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. Change of Information: WDID# 1B02137NSON

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

II. DISCHARGER INFORMATION

A. Name Sonoma County Regional Parks			
B. Mailing Address 2300 County Center Drive Suite #120A			
C. City Santa Rosa	D. County Sonoma County	E. State CA	F. Zip 95403
G. Contact Person Bert Whitaker	H. E-mail address bert.whitaker@sonoma-county.org	I. Title Park Manager	J. Phone 707-565-2041

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):

1. ☐ Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.
   Name of the conveyance system: _____
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. Directly to river, lake, creek, stream, bay, ocean, etc.
   Name of water body: Spring Lake, Tolay Lakes, Ernie Smith Park Wetland, Helen Putnam Regional Park Pond

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

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: ____
Water Hyacinth, Mosquito Fern, Creeping Water Primrose, Duckweed, Watermeal, Eurasian Watermilfoil, Coontail, and Brazilian Elodea. Spring Lake also gets planktonic algae blooms.

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients
Herbicides - Reward (diquat) Aquathol K (Dipotassium salt of endothall) Hydrothol 191 (Mono N,N-dimethylalkylamine salt of endothall) Sonar Formulations (Fluridone) Nautique (Copper Carbonate) Clearcast (Ammonium salt of imazamox) Galleon SC (Penoxsulam)
Algaecides - GreenClean Liquid (Hydrogen Dioxide)
PAK27 (Sodium Carbonate Peroxyhydrate

C. Period of Application: Start Date April - "for the life of permit" End Date November - "for the life of permit"

D. Types of Adjuvants Used: Cygnet Plus (Active Ingriedients - Limonene, methylated vegetable oil, alkyl hydroxypoly oxyethylene)

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:** Bert Whitaker

B. **Signature:** _____ **Date:** 10/21/2013

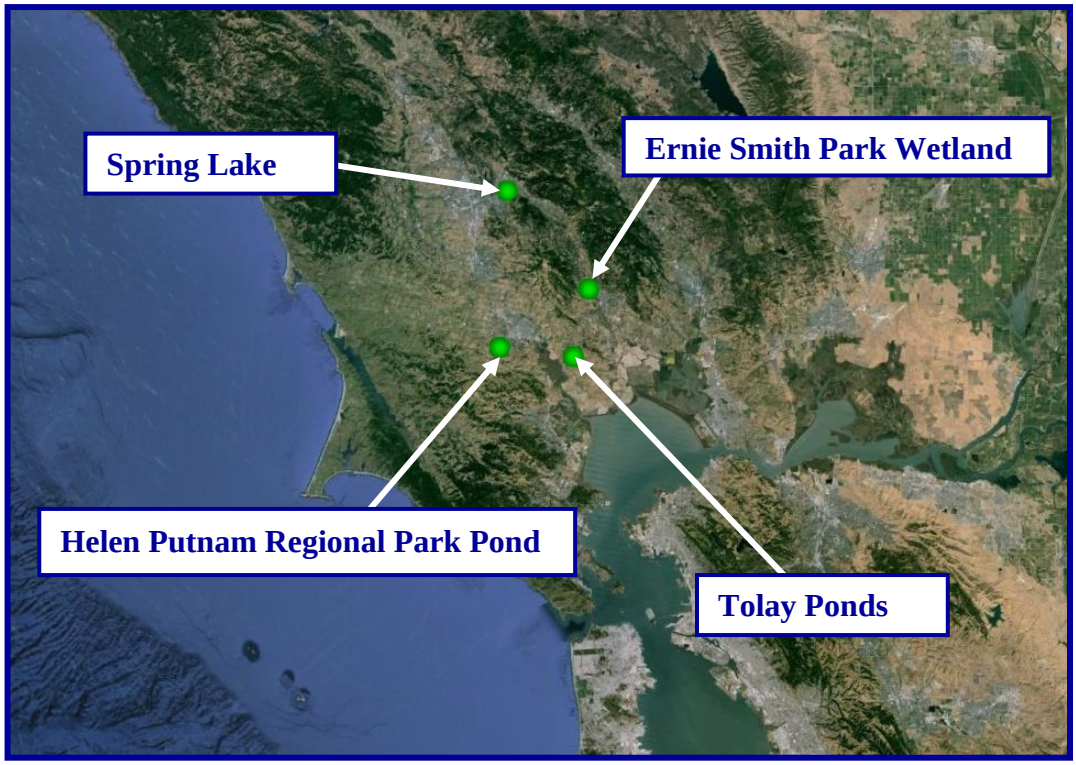
C. **Title:** Park Manager

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** _____

CLEAN LAKES INC.

AQUATIC PESTICIDE APPLICATION PLAN (APAP)
For
Sonoma County Regional Parks



Prepared By:
Clean Lakes Inc.
P.O. Box 3186
Martinez, CA 94553

Prepared For

SONOMA COUNTY REGIONAL PARKS
2300 County Center Drive, Suite 120A
Santa Rosa, California 95403

September 2013

Purpose: To meet the requirements and ensure compliance with Water Quality Order No. 2013-0002-DWQ, Statewide General National Pollutant Discharge Elimination System Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, General Permit No. CAG990005, adopted by the State Water Resource Control Board on March 5, 2013

CERTIFICATION

In accordance with Attachment B, Section V.B.1. Standard Provisions – Reporting, Signatory and Certification Requirements, Water Quality Order No. 2013-0002-DWQ Statewide General National Pollutant Discharge Elimination System Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, General Permit No. CAG 990005:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure 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 and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

10/23/13

Park Manager
Sonoma County Regional Parks
2300 County Center Drive, Suite 120A
Santa Rosa, California 95403

Date

10/22/13

Tyler Fowler
Manager
Clean Lakes, Inc.
2150 Franklin Canyon Rd.
Martinez, CA 94553

Date

Contents

BACKGROUND INFORMATION

This Aquatic Pesticide Application Plan (APAP) is a comprehensive plan developed by the discharger to comply with the provisions of Water Quality Order No. 2013-0002-DWQ, Statewide General National Pollutant Discharge Elimination System Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, General Permit No. CAG990005, adopted by the State Water Resource Control Board on March 5, 2013.

This Aquatic Pesticide Application Plan (APAP) describes the project site, aquatic plant and algae nuisances, aquatic pesticide products expected to be used, the monitoring program, and Best Management Practices to be followed, as well as the other conditions addressed in the General Permit, Section VIII C, Aquatic Pesticide Use Requirements, Aquatic Pesticide Application Plan.

The use of aquatic pesticides within Spring Lake, Ernie Smith Wetland, Helen Putnam Pond, and Tolay Ponds is necessary to manage the water bodies and maintain the beneficial uses. The beneficial uses for each system are outlined below

- Spring Lake – Recreation, (boating, fishing, swimming) storm water retention, aesthetics, and a habitat for wildlife
- Ernie Smith Pond/Wetland – aesthetics, habitat for wildlife, fishing, and storm water retention.
- Helen Putnam Pond – Recreation, (fishing, boating) aesthetics.
- Tolay Ponds - Habitat for wildlife and for viewing by the public (aesthetics).

The Aquatic Vegetation Control Program is an undertaking necessary to control specific types of aquatic vegetation and algae that have become a nuisance to the management of the water body and are impacting its health and beneficial uses. The need for aquatic pesticide application events as part of this program vary from week to week and from season to season due to such things as water temperature, sunlight, nutrient levels, plant and algae growth and other factors. This APAP per the General Permit requirements

described below provides the outline to ensure that the Aquatic Vegetation Control Program is successful.

PERMIT COVERAGE: The General Permit (No. CAG990005) addresses the discharge of aquatic pesticides related to the application of 2,4-D, acrolein, copper, diquat, endothall, fluridone, imazapyr, glyphosate, sodium carbonate peroxyhydrate, triclopyr based algaecides and aquatic pesticides, and adjuvants containing ingredients represented by the surrogate nonylphenol. Aquatic pesticides that are applied to application areas within waters of the United States in accordance with FIFRA label requirements and Use Permit restrictions are not considered pollutants. However, residues associated with aquatic pesticide application require coverage under the General Permit. These include over-applied or misdirected pesticide products and pesticide residues. Residues are any pesticide byproduct, or breakdown product, or pesticide product that is present after the use of the pesticide to kill or control the target weed.

The General Permit does not cover agricultural storm water discharges or return flows from irrigated agriculture because these discharges are not defined as "point sources" and do not require coverage under an NPDES permit. The General Permit also does not cover other indirect or non-point source discharges from applications of pesticides, including discharges of pesticides to land that may be conveyed in storm water or irrigation runoff. The General Permit does not cover the discharge of pollutants related to applications of pesticides other than 2,4-D, acrolein, copper, diquat, endothall, fluridone, imazapyr, glyphosate, sodium carbonate peroxyhydrate, triclopyr based algaecides and aquatic pesticides, and adjuvants containing ingredients represented by the surrogate nonylphenol based pesticides; however, the General Permit includes a re-opener statement specifying that the permit may be reopened for the specific purpose of modifying the list of pesticides whose associated discharge is authorized by this General Permit.

WATERS OF THE UNITED STATES: The General Permit regulates the discharge of residues associated with the application of aquatic pesticides to waters of the United States. "Waters of the United States" are defined by the General Permit as follows:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters, including interstate "wetlands;"

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;

b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

c. Which are used or could be used for industrial purposes by industries in interstate commerce.

