MAXIMUM EXTENT PRACTICABLE MEETS TMDL FOR MUNICIPAL STORMWATER PERMITS- WHICH WILL PREVAIL?

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OVERVIEW

Concern about sprawl and nonpoint source pollution to our nation's waters is increasing across the country. This has put greater emphasis on the control of pollution from municipal stormwater sewer systems so that water quality standards can be met. There are two approaches being used to manage these stormwater discharges: National Pollutant Discharge Elimination System (NPDES) permit limits and total maximum daily loads (TMDLs).

NPDES permits typically require municipalities to implement controls and best management practices (BMPs) to reduce pollutants as identified in a stormwater management plan prepared in accordance with 40 CFR Part 122.44(k)(2). If municipal stormwater discharges to a waterbody for which a TMDL has been established, treatment requirements for the stormwater can change drastically. Many TMDLs require 50% to 99% pollutant removal, but removal rates for most BMPs are much lower, and some that are designed to mitigate quantity are exacerbating pollutant loads. TMDLs also rarely address mitigating impacts of future development, all but ensuring that water quality (WQ) standards cannot be met.

This sets the stage for real conflict between two contestants: Ms. Maximum Extent Practicable (Ms. MEP) and Ms. TMDL. As discussed below, the ground rules of this "battle" are fairly clear and the contestants have different motivating factors. Example "rounds" illustrate the potential conflicts that arise when these contestants battle. Finally, creative solutions, which allow Ms. MEP and Ms. TMDL to resolve their differences and still comply with the intent of the Clean Water Act are explored. These solutions include tailoring TMDL targets; employing adaptive watershed management; and demonstrating that wasteload allocations (WLAs) for municipal stormwater can be met through non-numeric effluent requirements. Finally, if a third contestant enters the ring (Ms. Numeric Permit Limits), mass loading calculations are suggested as a possible compromise.

THE RULES OF THE BATTLE

Section 402(p) of the Clean Water Act specifies that NPDES permits for municipal storm sewer discharges "shall require controls to reduce the discharge of pollutants to the maximum extent practicable…and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." See 33 U.S.C. §1342(p)(3)(B)(iii). So far, permit conditions for municipal stormwater have not been expressed as numeric limits. Rather the conditions specify that a municipality implement controls, BMPs, and other activities to reduce pollutants as identified in a Stormwater Management Plan that the municipality prepares in accordance with 40 CFR Part 122.44(k)(2). The plan generally must address the six minimum control measures (public education and outreach, public participation/involvement, illicit discharge detection and elimination, construction site runoff control, post construction runoff control, and pollution prevention/good housekeeping), measurable goals to evaluate the effectiveness of individual control measures and the stormwater management program as a whole, requirements for industrial storm water discharges to the MS4, and reporting requirements.

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet WQ standards, and an allocation of that amount to the pollutant's sources. Specifically, the TMDL consists of wasteload allocations (WLAs) for point sources; load allocations (LAs) for nonpoint sources; and a margin-of-safety; the TMDL also addresses seasonality. EPA outlined its requirements for how TMDLs should address municipal Phase I and Phase II stormwater discharges in a policy memorandum

dated November 22, 2002 (Wayland & Hanlon, 2002). EPA clarified that these discharges must be given WLAs that are then used to establish WQ-based effluent limits and NPDES permit conditions. EPA also clarified that these discharges cannot be addressed by the LA component of the TMDL. Most importantly, EPA recognized the difficulty in addressing stormwater in TMDLs due to the variability in the size, location, frequency and duration of the discharges. EPA recommended that effluent limits be expressed as BMPs or other similar requirements, rather than as numeric limits. EPA also indicated that "if it is determined that a BMP approach (including an Iterative BMP approach) is appropriate to meet the storm water component of the TMDL, EPA recommends that the TMDL reflect this."

