

**APPLICATION OF COPPER  
TO THE STATE WATER PROJECT TO CONTROL  
AQUATIC WEEDS AND  
ALGAL BLOOMS**

**INITIAL STUDY/  
FINAL MITIGATED NEGATIVE DECLARATION  
MAY 2014**

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# **APPLICATION OF COPPER TO THE STATE WATER PROJECT TO CONTROL AQUATIC WEEDS AND ALGAL BLOOMS**

## **SECTION 1: PROJECT DESCRIPTION**

### **INTRODUCTION AND LOCATION**

The Department of Water Resources (DWR) has applied for a State Water Resources Control Board (SWRCB) permit for application of aquatic herbicides to State Water Project (SWP) facilities to control aquatic weeds and algal blooms, in order to protect drinking water quality from diminishing through elevated tastes and odors, production of algal toxins, and to avoid aquatic plant buildup that can clog SWP filters and reduce water flows. This Initial Study (IS) evaluates the potential environmental impacts of applying aquatic herbicides on SWP facilities. The IS was prepared by DWR, for public circulation, to comply with California Environmental Quality Act (CEQA) prior to adopting a Mitigated Negative Declaration (MND). After public review and comment, DWR anticipates certifying a MND, shown in Appendix A, that will include the adoption of mitigation measures to reduce potentially significant impacts of the project to less than significant levels.

DWR has applied for a statewide General National Pollutant Discharge Elimination System (NPDES) Permit from the SWRCB to apply aquatic herbicides, when necessary, to SWP forebays and reservoirs listed in Table 1 and shown in project area maps, Figures 1-4. O'Neill Forebay lies at the foot of the Diablo Mountain Range, on the west side of the San Joaquin Valley in Merced County. Quail Lake is located in Los Angeles County within the transition zone between the Mojave Desert and mountains of the Los Padres and Angeles National Forests. Pyramid Lake is situated between the Los Padres and Angeles National Forests, about 16 miles north of Castaic in Los Angeles County. Silverwood Lake is situated at an elevation of 3,350 feet in the San Bernardino Forest within San Bernardino County.

DWR plans to apply copper complexes including copper sulfate, chelated copper compounds (Komeen® and Nautique®), and EarthTec® on an as-needed basis to control aquatic weeds and algal blooms so that the blooms do not degrade drinking water through elevated tastes and odors, production of algal toxins, clogging of filters, and reduction in water flows. Applications of copper for resource management are authorized under the General NPDES Permit No. 2013-0002-DWQ which has an effective date of December 1, 2013.

General NPDES Permit No. 2013-0002-DWQ requires strict compliance with California Toxics Rule (CTR) criteria. The SWRCB implements CTR criteria with their Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, also known as the State Implementation Plan (SIP), and applicable Basin Plans. Thus, any aquatic pesticide that contains a priority pollutant such as copper would be prohibited from being applied in concentrations that would exceed applicable water quality criteria outside an established mixing zone.

Section 5.3 of the SIP provides a categorical exception from the toxics standards where the discharge is necessary to implement control measures: 1) for resource or pest management or 2) to meet statutory requirements under the federal Safe Drinking Water Act or California Health and Safety Code, and for certain maintenance and cleaning activities. DWR's primary purpose in periodically applying aquatic herbicides to its reservoirs is: 1) to control algal blooms, and in turn, achieve secondary drinking water

standards for taste and odor and 2) to control aquatic weeds that impact the beneficial uses and conveyance of water supplies for municipal, irrigation, and industrial purposes.

Therefore, such discharges qualify for a categorical exception to the toxics standards. Accordingly, DWR plans to apply for coverage under the SWRCB’s new general permit for aquatic pesticides and, as part of that application, seek a categorical exception for its use of copper in the SWP facilities shown in Table 1. If granted, DWR would comply with all terms and conditions of the general permit.

**Table 1. SWP Facilities and Aquatic Weed and Algal Management**

	<b>Region</b>	<b>Counties</b>	<b>Problem Biota</b>	<b>Associated Problems</b>	<b>Aquatic Herbicide</b>
<b>RESERVOIRS</b>					
O’Neill Forebay	5	Merced	aquatic weeds and cyanobacteria	reduced water flows	copper-based
Quail Lake	4	Los Angeles	aquatic weeds and cyanobacteria	taste and odor and toxins	copper-based
Pyramid Lake	4	Los Angeles	aquatic weeds and cyanobacteria	taste and odor and toxins	copper-based
Silverwood Lake	6	San Bernardino	aquatic weeds and cyanobacteria	taste and odor and toxins	copper-based

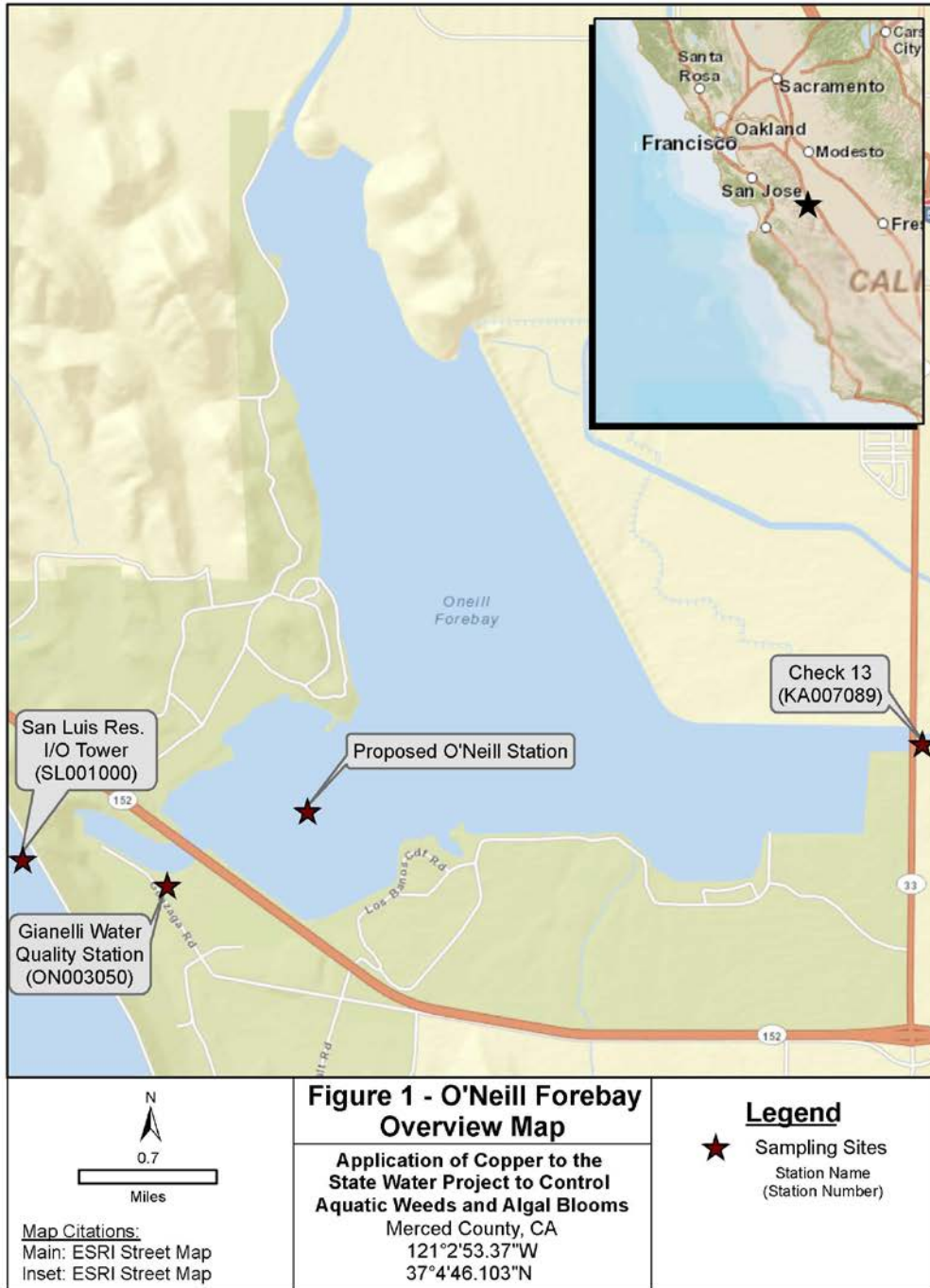
The proposed project would involve the continued applications of copper to control aquatic weeds and algal blooms at SWP reservoirs. Figures 1 – 4 provide area maps for each of the reservoirs of this project. The facilities are located within the boundaries of three Regional Water Quality Control Boards (Regions 4, 5, and 6). Table 2 summarizes general characteristics of each reservoir.

**Table 2. SWP Reservoir Characteristics**

<b>Reservoirs</b>	<b>Maximum Volume (af)</b>	<b>Surface Area at Maximum Volume (ac)</b>
O’Neill Forebay	56,400	2,700
Quail Lake	7,600	290
Pyramid Lake	171,200	1,300
Silverwood Lake	75,000	980