4. All impoundments of waters otherwise defined as waters of the United States under this definition;

5. Tributaries of waters identified in items 1 through 4 of this definition;

6. The territorial sea; and

7. "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. section 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States [See Note 1 of this Section.] Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with U.S. EPA.

WATER QUALITY STANDARDS: The Clean Water Act (CWA) defines Water Quality Standards as "Provisions of state or federal law which consist of designated uses for the waters of the United States, water quality criteria for waters based upon such uses, and antidegradation policies. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the Act." [40 Code of Federal Regulations (CFR) section 131.3(i)].

In California, *Water Quality Control Plans* designate the beneficial uses of waters of the State and water quality objectives (WQOs) to protect those uses. The *Water Quality Control Plans* are adopted by the State and Regional Boards through a formal

administrative rulemaking process, and, upon approval by USEPA, the WQOs for waters of the United States (generally surface waters) become State water quality standards.

USEPA has established water quality criteria in California for priority pollutants in the National Toxics Rule and the California Toxics Rule (CTR). The CTR criteria are also water quality standards.

EFFLUENT LIMITATIONS: NPDES permits for discharges to surface waters must meet all applicable provisions of sections 301 and 402 of the CWA. These provisions require controls that utilize best available technology economically achievable (BAT), best conventional pollutant control technology (BCT), and any more stringent controls necessary to reduce pollutant discharge and meet water quality standards.

Title 40, CFR section 122.44 states that if a discharge causes, has the reasonable potential to cause, or contributes to an excursion (Reasonable Potential) of a numeric or narrative water quality criterion, the permitting authority must develop effluent limits as necessary to meet water quality standards. Title 40, CFR section 122.44(k)(3) allows these effluent limits to be requirements to implement BMPs if numeric effluent limits are infeasible. It is infeasible for the State Board to establish numeric effluent limitations in this General Permit, because the application of aquatic pesticides is not necessarily considered a discharge of pollutants according to the Talent decision. The regulated discharge is the discharge of residues associated with the application of aquatic pesticides. These include over-applied and misdirected pesticide product and pesticide residue. At what point the pesticide becomes a residue is not precisely known and varies depending on such things as target weed, water chemistry, and flow. Therefore, the effluent limitations contained in the General Permit are narrative and include requirements to develop and implement this APAP that describes appropriate BMPs, including compliance with all pesticide label instructions, and to comply with receiving water limitations.

The BMPs required herein constitute BAT and BCT and will be implemented to minimize the area and duration of impacts caused by the discharge of aquatic pesticides in the treatment area, and to allow for the restoration of water quality and protection of

beneficial uses of the receiving waters to pre-application quality following completion of a treatment event.

Once an aquatic pesticide has been applied to an application area, the pesticide product can actively treat the target species within the treatment area. During the treatment event, the aquatic pesticide is at a sufficient concentration to actively kill or control the target weeds plants or algae. When active ingredient concentrations are below this effective concentration, the aquatic pesticide becomes a residue. The minimum effective concentration, and the time required to reach it, vary due to site specific conditions, such as flow, target species, and water chemistry. The Receiving Water Limitations require that an application event does not result in an exceedance of water quality standards in the receiving water. The receiving water includes:

- Anywhere outside of the treatment area at any time, and
- Anywhere inside the treatment area after completion of the treatment event.

In recognition of the variability in the temporal extent of a treatment event, the General Permit does not require it to be discretely defined. Instead, post-event monitoring of the water is required no more than a week from the time of aquatic pesticide application.

Receiving water limitations are provided in the General Permit and are provided as follows: The instantaneous maximum receiving water limitations are based on promulgated water quality criteria such as those provided in the CTR, water quality objectives adopted by the State and Regional Water Boards in their Basin Plans, water quality criteria adopted by the California Department of Fish and Wildlife, water quality standards such as drinking water standards adopted by U.S. EPA or the California Department of Public Health (CDPH), or the U.S. EPA's National Recommended Ambient Water Quality Criteria.

This General Permit provides receiving water limitations based on the lowest water quality criteria/objectives to protect all designated beneficial uses of the receiving water. The receiving water limitations in this General Permit are similar as those in Order No. 2004-0009-DWQ, with the exception of copper, which has an update formula to calculate copper exceedence limits based on the CTR.

The rationale for each limitation is summarized in the table below:

Constituent/ Parameter	BENEFICIAL USE[1]				Basis
	MUN, µg/L	WARM or COLD, µg/L	Other than MUN, WARM, or COLD, µg/L	All Designations	
2,4,-D	70				U.S. EPA MCL
Acrolein[2]	320	21	780		U.S. EPA Water Quality Criteria, 1986.
Copper[2]				Dissolved Freshwater[3] Copper Chronic = 0.960exp{0.8545 [ln(hardness[4])] – 1.702}[5, 6] Dissolved saltwater[3] Copper Chronic = 0.83exp{0.8545 [ln(hardness[4])] – 1.702}[5,6]	California Toxics Rule
Diquat	20				U.S. EPA MCL
Endothall	100				U.S. EPA MCL
Fluridone	560				U.S. EPA Integrated Risk Information System
Glyphosate	700				U.S. EPA MCL
Nonylphenol				Freshwater Chronic Criterion = 6.6 µg/L Saltwater Chronic Criterion = 1.7 µg/L	U.S. EPA National Recommended Ambient Water Quality Criteria
Toxicity	Algaecide and aquatic herbicide applications shall not cause or contribute to toxicity in receiving water(s).				Regional Water Boards' Basin Plans

Notes

1. See Regional Water Boards' Water Quality Control Plans (Basin Plans) for beneficial use definitions.
2. Public entities and mutual water companies listed in Attachment G are not required to meet this receiving water limitation during the exception period described in Section VIII.C.10, Limitations
3. For waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the freshwater criteria apply. For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, saltwater criteria apply. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria.
4. For freshwater aquatic life criteria, waters with a hardness 400 mg/L or less as calcium carbonate, the actual ambient hardness of surface water shall be used. For waters with a hardness of over 400 mg/L as calcium carbonate, a hardness of 400 mg/L as calcium carbonate shall be used with a default Water-Effect Ratio of 1.
5. Values should be rounded to two significant figures.
6. This limitation does not apply to the Sacramento River and its tributaries above the State Highway 32 Bridge at Hamilton City. See Table III-1 of the Basin Plan for the Sacramento and San Joaquin River Basins for copper limitation.

MONITORING REQUIREMENTS: The General Permit requires dischargers to comply with the Monitoring and Reporting Program (MRP). The goals of the MRP are to:

1. Identify and characterize algaecide or aquatic herbicide application projects conducted by the Discharger;
2. Determine compliance with the receiving water limitations and other requirements specified in this General Permit;
3. Measure and improve the effectiveness of the APAP;
4. Support the development, implementation, and effectiveness of BMPs;
5. Assess the chemical, physical, and biological impacts on receiving waters resulting from algaecide or aquatic herbicide applications;
6. Assess the overall health and evaluate long-term trends in receiving water quality;
7. Demonstrate that water quality of the receiving waters following completion of resource or weed management projects are equivalent to pre-application conditions; and
8. Ensure that projects that are monitored are representative of all algaecide or aquatic herbicide applications and methods used by the Discharger.

This APAP was prepared to address the above requirements and those detailed in the General Permit.

DESCRIPTION OF THE WATER SYSTEMS

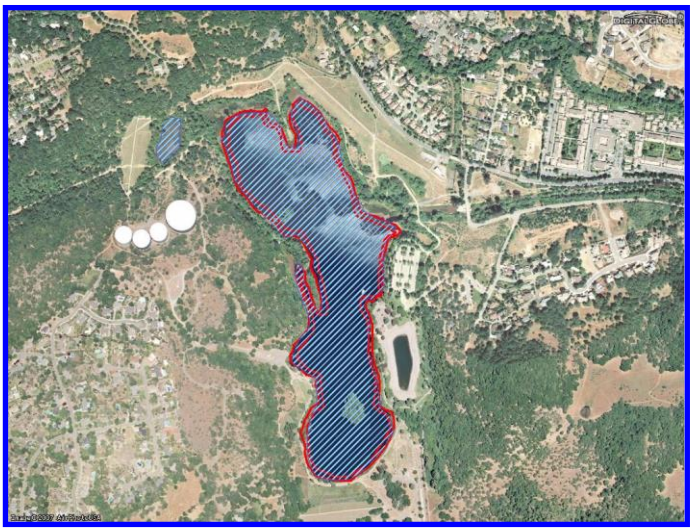
SPRING LAKE

Spring Lake is a 72 acre lake located within Spring Lake Regional Park which is a 320 acre public park in the foothills on the eastern edge of the city of Santa Rosa in the County of Sonoma. The lake is the park's main feature and is a popular spot for fishing and boating. It is stocked with trout in the cooler months and has warm water fishing year round. The lake was created by the construction of the Santa Rosa Creek Reservoir Earthen Dam in 1963 and is maintained by the Sonoma County Regional Parks Department. Water enters Spring Lake from a diversion structure on Santa Rosa Creek during high-flow times. There is an overflow structure on

the northern corner of the lake, which directs the water back into Santa Rosa Creek. Santa Rosa Creek eventually flows into the Laguna de Santa Rosa. Nuisance growths of submersed aquatic vegetation and algae have impacted the beneficial uses of the system that include Recreation, (boating, fishing, swimming) storm water retention, aesthetics, and a habitat for wildlife. Historical methods that have been utilized for the control of aquatic vegetation include the use of aquatic herbicides and algaecides, mechanical aquatic weed harvesting.