Recent experience with TMDLs and lawsuits involving environmental groups frustrated over the perceived need for more controls on municipal stormwater has demonstrated that public education and practical, creative solutions are required for complying with the intent of the Clean Water Act. To ensure that TMDLs will result in the desired pollutant reductions and compliance with WQ standards, municipalities need to be involved in determining how the WLA is established as the TMDL is developed. More importantly, the public needs to be educated about watersheds, WQ standards, and the ability of today's technology to achieve the desired reductions at a reasonable cost. Maximum flexibility for development of attainable WQ standards and permit limits is also needed if our two contestants are to survive this battle.

THE CONTESTANTS

Ms. MEP and Ms. TMDL (Figure 1) could not be more different. Ms. MEP worries about practical day-to-day activities. Ms. MEP knows that every five years, she will be faced with figuring out how to meet more stringent regulatory requirements and more BMPs. Ms. TMDL, however, genuinely believes that once she has developed TMDLs for an impaired waterbody she can (and has to) move on to the next.

Ms. MEP is similar to "Doc" of the seven dwarfs in Disney's Snow White. Like Doc, Ms. MEP is the experienced leader who convinces others to follow. Ms. MEP worked hard to make sure that the goals in the City's MS4 permit were attainable and achievable at reasonable cost. She manages multiple expectations of the City's Public Works Board, the ratepayers, the regulators, and environmental groups. For years, she has been faithfully leading her staff to implement the City's MS4 permit and routinely plans, inspects, and develops reports on the system with her team. Unlike Doc, Ms. MEP fully appreciates the seriousness of her position, knowing that there are fines, enforcement actions, and even jail for serious infractions and negative publicity for even minor infractions, no matter how infrequent.

Figure 1. Ms. MEP (Doc) and Ms. TMDL (Cinderella)

Ms. TMDL is more like Cinderella. Overworked and criticized from all sides, she endures days of drudgery churning out thousands of TMDLs, with artificially imposed deadlines, imperfect targets, and

scarce resources. Everyone has a different definition of how the TMDL should be developed, and it can change on a daily basis. She strives for the idealized goal of writing plans that will achieve the lofty goals of the Clean Water Act (i.e., all waterbodies will be fishable/swimmable by a date certain). To realize her goal, she relies on a chariot pulled by expensive monitoring data and computer models to get her to her destination, only to return the next day to her daily chores and more criticism.

EXAMPLE ROUNDS

Although there have been many battles between Ms. MEP and Ms. TMDL, a few provide excellent examples of the conflicts that can arise[1]. These include the Los Angeles River TMDLs in California, the Lower St. Johns River nutrient TMDL in Florida, and TMDLs for the Anacostia River in Washington, DC.

Los Angeles River TMDLs

California has been at the forefront of Ms. MEP and Ms. TMDL's conflict over TMDLs involving stormwater. In 2001, a "zero trash" TMDL was completed for the Los Angeles River watershed in response to an environmental lawsuit about the perceived slow pace of TMDL development. The trash TMDL adopted a target of zero trash and with controls to be phased over a 14-year period.

Cities under a MS4 permit obtained a legal ruling that compliance with a zero trash TMDL is impossible and that permittees should be required to reduce pollutants to MEP. A California appeals court overturned this ruling on the basis that the NPDES authority could require whatever controls were necessary. In 2005, the Regional Water Quality Control Board issued a TMDL for metals. The TMDL maps out a two-decade approach for achieving a goal of prohibiting toxic pollutants in toxic amounts. Ms. MEP contends that even though the Board included an iterative BMP approach through an interim Benchmark process, the TMDL will ultimately result in end-of-pipe, numeric limits for wet and dry weather discharges that do not account for differences in storm size.

Based on similar experiences, the State Board is now working on a Policy for the Implementation of the Storm Water Program. Stakeholders are requesting that the Board define MEP, clarify its position on numeric limits, and develop consistent methods for establishing permit limits, including defining what constitutes discharges "causing or contributing" to water quality standards violations.

