

Law Offices of  
THOMAS N. LIPPE

329 Bryant Street  
Suite 3D  
San Francisco, CA 94107

Telephone: 415-777-5600  
Facsimile: 415-777-9809  
email: lippelaw@sonic.net

March 23, 2006

By Hand Delivery

Felix Riesenberg  
City of Napa Department of Public Works  
PO Box 660  
Napa, CA 94559

**Re: Use of Copper to Control Aquatic Weeds at the Milliken Diversion Dam and Lake Hennessey: CEQA Initial Study and Negative Declaration**

Dear Mr. Riesenberg:

This office represents Living Rivers Council ("LRC") with respect to the City of Napa's proposal to use copper sulfate to control aquatic weeds in Milliken Reservoir and Lake Hennessey. I have reviewed the Initial Study ("IS") and Mitigated Negative Declaration ("MND") prepared for this project and write today to submit the following comments on LRC's behalf. LRC objects to the adoption of the proposed Mitigated Negative Declaration on the ground that an environmental impact report ("EIR") is required under the California Environmental Quality Act ("CEQA").

**I. SUMMARY OF COMMENTS.**

There is substantial evidence supporting a fair argument that this project will contribute to significant cumulative environmental effects in several respects; therefore, an EIR is required under CEQA. First, the IS/MND fails to provide adequate information to determine the significance of the impacts. Second, the mitigation measures provided in the IS/MND will not reduce potentially significant effect to a less than significant level. Instead, they are likely to cause additional significant effects. Third, effects on other wildlife are likely to be significant. Fourth, the IS/MND provides inconsistent information concerning measurements of copper concentrations from previous treatments; these inconsistencies call into question the resulting conclusions about significant impacts.

In addition to the above issues, it is the policy of the State that public agencies should not approve a project as proposed if there are feasible alternatives available which would substantially lessen the significant environmental impacts of the project. Pub. Res. Code §21002. Further, information relevant to alternatives must be made available to the public. *Id.* §21003.1(b). Here, the applicant has not provided information or considered any alternatives besides the proposed action of applying Copper sulfate. LRC submits herein information on several feasible available alternatives that are both reasonable and have the potential to reduce harmful environmental effects.

## II. DISCUSSION.

### A. AN EIR IS REQUIRED BECAUSE SUBSTANTIAL EVIDENCE SUPPORTS A FAIR ARGUMENT THE PROJECT WILL CONTRIBUTE TO SIGNIFICANT CUMULATIVE ENVIRONMENTAL EFFECTS.

CEQA requires that an agency analyze the environmental impacts of its proposed actions in an Environmental Impact Report ("EIR") except in certain limited circumstances. (*See, e.g.*, Pub. Res. Code § 21100.) For example, a negative declaration may be prepared instead of an EIR when, after preparing an initial study, a lead agency determines that a project "would not have a significant effect on the environment." (*Id.*, § 21080(c).) However, such a determination may be made only if "[t]here is no substantial evidence in light of the whole record before the lead agency" that such an impact may occur. (*Id.*, § 21080(c)(1).)

A negative declaration is improper, and an EIR is required, whenever substantial evidence in the record supports a "fair argument" that significant impacts may occur. The "fair argument" standard creates a "low threshold" favoring environmental review through an EIR rather than through issuance of negative declarations or notices of exemption from CEQA. (*Citizens Action to Serve All Students v. Thornley* (1990) 222 Cal.App.3d 748, 754.) CEQA Guidelines Section 15064(f)(1) describes the "fair argument" standard as follows:

If the lead agency determines there is substantial evidence in the record that the project may have a significant effect on the environment, the lead agency shall prepare an EIR (*Friends of B Street v. City of Hayward* (1980) 106 Cal.App.3d 988). Said another way, if a lead agency is presented with a fair argument that a project may have a significant effect on the environment, the lead agency shall prepare an EIR even though it may also be presented with other substantial evidence that the project will not have a significant effect (*No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68).

Accordingly, substantial evidence of an actual impact need not be established. If there is substantial evidence in the record that a project may have a significant effect on the environment, the lead agency must prepare an EIR. (Guidelines, § 15064(f)(1); *Friends of B Street v. City of Hayward* (1980) 106 Cal.App.3d 988, 1000-1003.) As a matter of law, "substantial evidence includes ... expert opinion." (Pub. Res. Code § 21080(e)(1); CEQA Guidelines § 15064(f)(5).)