DESCRIPTION OF THE TREATMENT AREA

Typically submerged aquatic weed growth (Eurasian Water Milfoil, Coontail, Thinleaf Pondweed, and Common Elodea) in Spring Lake occurs along the shoreline out to about 30-50 feet depending on the location of the lake. The lake also has floating plants (Mosquito Fern, Duckweed) that impact the shoreline but also can grow well out into the lake. The lake has seventy two (72) surface acres and an average depth of six feet (6) thus giving the lake approximately four hundred and thirty two (432) acre feet of water. When treating for control of planktonic algae the top three (3) to four (4) acre feet of water are treated.



The aquatic weeds most commonly controlled in Spring Lake are Eurasian Water Milfoil, Coontail, Mosquito Fern, Duckweed, Water Hyacinth, and Yellow Iris.

Spring Lake contains a discharge valve that is opened infrequently to lower the lake level prior to winter runoff. This discharge valve will be inspected prior to all treatments to ensure that it is in good working condition and not open prior to any aquatic pesticide application.

ERNIE SMITH WETLAND

Ernie Smith Community Park is located off Arnold Dr. in between Craig Ave. and W. Verano Ave. in El Verano. The wetland was put in for aesthetics; habitat, and storm water detention. Water from Ernie Smith comes from runoff from the surrounding hills, roads, and property owners. Water leaving Ernie Smith drains into Dowdall Creek then into Sonoma Creek, and eventually into San Pablo Bay. The pond and wetland have been impacted by nuisance growths of Creeping Water Primrose (*Ludwigia*) Sonoma County Regional Parks has not used any method of control in the past, as this has been the first outbreak in the system. The goal of this management plan is to control the weeds, and curb the threat of spreading invasive species

DESCRIPTION OF THE TREATMENT AREA

The Creeping water primrose grows throughout the entire 0.6 acres of wetland. By the time it is ready for treatment there is usually no more water in the system and just wet soil. Because this is the case there is usually no water samples associated with the treatment. However there is potential for the site to have water during treatment so it is included in this NPDES APAP.

HELEN PUTNAM POND

Helen Putnam Pond is located within Helen Putnam Regional Park which runs along Chileno Valley Rd. in Petaluma, CA. The beneficial uses of the pond are aesthetics and recreation for park users. Water enters Putnam pond from seasonal drainage from the surrounding hills. There is a culvert overflow on the east side of the pond which directs the flow back into the seasonal drainage course. This drainage is a tributary to San Antonio Creek. The pond has been infested recently with nuisance growths of Brazilian Water Weed (*Egeria Densa*) which has impacted the beneficial uses of the system.

DESCRIPTION OF THE TREATMENT AREA

Helen Putnam Pond is approximately 0.8 acres in size and has an average depth of four (4) feet, thus giving the pond approximately 3.2 acre feet of water. The nuisance growths of Brazilian Water Weed (*Egeria Densa*) occur throughout the entire pond so the treatment area is the full 0.8 acres.

TOLAY LAKES

The Tolay Lakes are located in Tolay Lake Regional Park which is located between the Petaluma River and Sonoma Valley in the San Francisco North Bay region. The Tolay lakes (Duck Pond and Willow Pond) eventually drain into Tolay Creek which then flows to San Pablo Bay. The ponds are currently used for habitat for wildlife and for viewing by the public. There is no public access, fishing, etc… to these ponds currently. The ponds are fed from springs and runoff from the surrounding hills. The lakes currently have nuisance growths of Creeping Water Primrose (*Ludwigia*) and Duckweed. Regional Parks has not completed any treatments of these ponds since taking ownership of the property in approximately 2005. I have verbal information that the previous owners may have done mechanical removal efforts in the past, but I have nothing in writing to confirm that.

DESCRIPTION OF THE TREATMENT AREA

The Tolay lakes combine to be 1.5 surface acres and their average depth is three (3) feet, thus giving the lakes a water volume of 4.5 acre ft. Both lakes get completely inundated with nuisance growths of Creeping Water Primrose and both will also get extensive growths of Duckweed. Both of these nuisance growths heavily impact the beneficial uses of these systems.

The previous APAP as well as this one are designed to ensure that nuisance growths of aquatic vegetation and algae do not impact the beneficial uses of these aquatic systems.

APPLICATION SCHEDULE

Sonoma County Regional Parks and or applicator will provide a phone number or other specific contact information to all persons who request the Sonoma County Regional Parks application schedule and will inform the requester if the schedule is subject to change. Information may be made available posting it on a well-known website.

PUBLIC NOTICE REQUIREMENTS

Every calendar year at least 15 days prior to the first application of algaecide or aquatic herbicide, Sonoma County Regional Parks and or the applicator will notify the potentially affected public agencies. The notification will include all of the information outlined in Section VIII. B.

AQUATIC PESTICIDES AND ADJUVANTS EXPECTED TO BE USED AND APPLICATION METHODS

Provided in the table below are the aquatic herbicides and algaecides that may be used in the aquatic plant and algae control program for the aquatic systems outlined above. The need for treatments is based on algal counts and visual monitoring.

	Water Use Restrictions			
Herbicide* Algaecide*	***Days for Swimming***	***Days for Fish Consumption***	***Days for Irrigation of Turf/Food Crops***	***Degradation Byproducts***
Reward *(Diquat dibromide)*	0	0	3-5	None
Aquathol K *(Dipotassium salt of endothall)*	0	0	0	None
Hydrothol 191 *(Mono(N,N-dimethylalkylamine salt of endothall)*	0	0	0	None
Sonar formulations *(fluridone)*	0	0	0 to 30	n-methyl formamide (NMF) and 3-trifluoromethyl

				benzoic acid
Green Clean Liquid *(Hydrogen Dioxide)*	0	0	0	None
Renovate *(Triclopyr)*	0	0	120	None
Clearcast *(Ammonium salt of immazamox)*	0	0	See below**	None
Galleon SC *(Penoxsulam)*	0	0	See below**	None
PAK27 *(Sodium Carbonate Peroxyhydrate)*	0	0	0	None
Aquamaster *(Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt)*	0	0	0	None

Refer to Product Labels and MSDS's for Further Information

**Clearcast Irrigation Restrictions

Irrigation Restrictions

- **DO NOT** use treated water to irrigate greenhouses, nurseries or hydroponics.
- **DO NOT** plant sugar beets, onions, potatoes or non-**CLEARFIELD®** canola in soils that have been previously irrigated with **Clearcast**-treated water until a soil bioassay successfully demonstrates acceptable levels of crop tolerance.
- **DO NOT** use **Clearcast**-treated waters resulting in a concentration > 50 ppb for irrigation until residue levels have been shown to be ≤ 50 ppb by an acceptable method.
- Wait 24 hours before irrigating from still or quiescent waters after making a **Clearcast**-treated application for submerged vegetation < 100 feet from an irrigation intake.
- Wait 24 hours before irrigating from still and quiescent waters after making a **Clearcast** application to emergent and/or floating vegetation if > 25% of the surface area of the water body has been treated or application was made < 100 feet from an irrigation intake.
- Flowing waters may be used to irrigate allowable sites with no restrictions when **Clearcast** is applied at ≤ 2 quarts per acre to waters with an average depth of ≥ 4 feet.
- After application of **Clearcast** to dry irrigation canals/ditches, the initial flush of water during recharge must not be used for irrigation purposes unless the imazamox concentration has been determined by an acceptable method to be < 50 ppb.

Clearcast applied at ≤ 2 quarts per acre in or on waters with a minimum average depth ≥ 4 feet will result in **Clearcast** concentrations < 50 ppb.

**Galleon SC Irrigation Restrictions

APPLICATION TO WATERS USED FOR IRRIGATION

Irrigation using water treated with Galleon SC may result in injury to sensitive irrigated vegetation. The following restrictions are required for irrigation use of treated water:

- Do not use water treated with Galleon SC for hydroponic farming.
- Do not apply Galleon SC to water to be used for irrigation of greenhouse or nursery plants. Do not use water treated with Galleon SC for irrigating greenhouse or nursery plants.
- Do not irrigate established food crops, other than rice, if concentrations of Galleon SC in irrigation source water exceed 1 ppb as determined using ELISA or other analytical techniques. Do not irrigate established rice if concentrations in treated water exceed 30 ppb.
- There is no restriction on use of water treated with Galleon SC for turf irrigation, if concentrations are less than 30 ppb. For other non-food crop irrigation (e.g., landscape ornamentals) or for other irrigation uses not described above, confer with SePRO Corporation prior to commencing irrigation if concentrations in treated water exceed 1 ppb as determined using ELISA or other analytical techniques.

- Areas previously irrigated with water treated with Galleon SC may be planted in rice or turf. For other food crops and in areas irrigated with Galleon SC at concentrations exceeding 1 ppb, consult with SePRO Corporation for site-specific risk evaluations before planting.
- Do not apply Galleon SC to actively moving or running waters (i.e. lotic waters) used for irrigation, including rivers and streams. When making applications near an active irrigation water intake, the intake must be shut-off until concentrations in the water are 1 ppb or less as determined using ELISA or other analytical techniques, except when irrigating turf or rice (see restrictions under *Applications to Waters Used for Irrigation*). The intakes must be shut off for a sufficient period of time to allow penoxsulam in treated water to decrease to 1 ppb or less at the intake before use can resume. Consult with state, federal, or local water authorities before making application near an active irrigation intake.