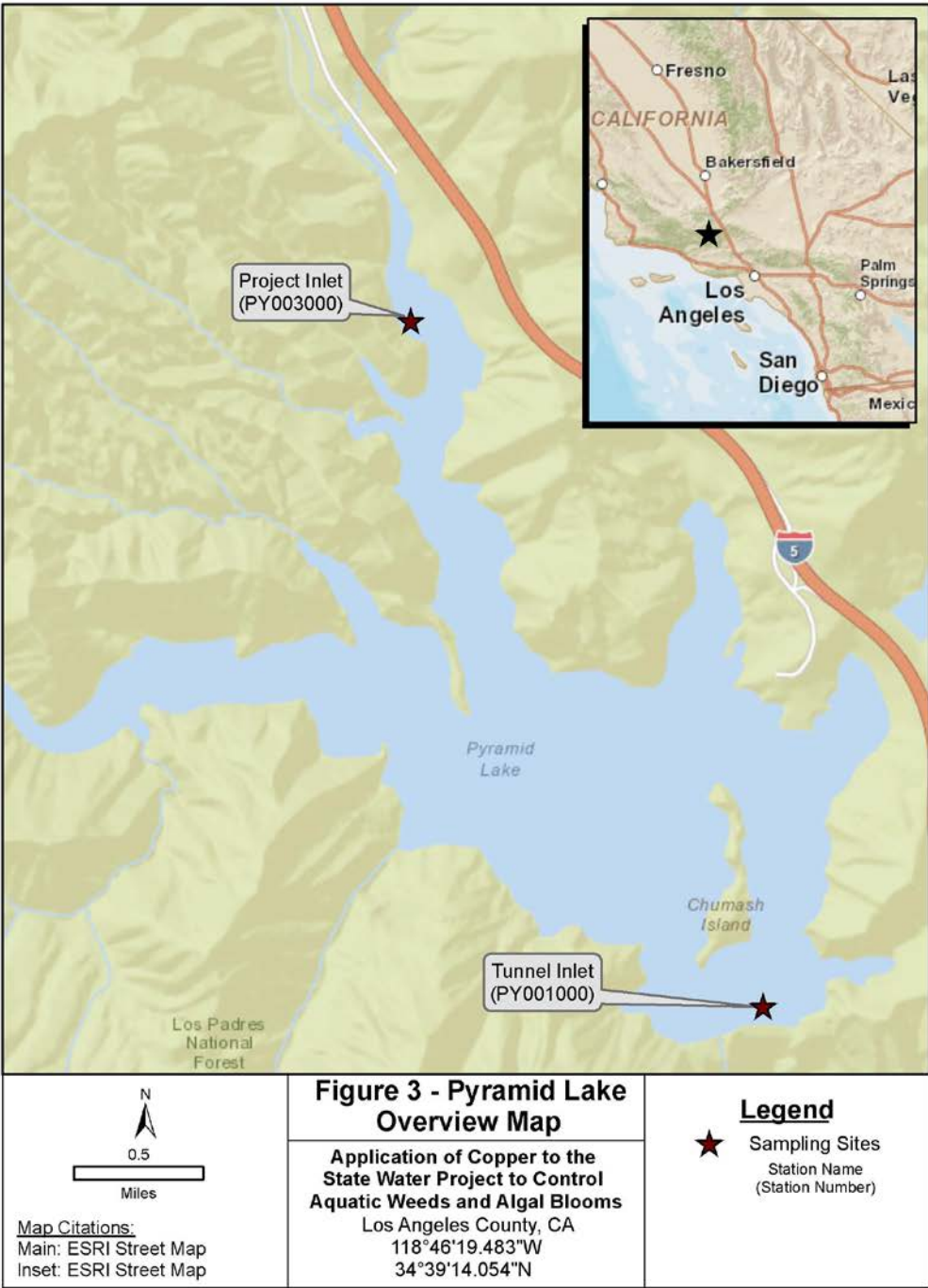
Total SWP reservoir storage volume is 5.8 million af.

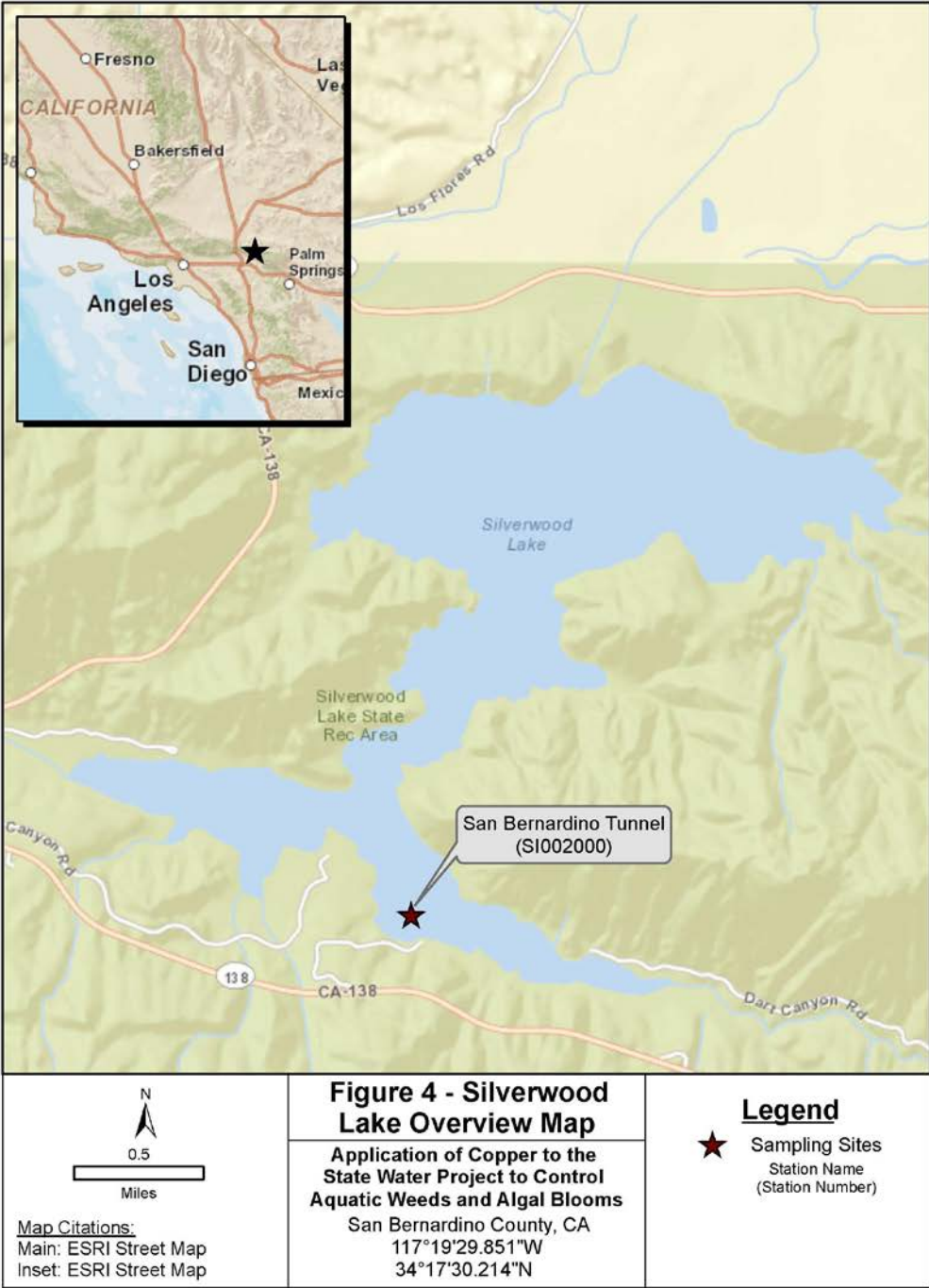
*Source: DWR, Data Handbook State Water Project, 2009*











## PROJECT BACKGROUND

DWR operates and manages the SWP, the largest state-built, multipurpose water project in the United States. The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water. The SWP provides drinking water to more than 23 million California residents and SWP water is used to irrigate about 600,000 acres of farmland, mainly in the south San Joaquin Valley. Also, the SWP was designed and built to control floods, generate power, provide recreational facilities, and enhance habitats for fish and wildlife.

DWR's mission is:

*"To manage the water resources of California in cooperation with other agencies, to benefit the state's people, and to protect, restore, and enhance the natural and human environments."*

To carry out this mission, DWR routinely monitors and tests water samples from its reservoirs, canals, aqueducts, and other water supply facilities to assure compliance with state and federal requirements for safe drinking water quality.

DWR has more than 40 monitoring stations through the SWP, and water quality monitoring provides detailed information on concentrations and distribution of chemical, physical, and biological properties at SWP facilities. Objectives of monitoring are to:

- Assess the influence of hydrological conditions and project operations on water quality.
- Document long-term changes in SWP water quality.
- Provide water quality data to assess water treatment plant operational needs.
- Identify, monitor, and respond to water quality emergencies and determine impacts to the SWP.
- Provide data needed to determine if State Water Contractors Article 19 and California Department of Public Health Drinking water Standards are being met.
- Assess issues of concern through special studies.

DWR applies copper for two main purposes: 1) to control cyanobacteria (bluegreen algae) that can produce taste and odor compounds and 2) control aquatic weeds and attached algae that can negatively impact conveyance of water supplies for municipal, irrigation and industrial purposes.

DWR routinely monitors the taste and odor compounds produced by algae. These compounds in water are often associated with earthy, musty smelling or tasting water include geosmin and 2-methylisoborneol (MIB), which are produced in natural and manmade lakes by certain types of algae. Geosmin and MIB are natural byproducts of algal chlorophyll production, although not all algae produce them in the same amounts, so the presence of algae alone is not a good indicator of taste and odor problems.

DWR's evaluation of taste and odor is based upon microscopic examination of samples, flavor profile analysis, and most importantly, the chemical analysis of MIB and geosmin. When sampling results indicate that concentrations of geosmin or MIB in reservoir waters are increasing within the 1 to 10 nanograms per liter (ng/L) range (1 ng/L is one part per trillion), DWR water quality staff respond by searching for the location of the source of the geosmin and/or MIB. To do this, water quality samples are collected and analyzed, and field staff ascertains possible algae sources. If an algae source is identified, DWR staff then develops a copper application plan to control the specific algae associated with the elevated geosmin and/or MIB concentrations.

Prior to application of copper-based compounds, DWR evaluates potential operational strategies to avoid introducing the taste and odor compounds into the distribution system. These modifications may include

withdrawing water from varying depths on the intake towers, blending, or utilizing other sources of water until the taste and odor compounds naturally disperse. If application of copper-based compounds is deemed necessary, this early warning monitoring provides detailed information on the location of the source blooms, allowing for spot applications.

Aquatic weeds and attached algae can restrict the conveyance of water in the SWP. Aquatic weed accumulation may be so severe that pumping plants experience outages thereby negatively impacting water deliveries. In O'Neill Forebay nuisance aquatic weeds include narrow-leaf pondweeds (*Potamogeton* sp.), broad pondweed (*Stuckenia striata*), and sago pondweed (*Potamogeton pectinatus* L.). Aquatic weed problems associated with the forebay include clogged trash racks and reduction of water flow into San Luis Reservoir.

To minimize the impact of aquatic weeds and algae, DWR plans to apply copper on an as-needed basis throughout the growing season at O'Neill Forebay, Quail Lake, Pyramid Lake, and Silverwood Lake. The typical growing season is from April – October, but in any given year, the growing season may extend beyond that period. DWR regularly applies copper at several other SWP facilities under a categorical exception obtained in 2004 and achieves control of aquatic weeds and algae without degrading water quality. The facilities included under the previously approved categorical exception are the South Bay Aqueduct, Clifton Court Forebay, Coastal Branch Aqueduct, the East Branch of the California Aqueduct, Tehachapi Afterbays, Castaic Lake, and Lake Perris.

