Ex. 1

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED 35 Ill. Adm. Code 304.123(g), 304.123(h), 304.123(i), 304.123(j), and 304.123(k)	))	R04-26 (Rulemaking - Water)

TESTIMONY OF PAUL J. TERRIO

My name is Paul Terrio and I am a Hydrologist with the U.S. Geological Survey (USGS) in Urbana, Illinois. I have worked with the USGS for just over 20 years and the majority of that time has been in Illinois. For the past 12 years, I have served as the Water Quality Specialist for the Illinois District of the USGS. I hold a degree in Hydrology from the University of Arizona.

My testimony today will consist of brief statements regarding the rationale for the proposed interim phosphorus standard; including the role of phosphorus in the aquatic environment, the reasoning behind proposing a standard for total phosphorus, and the basis for the proposed effluent standard of 1 mg/L (milligram per liter).

Nitrogen and phosphorus are the primary nutrients required for virtually all plant life on earth, both terrestrial and aquatic (Hem 1982, American Public Health Association 1998, Terrio1995). These nutrients are each available to water bodies naturally, as well as through anthropogenic inputs to watersheds such as commercial fertilizer and wastewater effluent. Other elements, such as carbon and potassium, are also required for biological organisms, but generally are present in natural waters in amounts sufficient to support biological growth and seldom are "limiting" nutrients. A limiting nutrient is the nutrient present in shortest supply and that which will be exhausted first, limiting further growth potential (O'Shaughnessy and McDonnell 1973).

Nitrogen is also typically present in concentrations sufficient to support aquatic algal and

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plant growth, but might be the limiting nutrient in some locations or at some times, such as during low-flow periods when the supply of soluble nitrogen is exhausted from the water column (American Public Health Association 1998, Dodds and Welch 2000, Francoeur et al 1999). Because of its' soluble nature and plentiful sources, nitrogen concentrations in Illinois water bodies are virtually always sufficient for aquatic plant growth (Terrio 1995). Concurrent non-limiting levels of nitrogen and phosphorus can result in excessive and problematic plant and algal growth, a condition known as eutrophication. In most fresh water environments, phosphorus is considered to be the limiting nutrient or the nutrient in shortest supply (American Public Health Association 1998, Hem 1982, U.S. Geological Survey 1999). Because the available supply of phosphorus in water bodies is typically less than that of nitrogen, further reductions in the sources of phosphorus might prevent the occurrence of problematic or eutrophic conditions in water bodies receiving wastewater treatment effluents.

The presence and behavior of phosphorus in the aquatic environment is complex (Hem 1985, U.S. Geological Survey 1999). Phosphorus can be present in organic and inorganic form, in plant and animal matter, absorbed to particulate material, sequestered in benthic sediments, or in the water column in particulate or dissolved form. Phosphorus is transformed and cycled between organically bound forms and oxidized inorganic forms and occurs in natural waters and wastewater primarily as phosphate (American Public Health Association 1998 and Hem 1982). Orthophosphate, often referred to as soluble reactive phosphorus, is the form most readily available for incorporation by organic life forms. However, because of the continual cycling of phosphorus and the presence of inorganic, organic, soluble, and absorbed phosphorus forms in water bodies, the orthophosphate form alone does not provide an accurate and complete assessment of phosphorus in an aquatic environment. Total phosphorus analysis provides a more comprehensive quantification because it incorporates phosphorus present in dissolved, particulate, and biological forms.

Several investigations regarding the practicality, feasibility, and economics of treating municipal wastewaters to low levels of phosphorus have been or are being conducted, including studies by the Illinois Association of Wastewater Agencies (IAWA) and the Water Environment Research Foundation. A report commissioned by the IAWA, "*Technical Feasibility and Cost to Meet Nutrient Standards in the State of Illinois*", states that most existing treatment facilities in Illinois could be retrofitted or augmented with biological or biological and chemical processes to achieve monthly average effluent total phosphorus concentrations of 0.5 mg/L on a reliable and consistent basis. Most existing wastewater treatment facilities would need additional tankage to incorporate anaerobic and anoxic systems into the treatment process to increase phosphorus removal.