PAK27, GreenClean Liquid, and Hydrothol 191 are the algaecides used to control planktonic algae in Spring Lake. All other herbicides listed have the potential for use at each aquatic system

Aquatic herbicide and algaecide applications are performed utilizing Best Management Practices (BMP's) by licensed personnel in accordance with a Pest Control Recommendations (PCR) issued by a State of California, Department of Pesticide Regulation (DPR) Pest Control Advisor. Clean Lakes, Inc. performs aquatic plant control applications and water quality monitoring. Clean Lakes, Inc.'s application staff hold State of California, Department of Pesticide Regulation (DPR), Pest Control Advisor licenses and Qualified Applicator Licenses or Certificates. Applications are performed from a boat as surface or subsurface applications based on the target species. Alternatively, if a granular product is used, an educator or blower application system is used to apply the granular formulation. Aquatic herbicide applications are carried out using GPS technology to track treatment location, date, time and boat speed.

FACTORS INFLUENCING ALGAE AND WEED CONTROL

The decision to implement aquatic vegetation control treatments is based on the plant's growth stage in the spring of each season, and re-evaluated during the summer months. Planktonic and filamentous algae treatments are based on growth as well their nuisance level as they develop, typically through the spring and summer months. When submerged vegetation or planktonic algae is treated in an early growth stage, there is less plant biomass that is controlled, and decomposing in the system, which helps reduce and protect against impacts to dissolved oxygen depletion from decomposing biomass. Based on nuisance levels of aquatic plant growth, and or algae densities and there potential to impact beneficial uses of the lake system, a Pest Control Advisor (PCA) will review control options. Based on the PCA's findings, a Pest Control Recommendation (PCR) will be developed for aquatic pesticide applications.

Aquatic herbicide and algaecide treatments are determined based on the following characteristics:

SPRING LAKE

- Spring Lake has seventy two (72) surface acres and an average depth of six feet (6) thus giving the lake approximately four hundred and thirty two (432) acre feet of water.
    - The area targeted for planktonic algae control is the entire lake system (72 surface acres). Sonoma County Regional Parks monitors planktonic algae visually. Once their threshold is reached they contact Clean Lakes Inc. to perform a treatment. If for some reason an algae bloom is not treated early and gets out of control, split applications will be performed where only one half of the lake system is treated at a time to ensure that dissolved oxygen levels are not depleted.
    - Aquatic weeds are monitored in the spring and early summer. All of the submerged aquatic weeds grow within 30-50 feet of the shoreline depending on the area of the lake. Once the submerged aquatic weeds get within a few feet of the surface CLI treats the infestation before it can impact beneficial uses. For floating aquatic plants CLI will wait until there is enough to warrant a treatment, this amount varies but is usually when there is 2+ acres.
- The water volume of the area targeted for a planktonic algae treatment is the top three (3) to four (4) acre feet of the entire lake, or approximately two hundred and sixteen (216) to two hundred and eighty eight acre feet. (288) (72 surface acres x top 3 and 4 acre feet).
- Water enters Spring Lake from a diversion structure on Santa Rosa Creek during high-flow times. There is an overflow structure on the northern corner of the lake,

which directs the water back into Santa Rosa Creek. Santa Rosa Creek eventually flows into the Laguna de Santa Rosa.

ERNIE SMITH WETLAND

- Typically the entire 0.6 acres of wetland is treated for control of Creeping Water Primrose. The primrose growth starts in the late spring and reaches nuisance levels in the summer. As mentioned above by the time it is ready for treatment the wetland no longer has water in the system. Therefore we cannot collect water samples and NPDES permit compliance is not an issue. However there is always a chance that there will be water in the system when it is treated as no one can predict the weather so Ernie Smith Wetland is included for coverage.

- Water from Ernie Smith comes from runoff from the surrounding hills, roads, and property owners. Water leaving Ernie Smith drains into Dowdall Creek then into Sonoma Creek, and eventually into San Pablo Bay.

HELEN PUTNAM POND

- Helen Putnam Pond is approximately 0.8 acres in size and has an average depth of four (4) feet, thus giving the pond approximately 3.2 acre feet of water.

- Brazilian Water Weed (*Egeria Densa*) starts growing in mid spring and reaches maturity in the late spring and early summer. CLI likes to treat the Egeria before it blooms in which you will see small white flowers that breach the surface. That way it is under control before it becomes a nuisance. The Egeria growth occurs throughout the entire pond so the treatment area is the full 0.8 acres.

TOLAY LAKES

- The Tolay lakes combine to be 1.5 surface acres and their average depth is three (3) feet, thus giving the lakes a water volume of 4.5 acre ft.

- In mid-spring the Creeping Water Primrose starts to grow and by mid-June to early July it has grown to take over approximately 90% of the lakes. Both lakes also get nuisance growths of duckweed around the same time. CLI likes to treat both of these aquatic plants before they completely take over the lake systems so when the growth reaches around 40%-50% of the lake treatments are performed.

MONITORING AND REPORTING PROGRAM

Monitoring Requirements: The General Permit requires that dischargers comply with the Monitoring and Reporting Program (MRP) outlined in the General Permit. The goals of the MRP are to:

1. Identify and characterize algaecide or aquatic herbicide application projects conducted by the Discharger;
2. Determine compliance with the receiving water limitations and other requirements specified in this General Permit;
3. Measure and improve the effectiveness of the APAP;
4. Support the development, implementation, and effectiveness of BMPs;
5. Assess the chemical, physical, and biological impacts on receiving waters resulting from algaecide or aquatic herbicide applications;
6. Assess the overall health and evaluate long-term trends in receiving water quality;
7. Demonstrate that water quality of the receiving waters following completion of resource or weed management projects are equivalent to pre-application conditions; and
8. Ensure that projects that are monitored are representative of all algaecide or aquatic herbicide and application methods used by the Discharger.

General Monitoring

1. All of the aquatic systems outlined above except for Ernie Smith will have aquatic weed treatments that will occur as full lake or pond treatments, partial lake or pond treatments or lake or pond shoreline treatments. As Ernie Smith is a wetland the entire area impacted with the nuisance vegetation will be treated during one treatment event. Spring Lake algae (planktonic) treatments will occur as full or half lake treatments based on the level on growth and the Dissolved Oxygen levels. CLI has developed appropriate sampling locations for each aquatic system

to ensure that the pre, post, and event monitoring points are ideal for each sampling event.

2. Algaecide and aquatic herbicide application practices will be established based on the Pest Control Recommendations (PCR) from a DPR licensed Pest Control Advisor (PCA). Aquatic plant and algae growth will be evaluated to determine the potential for creating impacts or nuisances to lake, pond, and wetland use and management prior to any treatments. The aquatic herbicide and or algaecide labels directions are factored into treatments to determine timing and application rates. Application practices utilize the most appropriate application technique to comply with BMP's via surface or subsurface treatment methods. GIS and GPS technology allow a high level of precision when calculating area and for guiding treatments, respectively.
3. Aquatic herbicides and algaecides are registered by the US Environmental Protection Agency (USEPA) nationally, and the CA Department of Pesticide Regulation (CADPR) within California. Manufacturers of products must provide information to the USEPA for registration or re-registration purposes that includes information with regard to transport, environmental fate and effects of algaecides and aquatic herbicides. Algaecides and aquatic herbicides planned for use in Sonoma County Regional Parks aquatic systems are registered for use by both the USEPA and the CADPR. Detailed information about transport, fate and effects of algaecides and aquatic herbicides are addressed in USEPA's Re-registration Eligibility Decisions. (RED) Documents for some (Others can be found on the website) of the active ingredients that will be used in the aquatic systems outlined above are as follows:

    - Reward (diquat dibromide): http://www.epa.gov/oppsrrd1/REDs/0288.pdf
    - Aquathol K/Hydrothol 191 (endothall): http://www.epa.gov/oppsrrd1/REDs/endothall_red.pdf
    - Sonar Formulations (fluridone): http://www.epa.gov/oppsrrd1/REDs/fluridone_tred.pdf
    - Green Clean (sodium carbonate peroxyhydrate): http://www.epa.gov/pesticides/chem_search/reg_actions/registration/decision_PC-128860_16-Sep-02.pdf

4. Designated Beneficial Uses for each of the aquatic systems in this APAP are outlined below:

    - Spring Lake – Recreation, (boating, fishing, swimming) storm water retention, aesthetics, and a habitat for wildlife
    - Ernie Smith Pond/Wetland – aesthetics, habitat for wildlife, fishing, and storm water retention.
    - Helen Putnam Pond – Recreation, (fishing, boating) aesthetics.
    - Tolay Ponds - Habitat for wildlife and for viewing by the public (aesthetics).

