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VIA EMAIL & U.S. MAIL
Gina McCarthy, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W. (2410T)
Washington, DC 20460

Susan Hedman
Region 5 Administrator
U.S. Environmental Protection Agency
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Chicago, IL 60604-3507

RE: Request for EPA to Withdraw and Modify its Approval of Minnesota's Stream Nutrient Water Quality Standards

Dear Ms. McCarthy and Ms. Hedman:

This letter details the Center for Regulatory Reasonableness' ("CRR") objections to EPA's January 23, 2015 approval of the Minnesota Pollution Control Agency's ("MPCA") August 20, 2014 submission of new and revised water quality standards ("WQS") and criteria. *See* Ex. 1, EPA's Approval Letter. Specifically, CRR takes issue with EPA's approval of two of the response variables (*i.e.,* diel DO flux and BOD5) associated with MPCA's new eutrophication criteria for rivers and streams. As discussed in more detail below, EPA's approval failed to meet the applicable review standard because the Agency possessed no information demonstrating that the BOD5 test and diel DO flux were valid impairment response criteria for nutrients. Rather, in both cases, EPA possessed clear and extensive documentation (*Standard Methods* publications, regulatory notices, hearing transcripts and EPA correspondence) confirming that these parameters were *not* scientifically defensible indicators for nutrient impairments. EPA's unprecedented approval of these metrics as nutrient impairment indicators will misdirect state and local resources unless it is corrected.

Accordingly, CRR requests EPA to promptly withdraw its January 23, 2015 approval of Minnesota's revised water quality standards for those two response variables. If EPA does not withdraw its approval, CRR (on behalf of its numerous Minnesota municipal members who will be negatively impacted by the revised standards and municipal entities in other states considering numeric criteria adoption) will be forced to challenge EPA's approval in federal District Court.

Standard Governing EPA's Review and Approval of State WQS

It well settled in administrative law, that a federal agency's action is arbitrary and/or capricious where the agency has:

> relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view of the product of agency expertise.

Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983). Beyond these general requirements applicable to all agency actions, when it comes to water quality standards approval, EPA must confirm that state water quality standards (including numeric and narrative criterion) are "consistent" with the Clean Water Act ("CWA"), are "based on [EPA's] 304(a) guidance … or other scientifically defensible methods,"[1] and are developed using "sound scientific rationale." *See* 33 U.S.C. § 1313(c)(3) ("If the Administrator determines that any such revised or new standard is not consistent with the applicable requirements of this chapter, he shall … notify the State and specify the changes to meet such requirements."); 40 C.F.R. § 131.11(a) ("States must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use."); 40 C.F.R. § 131.11(b)(1) ("In establishing criteria, States should: (1) Establish numerical values based on: (i) 304(a) Guidance; or (ii) 304(a) Guidance modified to reflect site-specific conditions; or (iii) Other scientifically defensible methods."); 80 Fed. Reg. 51020, 51028 (Aug. 21, 2015) ("Ultimately, states and authorized tribes must adopt criteria that are scientifically defensible and protective of the designated use to

[1] 80 Fed. Reg. 51020, 51021 (Aug. 21, 2015) ("[W]ater quality criteria define the minimum conditions necessary to achieve those environmental objectives.").

ensure that WQS continue to 'protect the public health or welfare, enhance the quality of water and serve the purpose of ' the Act.").[2]

EPA regulations further delineate the components of the Agency's review of state water quality standards. Relevant to this request, 40 C.F.R. § 131.5(a)(4) (2008) requires EPA to confirm "whether the State standards which do not include the uses specified in section 101(a)(2) of the Act are based upon appropriate technical and scientific data and analyses…." This rule was revised in 2015 to clarify that, as part of its review and approval of state WQS, EPA must confirm that adopted state criteria are "based on sound scientific rationale consistent with § 131.11." 40 C.F.R. § 131.5(a)(2) (2015); 80 Fed. Reg. 51020 (Aug. 21, 2015).[3]

In a case challenging EPA's review and approval of nutrient standards and specific biological response variables/thresholds, the Agency itself espoused an even more specific checklist for approving Florida's nutrient standards. Specifically, the Agency stated that:

> if one-sided thresholds are implemented for assessment purposes, the translator must (1) [h]ave a basis in science that relates the measurements specified by the procedure to the desired condition or adverse condition to be avoided, as described by the narrative; (2) [e]ffectively separate waters into groups where (a) protection of the use is clearly threatened or impaired and (b) where protection of the use is uncertain . . . ; [and](3) *[u]tilize the proper parameters and constituents to achieve the objectives set forth above.*

Fla. Clean Water Network, Inc. v. EPA, 2012 U.S. Dist. LEXIS 44539, *32 (N.D. Fla. 2012) (emphasis added).

