

News Release

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EPA SCIENCE ADVISORY BOARD REJECTS NEW GUIDANCE ON NUTRIENT CRITERIA DERIVATION

The EPA Science Advisory Board ("SAB") met on September 9-11, 2009 to review new draft guidance entitled "*Empirical Approaches for Nutrient Criteria Derivation*" (EPA, August 17, 2009). The new EPA approach did not consider whether or not nutrients were triggering excessive plant growth in streams but rather sought to develop a direct relationship between invertebrate populations and ambient nutrient levels. The review committee unanimously rejected the EPA-recommended simplified approaches for establishing nutrient criteria for fresh waters concluding that the approaches failed to establish a cause and effect relationship between nutrients and the impact of concern. As stated by Dr. Judith Meyer, a distinguished research professor emeritus at the University of Georgia and Committee chair, stressor response "gives one a very good indicator of what the relationships are but it does not demonstrate cause and effect. Mechanistic modeling or experimental approaches would provide further justification for the relationships that are established with stressor-response." The Peer Review Committee stated that a scientifically defensible approach must account for the numerous environmental factors and known plant growth mechanisms that govern whether or not the addition of nutrients will cause adverse impacts at a particular location. John Hall of Hall & Associates hailed the SAB action as the most important determination in a decade which, if heeded by EPA, will set the agency on the correct path for assessing nutrient impacts and developing appropriate solutions for restoring impaired waters. The effected parties have requested that EPA withdraw the various TMDL actions that were premised on the now discredited methods.

Background

EPA had prepared the guidance to assist states in developing water quality criteria for nutrients. For the past two years EPA had been informally recommending that states use statistical approaches as scientifically defensible methods for identifying "protective" levels for nutrients in rivers and streams. In August 2008, a petition for SAB review was filed by Hall & Associates for a coalition of Pennsylvania communities that objected to the approaches as technically unsound and lacking scientific peer review approval that must precede use of all new EPA procedures of national significance. The petition asserted that the new EPA approach would force unnecessary nutrient regulation, misdirect water body restoration efforts and waste energy/resources on an unprecedented scale. The petition stated that the SAB review would be one of the most important technical evaluations in decades with hundreds of billions of treatment dollars at stake.

Prior to this review, EPA had applied one of the new empirical methods, conditional probability analysis, to generate extremely restrictive stream nutrient standards (0.025-

0.040 mg/l total phosphorus) for three Pennsylvania watersheds. The TMDLs, finalized on June 30, 2008, called for drastic reductions in total phosphorus, costing hundreds of millions of dollars and prohibiting virtually all development in the watersheds. This new approach to nutrient criteria derivation was even applied to waters never identified as nutrient impaired on Section 303(d) lists and where EPA had concluded excessive plant growth did not occur. The methods were also used to claim that nutrients were the cause of reduced invertebrate populations in a concrete lined channel passing through the City of Harrisburg. The effected communities contacted EPA Headquarters in April 2008, complaining that the approaches applied in the TMDLs were grossly flawed. In June 2008, EPA affirmed that the Regional Office was simply following EPA Headquarters' advice on acceptable methods for nutrient endpoint development and that these procedures were recommended for nationwide application. Given the unprecedented impact of these methods Hall & Associates asserted that the new methods should have undergone a rigorous peer review prior to its application in accordance with EPA's own peer review policy. This request for review was supported by Senate and Congressional representatives of the communities affected by the TMDLs.

In December 2008 EPA agreed to the peer review again asserting that if the peer review approved of the approaches, the methods would be recommended for nationwide implementation. The draft guidance document released in late August 2009 presented empirical methods for five types of regression analysis (simple linear, quantile, logistic, multiple linear, and discontinuous) and conditional probability analysis as a basis to develop criteria for total nitrogen (TN) and total phosphorus (TP). Each of the six empirical methods presumed that nutrients (i.e., TN, TP) cause a response (e.g., chlorophyll-a concentration, invertebrate taxa richness) and the response is related to use impairment. EPA asked the SAB to review these methods and assess their appropriateness for deriving water quality criteria.

The SAB meeting concluded on September 11 with an oral summary of the preliminary findings of the review Committee. On the whole, there was an overwhelming consensus by the SAB Committee that the empirical approaches recommended by EPA do not demonstrate the "cause-and-effect" relationship necessary to derive water quality criteria and a more mechanistic understanding of how nutrients affect the environment is required. The Committee found that the approaches recommended by EPA were fundamentally lacking. Response variables must be coupled to designated uses in a clear and rational manner before those responses can be used to derive criteria. Rather than attempt to derive nutrient criteria using these statistical methods, the Committee concluded that a solid conceptual model, including all the major stressors governing the dynamics of the response variable, is essential to assess impairments associated with nutrients. In particular, the Committee concluded that conditional probability analysis is only inferential and cannot serve as the basis for developing a scientifically defensible criterion.

The Board will reconvene via teleconference on November 2, 2009 to review the findings of each subcommittee and a final report is due to EPA by December 10, 2009.

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