5. Cumulative and indirect effects of algaecides and aquatic herbicides are discussed in USEPA Re-registration Eligibility Documents (RED) discussed in item 3 above. No known negative impacts have been observed from aquatic herbicide and or algaecide applications in any of the aquatic systems outlined above.
6. The potential for algaecide and aquatic herbicide applications leading to designated use impacts is unlikely since DPR licensed Qualified Applicators implement the treatments based on a Pest Control Recommendation (PCR) and by following herbicide label directions. Misuse, over use, or use of incorrect products are not expected to occur due to the preparations and planning that take place prior to implementing a treatment.
7. No known or potential impacts from algaecides and aquatic herbicide applications on water quality are anticipated based on following herbicide label requirements, the infrequent applications that are anticipated to take place, and the short duration that algaecides or aquatic herbicides are present in the water column. A Risk Assessment is provided for each of the active ingredients in the USEPA REDs discussed in Item 3.
8. Pre and post water quality sampling stations are sufficient to assess algaecide or aquatic herbicide applications due to the small nature of the aquatic systems, the size of the treatments, and the relative ease that sample locations can be visited.
9. The monitoring plan prepared for this APAP is described below.

Receiving Water Monitoring

Treatment Maps: For each application at each site, a treatment map will be developed with a convenient scale showing the application area, treatment area, immediately adjacent untreated areas (if entire water body is not treated), and water bodies receiving treated water. Information about surface area and/or volume of the application area, treatment area, and any other information used to calculate dosage and quantity of each pesticide used at each application site will be included with the algaecide and aquatic herbicide application monitoring log forms (see below). Sampling locations will be noted on the treatment map and global positioning systems (GPS) coordinates for each sampling site will be noted on application monitoring log forms.

Control Structure Inspections: Prior to every application, an inspection of the integrity of the discharge structures will be performed to ascertain that treated water does not unintentionally get discharged from all of the aquatic systems.

Aquatic Pesticide Monitoring Frequency: Samples will be collected from a minimum of six application events for each active ingredient. If there are less than six application events in a year, samples will be collected during each application event for each active ingredient. If the results from six consecutive sampling events show concentrations that are less than the receiving water limitation/trigger for an active ingredient, sampling shall be reduced to one application event per year for that active ingredient. If the yearly sampling event shows exceedence of the receiving water limitation/trigger for an active ingredient, then sampling shall return to six application events for that active ingredient.

Aquatic Pesticide Monitoring: The following monitoring activities will be performed for a minimum of six application events, or as many applications as occur in a year if there are less than six application events, at representative locations:

1. Background Monitoring. Background monitoring samples will be collected upstream at the time of the application event or in the application area just prior to (up to 24 hours in advance of) the application event.
2. Event Monitoring. Event monitoring samples will 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 that treated water would have exited the treatment area.
3. Post-Event Monitoring**.** Post-event monitoring samples will be collected within the treatment area within one week after application.

Sample Analysis: All samples requiring laboratory analyses will be collected and analyzed by a laboratory certified for such analyses by the California Department of Public Health. All analyses will be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" (Guidelines), promulgated by the U.S. Environmental Protection Agency (USEPA) (Title 40 Code of Federal Regulations part 136). Field analysis for the parameters of temperature, dissolved oxygen (DO), electrical conductivity, and pH will be performed using a Portable Multi-Parameter Meter (YSI or equivalent) with a sufficiently long probe cable, and will be maintained and calibrated at regular intervals according to the manufacturer specifications. Secchi Disk measurements will be performed using a standard Secchi disk. Water samples collected for laboratory analysis will be accompanied with a completed chain of custody form identifying the chemical constituents requiring analysis, and delivered to a State of California Certified Laboratory per the NPDES Permit requirements.

Monitoring Parameters: The following parameters will be collected or analyzed:

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description (pond, lake, open waterway, channel, etc.) 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)	Not applicable	Visual Observation	[1]	Background, Event and Post-event Monitoring	Not applicable
Physical	1. Temperature[2]	ºF	Grab[4]	[5]	Background, Event and Post-event Monitoring	[6]
	2. pH[3]	Number				
	3. Turbidity[3]	NTU				
	4. Electric Conductivity[3] @ 25°C	µmhos/cm				
Chemical	1. Active Ingredient[7]	µg/L	Grab[4]	[5]	Background, Event and Post-event Monitoring	[6]
	2. Nonylphenol[8]	µg/L				
	3. Hardness (if copper is monitored)	mg/L				
	4. Dissolved Oxygen[2]	mg/L				

[1] All applications at all sites.
[2] Field testing.
[3] Field or laboratory testing.
[4] Samples shall be collected at three feet below the surface of the water body or at mid water column depth if the depth is less than three feet.
[5] Collect samples from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non-flowing water) per year, except for glyphosate. If there are less than six application events in a year, collect samples during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water). 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.
[6] Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136.
[7] 2,4-D, acrolein, dissolved copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, and triclopyr.
[8] It is required only when a surfactant is used.

Sampling Procedures: Samples will be collected using sampling procedures which minimize loss of monitored constituents during sample collection and analysis to maintain sample integrity.

Sampling protocols: Samples will be retrieved, stored, recorded, and shipped to a third party laboratory using the following methods and precautions. Any deviation from these methods and precautions will be recorded and explained.

Materials for in field sampling:

1) New sampling bottles, one per sample with sample ID label.
2) Cooler(s) sufficient to hold ample bottles, with ice- or gel-packs
3) Plastic gloves
4) Subsurface grab sampler
5) Depth finder, marked pole, Secchi Disk (cord marked with half foot increments), or water quality monitoring probe with depth sensor.
6) Instrument(s) for measurement of temperature, pH, dissolved oxygen, hardness, electrical conductivity, depth.
7) GPS for sample location coordinates.
8) Field data sheets and clipboard
9) A clean boat and a transport vehicle

Method to collect a single sample: Samples will be simple grab samples.

1) When approaching a sampling location, care will be taken to not stir up sediments and to approach from downstream or down wind direction. If anchoring is required, lower anchor gently.
2) Immediately prior to collecting the sample, the sample bottle label details will be completed (i.e. date, time, sample collector…)
3) When taking the sample, the cap will be left on the bottle until it is at three feet of depth or at midpoint in the water column if less than three feet, per the monitoring forms outlined below.
4) Once the bottle is at the appropriate depth, the cap will be removed below the surface. Stirring of the sediments will be avoided.
5) The bottle will be rinsed with sample water and emptied twice, then filled completely
6) Once the bottle is full, it will be capped.
7) The bottle will be placed in the appropriate cooler. The bottles will be kept in contact with ice packs
8) Other water quality measurements will be taken and recorded
9) The Water Sampling Data Sheet will be filled out with information for the sample

10) In the office, the bottle will be placed into a refrigerator, unless samples are taken immediately to a laboratory.

SPECIAL NOTES:

1) For a spot treatment, a sketch map will be made showing the site of the treatment and the location of the sample relative to the treated area
2) In addition, a Global Positioning System (GPS) reading will be taken, noting the latitude and longitude in WGS 1984 datum to six decimal places and recording on the application monitoring form.

Submitting sample to lab:

1) Samples will be submitted within 48 hours of sample collection or sooner to a laboratory.
2) Samples will be packed in a cooler with ice packs between each bottle
3) Chain of Custody (COC) form will be prepared to include details on the sample bottle labels.
4) If the samples are shipped to the lab, the pick-up person will sign the COC and a copy will be made before sending out the shipment. If the samples are delivered to the lab, the delivering person will have the receiving person sign the COC form and provide a copy before turning over the shipment.

Retention of Records: Records of all monitoring information including all calibration and maintenance records, copies of all reports required by the General Permit, and records of all data used to complete the application per the General Permit will be retained. Records will be maintained for a minimum of three years from the date of the sampling event. This period may be extended during the course of any unresolved litigation regarding a discharge, or when requested by the appropriate Regional Board Executive Officer.

Monitoring Records: Records of monitoring events will include the following information:

a. The date, exact place, and time of sampling or measurements;
b. The individuals who performed the sampling or measurements;
c. The date's analyses were performed;
d. The individuals who performed the analyses;
e. The analytical techniques or method used; and
f. The results of such analyses.

The following forms will be used to collect and track information required for each treatment event as required by the Genera Permit:

CLEAN LAKES, INC. AQUATIC WEED CONTROL
NPDES AQUATIC PESTICIDE APPLICATION LOG

Date of Application:	**Location:**	**App. Start Time:** **App. Stop Time:**
Applicator Name:	**APAP Certification:**	
Attach map showing application area, treatment area, immediately adjacent untreated area, and water bodies receiving treated water.		

Discharge Gates or Control Structures				
Name	**Date Closed**	**Time Closed**	**Date Opened**	**Time Opened**
1.				

Calculations to Determine Opening and Closures:
2. Provide information on surface area and/or volume of application area and treatment area and other information used to calculate dosage and quantity of each pesticide used at each application site:

2.a Application Area – Surface Area:	**2.b Application Area – Volume:**
2.c Treatment Area – Surface Area:	**2.d Treatment Area – Volume:**
2.e Dosage and Quantity Information for each pesticide used:	

Application Details					
Plot Number	**Area (ac. or sq. ft.)**	**Average Depth**	**Product**	**Product Quantity**	**Concentration or Rate**

For additional treatment areas use additional forms.