The Lower St. Johns Nutrient TMDL in Florida

The Florida Department of Environmental Protection (FDEP) developed a nutrient TMDL for the Lower St. John's River, recognizing that site-specific dissolved oxygen criteria were needed to account for normal variations in dissolved oxygen that are not reflected in the statewide criteria. The St. Johns Riverkeeper, Inc. and the Clean Water Network of Florida, Inc. (CWNF) sued to have EPA reverse its approval of the TMDL which it did in November 2005. This resulted in a federal judge issuing an order that EPA could not approve any new or expanded discharges until a new TMDL was promulgated. EPA issued its own TMDL in January 2006, which requires three times as much load reduction as FDEP's TMDL. Although EPA recognizes that site specific criteria and adjustment of the TMDL may be appropriate in this instance, the Riverkeeper and CWNF have pledged to fight any attempt to "weaken water quality standards."

District of Columbia's Anacostia TMDLs

The District of Columbia Department of Public Health developed phased TMDLs for biochemical oxygen demand and total suspended solids for the Anacostia River, an urban freshwater estuary that

[1] Additional examples are available from the authors.

experiences frequent low levels of dissolved oxygen. The TMDL provides separate WLAs for combined sewer overflows (CSOs) for the Upper and Lower Anacostia and WLAs for stormwater to the Upper and Lower Anacostia. These WLAs were established by simulating the river with daily loads for a three year period to account for wet and dry weather loads and varying retention times within the river.

The development of these WLAs was also coordinated with a plan for the city to spend an additional $1.3 billion on more CSO control. In his approval letter of the District of Columbia's CSO long-term control plan, the Chief of the Department of Health's Bureau of Environmental Quality wrote "…the fact that for a few areas for a few days of the year the risk will be higher than other days and other areas does not negate the attainment of the designated use of the waterbody" (Collier, 2003).

The Friends of the Earth (FoE) sued EPA over approving these TMDLs[2]. They claim that it was inappropriate for the TMDLs to be calculated on an annual and seasonal basis (rather than daily); for targets to be specified as annual and seasonal (vs. daily); and for WLAs to be assigned for categories of sources (i.e., a single WLA for all stormwater) as opposed to individual WLAs for each point source[3]. EPA and the Water and Sewer Authority moved for summary judgment, the CSO Partnership and AMSA filed amicus briefs, and Judge Urbina rejected all of FoE's claims. FoE appealed and in March 2006, the U.S. Court of Appeals for the District of Columbia heard oral arguments and supported the idea that the word "daily" in TMDL should be applied to daily loadings. The three-judge panel also expressed concern about the practical implications associated with FoE's arguments. If the claims survive, there is a high probability that both Ms. MEP and Ms. TMDL will undergo significant changes.

CREATIVE SOLUTIONS

Requirements for TMDLs are contained in 40 CFR 130.7. Although there is national guidance on the components of a TMDL (EPA, 1998), states and EPA regions have guidance that often specifies additional components (Freedman, et. al, 2002). The research in Freedman, et. al identified a number of shortcomings and recommendations for improvement, including revising WQ standards, incorporating urban wet weather sources, allocating loads, linking BMPs to load reductions, and expanding the use of adaptive watershed management in certain situations. Since that time, our contestants (and the country) have gained additional experience in tailoring TMDLs to specific situations. Because of the nature of municipal stormwater discharges, these tailored solutions can be extremely important. Below are some examples of the benefits of a few specific approaches.

Tailoring TMDL Targets

Selection of the target is a critical first step in the TMDL process as it ultimately determines the amount of load allocated to different sources. If targets are unattainable, there are a number of options available such as changing the designated use through a Use Attainability Analysis (UAA), establishing site-specific criteria, using space/time averaging to assess compliance with the water quality standard, and using an interim target.

