



Challenges with Addressing Stormwater in TMDLs and NPDES Permits

Addressing stormwater pollution through traditional regulatory programs is proving challenging. Did Congress fully anticipate these challenges with the 1987 Clean Water Act amendments that established phased NPDES requirements for stormwater? Most likely not. EPA, for example, has more than 100 documents on the Office of Wastewater Management website to explain what aspects of the stormwater program are and are not applicable to what situations, and to clarify how stormwater should be permitted and addressed in Total Maximum Daily Loads (TMDLs).

As environmental advocates sued EPA and States over the lack of progress in completing TMDLs, questions arose about how stormwater should be included in the TMDL calculation. Research conducted by LTI for the Water Environment Research Federation (Project 00-WSM-1, published 2003) identified that stormwater was often neglected or included in an overall load allocation for nonpoint sources, since tools for accurately quantifying the volume and load of stormwater often did not exist. Other findings determined that separate TMDLs should be conducted for dry and wet weather conditions, and that wet weather standards needed to be developed for some situations. The research also pointed out that a comprehensive watershed management plan was often better suited for remedying stormwater impacts than pollutant-specific TMDLs.

In *Friends of the Earth Inc. v. EPA, D.C. Cir., No. 05-5015, 4/25/06*, the D.C. Circuit Court of Appeals ruled that EPA should not have approved seasonal annual TMDLs for the turbidity and oxygen-demanding stormwater loads to the Anacostia River, a tidal freshwater estuary near Washington, D.C.

In a landmark TMDL lawsuit, the United States Court of Appeals for the District of Columbia Circuit ruled in April 2006 that “[d]aily means daily, nothing else.” The court indicated that TMDLs should “establish daily loads that *also* meet applicable water quality standards.” Many might interpret this to logically mean that a stormwater discharge should receive a daily mass loading limit, and that all pollutants where a TMDL is required will have an acute (immediate) effect. Most water quality standards, however, were developed based on steady-state conditions or long-term averages with a statistical relationship for maximum concentrations – standards ill-suited to define allowable, daily pollutant loads associated with intermittent discharges.

Many environmental advocates are calling for the adoption of numeric permit limits for stormwater. This may eventually make sense in certain limited situations, but should be approached with extreme caution and only after extensive study, a holistic evaluation of costs/benefits, and significant public education and discussion. In other situations, effort may be better spent at reassuring the public that a revised water quality standard is appropriate. With support from EPA, several states and the Ohio River Valley Water Sanitation Commission (ORSANCO), for example, are working on adopting wet weather water quality standards because of the cost and impracticality of fully controlling wet weather discharges every day. This is an exciting time in our Clean Water regulatory history – one that is probably best addressed at the local level rather than the Federal courts.

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Evolution of the MS4 Program: From Theory to Results

Thousands of communities across the country are covered under the NPDES permit program for municipal separate storm sewer systems (MS4s). These communities are subject to increasing regulatory requirements and scrutiny. One community in South Carolina was recently assessed a fine of more than \$800,000 for failing to comply with its MS4 permit. This increased regulatory interest is causing many communities to focus more attention on their stormwater programs.

Regulations for “Phase I” MS4s (population greater than 100,000) have been in place since 1990; for “Phase II” small MS4s, regulations were promulgated in 1999. Phase I permittees are required to develop stormwater management programs (SWMPs), including public education and outreach, public participation, illicit discharge detection and elimination (IDDE), construction and post-construction runoff control, and best management practices (BMPs) to reduce pollutants. Phase II permits require six minimum control measures (MCMs): public education and outreach, public participation, IDDE, construction runoff control, post-construction runoff control, and good housekeeping/pollution prevention. Phase II also requires assessment of identified BMPs and measurable goals for each minimum control measure.

As the MS4 permit program evolves, there is increasing emphasis on results. Regulators want to ensure that stormwater impacts are truly controlled to the maximum extent practicable (MEP), and that the permitting process is not just a paper exercise. States are adding more permit requirements to try to ensure that SWMPs are meeting MEP, yet there is no standard for defining how to demonstrate this.



The establishment of measurable goals, which indicate effort expended (number of brochures developed, number of sites inspected, etc.), is one mechanism to allow the community to document compliance with its permit. Measurable goals can also provide some indication of program effectiveness.

Beyond measurable goals, many permitting authorities are requiring more direct assessment of the effectiveness of the SWMP. California, for example, requires an annual evaluation of program effectiveness. This involves selection of assessment parameters, which are quantifiable measurements that reflect BMP or minimum control measure effectiveness. Assessment parameters may include reporting on the number of calls to an illicit discharge hotline, percentage of population participating in a particular program, or mass of pollutant removed, among others.

