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PLANNING ASSISTANCE TO STATES

**TURNER RESERVOIR STUDY
EAST PROVIDENCE, RHODE ISLAND**

February 2001



**US Army Corps
of Engineers**

New England District

C. Project Study Area and History

The study area is located in the city of East Providence on the Massachusetts-Rhode Island border with parts of the reservoir area extending into Seekonk, Massachusetts (see Figure 1). The James V. Turner Reservoir consists of a series of three (3) ponds with a combined surface area of 225 acres and is located at the end of the freshwater section of the Ten Mile River. The three ponds are individually named North, Central, and South Pond, but collectively known as Turner Reservoir. Below Turner Dam, at the south end of South Pond, the Ten Mile River flows about two miles to the Providence River. Total drainage area at the dam is 52.1 square miles.

Between 50 years and 100 years ago, a dam was constructed on the Ten-Mile River approximately 100 feet upstream from what is now Route 152 presumably to provide waterpower for a local mill. The resulting one-mile long impoundment is the area now known as Central and North Ponds, and consisted of approximately 100 acres of artificial lake. In 1930, another dam was constructed approximately 0.75 miles downstream from the original milldam as a water supply for the city of East Providence. The weir elevation of this new dam (Turner Reservoir Dam) was approximately 5 feet higher than that of the milldam upstream. The resulting impoundment was known as Turner Reservoir, and consisted primarily of the flooded pasture/wetland immediately downstream from the milldam (i.e. Route 152). It also included the upstream areas of Central and North Ponds, due to the higher weir elevation of the new dam, which raised the impoundment surface elevation above the previous level of Central/North Pond (i.e. overtopping the milldam). This formed the existing Turner Reservoir Central/North Pond complex. The remains of the mill dam (i.e. the water control structures) can be seen upstream from Route 152, and the weir still stands approximately 5 feet below the existing water surface.

During the period following the construction of the dam to 1969, Turner Reservoir was used as a water supply for the City of East Providence. It was discontinued due to odor and other aesthetic water quality problems. It is currently used for recreational fishing and boating.

EPA improperly Applies Rhode Island's Water Quality Standards.

Although EPA's current version of the fact sheet contains references to various agency documents and guidelines, those same documents and guidelines were referenced in the prior version of the fact sheet, and were thus presumably used to support the requirement for the 0.2 mg/l. Thus, they appear not to be the essential reason for reissuing the draft permit with a lower phosphorus limit.

EPA bases its decision to revise the permit based on comments submitted by the Rhode Island Department of Environmental Management. RIDEM apparently claims that the 0.2 mg/l limit is inadequate to provide for compliance with the Rhode Island Water Quality Standards. According to EPA, the Rhode Island Water Quality Standards require that:

"Average Total Phosphorus shall not exceed 0.025 mg/l in any lake, pond, kettlehole or reservoir, and average Total P in tributaries at the point where they enter such bodies of water shall not cause exceedance of this phosphorus criteria, except as naturally occurs, unless the Director determines, on a site specific basis, that a different value for phosphorus is necessary to prevent cultural eutrophication." Rule 8.D. (2).

In developing its limits, the Agency did not estimate the contribution from Attleboro that is necessary to keep the "Average Total Phosphorus" below 0.025 mg/l. Rather, it appears that they have relied upon flow conditions associated with the 7 day, ten year low flow. In most systems, this would represent a flow that happens very infrequently, far different from the "average" referenced in the state's water quality standards.

The use of average concentrations over appropriately long periods is recommended by the Agency's guidance. In its "Ambient Water Quality Criteria Recommendations; Information Supporting the Development of State and Tribal Nutrient Criteria Lakes and Reservoirs in Nutrient Ecoregion XIV" EPA encourages States to

"Identify appropriate periods of duration (how long) and frequency (how often) of occurrence in addition to magnitude (how much). EPA does not recommend identifying nutrient concentrations that must be met at all times; rather a seasonal or annual averaging period (e.g., based on weekly or biweekly measurements) is considered appropriate. However, these central tendency measures should apply each season or each year, except under the most extraordinary conditions (e.g., a 100-year flood)." See

http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/lakes/lakes_14.pdf, page 8

The use of seasonal averages would provide additional dilution, and would thus serve to lower the treatment requirements required of the City. MAY OR MAY NOT WANT TO INCLUDE THE FOLLOWING For example, based on gage data, the average flow in the river from April to October (the period specified for the effluent limit) for the period of

record of the gage is 88.9 cubic feet per second, which provides for a dilution of approximately 6.7:1.

EPA has indicated that there is "some natural uptake of phosphorus by the aquatic plant biomass". This uptake, coupled with other natural sedimentary process and the additional dilution mentioned above should serve to

The Agency failed to conduct a wasteload allocation as suggested by RIDEM, and failed to consider that other sources of phosphorus could represent significant contributions to the problems of the waterbody as referenced in the State's 2004 integrated waters list. In particular, there are several golf courses adjacent to the John V. Turner reservoir that could significantly impact the phosphorus loading on the Reservoir. TMDL's ought be established and waste load allocations adopted in order that to properly manage the waterbody.

The Agency failed to establish that the John V. Turner Reservoir is in fact subject to the quoted Rhode Island Standard. Although it is named a reservoir, it no longer functions as such, and the Agency presents no information to support the assertion that the cited Rhode Island Standard applies to this water body.

OTHER ISSUES

How does the State certify this permit? The issues being covered do not address Mass water quality standards. Does lack of a certification really mean anything?

Absent the dam that creates the impoundment, there would be no problem in this water body. So, can we argue that the owner of the Dam should remove it? Or, that the owner has some responsibility for this issue?