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**TITLE 327 WATER POLLUTION CONTROL BOARD**

**FIRST NOTICE OF COMMENT PERIOD**

LSA Document #10-424

**DEVELOPMENT OF AMENDMENTS TO RULES CONCERNING NUTRIENT CRITERIA AND WATER QUALITY STANDARDS FOR LAKES AND RESERVOIRS**

**PURPOSE OF NOTICE**

The Indiana Department of Environmental Management (IDEM) is soliciting public comment on amendments to rules to add new numerical criteria to protect designated uses of lakes and reservoirs from the impacts of total phosphorus (TP). IDEM seeks comment on the affected citations listed and any other provisions of Title 327 that may be affected by this rulemaking.

**CITATIONS AFFECTED:** [327 IAC 2-1-6](#); [327 IAC 2-1.5-8](#); [327 IAC 5-2-11.1](#); [327 IAC 5-2-11.4](#); [327 IAC 5-2-11.5](#); [327 IAC 5-2-11.6](#); [327 IAC 5-10-2](#); [327 IAC 5-10-4](#).

**AUTHORITY:** [IC 13-14-9](#); [IC 13-18-3](#); [IC 13-18-4](#).

**SUBJECT MATTER AND BASIC PURPOSE OF RULEMAKING**

**Basic Purpose and Background**

IDEM is initiating rulemaking to adopt numeric nutrient water quality standards for Indiana's lakes and reservoirs to facilitate the assessment of designated use attainment and to provide a better means to protect these waterbodies from the adverse effects of nutrient enrichment. Excess nutrients can cause negative environmental impacts on fresh surface waters, such as algal blooms, low dissolved oxygen concentrations, and excessive growth of filamentous algae.

In this rule, IDEM is proposing to adopt new eutrophication criteria for three categories of lakes that will include both TP concentrations and response variable measurements. The standards for the natural lakes, reservoirs, and mine pits will include TP concentrations as the indicator of excess nutrients, and may also include chlorophyll a (chl a) concentrations or Secchi disk transparency, or both, as response measurements. Criteria were developed by Limno Tech, Inc., and Tetra Tech using the stressor-response approach and derived based on preventing eutrophic conditions.

**Alternatives to Be Considered Within the Rulemaking**

**Alternative 1.**

The only option for adding or revising a water quality standard contained in Title 327 is through rulemaking.

- Is this alternative an incorporation of federal standards, either by reference or full text incorporation? No.
- Is this alternative imposed by federal law or is there a comparable federal law? Yes. Section 303(c) of the Clean Water Act (CWA) requires states to have numeric nutrient water quality criteria for lakes and reservoirs.
- If it is a federal requirement, is it different from federal law? Section 303(c) does not specify rule language but requires states to have numeric nutrient water quality criteria for lakes and reservoirs.
- If it is different, describe the differences. See preceding answer.

**Alternative 2.**

Do no rulemaking and continue having no lake nutrient criteria, which might result in U.S. Environmental Protection Agency (U.S. EPA) promulgating national lakes nutrient criteria for Indiana lakes. Criteria promulgated by U.S.EPA might not be acceptable to Indiana.

**Alternative 3.**

Develop a rule with nutrient criteria other than those developed by Limno Tech, Inc., and Tetra Tech. The process of criteria development by Limno Tech, Inc., and Tetra Tech was done according to accepted scientific principles.

**Applicable Federal Law**

It is necessary to have numeric nutrient water quality criteria for lakes and reservoirs to meet the requirements under Section 303(c) of the Clean Water Act (CWA). Additionally, water quality standards for the state's waters must be reviewed and approved by the U.S. EPA according to 40 CFR 131.20. Indiana's NPDES permit issuance program is a delegated program under the federal authority, and to maintain delegation requires federal approval.

**Potential Fiscal Impact**

The addition of numerical nutrient criteria for lakes and reservoirs to [327 IAC 2-1-6](#) and [327 IAC 2-1.5](#) could have potential fiscal impact on dischargers with phosphorus limits and possibly others with phosphorus monitoring requirements in their permits. Currently, there are approximately 58 major dischargers and 159 minor dischargers who either have limits or monitoring requirements for phosphorus in their permits. Additionally, new dischargers to

lakes or reservoirs could be impacted by this rule if there is a reasonable potential to exceed water quality based effluent limits (WQBELs) based on proposed TP criteria.

