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# California Regional Water Quality Control Board Central Valley Region

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**TO:** Tom Howard  
Acting Executive Director  
State Water Resource Control  
Board

**FROM:** Pamela C. Creedon  
Executive Officer

**SIGNATURE:** \_\_\_\_\_

**DATE:** 1 February 2007

**SUBJECT:** CORRECTIONS TO THE BASIN PLAN AMENDMENT FOR THE CONTROL OF  
NUTRIENTS IN CLEAR LAKE AND RESPONSE TO STAFF REPORT  
COMMENTS

Attached are minor corrections to portions of the Basin Plan amendment for the control of nutrients in Clear Lake and the response to comments on the staff report. The amendment has been changed to improve clarity and consistency and to remove grammatical errors. In the response to comments an error has been corrected where the words "compliant" and "non-compliant" were inadvertently reversed.

The resolution adopting this amendment (Resolution No. 2006-0060) allows the Executive Officer to make minor, non-substantive corrections to the language of the amendment, such as described above, that are needed for clarity or consistency.

If you have any questions, please call me at (916) 464-4838 or your staff can contact Lori Webber at (916) 464-4745.

Attachment(s)  
Corrected Basin Plan amendment language  
Corrected response to comments

cc: Regional Board Members  
Rik Rasmussen, State Water Resources Control Board  
Michael Buckman, State Water Resources Control Board

ATTACHMENT 1  
RESOLUTION NO. R5-2006-0060  
AMENDMENT TO BASIN PLAN  
FOR  
THE CONTROL OF NUTRIENTS IN CLEAR LAKE

Executive Officer 1 February 2007 minor revisions are shown with double underlined and gray shading for added text (added text) and double strike-through text for deleted text (~~deleted text~~).

Revise Basin Plan sections as follows:

CHAPTER IV: IMPLEMENTATION

Central Valley Water Board staff proposes the following language be added after the new subheading **Clear Lake Nutrients**.

Nuisance algae blooms impair beneficial uses in Clear Lake, which is a violation of the narrative basin plan objective that states "water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses"

Research and studies have concluded that there are likely multiple factors that influence the occurrence of nuisance algae blooms in Clear Lake. Recent improvements in water clarity may be due to a reduction in phosphorus loading or a result of other factors such as iron or sulfur availability, changes to lake ecology (introduced species, etc.), water year type or a combination of factors. For the purposes of this program of implementation both phosphorus loading and other factors that may affect algae growth will be addressed.

1. Modeling studies predict that a 40% reduction in average phosphorus loading will significantly reduce the incidence of algae blooms. A 40% reduction would equal an annual allowable loading of approximately 87,100 kg. Therefore, for this program of implementation, an average annual (five year rolling average) phosphorus load of 87,100 kg is established as the loading capacity for Clear Lake.
2. Waste load allocations for the NPDES facilities discharging to the lake or tributaries are as follows:
  - a. Lake County Stormwater Permittees (Lake County, City of Clearlake, City of Lakeport) - 2,000 kg phosphorus/yr
  - b. California Department of Transportation (Caltrans) – 100 kg phosphorus/yr

3. The load allocation for nonpoint source dischargers is 85,000 kg phosphorus/yr average annual load (five year rolling average). The U.S. Bureau of Land Management (USBLM), U.S. Forest Service (USFS), Lake County (County) and irrigated agriculture are responsible for controlling phosphorus discharges from those portions of the watershed within their respective authority.
4. Regional Water Board staff will work with the responsible parties – Stormwater permittees, Caltrans, USBLM, USFS, County and irrigated agriculture – to develop and implement a plan to collect the information needed to determine what factors are important in controlling nuisance blooms and to recommend what control strategy should be implemented. The responsible parties will submit the plan to the Regional Water Board by [one year after approval by OAL]. The plan should address the following topics:
  - Studies to assess the current limnological conditions and to determine the appropriate measures necessary for Clear Lake to meet the Basin Plan objectives
  - Appropriate monitoring for evaluating conditions in the lake
  - Effective collection of phosphorus loading information from the various sources
  - Practices implemented or planned to control phosphorus loading to the lake
  - Develop criteria to determine when Clear Lake is no longer impaired
5. Compliance with load and waste load allocations for phosphorus in Clear Lake is required by [ten years after approval by OAL]. However, by [five years and three months after approval by OAL], the Regional Water Board will consider information developed and determine whether the phosphorus load and waste load allocations should continue to be required or if some other control strategy or approach is more appropriate. To the extent that other controllable water quality factors, besides phosphorus, cause or contribute to nuisance algae blooms, those factors will be addressed in revisions to this program of implementation. Implementation of phosphorus control practices to achieve load and waste load allocations will occur under waste discharge requirements or waivers of waste discharge requirements.
6. If Clear Lake is attaining its beneficial uses and the Regional Water Board determine that phosphorus loads above allocated amounts are not causing or contributing to nuisance algae problems, the Regional Water Board will amend the Basin Plan to revise this nutrient control program for Clear Lake.