AQUATIC WEED CONTROL
NPDES RECEIVING WATER MONITORING

Visual Observation Form (Background Monitoring)

Monitoring Date:	**Location:**		**Sampled by:**
Monitoring Area Description (pond, lake, waterway channel…):			
Site Conditions/Appearance of Waterway			
Floating or suspended matter: **Present** ☐ **Absent** ☐	**Discoloration:** **Present** ☐ **Absent** ☐	**Bottom deposits:** **Present** ☐ **Absent** ☐	**Aquatic life:** **Present** ☐ **Absent** ☐
Visible films, sheens or coatings: **Present** ☐ **Absent** ☐	**Fungi, slimes, or objectionable growths:** **Present** ☐ **Absent** ☐		**Potential nuisance conditions:** **Present** ☐ **Absent** ☐
Weather conditions and other observations (fog, rain, wind, wind direction…):			

Visual Observation Form (Event Monitoring)

Monitoring Date:	**Location:**		**Sampled by:**
Monitoring Area Description (pond, lake, waterway channel…):			
Site Conditions/Appearance of Waterway			
Floating or suspended matter: **Present** ☐ **Absent** ☐	**Discoloration:** **Present** ☐ **Absent** ☐	**Bottom deposits:** **Present** ☐ **Absent** ☐	**Aquatic life:** **Present** ☐ **Absent** ☐
Visible films, sheens or coatings: **Present** ☐ **Absent** ☐	**Fungi, slimes, or objectionable growths:** **Present** ☐ **Absent** ☐		**Potential nuisance conditions:** **Present** ☐ **Absent** ☐
Weather conditions and other observations (fog, rain, wind, wind direction…):			

Visual Observation Form (Post Event Monitoring)

Monitoring Date:	**Location:**		**Sampled by:**
Monitoring Area Description (pond, lake, waterway channel…):			
Site Conditions/Appearance of Waterway			
Floating or suspended matter: **Present** ☐ **Absent** ☐	**Discoloration:** **Present** ☐ **Absent** ☐	**Bottom deposits:** **Present** ☐ **Absent** ☐	**Aquatic life:** **Present** ☐ **Absent** ☐
Visible films, sheens or coatings: **Present** ☐ **Absent** ☐	**Fungi, slimes, or objectionable growths:** **Present** ☐ **Absent** ☐		**Potential nuisance conditions:** **Present** ☐ **Absent** ☐
Weather conditions and other observations (fog, rain, wind, wind direction…):			

AQUATIC WEED CONTROL
NPDES RECEIVING WATER MONITORING

Physical and Chemical Monitoring **Location: _____Sampled by:_____**

(Physical and chemical monitoring required for six (6) applications for each type of pesticide at each waterbody site. See General Permit)

1. Background Monitoring Parameters (u/s or at treatment area up to 24 hours before or at time of treatment)			**Date:**
Physical Sample Type (3 feet below water surface or mid depth if < 3 feet)	**Temperature (F)** [1]	**Turbidity (NTU)** [2]	**Electrical Conductivity (µmhos/cm)** [2]
Chemical Sample Type (3 feet below water surface or mid depth if < 3 feet)	**Active Ingredient (µg/l)**	**Nonylphenol (µg/l)** [3]	**pH** [2]
	Dissolved Oxygen (mg/L) [2]	**Hardness ($CaCO_3$)** [4]	**GPS latitude and longitude coordinates**
2. Event Monitoring Parameters (d/s or immediately adjacent to treatment area immediately after application)			**Date:**
Physical Sample Type (3 feet below water surface or mid depth if < 3 feet)	**Temperature (F)** [1]	**Turbidity (NTU)** [2]	**Electrical Conductivity (µmhos/cm)** [2]
Chemical Sample Type (3 feet below water surface or mid depth if < 3 feet)	**Active Ingredient (µg/l)**	**Nonylphenol (µg/l)** [3]	**pH** [2]
	Dissolved Oxygen (mg/L) [2]	**Hardness ($CaCO_3$)** [4]	**GPS latitude and longitude coordinates**
3. Post Event Monitoring Parameters (w/i treatment area + immediately d/s in flowing water or adjacent to treatment area w/i 1 week)			**Date:**
Physical Sample Type (3 feet below water surface or mid depth if < 3 feet)	**Temperature (F)** [1]	**Turbidity (NTU)** [2]	**Electrical Conductivity (µmhos/cm)** [2]
Chemical Sample Type (3 feet below water surface or mid depth if < 3 feet)	**Active Ingredient (µg/l)**	**Nonylphenol (µg/l)** [3]	**pH** [2]
	Dissolved Oxygen (mg/L) [2]	**Hardness ($CaCO_3$)** [4]	**GPS latitude and longitude coordinates**

[1] Field Test; [2] Field or Laboratory Test; [3] Required when nonylphenol is used; [4] Required for copper applications.

Device Calibration and Maintenance: All monitoring instruments and devices that will be used by the discharger to fulfill the prescribed monitoring program will be properly maintained and calibrated as necessary to ensure their continued accuracy.

Reporting

Annual Report

All reports will be submitted to the appropriate Regional Board Executive Director or Deputy Director. All reports submitted in response to the Water Quality Order will comply with the provisions stated in the Standard Provisions (Attachment B) and Monitoring and Reporting Program (Attachment C), of the General Permit. The Annual reports will contain the following information:

- An executive summary discussing compliance or violation of the General Permit, and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with algaecide and aquatic herbicide applications;
- A summary of monitoring data, including the identification of water quality improvements, or degradation as a result of the algaecide or aquatic pesticide application, if appropriate, and recommendations for improvements to the APAP (including proposed best management practices (BMPs) and monitoring program based on the monitoring results). All receiving water monitoring data will be compared to receiving water limitations and receiving water monitoring triggers;
- Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in this General Permit;
- A discussion of BMP modifications addressing violations of this General Permit;
- A map showing the location of each treatment area;
- Types and amounts of algaecides and aquatic herbicides used at each application event;
- Information on surface area and/or volume of treatment areas and any other information used to calculate dosage, concentration, and quantity of each algaecide and aquatic herbicide used;

- Sampling results will indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling area (address, cross roads, etc.), collection date, name of constituent/parameter and the concentration detected, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled, and a comparison with applicable water quality standards, and a description of the analytical QA/quality control plan. Sampling results will be tabulated so that they are readily discernible; and
- A summary of the algaecide and aquatic herbicide application logs.

24 Hour Report and Five Day Reporting

The Sonoma County Regional Parks and or applicator will orally report any non-compliance. This includes any unexpected or unintended effect of the use of an algaecide or aquatic herbicide that may danger health or the environment. This information will be provided orally within 24 hours from the time the Sonoma County Regional Parks and or applicator becomes aware of the circumstances. A written report of the non-compliance will be provided within five (5) days of the time the Sonoma County Regional Parks and or applicator becomes aware of the noncompliance. The 24 hour report as well as the 5 day written report will follow the format in Attachment C.

Data Storage: All data will be recorded on supplied forms. At the end of each day, all data forms will be double copied. The original will stay in specified notebooks. The first copy will be stored in a file cabinet. The second copy will be stored and shipped with the samples.

Quality Assurance Audits and Personnel: The discharger will provide a Quality Assurance Officer and the Certified Laboratory will provide one Quality Assurance Officer. In addition, the Water Quality Control Board is welcome to provide third party validation of the sampling procedures.

Methods for Determination of Other Water Quality Parameters: Water quality parameters such as pH, dissolved oxygen, and temperature will be measured by appropriate instrumentation within the manufacturer's tolerances. These parameters will be measured at the same sites where

water samples for aquatic pesticides are retrieved. These parameters will be measured at the same depths from which the water samples for aquatic pesticides are retrieved, within +/- 0.5 meters. Data and deviations will be recorded on specified forms and/or lab notebooks.

Methods for Data Summarization, Analysis, Review, and Reporting: All data will be included in the final report. The final report will also contain narrative and numerical summaries as appropriate. Final data reports will also be reviewed by a Quality Assurance Officer.

Training on Sampling Techniques: All personnel performing water sampling will have been trained before water sampling is scheduled to begin, a training session will be held reviewing sampling technique; equipment and instrument calibration, maintenance, and operation; sample storage and delivery; the proper use of COC and other forms; and other records and deviations.

DESCRIPTION OF PROCEDURES TO PREVENT SAMPLE CONTAMINATION

Measures will be taken to prevent sample collection contamination from persons, equipment and vehicles associated with algaecide and aquatic herbicides application, as follows:

- Background monitoring sample collection will be carried out prior to application equipment or algaecides/aquatic herbicides being loaded into a boat. Background monitoring sampling, as well as post event monitoring sampling (within one week), if appropriate, sampling may be carried out from shore at a dock within the sampling areas to eliminate the potential for contamination. Sampling equipment, with particular emphasis on cooler and sample bottles will be transported separately from algaecides or aquatic herbicides and application equipment on the day of the application event. Background monitoring will take place immediately prior to the application event.

- For event monitoring, sampling will be carried out after application equipment and all application related equipment and devices including personal protection equipment (PPE) used during the application has been removed from the boat, if no other boats are available to support sampling efforts. If there are multiple personnel supporting

applications, one will be designated the sample collector while the other will be responsible for boat operation. Hands will be washed with soap and clean potable water before handling sampling equipment, cooler and sample bottle. During sample bottle handling and sample collection, disposable rubber gloves will be used to collect a water sample. The pre labeled sample bottle will be completed with time and date of sample collection immediately after removing from the sample cooler and replaced in the cooler immediately after sample collection. Once sampling has been completed, water samples will be delivered immediately to the laboratory, if possible. If background and event samples cannot be delivered the same days, sample bottles will be stored in a clean refrigerator at the office until samples can be delivered the next business day.

