TMDL Implementation Plan for Savannah River, Downstream of Clark's Hill Lake Dam to Stevens Creek Dam -- Dissolved Oxygen

Introduction

The portion of the Savannah River downstream of the dam for Clark's Hill Lake (which has been renamed Lake Thurmond) to the Stevens Creek Dam, is located a short distance north of the Consolidated Government of Augusta/Richmond County, Georgia. The Clark's Hill Lake dam is operated by the U.S. Army Corps of Engineers, Savannah District. Reservoir water flows through the turbine generators in the dam to produce hydroelectric power. The water for such use is taken from the lower (hypolimnion) zone of the Reservoir where the water is naturally lower in dissolved oxygen (D.O.).

Plan for Implementation of the TMDL

The TMDL for this and seven other low D.O. river segments below dams, was finalized in November, 2000. The designated use for the Savannah River downstream of the dam for Clark's Hill Lake, is for drinking water (after appropriate treatment at a water plant). The applicable water quality standards there for D.O. are a concentration of 5 milligrams per liter (mg/l) as a daily average and a concentration of 4 mg/l as a minimum value.

Attainment and maintenance of these two D.O. water quality standards are the goals of this Implementation Plan.

The TMDL recommends that the appropriate federal and state agencies work together in developing an implementation strategy to provide higher oxygenated water from these dam releases. The TMDL adds that these strategies may include oxygenation or aeration of the water, redesigned spillways, or other measures, and that ongoing water quality monitoring is needed to monitor progress.

The Corps of Engineers is in the process of rehabilitating the turbines and generators at the Lake Thurmond dam. Turbine rehabilitation will include an engineering design for reventing the turbine blades -- that is, injecting air in hollow blades so that when water passes through them (to generate electricity using the generators also), air and thus dissolved oxygen is injected into the water. This will represent "state of the art" technology and will add at least 2 mg/l of D.O. when D.O. is low.

Presently, it is our understanding that a lawsuit in the U.S. District Court in Charleston, South Carolina, that relates to pumpback operations at Lake Russell upstream, is delaying implementation of a complete strategy that is designed to achieve compliance with D.O. standards. This is because the outcome of that lawsuit will in part determine whether an oxygen

injection system will be added at Lake Thurmond, that is designed to add 5 mg/l of D.O. at the point of injection a mile above the dam, which would add 3 mg/l of D.O. at the dam. It is also our understanding that the suit revolves around the issue of entrainment at the Lake Russell dam. According to the Corps, if that suit is decided favorably to the Corps, or is settled on terms that allow this D.O. injection project, the described D.O. improvement measures can proceed and could be built in about 2-3 years. A motion to lift the injunction has been filed and argued, and a decision on that motion is pending. This system would also greatly enhance the fishery at Lake Thurmond.

EPD will work with EPA to set up periodic meetings with the Corps of Engineer on this and the other TMDL segments where river segments below Corps dams are not meeting water quality standards for D.O. This is the approach recommended in the TMDL. The purpose of this process is to seek to reach agreement on a schedule for implementing solutions on the D.O. non-compliance, to track progress on improvement measures, and to provide input as needed, until water quality standards for D.O. are met.

A summary of the Implementation Plan is as follows.

A. Source categories, subcategories, or individual sources which must be controlled to implement the load allocations: Dam immediately upgradient.

B. Description of regulatory or voluntary actions, intended to achieve reductions: Continued monitoring at same locations, plus work with U.S. Army Corps of Engineers and EPA to develop plan for reventing turbine blades to allow air to be injected in water when power generation turbines in dam are operating.

C. Description of regulatory or voluntary actions, including management measures or other controls, by governments or individuals, that provide reasonable assurance that reductions will be achieved to meet water quality standards: See previous response. Aeration system design must have target of full compliance with D.O. water quality standards.

D. Schedule for implementing the management measures or other control actions as expeditiously as practicable: Will set up first meeting with EPA and COE as soon as feasible, and seek to obtain agreement on an implementation schedule as expeditiously as practicable.

E. Projected attainment date and basis for it: The projected attainment date is on or before 2006, for this Implementation Plan, but might be later, because of an injunction in a related lawsuit.

F. Measurable milestones for determining whether management measures or other control actions are being implemented: Periodic re-evaluation of D.O. data will be undertaken, to confirm or refine the projections. If an agreement is reached

with the COE on a schedule, that schedule will include appropriate milestones.

G. Monitoring or modeling plan designed to measure the effectiveness of the management measures or other controls, the progress the water body is making toward attainment, and a process for implementing stronger and more effective management measures if necessary: Periodic monitoring will be conducted using the same methodology and analytical approach as before. An aeration system for the power generation turbines is believed to be the most effective and feasible approach for this dam.

H. The criteria to determine whether substantial progress toward attainment is being made, and if not, whether the TMDL needs to be revised: The criteria are the in-stream D.O. analyses, from samples taken at the same locations as for data collected in the past. If compliance is not achieved after the turbine venting systems are installed and operating properly, the Implementation Plan will be revised as appropriate, based on facts known at that time.

I. Goal of attaining and maintaining the applicable water quality standards within 10 years, where that is practicable: That should be accomplished, for this segment.