UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Ms. Dorothy Rice
Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Ms. Rice:

Thank you for submitting the Basin Plan amendment containing total maximum daily loads (TMDLs) to address nutrients in Machado Lake in Los Angeles. The TMDL submittal was dated December 23, 2008 and supplemental information was provided on March 3, 2009. The State adopted total nitrogen and total phosphorus TMDLs to address ammonia, algae, odors, and eutrophic conditions identified on California's 2006 Clean Water Act Section 303(d) list.

Based on EPA's review of the TMDL submittals under Clean Water Act Section 303(d)(2), I have concluded the TMDLs adequately address the pollutants of concern and, upon implementation, will result in attainment of applicable water quality standards. These TMDLs include wasteload and load allocations as needed, take into consideration seasonal variations and critical conditions, and provide an adequate margin of safety. The State provided sufficient opportunities for public review and comment on the TMDLs and demonstrated how public comments were considered in the final TMDLs. All required elements are adequately addressed; therefore, the TMDLs are hereby approved pursuant to Clean Water Act Section 303(d)(2).

The State's submittal also contains a detailed plan for implementing these TMDLs. Current federal regulations do not define TMDLs as containing implementation plans; therefore, EPA is not taking action on the implementation plan provided with the TMDLs. However, EPA generally concurs with the State's proposed implementation approaches.

The enclosed review discusses the basis for this decision in greater detail. I appreciate the State and Regional Boards' work to adopt these TMDLs and look forward to our continuing partnership in TMDL development. If you have questions concerning this approval, please call me at (415) 972-3572 or Peter Kozelka at (415) 972-3448.

Sincerely yours,

Alexis Strauss 11 March 2009
Alexis Strauss
Director, Water Division

Enclosure

cc: T. Egoscue, Los Angeles RWQCB

TMDL Review Checklist

State: California

Waterbodies: Machado Lake

Pollutant(s): Total Phosphorus, Total Nitrogen (including ammonia)

Date of Initial Submittal: December 23, 2008

Date Received By EPA: December 29, 2008

Dates of Supplemental Submittal(s) and Receipt by EPA: March 3, 2009

EPA Reviewer: Valentina Cabrera-Stagno

1. Submittal Letter: *State submittal letter indicates final TMDL(s) for specific water(s)/pollutant(s) were adopted by state and submitted to EPA for approval under 303(d).*

Submittal letter from Elizabeth Haven to Alexis Strauss, dated December 23, 2008. State submittal was completed March 3, 2009. The Los Angeles Regional Water Quality Control Board (RWQCB) adopted the TMDLs to address ammonia, algae, odors and eutrophic [conditions] impairments at Machado Lake on May 1, 2008 (RWQCB Resolution # R4-2008-006). The submittal addresses ammonia, algae, odors, and eutrophic [conditions] impairments identified on the State's 1998, 2002 and 2006 Clean Water Act Section 303(d) lists. The State Water Resources Control Board (SWRCB) approved these TMDLs on December 2, 2008 (SWRCB Resolution # 2008-0089). The State Office of Administrative Law (OAL) approved these TMDLs on February 19, 2009 (OAL File #2009-0106-01 S). The submittal package contained the final Regional Board adopted Resolution, final State Board adopted Resolution, OAL approval, final Technical Staff Report and Responses to comments.

2. TMDLs Included: *The submittal clearly identifies the water segments and pollutants or stressors for which TMDLs were developed. The submittal should include the water segment identifier (e.g., NHD code) for each segment addressed. The submittal should clearly identify the TMDLs adopted for currently 303(d) listed waterbody-pollutant combinations. It should also clarify if TMDLs were adopted for new impairment findings (by waterbody-pollutant combinations) that do not exist on the current 303(d list. If appropriate, the submittal should describe any assessment decisions that may have resulted in non-impairment status for water/pollutant combinations that exist on State's most current 303(d) list.*

These Machado Lake TMDLs were adopted to address the following impairments identified on the state's 1998, 2002 and 2006 303d lists:

- Ammonia
- Algae
- Odors
- Eutrophic [conditions]

These TMDLs address all the water body-pollutant combinations identified in Analytical Unit # 76 of the *Heal the Bay* consent decree.

3. Water Quality Standards Attainment: *TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.*

(See Staff Report, dated May 1, 2008, pp.24-27)

The Staff Report identified designated beneficial uses for recreation (REC1 and REC2), aquatic life (WARM, WILD, RARE, and WET) and water supply (MUN) for Machado Lake. The TMDLs are designed to protect these beneficial uses and implement the existing narrative water quality objectives for biostimulatory substances and taste and odor as well as the numeric water quality objectives for dissolved oxygen and ammonia. Machado Lake is identified as impaired by ammonia, algae, odors and eutrophic [conditions] on the state's 1998, 2002 and 2006 303d lists.

The State reasonably concluded that the specified load and wasteload allocations will lead to attainment of the applicable water quality objectives.

