have not been detected, there is no anticipated effect on non-target species which include the plants which are to be irrigated with this water.

10.2 Prevention

Prevention for the purpose of this document is defined as any method to prevent the emergence of the target species prior to applying water to the channel system. This may include applying a herbicide when the channels are dry. In certain areas water is present year-round. Therefore this method is not feasible for these areas.

10.3 Mechanical or physical methods

Mechanical or physical methods include ripping, plowing, disking, grading, and/or manual labor. Each one of these options is not only costly due to the required manpower but also may remove the root structure, which would degrade water quality due to an increased sediment load. This sediment load may increase the chemical oxygen demand and lower the DO concentration of the water. This impact may be detrimental to non-target species.

10.4 Cultural methods

Cultural methods would involve the mechanical removal of the unwanted species and replacement with a less problematic species that is maintained, or managing the existing species through cultivation. It would not be feasible to cultivate materials inside of the channel structures as they are not large enough to provide access for the equipment required. The cost to replace and maintain the crop inside of the channels would also be significant.

10.5 Biological control agents

The use of biological control agents is a method of controlling target species using other living organisms. One such method would be to allow livestock to graze on the target species to remove them. The channel structures are not fenced and livestock may escape and damage adjacent farmland. Therefore this alternative may create and additional liability. The livestock would also generate waste and possibly expose soil, which may degrade water quality.

10.6 Algaecides and Aquatic Herbicides

As described in previous sections aquatic herbicides are used to control nucience plant species which may pose a threat to public and private resources. The aquatic herbicides have been used with success for multiple years, which is indicative of its cost effectiveness and ability to be implemented. The use of aquatic herbicides is the preferred method of managing the unwanted plant species.