Annual reports called for under MS4 permits are increasingly required to include analyses of trends, assessments of program effectiveness, and evaluations of BMP appropriateness. Some permits also specify receiving water monitoring, and require the permittee to compare results to water quality standards as a measure of the effectiveness of the stormwater management program.

Finally, program evaluations and audits are becoming increasingly common, with a goal of determining not only compliance with permit requirements, but also the effectiveness of the programs. Some States, such as California and Florida, have been actively auditing MS4 programs. EPA has been conducting audits of Phase I MS4s, and is expected to expand its auditing efforts to include Phase II communities within the next two years. LTI has provided assistance to Phase I communities not only in MS4 permit negotiations, but also in program audits. MS4s can expect continued emphasis on program effectiveness as time goes on, whether through annual reporting or formal program audits.

Stormwater Management - Restoring Urban Watersheds

Urban streams and rivers, for many years the victims of stormwater impacts, have become the focus of restoration efforts. But all too often, finding a way to improve water quality, let alone restore the natural “feel” in a watershed, seems like an overwhelming or impossible task. This difficulty comes from the fact that the impacts from urban stormwater are felt in many ways over a widespread area, and because multiple issues frequently require attention.

The challenges faced by today’s municipal stormwater managers often require action on many fronts. Foremost is the need to improve water quality (the Phase II NPDES program) or to meet a requirement to reduce a specific pollutant or nutrient (TMDLs). Add to that a fixed or limited budget, local groups calling for land preservation and recreational opportunities, or watershed organizations wanting (and not wrongly so) more “natural” ways to address urban stormwater impacts, and any municipality has more than enough to “chew on.”

Restoration techniques can be effective in addressing the impacts associated with urban stormwater. Restoration can not only improve water quality, but can also provide ecological habitat or create aesthetic improvements that



A clear understanding of the causes leading to stormwater degradation of watersheds is key to identifying a successful restoration effort. In this photo, the stream was downcut in elevation several feet by increased stormwater flow. The upland areas that formerly helped sustain it are now disconnected from the stream.

Four Common Issues with Urban Stormwater

1. Urbanization often leads to more polluted stormwater, and higher and faster flows in streams.
2. Faster flows lead to increased erosion, which degrades stream quality and habitat.
3. Increased erosion can be a significant source of sediment and nutrients, such as phosphorus.
4. High build-out in urban areas can limit the areas where restoration can be performed.

can be appreciated and enjoyed by residents in the community. Be it improving or preserving the habitat in a stream or riparian zone, stabilizing eroded stream banks, creating or improving a wetland, or retrofitting existing stormwater detention, restoration techniques can improve urban watersheds and address several of the issues tied to stormwater impacts.

Knowing the right restoration techniques and the best locations to apply them is key to success. Whether the goal is restoring ecological habitat, treating stormwater pollutants, or managing a stream corridor, success depends on understanding current and future land uses, the quantities of stormwater being generated, and impacts on flows and water quality, as well as the feasibility of specific restoration techniques.

These challenges can be overcome. To get answers, conventional information tools, such as geographical information systems (GIS), monitoring, and field surveys, can now be augmented with newer technologies (e.g., remote sensing and automated data entry in the field). Because each community is unique, a strategy must blend and customize the right set of these tools and then apply them to issues faced in each specific urban watershed.

Having the right strategy greatly improves the chances of success for a restoration effort, whether it involves getting a system in place to gather the right information, identifying and designing the appropriate restoration techniques at the right locations, or finding available funding mechanisms. LTI has developed these strategies and approaches for several communities, and has helped implement effective restoration measures at numerous locations.

StormCon, the North American Surface Water Quality Conference and Exposition, will take place in Denver, Colorado, from July 24 to 27. **StormCon** is the nation's largest exhibition of stormwater products and services each year, offering workshops, discussions and presentations on numerous stormwater-related topics. LTI is proud to be a part of this information-sharing experience by contributing the following presentations. We look forward to seeing you there!

The Application of Bacteria Source Tracking Methods in a Municipal Storm Sewer System to Support TMDL Implementation, presented by Carrie Turner, Limno-Tech, Tuesday, 2:15 pm (Q20).

Lessons Learned from Toledo's MS4 Audit, presented by Kathryn Sweet of Limno-Tech, and Tim Murphy of City of Toledo, OH, Tuesday, 2:15 pm (M20).