4. Numeric Target(s): *Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. Numeric water quality target(s) for TMDL identified, and adequate basis for target(s) as interpretation of water quality standards is provided.*

(See Staff Report, pp. 32-36 and Basin Plan Amendment Attachment A Table 7-29.1 pp.2-3)

The table below shows the numeric targets in these TMDLs. The total phosphorus target is based on upon US EPA Nutrient Criteria Technical Guidance Manual for Lakes and Reservoirs. The total nitrogen target is based on a ratio of total nitrogen to total phosphorus of 10. The chlorophyll *a* target is based on EPA guidance and the Carlson Trophic Status Index. The numeric targets for ammonia and dissolved oxygen are based on existing State numeric water quality objectives.

Indicator	**Numeric Target**
Total Phosphorus	0.1 mg/L monthly average
Total Nitrogen	1.0 mg/L monthly average
Ammonia – N	5.95 mg/L one-hour average
Ammonia – N	2.15 mg/L 30 day average
Dissolved Oxygen	5 mg/L single sample minimum measured 0.3m above the sediments
Chlorophyll *a*	20 ug/L monthly average

The State's approach is a reasonable and environmentally protective approach to account for uncertainty in the relationship between pollutant loading levels and attainment of water quality standards, as required by CWA Section 303(d)(1)(C).

5. Source Analysis: *Point, non-point, and background sources of pollutants of concern are described, including the magnitude and location of sources. Submittal demonstrates all significant sources have been considered.*

(See Staff Report, pp. 37-47 and Basin Plan Amendment Attachment A Table 7-29.1 pp.3)

The TMDL analysis examined all existing and relevant information concerning the sources of nutrients impairing Machado Lake, including monitoring data and a sediment nutrient flux study.

The major nonpoint source of nutrients to Machado Lake is internal nutrient loading (nutrient flux from

sediments). Atmospheric deposition is also a nonpoint source of total nitrogen. Nutrient loads from wind resuspension, bioturbation, birds and general surface runoff are minor sources.

The point sources of nutrients into Machado Lake are stormwater discharges from the municipal separate storm sewer system (MS4), California Department of Transportation (Caltrans), and general construction and industrial stormwater discharges.

The TMDLs adequately considered all significant sources by examining data from all relevant sources. The TMDLs sufficiently described all sources of impairments.

6. Loading Capacity Linkage Analysis: *Submittal describes relationship between numeric target(s) and identified pollutant sources. Submittal clearly identifies loading capacity. For each pollutant, describes analytical basis for conclusion that sum of allocations and margin of safety does not exceed the loading capacity of the receiving water(s).*

(See Staff Report, pp.47-56 and Basin Plan Amendment Attachment A Table 7-29.1 pp.3)

The Regional Board used the Numeric Nutrient Endpoint BATHTUB Spreadsheet Model, developed by Tetra Tech for US EPA, to establish the linkage between nutrient loading to Machado Lake and the desired water quality conditions. The eutrophication related water quality conditions are expressed in terms of total phosphorus, ortho-phosphorus, total nitrogen, inorganic nitrogen, chlorophyll *a*, transparency (Secchi depth) and hypolimnetic oxygen depletion rates. The linkage analysis demonstrates that assigning allocations for total nitrogen and total phosphorus will address the following impairments: excessive algae, odors, and eutrophic conditions. The total nitrogen allocation includes ammonia, since this parameter is measured within total kejldahl nitrogen (TKN).

The State's analysis sufficiently describes the link between the numeric targets and the pollutant sources.

7. TMDL and Allocations:
TMDL—Submittal identifies the total allowable load, which is set equal to or less than the loading capacity. TMDL is expressed in terms of mass-based, concentration-based or other equivalent approaches that are consistent with federal requirements. If TMDL has seasonal features then please describe.

Allocations—Submittal identifies appropriate wasteload allocations for all point sources and load allocations for all non-point sources. If point sources are present, submittal identifies existing NPDES permits by name and number. If no point sources are present, wasteload allocations are zero. If no non-point sources are present, then load allocations are zero. Allocations are expressed in terms of mass-based, concentration-based or other equivalent approaches and the submittal explains why it is reasonable and appropriate to express the TMDL in those terms.
TMDLs and allocations should be expressed in terms of daily time steps. If the TMDL and/or allocations are also expressed in terms other than mass loads per day, the submittal explains why it is reasonable and appropriate to express the TMDL in those terms.

(See Staff Report, pp.56-60 and Basin Plan Amendment Attachment A Table 7-29.1 pp.3-5)

The TMDLs include wasteload allocations for point sources and load allocations for non point sources. Wasteload and load allocations are concentration based allocations of 0.1 mg/L and 1.0 mg/L as monthly averages for total phosphorus and total nitrogen (TKN + NO3-N + NO2-N), respectively. TMDLs, wasteload and load allocations are not specified for chlorophyll *a*, dissolved oxygen or ammonia because

the total phosphorus and total nitrogen allocations should achieve these targets as well.