The first recommendation by the National Research Council (NRC) on improving the TMDL program was that "*[s]tates should develop appropriate use designations for waterbodies in advance of assessment and refine these use designations prior to TMDL development*" (NRC, 2001). In the past, few were willing to consider this for fear of "downgrading" or political backlash. This is slowly changing as more information is made available. Information on using UAAs and site-specific criteria for TMDLs can be found in handbooks by AMSA (2004), the National Association of Clean Water

[2] Friends of the Earth v. USEPA, D.D.C. 04cv92 RMU

[3] Friends of the Earth v US EPA, 346 F. Supp. 2d. 182 (DDC 2004)

Agencies and the Water Environment Research Federation (DuPuis, et al, 2005). EPA's Office of Science and Technology also has a program dedicated to promoting the appropriate use of UAAs and WQ standards revisions.

TMDLs are generally constructed using computer models of the pollutant loads and the receiving waters. These models are applied with different load reductions until the target is achieved under critical conditions. The intermittent nature of stormwater discharges and their transient impacts makes them challenging to incorporate into TMDLs, which by definition assume a constant daily loading. Ms. TMDL actually has a lot of flexibility in using the model output to determine if the target is achieved. Another option if the target is unattainable is to establish an interim target. For example, Georgia and South Carolina's criteria for dissolved oxygen for the Savannah Harbor are unattainable with natural background loads. EPA Region 4 therefore prepared a TMDL that includes a second target achievable with a 30 percent reduction in point source loads. EPA recommends that the states adopt this standard.

Adaptive Watershed Management

Ms. TMDL is often under a court-ordered deadline to produce many TMDLs in a fairly short time span, with limited opportunity for Ms. MEP to effectively participate in the development of the TMDL. The lack of time and resources, means that there is a high probability that the TMDL could result in a WLA that Ms. MEP cannot even hope to meet. The solution that Ms. TMDL may turn to is a "phased" or "adaptive management" TMDL. EPA guidance has not, however, specifically defined what is meant by these terms (AMSA, 2004).

In theory, an adaptive approach allows stakeholders to commit to load reductions where the water quality improvements are fairly certain or are low cost. More data is then collected on the watershed to improve the understanding of the system, evaluate the appropriateness of the target, and to monitor whether the controls are effective towards meeting the target. Therefore, it is important that Ms. TMDL clarify what controls stakeholders are willing to commit to implementing, how additional information will be obtained, and how the TMDL will be revisited.

Meeting WLAs with Non-Numeric Effluent Requirements

Ms. MEP has developed a detailed collection system model to assist in managing her stormwater discharges. Ms. TMDL proceeds with TMDL development using the results of the collection system model, even though Ms. MEP has cautioned that the model is accurate only within 20 percent. In developing the TMDL, the WLA in the draft TMDL is proposed as individual WLAs for each outfall.

Ideally, Ms. MEP will convince Ms. TMDL to express the WLA as a single, watershed-wide stormwater WLA. This will allow Ms. MEP to continue to implement reductions through an iterative BMP approach or pollutant reduction plans like pollutant minimization plans (PMPs) for toxic chemicals or bacterial management plans which are being incorporated into TMDLs by several states (e.g., Washington). Expressing the WLA as a single number is particularly appropriate unless effort is taken within the TMDL to demonstrate that more stringent controls are required within individual subbasins to meet water quality standards at a particular location within the waterbody.

CONCLUSION

Ms. MEP and Ms. TMDL may do battle over individual TMDLs for quite some time, depending on the "audience" participation. Solutions do exist, however, for TMDLs to be developed in a manner that recognizes that a "one-size-fits-all" water quality standard is not necessarily appropriate and that meaningful pollution reductions can be achieved even if loading targets are established on an aggregate

or seasonal/annual average basis. Additionally, there are several important court cases that affect the future of the TMDL and stormwater permitting programs.

Ms. MEP and Ms. TMDL advocate for time to let these battles to play out and for creative solutions to prove their effectiveness. For example, improvement in water quality due to BMPs may take decades in some watersheds. The increased scrutiny on the negative effects of municipal stormwater discharges is good, and should lead to improved technologies for pollutant removal at lower cost, which will also take time. If, however, it becomes apparent that Ms. Numeric Permit Limits is truly needed, the contestants advocate the use of long-term average mass limits due to the variation in the size, location, frequency, and pollutant concentrations in stormwater discharges.

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