Aquatic Pesticide Application Plan

Prepared for

West Stanislaus Irrigation District

In Compliance with General Permit No. CAG990005

WDID No. 5B50AP00003

November 11, 2020

SEI
Summers Engineering, Inc
Since 1965

Table of Contents

Forward: Following is an updated Aquatic Pesticide Application Plan (APAP) developed in accordance with the requirements listed in the Water Quality Order No. 2013-00002-DWQ, General Permit No. CAG990005 for West Stanislaus Irrigation District (WSID or District). Topics below are numbered consistent with VIII.C of that Order. The District's Waste Discharger Identification (WDID) is 5B50AP00003.

Element 1: Description of the water system

West Stanislaus Irrigation District (District) delivers agricultural water to growers within the District. The conveyance system is made up of one Main Canal with six lifts. On each lift, there is a lateral that runs north and another that runs south. See Figure 1.

Element 2: Description of the treatment area

Aquatic weed control is required in eight laterals: Laterals 2-South, 3-South, 4-North, 4-South, 5-North, 5-South, 6-North, and 6-South. These are labeled on the attached vicinity map as 2S, 3S, 4N, 4S, 5N, 5S, 6N, and 6S, respectively. Additionally, post-emergent weed control along canal banks, above the waterline, is needed.

Element 3: Description of Weeds and Algae

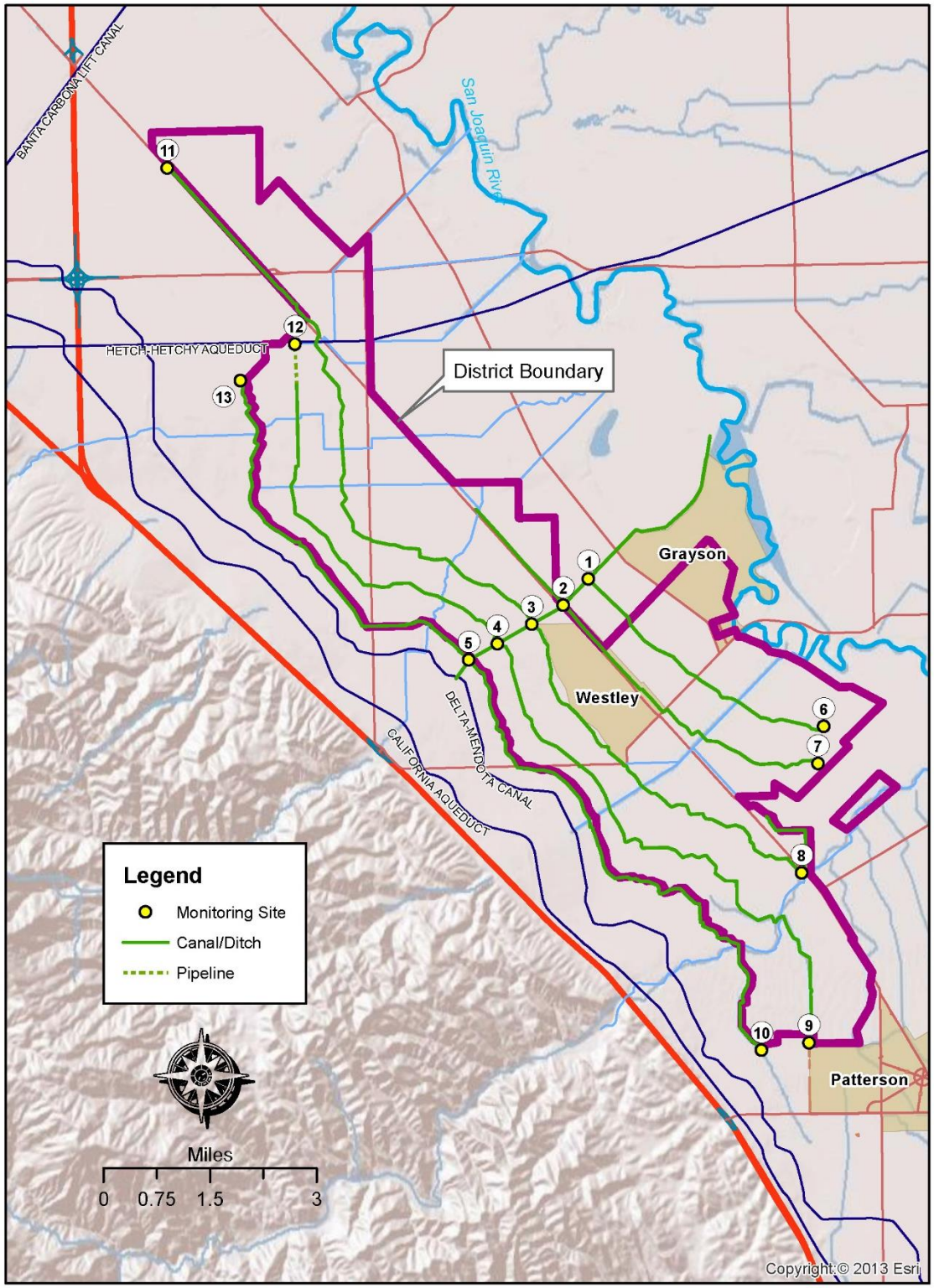
Sago Pondweed, Horned Pondweed and Algae are major problems within the District. Weed growth restricts conveyance capacity in each lateral thereby limiting deliveries to farms especially at times of peak demand when it is most important to water crops. Weed growth breaks off at times and plugs screens, turnout gates, siphons, on-farm siphon pipes, and filtration systems resulting in overtopping of canals which cause significant damage to property, increase in maintenance and repair labor, and loss of water. Additionally, various grasses and other noxious weeds grow along the banks of the canals, the most prevalent being Bermuda grass. These weeds are a nuisance and hamper operations.