DESCRIPTION OF BEST MANAGEMENT PRACTICES (BMPs) TO BE IMPLEMETED:

A variety of approaches will be utilized to minimize the impacts of aquatic pesticides used while still achieving their goals.

- Techniques that help reduce pesticide impacts include:
    - Non-pesticide control methods as outlined below (Alternatives) have been attempted or considered.
    - Pre Treatment surveys are carried out to identify potential treatment areas and timing
    - Adjustments will be made to treatment protocols based upon survey results
    - Choice of pesticides based on toxicity
    - All attempts will be made to time treatments when no water is being discharged from the lake system
    - Aquatic Pesticide use rates will be per the EPA label and will be limited to ensure compliance with Receiving Water Limitations
    - Partial water body treatments or split treatments will be utilized to minimize impacts that might otherwise occur

- From the aquatic herbicides available, the most effective and safest options have been selected for use in this program. The Pest Control Advisor (PCA) and Herbicide application personnel (Qualified Applicators) know the strengths and weaknesses of the various available options, and take them into consideration when choosing a treatment protocol for a specific site.

- In order to avoid inadvertent or accidental soil or water contamination with aquatic pesticides, application personnel follow the storage, transport, and spill control procedures per USEPA and DPR rules, regulations and label instructions.

- Over application is avoided by following the specific product labels for the aquatic pesticides used in the program. Algaecide and aquatic herbicide quantities required for each treatment are calculated at the office and only sufficient material to carry out the treatment is transported for the day's application. Application equipment is routinely cleaned and maintained, and all label directions and DPR guidelines are followed as to acceptable application methods as well as weather conditions. Surface applications are not made in winds above 10 miles per hour.

- The various BMP's being implemented ensures that the Aquatic Vegetation Control Program will meet the requirements of the general NPDES Permit for the use of aquatic pesticides.

- Licensing: All crew leaders and biologists that apply or supervise the application of aquatic pesticides are certified and or licensed by DPR.

- Notification: As detailed elsewhere in this document, whenever pesticides are used that might lead to damage to irrigated landscape (the most severe potential impact on beneficial uses caused by the program), potentially affected users in the area are informed of the treatments so that means can be taken to avoid using the treated water for irrigation purposes.

- Site Evaluations: As has been detailed in this section and elsewhere, both preliminary and secondary site evaluations are a major aspect of the program, as represented by the extensive surveying carried out by the field crews.

- Alternative Treatments: Staff considers a number of potential alternative control strategies in every situation, and will make use of non-herbicide options when conditions are suitable.

- Treatment Conditions: Every application is made according to label directions and other requirements as directed by DPR or the agricultural commissioner, which not only specify the amounts and situations where pesticides may be applied, but the atmospheric and environmental conditions under which they may be applied. If there are conditions where it is determined that the treatment would be ineffective, application staff wait for other conditions or use a different treatment method.

- Post-treatment: Surveys are also carried out for post-treatment assessment of treatment efficacy and non-target impacts. Survey crews are instructed to look for possible non-target impacts that can be seen with the naked eye, such as dead fish or damage to plants on the shoreline.

- The applicator follows all pesticide label instructions and any Use Permits issued by a CAC;

- The discharger's applicators are licensed by DPR, or work with or under the supervision of someone who is licensed;

- The discharger's applicators comply with effluent limitations

- The discharger's applicators will follow this Aquatic Pesticide Application Plan (APAP);

- The discharger's applicator's comply with applicable receiving water limitations; and

- The discharger's applicators will comply with the monitoring and reporting requirements outlined in this APAP.

Aquatic Pesticide Use Requirements:

- **License Requirements.** Dischargers applicators will be licensed by DPR if such licensing is required for the aquatic pesticide application project

- **Application Requirements.** The pesticide will be consistent with FIFRA pesticide label instructions and any Use Permits issued by CACs.

- **Application Schedule.** When requested, the discharger will provide a phone number to persons who request the discharger's application schedule. The discharger shall provide the requester with the most current application schedule and inform the requester if the schedule is subject to change. Information may be made available by electronic means.

- **Public Notice Requirements.** Every calendar year, at least 15 days prior to the first application of aquatic pesticides, the Discharger will notify potentially affected public agencies (IF NEEDED). The Discharger will post the notification on its website if available. The notification will include the following information:

    1. A statement of the discharger's intent to apply algaecide or aquatic herbicide(s);
    2. Name of algaecide and or aquatic herbicide to be used;
    3. Purpose of use;
    4. General time period and locations of expected use;
    5. Any water use restrictions or precautions during treatment; and
    6. A phone number that interested persons may call to obtain additional information from the Discharger.

EXAMINATION OF AQUATIC VEGETATION CONTROL ALTERNATIVES

All appropriate aquatic plant management technologies within the context of the identified beneficial uses and impacted areas of the lake have been evaluated, and include all available cultural, biological, mechanical, and aquatic pesticide formulations.

Aquatic weed and algae control options have been broken down into four basic categories that include:

- Watershed Management
- Biological Control
- Physical and Mechanical Control
- Aquatic Algaecides

A discussion on each of the options follows:

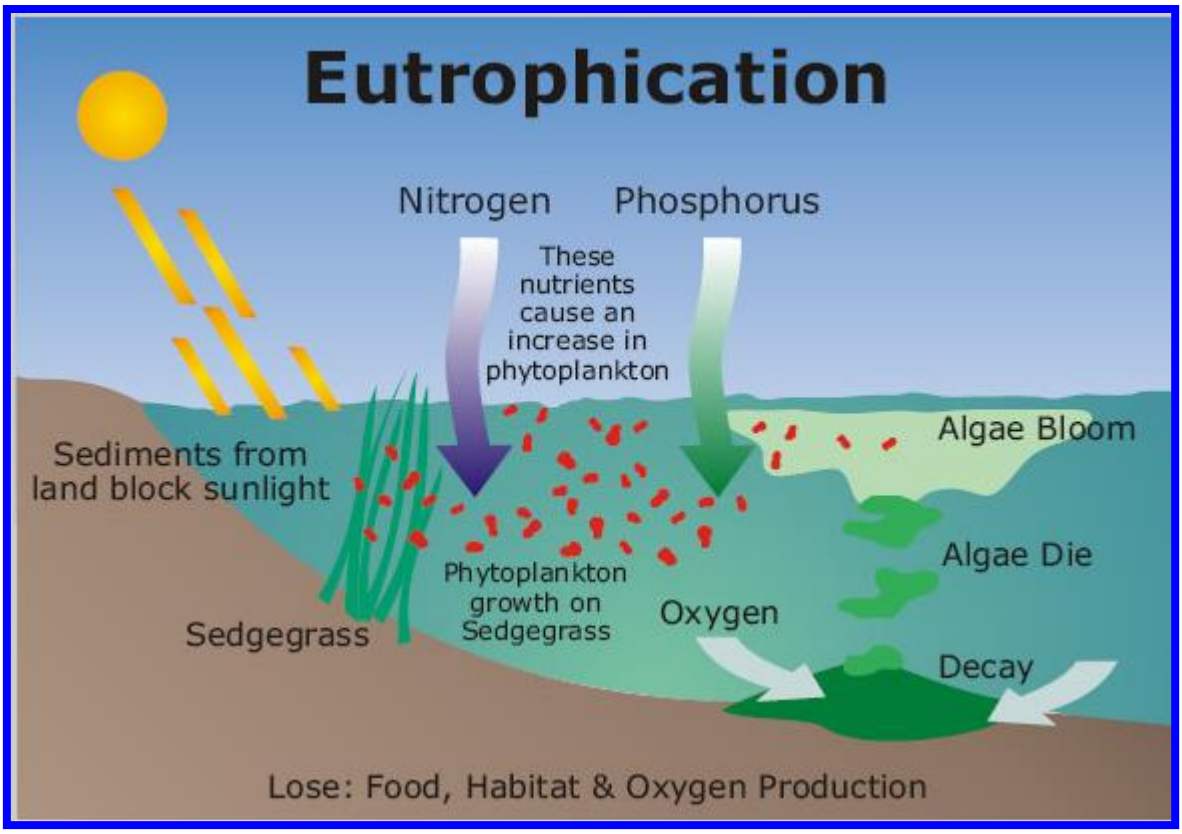
Watershed Management and the Runoff Impacts:

Watershed management is one of the most important control parameters as it deals with limiting nutrients and runoff into a lake system from the watershed. It entails implementing practices in the watershed that will support the reduction of nutrient and other pollutant runoff into the lake system. In natural areas, 10 % is runoff and 50 to 60 % is direct infiltration (*Runoff Coefficients for the Rational Method of Estimating Rainfall (McCuen, 1989*)).