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[2] *Fla. Clean Water Network, Inc. v. EPA*, 2012 U.S. Dist. LEXIS 44539, *30 (N.D. Fla. 2012) ("In order to approve a new or revised water quality standard, the EPA must find that it is consistent with federal regulations and the CWA; in making such a determination, the EPA must consider whether the new or revised standard adequately protects the designated uses of the state's waterbodies and is based on a sound scientific rationale."); *Mississippi Com. On Natural Resources v. Costle*, 625 F.2d 1269, 1276 (5th Cir. 1980) ("It was not unreasonable for the EPA Administrator to… require states to justify standards not in conformance with the [EPA 33 U.S.C.§ 1314(a)(1)] criteria policy.").

[3] *See* 40 C.F.R. § 131.21 ("The Regional Administrator's approval or disapproval of a State water quality standard shall be based on the requirements of the Act as described in §§ 131.5 and 131.6, and, with respect to Great Lakes States or Tribes (as defined in 40 CFR 132.2), 40 CFR part 132.").

In short, EPA's approval of a state WQS submission is more than a "rubber-stamp."[4] Before approving, EPA must conduct a thorough and probing review of a state submission to ensure that "sound scientific rationale" was employed and well-documented in the WQS submission record. In the case of nutrients, the chosen nutrient impairment response variables (1) must have a demonstrated adverse effect on aquatic life, and (2) be set at a level such that attainment is necessary to prevent nutrient impairment. As discussed below, EPA's approval of MPCA's BOD5 test and diel DO flux as indicators of eutrophication entirely fail to meet the governing review standard.

Specific Objections to Use of diel DO flux and BOD5

Under MPCA's revised eutrophication criteria, a Minnesota stream or river is impaired for nutrients if (1) the total phosphorus (TP) value is exceeded, and any of the four response variables (*i.e.,* sestonic chlorophyll *a,* diel DO flux, BOD5 and pH) are also exceeded. Conversely, if the TP value is met, or all four of the response variables are in compliance with MPCA's threshold values, then the waterbody is not considered nutrient impaired. The concerns regarding the efficacy of the BOD test and DO Flux as valid nutrient impairment indicators were extensively addressed in comments submitted by the municipal entities that are members of CRR and directly impacted by the rulemaking (*e.g.,* MESERB).

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[4] The Agency's decision, regardless of traditional notions of deference, must still adhere to the fundamental tenets of administrative law and its own regulations that govern the process. *See Michigan v. EPA*, 135 S. Ct. 2699, 2706 (U.S. 2015) (despite the deference afforded under *Chevron* and *Seminole Rock*, "[f]ederal administrative agencies are required to engage in reasoned decisionmaking. Not only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational.") (internal citations and quotations omitted); *see also Pennaco Energy Inc. v. EPA*, 692 F. Supp. 2d 1297, 1312 (D. Wyo. 2009) ("EPA's statutory duty is not to review whether [the state] found that the standards are in accordance with the Clean Water Act… Rather, the EPA must act objectively and independently and make its own determination. In so doing, it must explain its reasoning."); *id.*, at 1314 (in reviewing WQS "[t]he EPA must make plain its course of inquiry, its analysis and its reasoning. … [T]he agency must nevertheless explain the evidence which is available, and must offer a rational connection between the facts found and the choice made.") (internal citations and quotations omitted).

