Washington University in St. Louis
SCHOOL OF LAW

Civil Justice Clinic
Interdisciplinary Environmental Clinic

June 6, 2007

Mr. Mark Osborn
Ms. Georganne Bowman
Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
P.O. Box 176
Jefferson City, MO 65102

Dear Mr. Osborn and Ms. Bowman:

On behalf of the Missouri Coalition for the Environment, the Interdisciplinary Environmental Clinic (IEC) has been participating on the Nutrient Criteria Workgroup and Technical Subcommittee over the past 18 months. We are providing these comments on the draft criteria for reservoirs developed by the Technical Subcommittee and presented to the full Workgroup on May 23, 2007. We appreciate the opportunity to provide these comments.

The Technical Subcommittee has worked diligently since the beginning of the year to develop draft criteria. In general, the MCE supports the establishment of specific numeric criteria for nutrients as proposed to the workgroup with a few caveats. First, the MCE is concerned that response variables have not been included in the criteria. Second, the proposed relaxed criteria for reservoirs managed by the Missouri Department of Conservation for sport fishing are unsupported by science and regulation. Phosphorus is clearly the nutrient that impacts Missouri's reservoirs. Finally, in order to avoid another train wreck similar to what happened with the Workgroup's first nutrient proposal, we recommend that the department obtain an opinion from the U.S. Environmental Protection Agency (EPA) as to the "approvability" of the draft criteria for reservoirs.

The workgroup should establish response variables as part of the nutrient criteria.

The purpose of establishing a response variable as part of the nutrient criteria is to establish another benchmark for determining compliance beyond an input variable such as phosphorus and nitrogen. The typical response variables are Secchi depth and chlorophyll-a. Since the workgroup has focused on establishing criteria to protect aquatic life, it is more appropriate to use chlorophyll-a as the response variable. The EPA also requires that a response variable be established. The EPA reinforced this requirement in a recent memo stating that "to be effective, nutrient criteria should address causal (both nitrogen and phosphorus) and response (chlorophyll-a and transparency) variables for all

waters that contribute nutrient loadings to our waterways."[1] Jones and Knowlton have indicated the correlation in Missouri reservoirs between phosphorus and chlorophyll-a.[2] Therefore, it would seem to be possible to establish a chlorophyll-a value for reservoirs where data is available.

Using chlorophyll-a as an additional parameter may aid in determining compliance status of the reservoir. The department has suggested that a use attainability analysis could be used as the final determining factor for placing a reservoir on the impaired waterbody list. This proposal is either a misuse of the UAA term or an inappropriate use of the UAA process. In any case, the addition of chlorophyll-a as part of the criteria would allow this step in the process to be eliminated by providing a second parameter that would need to be violated in order for a reservoir to be added to the 303(d) list.

The proposed relaxed criteria for reservoirs managed by the Missouri Department of Conservation for sport fishing are unsupported by science and regulation.

The Technical Subcommittee decided at the onset of the criteria development process that the criteria should be protective of aquatic life. The proposal to include relaxed criteria for MDC-managed reservoirs is inconsistent with the protection of aquatic life use. The section titled "Nutrient criteria for fishing reservoirs" in the most recent draft proposal contains relaxed phosphorus limits for certain reservoirs. It appears that this proposal for MDC managed reservoirs is simply to promote the growth of a few species of fish. The draft states that "in some cases MDC fertilizes these lakes to promote productivity and fish growth." Aquatic life encompasses more than just fish populations. It is also troubling that MDC admits to adding nutrients to reservoirs. Discharge of pollutants to waters of the state requires a permit regardless of the purpose for the discharge. It also appears that the less stringent criteria are being proposed to keep some reservoirs off of the 303(d) list. The proposal states:

> The University of Missouri data set contains long-term information on 41 MDC owned reservoirs, and 22 of these were non-compliant based on regional criteria. Replacing criteria calculated using regional formulas with the more accommodating criteria proposed above reduces non-compliant reservoirs from 22 to 7.

Clearly the proposal is an inappropriate concession to MDC. The department has not even attempted to justify this proposal with any data demonstrating that aquatic life will be protected. In fact, allowing additional phosphorus into a reservoir may reduce its aquatic life diversity. There is a considerable body of literature that cites reduced nutrient loading as benefiting sportfish populations. For example, a recent exploration of the dynamics of fish communities within Lake Erie, a system formerly degraded by eutrophication and now undergoing oligotrophication as a result of phosphorus abatement

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[1] Memorandum titled "Nutrient Pollution and Numeric Water Quality Standards," Benjamin Grumbles to State Water Programs Directors, May 25, 2007.

[2] Chlorophyll Response to Nutrients and Non-algal Seston in Missouri Reservoirs and Oxbow Lakes, Jones and Knowlton, *Lake and Reservoir Management* 21(3):361-371, 2005.

programs, revealed increased levels of species richness and productivity in some basins of the system. Specifically, "phosphorus-driven reductions in tolerant species abundance caused species richness to decline in the west basin. In contrast, phosphorus abatement conceivably caused species richness to increase in the central basin by allowing a variety of species intolerant of degraded water quality to recover."[3]

The most applicable study of sportfish population related to reservoir productivity in Missouri was conducted by Paul Michaletz.[4] Michaletz observed population characteristics of gizzard shad in 14 Missouri reservoirs to determine if they were related to reservoir productivity (chlorophyll-a concentrations, mg/m^3), mean depth, and sportfish growth. Populations in the eutrophic reservoirs studied were characterized by higher abundance, smaller and younger fish, slower growth (after age 1), and poorer conditions than in mesotrophic reservoirs. Furthermore, mortality increased and recruitment became more consistent with increasing productivity. Essentially, gizzard shad grew slower during their first year in deep, mesotrophic reservoirs than in shallow eutrophic reservoirs, even though food supply, zooplankton abundance and biomass, increased in eutrophic reservoirs. The study confirmed the importance of age-0 gizzard shad as prey for piscivorous sport fishes. The study determined that sport fish grew faster in reservoirs where first-year growth of gizzard shad was slower.

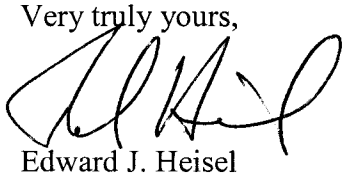
The MCE requests that the misguided proposal for the MDC-managed reservoirs be deleted from the draft proposal and that these reservoirs be subject to the same approach as all other reservoirs.

The MCE suggests that the department thoroughly consult with the EPA regarding the proposed draft criteria for reservoirs.

The draft criteria are definitely a hybrid between predictive hydrology approach and a reference waterbody approach. While we do not expect the EPA to prematurely approve the draft, it would be helpful if the workgroup knew if any portions of the draft need refinement or could not be approved by the EPA.

Thank you for your consideration of our comments.

Very truly yours,



Edward J. Heisel
Clinic Attorney

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[3] Ludsin, Stuart A., Mark W. Kershner, Karen A. Blocksom, Roger L. Knight, and Roy A. Stein. June 2001. Life after Death in Lake Erie: Nutrient Controls Drive Fish Species Richness, Rehabilitation. Ecological Applications 11(3): 731-746.

[4] Michaletz, Paul H. 1998. Population Characteristics of Gizzard Shad in Missouri Reservoirs and Their Relation to Reservoir Productivity, Mean Depth, and Sport Fish Growth. North American Journal of Fisheries Management 18: 114-123.