Wasteload Allocations

Point source discharges of nutrients to Machado Lake include MS4 permittees, Caltrans, General Construction and Industrial stormwater permits. Los Angeles County MS4 permittees that are responsible for discharges to Machado Lake include: Los Angeles County, Los Angeles County Flood Control District, and the Cities of Carson, Lomita, Los Angeles, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, and Torrance (Los Angeles County NPDES No. CAS 004001). Caltrans (NPDES Permit No. CAS 000003), General Industrial Stormwater Permit Enrollees (NPDES Permit No. CAS000001) and General Construction Stormwater Permit Enrollees (NPDES No. CAS000002) also received wasteload allocations. All wasteload allocations are concentration based allocations of 0.1 mg/L and 1.0 mg/L as monthly averages for total phosphorus and total nitrogen (TKN + NO_3-N + NO_2-N), respectively. An estimated 73% reduction to total phosphorus in stormwater loadings is needed to achieve these allocations.

Load Allocations

Load allocations are concentration based allocations of 0.1 mg/L and 1.0 mg/L as monthly averages for total phosphorus and total nitrogen (TKN + NO_3-N + NO_2-N), respectively. A load allocation is assigned to internal nutrient loading from sediments (City of Los Angeles Department of Recreation and Parks). An estimated 90% reduction in total phosphorus and 63% reduction in total nitrogen loadings is needed to achieve this allocation.

Interim limits for wasteload allocations and load allocations are included to allow sufficient time for dischargers to set up implementation measures necessary to achieve the final load allocations.

Based on the information in the Staff Report and the Basin Plan Amendment, EPA concludes that the TMDLs include appropriate wasteload and load allocations that are consistent with federal requirements.

8. Margin of Safety: *Submittal describes explicit and/or implicit margin of safety for each pollutant.*

(See Staff Report, pp.61 and Basin Plan Amendment Attachment A Table 7-29.1 pp.5-6)

These TMDLs include an implicit margin of safety through conservative assumptions. Conservative numeric targets were selected by establishing the targets under a critical lake volume. Likewise, the wasteload and load allocations are based on a constant value for internal loading. Moreover, the lake conditions under which the loading capacity was developed were based on dry weather critical conditions when the lake level is reduced and therefore loading capacity is reduced.

EPA considers this a permissible and appropriate way of dealing with uncertainty concerning the relationships between wasteload allocations, load allocations and water quality.

9. Seasonal Variations and Critical Conditions: *Submittal describes method for accounting for seasonal variations and critical conditions in the TMDL(s)*

(See Staff Report, pp.61-62 and Basin Plan Amendment Attachment A Table 7-29.1 pp.6)

External loads to Machado Lake generally occur during winter and spring months in conjunction with storm events. The critical condition for the attainment of beneficial uses at Machado Lake occurs during the summer months when sediments release nutrients, lake level decreases and algal respiration is highest. The TMDLs account for seasonal and critical conditions during the summer months by assigning a load

allocation to the lake sediments and requiring a reduction in this source of nutrients to the lake, and by assigning wasteload allocations to urban stormwater dischargers year-round.

The TMDLs adequately account for the seasonal variations and critical conditions by establishing loading capacity and allocations that attain water quality objectives during the critical summer months.

10. Public Participation: *Submittal documents provision of public notice and public comment opportunity; and explains how public comments were considered in the final TMDL(s).*

(See Regional Board's Public Meetings February 5, 2007, June 6, 2007 and October 25, 2007; Regional Board's CEQA Scoping Meeting on September 12, 2007; Regional Board's Notice of Public Hearing on May 1, 2007; State Water Board's Notice of Opportunity for Public Comment, State Water Board's December 2, 2008 Meeting Agenda, and Regional and State Board Response to Comments documents)

The Regional and State Boards provided public notice and opportunities to comment on the draft and final TMDLs through newspaper notices, mailings and via formal hearings. The State Board also held several public meetings between February 5, 2007 and October 25, 2007 for these TMDLs. Public comments were received in writing and in oral testimony.

The State demonstrated that it provided sufficient opportunities for public comments and considered public comments in its final decision by providing reasonably detailed responsiveness summaries.

11. Technical Analysis: *Submittal provides appropriate level of technical analysis supporting TMDL elements.*

The TMDL analysis provides a thorough review and summary of available information concerning ammonia, algae, odors and eutrophication impairments in Machado Lake. We conclude the Regional Board was reasonably diligent in its technical analysis of nutrient related impairments in Machado Lake.

12. Reasonable Assurances: *If wasteload allocations are made less stringent based on inclusion of load allocations that reflect nonpoint source reductions, submittal describes how there are reasonable assurances that necessary nonpoint source reductions will occur.*

Not Applicable

13. Other: *Table for clarifying submittal for TMDL waterbody-combinations for 303(d) listed water, new impairment findings or non-impairment findings.*

Not applicable.