GeoServ Inc
Engineering Geologists
Rock - Soil - Water

Aquatic Pesticide Application Plan

(APAP)

Willow Creek Ranch Pond Aquatic Plant Management

Prepared By:

PO Box 831
Mount Shasta CA, 96067
GeoServ, Inc.

February 2018

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

TABLE OF CONTENTS

1.0	BACKGROUND INFORMATION	pg. 3
2.0	DESCRIPTION OF THE WATER SYSTEM	pg. 3
3.0	DESCRIPTION OF THE AQUATIC HERBICIDE TREATMENT AREA	pg. 4
4.0	DESCRIPTION OF TYPES OF WEEDS TO BE CONTROLLED	pg. 4
5.0	AQUATIC HERBICIDE AND SURFACTANT PRODUCTS AND APPLICATION	pg. 5
6.0	EXAMINATION OF ALTERNATIVES	pg. 5
7.0	MONITORING AND SAMPLING	pg. 5
8.0	BEST MANAGEMENT PRACTICES	pg. 6
9.0	LIMITATIONS	pg. 6

1.0
BACKGROUND INFORMATION

GeoServ, Inc and Pest Management Technology, Inc, on behalf of Willow Creek Ranch, Pond Aquatic Plant Management, have prepared this Aquatic Pesticide Application Plan (APAP) for the Willow Creek Ranch located at 30044 Willow Creek Road McCloud, CA. This document is prepared to comply with Sections VIII. Aquatic Pesticide Use Requirements, C. Aquatic Pesticides Application Plan (APAP), of Water Quality Order 2013-0002-DWQ (General Order) and its amendments, requiring preparation of and adherence to an APAP for application of aquatic herbicides.

This APAP describes the site, the treatment areas, the aquatic weeds needing control, an evaluation of practical methods or week control leading to aquatic pesticide (herbicide) use, types of herbicides expected to be used, the application monitoring program, and best management practices to be implemented during herbicide application.

2.0
DESCRIPTION OF THE WATER SYSTEM

The Willow Creek Ranch Pond is located on the Willow Creek Ranch on the Shasta-Siskiyou county line. It is six acres in area and was constructed about twenty-seven years ago has an average depth of 8 ft. The shallowest portion of the pond is on the northern side. The ponds depth ranges from 4-6 ft. The deepest is near the south, and south east, where the depth was estimated to be ~12 ft deep. Assuming an average depth of ~8 ft the current water storage, as of 10/11/17, was estimated to be about 13 million gallons or 40 acre-ft. Inflow to the pond consists of two controls, the diversion from Dairy Creek and water from a 12 in well. The Dairy Creek diversion water flows into the north side of the pond through a 24 in culvert. Dairy Creek is an intermittent stream and is used to fill the pond during high flow (i.e., winter and spring). Between, June and November, the pond inflow the well and shallow groundwater. Water is pumped from the 12 in well using a 15 HP pump into a 6 in pipe.

Due to the loose sand soils and volcanic rock in the area, the pond also has an inflow of intermittent shallow groundwater during the winter and spring. The pond discharges during the spring time as the streamflow increases and the groundwater level rises. Overland flow into the pond is limited but with the high transmittance rate of the volcanic soils, and high-water table, its's probable that true control of the ponds water balance is limited to the dry months.

The pond has two outflow locations on the east central side of the pond (Figure 1). Under the dock the lake overflow diverts the water back into Dairy Creek through an unknown sized culvert. About 40 ft south of the overflow is a 6 in drain pipe that discharges into the adjacent meadow.

3.0
DESCRIPTION OF THE AQUATIC HERBICIDE TREATMENT AREA

The weed growth occurs over approximately 90% of the pond, the application area includes 5.5 acres of pond.

4.0
DESCRIPTION OF TYPES OF WEEDS TO BE CONTROLLED

There are three main pond vegetation species that have grown to dominate the pond and were identified by Warren Sour, A Qualified Applicator of Pest Management Technology, Inc. The three-identified species are:

1. American Pondweed
2. Eurasian Watermilfoil
3. Chara.

Filamentous algae was also observed.

The American Pondweed is a perennial plant that competes for sunlight and grows to the surface of water bodies. This weed provides food for aquatic species and waterfowl but will destroy recreation if patches are too large. Currently the pond has several large patches and are most abundant near the edges of the pond and shallow regions.

The Eurasian Watermilfoil is the most productive species in the pond. It's a perennial submersed plant that begins to grow horizontally once it grows to the water's surface. It's known to be most abundant in waterbodies that have a high amount of nutrients or high productivity. The weed dies down in the winter but begins to grow from the roots once the ponds temperature rises above ~60 degrees Fahrenheit in the spring. The plant isn't a valuable food source for waterfowl and is currently dominating most of the pond in the shallow portions to the north it can be seen at the surface and in the deeper portions it was observed at a height of 4-6 ft during the site visit. Control of Eurasian Milfoil is similar to that of American Pondweed.

Chara is an alga that grows near the bottom of ponds. Chara can be a problem in shallow waters for treatment but it's overall a beneficial plant because it produces oxygen. Chara was the least observed species of the three and much of the algae has most likely been pushed out to the deeper portions of the pond due to the large Watermilfoil blooms in the shallower areas.

Large Patches of Pondweed and Eurasian Watermilfoil block the majority of the sunlight which can kill the oxygen producing algae's. Once these algae's die, the decomposition will consume oxygen. Most of the treatments listed below will harm the more beneficial algae, but if the monoculture of milfoil is reduced, the overall productivity of the pond will decrease.

5.0
AQUATIC HERBICIDE AND SURFACTANT PRODUCTS AND APPLICATION

Sonar

Application of Sonar One should be in the early Spring while targeted plants are in the small early growth stages. Application should be 20 pounds per surface acre. This is an application rate of 45 ppb. The plants controlled will be the pondweed, milfoil as well as other submerged species. Sonar is a systemic herbicide and will translocate throughout the plant. Milfoil and pondweed control should be season long and may extent into 2019 and possibly longer. The time extension depends on the amount of water allowed to move through the pond during the wet season and the source of the infestation.

Sonar will not control Chara and other algae. Retention of these algae should provide adequate oxygenation for the pond. If the filamentous algae become overly abundant, the pond may be treated with up to 0.6 gallon per acre foot of Cutrine Plus or Captain. This application will control the filamentous algae but only suppress the Chara, allowing enough Chara to oxygenate the pond.

Water Management

Sonar One is a slow release herbicide. Water should not be added and allowed to overflow out of the pond after the Sonar application. Any seepage through the soil is not believed to be a problem. If the pond water level becomes low due to evaporation, it is alright to raise the water level but not overflow the pond.

6.0
EXAMINATION OF ALTERNATIVES

An alternative option looked at for the Willow Creek Ranch Pond, was to dredge and deepen the pond. By removing the bottom sediments and constructing steeper pond slopes along the banks. Dredging reduces aquatic plant problems by directly removing the plants and associated nutrients. Dredging and deepening a shallow shoreline area indirectly limits weed growth by exposing various soils that may be nutrient-poor or impervious to plant roots.

In smaller ponds dredging would be done once the pone has been drained, in larger bodies of water a hydraulic dredging system would be used. After the site visit it was decided that dredging would not be the best course of action to take. The pond itself stays full year-round and is too small to justify using a hydraulic dredging system unless all else fails.

7.0
MONITORING AND SAMPLING

Monitoring and sampling will be conducted in accordance with the requirements contained in the General Oder's Attachment C – Monitoring and reporting Program (MRP), with the objective of addressing two key questions:

1. Does the residual algaecides and aquatic herbicides discharge cause an exceedance of receiving water limitations?
2. Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, inert ingredients, and degradation byproducts in any combination cause or contribute to an exceedance of the "no toxics in toxic amount" narrative toxicity objective?

The goals of the MRP are to:

1. Identify and characterize 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 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 aquatic herbicide and application methods used by the Discharger.

Application

Aquatic herbicide treatments will occur in the entire pond area

Compliance with Permit Requirements

The following monitoring is required by the General Permit for each sampling:

1. Background Monitoring. Background monitoring samples shall be collected upstream at the time of the application event *or in the application area* just prior to (up to 24 hours in advance of) the application event.
2. Event Monitoring. Event monitoring samples shall be collected immediately downstream of the treatment area (but upstream of any secondary discharge or disturbance such as tributaries). In flowing waters or immediately outside of the treatment area in non-flowing waters, immediately after the application event, but after sufficient times has elapsed such that treated water would have exited the treatment area.
3. Post-Event Monitoring. Post- event monitoring samples shall be collected within the treatment area within one week after application.

All aquatic herbicides being used are registered for aquatic use with CADPR and USEPA. Information concerning the environmental effects and transport are detailed on the EPS's website and will be consulted for reference as necessary.

It is not expected that applications of aquatic herbicide made following the label requirements and the requirements of this plan will cause impacts to designated use or receiving water quality in the waterways in which they are made.

8.0
BEST MANAGEMENT PRACTICES

The following BMPs will be implemented by GeoServ, Inc.

Licensing

GeoServ, Inc will use pesticide applicators with a Qualified Applicator Certificate (QAC) License or Qualified Applicator License Categories D& F (QAL). All applications will be performed under the direction of applicators with these qualifications.

Inflow and Outflow Control

GeoServ, Inc. will shut off the pond inflow and outflow valves one day before application and for two weeks after application. This will help prevent discharge of treated pond water.

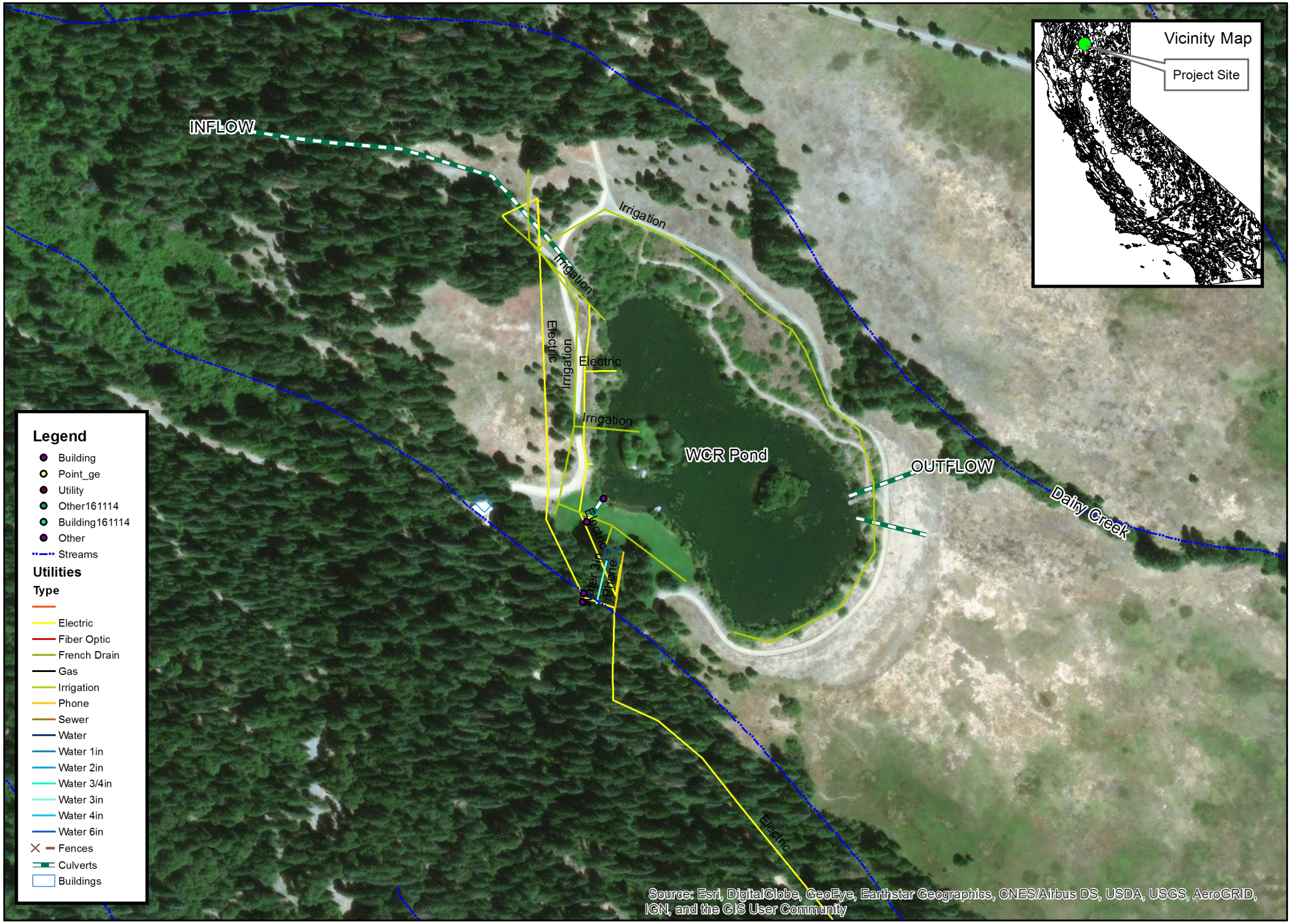
9.0
LIMITATIONS

This APAP was prepared in general accordance with accepted standards of care that existed at the time this work was performed. No other warranty, expressed or implied, is made. Conclusions and recommendations are based on field observations and data obtained from previous investigations. It should be recognized that definition and evaluation of environmental conditions are difficult and somewhat inexact science. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the site conditions present. More extensive studies may be performed to reduce uncertainties. This document is solely for the use and information of our client unless otherwise noted.

GeoServ, Inc
Engineering Geologists
Rock - Soil - Water

FIGURES

Figure 1- APAP Sampling Locations



Prepared By:
GeoServ
Engineering Geologists
Rock - Soil - Water

Project: WCR Pond APAP
Location: Willow Creek Ranch, McCloud CA
Figure 1: Pond Map

0 100 200 400 Feet

Date: 8/11/17

GeoServ, Inc
Engineering Geologists
Rock - Soil - Water

APPENDIX A

Sample Pesticide Application Record

GeoServ Inc
Engineering Geologists
Rock - Soil - Water

PESTICIDE APPLICATION RECORD

Application Site:_____ Owner:_____ Location:_____

Description: (Truf, Ag Crop, etc)

_____

Pesticides Used

Pesticides	Concentration	Rate	Total Amount Used

Adjuvant: Type_____ Amount_____ Total Gallons_____

Date of Application:
Equipment Used:
Calibrated By:
Mixed by:
Applied By:

Temperature:
Cloud Cover:
Wind Speed:
Wind Direction:
Other:

Flow:
Level of Pond:
Travel Speed:
Application Start Time:
Application End Time:
Total time:

Visual Monitoring: (Check if Present)

- Floating/Suspended Matter
- Discoloration
- Visible Film, Sheen, or Coating
- Slime
- Aquatic Life
- Observation Descriptions:

Applicator's Certification:

I_____ Certify that the Aquatic Pesticide Application Plan has been Followed.

Signature_____ Date _____

GeoServ, Inc
Engineering Geologists
Rock - Soil - Water

APPENDIX B

Sample Herbicide Application/Monitoring Event Log

GeoServ Inc
Engineering Geologists
Rock - Soil - Water

Aquatic Pesticide Application Water Quality Monitoring Form

Sampling crew (circle recorders name): _____
Date: _____ **Time:** _____**Site ID:** _____
Sampling Location (Lat, Long): _____
Coordinate System: _____ **Accuracy:** _____ **(**ft. / m.**) Photo start/end #s:** _____
This is a (Background / Event / Post-Event**) sample.**
Active ingredient(s) of interest: _____
Testing for Nonylphenol? Y / N

Creekside and Environmental Observations

Air Temperature (°F): _____

Sky **Wind** **Precipitation** **Hydrology** clear none fog pond
partly cloudy light light rain lake overcast moderate moderate rain open waterway
heavy heavy rain channel
other: _____

Is there oil present? Y / N **Oil location:** bank / water **Oil amount:** Thick / Thin / Sheen

Is there algae present? Y / N **Algae location:** Only on rock / Suspended / Surface cover
Algae color: Brown / Red / Green / Blue / Olive-green / Yellow

Is there floating material? Y / N T**ype:** Oily sheen / Sewage / Garbage / Other: _____

Flow: **Water source:** **Clarity:**
None (no water present) fresh/stormwater clear ponded/stagnant
runoff muddy trickle/intermittent spring
cloudy
steady milky flooded other

Color: **Odor:** **Dominate Substrate:**
Colorless none metal Brownish sewage concrete
Reddish abnormally fishy smell rocks
Greenish musty sandy
Bluish chlorine silty/sandy Olive greenish ammonia PVC Yellowish
petroleum
Chemical
Rotten eggs/sulfur

Physical and Chemical Field Tests

Dissolved Oxygen (mg/L): _____ **pH:** _____ **Water Temperature (°F):** _____
Electrical Conductivity (µs/cm): _____ **Turbidity (NTU):** _____ **Hardness (mg/L):** _____

General notes on observation including alterations to the site since last time site was sampled: _____
_____
_____
_____