## **PROJECT DESCRIPTION**

DWR proposes to apply copper to O'Neill Forebay, Quail Lake, Pyramid Lake, and Silverwood Lake to control aquatic weeds and algal blooms under the new statewide NPDES permit Water Quality Order No. 2013-0002-DWQ (NPDES permit). DWR's *Aquatic Pesticides Application Plan (APAP), 2013* was prepared to control aquatic weed and taste and odor problems while minimizing the use of copper (DWR's APAP is in Appendix B). Receiving water monitoring procedures will adhere to the Monitoring and Reporting Program described in Attachment C of the NPDES permit. The monitoring would support DWR's treatment of reservoirs and forebays with copper sulfate crystals, chelated copper products, and EarthTec® to control aquatic weeds and algal blooms.

### **Treatment of reservoirs and forebays with copper sulfate crystals to control algal blooms**

Applications of solid copper sulfate (in crystalline form) would be made to SWP reservoirs using agricultural spreaders suspended from helicopters. The spreaders would be operated over areas identified for treatment. Heliports or landing pads with loading areas located at Quail Lake, Pyramid Lake, Silverwood Lake, and O'Neill Forebay would continue to be used for the project. Quail Lake and O'Neill Forebay would also be treated nearshore by boat to control aquatic weeds. Application areas would vary in size, but would not exceed 145 acres at Quail Lake, 650 acres at Pyramid Lake, 490 acres at Silverwood Lake, or 1,350 acres at O'Neill Forebay. The applicator would be properly licensed for application of pesticides, and ground crews would wear appropriate personal protective equipment to reduce exposure to copper-based herbicides. During application, Quail Lake, Pyramid Lake and Silverwood Lake would be closed for recreational use. Access to recreational areas would be restricted at O'Neill Forebay.

## Implementation of APAP

State water quality regulators require persons using aquatic pesticides to apply for coverage under the general NPDES permit, No. 2013-0002-DWQ. To obtain coverage under this permit, applicants are required to demonstrate either that its discharges comply with the water quality criteria for priority pollutants under the CTR and National Toxics Rule (NTR) or that it qualifies for an exception from compliance with such criteria, pursuant to section 5.3 of the SWRCB's SIP. Furthermore, the permit requires applicants to develop and submit an APAP describing their pesticide applications, including best management practices (BMPs), and water quality monitoring programs.

DWR has developed an APAP (Appendix B) for copper applications that includes comprehensive BMPs to avoid and minimize the potential for copper toxicities to sensitive biological resources and a monitoring program intended to detect copper concentrations in water and any potential effects to wildlife, including fish.

The following BMPs are included in DWR's APAP for copper applications:

- **Application:** Copper sulfate is applied under the supervision of a certified pesticide applicator. Delta Field Division has one licensed Pest Control Advisor (PCA) who also works in the San Luis Field Division and a total of seven Certified Qualified Applicators (QAC). Southern Field Division has two licensed PCAs and six to eight certified QACs. These individuals are trained to ensure that algaecides and aquatic herbicides are applied at rates consistent with label requirements and in a manner that avoids potential adverse effects including, but not limited to, fish kills. Copper sulfate has been used since the early 1970s to control filter clogging algae and taste and odor producing cyanobacteria.
- **Notification:** State Water Contractors, who also provide treated municipal water to customers, are notified by email at least 48 hours prior to a treatment. The notification includes date, start and end time of the treatment, and travel time of copper sulfate by milepost. Additionally, a PCA will submit a written recommendation for the use of aquatic herbicides to the County Agricultural Commissioner.
- **Treatment:** The copper is applied during daylight hours of maximum photosynthetic activity to optimize copper uptake by the algal community.
- **Spill Prevention and Cleanup:** Staff will apply copper sulfate according to label instructions in order to prevent spills. In the event of a spill, staff will follow the field division's established emergency response procedures and refer to the applicable material safety data sheet (MSDS) for instructions on containing and cleaning up the spill. Emergency response and MSDS procedures will be reviewed regularly. A copy of the emergency response procedures and MSDSs will be available during each treatment. Cleanup equipment will be kept in good working order and will be readily available at each application site.
- **Monitoring:** Water quality is monitored before, during, and after treatments. Parameters measured are water temperature, turbidity, pH, specific conductance, active ingredient (copper), dissolved oxygen (DO), and hardness as required by the NPDES general permit and stated in the APAP (Appendix B).
- **Access:** Depending on the facility, public access is temporarily closed or restricted in order to avoid exposure.

- **Post-Treatment:** The efficacy of the treatment is evaluated at about one week after the application. Algae are surveyed to determine the effectiveness of the treatment at reducing biomass, and taste and odor compounds are monitored weekly throughout the year.

Monitoring data collected as part of the APAP are used to:

- identify water quality improvements or degradation;
- detect fish (and other wildlife) kills through visual fish and wildlife monitoring;
- recommend improvements to the APAP; and
- compare monitoring data to water quality standards.

## **PROJECT SCHEDULE**

Application of copper to the lakes and forebay would be carried out only as needed, that is, when other control options have been exhausted.

## **REQUIRED APPROVALS**

Application of copper would require obtaining a permit from the SWRCB.

## SECTION 2: Environmental Checklist Form

1. **Project title:** Application of Copper to the State Water Project to Control Aquatic Weeds and Algal Blooms
2. **Lead agency name and address:**  
Department of Water Resources  
1416 Ninth Street, Room 620  
Sacramento, CA 95814
3. **Contact person and phone number:** Diane Shimizu, (916) 653-1154
4. **Project location:** O'Neill Forebay, Quail Lake, Pyramid Lake, and Silverwood Lake California
5. **Project sponsor's name and address:**  
Department of Water Resources  
1416 Ninth Street, Room 620  
Sacramento, CA 95814
6. **General plan designation:** Reservoirs      7. **Zoning:** Public Facilities
8. **Description of project:** See Project Description in Section 1 of the IS/Mitigated Negative Declaration
9. **Surrounding land uses and setting:** See Project Description in Section 1 of the IS/Mitigated Negative Declaration
10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):** State Water Resources Control Board

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Aesthetics                      | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality                        |
| <input checked="" type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology/Soils                      |
| <input type="checkbox"/> Greenhouse Gas Emissions        | <input type="checkbox"/> Hazards & Hazardous Materials      | <input checked="" type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning               | <input type="checkbox"/> Mineral Resources                  | <input type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population/Housing              | <input type="checkbox"/> Public Services                    | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Transportation/Traffic          | <input type="checkbox"/> Utilities/Service Systems          | <input type="checkbox"/> Mandatory Findings of Significance |

DETERMINATION:

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



### SECTION 3: EVALUATION OF ENVIRONMENTAL IMPACTS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a, b, & c.** This project involves the periodic application of copper sulfate to several reservoirs. All project work is short-term, with each treatment occurring during a single day, and will not have a presence beyond work windows. Each reservoir would be treated a maximum of five times per year. While Silverwood Lake has designated scenic viewpoints and Highway 152, adjacent to O’Neill Forebay, is a designated state scenic highway, the work will be temporary near these areas. In addition, the only on ground footprint during application periods will be the small staging areas. Since the staging areas will be located in previously developed areas, no alterations to the land will be necessary. Due to the short work windows and lack of permanent structures or alterations to the environment, this project will have less than significant impact on the aesthetics of the regions in question.

**d.** The proposed project will not result in any new sources of light or glare and any activities during work windows will be limited in time and scope. Therefore, this project will have no adverse impact on day or nighttime views.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>II. AGRICULTURAL AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. -- Would the project:</p>				
<p>a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a, b, c, d, & e.** All project locations will be located within DWR owned and operated lands. There are no current agriculture or forest resources located at any of the staging areas, and there is no conflict with existing zoning or Williamson Act lands. Furthermore, since work site footprints will be located on developed land, no land use conversions will occur as a result of this project. Therefore, this project poses no impact to agricultural or forest resources.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:</p>				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a, b, & c.** The reservoirs covered by this project are located within two separate air quality districts. The southern reservoirs (Quail Lake, Pyramid Lake, and Silverwood Lake) are under the jurisdiction of the South Coast Air Quality Management District (SCAQMD), while O’Neill Forebay is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Each of these districts has the authority and responsibility to regulate air quality within their respective administrative areas. Regulation by either agency occurs through the implementation and enforcement of appropriate air quality management plans (AQMP). All projects occurring within the jurisdiction of each district must

identify and mitigate any contribution to adverse air quality deemed significant based on thresholds in the applicable AQMP.

In order to identify any contributions to adverse air quality produced by the proposed project, the major emissions sources related to the project were evaluated for their impacts to regional air quality. The activities included in this analysis include those associated with emissions from vehicle trips and emissions from spraying operations. The air quality analysis was performed using several emissions factors and models, based on known and assumed procedures.

The mobile emissions, those from staff vehicles and the truck transporting the application material, were calculated using the most recent emissions factors used by the California Air Resources Board's (CARB's) EMFAC2011 emissions model for both air districts. The air pollutant constituents provided by this model include reactive organic gasses (ROG), total organic gasses (TOG), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>) and sulfur (SO<sub>x</sub>), and both inhalable coarse particulate matter less than 10 microns in diameter (PM<sub>10</sub>), and fine particles less than 2.5 microns in diameter (PM<sub>2.5</sub>). For the EMFAC model, ROG is the same as VOC (volatile organic compounds). The parameters used for calculating the total automobile source emissions derived from the vehicle type and usage for similar projects at other locations. For this project it was assumed there would be no more than five pickup trucks (EMFAC2011 vehicle classification LDT2), a hopper truck (T7 Ag), a water truck (T6 instate small), and a flatbed trailer (T7 tractor), each averaging 75 miles per day. The total emissions from each vehicle class for each district are shown in Tables 3(a) & (b). Detailed information about each calculation, as well as the specific emissions factors used, is located in Appendix C.

In addition to the automobile source emissions, mobile source emissions for the helicopter used during this project were also calculated. The emissions factors used for this calculation are for a Bell 206b and were taken from the Swiss Confederation, Federal Office of Civil Aviation's (FOCA) report "Guidance on the Determination of Helicopter Emissions". Aircraft emissions calculations require separate emissions factors for both the landing and take-off cycle (LTO) and hourly sustained flight; both emission factors are calculated in Appendix C. The specific pollutants addressed for the helicopter emissions include CO, NO<sub>x</sub>, and PM<sub>2.5</sub>, as well as total hydrocarbons (THC). In most cases, THC is analogous to TOG (EPA, 2010), meaning they can be combined for the comparison portion of this analysis. In addition to the EMFAC emissions results, Tables 3(a) & (b) show the total helicopter emissions calculated for this project and total pounds per day for each air district.

**Table 3(a) – San Joaquin Project Emissions Results**

Pollutant	LDT2 Emissions (lbs/day)	T7 Ag Emissions (lbs/day)	T6 instate small Emissions (lbs/day)	T7 tractor Emissions (lbs/day)	Helicopter Emissions (lbs/day)	Total Emissions (lbs/day)
ROG	0.194	0.107	0.057	0.070	-	0.428
TOG	0.214	0.122	0.065	0.080	-	0.481
THC	-	-	-	-	25.85	25.85
CO	2.079	0.500	0.187	0.327	33.12	36.213
NOX	0.252	2.318	0.953	1.860	10.23	15.613
PM10	0.039	0.086	0.058	0.052	-	0.235
PM2.5	0.017	0.070	0.042	0.039	0.34	0.508
SOX	0.004	0.003	0.002	0.003	-	0.012

Source: CARB EMFAC2011 & FOCA

**Table 3(b) – South Coast Project Emissions Results**

Pollutant	LDT2 Emissions (lbs/day)	T7 Ag Emissions (lbs/day)	T6 instate small Emissions (lbs/day)	T7 tractor Emissions (lbs/day)	Helicopter Emissions (lbs/day)	Total Emissions (lbs/day)
ROG	0.167	0.100	0.035	0.067	-	0.369
TOG	0.186	0.114	0.040	0.076	-	0.416
THC	-	-	-	-	25.86	25.86
CO	1.857	0.450	0.143		33.12	35.895
NOX	0.215	2.289	0.743	1.868	10.23	15.345
PM10	0.039	0.092	0.051	0.056	-	0.238
PM2.5	0.017	0.075	0.035	0.043	0.34	0.51
SOX	0.004	0.003	0.002	0.003	-	0.012

Source: CARB EMFAC2011 & FOCA

SCAQMD is a non-attainment region for State and Federal levels of ozone, PM2.5, and PM10.

SJVAPCD is an attainment region for PM10 at the Federal level but non-attainment at the State level. In addition, SJVAPCD is non-attainment for State and Federal levels of ozone and PM2.5. Both air districts have prepared AQMPs to reach attainment for these pollutants in their respective air basins. The AQMPs contain project-level thresholds that must not be exceeded in order for each district to reach attainment. Projects that increase pollutant levels of the criteria pollutants beyond approved thresholds may have a potentially significant affect on the environment. Since each district is individual in their approach to determining significance, separate analysis was required for each project region.

### SCAQMD Analysis

The SCAQMD uses two significance threshold tables for determining project effects on air quality. These thresholds, localized and regional significance thresholds, each have their own requirements and are utilized separately. The regional significance thresholds are the overarching set of values used to determine the project's effects on air quality. The regional significance thresholds for the SCAQMD are shown in Table 4. When these values are compared to the calculated project emissions, it is clear that this project is far below the significance thresholds determined by the SCAQMD.

**Table 4 – SCAQMD Mass Daily Thresholds Comparison (lbs/day)**

Pollutant	Mass Daily Threshold (Construction)	Calculated Emissions from Table 3(b)
NOX	100	15.345
VOC	75	0.369
PM10	150	0.238
PM2.5	55	0.51
SOX	150	0.012
CO	550	35.895

*Source: SCAQMD Air Quality Significance Thresholds*

The second set of significance thresholds are the localized significance thresholds. The specific values used for determining a project’s localized impacts are based, in part, on the distance from the nearest sensitive receptors. The furthest distance used by the localized significance thresholds is 500 meters. While the classification of sensitive receptors differs between agencies, “for the purposes of a CEQA analysis, the SCAQMD considers a sensitive receptor to be to be a receptor such as residence, hospital, convalescent facility were [sic] it is possible that an individual could remain for 24 hours” (SCAQMD, 2008). The only project site within 500 meters of a sensitive receptor is Quail Lake; however, project operations and helicopter flyovers will not occur in those areas within 500 meters of the sensitive receptor. Since the operations at Quail Lake and at the other sites will not occur within 500 meters of any sensitive receptors, no further examination under the localized significance thresholds is necessary.

**SJVAPCD Analysis**

The SJVAPCD analysis method uses estimated emissions calculations, however, the classification and determination of the thresholds of significance differ from SCAQMD emission types. Project emissions for this air district were calculated using EMFAC2011 then compared to predetermined thresholds of significant impact for ROG, NOx, and CO. The thresholds for the ozone precursors (ROG and NOx) are based on annual accumulation and are determined to be 10 tons/year for each type. The carbon monoxide threshold is calculated differently and is based on the California Ambient Air Quality Standard (CAAQS) of 9 parts per million (ppm) averaged over 8 hours. Based on the calculated daily emissions in Table 3(a), this project will fall well below these standards. Thus the project’s emissions are deemed to be less than significant.

In addition to the comparison of emissions to significance thresholds, the SJVAPCD has approved a series of rules to mitigate fugitive dust (PM10). These rules, collectively called Regulation VIII, address PM10 generated during the construction phase and provide a series of control measures that projects should implement. According to the SJVAPCD, “compliance with Regulation VIII for all sites and implementation of all other control measures indicated in Tables 6-2 and 6-3 (as appropriate, depending on the size and location of the project site) will constitute sufficient mitigation to reduce PM-10 impacts to a level considered less than- significant” (SJVAPCD, 2002). The other control measures indicated in Table 6-3 in the Guide for Assessing and Mitigating Air Quality Impacts refer to projects larger than the project proposed here. The control measures shown on Table 6-2 of the GAMAQI are meant for projects

of this size and include the Regulation VIII control measures necessary for this project. The applicable control measures from Table 6-2 of the GAMAQI are listed below.

Regulation VIII Control Measures Applicable to this Project:

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)

This project will implement these applicable Regulation VIII control measures thereby ensuring that this project's PM10 emissions are at a level deemed less than significant.

One area in which these two air districts are similar is the treatment of hazardous air pollutants. Both districts have set thresholds of significance for carcinogenic and non-carcinogenic exposure due to project activities. The application materials used during this project are not known carcinogens nor are they listed as hazardous air pollutants. Therefore, this project will not contribute to an increase in the probability of nearby individuals contracting cancer nor will it increase concentrations of toxic air contaminants.

Due to this project's compliance with each district's thresholds of significance, the lack of carcinogenic and hazardous air pollutants, and the use of recommended control measures for PM10 it has been determined that this project has a less than significant impact on the implementation of any AQMP and will not violate air quality standards or contribute to a significant increase in pollutants classified as non-attainment.

**d.** Since the project distance from sensitive receptors is unique for each reservoir, it was determined using aerial photography for each reservoir individually. In the case of this project, the distance to sensitive receptors was measured from the edge of the expected application areas to the nearest sensitive receptor. This was done to ensure that the effects on sensitive receptors from emissions by vehicles used for the application (either boats or helicopters) are included in the analysis. The standard operating procedure for this type of pesticide application requires closing the water body to all recreational uses for the duration of the project, meaning the nearest receptors would all be on land. All four reservoirs involved in this project have publicly accessible recreation facilities along the shore. In order to minimize exposure to these receptors, all project staging areas will be located away from recreational facilities or on those facilities that will be closed to the public during the application period.

In addition, both Silverwood Lake and O'Neill Forebay have State Parks campgrounds located adjacent to the waterline, which will not be closed during application periods. While the emissions from the helicopters have been found to be negligible and the application material being used is not a known hazardous air pollutant, steps will be taken to limit public concerns surrounding the aerial spraying. The purpose of this is to limit concerns over potential overspray into areas near the public access points. These steps include ceasing aerial spraying in high winds and the use of boats for all applications within 500



meters of sensitive receptors. Following these procedures, as well as typical operating procedures for these types of projects, there will be a less than significant impact on nearby sensitive receptors.

e. A further analysis requirement for each district is for odor affects. Since the copper compounds applied during this project are odorless, there will be no impacts due to odors from the project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>IV. BIOLOGICAL RESOURCES -- Would the project:</p>				
<p>a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Discussion

DWR contracted with ESA consultants to conduct a biological survey to evaluate potential impacts to biological resources resulting from the project. Their technical report is included as Appendix D of this document. The *Impact Analysis* of the ESA report is incorporated in the biological resources section of this IS.

a. This section describes the potential impacts to special-status species that may occur within or along the shoreline of each water body. No critical habitat, as designated by USFWS, occurs in the project area. The staging areas for the herbicide application are developed to accommodate SWP operational activities and do not contain special-status plant or animal species.

## Special-Status Plants

This section describes the potential impact to special-status plant species that may occur along the shore of each water body.

The following seven special-status plants have the potential to occur along the shoreline of Pyramid Lake:

- Horn's milkvetch (*Astragalus hornii* ssp. *hornii*)
- Monkey-flower savory (*Clinopodium mimuloides*)

- Mojave tarplant (*Deinandra mohavensis*)
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*)
- California satintail (*Imperata brevifolia*)
- Ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*)
- San Bernardino aster (*Symphotrichum defoliatum*)

The following three special-status plants have the potential to occur along the shoreline of Silverwood Lake:

- Palmer's mariposa-lily (*Calochortus palmeri*)
- San Bernardino aster
- Black bogrush (*Schoenus nigricans*)

The following three special-status plants have the potential to occur along the shoreline of Quail Lake:

- Late-flowered mariposa-lily (*Calochortus fimbriata*)
- Palmer's mariposa-lily
- San Bernardino aster

The following two special-status plants have the potential to occur along the shoreline of O'Neill Forebay:

- Hispid birds-beak (*Chloropyron molle* ssp. *hispidum*)
- Sanford's arrowhead (*Sagittaria sanfordii*)

### **Plants Potentially Occurring in Upland Areas**

The copper sulfate would be applied using a helicopter that would depart from previously developed areas, away from native habitats where special-status plants potentially occurring in upland areas (i.e., Horn's milkvetch, monkey-flower savory, Mojave tarplant, Los Angeles sunflower, California satintail, ocellated Humboldt lily, San Bernardino aster, Palmer's mariposa-lily, late-flowered mariposa-lily, and hispid birds-beak) could be present. Project activities would include unloading pallets of copper sulfate from a truck to the helicopter pad area, loading the copper sulfate into bins and depositing the material into the reservoir using a helicopter or boat. No copper sulfate would be dispersed within upland habitat areas where these plants could be present, and the helicopter pad areas are generally devoid of vegetation. As a result, potential impacts to special-status plants potentially occurring in upland areas (i.e., Horn's milkvetch, monkey-flower savory, Mojave tarplant, Los Angeles sunflower, California satintail, ocellated Humboldt lily, San Bernardino aster, Palmer's mariposa-lily, late-flowered mariposa-lily, and hispid birds-beak) would be less than significant.

### **Plants Potentially Occurring in Open Water Areas**

The copper sulfate would be applied to control planktonic algae by helicopter and/or boat to open water areas of the lake away from the immediate shoreline. Applications would be dispersed on the lake using a boat targeting nuisance algal blooms and submerged aquatic weeds. No special-status plant species would be present within the open water areas of the lake/forebay where applications would be primarily

targeted, and therefore, there would be no special-status plants impacted directly or indirectly during the applications in open water areas.

### **Plants Potentially Occurring in Shoreline Areas**

There is potential for two special-status plants to occur within the shoreline areas of the reservoirs where copper sulfate applications would be conducted to reduce nuisance algae. Special-status species with the potential to occur in shoreline areas of the reservoirs are wetland plants and include black bogrush and Sanford's arrowhead. Black bullrush and Sanford's arrowhead, if present, would occur in seasonally or perennially saturated areas along the shorelines of Silverwood Lake (black bogrush) and O'Neill Forebay (Sanford's arrowhead). Sanford's arrowhead also has the potential to occur in inundated areas at O'Neill Forebay.

The use of copper sulfate for weed and algae management is limited to aquatic environments and affected vegetation generally includes algae and submerged and floating broadleaf plants (DiTomaso, 2012). The US Environmental Protection Agency ascertains that their assessment of the ecological effects of copper sulfate "does not indicate a risk of concern to freshwater vascular plants or estuarine/marine plants" (United States Environmental Protection Agency [USEPA], 2008).

Only plant tissues present in water would potentially come in contact with copper sulfate. Wetland habitats with saturated soils but no standing water are considered to be outside of the area where applications would be targeted and these are the areas most likely to support black bogrush. Copper sulfate is not likely to be taken up through roots in soil substrate. Copper is generally considered to be biologically inactive in sediments (Gettys, Haller, and Bellaud, 2009) because it becomes strongly adsorbed to the soil (DiTomaso et al 2013). Therefore, even in inundated areas, plants rooted in soil are unlikely to take up toxic levels of copper via the root system.

Black bogrush and Sanford's arrowhead, if present, are unlikely to be negatively affected by the application of copper sulfate because the majority of the above-ground tissue is typically present outside of the water column and limited plant tissue would come in contact with copper sulfate resulting in limited exposure. Black bogrush and Sanford's arrowhead would be unlikely to accumulate enough copper sulfate to result in toxicity. As a result, potential impacts to special-status plants potentially occurring in shoreline areas would be less than significant.

### **Special-Status Wildlife**

Several special-status species have the potential to occur within the reservoirs or along the immediate shoreline areas and a list of special-status species by reservoir is provided below. A discussion of potential impacts to these species is also provided below. The discussion is organized into two sections based on habitat types used by the different species – impacts to aquatic habitat and impacts to upland habitat.

The following eight special-status wildlife species have the potential to occur within Pyramid Lake or along the immediate shoreline:

- Western pond turtle (*Emys marmorata*)
- Arroyo toad (*Anaxyrus californicus*)

- Foothill yellow-legged frog (*Rana boylei*)
- Western spadefoot (*Spea hammondi*)
- Two-striped garter snake (*Thamnophis hammondi*)
- Tricolored blackbird (*Agelaius tricolor*)
- Northern harrier (*Circus cyaneus*)
- Bald eagle (*Haliaeetus leucocephalus*)

The following seven special-status wildlife species have the potential to occur within Silverwood Lake or along the immediate shoreline:

- Arroyo toad
- California red-legged frog (*Rana draytonii*)
- San Bernardino ring-necked snake (*Diadophis punctatus* ssp. *modestus*)
- Southern mountain yellow-legged frog (*Rana muscosa*)
- Two-striped garter snake
- Western pond turtle
- Bald eagle

The following four special-status wildlife species have the potential to occur within Quail Lake or along the immediate shoreline:

- Northern harrier
- Foothill yellow-legged frog
- Western pond turtle
- Bald eagle

The following ~~nine~~<sup>thirteen</sup> special-status wildlife species have the potential to occur within O’Neill Forebay or along the immediate shoreline:

- California tiger salamander (*Ambystoma californiense*)
- Cackling goose (*Branta hutchinsii* ssp. *leucopareia*)
- Northern harrier
- Western pond turtle
- California red-legged frog
- Western spadefoot
- Giant garter snake (*Thamnophis gigas*)
- Tricolored blackbird
- Yellow warbler (*Dendroica petechia brewsteri*)
- Bald eagle
- Golden eagle (*Aquila chrysaetos*)
- Swainson’s hawk (*Buteo swainsoni*)
- White-tailed kite (*Elanus leucurus*)

## **Impacts to Aquatic Habitat**

Impacts to aquatic habitat could occur through immediate exposure and toxicity, long-term exposure and bioaccumulation, and through post-application decreases in dissolved oxygen. Each of these impact mechanisms is described below.

### ***Immediate Exposure and Toxicity***

Wildlife species that utilize aquatic habitats associated with the lakes, including fish, amphibians, reptiles, and birds, could be exposed to copper sulfate, the active ingredient in aquatic herbicides being used, if they are present in the application areas during periods when applications are taking place. Studies have shown that the application of copper sulfate to surface waters for nuisance algae control in reservoirs have no apparent negative effects for most adult game fish (Anderson et al., 2001). However, copper sulfate has been shown to be toxic to larval fish and aquatic invertebrates (Diamond, et al., 1997; TOXNET, 1975-1986.). CDFW laboratory tests have shown that concentrations of 1,000 parts per billion (ppb) are many times below the toxicity values for delta smelt (California Department of Boating and Waterways [DBW], 2001). Salmonids tend to be more sensitive to copper sulfate than other fish species but tests for rainbow trout have also shown toxicity values many times higher than the application concentrations that would occur with this project (DBW, 2001). Copper concentrations would be applied according to the label to achieve a maximum concentration of 1,000 ppb, well below any known concentrations that may be toxic to fish in the project area.

Copper sulfate exposure poses less of a threat to birds than to other animals, with the lowest lethal dose for this material in pigeons and ducks being 1,000 parts per million (ppm) (Tucker and Crabtree, 1970). This toxicity value is many times higher than the application concentrations that would occur for this project.

The potential for special-status amphibians to be exposed to copper applications is low because habitat within the reservoirs is generally not suitable and these species would not be expected to occur where applications would be targeted. Arroyo toad inhabits washes, arroyos, sandy riverbanks, and riparian areas. Southern mountain yellow-legged frog and foothill yellow-legged frog also inhabit small streams with sandy banks and would not be expected to occur within the reservoirs. California red-legged frog is principally a pond frog that can be found in quiet permanent waters of ponds, pools, streams, springs, and marshes. Similarly, California tiger salamander are typically found occupying habitat in small stock ponds and would not be expected to occur in any of the reservoirs.

The potential for two-striped garter snakes to be exposed to copper applications is also low because this species is generally found around pools, creeks, cattle tanks, and other water sources, often in rocky areas, in oak woodland, chaparral, brushland, and coniferous forest. The potential for giant garter snakes to be exposed to applications is also low because this species generally inhabits freshwater marshes and swamps of the Central Valley. Western pond turtles are typically found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grasslands. While it is possible that they could be present in areas exposed to applications of copper sulfate, it is unlikely. If they are present in areas where copper applications would be conducted, the effects would be expected to be negligible due to the small amount of copper that would be applied. Lastly, with implementation of the Aquatic Pesticides Application Plan (see Appendix

B), fish (and other wildlife) distress and/or kills would be detected through visual fish and wildlife monitoring during and after applications. If distressed turtles are observed during monitoring, these results would be reported and application procedures would be refined in order to avoid any potential harm.

Because the potential for special-status species exposure to copper sulfate applications is low and because targeted application concentrations of copper sulfate are substantially lower than toxicity thresholds for sensitive fish and wildlife, impacts associated with immediate exposure and toxicity would be less than significant.

### ***Long-term Exposure and Bioaccumulation***

Although copper sulfate is highly water soluble; that is, it dissolves very easily in water, the copper ions are strongly adsorbed by soil (lake-bottom sediment) particles when it is applied (TOXNET, 1975-1986). Copper compounds, or precipitates, also settle out of solution, in a process called precipitation. Copper that is absorbed by sediments and copper precipitates are biologically inactive, meaning that they do not undergo further biological changes (Gangstad, 1986). Additionally, copper that is not in a soluble form (i.e., absorbed by sediment or copper precipitate) is less available for uptake into the food web and less toxic (Moffett et al., 1998). Because copper sulfate applications are expected to be rapidly absorbed by lake sediments (TOXNET, 1975-1986) and/or form precipitates and fall out of solution, and these forms are much less bio-available and toxic, impacts associated with long-term exposure and bioaccumulation of copper are less than significant.

### ***Post-application Decreases in Dissolved Oxygen***

While not associated with direct copper toxicity, aquatic herbicides, including copper sulfate have the potential to result in temporary decreases in dissolved oxygen (DO) concentrations in water if large blooms of algae are treated at one time or through frequent treatments that occur over a relatively short duration. Low DO concentrations (< 5 to 6 mg/L) can occur when the decomposition of organic matter (dead algal matter) results in high biological oxygen demand (BOD). Sudden increases in BOD and associated decreases in DO (below 5 to 6 mg/L for warmwater fish and below 6 to 8 mg/L for coldwater fish, including salmonids) can result in conditions that are unsuitable for fish and lead to fish kills (State Water Resources Control Board [SWRCB], 2004). Substantial decreases in DO are not expected to result from copper sulfate applications because DWR has developed and implements an APAP describing their copper sulfate applications, including best management practices (BMPs), and water quality monitoring programs. Therefore, with the implementation of the APAP, this impact is less than significant.

Additionally, at O'Neill Forebay, water would not be released from the forebay into the adjacent O'Neill Forebay Wildlife Area during copper sulfate application.

Based on a review of past monitoring reports (DWR, 2011, 2012, and 2013b), there have been no reported periods of prolonged water quality degradation, distressed fish, or fish kills associated with these past copper sulfate applications.

In summary, based on a review of copper concentration toxicities to fish and birds, the concentrations of copper that would be achieved with applications of copper, and bioavailability of copper in lake sediments, impacts resulting from copper sulfate exposure would be **less than significant**. DWR's

adherence to the APAP would further ensure that water quality and sensitive biological resources within the lakes would not be impacted by the application of copper sulfate. Additionally, copper sulfate applications may reduce the potential for fish kills, and reduce risks to other animals, by killing algal biomass which can produce toxins that are toxic to all animals.

### **Impacts to Upland Habitats**

As discussed above for special-status plants, the proposed project would not affect upland native habitat areas and, as a result, would not be anticipated to affect any terrestrial wildlife species utilizing those habitats, including special-status species such as western spadefoot. However, there are a number of resident and seasonally present bird species that have the potential to nest and/or forage in the vicinity of the proposed project site in trees and adjacent vegetation along the shoreline. These species include tricolored blackbird, northern harrier, bald eagle, cackling goose, and yellow warbler. Depending on the timing of application, repeated noise and wind disturbance from helicopters and drift of copper sulfate during aerial applications could affect habitats close to the shoreline where birds may nest. Repeated noise and wind disturbance from helicopters and copper sulfate drift could also cause a nesting bird to abandon a nest resulting in loss of eggs or chicks, or affect the nest directly if eggs or chicks are present. Such impacts to active nests would be a violation of the MBTA and Fish and Game Code (see Section 3.2.1 above). Implementation of the mitigation measure recommended below would reduce the potential for injury or mortality of nesting birds during helicopter applications through application timing, pre-application nesting bird surveys, and establishment of nesting buffers.

#### **Mitigation Measure BIO-1: Impact Avoidance to Nesting Birds**

The following mitigation measures are recommended to reduce potential impacts to nesting birds during application of copper sulfate by helicopters:

- If a copper sulfate application is scheduled to occur during the breeding season (February 1–~~August 31~~September 15), it is recommended that a qualified biologist conduct pre-application surveys of all potential nesting habitats within 500 feet of proposed helicopter application activities. Surveys at O’Neill Forebay will follow the survey methodology of the Swainson’s Hawk Technical Advisory Committee (SWHA TAC, 2000) and the Bald Eagle Breeding Survey Instructions (California Department of Fish and Game (CDFG), 2010). At least one survey should be conducted no more than three days prior to these activities. If the application is scheduled to occur during the non-nesting season (September 1–16 through January 31) at Quail Lake, Pyramid Lake, or Silverwood Lake, a pre-application survey is not necessary and no additional measures are recommended. At O’Neill Forebay, surveys for burrowing owl nests will be conducted using the survey methodology described in “Staff Report on Burrowing Owl Mitigation dated March 7, 2012 (CDFG, 2012) any time of year that an application by helicopter is planned.
- If active nests are found at Quail Lake, Pyramid Lake, or Silverwood Lake, no-disturbance buffers shall be implemented around each nest based on the species and location of the nest as determined by a qualified biologist, or the nest should be closely monitored during applications to ensure that helicopter does not create physical disturbance and copper sulfate does not inadvertently drift into the nest. If a buffer is preferred, a general buffer distance typically includes 500 feet around any confirmed active raptor nest or a 300-foot buffer around nests of passerine bird species protected in accordance with the MBTA and/or Fish and Game Code. Additionally, helicopters shall not fly vertically over trees with active nests



unless an adequate elevation can be achieved to ensure that downward wind generated by the propulsion would not physically disturb the tree. However, buffer distances can be determined by the biologist based on location, vegetation cover, species, and other factors. The buffers should be implemented until it is determined by a qualified wildlife biologist that young have fledged and the nest is determined to be inactive.

- If active nests are found at O’Neill Forebay, identified nests of special status species will be continuously surveyed for 24 hours prior to any activities related to helicopter applications in order to establish a behavioral baseline. During the application, the nests will be continuously monitored to detect any behavioral changes. No-disturbance buffers of 500 feet shall be implemented around each nest for non-listed bird species, while buffers of 0.5 miles will be implemented for nests of all raptors. Additionally, helicopters shall not fly vertically over trees with active nests unless an adequate elevation can be achieved to ensure that downward wind generated by the propulsion would not physically disturb the tree. The buffers should be implemented until it is determined by a qualified wildlife biologist that young have fledged and the nest is determined to be inactive. If burrowing owl nests are identified, impacts to occupied burrows will be avoided by implementing no-disturbance buffers in accordance with the table below unless a qualified biologist determines either: 1) the birds have not begun egg-laying and incubation or 2) juveniles from the occupied burrows are foraging independently and are capable of survival.

<u>Location</u>	<u>Time of Year</u>	<u>Level of Disturbance</u>		
		<u>Low</u>	<u>Med.</u>	<u>High</u>
<u>Nesting sites</u>	<u>April 1-Aug 15</u>	<u>200 m*</u>	<u>500 m</u>	<u>500 m</u>
<u>Nesting sites</u>	<u>Aug 16-Oct 15</u>	<u>200 m</u>	<u>200 m</u>	<u>500 m</u>
<u>Nesting sites</u>	<u>Oct 16-Mar 31</u>	<u>50 m</u>	<u>100 m</u>	<u>500 m</u>

\*meters (m)

**Mitigation Measure BIO-2: Focused Biological Surveys**

Prior to a copper application by helicopter, a qualified wildlife biologist will conduct a survey of the project area to determine if special status species could be impacted. Survey results will be used to identify any mitigation minimization and avoidance measures that may be needed to reduce potential impacts to special status wildlife species to a less than significant level.

**Mitigation Measure BIO-3: Special Status Plant Surveys at O’Neill Forebay**

Prior to a copper application by helicopter at O’Neill Forebay, a qualified botanist will survey the land adjacent to the application area for special status species plants. The botanist will follow the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (November 24, 2009)*. If special status species are found, DWR will monitor wind speed and wind direction to avoid potential impacts to the species from a helicopter application.

With implementation of the proposed mitigation measures, impacts to uplands habitat and terrestrial species, including nesting birds, would be **less than significant**.

**b & c.** All four water bodies contain wetland features that may be considered jurisdictional by the USACE under Section 404 of the Clean Water Act, by the RWQCB under Section 401 of the Clean Water Act, and by CDFW under the Fish and Game Code (including riparian habitat, and/or other vegetation communities considered sensitive by CDFW).

Potential wetlands and/or sensitive communities within Pyramid Lake include cattail marsh and riparian forest (which in some locations is classified as Southern Cottonwood Willow Riparian Forest and Southern Willow Scrub, two sensitive natural communities defined by CDFW). Potential wetlands and/or sensitive communities within Silverwood Lake include cattail marsh and riparian forest (which in some locations is classified as Southern Sycamore Alder Riparian Woodland, Southern Cottonwood Riparian Forest or Southern Willow Scrub; all of which are sensitive natural communities defined by CDFW). Potential wetlands and/or sensitive communities within Quail Lake include cattail marsh and riparian forest/scrub (which in some locations is classified as Southern Willow Scrub, a sensitive natural community defined by CDFW). Potential wetlands and/or sensitive communities within O'Neill Forebay include freshwater marsh, riparian forest (which in some locations is classified as Great Valley Cottonwood Riparian Forest), and Southern Riparian Scrub.

No loss of wetland features that may be considered jurisdictional by the USACE, RWQCB, or CDFW; nor the loss of riparian habitat, or other communities considered sensitive by CDFW, would occur as a result of the proposed project. The project does not propose to remove, fill, or alter the existing wetland or riparian features within any of the water bodies. Therefore, it is not anticipated that a permit would be required from the USACE, RWQCB, or CDFW for impacts to wetlands or riparian habitat as a result of the proposed project.

The helicopter and/or boat used for copper sulfate application at all four water bodies would be staged at existing developed areas. Copper sulfate application to control planktonic algae would be limited to open water areas away from the shoreline and would not impact wetlands, riparian habitats, or other sensitive natural communities. The helicopter would be staged at existing developed areas as shown in Figures 2, 4, 6, and 8 of Appendix D for Pyramid Lake, Silverwood Lake, Quail Lake, and O'Neill Forebay, respectively.

**d.** All four water bodies are situated within relatively undisturbed habitat and provide habitat for migratory species. All four sites are located within the Pacific Flyway and provide a stopover for a variety of migratory birds, notably waterfowl. Pyramid Lake is situated between the Los Padres and Angeles National Forests and provides linkage for terrestrial wildlife between the two natural areas. Piru Creek and other drainages that flow into Pyramid Lake provide movement for both aquatic and terrestrial species. Silverwood Lake is located along the Mojave River, which provides access to other undisturbed areas of the San Bernardino Mountains and access to the Mojave Desert. Quail Lake is located within the transition zone between the Mojave Desert and mountains of the Los Padres and Angeles National Forests. O'Neill Forebay is located within the base of the Diablo Mountain Range and provides habitat for wildlife migrating north-south through central California.

The project would not affect movement of wildlife species. The project would not remove any existing habitat nor would it add any fill or structures that would impede wildlife movement. The helicopter and/or boat applying the copper sulfate would be operated for only a short duration in areas away from native terrestrial habitats. Migrating waterfowl or other avian species utilizing the water bodies would be able to utilize other areas of the water body located away from the noise of the helicopter and/or boat.

Implementation of DWR’s APAP (Appendix B) will ensure impacts to migratory corridors are **less than significant** level.

e. The Project would consist of applying copper sulfate to the water of existing reservoirs and would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. **No impact** would occur.

f. Select upland areas around Pyramid Lake, Silverwood Lake, Quail Lake, and O’Neill Forebay are designated as reserves and managed under various conservation and/or resource management plans. The proposed project would be conducted entirely within the existing reservoir open water areas, outside of upland habitat, and would not affect any Multiple Species Habitat Conservation Plan, or Natural Community Conservation Plan or other Conservation Plan. Therefore, the proposed project would not conflict with any provisions of such adopted plans, or other approved local, regional, or state habitat conservation plan. **No impact** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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V. CULTURAL RESOURCES --

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a & b.** The proposed project would be implemented entirely within the open water of existing State Water Project reservoirs. Treatments would be made by helicopter (at all four reservoirs) or by boat (O’Neill Forebay and Quail Lake) utilizing existing staging areas. The project would not include any elements that would alter or otherwise disturb any known historical or archaeological resources. Therefore, no impact to historical or archaeological resources would occur.

**c & d.** As this project would only involve water treatment with copper-based aquatic pesticides with no ground disturbances, there would be no impact to paleontological resources or sites or to unique geological features. Further, application of aquatic pesticides would not cause any disturbance of human remains. The project, as outlined in the project description, would cause no impact to cultural resources.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. GEOLOGY AND SOILS --</b>				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Discussion

**a (i).** The Division of Mines and Geology Special Publication 42 (2007) shows that O’Neill Forebay and Quail Lake are located in earthquake fault zones, within the San Luis Dam and La Liebre Ranch Quadrangles, respectively. The Ortigalita Fault is located to the west of O’Neill Forebay, and according to Figure 1 in Special Publication 42 (Bryant, et al., 2007), it is not identified as a fault with historic surface rupture. Quail Lake was originally a pond created by a cataclysmic movement of the San Andreas Fault ages ago. Before it became part of the SWP, Quail Lake was enlarged to move water safely across the fault. The proposed project would consist of applying aquatic herbicides to four existing reservoirs of the SWP. The project does not involve the construction of any new structures that would be subject to the Alquist-Priolo Earthquake Fault Zoning Act. Therefore, no impacts relating to rupture of a known fault would occur.

**a (ii, iii, iv).** Several active and/or potentially active faults in the region, such as the Ortigalita and San Andreas Faults discussed in section a (i) above, could produce ground shaking at the site. Although it is possible that ground shaking could occur at the project site, secondary effects such as liquefaction would not increase with implementation of the project. Further, the project would not include building any structures or increasing the population on or near the project site. The project would not have the potential to increase the risk of landslides in the area, since it would not involve building structures and would not affect any existing slopes. Therefore, no impacts associated with liquefaction and other seismic-related ground failure would occur.

**b, c, d, & e.** This project consists of the application of aquatic herbicides to four reservoirs of the SWP and does not involve any digging or other physical disturbance that would result in soil erosion or loss of topsoil. The project would not result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. Additionally, the proposed project does not entail the construction of any building and has no effect on expansive soil. The proposed application of aquatic herbicides would not require a septic or other wastewater system as workers would use existing facilities in the operation areas of the reservoirs. Therefore, the project would have no impact.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VII. GREENHOUSE GAS EMISSIONS -- Would the project:</b>				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Discussion**

**a & b.**

**GHG Emissions Analysis**

In May 2012, DWR adopted the DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (GGERP), which details DWR’s efforts to reduce its greenhouse gas (GHG) emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. Both the GGERP and Initial Study/Negative Declaration are incorporated herein by reference and are available at: <http://www.water.ca.gov/climatechange/CAP.cfm>. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g. building-related energy use). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

DWR specifically prepared its GGERP as a “Plan for the Reduction of Greenhouse Gas Emissions” for purposes of CEQA Guidelines section 15183.5. That section provides that such a document, which must meet certain specified requirements, “may be used in the cumulative impacts analysis of later projects.” Because global climate change, by its very nature, is a global cumulative impact, an individual project’s compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project’s incremental contribution to that cumulative impact to a level that is not “cumulatively considerable.” (CEQA Guidelines, § 15064, subd. (h)(3).)

More specifically, “[l]ater project-specific environmental documents may tier from and/or incorporate by reference” the “programmatic review” conducted for the GHG emissions reduction plan. “An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project.” (CEQA Guidelines § 15183.5, subd. (b)(2).)

Section 12 of the GGERP outlines the steps that each DWR project will take to demonstrate consistency with the GGERP. These steps include: 1) analysis of GHG emissions from construction of the proposed project, 2) determination that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP, 3) incorporation into the design of the project DWR's project level GHG emissions reduction strategies, 4) determination that the project does not conflict with DWR's ability to implement any of the "Specific Action" GHG emissions reduction measures identified in the GGERP, and 5) determination that the project would not add electricity demands to the SWP system that could alter DWR's emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Consistent with these requirements, a GGERP Consistency Determination Checklist is attached, Appendix K, documenting that the project has met each of the required elements.

Based on the analysis provided in the GGERP and the demonstration that the proposed project is consistent with the GGERP (as shown in the attached Consistency Determination Checklist), DWR as the lead agency has determined that the proposed project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs is less than cumulatively considerable and, therefore, less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VIII. HAZARDS AND HAZARDOUS MATERIALS --</b>				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



## Discussion

**a & b.** The proposed project involves the treatment of SWP reservoirs with copper-based pesticides. These copper compounds (copper sulfate pentahydrate, Nautique®, Komeen®, EarthTec®, & Captain® XTR) all contain components considered hazardous by the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard. While the active ingredients in these compounds differ, they all pose potential health effects due to ingestion, inhalation, or contact with eyes or skin.

To minimize the risks associated with the use of hazardous compounds, this project will follow guidelines developed as part of the DWR Hazardous Waste Management Program. These guidelines include procedures for the handling, storage, disposal, transport, and source reduction of hazardous wastes. This program also has procedures for the containment and cleanup of hazardous waste spills and establishes hazardous waste contingency. Furthermore, each Field Division has contracts with private firms specializing in hazardous waste cleanup.

In addition to the procedures developed by the Hazardous Waste Management Program, all staff on site will follow procedures laid out on the respective pesticide MSDS and label. Included in these procedures is the use of personal protection equipment, consisting of disposable coveralls, gloves, boots, respirators, and protective eyewear. These measures, along with the implementation of the APAP as described in Section 1 and included as Appendix B of this IS/Draft Mitigated Negative Declaration, will limit hazards to project staff and the public to a level deemed less than significant.

**c.** There are no known current or proposed schools within ¼ mile of any project reservoirs or staging areas. Therefore, no impacts will occur.

**d.** None of the project sites are located on or near properties listed as hazardous material sites. The specific lists used for this determination include the State Water Resources Control Board's GeoTracker, the Department of Toxic Substance Control's EnviroStor list, and the EPA's CERCLIS database of Superfund sites and Cleanups in My Community (CIMC) website. Due to the lack of hazardous material sites in the vicinity of the project sites, there will be no impact to the public due to project activities.

**e & f.** The only airstrip within the vicinity of any project location is the private airstrip located adjacent to Quail Lake. When using helicopters for applications at Quail Lake, proper steps will be taken to ensure that there is no overlap in the operation of the airstrip and project helicopter use. This precaution and continued communication during aerial treatment periods will ensure any impacts will be less than significant. Other project locations using helicopters for applications, will limit their usage to only the areas deemed necessary to complete the application. This will limit the exposure of helicopter operations to the public, thereby limiting public impacts to less than significant.

**g.** This project will not block or alter any public roadways, thereby limiting their availability in the event of an emergency. Project staging areas will be located at well established locations and will have easy access to and from in the event of an emergency. This project will have no impact on emergency response or evacuation plans.

**h.** This project will not increase the risk for wildland fires. All project staging areas will be located at preexisting facilities and on paved or gravel lots. In addition, this project will not increase the population or change land usage within or adjacent to the project area. Therefore, this project will not impact or increase local wildland fire risk.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX. HYDROLOGY AND WATER QUALITY -- Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Discussion

**a & f.** The proposed project seeks to reduce algae and aquatic weed growth in drinking water storage reservoirs. The algae and aquatic weeds targeted are of concern due to their potential to inhibit compliance with secondary drinking water standards for taste and odor or to interfere with public use and SWP operations. The project will involve the treatment of these reservoirs with one of several copper-based algaecides or herbicides. Both the U.S. EPA and the California Department of Pesticide Regulation have approved all of the proposed treatment materials for use in California. The specific pesticide type and amount used in each treatment occurrence will depend on target species' composition and concentration, as well as several limnological factors.

State water quality regulators require persons using aquatic pesticides to apply for coverage under the general NPDES permit, No. 2013-0002-DWQ. To obtain coverage under this NPDES permit, applicants are required to demonstrate either that its discharges comply with the water quality criteria for priority pollutants under the CTR and NTR or that it qualifies for an exception from compliance with such criteria, pursuant to section 5.3 of the SWRCB's SIP. Furthermore, the permit requires applicants to submit an APAP describing their pesticide application and water quality monitoring programs.

The application of copper-based compounds to DWR reservoirs could raise dissolved copper levels above approved receiving water limitations. To comply with water quality regulations, DWR is pursuing a categorical exception for use of copper under section 5.3 of the SIP and will submit a notice of intent and an APAP for the copper applications, as required by the NPDES permit.

Past copper treatments in similar water bodies have shown the dissolved copper concentration to fall soon after application and remain below the CTR human health criteria for copper of 1.3 mg/L. Therefore, with the implementation of the following mitigation measures, this project will present a less than significant impact on water quality.

**HYDRO-1: Submit the Proper Regulatory Documents (NPDES Permit and APAP)**

- Develop and follow the monitoring requirements associated with the NPDES permit and APAP.
- To the extent feasible, take full advantage of operational options (e.g., selective water withdrawal, bypass and blending) to avoid or minimize the use of copper compounds.
- To the extent feasible, treat algal blooms prior to their exponential growth phase to minimize the amount of aquatic pesticides used.

**b.** Since this project is limited to the application of copper compounds to surface water reservoirs, there will not be an increase in groundwater use or a decrease in groundwater recharge. The project does not include any new developments or facilitate an increase in population, so there will not be any long-term or future impacts to groundwater supplies due to this project.

**c, d, & e.** The proposed project will not include any ground moving activities nor will it alter any pre-existing drainages. In addition, there will not be an increase in the amount of water present at the project locations since the treatment is based on reservoir volume at that time. Therefore, this project will not impact the amount or flow of surface water on site.

**g, h, & i.** The project will not involve the construction of any new structures or result in an increase in surface water at the project locations. The project would not place any housing or other structures in danger of flood damage due to increased or redirected flow. This project will only involve application of copper compounds to retained water at pre-existing reservoirs. No alterations to dams or levees will occur, therefore, there will not be an increased exposure to flooding risks due to their failure.

**j.** Staging areas for each project reservoir will be located at pre-existing facilities normally open to the public. These areas are high enough above the reservoir water level to avoid seiche waves and far enough from the ocean to avoid tsunamis. In addition, these sites are not located in potential mudslide areas.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X. LAND USE AND PLANNING --</b>				
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a.** The footprint of this project will be existing reservoirs and staging areas. There will not be any new development or disturbance to communities caused by any project activities. This project will not impact the continuity of established communities.

**b & c.** The proposed plan is limited to the treatment of reservoirs with copper-based herbicides. These reservoirs are located on DWR land and this project is consistent with standard operating procedures for treatment of aquatic vegetation in DWR waters. In addition, this project will not require physical changes to the landscape or require a change in existing land use and adopted land use classifications. Furthermore, the locations covered by this project aren't located in areas covered by existing habitat or natural community conservation plans. Therefore, this project will not have an impact on land use planning or policies.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Result in the loss of availability of a locally- important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a & b.** The proposed project will be limited to the treatment of existing reservoirs with copper-based herbicides. All project staging areas will be located at pre-existing facilities and there will be no further disturbance from this project. As such, there will be no impact to mineral resources due to project activities.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. NOISE -- Would the project:</b>				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Discussion**

**a, b, c, & d.** The proposed project will include several noise generating activities, namely the hauling and dispersal of application material using trucks and a helicopter or boat, which would increase noise levels above ambient levels. These activities however occur during daytime hours, in areas closed to public use. Therefore, they would not expose nearby persons to significant levels of noise or groundborne vibration. Likewise, since there is no permanent footprint to this project there will not be a permanent increase in noise above ambient levels.

**e & f.** The only project site located within two miles of any airstrip is Quail Lake, which is adjacent to the Quail Lake Sky Park, a private, single runway airstrip. While the airstrip is located close to the southeast shore of the lake, the staging area will be located at the western or northern shore, one mile and half a mile respectively from the airstrip. This distance will limit the exposure of project staff to airstrip noise to a level less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIII. POPULATION AND HOUSING -- Would the project:</b>				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a, b, &c.** This project will be confined to preexisting reservoirs and staging areas. No aspect of this project will include the construction, alteration, or demolition of any homes or other buildings. Therefore, this project will not increase population growth in the area or the need for replacement housing elsewhere. While, this project will improve water quality there will be no increase in water quantity, meaning there will not be an increase in water supply which might indirectly increase population growth. Also, due to the short-term nature of the treatment periods, there will be no need for employees working on the project to relocate closer to the worksites nor would nearby residents need to relocate away from the worksites. For these reasons it has been determined that this project will have no impact on population and housing.



	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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XIV. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

a. This project is limited to the treatment of existing reservoirs and does not require any new construction. In turn there will be no increase in demand or changes to existing public services. Likewise, the short-term nature of each treatment periods means there will be no impact on the existing demand for police and fire protection.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION --				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion**

**a & b.** This project involves the infrequent treatment of SWP reservoirs with copper compounds and will not result in an increase of usage for recreational facilities. In addition, the project will not require the construction or expansion of recreational facilities. A less than significant increase in use of other local recreational facilities may occur as a result of the DWR facilities being closed or with limited access. However, the closures are short-term (generally one day) and would be reopened to public use as soon as feasible.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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XVI. TRANSPORTATION/TRAFFIC

-- Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Discussion

**a & b.** The necessary number of people and vehicles required for this project is negligible in size compared to normal transportation volumes. It is estimated that five to ten passenger vehicles will be required along with one or two material transport trucks. Due to the small volume of vehicle traffic associated with this project, no impacts will occur to any plans, ordinances, or policies concerning traffic circulation or congestion management.

**c.** A portion of this project will require the localized use of helicopters over the reservoirs mentioned in this document. All appropriate regulations and procedures will be followed in the use of these helicopters, including but not limited to the filing of flight plans for each treatment period. Due to the small size and infrequency of treatments (a yearly maximum of five treatments per reservoir), the use of helicopters for this project will not impact existing air traffic patterns.

**d.** The activities in this project will be contained to the boundaries of existing reservoirs and parking lots. There are no planned alterations or incompatible uses from this project; therefore it will have no impact on an increase in road hazards.

**e.** Vehicles parking at SWP facilities and staging areas are routine and will occur in designated areas so there will be no impact on emergency access or evacuation.

**f.** The project will not add any facilities that would impact existing policies, plans, or programs associated with public transit. The project will not impact, close, impede, or restrict use of existing transit facilities. Temporary closures of existing bicycle or pedestrian access at some SWP facilities may occur, but given their short duration these impacts will be less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVII. UTILITIES AND SERVICE SYSTEMS -- Would the project:</b>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Discussion

**a, b, c, d, & e.** The proposed project involves the application of copper-based algaecide to several existing water storage reservoirs and will not involve the construction of new facilities, a change in water supply, or a change in water demand. There will be no discharges of wastewater or increased demand placed on existing water, wastewater, or storm water systems. There will be no impact on, or need for new or expanded facilities, or entitlements. Likewise, there would be no conflict with local wastewater treatment providers' capacity.

**f & g.** This project may generate a minor amount of solid waste during each application. These applications would be infrequent (a maximum of five treatments per reservoir per year) and would produce a negligible amount solid waste (e.g., empty herbicide containers) after the application period is over. Therefore, any solid waste from this project would be negligible and would not place a strain on landfill capacities. In addition, any solid waste from this project will be taken to appropriate disposal or recycling facilities in coordination with federal, state, and local regulations.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. -- MANDATORY FINDINGS OF SIGNIFICANCE --				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Discussion**

a. The proposed project would involve the periodic application of copper-based herbicides to existing State Water Project water storage reservoirs: O’Neill Forebay, Quail Lake, Pyramid Lake, and Silverwood Lake by the Department of Water Resources. Application of these aquatic herbicides would occur on an as-needed basis, to control algal blooms and aquatic weeds so that such blooms do not degrade drinking water quality through elevated taste and odor problems, production of algal toxins, and/or through filter clogging. The project would not require any physical alteration or construction of any facilities at the project sites, nor would the project result in any ground disturbance or tree or vegetation removal, with exception of the algae and aquatic weeds. Implementation of the project may temporarily impact aquatic species present in the reservoirs and their associated habitats during pesticide applications. However, these impacts would be reduced to a less than significant level by the

implementation of mitigation factors identified in this MND. Several species of rare or endangered animals are known to exist in the terrestrial areas adjacent to the project sites. However, none of these species would be impacted by the project. Likewise the project would not eliminate any important examples of California history. Therefore, implementation of the proposed project, in conjunction with the proposed mitigation measures would reduce potentially significant impacts, to less than significant levels.

**b.** The project sites are each located within properties owned and operated by DWR. The project consists of a routine maintenance activity to maintain existing infrastructure and maintain water quality for DWR customers. No foreseeable cumulative impacts in conjunction with potential local or regional projects would occur. Application events would typically be conducted only a maximum of five times per year per reservoir on an as-needed basis. Therefore, the impacts of the project application in the area would not be cumulatively considerable and would have no cumulative impact.

**c.** The proposed project would have a less than significant impact to human beings with the implementation of the APAP and its BMPs, described in Section 1. The proposed project may cause limited and temporary noise intrusions during project applications, which would be less than significant. Hence, the proposed project would result in less than significant effects on human beings.

## SECTION 4: LIST OF MITIGATION MEASURES

### BIOLOGICAL RESOURCES

#### BIO-1: Impact Avoidance to Nesting Birds

The following mitigation measure is recommended to reduce potential impacts to nesting birds during application of copper sulfate by helicopters:

- If a copper sulfate application is scheduled to occur during the breeding season (February 1–~~August 31~~September 15), it is recommended that a qualified biologist conduct pre-application surveys of all potential nesting habitats within 500 feet of proposed helicopter application activities. Surveys at O’Neill Forebay will follow the survey methodology of the Swainson’s Hawk Technical Advisory Committee (SWHA TAC, 2000) and the Bald Eagle Breeding Survey Instructions (California Department of Fish and Game (CDFG), 2010). At least one survey should be conducted no more than three days prior to these activities. If the application is scheduled to occur during the non-nesting season (September ~~1–16~~ through January 31) at Quail Lake, Pyramid Lake, or Silverwood Lake, a pre-application survey is not necessary and no additional measures are recommended. At O’Neill Forebay, surveys for burrowing owl nests will be conducted using the survey methodology described in “Staff Report on Burrowing Owl Mitigation dated March 7, 2012 (CDFG, 2012) any time of year that an application by helicopter is planned.
- If active nests are found at Quail Lake, Pyramid Lake, or Silverwood Lake, no-disturbance buffers shall be implemented around each nest based on the species and location of the nest as determined by a qualified biologist, or the nest should be closely monitored during applications to ensure that helicopter does not create physical disturbance and copper sulfate does not inadvertently drift into the nest. If a buffer is preferred, a general buffer distance typically includes 500 feet around any confirmed active raptor nest or a 300-foot buffer around nests of passerine bird species protected in accordance with the MBTA and/or Fish and Game Code. Additionally, helicopters shall not fly vertically over trees with active nests unless an adequate elevation can be achieved to ensure that downward wind generated by the propulsion would not physically disturb the tree. However, buffer distances can be determined by the biologist based on location, vegetation cover, species, and other factors. The buffers should be implemented until it is determined by a qualified wildlife biologist that young have fledged and the nest is determined to be inactive.
- If active nests are found at O’Neill Forebay, identified nests of special status species will be continuously surveyed for 24 hours prior to any activities related to helicopter applications in order to establish a behavioral baseline. During the application, the nests will be continuously monitored to detect any behavioral changes. No-disturbance buffers of 500 feet shall be implemented around each nest for non-listed bird species, while buffers of 0.5 miles will be implemented for nests of all raptors. Additionally, helicopters shall not fly vertically over trees with active nests unless an adequate elevation can be achieved to ensure that downward wind generated by the propulsion would not physically disturb the tree. The buffers should be implemented until it is determined by a qualified wildlife biologist that young have fledged and the nest is determined to be inactive. If burrowing owl nests are identified, impacts to occupied burrows will be avoided by implementing no-disturbance buffers in accordance with the table below unless a qualified biologist determines either: 1) the birds have not begun egg-laying and incubation or 2) juveniles from the occupied burrows are foraging independently and are capable of survival.



<u>Location</u>	<u>Time of Year</u>	<u>Level of Disturbance</u>		
		<u>Low</u>	<u>Med.</u>	<u>High</u>
<u>Nesting sites</u>	<u>April 1-Aug 15</u>	<u>200 m*</u>	<u>500 m</u>	<u>500 m</u>
<u>Nesting sites</u>	<u>Aug 16-Oct 15</u>	<u>200 m</u>	<u>200 m</u>	<u>500 m</u>
<u>Nesting sites</u>	<u>Oct 16-Mar 31</u>	<u>50 m</u>	<u>100 m</u>	<u>500 m</u>

\*meters (m)

**Mitigation Measure BIO-2: Focused Biological Surveys**

Prior to a copper application by helicopter, a qualified wildlife biologist will conduct a survey of the project area to determine if special status species could be impacted. Survey results will be used to identify any mitigation minimization and avoidance measures that may be needed to reduce potential impacts to special status wildlife species to a less than significant level.

**Mitigation Measure BIO-3: Special Status Plant Surveys at O’Neill Forebay**

Prior to a copper application by helicopter at O’Neill Forebay, a qualified botanist will survey the land adjacent to the application area for special status species plants. The botanist will follow the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (November 24, 2009)*. If special status species are found, DWR will monitor wind speed and wind direction to avoid potential impacts to the species from a helicopter application.

**HYDROLOGY AND WATER QUALITY**

**HYDRO-1: Submit the Proper Regulatory Documents (NPDES Permit and APAP)**

- Develop and follow the monitoring requirements associated with the NPDES permit and APAP.
- To the extent feasible, take full advantage of operational options (e.g., selective water withdrawal, bypass and blending) to avoid or minimize the use of copper compounds.
- To the extent feasible, treat algal blooms prior to their exponential growth phase to minimize the amount of aquatic pesticides used.

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## **SECTION 6: AGENCIES CONTACTED**

1. State Water Resources Control Board

## **SECTION 7: LIST OF PREPARERS**

1. Department of Water Resources:

- Jeff Janik, Program Manager
- Diane Shimizu, Senior Environmental Scientist (Specialist)
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