Element 4: Algaecides and Aquatic Herbicides Used

The District proposes to apply endothall in the form of Teton (53% endothall) and Cascade (40.3% endothall). Endothall disperses with water flow and is broken down into carbon, hydrogen, and oxygen by microorganisms. Surfactants or adjuvants will not be used during treatment. The half-life for Teton ranges from five to ten days and full decomposition ranging from 30 to 60 days and the half-life for Teton is 8 hours District expects to perform spot treatments within the affected laterals according to the level of aquatic growth present. Applications will be made by metering pump at a rate consistent with the label requirements and as recommended by a certified pest control advisor. No adjuvants will be used during application of either endothall pesticide.

In addition to endothall, the District proposes to apply copper carbonate in the form of Captain Liquid Copper algaecide and Nautique Aquatic Herbicide (both 15.9% copper carbonate). Captain Liquid Copper Algaecide will be used to control algae and applied per product label at 0.6 to 1.8 gallons per acre foot of water. Lower rates will be used when algae are young and actively growing. Application will be in a uniform manner using calibrated surface spray or drip application at first sign of algae growth. For maximum results it is preferred to apply pesticide when water temperatures is 60 degrees F or higher. Nautique Aquatic Herbicide will be used to control Sago Pondweed and will be applied per product label at 0.5 to 1.0 ppm. Lower rates will be applied when aquatic weeds are young, actively growing and low in density. Application will be in a uniform manner using drip application at first sign of weed growth.

Figure 1



West Stanislaus Irrigation District
Pesticide Application Monitoring Sites

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Application will be through a calibrated drip system or metering pump. No adjuvants will be used during application of either copper carbonate pesticide.

The District proposes to use glyphosate in the form of Roundup Custom (50.2% glyphosate) to control vegetation on canal roads/right-of-way and the inside of slope of canals. A non-ionic wetting agent, Target Pro Spreader, will be used as an adjuvant. The Roundup Custom will be applied at a rate 3 qts/acre and Target Spreader Pro will be applied at a rate of 16 oz/acre at a dilution rate of 50 gallons. This mixture will be applied to actively growing weeds above the waterline.

Element 5: Discussion of Factors Influencing Herbicide Use

Various options of aquatic weed control have been researched and implemented including no action where no control measures were taken. This proved to be bad management practice as this reduced water supply to farms and caused various damage as described above. Dragging a heavy chain has been used to break up the weeds sending them downstream to be cleaned out at the next canal crossing. This method has also proven to be a bad management practice as this method is extremely labor intensive, causes severe damage to the canals' concrete lining, and drastically stirs up sediment which plugs irrigators' filtration systems. In addition, the weeds plug screens, filtration systems, gates, siphons and on-farm irrigation siphons. When this method is scheduled, water users are notified 24 hours in advance so that irrigations can be re-scheduled.