**1. The IS/MND Provides Inadequate Information to Determine Whether the Impacts of this Project will be Significant.**

The lack of information and analysis regarding the project's potential impacts renders the IS/MND and its project description legally inadequate under CEQA. *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 199.

Copper is known to be toxic to a wide variety of organisms.<sup>1</sup> For freshwater species, toxicity is a function of water hardness (*See* Exhibit 3 (letter dated March 22, 2006 from Dr. Robert Coats).) It is known to be very toxic to fish and frogs, and “[d]irect application of copper sulfate to water may cause a significant decrease in populations of aquatic invertebrates, plants, and fish.”<sup>2</sup>

Copper is especially toxic to trout, with brook trout having one of the lowest levels of chronic toxicity.<sup>3</sup> Steelhead are vulnerable to copper both for its direct toxicity and the effect it has on the food chain. When copper kills microorganisms at the base of the food chain such as algae, the food source for larger organisms is eliminated, and the entire ecosystem is disrupted.<sup>4</sup>

**a. The City must measure copper concentrations upstream for baseline data to allow comparison of project impacts to the natural level of copper.**

At the request of this office, the City provided spreadsheets of the results of water quality monitoring for the two reservoirs since about 2001. These spreadsheets are attached as Exhibit 17. While useful in some ways, this data lacks information about upstream concentrations of copper which would indicate what is “natural.” Therefore, there is no baseline data to allow spatial or temporal comparisons.

**b. The City must measure copper concentrations in the sediment and downstream to determine how much copper remains in them due to previous treatments.**

According to the IS/MND, the City has previously treated these waters with copper.

---

<sup>1</sup>U.S. EPA (1986), at p. 102, attached as Exhibit 7, indicates that acute toxicity data are available for 41 genera of freshwater animals.

<sup>2</sup>Exhibit 15, Extension Toxicology Network fact sheet on Copper Sulfate.

<sup>3</sup>U.S. EPA (1986) at p. 102.

<sup>4</sup>Exhibit 2 (letter dated March 22, 2006 from Dr. Nicole Beck).

However, there is no information in the IS/MND or the City's spreadsheets concerning the ultimate fate of the copper applied in these treatments. There are at least two possibilities. Either the copper precipitated out of solution and remains in sediments at the reservoirs' bottoms, or it washed out of the reservoir while still dissolved. (If the copper washed out, it may also have precipitated out into sediments below the dam.) It is likely the actual result represents some combination of these processes.

Precipitation is the process of oppositely charged ions in solution combining to form an insoluble solid. Precipitation can occur as a result of a physical change in the dissolving water. Two common causes of precipitation are a change in temperature or pH, which lower the solubility of copper and cause it to combine with carbonate ions and drop into bottom sediments. (Exhibit 2 (Dr. Beck)). These precipitation processes, however, are unlikely to completely remove dissolved copper from suspension, and remaining dissolved copper eventually "washes out" of the reservoir. In addition, even precipitated copper may re-dissolve into suspension and thus become "bio-available" again as a result of various changes in water chemistry or physical disturbances, such as, storms, floods and reduced pH, thereby creating a new toxic hazard to aquatic life.<sup>5</sup>

Precipitated copper in sediments can be toxic to benthic organisms or microbes that live on the bottom of the reservoir or in the sediment. Again, because many of these species are food sources, this impact can spread throughout the food chain. Also, copper that washes out of the reservoirs will be toxic to any downstream aquatic species, such as fish, amphibians, turtles, etc.<sup>6</sup>

In order to determine the extent of copper precipitation and wash-out, the City must determine the amount of copper in the sediments both in the reservoirs and downstream, as well as any remaining copper dissolved in the creeks downstream. Without this information, neither the City nor the public can consider the extent to which copper added by the proposed treatments may effect the environment.

For example, copper that precipitates out in the reservoir will remain there until disturbed. While in the sediment, it may contaminate or kill benthic or other sediment dwelling organisms. While precipitation will temporarily spare both reservoir dwelling fish and downstream organisms from exposure to copper stored in reservoir sediment, these organisms will be exposed by any later release of this stored copper by changes in water chemistry or other disturbances. On the other hand, if high concentrations of copper are transported out of the reservoirs soon after application, as Dr. Coats shows will occur here (Exhibit 3), then downstream species will be also be significantly effected. In any case, this IS/MND does not present sufficient information to gauge the absolute or relative extent of reservoir sediment and outflow pollution by copper without assessing the fate of

---

<sup>5</sup>*Id.*

<sup>6</sup>Exhibit 2 (Dr. Beck).

previously applied copper.