U. S. EPA has published some technology releases addressing nutrient removal technologies and has compiled some cost data from case studies conducted on a variety of wastewater treatment projects. In general, there are two basic types of treatment processes available for P removal, chemical P removal and biological P removal. Specific variations exist for each type of process. Tertiary filtration process may also be added to supplement either chemical or biological processes. Currently, the most widely used process, particularly in Indiana, is chemical P removal consisting of chemical addition (precipitation) and, in some cases, tertiary filtration. Biological P removal is gaining more attention and will likely be considered for more use in the future.

Basic chemical addition (precipitation) is currently used in many facilities that have P limits of 1.0 mg/l. Tertiary filtration is typically not required to achieve that level of P removal but would be needed for limits less than that (for example, 0.1 - 0.5 mg/l).

Biological P removal technology has not yet proven reliable enough to achieve P limits below 1.0 mg/l without supplemental filtration or chemical addition, or both. Biological P removal plus filtration may be reliable enough to meet 0.1 mg/l, but more research likely is needed, and the process may need backup chemical addition support. The biological P removal process is typically not a simply add-on type of process but rather a conversion of the secondary treatment (activated sludge) process plus added fermenters and filters.

U.S. EPA's Nutrient Removal Technologies Reference Document Vol. 1 (Executive Summary) provides summarized cost information that includes the following capital cost and operation and maintenance (O & M) cost information for treatment plant retrofits and expansions:

**Retrofits:** For chemical P removal, capital costs range from \$0.03-\$0.29 per gallon per day (gpd) capacity. O & M costs range from \$91-\$215 per million gallons (MG) treated. The O & M costs include the cost of chemicals, power, labor, and the handling of the additional sludge caused by chemical addition. The low cost range represents chemical feed equipment and storage tanks for single-point chemical feed to achieve a target P limit of 0.5 mg/l. The high cost range represents two-point chemical feed with tertiary filtration to achieve a lower target limit of 0.1 mg/l.

For biological P removal, capital costs range from \$0.44-\$0.47 per gpd capacity. O & M costs range from \$25-\$106 per MG treated. The low cost range represents conversion of the activated sludge (AS) process and the addition of fermenters and filters to achieve a target P limit of 0.5 mg/l. The high cost range represents conversion of the AS process and the addition of fermenters, filters, and chemical addition to achieve a target P limit of 0.1 mg/l.

**Expansions:** For chemical P removal, capital costs and O & M were noted the same as for retrofits. For biological P removal to achieve levels down to 1.0 mg/l without additional chemicals, the capital cost was estimated to be \$1.21 per gpd capacity. For biological P removal to achieve greater removal rates, the capital costs range from \$1.26-\$1.55 per gpd capacity. O & M costs range from \$290-\$389 per MG treated. The low cost range represents an anoxic/oxic (A/O) process with fermenter/filter to achieve a target P limit of 0.5 mg/l. The high cost range represents an A/O process with fermenter, filter, and chemical addition to achieve a target P limit of 0.1 mg/l.

The term "expansion", as used here, is defined as a parallel treatment train and no increase in design flow. In general, costs are higher for the "expansion" process compared to the "retrofit" process because there is no opportunity to use the existing facilities.

U.S. EPA also used life cycle cost as another method to express potential costs. Life cycle cost combines capital cost and O & M. Life cycle costs were calculated for the U.S. EPA's reference document by first annualizing the capital cost at 20 years at six percent interest. The annualized capital cost was then added to the annual O & M cost to obtain a total annual cost. This cost was then divided by the annual flow to get the life cycle cost per MG treated.

Life cycle cost for chemical P removal ranged from \$98 - \$283 per MG treated.

Life cycle cost for biological P removal ranged from \$130 - \$218 for retrofits and from \$590-\$758 for expansions.

The low life cycle cost range is for a target effluent of 0.5 mg/l P, and the high cost range is for a target effluent of 0.1 mg/l P.

These costs were derived from case studies of a number of wastewater projects (12 retrofits and 20 expansions), and the costs were updated to 2007 cost index values. IDEM will continue to refine fiscal impact information as the rule is developed.