Many Midwestern states (Indiana, Wisconsin, Michigan, Kentucky, Ohio) have some form of a 1.0 mg/L total phosphorus effluent standard in place, while other states (Minnesota) have pending revisions to incorporate such a standard (USEPA website: http://www.epa.gov/waterscience/wqs/).

The costs of achieving an average of 1.0 mg/L total phosphorus in affected sewage treatment plant effluents may be estimated from recent examples. Two principal methods for phosphorus removal, biological removal and chemical precipitation, are available. While biological phosphorus removal may be a superior method in terms of lower final effluent concentrations and minimal operations and maintenances costs, this method would probably entail higher capital costs, would not be compatible with all existing plant configurations and will not be necessary to meet the proposed phosphorus effluent standard. Biological phosphorus removal may become the method of choice for new or extensively updated plants looking to future nutrient removal requirements beyond the proposed effluent standard. These facilities would be designed with additional tankage and related needs. Many existing plants would have to add tankage to achieve biological

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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PROPOSED 35 Ill. Adm. Code 304.123(g), 304.123(h), 304.123(i), 304.123(j), and 304.123(k)	))	R04-26 (Rulemaking - Water)

TESTIMONY OF ROBERT MOSHER

My name is Robert Mosher and I have been employed by Illinois EPA for almost 19 years. I have been assigned to the Water Quality Standards Unit for 18 of those years and have participated in the development and adoption of numerous water quality and effluent standards. Prior to my employment by the Agency I worked for Monsanto Company in the development of laboratory toxicity tests using aquatic organisms and the determination of the aquatic toxicity values for individual chemicals and industrial wastewater effluents. I hold a M.S. degree in zoology from Eastern Illinois University where I specialized in the effects of wastewater discharges on stream ecology.

My testimony today will describe the proposed changes to the phosphorus effluent standard. Underlying principles behind the rule, brought forth in subsection (g), are that certain wastewater discharges are significant sources of phosphorus and that facilities that are new or undergoing expansion are opportune venues for building in phosphorus removal capabilities. Costs for the addition of phosphorus removal equipment will be most reasonable when they can be designed into the original construction. Therefore, only new or expanding municipal wastewater treatment facilities with a design average flow of one million gallons per day (MGD) are subject to the proposed phosphorus effluent limit of 1.0 mg/L total phosphorus on a monthly average basis. Likewise, other types of new or expanded wastewater treatment facilities are subject to the limit if

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they would discharge phosphorus at the same pound loading as a one MGD municipal sewage treatment plant. The value of 25 pounds per day was determined from the pound loading of a typical municipal wastewater effluent that contains, with no special phosphorus removal equipment in place, on average about 3.0 mg/L total phosphorus. Both the size of facilities covered and the concentration of phosphorus to be met in subject effluents have precedent in the existing phosphorus effluent standard.

Subsection (h) recognizes the fact that sometimes the generally prescribed phosphorus effluent limit will be either unnecessarily stringent or not protective enough depending on the nature of the receiving water body. Phosphorus is generally believed to be the nutrient in shortest supply in freshwater ecosystems, i.e., the limiting nutrient factor, and therefore its concentration may often limit plant growth. If it can be demonstrated that a water body receiving an effluent has algae or noxious aquatic plant growth that is not limited by phosphorus, but rather another nutrient or water quality factor, then no phosphorus effluent limit must be imposed. On the other hand, if it is demonstrated that 1 mg/L total phosphorus will be inadequate to control noxious plant growth in the receiving water and further phosphorus control below a monthly average of 1.0 mg/L is feasible at a facility, the Agency may impose a lower phosphorus limit to protect that water body.

Subsection (i) is intended to clarify which wastewater treatment facilities are not subject to the phosphorus effluent limitation.

Subsection (j) stipulates that compliance with the effluent phosphorus standard fulfills the obligation of the discharger to meet water quality standards, specifically, the narrative standard prohibiting offensive conditions that includes a statement on unnatural plant or algal growth.

Subsection (K) recognizes that the phosphorus effluent standard will likely someday be supplemented by water quality standards for phosphorus that may dictate the removal of these proposed effluent limits, other effluent phosphorus limits or water quality based effluent limits. At

such time the phosphorus standard will probably be reworked to compliment the new water quality standards.