BOD5 Test issues

The use of the BOD5 test as an indicator of nutrient impairment was documented by MESERB as completely unprecedented and unsupportable. Nutrients (nitrogen and phosphorus) do not exert a BOD. As noted by Dr. Chapra, one of the foremost authorities on nutrient impairment evaluation, the 5-day BOD demand measures the effects of numerous non-nutrient parameters (organic substances, nitrogenous material) and is artificially inflated by effects from live algae placed in the dark for five days. Therefore, utilizing this test with ambient samples containing live algae would very likely produce a BOD reading that does not actually exist and is simply an artifact of the test method. *See* Ex. 2, Chapra Analysis of BOD5. ("It is my assessment that the creation of a BOD_5 criteria as a nutrient impairment indicator is fundamentally flawed and not consistent with accepted scientific practices for assessing nutrient impacts in streams or any other natural waters."). Beyond this, BOD is not a "toxic" measurement and does not directly impair aquatic life. It is impossible to determine what ecological impact could be associated with a BOD reading without further site-specific analyses. *See* Ex. 7, Excerpts of January 8, 2014 MPCA hearing testimony, at 142-143.

Consistent with these observations (and Dr. Chapra's expert opinion), no published EPA nutrient criteria document states that the BOD5 test is a valid indicator of nutrient impairment. In fact, prior to EPA's approval action, counsel for MESERB submitted a FOIA request to EPA regarding the use of this test as a valid nutrient impairment indicator. *See* Ex. 3, BOD5 FOIA Request/Response. In its response to the FOIA request, EPA conceded that it possesses no documentation supporting the use of the 5-day BOD demand (BOD5) test as a proper nutrient response criterion. *Id.* Finally, Standard Methods (the expert EPA relies upon for proper test development and usage – *see* 40 C.F.R. § 136.3) states that BOD5 should *not* be used as a parameter to evaluate the presence of a nutrient impairment. *See* Ex. 4, Standard Methods Memo on BOD5 test ("The BOD test (Standard Method 5210 B) is not considered to provide an appropriate measure of nutrient pollution nor is it a valid predictor of nutrient impacts.").[5] This "oxygen demand" test is simply being misapplied as it plainly was not designed to, and is incapable of reliably predicting nutrient impairment in the environment, as MPCA itself admitted under oath. Given this clear record, it is apparent that EPA's approval of the BOD5 test was inconsistent with the Clean Water Act and the implementing rules that require a sound scientific rationale to be presented. *See Humana of Aurora v. Heckler*, 753 F.2d 1579, 1583 (10th Cir.

[5] Eaton, A. November 19, 2014. *Memorandum: RE: BOD as an Indicator of Nutrient Pollution.* Standard Methods for the Examination of Water and Wastewater Joint Editorial Board. Available at https://www.standardmethods.org/PDF/BOD_Nutrient_Pollution_Memo_2014.pdf

1985) ("When an agency [decision is] based on a study [that is] not designed for the purpose and which is limited and criticized by its authors on points essential to the use sought to be made of it, the administrative action is arbitrary and capricious and a clear error in judgment.'").

Diel DO Flux issues

Similar to the BOD5 test concerns, MESERB noted that the diel DO flux is not an appropriate response variable for prevention or identification of nutrient impairment. Use of DO flux as a nutrient response variable to identify aquatic life impairment, as opposed to minimum DO, has not been accepted by the scientific community and has not been endorsed in any EPA guidance documents dealing with the development of nutrient criteria. As with the BOD test, this response criteria is affected by other, non-nutrient factors (*e.g.*, temperature, natural plant growth, stream depth existence of wetlands, and velocity) and one cannot assess the ecological significance of the measured DO flux without conducting further detailed assessments. The use of this metric as an indicator of nutrient-induced use impairment was also unprecedented.

A separate different EPA FOIA response affirmed that the Agency has no documentation supporting use of DO flux as an aquatic life impairment parameter. *See* Ex. 5, DO flux FOIA Request/Response with follow-up correspondence (confirming that "EPA currently has no official records dealing with DO variation as a water quality impairment in and of itself (that is, when DO levels never drop below the daily minimum OR the 7-day mean minimum)"). This response is consistent with EPA's Gold Book (and 304(a) criterion), which indicated that DO minimum is the factor of concern and nowhere indicates DO flux as an independent aquatic life impairment metric. *See Quality Criteria for Water 1986* ("Gold Book"), EPA Publication 440586001, May 1987, at 209-216 ("Each criterion may thus be viewed as an estimate of the threshold concentration below which detrimental effects are expected.").[6] EPA's approval of a response variable that radically deviates from the applicable 304(a) criterion – without justification – is per se arbitrary and capricious. *See* 80 Fed. Reg. 51020, 51028 (Aug. 21, 2015) ("While states and authorized tribes are not required to adopt the CWA section 304(a) criteria recommendations, they are required under the Act and EPA's implementing regulations to adopt

[6] The *Gold Book* doesn't have page numbers. Accordingly, the cited page numbers are PDF version page numbers.

criteria that protect applicable designated uses and that are based on sound scientific rationale.").[7]

In addition to the general flaw of using diel DO flux as an indicator for nutrient-induced use impairment, MPCA's submission provided no information to confirm that the selected DO range is beyond that expected to be naturally occurring. Plant growth occurs in virtually all streams and is necessary to support a healthy fishery and diverse assemblage of insect life. As EPA is well aware from its nutrient TMDL assessments, extensively published literature, and MPCA documentation as part of this rulemaking, plant growth (periphyton) may reach high levels (>200 mg/m2 chlorophyll a) even in nutrient poor waters. Both EPA and MPCA recognize that up to 150 mg/m^2 chl-a represents a "safe level" of plant growth in streams. Minn. R. 7050.0222, Subp. 2b(C) (2015); *see also* Nutrient Criteria Technical Guidance Manual Rivers and Streams, EPA-822-B-00-002, July 2000, at 100. The degree of DO flux caused by the "safe" level of periphyton growth, conversely, is a function of the physical conditions of a stream (*e.g.*, depth, slope, etc.). Data presented by MPCA confirmed that even streams with a safe level of plant growth will violate this DO flux "impairment" criteria. *See also* Ex. 6, Gallagher Analysis, at 2 ("The DO flux variations identified by MPCA are, in my professional opinion, commonly found in surface waters and are not indicative of nutrient impairment. This was confirmed by MPCA monitoring that showed even with very low phytoplankton levels reported for streams, DO flux variations in the range of 2-6 mg/l occurred.").

MPCA's own data presentation and the testimony of an independent expert (nowhere refuted in the record) clearly demonstrate that the DO flux range approved by EPA is not necessary to protect stream uses. In fact, it would regulate natural and otherwise "safe" conditions, which is beyond federal authority. *See* 80 Fed. Reg. 51020, 51025 (Aug. 21, 2015) ("The CWA does not require states and authorized tribes to adopt designated uses to protect a level beyond what is naturally occurring in the water body."). Consequently, EPA's approval of diel DO flux must be withdrawn.

<u>Different BOD5 and diel DO flux values in similarly classified waters</u>

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[7] *See also* 80 Fed. Reg. 51020, 51028 (Aug. 21, 2015) (At a minimum, states must "provide an explanation for why they did not adopt new or revised parameters for which EPA has published new or updated CWA section 304(a) criteria.").

Beyond the fundamental deficiencies noted above, the values promulgated by MPCA and approved by EPA are, on their face, arbitrary and lacking in sound scientific rationale. Specifically, as was noted by one of the peer reviewers, EPA approved different BOD5 and diel DO flux numeric variables as necessary to protect *the same type of fishery classification*. For instance, depending on its location within the state of Minnesota, the impairment threshold BOD5 level can be anywhere from 1.5 mg/L to 3.0 mg/L for warm water fisheries and the diel DO flux range can be as large as 4.5 mg/L to as small as 3.0 mg/L. It is not apparent how warm water (Class 2) fishery sensitivity could vary based on the location within the state. Moreover, no physiological basis was provided to justify different "protective criteria" for response variables in waters similarly classified. For example, no data show that warm water fisheries in the North ecoregion are more sensitive to DO flux than those found in South ecoregion. Absent some rational explanation of, mechanistically, how this could occur and credible scientific studies supporting the conclusion (which do not exist in the record), it is arbitrary and capricious to impose more restrictive aquatic life protection needs based on geographic location.

