UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

JUL 28 1997

Reply To
Attn Of: OW-134

Megan White, P.E., Manager
Water Quality Program
Washington Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Re: Approval of Total Maximum Daily Load (TMDL) for Campbell Lake and Erie Lake

Dear Ms. White:

On August 25, 1992, the Department of Ecology (DOE) submitted Campbell Lake and Erie Lake TMDLs for the Environmental Protection Agency (EPA) review and approval. In March 1993, EPA determined that both TMDLs were incomplete because adequate supporting documents, i.e., Phase I-III reports, were not provided. As part of EPA's and DOE's efforts to address these unresolved TMDLs, DOE submitted the necessary information in January 1997. Based on EPA's findings from its review of the supporting documents, I am pleased to approve the following TMDLs:

| Waterbody Segment | Waterbody Name | TMDL Parameter |
|---|---|---|
| WA-03-9040 | Campbell Lake | Total Phosphorus |
| WA-03-9090 | Lake Erie | Total Phosphorus |

Phosphorus control by alum treatment has been completed to achieve the water quality standard for aesthetics. Monitoring has demonstrated success provided that the treatment is performed on a recurring basis.

Printed on Recycled Paper

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

MAR 23 1993

Reply to
Attn of: WD-139

MEMORANDUM

SUBJECT: Determination that Submittal is Incomplete
Lake Campbell - (WA-03-9040) - Total Phosphorus

FROM: Amber Wong, Standards to Permits Specialist
Water Quality Section

TO: File

- **WA-03-9040 is not on Washington's §303(d) list or on the water quality limited list. It is mentioned in the 1992 §305(b) report as a federal Clean Lakes Program Project - completed.**
- TMDL submitted August 25, 1992
- TMDL package completed _____
  - EPA Approval Checklist
  - Document 1: Transmittal letter
  - Document 2: TMDL document

Transmittal letter - Complete (see Document 1)

- states that TMDL has been established in accordance with Section 303(d)(1) of the Clean Water Act.
- **Review note: meets requirements**

Problem Assessment - Complete (see Document 2)

- This is a Clean Lakes project. Problems cited were dense blooms of blue-green algae and occasional fish kills. The Phase I diagnostic study and restoration plan was developed in 1983. The Phase II implementation project began in 1985. Currently, a Phase III project is underway to evaluate the long-term

Printed on Recycled Paper

effectiveness of the alum treatment. The University of Washington is conducting the intensive monitoring program.

- There are no point sources to the lake. The main nonpoint sources have been identified as surface water tributaries, precipitation, groundwater, and internal loading.

- The assessment is aimed at meeting the water quality standard for aesthetics. Total phosphorus was selected as the best indicator parameter for lake management. Interpretation of the narrative aesthetics standard is typically developed during the Clean Lakes project by the affected public.

- **Review note: Assessment gives problem parameter and outline of the water quality problem. Additional detail should be found in the Phase I report, which was not submitted.**

TMDL document - Complete (see Document 2)

- The load capacity for total phosphorus of 0.87 kg/day (317 kg/yr) has been established. This load was established to meet the goal of an in-lake mean summer total phosphorus concentration of 28 ug/l and a mean summer chlorophyll-a concentration of 10 ug/l.

  Load allocations are as follows:

  Surface Water Tributaries - 76 kg P/yr
  Precipitation - 33 kg P/yr
  Groundwater - 53 kg P/yr
  Internal Loading - 155 kg P/yr

- **Review note: Documentation was not complete to verify the load capacity, or the derivation of the allocations.**

Supporting Studies - Incomplete

- No documentation to support TMDL submittal.

- Review note: no documentation to support submittal. Need Phase I, II, and III studies, and supporting monitoring results.

- **Review note: Need to submit necessary documentation.**

Public participation - Complete (see Document 2)

- Community involvement program initiated during Phase I adequately involved public in management decisions.

- **Review notes: Adequate public participation.**

Enforceability - Incomplete

- Adoption of the Phase I restoration plan, the Phase II implementation plan, and the Phase III monitoring project as TMDL components should strengthen the numeric TMDL values. However, the documentation has not been submitted to support approval of these plans.

- **Review notes: Need to submit the valid supporting documentation with applicable conditions**

TMDL effectiveness plan - Incomplete

- This is assumed to be part of the Phase III monitoring study. To evaluate this, we need to see the frequency of monitoring and the feedback loop.