ILLINOIS ENVIRONMENTALPROTECTION AGENCY

By:_____

Sanjay K Sofat
Assistant Counsel
Division of Legal Counsel

DATED: August 25, 2004

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Ex 3

ENVIRONMENTAL LAW & POLICY CENTER
ILLINOIS INDIANA MICHIGAN MINNESOTA OHIO WISCONSIN

February 2, 2004

Renee Cipriano, Director
Marcia Willhite, Chief Bureau of Water
Illinois E.P.A
1021 N. Grand Ave. East
P.O. Box 19276
Springfield, Illinois
62794-9276

Dear Renee and Marcia:

We sincerely appreciate the commitment of Governor Blagojevich and the Agency to improve on past efforts to address nutrient pollution in Illinois waters. We feel strongly that more must be done now and in the future to prevent further degradation of water quality from nutrient loading, and to restore healthy conditions in waters already suffering from excessive nutrients. Our hope that we can agree on a common strategy with specific steps to move forward and address the issues on a statewide basis, rather than debating them in the context of individual permits.

As we made clear at our January 14 meeting, we do not believe it is legal or defensible as a policy matter for the Agency to continue generally to issue NPDES permits without limits for phosphorus given federal law, Illinois law, and the facts regarding detriments to Illinois waters and those downstream. While there was apparently some confusion within the Agency, we did not in connection with the settlement of the Fox River Water Reclamation District permit appeal or otherwise agree that it was appropriate to issue permits without nutrient limits for new or increased discharges in the Fox watershed or anywhere else.

Not to start a legal debate but to make our position clear, IEPA should be writing nutrient limits for at least three reasons:

1. Section 39(a) of the Illinois Environmental Protection Act clearly places the burden on the applicant to offer "proof" that its proposed permit "will not cause the a violation of this Act or of regulations thereof." Permits that allow discharges that may cause or contribute to violations of water quality standards violate 40 CFR 122.44(d) and the Illinois regulations that incorporate those federal requirements. 35 Ill. Adm. Code 309.141. Accordingly, the Agency should not be granting NPDES permits for discharges without proof by the applicant that the discharge will not cause or contribute to violations of state dissolved oxygen standards. Insofar

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as applicants never offer anything like such proof, the Agency should not be issuing permits without nutrient limits.

2. Similarly, it is apparent that many Illinois discharges are causing or contributing to violations of state narrative standards prohibiting creation of "offensive conditions." Certainly, dischargers are not offering proof that their discharges will not cause such conditions. 40 CFR 122.44(d) explicitly states that a permit may not be granted for a discharge that may cause or contribute to a violation of narrative standards.

3. Under the antidegradation regulations, lowering of water quality may only be allowed if it is necessary to accommodate important economic or social development. 40 CFR 131.12; 35 Ill. Adm. Code 302.105(c). A lowering of water quality is not necessary if it can practicably be avoided. Given that no one denies that it is practicable to treat sewerage effluent to a level of 1 mg/L phosphorus or lower, no permit for a new or increased discharge should be allowed for more phosphorus than that.

Because applicants cannot prove that their discharges will not cause or contribute to violations of dissolved oxygen or offensive conditions standards (or at least have never tried to do so), the Agency should probably not grant any permits involving discharge of nutrients unless the discharge concentrations are below ambient levels.

Further, there are also practical economic reasons for imposing nutrient limits now. Currently many dischargers are building or expanding sewerage treatment plants and making treatment choices that will prove to be unwise if later nutrient standards impose treatment requirements that will require costly retrofitting. More critically, a land, sub-surface or other "no discharge" alternative that looks more costly now because the Agency does not require nutrient controls will be rejected by many POTWs in favor of conventional treatment systems that will be more costly in a few years after nutrient standards are developed.

One may predict building of a large amount of conventional treatment capacity in the next four years without nutrient controls if the Agency continues to grant permits without nutrient limits. The water quality of many streams will be severely degraded by discharges from these plants. When numeric nutrient standards are established, the entities that have conventional plants that cannot economically meet the standards will seek variances, use re-designations and other relief that, if granted, would result in many Illinois streams that could have been protected or restored if nutrient limits were imposed being nutrient-impaired for decades.

