DRAFT 3.28.11

NOT FOR PUBLICATION OR QUOTATION. FOR DISCUSSION PURPOSES ONLY

A MODEST PROPOSAL TO BEGIN TO ADDRESS NUTRIENT POLLUTION

BY

G. TRACY MEHAN, III

I think it is fair to say that, from a national perspective, control of nutrient pollution, specifically Total nitrogen (N) and Total phosphorus (P) is not progressing very well. According to the U.S. Environmental Protection Agency (EPA), 50 percent of U.S. streams have medium to high levels of N and P and 78 percent of assessed coastal waters exhibit eutrophication. Nitrate drinking water violations have doubled in eight years. The Gulf of Mexico with its infamous "dead zone", the western basin of Lake Erie and many other iconic bodies of water are suffering from over-enrichment of nutrients (So does the Chesapeake Bay, but it is exceptional in that nutrients are being aggressively, if controversially, regulated.).

Add to this another 135 million Americans to the census over the next four decades which, along with (hopefully) a return to economic growth will generate even more challenges.

While the causes of such nutrient problems are, depending on the watershed, primarily the result of unregulated agricultural runoff, say, from row crops, and livestock operations, little is being done to manage discharges from traditional "point sources," the proverbial big pipes in the water, be they municipal wastewater systems or industrial plants. This may seem counter-intuitive since the Clean Water Act (CWA), the present incarnation of which became law in 1972, is almost entirely directed toward the regulation of these discharge pipes and, only indirectly, managing diffuse, "nonpoint sources" of polluted runoff.

A 2009 report of a joint state-EPA task force stated, "Of more than 16,500 municipal POTWs [publicly owned treatment works] nationwide, approximately 4 percent have numeric limits for nitrogen and 9.9 percent for phosphorus." This means that state permit writers must rely on narrative criteria, exercising best professional judgment in setting any limits for the source under review. Given the technical and political challenges of doing this, it usually doesn't happen. Most citizens would be surprised to learn that such nutrients are hardly controlled at all 39 years after passage of the CWA. I certainly was.

Besides the exercise of a nebulous best professional judgment, typically, by a young engineer, a couple of years out of school, and working in a state regulatory program, there are two other ways to effectively regulate point source discharges of nutrients. The first is through a technology-based approach which, categorically, requires the implementation of certain kinds of controls irrespective of

the quality of the receiving waters of the discharge. This is the "Just do it" option which Congress mandated as the initial play under the CWA, mandating secondary treatment for wastewater systems.

The second way to ensure permit limits for nutrients is to implement numeric water quality limits which are then translated into a permitted requirement. This limit is designed to address the needs of the receiving water. The catch is that the development of such numeric standards is extremely difficult, controversial, site-specific, costly and time-consuming. This is why both the states and EPA have been unable to cut the Gordian Knot of numeric water quality standards since a national strategy was first announced back in 1998. Of course, there are waters where states and EPA have imposed such numeric criteria, resulting in the introduction of tertiary or advanced treatment. But, again, that is the exception to the rule.

Moreover, wastewater operators have a number of concerns regarding the imposition of nutrient controls on their systems. What about the farmers, the paramount source of nutrients? How will we convince ratepayers to should higher costs? Nutrient control is energy intensive and will generate more greenhouse gases and is therefore unsustainable.

My purpose here is not to resolve any of these serious technical, economic and policy issues. Instead, I want to offer a suggestion for moving the dialogue further, while actually improving the wastewater sector's environmental performance, in a cost-effective, measured and prudent manner. I want to suggest an information-based policy which would offer numerous opportunities for reducing nutrient pollution, avoiding unnecessary costs and generating increased learning as to the best means of controlling such discharges from municipal sources.

Recall that asymmetric information is one of the classic causes of market failure. Generating more information as to the precise amount of N and P discharges coming from wastewater systems would be a good way to begin building an environmental market for low-hanging fruit, i.e., inexpensive, low-cost reductions in nutrient pollution.