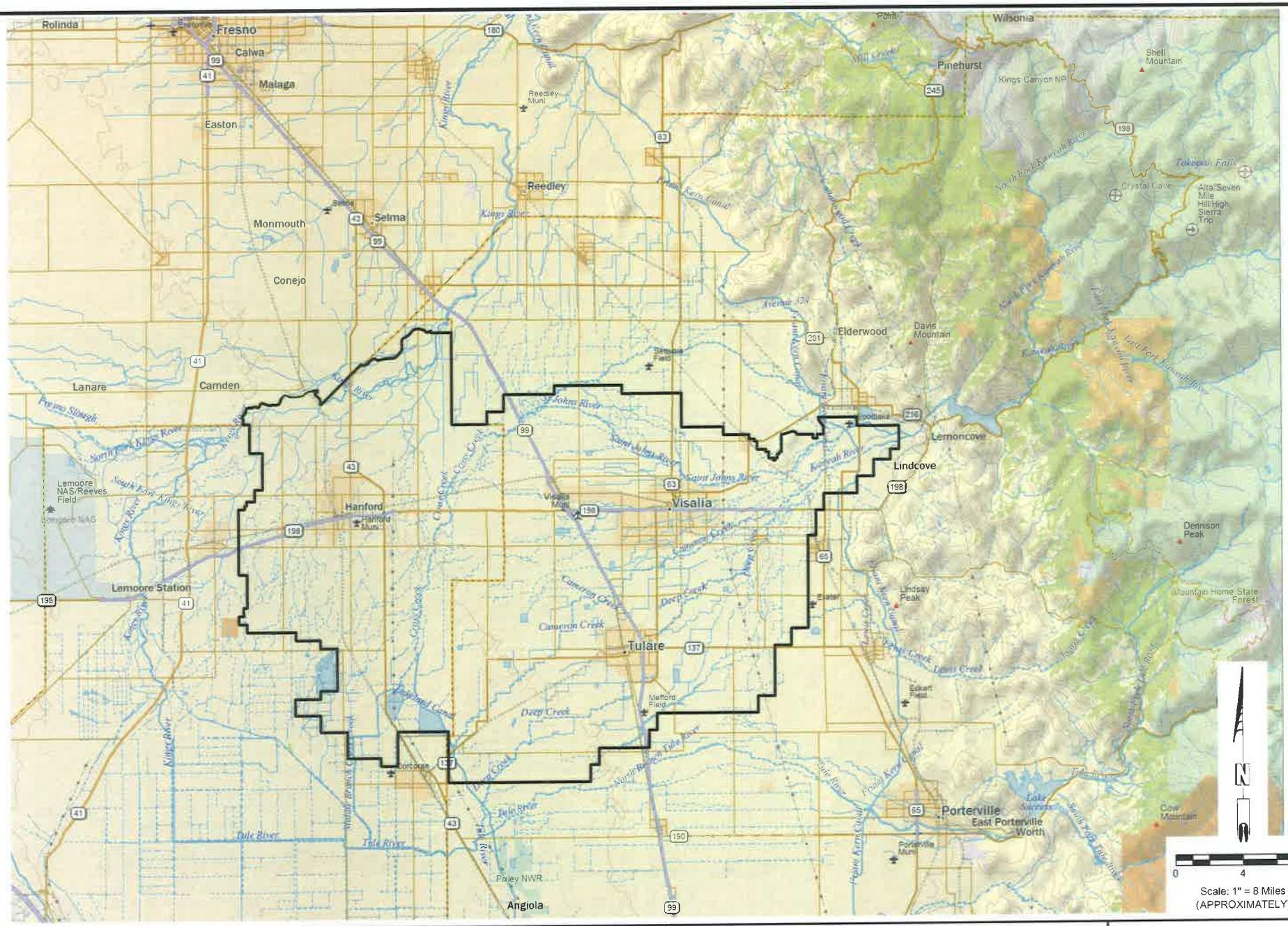
11.0 LIMITATIONS

This APAP has been prepared for the exclusive use of the Client, parties performing required activities related to the monitoring at the subject property, and regulatory agencies responsible for overseeing the APAP. It has been prepared in accordance with generally accepted environmental engineering practices in Tulare and Kings County, California. The passage of

time, natural processes, or human intervention on the subject property or adjacent properties and changes in the regulations can cause changed conditions that can invalidate the findings and conclusions presented in this report. No other warranties either express or implied are made as to the professional advice provided under the terms of BSK's agreement with Client.

BSK ASSOCIATES

FIGURES



LEGEND:

——— ESTIMATED KAWEAH DELTA WATER CONSERVATION DISTRICT

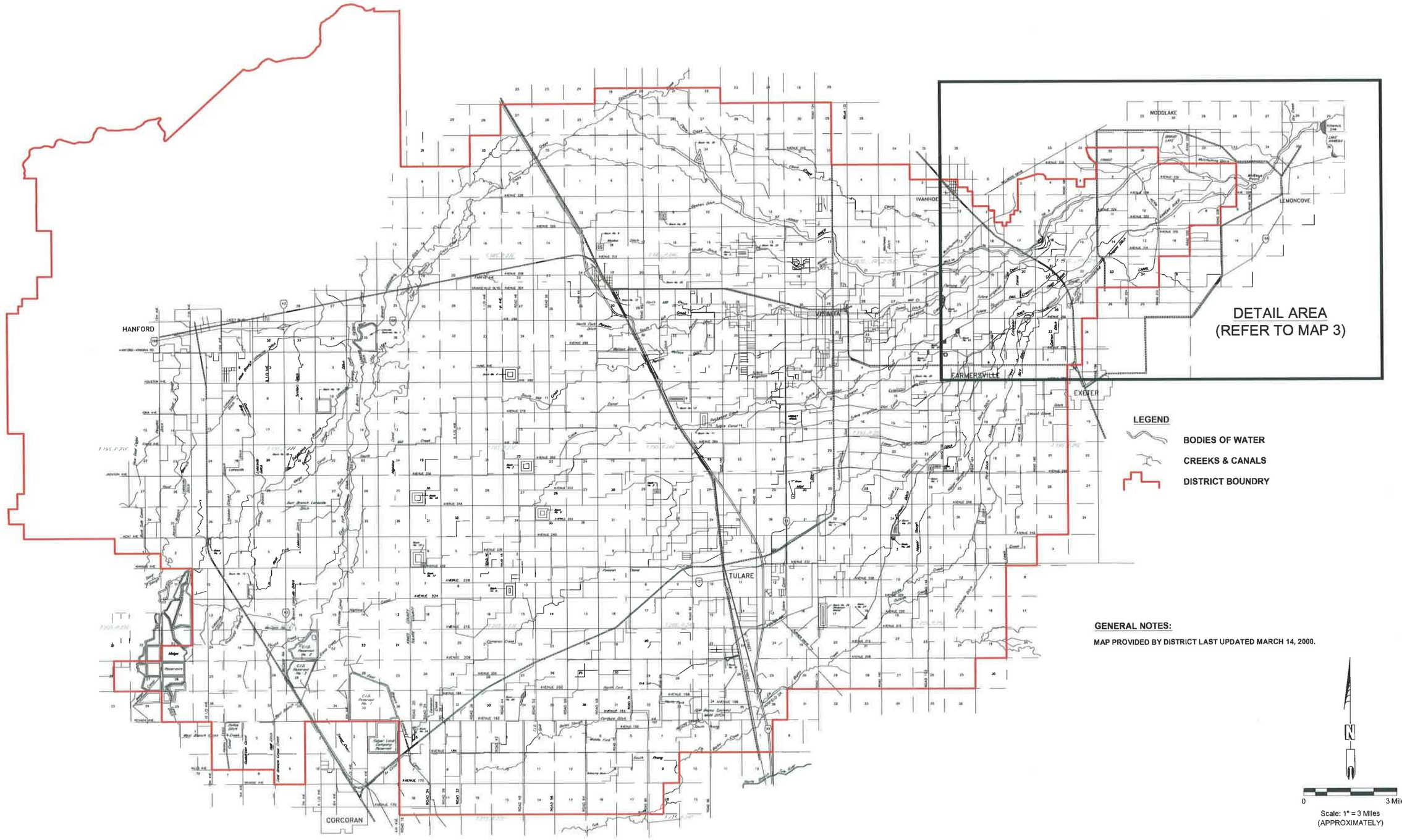
BSK
550 West Locust Avenue
Fresno, California 93650
Tel. (559) 497-2880

VICINITY MAP

Aquatic Pesticide Application Plan
Kaweah Delta Water Conservation District
2975 N Farmersville Boulevard
Farmersville, California

FIGURE 1

JOB NO. E13-091-01F
DATE February 6, 2014
DR. BY JRA
CH. BY
SCALE AS SHOWN
SHEET NO. 1
OF 1 SHEETS



GENERAL NOTES:

MAP PROVIDED BY DISTRICT LAST UPDATED MARCH 14, 2000.

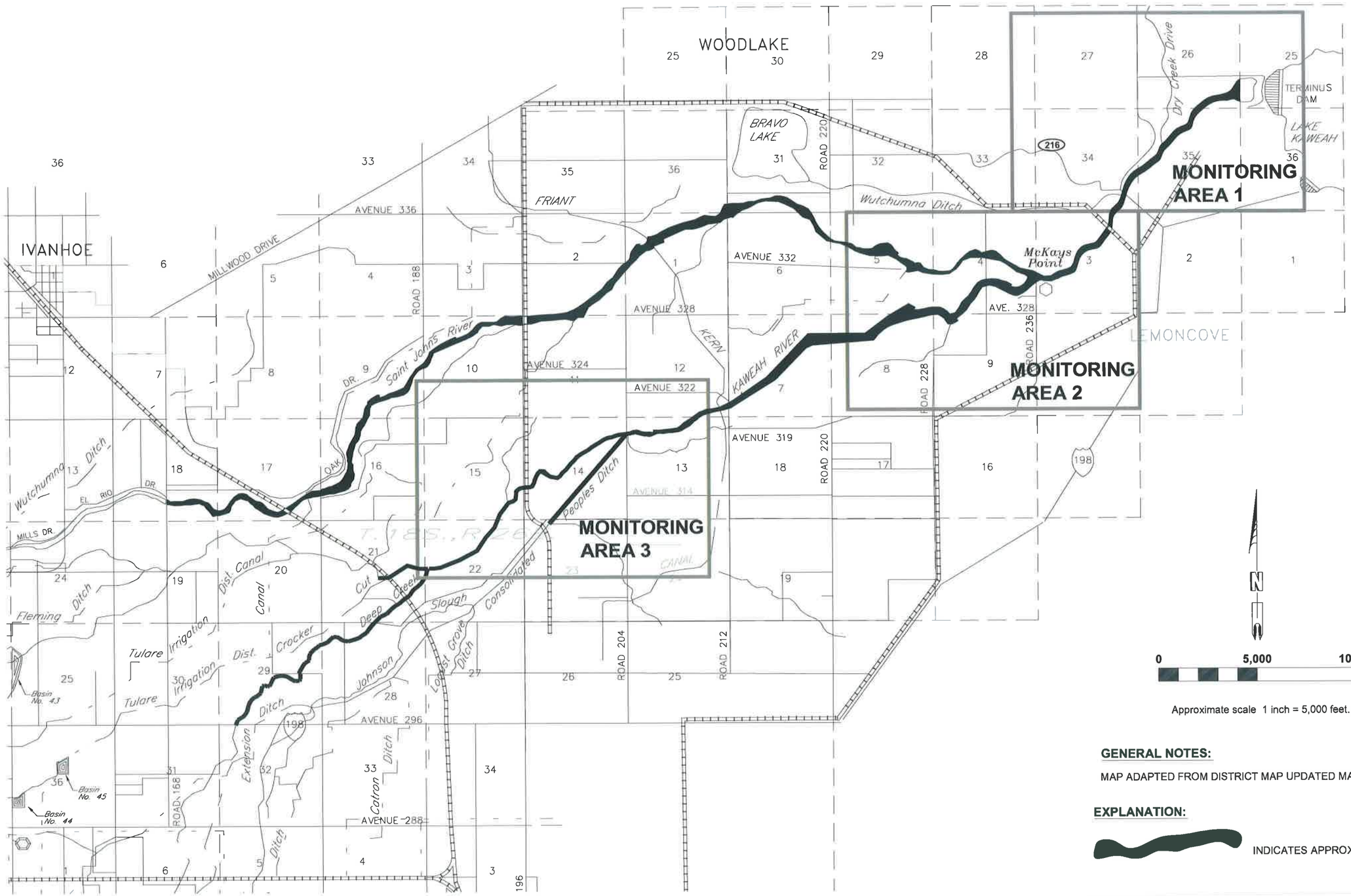
BSK
550 West Locust Avenue
Fresno, California 93650
Tel. (559) 497-2880

DISTRICT BOUNDARY MAP

Aquatic Pesticide Application Plan
Kaweah Delta Water Conservation District
2975 N Farmersville Boulevard
Farmersville, California

FIGURE 2

JOB NO. E13-091-01F
DATE February 6, 2014
DR. BY JRA
CH. BY
SCALE AS SHOWN
SHEET NO. 1
OF 1 SHEETS



Approximate scale 1 inch = 5,000 feet.

GENERAL NOTES:

MAP ADAPTED FROM DISTRICT MAP UPDATED MARCH 14, 2000.

EXPLANATION:

INDICATES APPROXIMATE EXTENT OF TREATED ARI

BSK
550 West Locust Avenue
Fresno, California 93650
Tel. (559) 497-2880

PROPOSED TREATMENT AND MONITORING AREAS

Aquatic Pesticide Application Plan
Kaweah Delta Water Conservation District
2975 N Farmersville Boulevard
Farmersville, California

FIGURE 3

JOB NO E13-091-01F
DATE February 6, 2014
DR. BY JRA
CH. BY
SCALE AS SHOWN
SHEET NO. 1
OF 1 SHEETS

APPENDIX A

Monitoring and Reporting Plan

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APPENDIX

BSK

1.0 INTRODUCTION

This Monitoring and Reporting Plan (MRP) has been prepared by BSK Associates (BSK) on behalf of Kaweah Delta Water Conservation District (District). This document, which accompanies and supplements the District's Aquatic Pesticide Application Plan (APAP), provides a common framework of monitoring and reporting practices designed to be followed as part of the program. This document will be periodically reviewed and revised to update analytical procedures and program information. All revisions of this MRP must be approved by the California Regional Water Quality Control Board (CRWQCB).

The District is located in Tulare and Kings Counties in Central California as depicted on Figure 1, Vicinity Map. The District's upstream and eastward boundary extends to the confluence of Dry Creek, within one mile below Terminus Dam and the downstream boundary extends westward to the Hanford and Corcoran area, as depicted on Figure 2, District Boundary Map.

The District encompasses portions of the Kaweah and St. John's Rivers, and various tributaries. The principal water supply for the District is the Kaweah River. The District is responsible for delivering water to multiple private ditch companies, and maintaining adequate flow for flood water management.

2.0 PROBLEM DEFINITION/BACKGROUND

2.1 Problem Statement

In order to maintain flood flows and the operability of various diversion structures, the District has found it necessary to conduct an in-stream aquatic vegetation control program across various streams and channels within its eastern portion, depicted as the "detail area" on Figure 2. A topographic map of this detail area is provided in Figure 3.

The problematic types of aquatic vegetation have primarily been willows, mare's tail, tules, and parrot feather. Prior to last decade, the District employed non-herbicide techniques for control of the willows, mare's tail, and tules; specifically, mechanical removal and burning. This management practice generally required entering the steambed with large tracklayer tractor equipment, to essentially "rake" the vegetation into piles, which would then be burned. However, this practice became more restricted and impractical with the advent of Section 404 of the Clean Water Act.

Another practice employed was to burn these types of vegetation in place, when streamflows were low, using a propane torch-type burner. However, this control method was discontinued due to potential impacts to air quality.

When mechanical removal was attempted for parrot feather, small fragments of the plant would be translocated, causing the parrot feather to spread even more broadly to downstream areas. The District also conducted some tests using a copper sulfate-based herbicide, but it was found to not be cost effective because the flowing water conditions required use of too much product to achieve adequate concentrations for control.

During the past decade, the District has employed an aquatic herbicide product under the trade name AquaMaster. The District has also employed an adjuvant under the trade name Activator 90, to increase retention of the aquatic herbicide. These products have been applied to the unsubmerged (i.e. emerged) portions of all four types of problematic vegetation.

Willows, mare's tail, and tules are indigenous vegetation. Willows and mare's tail, which can become submerged with fluctuating stream flows, have been a persistent problem at Area 1. Willows, in particular, cause obstruction to flow especially when they trap and accumulate floating debris. Such restrictions to water flow have aggravated upstream flooding impacts, during periods of high runoff. Tules are normally submerged aquatic plants, which also restrict stream flow.

Parrot feather is a floating exotic plant which has become prevalent in various channels during the past decade. This plant has been commonly used in aquariums, and District staff suspect it may have been introduced inadvertently into the District's waterways through the discharge of aquarium water. Even a small fragment of this plant, if disrupted from a mass, has been shown to readily translocate, reestablish, and regenerate itself at a downstream location.

2.2 Intended Usage of Data

This MRP presents the organization, functions, procedures, and specific quality assurance (QA) and quality control (QC) activities for collecting and analyzing water samples under the District's aquatic weed control program along reaches of the Kaweah and St. John's Rivers, and other streams and channels within the District's purview of operations to assess the potential presence of the vegetation control products in these waterways. The primary users of this MRP include the staff performing laboratory analyses and fieldwork for this program. This guidance document was prepared to address the requirements of Attachment C of the General NPDES Permit for Residual Aquatic Pesticide Discharges from Algae and Aquatic Weed Control Applications Order No. 2013-0002-DWQ, which became effective December 1, 2013.,

The goal of the procedures and specifications established in this MRP is to provide references, standardized procedures and quality specifications for the sampling, analysis and data review procedures required for the APAP in the District's waterways. The active ingredient in AquaMaster is glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt (53.8%). Additionally, the adjuvant employed by the District is Activator 90. Activator 90 is an emulsified concentrate containing 750 grams per liter (g/l) alkylphenyl hydroxypolyoxyethylene and 150 g/l natural fatty acids. This MRP also establishes QA procedures for reviewing and documenting compliance with field and analytical procedures.

This MRP details the specific activities and standard field procedures and specifications for this program. The MRP presents the site-specific data quality objectives (DQOs) and sampling plans that identify sampling locations, number of samples, field procedures and analytical methods to be used.

A health and safety plan (HASP) will be prepared by the District for this sampling effort to establish the safety procedures and the level of personal protective equipment (PPE) required. This ensures that field activities are conducted in a manner that protects personnel performing the work and others in the vicinity.

3.0 PROJECT/TASK ORGANIZATION

3.1 General Overview of Project

The approximate extent of the District's channels typically requiring the application of aquatic herbicides is depicted on Figure 3. The District has selected three monitoring areas for monitoring the application of AquaMaster/Activator 90. and the three application areas are summarized as follows: Area 1 is along Dry Creek, immediately upstream of its confluence with the Kaweah River. Area 2 is on the Kaweah River, at the controlled diversion to St. John's River and the Kaweah River, near a park area known as McKay's Point. Area 3 is on the Kaweah River, at the controlled diversion to Consolidated People's Ditch.

3.2 Project/Task Organization

List key project personnel and their corresponding responsibilities.

Name	Project Title/Responsibility
Shane Smith	Project Manager/QA Officer

3.3 Sampling Types

The permit specifies three types of sampling for each sampling event:

1) Background Monitoring. Background monitoring samples shall be collected upstream at the time of the application event or in the application area just prior to (within 24 hours of) the application event.

2) Event Monitoring. Event monitoring samples shall be collected immediately downstream of the treatment area in flowing waters or immediately outside of the treatment area in non-flowing waters, immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.

3) Post-Event Monitoring. Post-event monitoring samples shall be collected within the treatment area within one week after application.

4.0 SAMPLING QUALITY OBJECTIVES

4.1 Monitoring Requirements

The following information will be collected or gathered from each sampling site for each sampling type.

	Constituent / Parameter	Analysis	Units
Visual Observations	Monitoring area description (pond, lake, open waterway, channel, etc.)	Observation	NA
	Appearance of waterway (sheen, color, clarity, etc.)	Observation	NA
	Weather Conditions (fog, rain, wind, etc.)	Observation	NA
Physical Characteristics	Temperature	Field meter	° F
	pH	Field meter or Laboratory Analysis	Std Units
	Turbidity	Field meter or Laboratory Analysis	NTU
	Electrical Conductivity @ 25°C	Field meter or Laboratory Analysis	umho/cm
Chemical Analysis	Glyphosate*	Laboratory Analysis	ug/L
	Nonylphenol	Laboratory Analysis	ug/L
	Dissolved Oxygen	Field meter	ug/L

Notes:
NA – Not Applicable
Std Units – Standard pH Units
NTU – Nephelometric Turbidity Unit
umho/cm – micromho per centimeter
ug/L – microgram per liter

* For glyphosate, collect samples from one application event from each environmental setting (flowing water and non-flowing water) per year.

4.2 Sample Collection

Monitoring areas have been chosen that represent the full range of application. Per the General Order monitoring requirements, samples shall be collected at 3 feet below the surface of the water body or at mid water column depth if the depth is less than 3 feet. Samples are anticipated to be collected from the shore using a telescoping sampling rod.

Duplicate samples will be collected to evaluate data comparability. One duplicate per application event will be collected.

5.0 TRAINING REQUIREMENTS

The personnel collecting samples will be given training to include introduction to a standard operating procedure, proper use of the chemical compounds per manufactures recommendations, actions to contain and notify if a spill occurs (which includes maintaining a spill kit), demonstration of techniques, and in-field supervision for first time application and collection of samples.