Because the alternate (non-chemical) methods described above proved to be poor management practices, aquatic pesticides must be used. The use of aquatic pesticides drastically reduces the equipment and labor resources required by the alternative methods because application and monitoring of the aquatic pesticides will require only one person and one vehicle. The chain method described above requires two to four people in addition to an excavator, dump truck, and two vehicles. The use of aquatic pesticides will eliminate damage to the concrete lining of the canals as compared to the no action and chain alternative. It will also improve water quality because application will not cause sediment to be stirred up. Aquatic pesticide use will not damage grower irrigation systems and will provide increased water supply and reliability to growers.

Element 6: Gates and Control Structures

The District's lateral system is effectively a closed system. Although each of the laterals are capable of spilling to regional drains, normal operating conditions is to keep all spills sealed and only allow discharge from the spills during dewatering procedures at the end of the irrigation season. South laterals would spill into Del Puerto and Black Gulch Creeks and North laterals would spill into the Blewett Drain. Prior to, during, and after the application of pesticides, District staff will visually inspect the spill structures of the treated lateral and confirm that it is adequately sealed. Inspections will occur 24 hours prior to applications, daily during the application period, and daily for the seven-day period after the application is complete. A list of the spill structures to monitored is shown below when applications are scheduled in the effected lateral.

- Lateral 2-S Spill
- Lateral 3-S Spill
- Lateral 4-S Spill

- Lateral 5-S Spill
- Lateral 6-S Spill
- Lateral 4-N Spill
- Lateral 5-N Spill
- Lateral 6-N Spill

Element 7: State Implementation Policy

Element 8: Description of Monitoring Program

Applications will be made when aquatic weed growth hampers the efficient delivery of irrigation water in the District. Due to the cost of product, application and monitoring, aquatic herbicides are used only when necessary. The basic monitoring plan is as follows:

- Grab sample during application at the application site.
- Grab sample at the end of laterals in operation during treatment.

The sample will be taken by District staff and processed by an approved laboratory with methods outlined by the BMP's. The sample location will vary depending on which laterals are being used during applications. The District intends to operate the treated lateral such that no water spills from the lateral during the treatment period.

The following MRP was prepared in accordance with Attachment C of the order.

Monitoring and Reporting Program (MRP)

This MRP is designed to address the two key questions listed in the Order:

Question 1: Does the residual algaecides and aquatic herbicides discharge cause an exceedance of receiving water limitations?

Question 2: Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, inert ingredients, and degradation by products, in any combination cause or contribute to an exceedance of the "no toxics in toxic amount" narrative toxicity objective?

West Stanislaus Irrigation District intends to implement a treatment program using endothall, copper carbonate and glyphosate to manage aquatic and bank weed growth within its laterals. Treatments will consist of the application of the appropriate amount of one of the following: endothall as either Cascade or Teton, copper carbonate as either Captain or Nautique, or glyphosate as Roundup Custom under the supervision of a licensed Pest Control Advisor. The District will address both questions listed above by preventing discharge from treated laterals during the treatment period. During treatment events, all spills from the treated lateral are sealed to prevent any discharge to a receiving waterway. Unless efforts to prevent discharge fail, receiving water samples will not be collected as part of WSID's MRP.

Monitoring Locations. Monitoring locations are shown in Figure 1. Each of the District laterals operate in the same manner in terms of both hydraulic performance and function. The District

does not anticipate any discharge of treated water to any water body as this is not normal operating procedure. The lateral sampled may vary from application to application but will always occur at one of the pre-specified sampling locations.

Sample Types. Grab samples will be taken from the application site. District staff will complete a field sheet with each sample collection (figure 2). Three major sample types are listed below and constitute a full sample set for an application:

- Background Monitoring: Background monitoring samples will be collected in the application area approximately 24 hours prior to the application event.
- Event Monitoring: Event monitoring samples will be collected during treatment to test the concentration of endothall.
- Post-Event Monitoring: Post-Event monitoring samples shall be collected within the treatment area one week after application.

Receiving Water Monitoring Requirements

As stated previously, in order to prevent receiving water quality impacts, the District seals all spills during treatments to prevent any discharge of treated water. District monitoring during treatment events will include visual inspection of all discharge points within the treated lateral to make certain no discharge is occurring. Receiving water samples will not be collected as long as the discharge points from treated laterals remain sealed.

In the event of an unplanned discharge during treatment, the District will be prepared to implement receiving water quality sampling and reporting.