- **Review notes: Adequate monitoring may be conducted to assess compliance with the lake restoration plan, but it needs to be submitted as documentation for the TMDL.**

Other Information -

- Other documents in EPA files include:

  Entranco Engineers. 1985. "Erie and Campbell Lakes Restoration Project, Phase II - Aquatic Plant Harvester Specifications", Bellevue, Washington

  Entranco Engineers. 1986. "Aquatic Plant Harvesting Program - Erie and Campbell Lakes", for Skagit County Department of Public Works

  Entranco Engineers. 1986. "Erie and Campbell Lakes Restoration Phase II - Quarterly Status Report", November 1985 through January 1986, June through July 1986, and August through October 1986, for Skagit County Planning.

  Skagit County Planning Department. 1984. "Final Environmental Impact Statement, Lake Restoration Project, Lake Erie and Lake Campbell", Skagit County, Washington

  Skagit County. Erie and Campbell Lakes Restoration Analysis, Grant Application

Recommendation, determine that the submittal is incomplete, but appears to be easily rectified with submittal of appropriate documentation.

ALW,3/15/93

# TOTAL MAXIMUM DAILY LOAD

Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Developed pursuant to 40 CFR 130.7 and the Federal Clean Water Act

---

**WATERBODY SEGMENT:** WA-03-9040

Campbell Lake

(outlet at TRS 34N-01E-12)

**RECEIVING SYSTEM INFORMATION:**

Basin: Lower Skagit-Samish
Counties: Skagit

**TMDL PARAMETER:**

Total Phosphorus

**APPLICABLE RULES:**

WAC 173-201-045(5)(viii)
Skagit County Ordinances

**SOURCES COVERED BY THIS TMDL:**

| Allocation Type | Source Description |
|---|---|
| LA | Campbell Lake Surface Water Tributaries |
| LA | Precipitation |
| LA | Groundwater |
| LA | Internal Loading |

---

TMDL:

A loading capacity for total phosphorus of 0.87 kilograms P per day (317 kg P/year) to Campbell Lake has been established. The loading rate has been shown to be consistent with a mean summer total phosphorus concentration of 28 ug P/L and a mean summer chlorophyll-a concentration of 10 ug/l. The LA for surface water tributaries is set at 76 kg-P/yr; for precipitation is set at 33 kg-P/yr; for groundwater is set at 53 kg-P/yr; and for internal loading is set at 155 kg-P/yr. These LA's have been set based on estimated loads achieved after implementation of various restoration activities to the lake that achieved levels of aesthetic enjoyment acceptable to the lake user community.

Technical Documents:

Entranco Engineers, Inc. 1983. Water Quality Analysis and Restoration Plan for Erie and Campbell Lakes. Report to Skagit County, WA.

Entranco Engineers, Inc. 1987. Erie and Campbell Lakes - Final Report: Restoration and Evaluation. Report to Skagit County, WA.

Entranco Engineers, Inc. 1983. Water Quality and Restoration Plan - Erie and Campbell Lakes. Report to Skagit County, WA.

Public Participation:

A community involvement program was initiated in Phase I and carried throughout Phase II in order to inform local residents of project findings and to invite community participation in decisions related to lake management. A Lake Study Review Committee, comprised of local residents and interested agency officials, met quarterly to review the status of the project and provide guidance to the project team. In addition, five public meeting were held to present project results and management options.

Implementation:

Due to dense blooms of blue-green algae and occasional fish kills, a Phase I diagnostic study was conducted (Entranco Engineers, 1983). The Phase I restoration plan recommended 4 major activities to restore the lake to acceptable levels; (1) alum treatment, (2) mechanical harvesting of aquatic plants, (3) watershed management plan for control of external loading, and (4) monitoring.

A Phase II implementation project was funded to implement these recommendations. Alum was applied in 1985 and aquatic plant harvesting conducted in 1986. The Phase II Watershed Management Plan consisted of evaluating current zoning regulations to determine adequacy for future lake protection. The consultants report that the regulatory programs and practices in place are progressive and will minimize future impacts to lake water quality if properly enforced.

Monitoring:

Monitoring of numerous quality constituents was conducted during and after the lake restoration effort. Currently, a Phase III project is being conducted on the lake to evaluate the long-term effectiveness of the alum treatment. The lake is being sampled by the University of Washington twice a month from June through September for total phosphorus and other water quality parameters for three years (1992-1994).