**c. The City must measure copper during storm events to see how much is released from sediments.**

Copper stored in sediments can be released when storms or floods disrupt the bottom of the lake. In order to determine the magnitude of this effect, the City needs to measure the concentration of copper both in the lake and below the dam during a major storm event. If the concentration remains steady, then any copper in the sediment is unlikely to affect resident species. If, however, the concentration rises, then adding more copper to lake sediments may have a significant impact on reservoir and downstream dwelling organisms.

**d. The accuracy of the City's data is questionable.**

The detection limit (the lowest concentration able to be measured accurately) for Copper is 0.05 mg/l (according to Exhibit 17, "Milliken Copper WQ for NPDES 2004-2005.xls" provided by the City). However, the City reported some values below 0.05.<sup>7</sup> The fact that the City recorded and reported values *below* anything that could be accurately measured calls into question the accuracy of all of the measurements.

**e. The City has not disclosed the ingredients of Earthtec, so the public can not consider or determine the impacts of applying this formulation.**

Inert ingredients make up 80% of Earthtec liquid Copper Sulfate (Fact sheet, Appendix B of IS/MND). These inert ingredients are considered a "trade secret" and they are not usually disclosed by the manufacturer. However, without knowing the nature of these ingredients, the public has no way to consider or analyze the impacts of Earthtec, nor can the public compare this treatment to other alternatives.

**f. The City must perform surveys for benthic organisms.**

The IS/MND at p. 35 states that City personnel have not reported adverse impacts to benthic organisms. However, there is no indication that systematic surveys for benthos have been undertaken, so it is impossible to determine anything about impacts, positive or negative, for any management actions with regard to the reservoirs. Because benthos feed on microorganisms at the bottom of the lake, they are especially vulnerable to any toxic compounds in sediment and they provide an indication of the health of the aquatic system. Therefore, in order to fully understand the

---

<sup>7</sup> E.g. the 8/16/04 and 0/10/04 Dosed measurements in "Milliken Copper WQ for NPDES 2004-2005" and several more in "HDS Copper WQ for NPDES 2004-2005."

impacts of this treatment to benthos, the City must thoroughly investigate the benthic community and report their findings.

**2. The Mitigation Measures Proposed in the IS/MND Will Have Significant Harmful Impacts**

**a. Mitigation Bio-2 may reduce flow of Conn Creek dangerously.**

Mitigation Measure Bio-2 (on page 17 of the IS/MND) states that “[w]hen the Lake is treated with a copper-containing aquatic pesticide to achieve a 0.5 ppm or less copper concentration, do not spill water sooner than 3 weeks after application of until the copper concentration is less than 0.01 ppm.” This mitigation will lower the flow of Conn Creek, to the detriment of downstream steelhead and other aquatic species. Reducing flows for three weeks during the hottest part of summer may go so far as to eliminate flows completely on some stretches, and any species depending on running water will not survive. (Exhibit 1 (letter dated March 22, 2006 from Jeff Hagar).)

Furthermore, given previous operations, it is possible that the reduced flow will continue far longer than three weeks. The IS/MND on page 3 states that copper treatment occurs twice per month from May to October when water temperature is above 60 degrees F. Mitigation Bio-2 requires a 3 week wait after treatment before spilling water. If treatment occurs every 2 weeks due to the appropriate temperature conditions, the 3 week mitigation period will not be achieved before the end of the dry season. It is therefore possible that no water will be spilled for an extended period, including perhaps the entire May through October time frame.

This mitigation measure also likely violates California Fish and Game Code §5937, requiring “Passage of water for fish below dam .” It states:

The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam. During the minimum flow of water in any river or stream, permission may be granted by the department to the owner of any dam to allow sufficient water to pass through a culvert, waste gate, or over or around the dam, to keep in good condition any fish that may be planted or exist below the dam, when, in the judgment of the department, it is impracticable or detrimental to the owner to pass the water through the fishway.

Note that flow is required *at all times*. Mitigation Bio-2 actually requires the *opposite*: the elimination of flow past a dam into an area known to be inhabited by fish. So besides having potentially significant impacts, Mitigation Bio-2 may actually be illegal.