MPCA admits it did not account for the effect of confounding factors

Unlike most other pollutants, it is well recognized that nutrients do not have any direct toxic effect on human or ecological health. Rather, the threat posed by nutrients is tied to excessive plant growth and the adverse side effects such plant growth can have on the aquatic community. The nutrient-plant growth relationship in streams, however, involves numerous intricate and interconnected factors (*e.g.*, scour, light availability, sedimentation) that dramatically alter the relationship between nutrients and plant growth. Certain metrics (such as invertebrate or fishery assemblage) are impacted by numerous non-nutrient factors (*e.g.*, habitat, toxics, sedimentation). In this instance, MPCA used an aquatic life fishery metric (*e.g.*, number of darters present) to determine impairment thresholds for BOD, algal growth and DO flux in a "stressor-response" regression analysis. To ensure such analyses are scientifically defensible, EPA's stressor response document requires those developing nutrient criteria to evaluate and adjust for the presence of confounding factors. *See Using Stressor-Response Relationships to Derive Numeric Nutrient Criteria*. EPA-820-S-10-001, November 2010, at 11, 65-67 ("Environmental factors that can potentially confound the relationship of interest should be identified early in the analysis when conceptual models are developed (see Section 2). At this evaluation stage in the criteria development process, analysts should systematically consider and document the possible effects of these potential confounders.").

As its eutrophication standards were adopted using *in situ* ecological data and were ostensibly based on a presumed cause and effect relationship, MPCA should have conducted a

confounding factors analysis. EPA's approval letter was premised on the fact that a confounding factors analysis, consistent with the 2010 Stressor-Response guidance, had been conducted by MPCA. Ultimately, however, MPCA admitted that no such analysis was done and that the correlations presented could have been affected by other factors. *See* Ex. 7, Excerpts of January 8, 2014 MPCA hearing testimony (MPCA: "[T]here is no analysis in the SONAR documents that specifically demonstrates that the biological conditions alone are due to phosphorus."); (Q: "Is there anywhere in the SONAR or in the backup documentation that I would find the Confounding Factors Analysis, the likes of which that are described in the 2010 Stress Response Guidance Document?" MPCA: "Probably not anything specific…"). Therefore, even assuming *arguendo* that BOD5 and diel DO flux were proper nutrient response variables, MPCA's submission should have been rejected by EPA because it failed to conduct a sufficient confounding factors analysis on response criteria/biological metrics that are impacted by a well-documented number of other physical and chemical factors. *See Ohio Valley Envtl. Coal., Inc. v. Fola Coal Co., LLC*, 82 F. Supp. 3d 673, 687 (S.D. W. Va. 2015) (proper to rely on EPA criteria reference document because it contained an adequate confounding factors analysis). EPA's failure to ensure that the MPCA completed the necessary confounding factors analysis renders its approval of the BOD and DO flux response criteria arbitrary and capricious.

Impacts of Revised Standards

EPA's approval of the revised standards will result in MPCA classifying Minnesota waterbodies as nutrient impaired even though there is, in fact, no impairment related to nutrients.[8] The regulatory effect of declaring a waterbody nutrient impaired – improperly or not – is significant. First, a Total Maximum Daily Load ("TMDL") must usually be prepared for all waterbodies that are nutrient impaired as a means to determine and allocate the total amount of nutrients a waterbody can retain without violating the water quality standard. *See* 33 U.S.C. § 1313(d); 40 C.F.R. § 130.2(h)-(i); 40 C.F.R. § 130.7(c). Second, dischargers to impaired waterbodies – whether a TMDL has been issued or not – customarily receive more stringent water quality-based effluent limitations under 40 C.F.R. § 122.44(d). As a means to comply with nutrient TMDLs and/or the more stringent permit limitations, permittees on waterbodies designated as nutrient impaired will have to expend resources to reduce nutrient discharges, creating additional solid waste for disposal, consuming electricity and chemical usage. Such technology comes at cost to the municipal permittees, which can only be funded through municipal bonds and tax hikes to the constituents. Given the potential massive fiscal impacts of

[8] Conversely, it also possible that the numeric criteria selected for DO flux and BOD5 will not be exceeded in situations where there is a real nutrient impairment.

classifying a waterbody as nutrient impaired and the adverse ecological effects of increasing chemical and energy usage, criteria and response variables that are not based on a sound scientific rationale and will result in misclassifications of nutrient impairments simply cannot be approved.

Conclusion

While CRR continues to fully support cost-effective, environmentally beneficial undertakings (including nutrient limits, where necessary), we are justifiably concerned that EPA's unprecedented approval of diel DO flux and BOD5 as nutrient response variables will result in the misdirection of municipal resources. Therefore, to ensure the limited fiscal resources of CRR members are only put towards meaningful environmental improvements, we request EPA withdraw its January 23, 2015 approval of Minnesota's nutrient standards.

Sincerely,

Christopher L. Rissetto
General Counsel

Exhibits (1-7)