Visual, Physical and Chemical Monitoring Requirements

The following data will be collected during treatment events. Field parameters (including temperature, dissolved oxygen, turbidity, conductivity, and pH) will be collected in the field using a probe or meter as appropriate, and logged on daily field sheets.

Depending on the chemical(s) used during treatment, samples will be collected in a laboratory-clean bottle and triple rinsed with site water before finally filling the sample bottle. The samples will be stored in an ice chest and delivered to the testing laboratory and chain-of-custody records will be maintained. The samples bottles will be labeled with information pertaining to the application event, location and date and time of collection.

After analysis, the laboratory will report the results using a standard format. At a minimum, each laboratory report will be accompanied by the following information:

- The date, place, and time of the sample taken by district staff
- The date the analysis was performed
- The analytical techniques and methods used by the laboratory
- The results of the analysis by the laboratory
- Chain-of-custody record

Field data sheets will be maintained by the District and summarized in the annual monitoring reports.

Figure 2: Field Sheet

West Stanislaus Irrigation District
Field Monitoring Data

Date: _____

Site Name: _____ **Site Coord. Code:** _____

Time: _____ AM PM **Weather:** _____

Monitoring Type:
- ☐ Pre-Application Monitoring
- ☐ Application Monitoring
- ☐ Post-Application Monitoring
- ☐ Discharge Monitoring

Notes: _____

Field Data:

Temp: _____ EC: _____ **Lab Sample Collected:**

D.O.: _____ pH _____ Yes

Turb: _____ No

Date: _____

Site Name: _____ **Site Coord. Code:** _____

Time: _____ AM PM **Weather:** _____

Monitoring Type:
- ☐ Pre-Application Monitoring
- ☐ Application Monitoring
- ☐ Post-Application Monitoring
- ☐ Discharge Monitoring

Notes: _____

Field Data:

Temp: _____ EC: _____ **Lab Sample Collected:**

D.O.: _____ pH _____ Yes

Turb: _____ No

Date: _____

Site Name: _____ **Site Coord. Code:** _____

Time: _____ AM PM **Weather:** _____

Monitoring Type:
- ☐ Pre-Application Monitoring
- ☐ Application Monitoring
- ☐ Post-Application Monitoring
- ☐ Discharge Monitoring

Notes: _____

Field Data:

Temp: _____ EC: _____ **Lab Sample Collected:**

D.O.: _____ pH _____ Yes

Turb: _____ No

Sample Tyle	Analyte	EPA Method	Reporting Limit	Hold Time (days)	Container	Chemical Preservative
Physical	Temperature*	-	-	Field	-	-
	Dissolved Oxygen*	360.1 or 360.2	0.0 mg/L	Field	NA	none
	Turbidity*	180.1	0.00 NTU	Field	NA	none
	Conductivity*	120.1	0 µS/cm	Field	NA	none
	pH*	150.1 or 150.2	1-14	Field	NA	none
Chemical	Endothall**	548.1	40µg/L	7	500mL HDPE	none
	Dissolved Copper**	200.8	0.5 µg/L	14	500mL HDPE	none
	Hardness**	200.7	n/a	7	500mL HDPE	none
	Glyphosate**	547	5 µg/L	14	500mL HDPE	none

* Measurements obtained in the field by District Staff

** Measurements obtained by laboratory testing and dependent on chemical applied

Reporting Requirements

The District will keep the original data outlined in section IV.B of Attachment C for three calendar years and have said information available for review by the Regional Water Board staff. Annual monitoring reports will be prepared and submitted to the Regional Water Board. These reports will include the following:

- Executive summary discussing compliance or violation of this Order and the effectiveness of the APAP.
- Summary of monitoring data.
- Identification of BMPS currently in use and a discussion of their effectiveness in achieving the goals outlined by the Order
- A discussion of BMP modifications if required.
- A map showing the location of the treated area
- Information of surface area and volume of treatment areas and ay other information used to calculate dosage, concentration, quantity of each algaecide and aquatic herbicide used.
- Sampling results.
- Summary of Algaecide and Aquatic herbicide Application Log
- An executive summary discussing compliance or violation of the Order and the Effectiveness of the APAP
- A summary of the monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application. The monitoring data will be submitted in accordance with the Reporting Protocols (IV.E) of the Order.

Should the District become aware of any violations of this Order, a Twenty- Four hour report will be submitted along with a Five-day report in accordance with Attachment C of the Order.