### **Small Business Assistance Information**

IDEM established a compliance and technical assistance (CTAP) program under [IC 13-28-3](#). The program provides assistance to small businesses and information regarding compliance with environmental regulations. In accordance with [IC 13-28-3](#) and [IC 13-28-5](#), there is a small business assistance program ombudsman to provide a point of contact for small businesses affected by environmental regulations. Information on the CTAP program, the monthly CTAP newsletter, and other resources available can be found at:

[www.in.gov/idem/ctap](http://www.in.gov/idem/ctap)

Small businesses affected by this rulemaking may contact the Small Business Regulatory Coordinator:

Alison Beumer  
IDEM Small Business Regulatory Coordinator  
MC 60-04 - IGCS W041  
100 North Senate Avenue  
Indianapolis, IN 46204-2251  
(317) 232-8172 or (800) 988-7901  
abeumer@idem.in.gov  
or  
ctap@idem.in.gov

The Small Business Assistance Program Ombudsman is:

Brad Baughn  
IDEM Small Business Assistance Program Ombudsman  
MC 50-01 - IGCN 1301  
100 North Senate Avenue  
Indianapolis, IN 46204-2251  
(317) 234-3386  
bbaughn@idem.in.gov

### **Public Participation and Workgroup Information**

An external workgroup will be established to discuss issues involved in this rulemaking. Workgroup meetings likely will begin after the end of the comment period stated in this first notice. The workgroup will consist of IDEM staff and a cross-section of stakeholders, including NPDES permit holders, environmental advocacy groups, lake users, and interested members of the public. If you wish to provide comments to the workgroup on the rulemaking, attend meetings, or have suggestions related to the workgroup process, please contact MaryAnn Stevens in the Office of Legal Counsel, Rules Development Branch at (317) 232-8635 or (800) 451-6027 (in Indiana). Please provide your name, phone number, and e-mail address, if applicable, where you can be contacted. The public is also encouraged to submit comments and questions to members of the workgroup who represent their particular interests in the rulemaking.

### **STATUTORY AND REGULATORY REQUIREMENTS**

[IC 13-14-8-4](#) requires the board to consider the following factors in promulgating rules:

- (1) All existing physical conditions and the character of the area affected.
- (2) Past, present, and probable future uses of the area, including the character of the uses of surrounding areas.
- (3) Zoning classifications.
- (4) The nature of the existing air quality or existing water quality, as the case may be.
- (5) Technical feasibility, including the quality conditions that could reasonably be achieved through coordinated control of all factors affecting the quality.
- (6) Economic reasonableness of measuring or reducing any particular type of pollution.
- (7) The right of all persons to an environment sufficiently uncontaminated as not to be injurious to human, plant, animal, or aquatic life or to the reasonable enjoyment of life and property.

### **REQUEST FOR PUBLIC COMMENTS**

At this time, IDEM solicits the following:

- (1) The submission of alternative ways to achieve the purpose of the rule.
- (2) The submission of suggestions for the development of draft rule language.

Mailed comments should be addressed to:

#10-424 (Lake nutrient criteria)  
MaryAnn Stevens  
Mail Code 65-41  
Rules Development Branch  
Office of Legal Counsel  
Indiana Department of Environmental Management  
100 North Senate Avenue  
Indianapolis, Indiana 46204-2251

Hand delivered comments will be accepted by the receptionist on duty at the thirteenth floor reception desk, Office of Legal Counsel, Indiana Government Center North, 100 North Senate Avenue, Room N1301, Indianapolis, Indiana. Comments also may be submitted by facsimile to (317) 233-5970. Please confirm the timely receipt of faxed comments by calling the Rules Development Branch at (317) 233-8903. Please note it is not necessary to follow a faxed comment letter with a copy of the letter submitted through the postal system.

**COMMENT PERIOD DEADLINE**

Comments must be postmarked, faxed, or hand delivered by July 30, 2010.

Additional information regarding this rulemaking action may be obtained from MaryAnn Stevens, Rules Development Branch, Office of Legal Counsel, (317) 232-8635 or (800) 451-6027 (in Indiana).

Nancy King, Chief  
Rules Development Branch  
Office of Legal Counsel

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