6.0 FIELD DOCUMENTATION AND RECORDS

All sample control information shall be documented in a master sample log. The data collected in the field shall be recorded on sample field sheets. Pertinent field information includes (as applicable);

- Identify monitoring areas with global positioning systems (GPS) coordinates (as applicable);
- Within the monitoring areas, identify the application areas, treated areas, untreated areas, and bodies of water receiving treated water;
- Document the width, depth, and flow rate of the stream; and
- Describe the surface water, and weather conditions.

All samples must be uniquely identified to ensure that results are properly reported and interpreted. Samples must be identified such that the individual who performed the sampling or measurements, sampling location; site; sample date and time; matrix; sampling equipment and sample types (normal field sample or QC sample) can be distinguished by a data reviewer or user. A separate chain-of-custody record shall be completed for each day of sampling, immediately subsequent to sample collection.

7.0 SAMPLING PROCESS DESIGN

7.1 Rationale for Selection of Sampling Sites

Sampling sites have been selected to be representative of typical operations, to be accessible, and to have nearby flow measurement stations.

8.0 SAMPLE HANDLING AND CUSTODY PROCEDURES

Sample possession during all sampling efforts must be traceable from the time of collection until results are reported and verified by the laboratory and samples are disposed of. Sample custody procedures provide a mechanism for documenting information related to sample collection and handling.

8.1 Documentation Procedures

The field activities coordinator is responsible for ensuring that the field sampling team adheres to proper custody and documentation procedures. A master sample logbook is maintained for all samples collected during each sampling activity.

Field personnel have the following responsibilities:

- Keep an accurate written record of sample collection activities on the Application Log and logbook;

- Ensure that all entries are legible, written in waterproof ink and contain accurate and inclusive documentation of the field activities;
- Date and initial daily entries;
- Note errors or changes using a single line to cross out the entry and date and initial the change; and
- Complete the chain of custody forms accurately and legibly.

A sample label shall be affixed to each sample collected. Sample labels shall be provided by the subcontracted laboratory, and shall uniquely identify samples with an identification number, analytical method requested, and date and time of sample collection.

8.2 Chain-of-Custody Form

A chain-of-custody form shall be completed after sample collection, and prior to sample shipment or release. The chain-of-custody form, sample labels, and field documentation shall be crossed checked to verify sample identification, number of containers, sample volume, and type of containers.

Information to be included in the chain-of-custody forms shall include:

- Sample identification;
- Date, time and location of collection;
- Sampler's initials;
- Analytical method(s) requested;
- Sample volume;
- QC sample identification;
- Signature blocks for release and acceptance of samples; and
- Any comments to identify special conditions or requests.

Sample transfer between field staff, courier, and laboratory is documented by signing and dating "relinquished by" and "received by" blocks whenever sample possession changes. If samples are not shipped on the collection day, they are to be refrigerated in a sample control area. A chain-of-custody form shall be provided by the subcontracted laboratory.

8.3 Sample Shipments and Handling

All sample shipments are to be accompanied by the chain-of-custody form, which identifies the content. The original form accompanies the shipment and a copy is retained in the project file.

All shipping containers are to be secured with chain-of-custody seals for transportation to the laboratory. Samples are either shipped to the laboratory according to Department of Transportation standard or picked up by the laboratory from the field. A generous amount of ice is to be packed with the samples to maintain the required receiving temperature for the method, which is typically less than 4° Celsius, but above freezing. The methods of shipment, courier name, and other pertinent information are entered in the "Received By" or "Remark" section of the chain of custody form.

The following procedures are to be used to prevent bottle breakage and cross-contamination:

- Bubble wrap or other cushioning material is to be used to keep bottles from contacting one another to prevent breakage;
- Sample bottles are to be individually sealed in plastic re-closeable bags;
- All samples are to be transported inside hard plastic coolers;
- The coolers are to be taped shut and sealed with chain-of-custody seals to prevent accidental opening; and
- Field staff must notify the laboratory prior to shipment of the samples.