A milestone in information-based environmental policy was Congress's enactment of the Emergency Planning and Community Right to Know Act in 1986 which established the Toxics Release Inventory (TRI). The TRI was first published in 1989, encompassing 329 chemicals, later increased to 600 in1995.

EPA was stunned by the initial inventory which, after adjustments, came in at approximately 7 billion pounds. However, the information was a key driver of pollution prevention, toxic use reduction, and improved environmental performance. From 1998 through 2004, the amount of toxic chemicals released declined by 45 percent, no doubt assisted by the Clean Air Act and other laws. Still, as a state environmental official in those early days, I recall how attentive industrial EHS staff were to those numbers and dedicated to improving them for their own plants and companies.

In 2009 a committee of the National Research Council of the National Academies, formed to address issues regarding nutrient control on the Mississippi River and the northern Gulf of Mexico, offered this disarmingly simple recommendation, one among many:

"To improve knowledge regarding point sources' relative contributions of nutrient pollution, EPA should require major municipal and industrial point source dischargers to monitor nutrient concentrations-nitrogen and phosphorus-in effluent at their discharge point as a condition of their National Pollutant Discharge Elimination System (NPDES) permits."

Full disclosure: I had the honor of serving on this committee and supported what I believed to be a useful, elegant recommendation with a very light regulatory impact. Basically, it would involve tracking N and P in monthly Discharge Monitoring Reports. But that is not to say it would have only modest environmental benefit. It would be a significant one. In fact, I would argue that within a very short time, after a baseline is established for any given facility, the creative, energetic engineers managing the facility would be falling all over themselves to reduce their discharges in ways that are low-cost, energy-efficient and free of any major capital investment. In the process, they would be forced to focus on the issue in such a way as to increase their knowledge of the challenge and prepare any future regulations which might, ultimately, be coming down the pike.

I should note that this could be an entirely voluntary program organized by organizations in the wastewater sector. More about that below.

I will go out on a limb here. I would predict that within a given 5-year permit term (shorter if the wastewater sector moved voluntarily!), after establishment of the nutrient discharge baseline, a facility would demonstrate reductions of N or P anywhere from 15 to 20 percent.

Why do I say this?

In 1989 North Carolina, an association of wastewater dischargers, the Environmental Defense Fund (EDF) and the Pamlico Tar River Foundation developed the Tar-Pamlico Nutrient Strategy (http://portal.ncdenr.org/web/wq/ps/nps/tarpamns) to reduce nutrient loadings to that estuary, It provided for a kind of point to nonpoint trading between point sources, the wastewater systems, and unregulated agricultural sources. The mode of trading was essentially the payment by the former to the latter for implementation of Best Management Practices (BMPs) through a state cost share program.

In the first phase of the program (1990-1994), before any actual trades occurred, the wastewater dischargers were able to keep nutrient loadings beneath an annually decreasing cap, reducing overall N and P by roughly 20 percent despite growth as reflected in a flow increase of 7 percent. "They were able to dos largely by improving treatment facilities' efficiencies following the optimization study," reports the North Carolina Division of Water. In other words, without significant capital investments or rate increases, through operational and other adjustments, the point sources were able to reduce nutrient loads by a fifth. Obviously, it was not a enough to deal with the estuary's problems, but what an accomplishment for the money.

The Tar-Pamlico is a classic example of when managerial focus is brought to bear on a problem and all of the organization's expertise is brought to bear on a problem with substantive results. Call it Total Quality Management, Environmental Management or just professionally driven outcomes-whatever label you put on it, it worked.

Given that nutrients have been largely ignored for the last 40 years, outside the Chesapeake Bay and the Great Lakes, one has to assume that there is a target rich environment for cost-effective, environmentally beneficial load reductions which do not break the bank of wastewater systems.

Certainly, EPA could drive this process or information-based approach. I understand that Region 5 (Chicago) is moving forward. That said, why not pursue a voluntary, sector-based initiative, right now, to accelerate reductions without the need for Federal Register publications, OMB reviews, lawyers and the other encumbrances of the regulatory process? There will be ample time to continue the discussion over numeric criteria, technology-based controls, technologies and costs. For the moment, there are environmental gains to be achieved.