Element 9: Procedures to Prevent Sample Contamination

Typical sample collection techniques will be utilized to collect samples. Laboratory-clean containers will be provided by a qualified laboratory. Samples will be triple-rinsed with site water, with the fourth filling capped and sealed. Sample containers will be sealed in an ice chest and delivered to the laboratory (with the appropriate chain of custody paperwork) by a courier.

Element 10: Description of BMPs

The following BMPs will be implemented by the District:

- Licensing, pesticide labeling and permits. West Stanislaus Irrigation District (WSID) consults with a licensed Pest Control Advisor and the employee who makes the aquatic applications is licensed with a Qualified Applicator Certificate.

- Personnel at WSID routinely make preliminary site evaluations. These are used to determine areas in need of a treatment, location of a treatment site (site suitability), and some of the precautions to be used for a particular type of treatment. Pest type and growth stage are also considered in order to help determine the treatment type. This greatly increases the likelihood of achieving a high level of control.

- Secondary site evaluations and pre-treatment monitoring are routinely made. Some of the factors considered are weed species present, growth stage, weed location and weed density. These are used to help determine such things as the appropriate mechanical control measure or herbicide to use, herbicide rate, and may also help in determining the number of treatment sites needed.

- Grower Awareness. WSID will notify growers of treatments 48 hours in advance of aquatic pesticide applications.

- Alternative Control Measures. Mechanical weed removal has been evaluated as an alternative to chemical application. The District has determined that this alternative is cost prohibitive and ineffective. It causes extreme canal bank erosion damage and a silt water quality problem. In addition, the mechanical removal alternative costs six to ten times more than the costs associated with application of the aquatic herbicide.
  The proposed aquatic herbicides the ability to control rooted aquatic weeds and algae. Most of the District canals are concrete lined and the District can minimize the available silt out well enough to keep most rooted aquatic weeds from growing (they need the silt to root in). Canal water quality is considered in the application of aquatic herbicides, and the application amount is adjusted according to the label recommendations to improve efficacy. Overall, site conditions, water use, and weather conditions are all considered in the decision to implement and/or continue with a treatment.

- Post-treatment assessment. This evaluation of efficacy is routine and normally starts at about one week after application and continues for the rest of the irrigation season. If a treatment is deemed ineffective then corrective measures are researched, that

treatment type is eliminated from a given area or totally eliminated from the program. If the control level is at a higher level considered necessary, the treatment rate will be reduced and/or the location of the treatment site will be adjusted.

- Applicator Safety. Safety measures listed on the product label will be followed. Applicators will be properly trained and licensed.

- Prevention of Fish Kill. Fish kill will be prevented by preventing aquatic pesticide spill to receiving waterbodies. Prevention of Pesticide Spill. All spills are sealed during treatments and inspected daily during treatment periods. No discharge outside of the District will be allowed during the treatment period.

Element 11: Examination of Possible Alternatives

- No action alternative. Should the District implement no aquatic weed abatement measures, the District would be unable to operate its canals effectively. The weeds would impede flow and cause the canal banks to overtop causing damages not limited to destruction of canal banks and damage to crops neighboring said canal.

- Prevention. WSID diverts water from the San Joaquin River and delivers it to growers within the District. Upon diversion from the river, algae and aquatic weed spores are already present in the irrigation supply making prevention impossible.

- Mechanical and Physical Methods. The District has employed mechanical methods for aquatic weed removal in the form of chaining. This is not an efficient aquatic weed abatement practice as it damages the canal, and must be performed every other day or thereabouts to effectively manage aquatic weeds. This management practice is not preferred by growers because the elevated silt levels it brings about are problematic to high-efficiency irrigation systems.

- Cultural Methods. Regional on-farm practices have no effect on aquatic weed growth in WSID laterals.

- Biological Control Methods. Aquatic weed abatement measures are employed by the District to prevent operational inefficiencies and provide high quality water to growers in the District. Biological control methods cannot achieve the level of aquatic weed control that the District to requires to effectively manage its water supply.

- Algaecides and Aquatic Herbicides. The District has been successful with algaecides and aquatic herbicides in the past. The District intends to apply only the amount of chemical required to adequately control aquatic weeds. The District will work in conjunction with a Licensed Pest Control Advisor and employ the best management practices discussed in number 10. The treated water will not be discharged to local drains under any foreseeable circumstance apart from a conveyance system failure (canal breach or flow control structure failure) or a flood event. Chemical applications will only occur on an as needed bases after the appropriate application site and application concentration have been determined.