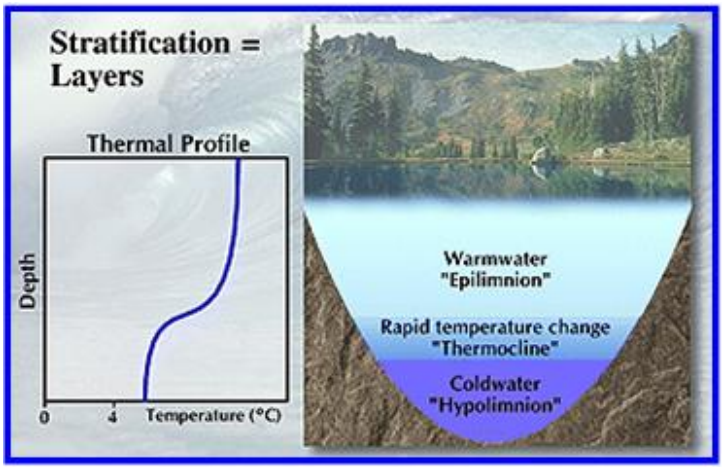
- Runoff Impacts
    - Non-point source pollution poses the most serious threat to the water quality of lakes.
    - Non-point pollution in runoff includes: sediments, oil, anti-freeze, road salt, pesticides, yard wastes and pet and waterfowl droppings.

- Nutrient Effects
    - Increase in algae blooms
    - Odor problems
    - Depletion of oxygen supply
    - Fish kills
    - Decrease in water clarity
    - Increase in the amount of rooted aquatic plants growing in the shallow waters of a lake
    - Reduction in the recreational value of the lake hinders boating, fishing, and reduces overall aesthetics of the lake

Eutrophication Process and Impacts:



- Impacts of Eutrophication
  - Fish kills due to low oxygen or high metals
  - Taste and odor problems, resulting in an increase in water treatment costs
  - Floating algae mats, decaying vegetation
  - Increased littoral vegetation in shallow areas



- Mobilization of sediment bound metals and ions during anoxic conditions (e.g., copper, ammonia, iron, sulfur, phosphorus)
- Increased temperature
- Reduced water clarity
- Nuisance algal blooms
- Reduced dissolved oxygen in hypolimnion
- Earlier onset and/or longer duration of periods of anoxia in hypolimnion

Several tools are available to control the use and misuse of the land surrounding the lake that includes:

- Comprehensive Plans to guide long-term growth;
- Storm Water and Surface Water Management Planning that considers data collection, land use, system site considerations, and design criteria for structures in setting goals for watershed runoff; and Rules for Lake Uses such as where, when and how a lake can be used recreationally to control shoreline erosion, nutrient recirculation and overuse.
- Other administrative alternatives may include shoreline erosion and sedimentation control management programs. Education is still probably the best way to combat water quality issues.

Non-structural alternatives: best management practices, such as buffer strips around water bodies to filter out sediments and reduce nutrients, are examples of non-structural alternatives. Chemical inactivation/precipitation of in-lake phosphorus, chemical control of algae, dredging of accumulated sediments, and mechanical harvesting of aquatic vegetation are additional examples.

Structural alternatives: Storm water detention basins and wetland treatment systems are structural alternatives that detain runoff to control peak flow rates and control downstream flooding. They also allow pollutants to settle out of the water before reaching the lake. Diversions routing storm water away from the lake and in-lake aeration systems to oxygenate the water are other structural alternatives

After a review of the various aquatic systems and their surrounding areas, there are some areas that have good potential for addressing watershed management issues to limit nutrient intake in the adjacent water bodies. One example is working with the golf course that is located along the shoreline of Spring Lake to see if anything can be done to reduce or eliminate the nutrients from the golf course (fertilizers, etc…) from entering Spring Lake. Sonoma County Regional Parks (SCRP) is actively involved in reviewing and researching various watershed management practices and methods to help manage their aquatic systems. Clean Lakes Inc. (CLI) has recommended that SCRP should look into implementing a Watershed Management Plan in the near future. CLI is looking to see if there are any watershed groups in the area so that CLI and the SCRP can participate in local watershed meetings to get information that can help reduce impacts from the watershed to the SCRP aquatic systems. However a Watershed Management Plan alone will more than likely not provide enough nutrient limitation to avoid plant growth and algae blooms.

Biological Control

There are very few biological control options for eliminating aquatic weed growth and planktonic algae blooms. One option used in smaller water bodies is treatment with microbes and beneficial bacteria. These products digest organic wastes generated by animal and plant life in the body of water, thus reducing the bottom sludge layer which provides nutrients to the water bodies. This is an option for some of the SCRP's aquatic systems and CLI regularly recommends using these products as part of an integrated management approach as alone CLI has not seen them remove enough nutrients to prevent aquatic weed growth and planktonic algae blooms. One other reason this may not be a good option is it is expensive and SCRP is working on a limited budget as are most agencies these days.

Physical

Aeration & Water Quality Alteration: Aeration has been used for decades to circulate water and increase Dissolved Oxygen within lake and pond systems. In stratified lake systems where the bottom layers are anoxic during the summer months, a properly designed aeration system will limit nutrient recycling by supporting aerobic bacteria that support nutrient breakdown in bottom waters and the hydrosoil. Aeration has proven to be a successful tool for reductions in planktonic algae growth in lakes and reservoirs. Systems vary in size and style from fountains to bottom bubbler diffuser type systems to hypolimnetic units that oxygenate the lower water below the thermocline. Aeration is a possibility for some of SCRP's smaller aquatic systems if they start getting algae blooms, but is not a feasible option for Spring Lake due to budgetary limits and lack of staff available to maintain an extensive aeration system. In order to properly aerate a 72 acre reservoir, it would take a large system that would be costly to install and maintain. Although aeration may help in Spring Lake, it would unlikely prevent planktonic algae blooms. And as all of the other aquatic systems are primarily trying to manage aquatic weeds and not algae, aeration systems would not provide much benefit.

Shading/Light Attenuation:

A basic environmental manipulation for algae control is light reduction or attenuation. Organic dye can be added to a lake or pond system and is usually a blend of blue and yellow dyes specifically designed to screen or shade portions of the sunlight spectrum (red-orange and blue-violet) required by underwater aquatic plant and algae growth. This action

effectively inhibits photosynthesis required for algae growth. Aquashade, or a generic such as Cygnet Select is primarily effective at depths of 2 feet or greater. Aquashade is non-corrosive and will not stain bathing suits, fountain surfaces or other water features at use dilution rates. This is a feasible option for use in some of SCRP's smaller aquatic systems as there is potential to limit aquatic weed growth by limiting light. CLI has discussed this option with SCRP's in the past and will revisit this option with them. This is not a very feasible option for Spring Lake as the costs would be very high to initially treat and maintain the dye level as it does naturally decay. Furthermore budgetary limits and lack of staff available to maintain the dye levels make this unfeasible.

Sediment Removal:

Dredging is usually not performed solely for aquatic plant management but to restore lakes that have been filled in with sediments, have excess nutrients, have inadequate hypolimnetic zones, need deepening, or require removal of toxic substances (Peterson 1982). However, lakes that are very shallow due to sedimentation typically do have excess plant and algae growth. Dredging could deepen shallow areas and remove some nutrients from the various SCRP aquatic systems; however dredging is typically one of the most expensive options for water body managers and with budgetary constraints this is not a feasible option at this time. Also this would not insure a reduction in aquatic weed growth and planktonic algae blooms.

Mechanical

There are not any proven mechanical options for the removal of planktonic algae from lake systems such as Spring Lake. Therefore mechanical removal is not a feasible option for the algal blooms. Mechanical removal of aquatic weeds is also not recommend in Spring Lake or any of the other aquatic systems as

several of these water bodies have the aquatic weeds Eurasian Water Milfoil, (EWM) and Brazilian Water Weed (BWW) better known as Elodea. EWM and BWW both spread by fragmentation and aquatic weed harvesters when cutting would be spreading several fragments around the water body thus creating several new EWM and BWW infestations. Mechanical harvesting is also very costly as the harvesting itself is expensive and the machines need regular maintenance. Also additional costs arise (Landfill fee's and hauling fee's) with removing the harvested material from the site to the landfill.

INTEGRATED AQUATIC VEGETATION CONTROL RECOMMENDATIONS:

The recommended control strategy includes establishment of treatment thresholds, monitoring protocols to determine when thresholds are exceeded, and protocols to implement control measures when thresholds are exceeded in compliance with Best Management Practices. The control recommendations to deal with exotic and nuisance aquatic vegetation growth present within the systems have been determined based on survey results, and recommended schedules for aquatic vegetation control are outlined in the APAP. It is recommended that an integrated approach that includes watershed management, biological control where feasible, and aquatic herbicide and algaecide treatments be initiated to control nuisance growths of algae and aquatic vegetation prior to their impact to the beneficial uses of the system.

A matrix that presents the control methods that have been reviewed for implementation follows:

Matrix of Control Options

OPTION	METHOD	PRACTICAL	RANK
Watershed Management	Structural Non Structural	Very Very	10 10
Biological Control		Practical where feasible	5
Physical and Cultural Control	**Sediment Removal** **Light Limitation** **Aeration** **Draw Down** **Hand Harvesting** **Benthic Barriers**	Not practical Not practical Not Practical Not Practical Not Practical Not Practical	2 4 2 1 1 1

Mechanical Control	Diver Dredging Harvesting Emergent Cutting	Not Practical Not Practical Not Practical	1 1 1
Herbicides/ Algaecides	Various	Very	8

APAP UPDATES: This APAP will be updated as the General Permit conditions change, any new algaecides or aquatic herbicides are need for the aquatic vegetation management program, or as new control technologies are developed and become available.

END OF APAP

References

- Water Quality Order No. 2013-0002-DWQ, General Permit No. CAG990005, Statewide General National Pollutant Discharge Elimination System Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications.