Attachment E – Notice of Intent

RECEIVED
AUG 2 9 2013
DIVISION OF WATER QUALITY

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# 241AP00018

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

II. DISCHARGER INFORMATION

A. Name San Francisco Public Utilities Commission, Natural Resources and Lands Management Division			
B. Mailing Address 525 Golden Gate Avenue, 10th Floor			
C. City San Francisco	D. County San Francisco	E. State CA	F. Zip 94103
G. Contact Person Lori Schectel	H. E-mail address lschectel@sfwater.org	I. Title Senior Environmental Planner	J. Phone (415) 554-1874

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: San Antonio, Calaveras, Upper Crystal Springs, Lower Crystal Springs, San Andreas and Moccasin Reservoirs

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

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: Algae

Please see the attached Aquatic Pesticide Application Plan.

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

Sodium carbonate peroxyhydrate and hydrogen dioxide (brand names PAK-27 and GreenClean.)

Please see the attached Aquatic Pesticide Application Plan for more details.

C. Period of Application: Start Date Anytime _____ End Date _____

D. Types of Adjuvants Used:

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: Tim Ramirez

B. Signature: _____ **Date:** 8/29/13

C. Title: NRLMD Division 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** _____

SFPUC Aquatic Pesticide Application Plan

For Compliance with NPDES General Permit No. CAG990005

California State Water Resources Control Board Water Quality Order No. 2013-0002-DWQ

I. INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) uses sodium carbonate peroxyhydrate and hydrogen dioxide, (brand names PAK™27 (granular) and GreenClean (liquid) respectively) to control algal blooms in reservoirs for the purpose of facilitating water treatment plant operation, reducing objectionable taste and odors and reducing filter/aerator clogging issues at end-user taps, appliances, and appurtenances conveying treated drinking water. PAK™27/GreenClean are the only pesticides used in SFPUC reservoirs for algae control and therefore, are the only pesticides covered in this Aquatic Pesticides Application Plan [APAP] and monitoring plan. The following is a description of the APAP and monitoring plan for PAK™27/GreenClean applications developed for compliance with NPDES General Permit No. CAG990005.

Application of PAK™27/GreenClean is possible at any of six SFPUC drinking water reservoirs: San Antonio Reservoir (Alameda County), Calaveras Reservoir (Alameda and Santa Clara counties), Upper Crystal Springs Reservoir (San Mateo County), Lower Crystal Springs Reservoir (San Mateo County), San Andreas Reservoir (San Mateo County) and Moccasin Reservoir (Tuolumne County) [see figures 2 through 7].

II. BACKGROUND

Management of algal problems in drinking water source supplies is necessary to meet public health and aesthetic standards, drinking water demand as well as limit distribution system issues. PAK™27 has been used in test applications to SFPUC reservoirs and is considered by researchers to be particularly effective in controlling blue-green algae blooms. In addition, PAK™27 has been approved by the National Sanitation Foundation for treatment of drinking water reservoirs for potable use. The State of California Department of Pesticide Regulation registered sodium carbonate peroxyhydrate (PAK™27) for aquatic application in February of 2006. The California State Water Resources Control Board in Resolution No. 2006-0039 recommended using sodium percarbonate as an alternative to copper as an algaecide.

Blue-green algae blooms regularly occur in SFPUC drinking water reservoirs in late spring, summer, and early fall. Occasionally, algae blooms occur due to the growth of diatoms, green algae or filamentous algae. Operational problems encountered during algal blooms include shortened filter runs at the Harry Tracy Water Treatment Plant (HTWTP), taste and odor issues at the Sunol Valley Water Treatment Plants (SVWTP) and filter/aerator clogging issues at end-user taps, appliances, appurtenances, etc. Taste and odor and filter/aerator clogging issues from algae in finished water have lead to increased consumer complaints during these episodes. In addition, there are a number of common species of bluegreen algae (cyanobacteria) that are known to produce a variety of cyanotoxins harmful to human health. In 1998, the U.S. Environmental Protection Agency, pursuant to the 1996 amendments to the Safe Drinking Water Act,

published its first list of priority pollutants to be considered for regulation. Several common cyanobacterial toxins were included on the drinking water contaminant candidate list, including microcystin. Microcystin producing algae have been confirmed in at least one SFPUC reservoir. PAK™27 is an effective oxidant and has significantly reduced the concentration of microcystin in SFPUC reservoir drinking water supplies.

III. AQUATIC PESTICIDE APPLICATION PLAN (APAP) ELEMENTS

A. ALTERNATIVES EVALUATION:

1. No Action: No action to algae growth will ensue until appropriate Response Levels (see Best Management Practices (BMPs), item 1, below) are triggered. Ongoing "No Action" alternative evaluations and assessments will be conducted during routine algae monitoring events.

2. Prevention: Prevention alternatives are ongoing especially during seasons when increased algae growth is typical. Sanitary Surveys are routinely conducted to identify and mitigate parameters that would induce algae blooms. In-Reservoir Algal Mitigation Measures are also implemented to prevent algae growth in specific SFPUC reservoirs (see BMPs, item 5, below).

3. Mechanical: Mechanical alternatives have been evaluated and are currently not a consideration for implementation, however, if mechanical alternatives are deemed financially and operationally viable, these alternatives will be considered.

4. Biological/Cultural: Biological/cultural alternatives have been evaluated and are currently not a consideration for use.

5. Pesticide Control: Specific algaecide application has been fully evaluated and is a viable alternative for all SFPUC reservoirs. Conservative algaecide use is always fully evaluated to ensure the minimal but effective amount of algaecide to be applied during each treatment. Clean Lakes Inc. ((CLI) contractor to SFPUC), SFPUC Natural Resources Land Management Division's biologists and the Water Supply and Treatment Manager, in consultation, will ensure only minimum and consistent amount of algaecide targeted at specific algae in accordance to PAK™27/GreenClean package label.

B. METHOD OF PESTICIDE APPLICATION

The SFPUC contracts with Clean Lakes, Inc. (CLI) to apply aquatic pesticides. CLI is a local company with extensive experience applying herbicides to water bodies, especially PAK™27/GreenClean to regional drinking water reservoirs. CLI's equipment includes application vessels with mounted inductor-type spreader systems for granular herbicide applications and injector systems for liquid algaecide applications made to the lower portion of the water column to increase algaecide concentration and exposure time relationships for the control of algae. Algaecides will be applied according to pre-designated transects or specifically targeted areas where algae growth is prevalent. For the PAK™27/GreenClean products, no adjuvants or surfactants will be used.

C. List of Gates/Control Structure and Inspection Schedules

See Table 5.

D. Monitoring Sample Contamination Prevention

To prevent monitoring sample contamination, physical water quality parameters are recorded through the use of various monitoring probes while chemical parameters are collected through standard protocols that include proper sample collection/technique, labeling and recording, use of Chain of Custodies, analyses of chemical samples by state certified laboratories, properly selected and prepared sample bottles/vessels, and adherence to hold times and refrigeration requirements.

E. Best Management Practices (BMPs)

In 2009, the SFPUC contracted with water quality experts and limnologists to develop an *Algae Monitoring and Mitigation Plan* (AMMP). The AMMP, which was first implemented in 2011, describes a number of BMPs that the SFPUC employs when managing algae issues in drinking water reservoirs. These include:

1. Setting Algae Response Levels. For each SFPUC reservoir or facility, and for each parameter of concern, there are two response levels identified (See Tables 1, 2 and 3).

a) *Response Level 1* - indicates a threshold above which a parameter is considered to be elevated, and triggers additional water quality monitoring with rapid analyte turnaround times until the parameter is no longer elevated.

b) *Response Level 2* – indicates a threshold above which a parameter is considered to be high, and triggers a mitigation measure (in a reservoir) or an operational response (in a treatment facility).

2. Frequent Reservoir Water Quality Monitoring. Under routine conditions, limnological data are collected bi-weekly at all reservoirs that would be considered for algaecide application (see item B of this document). Algal population trends are tracked closely year around.

3. Selective Withdrawal. When the appropriate *Response Level* is reached in a reservoir, the operational decision can be made not to use that reservoir for treatment and instead withdraw water from a higher quality source. Or, water can be withdrawn from a depth in the reservoir where algae concentrations are lower.

4. Monitoring Water Quality at the Treatment Facilities. Water quality parameters that would be expected to be affected by the presence of algae are tracked at the treatment facilities.

5. Use of in-reservoir algal mitigation measures. Hypolimnetic oxygen systems (HOS) were constructed in the two East Bay SFPUC reservoirs; Calaveras Reservoir in 2005, and San Antonio Reservoir in 2009. Historically, these two reservoirs thermally stratify in the summer and early fall causing the hypolimnion (lower depths of the reservoir) to become anoxic. Algal nutrients are generated under these chemical conditions. However, increasing dissolved oxygen in the hypolimnion restricts the generation of these nutrients, thus denying the algae a food source. Minimizing algae growth in this way minimizes or eliminates the need for algaecide use. SFPUC's current policy on algal bloom control is to use PAK™27 /GreenClean because of its lack of toxicity to non-target organisms and because it does not form harmful chemical byproducts post-application. Only water and oxygen are the byproducts of its use.

6. Watershed Management Plans and Sanitary Surveys. The SFPUC has developed a Peninsula Watershed Management Plan (for Upper Crystal Springs, Lower Crystal Springs, and San Andreas reservoirs) and an Alameda Watershed Management Plan (for Calaveras and San Antonio reservoirs). The SFPUC also conducts sanitary surveys assessing water quality issues in the Moccasin Reservoir watershed. These plans and surveys contain watershed management actions and guidelines designed to be implemented to protect water quality. Several of the management actions potentially control algae through nutrient load reduction thus limiting the need for aquatic pesticide application. These actions include control of stormwater runoff, control of human and animal waste, road maintenance practices, grazing management practices, fire and fuel load management, and aquatic zone protection. The executive summaries of these management plans are available on the SFPUC website at http://www.ci.sf.ca.us/puc/. Moccasin Reservoir watershed sanitary surveys can be made available upon request.

7. Qualified Applicator. The SFPUC contracts with Clean Lakes, Inc. (CLI) to apply aquatic pesticides. CLI is a local company with extensive experience applying herbicides to water bodies, especially PAK™27/GreenClean to regional drinking water reservoirs. In addition to the BMPs adopted by the SFPUC, CLI employs a series of BMPs when making an algaecide application. These include:

A. Decontaminating applicator boats prior to launching on reservoirs to restrict the spread of invasive aquatic species.

B. Planning pre-treatment operations and conducting safety meetings prior to initiating the application.

C. Using GPS to track applications to record the geo-spatial distribution of algaecide to the reservoir surface.

D. Accurately recording the amount of algaecide applied [lbs/acre-ft] across the surface of the reservoir.

E. Submitting an *Algaecide Application Services Report* to the SFPUC, which is included in the annual NPDES compliance report submitted to the Regional Water Quality Control Board. The report will include an *Algaecide and Aquatic Herbicide Application Log* containing the following information:

1. Date of application;
2. Location of application;
3. Name of applicator;
4. Type and amount of algaecide and aquatic herbicide used;
5. Application details, such as flow and level of water body, time application started and stopped, algaecide and aquatic herbicide application rate and concentration;
6. Visual monitoring assessment;
7. Certification that applicator followed the APAP.

F. All PAK™27/GreenClean applications are made as prescribed on the manufacturer's label. CLI, SFPUC Natural Resources Land Management Division's biologists, and the Water Supply and Treatment Manager, in consultation, determine the appropriate chemical dosage, which is never to exceed the maximum dosage specified on the PAK™27/GreenClean package label.

G. Pesticide Spill and Spill Contamination Prevention: Site Specific Safety Plans have been developed for each algaecide treatment at SFPUC reservoirs. These plans include site characterizations and job hazard analyses which identify spill control measures such as engineering controls (spill kits, absorbent mats/dikes, etc.), work practices (exercising care when handling algaecides), and personal protective equipment readily available during treatment operations. The Site Specific Safety Plan also includes a detailed Emergency Response Plan.

H. CLI, SFPUC Natural Resources Land Management Division's biologists, and the Water Supply and Treatment Manager, in consultation, will ensure only minimum and consistent amount of algaecide targeted at specific algae in accordance to PAK™27/GreenClean package label. In addition to the extensive experience of CLI in applying PAK™27/GreenClean algaecides, applicators will be educated on avoiding any adverse effects associated with algaecide applications preceding any algaecide treatment.

I. Any farmers or agencies having water rights to receiving waters proposed for treatment will be notified of proposed treatments well in advance of any applications so any farmers or agencies with water rights can implement contingency plans.

J. All algaecide applications will be conducted to minimize impacts to wildlife and fish. In addition, SFPUC biologists and staff will be prepared to implement operational measures (aerators, rescue operations, etc.) to mitigate impacts to wildlife, fish, and the environment.

F. WATER QUALITY MONITORING

In accordance with the AMMP, bi-weekly limnological monitoring is conducted year around on all SFPUC reservoirs that might be candidates for algaecide application. The following parameters are analyzed, most throughout the water column:

1. Temperature
2. pH
3. Dissolved Oxygen
4. Conductivity
5. Oxidation-Reduction Potential
6. Alkalinity
7. Hardness
8. Calcium
9. Total Organic Carbon
10. Iron – Dissolved and Total
11. Ammonia
12. Nitrate
13. Phosphate – Total and Orthophosphate
14. Turbidity
15. Phytoplankton – Water Column Tow
16. Chlorophyll-*a*
17. Phycocyanin
18. Geosmin
19. MIB
20. Filamentous Algae Growth

As per NPDES permit CAG990005, water quality monitoring is conducted 24 hours before, during, and within one week after algaecide application. Samples are taken at three feet below the surface of the receiving water. The following data are collected and reported in the annual NPDES compliance report:

1. Temperature
2. Turbidity
3. Conductivity
4. pH
5. Dissolved Oxygen
6. Visual observations during sampling (including any impacts to non-target organisms)

Additionally, the SFPUC reports:

7. Phytoplankton counts

The SFPUC monitors the following parameters at the treatment facilities:

1. Screening Triangle Test
2. Flavor Profile Analysis
3. Threshold Odor Analysis

G. FACTORS THAT INFLUENCE THE DECISION TO USE AQUATIC PESTICIDES

The AMMP sets *Response Levels* that trigger a mitigation measure, such as application of algaecide to a reservoir. PAK™27/GreenClean would be applied when a *Response Level 2* is reached. Below are the parameters considered in making the decision and the two *Response Levels*:

SFPUC East Bay Reservoirs			
Parameter	Unit	Response Level	Level
Phytoplankton Count	Million NU/m^3	1	6
		2	15
Chlorophyll-a	µg/L	1	12
		2	18
Geosmin	ng/L	1	10
		2	20
MIB	ng/L	1	10
		2	20

Table 1 Response Levels for SFPUC East Bay Reservoirs

SFPUC West Bay Reservoirs			
Parameter	Unit	Response Level	Level
Phytoplankton Count	Million NU/m^3	1	4
		2	6
Chlorophyll-a	µg/L	1	4
		2	None
Geosmin	ng/L	1	8
		2	20
MIB	ng/L	1	8
		2	20

Table 2 Response Levels for West Bay Reservoirs

SFPUC Moccasin Reservoir			
Parameter	Unit	Response Level	Level
Reservoir Algae Growth	Qualitative Observations	1	Initial Filamentous Algae Growth
		2	Advanced Filamentous Algae Growth

Table 3 Response Levels for Moccasin Reservoir

Other factors in the decision to apply algaecide to a SFPUC drinking water reservoir are operational in nature. For instance, if an alternate, higher quality source water can be used, an algaecide application would not be necessary. If the reservoir is critical to overall water supply to the system, treatment would be prioritized. If a treatment plant drawing water from the reservoir is off line, algaecide application would not be prioritized. Lastly, the application of algaecide would have to be logistically possible to make the decision to apply. For example, staffing, equipment, and material would have to be available. The decision-making logic is outlined in Figure 1.