8.4 Laboratory Custody Procedures

The following sample control activities must be conducted in the laboratory:

- Initial sample log-in and verification of samples received with the chain of custody form;
- Document discrepancies noted during log-in on the chain of custody;
- Initiate internal laboratory custody procedure;
- Verify sample preservation such as temperature;
- Notify the project coordinator if any problems or discrepancies are identified;
- Proper sample storage, including daily refrigerator temperature monitoring and sample security; and
- Return shipment of coolers.

9.0 ANALYTICAL METHODS REQUIREMENTS

The proposed water quality analytical method is U.S. EPA Method 547. Briefly, the method involves injecting the water sample into a high performance liquid chromatography (HPLC) system equipped with a post column reactor and a fluorescence detector. The limit of quantization of this method has been found to be well below the acute and chronic toxicity reference values (TRVs) for aquatic and terrestrial wildlife for glyphosate.

10.0 QUALITY CONTROL REQUIREMENTS

10.1 Field QC Checks

Duplicate samples will be collected in the field in a 1:10 ratio.

10.2 Laboratory QC Checks

Laboratory QC checks will be in accordance with the laboratory's QC manual.

11.0 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

Field equipment may be used in lieu of analytical testing for temperature, pH, EC, and DO. Field meters are preferable in the case of pH and DO which have a short laboratory hold time.

All meters shall be maintained in accordance with manufactures specifications. These specifications may include the routine replacement of meter probes and calibration of the meter. Calibration of the meters will require the use of standard/calibration fluids.

Meters shall be calibrated daily prior to use in the field. The calibration will be documented by recording the type of standard/calibration fluid used (or multiple fluids used), the date and time of the calibration, and the name of the personnel calibrating the meter.

12.0 INSPECTION/ACCEPTANCE REQUIREMENTS

The data will be accepted if it falls within the 80 to 120% recovery range and is above the method detection limit. Data outside this range will be inspected for possible causes.

13.0 ASSESSMENT AND RESPONSE ACTIONS

Data will be reviewed, validated, and verified. The data will be reconciled with the data quality objectives. Validated data will be reported. Data outside the acceptance range will be inspected for possible causes.

14.0 MONITORING REPORT

An annual monitoring report will be prepared prior to March 1st of every year to describe the activities conducted from January 1 through December 31 of the previous year. The annual report shall contain the following:

- Identification of each monitoring area with global positioning systems (GPS) coordinates;
- A map to identify the application areas, treated areas, untreated areas and bodies of water receiving treated water within each monitoring area;

- Documentation of water temperature, in addition to width, depth and flow rate of the stream;
- Description of the surface water and weather conditions;
- Identification of BMPs and a discussion of their effectiveness;
- Identify the types and amounts of aquatic pesticides applied to within each monitoring area;
- Identify the date, time and location of all water samples collected; and
- Identify the following constituents of each water sample:

    - Turbidity
    - Electroconductivity
    - Ph
    - Dissolved Oxygen
    - Hardness (CaCO3)
    - Presence and concentration of glyphosate (AquaMaster)
    - Presence and concentration nonylphenol (Activator 90)

- Discussion of recommendations to improve the APAP, MRP and BMPs in compliance with the General Permit.

APPENDIX A

Chemical Application Log

BSK

CHEMICAL APPLICATION LOG 2014

APPLICATION

LOCATION:	SITE NUMBER:	COUNTY:	DATE:	TIME:

APPLICATOR:	APPLICATION METHOD:	TARGET ORGANISMS:	APP. #

WATER CONDITIONS: DRY / STANDING WATER / EST. FLOW RATE:	WATER TEMPERATURE:

GENERAL WEATHER CONDITIONS:	WIND:	Ambient Temperature:

ACTIVE INGREDIENT(S):	MIX RATE:	APP. RATE:	APPLICATION PERFORMED: YES ☐ NO ☐
SPREADER:	MIX RATE:		REMARKS:

HOURS:	ACRES:	SOIL TYPE:

POST INSPECTION

DATE:	INSPECTOR:	DESCRIPTION OF EFFECTIVENESS:

RECOMMENDATIONS FOR BEST MANAGEMENT PRACTICES:

Form Date: 12/15/13

Kaweah Delta Water Conservation District
2975 North Farmerville Blvd., Farmersville, CA 93233