SECTION 4 – DECISION ON NUTRIENT CRITERIA

4.A. Approved – 10 CSR 20-7.031 (4) Specific Criteria (N) Nutrients (3), Table M

As part of the 2009 submittal, Missouri included the establishment of site specific numeric nutrient criteria for lakes and reservoirs that exhibit trophic characteristics that are fully supportive of aquatic life. EPA evaluated available data for these lakes (found in Table M) and concurs with the state's conclusion that the site specific criteria found in Table M (which represent the geometric mean values for total phosphorous, total nitrogen, and chlorophyll) are supportive of aquatic life uses at these lakes.

These twenty-five lakes, identified in Table 13, represent lakes with the lowest TP, TN, and Chlorophyll concentrations in the State (within their particular ecoregions) and are located in the lowest 25th percentile (i.e., best) of all lakes with respect to their levels of nutrient contamination. Accordingly, as provided in EPA's guidance for development of nutrient criteria for lakes (and visually depicted in Figure 6.1 of the guidance) these lakes can be used in establishing reference condition, with the understanding that resulting nutrient values are protective of aquatic life.[19] Additionally, the TP, TN, and Chlorophyll values presented in Table M are consistent with the Regional Ambient Water Quality Benchmarks for protection of aquatic life use in Region 7 as developed by the Regional Technical Advisory Group (RTAG)[20] as well as Ambient Water Quality Criteria Recommendations for Lakes in Nutrient Ecoregion VI[21], Ecoregion IX[22], and Ecoregion XI[23].

Therefore, EPA concludes that the site specific criteria in Table M are consistent with the CWA and its implementing regulations at 131.11(a) as being protective of the designated use and based on a sound scientific rationale. EPA accordingly approves Table M of 10 CSR 20-7.031., and only the first sentence of 10 CSR 20-7.031 (4) (N) (3), striking "*s*" at the end of the word Table as well as "*and N*" so the sentence reads:

(1) *Nutrient criteria for lakes and reservoirs with site-specific criteria are listed in Table M.*

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[19] USEPA. 2000a. Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs. Office of Water, Office of Science and Technology. Washington, DC. USEPA-822-B00-001

[20] http://www.cpcb.ku.edu/progwg/html/assets/nutrientwg/Lake_RTAG_2011Jun.pdf

[21] USEPA. 2000c. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Lakes and Reservoirs in Nutrient Ecoregion VI, EPA 822-B-00-008.

[22] USEPA. 2000e. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Lakes and Reservoirs in Nutrient Ecoregion IX, EPA 822-B-00-011.

[23] [23]USEPA. 2000f. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State andTribal Nutrient Criteria, Lakes and Reservoirs in Nutrient Ecoregion XI, EPA 822-B-012-008.

4.B. Disapproved – 10 CSR 20-7.031 (3)(N) Nutrients and Chlorophyll (except as noted in Sections 4.A., above)

Based upon its review, EPA does not believe the state has submitted nutrient criteria for lakes and reservoirs consistent with the requirements of the Clean Water Act in 40 CFR §131.11, with the exception noted above in Section 4.A. In reaching this conclusion, EPA relied upon the rule language found within 10 CSR 20-7.031(3)(N), the document cited as the technical basis for the numeric nutrient criteria or the Rationale, and the Responses from the state to EPA's initial comments submitted to the state during the public comment period as found in Volume 34, No. 18 of the Missouri Register.

Section 303(c)(2)(A) requires that states adopt "water quality criteria for such waters based upon such [designated] uses." EPA's regulations at 40 CFR § 131.11(a)(1) require that "[s]tates must adopt those water quality criteria to protect the designated use. Such criteria must be based on sound scientific rationale." The approach used to derive the criteria documented in the Rationale is not based on a sound scientific rationale because it does not include the data and other necessary information to allow others to independently reproduce the work. EPA attempted several times to replicate the analyses performed by the state and could not arrive at the same equations, values, and ultimately the same conclusions. For this reason, EPA cannot determine that the approach and resulting criteria are based on a sound scientific rationale as required by EPA's regulations.

In addition, numeric nutrient criteria found at 10 CSR 20-7.031 (3)(N) and as described in the Rationale (with the exception of values noted above in Section 4.A.) fail to demonstrate that the values or approaches to numeric nutrient criteria will protect the designated aquatic life or recreational uses. In addition, the Rationale put forth by the state is silent with respect to the fundamental requirements of the Clean Water Act which require that water quality criteria to protect designated uses. Under current Missouri Law, lakes in Missouri (with the exception of three that receive a cold water designation) are afforded the following designated aquatic life use:

> *"General Warm-Water fishery -Level of protection assigned to waters in which naturally occurring water quality and/or habitat conditions allow year around maintenance of a diverse warm-water biota, including naturally reproducing populations of recreationally important fish species."*

The Rationale put forth does not provide any information, data, or studies to indicate that the established criteria will, "allow year around maintenance of a diverse warm-water biota," and therefore it cannot be demonstrated to ultimately protect the designated uses for lakes within the state as required by the CWA and its implementing regulations.

The state must revise the criteria to clearly indicate which designated uses the criteria is intended to protect as well as supporting documentation to indicate that the criteria in fact will fully support the associated use. Additionally, supporting documentation needs to include the raw data and resulting statistical analyses so that the EPA may evaluate the soundness of the scientific rationale and protectiveness of the criteria pursuant to the

requirement found at 40 CFR § 131.11(a)(1). At minimum, it is important that the revised criteria also take into account the following:

- When using a reference approach or least-disturbed approach, reference water bodies should not be impaired by anthropogenic nutrient pollution and the selection process for reference waters should not exclude high quality lakes based solely on a particular landcover class, especially where other landcover classes may be more representative of minimal human disturbance.
- If using a modeling approach to develop TP, the approach must result in criteria that are supportive of the designated use. Accordingly such an approach should use data from waters that support the use such as reference/least-disturbed lakes (or alternatively a lower percentile i.e., <25th percentile of the full population), the number of lakes (n) for each ecoregion should be sufficient to establish a robust relationship, and the resulting relationship should be shown to predict lake TP concentrations with sufficient accuracy to inform criteria derivation. If these conditions are not met, the approach may not be scientifically defensible.
- Chlorophyll and TN concentrations in reference/least-disturbed lakes should be evaluated to inform criteria derivation. Statistical relationships between TP and Chlorophyll, TP and TN, and TN and Chlorophyll can also be estimated and used to translate chlorophyll criteria to corresponding TN and TP criteria. These multiple lines of evidence can then be used to develop a more robust and scientific rationale, rather than relying on a single relationship.

The Agency would also support the state if they chose to modify their criteria beyond the original framework established within their Rationale, and offers assistance to develop such additional lines of evidence and analyses to provide additional scientific support.

Accordingly, the EPA disapproves 10 CSR 20-7.031 (3)(N) Nutrients and Chlorophyll (except as noted in Sections 4.A., above) of Missouri's WQS because the methods used and analyses conducted to develop the lake nutrient criteria are not based on a sound scientific rationale as they do not include the data and other necessary information to allow others to independently reproduce the work; it also fails to demonstrate that the values or approaches to numeric nutrient criteria will protect the designated aquatic life or recreational uses per 40 CFR §§131.6(b) and (c).