**b. Bio-2 sets a lower limit on copper concentration that is not detectable using the City's methods.**

Bio-2 Mitigation (IS/MND p. 17) states that water will not be spilled for 3 weeks after treatment or "until the copper concentration is below 0.01 ppm." Since the method detection limit (MDL) of the City's analytic method is 0.05 ppm (as stated in the City's monitoring spreadsheets), it is impossible to measure the Cu concentration to determine when water release is allowed. Therefore, there is no way to ascertain (other than the already-discredited 3 week period) when the City will be allowed to resume spills from Lake Hennessey.

**c. Reliance on dilution of copper is unwarranted.**

According to the expert reports of Dr. Coats (Exhibit 3), Nicole Beck (Exhibit 2), and Jeff Hagar (Exhibit 1), the City should not rely on dilution to mitigate the toxic effects of copper on the ecosystem. Dr. Coats finds that the mean measurement of copper in Milliken Creek exceeds the State Water Resources Control Board's California Toxics Rule (CTR) criterion of 4.5  $\mu\text{g/l}$  by a factor of sixteen! Further, in 57 measurements in Lake Hennessey, most of the average values exceed the hardness-adjusted CTR limit of 21  $\text{mg/l}$ .<sup>8</sup> Dr. Coats notes that the highest concentrations occur near the surface, "probably in response to the copper sulfate treatments...."

Mr. Hagar found that "[f]ully treated water may enter the intake structure and be released to Conn Creek almost immediately following treatment. This is likely to result in exceedance of TRV's and adverse impacts to Steelhead, CRLF, and other aquatic life in Conn Creek downstream from Lake Hennessey." Mr. Hagar also notes that mitigation by dilution will be curtailed by thermal stratification. Warm surface water near Lake Hennessey intake will be treated with  $\text{CuSO}_4$  (IS/MND p. 4). The thermal stratification of the lake prevents mixing between layers of different temperatures. The water will be spilled without mixing, and thus without dilution. It is therefore likely that highly toxic water will wash out from the reservoir.

As a result, there are likely to be significant impacts from this treatment project.

**d. The City must prepare a mitigation monitoring plan.**

According to Pub. Res. Code §21081.6(a)(1), any MND requires a comprehensive monitoring plan to ensure that the mitigation does in fact eliminate significant impacts. Mitigation measure HWQ-1 calls for an Aquatic Pesticide Application Plan ("APAP"), with associated surface water sampling analysis before, during and after treatments.

---

<sup>8</sup>Coats states that these criteria are different because the two water bodies have different hardness, and copper toxicity is a function of water hardness.

Unfortunately, given the state of the City's copper monitoring, this monitoring will likely not be useful. Previous monitoring was limited by a Method Detection Limit of 0.05 ppm, almost four times the TRV of 0.013 ppm for steelhead. Thus, if the concentration of copper at some time after treatment was 0.02 ppm, there would be toxic effects to steelhead, but the City could not measure the concentration accurately. In order for the APAP to be of any value, the City must acquire more sensitive detection equipment that can measure copper concentrations at or below the TRV for steelhead.

**3. The Project is likely to have Significant Effects on Fish and Wildlife.**

**a. Western pond turtles.**

According to the IS/MND (p. 16) impacts to Western pond turtles will be mitigated by pre-treatment surveys, and treatment will be delayed if turtles are found in the treatment area. But Jeff Hagar indicates that Western pond turtles "are likely to remain there throughout the period when treatment is desirable" and "[f]ailure to observe them on any given day may not be evidence that they are not present." (Exhibit 1) Thus, if there are no sightings in a one-day survey and treatment occurs, it is possible that Western pond turtles will be harmed.<sup>9</sup>

**b. Rare and endangered amphibians.**

According to the IS/MND (p. 17) California red-legged frogs (Federally threatened) and Foothills yellow-legged frogs (State species of concern) occur in the area and may be impacted by the copper treatment. The City proposes to use the Bio-2 mitigation (wait 3 weeks after treatment before releasing water) to reduce the risk of harm. This mitigation measure is inadequate to reduce impacts to less than significant for the reasons discussed above in sections 2a and 2b. Indeed, Mr. Hagar notes in his expert commentary (Exhibit 1) that dilution and/or waiting for the concentration to drop may not be sufficient to protect at-risk species in Lake Hennessey. Furthermore, as Hagar notes, frogs in or below the Milliken diversion dam are not be protected by one-day surveys. The City must perform scientifically valid surveys according to accepted protocols in order to determine the location of imperiled frogs, in order to determine the appropriate steps necessary to protect them from this treatment.