Having stated these legal and environmental issues so that you can see the bases for our concern, those joining in this letter would like to reach a reasonable accord. We know that the Blagojevich Administration is committed to addressing nutrient pollution in Illinois and we sincerely appreciate the time and effort you and your staff are devoting to identifying ways to move forward. We would welcome a specific commitment to propose a numeric standard to the IPCB by Spring 2006. For the interim period, attached "Dear Design Engineer" letter, modeled on a letter sent by the Agency two years ago, generally states what we think a reasonable compromise in this situation is for the Agency and the environment and what we hope the

Agency will do. Basically, we would like to see discharges of nutrients minimized. We believe that the highest quality Illinois waters should not receive new or increased nutrient discharges. No waters, however, should receive new or increased discharges with more than 1 mg/L of phosphorus except perhaps in very special cases where economic proof of the need for such an exception can be adequately demonstrated.

We recognize that this is a difficult situation and are open to other ideas. We look forward to talking to you further about these issues.

Sincerely,

Albert Ettinger
Senior Staff Attorney
Environmental Law and Policy Center

Jack Darin
Director
Illinois Chapter Sierra Club

Jean (AFE)
Jean Flemma
Executive Director
Prairie Rivers Network

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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RENEE CIPRIANO, DIRECTOR

217/782-0610

July 18, 2002

Re: Revisions in the Permitting Procedures for All New and Expanded Sewage Treatment Plants.

Dear Design Engineer:

The purpose of this letter is to inform design professionals of recent changes to NPDES permit program administration within the Division of Water Pollution Control and how they relate to application documents submitted in support of a permit application. These changes pertain to new Illinois Pollution Control Board Regulations that place specific requirements upon the Agency for issuance of permits that authorize a new or increased discharge of wastewater into waters of the state. The Agency is adjusting its permit review and issuance process to comply with these new requirements with minimal additional time and burden upon both the permit applicant and Agency staff. In order to accomplish this, it is important for the engineering profession to understand the importance of early and comprehensive facility planning and engineering reports to the permitting process.

The Illinois Pollution Control Board adopted new anti-degradation regulations on February 21, 2002. These rules became effective on February 22, 2002 and can be downloaded from the Board at www.ipcb.state.il.us/Archive/docs/ds.nsf/Get/File-16619/R_01-013_022102_Opinion_and_Order.pdf using Adobe Acrobat®. Primarily, these regulations require that the Agency perform an analysis for all new and expanded discharges to surface waters (requiring NPDES permits). The primary purpose of the anti-degradation analysis is to ensure that new (or expanded) discharges do not cause degradation in the water into which discharge occurs unless absolutely necessary. If degradation is likely to occur, the degradation must be held to the smallest amount practically achievable and such degradation must be fully justified by the benefits of the project.

In times past, the permit applicant and their engineer have decided upon the method of wastewater treatment to be provided based primarily on cost and the requirements of the applicant. Review by the Agency took place primarily after design was completed (unless financial assistance was being provided by the Agency) and was based on whether or not the proposed treatment system would consistently meet effluent standards. It is now necessary for the Agency (and the public) to become involved in the process much earlier. The revised anti-degradation regulations focus less on the requirements necessary to meet water quality standards (although compliance with these standards is still necessary) and more on what kind of treatment system can be designed to have the least adverse impact on the receiving water.

In a letter of July 18, 2002, Tom McSwiggin, then Manager of the Permit Section of the Division of Water Pollution Control, wrote you regarding revisions in the permitting procedures for all new and expanded sewerage treatment plants. That letter

Any discharge of treated wastewater to surface waters has the potential to cause the quality of the receiving water to become degraded. Therefore, systems that do not discharge should be considered and must be deemed not feasible before a discharging system can be considered. Examples of non-discharging systems are golf course, agricultural land, and other types of spray irrigation, seepage fields, and other types of subsurface discharges. Regionalization should also be considered for communities so located.

Potential environmental impacts should be examined and included in the preliminary engineering report (or facility plan if the project is to receive funding through the IEPA loan program, etc.) for each option considered. To expedite the review process, an NPDES permit application should be submitted with the engineering report/facility plan in cases there a discharging system is the recommended construction alternative. Plans and specifications should not be prepared until the engineering report/facility plan has been approved by the Agency.