The proposed modification adds a new subheading under “Estimated Costs of Agricultural Water Quality Control Programs and Potential Sources of Financing” labeled **Clear Lake Nutrient Control Program**.

Estimated costs to implement management practices BMPs, if necessary, are \$400,000 to \$1,800,000 (2006 dollars).

Potential funding sources include:

1. Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

## CHAPTER V: SURVEILLANCE AND MONITORING

Regional Water Board staff proposes to add a new heading in Chapter V entitled **Clear Lake Nutrients**, which will include the following language.

The responsible parties – Lake County, City of Clearlake, City of Lakeport, Caltrans, USBLM, USFS and irrigated agriculture – will work with Regional Water Board staff to estimate nutrient loadings from activities in the watershed. Loading estimates can be conducted using either water quality monitoring or computer modeling or a combination of the two.

the lake. If it were found that there is another cause, the phosphorus load and waste load allocations would no longer apply.

7. *Comment: Without an update of the Clean Lakes Study ...it is difficult to determine whether Clear Lake, a naturally eutrophic lake, is water quality limited and whether a Total Maximum Daily Load is required or that phosphorus limitation will increase the lake clarity.*

Response: Staff agrees that an update of the Clean Lakes study would be useful. Both the original Basin Plan Amendment and the alternative Basin Plan Amendment call for further study to gain a better understanding of the factors that affect algae growth in Clear Lake. In the interim, staff believes that a focus on controlling phosphorus makes sense based on the reasons discussed in #5 and #6 above.

8. *Comment: The Target Report (Tetra Tech Report) also appears to draw erroneous conclusions on when the lake was in "compliance". The Target Report lists the "compliance period" to be between 1985 and 1989 and the non-compliance period to be 1990 and 1992. In reality, there have been significantly fewer nuisance, blue-green algal blooms since 1991. DWR secchi depth data for the Upper Arm of Clear Lake confirm this, with secchi depths averaging 0.9 meters during 1985 through 1990, and averaging 1.7 meters during 1991 through 1992, the "non-compliant" years ... Since 1991, the Upper Arm secchi depth has averaged 2.1 meters. How is a lake with double the clarity of the "compliant" lake "non-compliant"?*

Response: The ~~non~~-compliant years were 1985-1989 and the non-compliant years were 1990-1991. Severe algal blooms were documented in 1990 and 1991 (Richerson et. al., 1994), even though Secchi depth measurements during 1991 were higher than previous years. Water clarity cannot be expected to track perfectly with average algae density or modeled chlorophyll values, especially over a short period and with clarity measurements occurring only at monthly intervals. Nuisance algae blooms may only last several days and may occur in patches located away from the established sampling sites. It would be easy to miss a significant bloom if sampling was not conducted at the exact time and location where the bloom was occurring. The simulated chlorophyll-a values during the "compliant" and "non-compliant" years were based on a calibrated water quality model that considered multiple factors such as nutrient cycling, dissolved oxygen levels, mixing and residence time. These values are our best estimate of daily conditions in the lake.

9. *Comment: The Target Report also recommends that chlorophyll-a be utilized in determining whether Clear Lake is in compliance. There is very little historical data on chlorophyll-a levels in Clear Lake, therefore, the models used in preparation of the Target Report are unverifiable and we are unable to determine whether the recommended target is appropriate.*