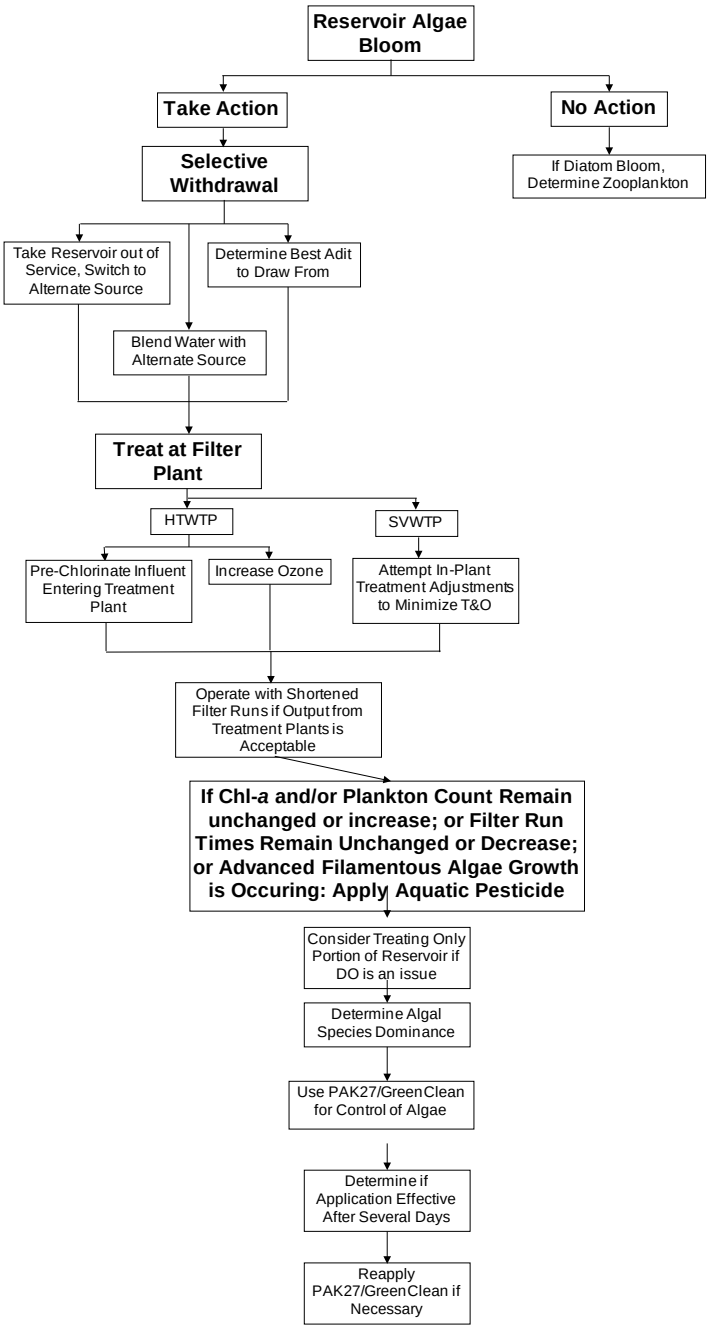

Figure 1 Algaecide Application Decision Making Flow Chart

IV. SFPUC RESERVOIRS

Reservoir	Volume	Surface Area	Treatment Area
San Antonio	16,500 MG (50,500 acre-feet)	825 acres	Transects across entire reservoir
Calaveras	31,550 MG (96,900 acre-feet) (currently operating at about 30% of maximum)	1435 acres	Transects across entire reservoir
Upper Crystal Springs	7611 MG (23,360 acre-feet)	597 acres	Transects across entire reservoir
Lower Crystal Springs	11,478 MG (35,040 acre-feet)	895 acres	Transects across entire reservoir
San Andreas	6,190 MG (19,000 acre-feet)	550 acres	Transects across entire reservoir
Moccasin	281 MG (861 acre-feet)	30 acres	Littoral zone, entire reservoir

Table 4 SFPUC Reservoirs

Reservoir	Gate Valves/Control Structures
San Antonio	Howell Bunger Valve (Y22, 48") inspected annually
Calaveras	V33 (72" fixed cone valve) inspected annually
Upper/Lower Crystal Springs	H94, H95 Gate Valves (8"); H91, H92 Gate Valves, inspected annually
San Andreas	Not applicable
Moccasin	Gate 3 (7' Slide Gate) inspected annually, Lower Powerhouse Outlet, inspected quarterly

Table 5 Reservoir Gate Valves/Control Structures

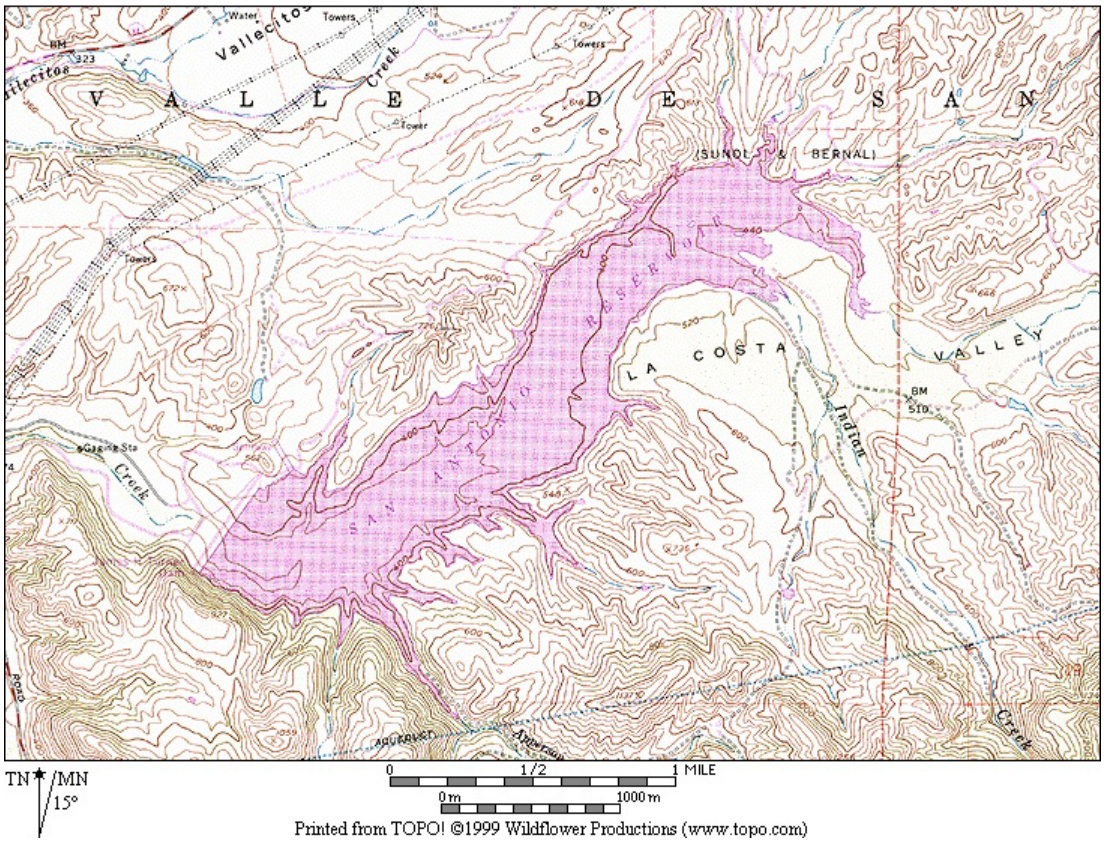

Figure 2 San Antonio Reservoir

Figure 3 Calaveras Reservoir

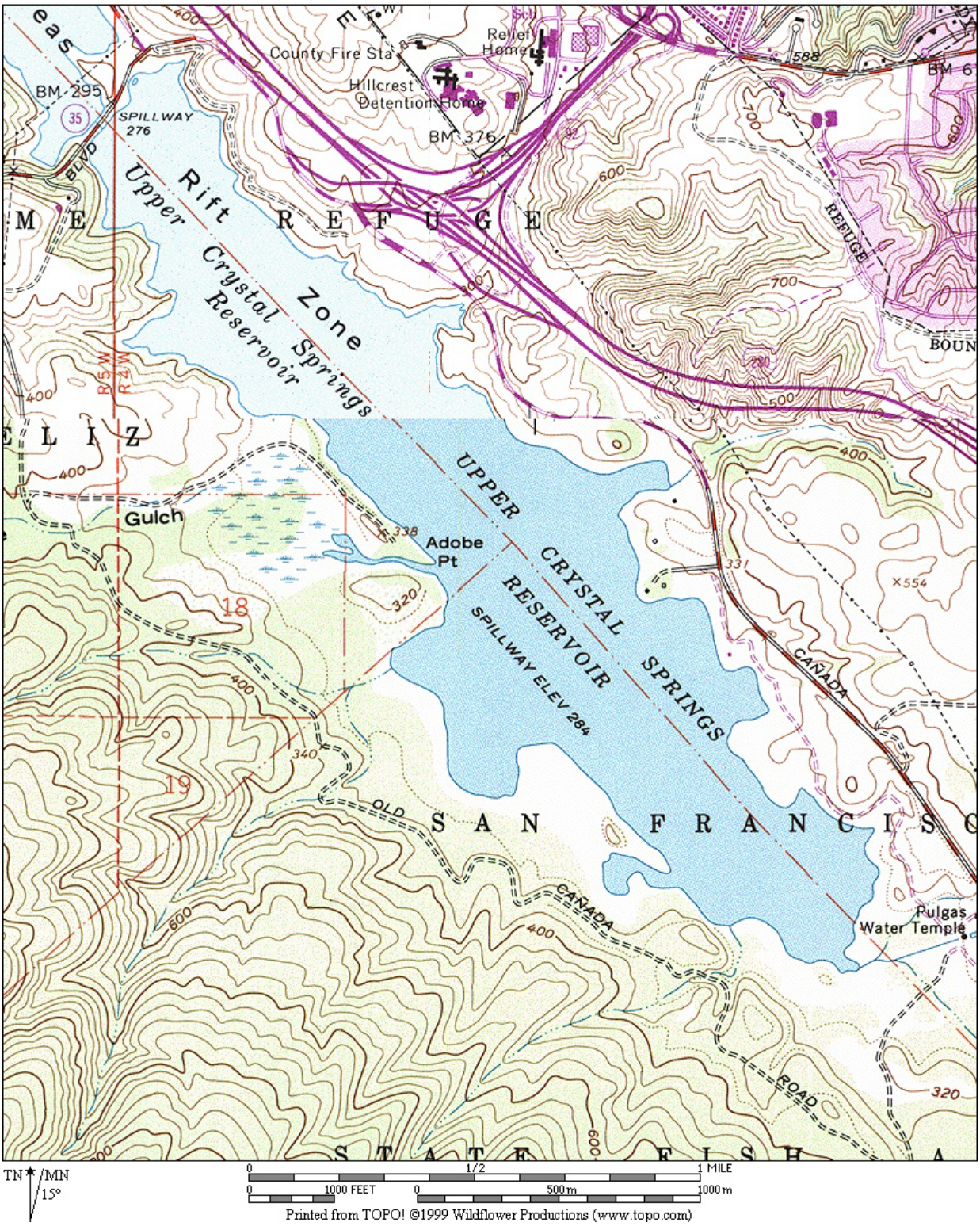

Figure 4 Upper Crystal Springs Reservoir

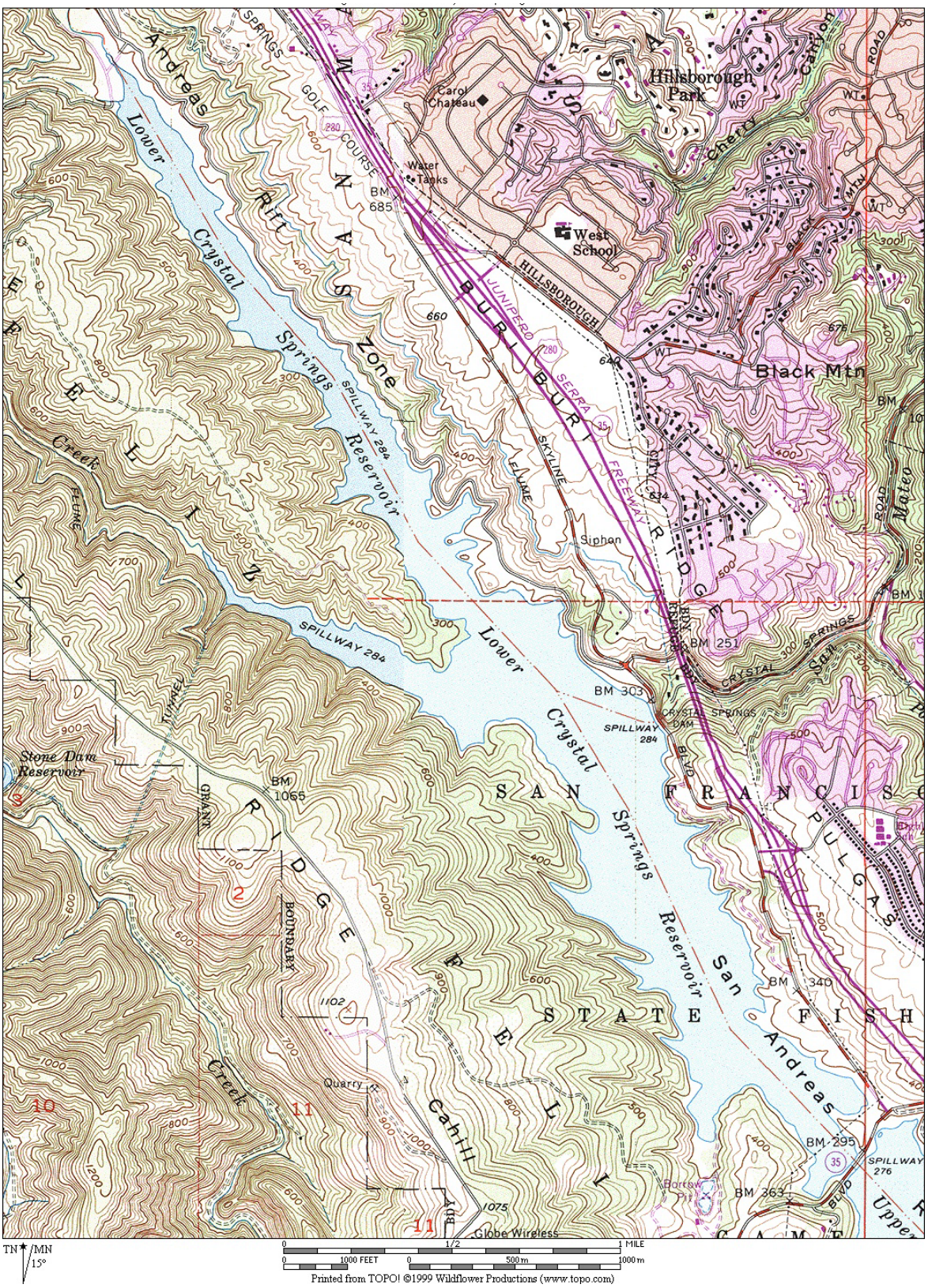

Figure 5 Lower Crystal Springs Reservoir

Figure 6 San Andreas Reservoir

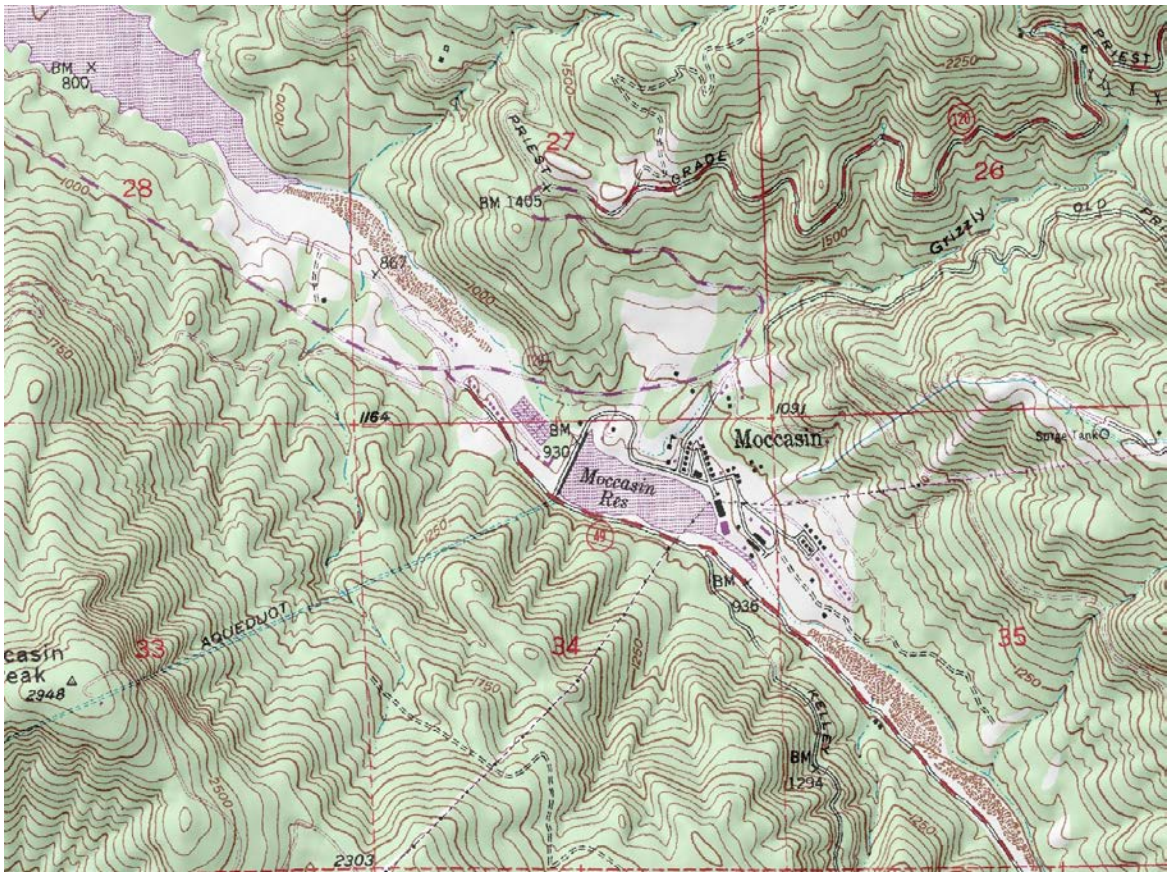

Figure 7 Moccasin Reservoir

V. REFERENCES

Cooke, G.D., *Restoration and Management of Lakes and Reservoirs*. Second Edition. Lewis Publishers.E.B. Welch, S.A. Peterson, and P.R. Newroth. 1993.