The new Board rules essentially merge the engineering report/facility plan and NPDES permit application procedures into one process that must be completed before a state authorization to construct (state permit) can be issued. The items to be included in the engineering report/facility plan are attached.

As the Agency implements the Board's anti-degradation regulations, additional items may come to light. The Agency will attempt to keep the regulated community apprised of these as they develop. In the meantime, we have compiled a list of commonly-made errors in the processing of sewage treatment plant permit applications. To expedite the issuing of permits, the Agency has included these as an attachment to this letter. Ensuring that your staff does not make any of these common errors on submissions to the Agency should help reduce the burden and time that it takes the Agency to review the submittal.

The Agency thanks you for your continuing cooperation and patience in this matter as we begin implementing these new requirements. If you have questions or comments on these changes, please contact our municipal engineer at the phone number given above.

Very truly yours,

Thomas G. McSwiggin, P.E.
Manager, Permit Section
Division of Water Pollution Control

TGM:DJS:[redacted]

and dischargers in Michigan, Minnesota, Wisconsin and many other states have been meeting 1mg/L effluent limits for years. The practicality of meeting this effluent limit is confirmed by the recent study of the Illinois Association of Wastewater Agencies. Accordingly, the Agency believes that a discharge of more than 1 mg/L of phosphorus will generally not be necessary to accommodate important economic or social activity and the Agency will normally require an effluent limit of 1 mg/L phosphorus in all permits subject to antidegradation requirements.

In summary, until the development of numeric nutrient standards, the Agency will not generally require nutrient effluent limits designed to meet the dissolved oxygen or offensive conditions standards. An exception here would be the situation in which a total maximum daily load study shows the need for such controls.

On the other hand, an effluent limit of 1 mg/L phosphorus will generally be imposed on all dischargers to lakes or streams proposing new or increased loadings with a reasonable potential to discharge that level or more of phosphorus. A 1 mg/L phosphorus limit will be imposed unless the discharger limits its total loading of phosphorus to that allowed under a prior permit (in which case there is no degradation as to phosphorus) or the applicant proves that, for reasons particular to it, it is economically infeasible for it to limit its discharge of phosphorus to 1 mg/L. Any applicant considering offering proof that it cannot feasibly limit its phosphorus discharge to 1 mg/L should consult the enclosed U.S. EPA Interim Economic Guidance for Water Quality Standards.

Sincerely,

Policy & Guidance

Interim Economic Guidance for Water Quality Standards

5. Antidegradation: Role of Economic Analysis

Under the Water Quality Standards program, each State must develop, adopt and retain a statewide antidegradation policy and establish procedures for its implementation. The antidegradation policy is intended to protect current water quality; in only a limited set of cases can economic grounds be used to allow for a lowering of water quality. In particular, if the quality of the water exceeds levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water (i.e. "high-quality water"), then economic considerations can be taken into account. Before any lowering of water quality in high-quality waters, however, an antidegradation review must determine that the lowering is necessary in order to accommodate important economic or social development in the area in which the waters are located.

Antidegradation is not a "no growth" rule and was never designed nor intended to be one. It is a policy that allows the public to make decisions about important environmental actions. Where the State intends to provide for development, it may decide that some lowering of water quality in "high-quality waters" is necessary to accommodate important economic or social development. Any such reduction in water quality, however, must protect existing uses fully and must satisfy the requirements for intergovernmental coordination and public participation.

While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing a use or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions; while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation review, the first question is whether the pollution controls needed to maintain the high-quality water will interfere with the proposed development. If not, then the lowering of water quality is not warranted. If, on the other hand, the pollution controls will interfere with development, then the review must show that the development would be an important economic and social one. These two steps rely on the same tests as the determination of substantial and widespread impacts. It should be stressed at the outset that substantial economic impacts does not mean driving profits to zero, nor precluding all other municipal expenditures.

The following sections describe the steps involved in performing an economic impact analysis as part of an antidegradation review. These steps are outlined in

SURVEY OF STATES, TRIBES AND TERRITORIES NUTRIENT STANDARDS

July 2003