**c. Bioaccumulation of copper.**

---

<sup>9</sup>This would be a taking under the Endangered Species Act, and the City will be in violation unless it obtains an Incidental Take Permit and Habitat Conservation Plan. "The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Both Hagar (Exhibit 1) and Beck (Exhibit 2) note the potential for significant impacts due to the bioaccumulation of copper. This occurs when copper is absorbed by one organism, which is then consumed by another organism higher on the food chain. The copper accumulates in higher concentrations as it travels up the food chain to ever larger organisms. As noted by Dr. Beck, Harrahy and Clements (at Exhibit 4, Figures 2 and 3) show bioaccumulation of Cu in benthos. Thus, it is distinctly possible that copper may accumulate due to repeated copper treatments in Lake Hennessey and Milliken Reservoir, and the City must consider and analyze this problem.

A related concern is the disruption of the local food chain. If microscopic organisms are killed by treatment, the larger species that feed on them will lose their food source, and this effect will spread to larger organisms as well. (Hagar, Exhibit 1). This effect may potentially change the entire balance of the ecosystem, causing unforeseen local extirpations. The City must also account for this effect.

**d. Resident steelhead/rainbow trout exist behind dams and may be impacted by treatment.**

Hagar notes that there is evidence that there are steelhead descended trout behind the impoundments that have adapted to spawning in freshwater. If that is the case, and given the highly imperiled status of steelhead below the dams, these resident trout may be genetically important to the remainder of the species. Thus, any impact to the residents could have a significant effect on the recovery of steelhead throughout the Napa river system.

In order to prevent such harm from occurring, the City must make efforts to confirm the existence of steelhead behind the dams. If so, the City must protect the trout from the impacts of any treatment undertaken within these impoundments.

**B. THE IS/MND USES AN INAPPROPRIATE BASELINE, OR NO BASELINE**

The impetus for this project is the fact that the City has been treating these reservoirs with copper sulfate for a long time, and has been doing so in violation of the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States (CAG 990005) ("Permit"), which was adopted by the State Water Resources Control Board on May 20, 2004. Thus, the City is now considering seeking an exception to the discharge limits for copper sulfate set in this permit.

The IS/MND, however, is silent as to the nature and extent of such past treatments: how many years, how many tons, how many times, what times of year, etc. The IS/MND is also silent as to the environmental effects of these past treatments. As a result, the IS/MND completely fails to describe the environmental setting of the project. In addition, the IS/MND implicitly, and inappropriately, uses the environment as effected by illegal past practices as the environmental

baseline. This is a false “baseline” because it is predicated on illegal conduct. *See, Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App.4th 859, 874. In that case, the court considered the Santa Rosa Water Agency’s EIR for a project to increase water diversions from the Russian River. The Court held that the EIRs description of the environmental setting or baseline should have included proposals pending before FERC to decrease Santa Rosa Water Agency’s diversions from the Eel River to the Russian River “in the future.” In other words, the baseline was required to include possible changes in conduct required by law.

### **C. THE CITY MUST CONSIDER LESS DAMAGING ALTERNATIVES**

As noted in the introduction, the City may not approve a project if there is a reasonable, feasible alternative action that would be more protective of the environment. Pub. Res. Code §21002. Because the IS/MND fails to provide any alternatives to the use of copper, LRC provides the following information in order to facilitate further consideration by the City.

#### **1. Identify and Reduce Artificial Nutrients Contributing to Algae Growth.**

Instead of relying on the application of artificial toxics to reduce algae, the City could investigate the source of nutrients that are causing algae growth and reduce or eliminate this source. This would cause the reduction or elimination of unwanted algae growth without injecting more chemicals into the ecosystem and without any unwanted side effects.

#### **2. Physical Removal of Weeds/algae.**

The City could also take steps to remove the unwanted algae by hand, with dip nets or swimmers. While physically more demanding than chemical treatments, this alternative would also have the benefit of no additions of harmful chemicals, while potentially providing teenagers or others seeking summer jobs with rewarding employment.

#### **3. Multiport Reservoir Outlets and Hypolimnetic Aeration.**

Hagar (Exhibit 1) suggests a combination of multiport outlets to draw water from the reservoir with a system of hypolimnetic aeration to change the oxygen content of the waters in order to prevent algae growth. As Hagar notes, this system is currently in use in other California reservoirs,<sup>10</sup> and has seen some success.

#### **4. Solar-powered Water Circulation.**

---

<sup>10</sup>*See, e.g.,* EBMUD’s Comanche Reservoir, and SF Public Utilities Commission’s Calaveras Reservoir.

Another option is the use of Solarbee technology,<sup>11</sup> which uses solar energy to circulate water in reservoirs. However, this kind of treatment must be carefully applied as it can disrupt temperature stratification and thus harm fish (such as resident trout) dependent on cold water.

#### **5. Biological Algae Treatment.**

Finally, another option is the use of biological treatments such as that sold by BioWorld.<sup>12</sup> Rather than chemical treatment, the algae is killed by competing microorganisms. However, this kind of treatment may also have negative impacts, such as invasive organisms, that must be fully explored before implementation.

### **III. CONCLUSION**

These comments present substantial evidence supporting a fair argument that the project may cause significant adverse impacts. The City of Napa has not provided sufficient information or mitigation to prevent such impacts. Therefore, a Mitigated Negative Declaration is inappropriate for this project. The City should prepare an EIR that fully examines the impacts from this proposed treatment and considers the full range of alternatives to copper that are feasible and reasonable.

Thank you for your attention to these comments.

Very truly yours,

Thomas N. Lippe

cc: Client

### **LIST OF EXHIBITS**

1. Letter dated March 22, 2006 to Thomas Lippe from Jeffrey Hagar, including Mr. Hagar's *curriculum vitae*.

---

<sup>11</sup>See, e.g., <http://www.solarbee.com/limnology.shtml>. For information on use in California, see <http://www.esemag.com/0305/algae.html>.

<sup>12</sup>See, e.g., <http://www.adbio.com/products/specsheet-algae.htm>

2. Letter dated March 22, 2006 to Thomas Lippe from Dr. Nicole Beck, including Dr. Beck's *curriculum vitae*.
3. Letter dated March 22, 2006 to Thomas Lippe from Dr. Robert Coats, including Dr. Coats's *curriculum vitae*.
4. Harrahy, Elisabeth A. and William Clements, 1997. Toxicity and bioaccumulation of a mixture of heavy metals in *chironomus tentans* (*Diptera:Chironomidae*) in synthetic sediment.  
Environmental Toxicology and Chemistry, 16(2), p. 317–327.
5. Fleming, C.A., and Trevors, J. T, 1989. Copper Toxicity and Chemistry in the Environment: A Review. Water, Air and Soil Pollution 44:143-158.
6. U.S. FWS 2005. Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog.
7. U.S. EPA 1986. Quality Criteria for Water.
8. Padgett-Flohr, G.E., and Jennings, M., 2002. Survey Protocol for the California Red-legged Frog.
9. Berntssen, Marc, Ketil Hylland, Sjoerd E. Wendelaar Bonga, Amund Maage, 1999. Toxic levels of dietary copper in Atlantic salmon (*Salmo salar L.*) parr. Aquatic Toxicology 46: p 87–99.
10. Van Hullebusch, Eric; Chatenet, Philippe; Deluchat, Veronique; Chazal, Philippe; Froissard, Didier; Botineau, Michel. 2003. Copper accumulation in a reservoir ecosystem following copper sulfate treatment (St. Germain Les Belles, France) Water, Air, and Soil Pollution 150: p. 3–22.
11. Beck, Nicole G, Bruland, Kenneth W. and Rue, Eden L. 2002. Short-term Biogeochemical Influence of a Diatom Bloom on the Nutrient and Trace Metal Concentrations in South San Francisco Bay Microcosm Experiments, Estuaries 25(6A); p. 1063–1076.
12. Handy R.D., 1993. The effect of acute exposure to dietary Cd and Cu on organ toxicant concentrations in rainbow trout, *Oncorhynchus mykiss*. Aquatic Toxicology, 27: p. 1-14.
13. Haughey, M.A., Anderson, M.A., Whitney, R.D., Taylor, W.D. and Losee, R.F. 2000. Forms and fate of Cu in a source drinking water reservoir following CuSO<sub>4</sub> treatment. Water Research 34(13); p. 3440-3452.

14. 62 Federal Register 43937, 1997. Listing of Several Evolutionary Significant Units of West Coast Steelhead.
15. Extension Toxicology Network, 1994. Fact sheet on Copper Sulfate.
16. Excerpt from Leidy, R.A., et al, 2005. Historical distribution and current status of steelhead/rainbow trout in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, pp. 213-249.
17. City of Napa Water Quality Monitoring Spreadsheets, Milliken Reservoir and Lake Hennessey, 2001-2005.