Maximum Extent Practicable Meets TMDL for Municipal Stormwater Permits: Which Will Prevail? presented by Adrienne Nemura of Limno-Tech, and Erika K. Powers of Barnes & Thornburg, Wednesday, 10:00 am (M40).

The Green Build-Out Model: A Tool to Quantify and Evaluate the Contribution of Trees and Greenroofs Toward Reducing Storm Water Runoff and Combined Sewer Overflows, presented by Anouk Savineau and Michael Sullivan of Limno-Tech, and Heather Whitlow and Barbara Deutsch of Casey Tree Endowment Fund, Wednesday, 4:15 pm (R60).

Stormwater and Non-Traditional MS4s

NPDES Phase II stormwater regulations were set forth under the Clean Water Act in 1999 to incorporate small municipalities into the existing MS4 stormwater program. A secondary effect of this action was that it brought other non-municipal institutions under NPDES permit requirements. This included many establishments largely unfamiliar with Phase II NPDES permit requirements, such as small villages, military bases, universities, schools, hospitals, prisons, DOTs, and airports. These non-traditional entities are required to implement the same elements of the stormwater program as small municipalities. Many are not well prepared to do so, and they therefore run the risk of being out of compliance and subject to fines and penalties.

The major challenges to non-traditional entities under the NPDES program are as follow:

- Non-traditional entities and their staff members may not be versed in NPDES and stormwater management requirements. Existing staff may not have the appropriate experience and technical expertise to understand programmatic requirements and achieve permit compliance.
- Non-traditional entities typically do not have legal authority and ordinance systems in place, as traditional municipalities do, to enforce stormwater requirements. They often rely on contractors, tenants, or others to implement stormwater management measures, but lack the legal authority to issue fines or penalties when these requirements are not met.
- Non-traditional entities may have difficulty identifying and reaching the appropriate audience for public education and outreach. Different communication methods are required to reach students, employees, travelers, patients, and prisoners.

Limno-Tech has extensive knowledge of the Phase II stormwater program as a result of providing direct contractor support to EPA as the program was implemented. In addition, We have assisted many MS4 communities and non-traditional entities, such as the Maryland Aviation Administration (MAA), with Phase II stormwater program compliance.

As a non-traditional municipality requiring coverage under the Phase II stormwater program, MAA has experienced some of the challenges listed above. Limno-Tech has helped MAA to meet these challenges by providing expertise and insight on Phase II stormwater program requirements and the expectations of regulatory agencies. We helped MAA to incorporate Phase II stormwater compliance into its existing environmental compliance program by identifying ways to implement and enforce permit requirements within the confines of MAA's existing non-traditional organizational structure. This included specifying and educating individuals responsible for programmatic requirements such as good housekeeping construction, and evaluating legal language in contracts and standard specifications to reinforce MAA's authority over these programs.

As more scrutiny is placed on the MS4 program, nontraditional MS4s will be under more pressure to demonstrate compliance. Non-traditional MS4s face many challenges in meeting MS4 requirements that to date have been defined mainly for traditional MS4s. Professional assistance could help nontraditional MS4s avoid fines and negative publicity, and need not be expensive.

Spotlight on LTI's Staff Charities



For a recent charity effort, LTI raised money to support **SafeHouse Center**, a non-profit organization dedicated to ending domestic violence and sexual assault in Washtenaw County, Michigan. SafeHouse provides free and confidential services for any person victimized that lives or works in Washtenaw County. Their programs include counseling, court accompaniment, information and referrals, emergency shelter, and personal advocacy. To support this worthy cause, we held bake sales, a raffle, a "March Madness" basketball tourney event, and sold ice cream to raise nearly \$700.

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In Focus: Evolution in Stormwater Management

It's been nearly 20 years since Congress amended the Clean Water Act to require the USEPA to establish phased requirements for control of stormwater discharges under the National Pollutant Discharge Elimination System (NPDES). In response to these requirements, USEPA published the Phase I rules for stormwater discharges associated with industrial activity and certain municipal separate storm sewer systems ("MS4s"). In the last 15 years, we have seen the Phase II rules come into being, dramatically increasing the size of the regulated stormwater community. We have also seen new, previously unforeseen, technical, regulatory, and legal challenges come into play. We discuss several of these challenges in this newsletter.

When the Phase II stormwater regulations were enacted, the goal was to exert control over stormwater discharges from smaller municipalities not covered under the Phase I rules. Specifically, the Phase II rules called for control of MS4s in "urbanized areas" as defined by census records. In effect, many non-municipal entities that were previously unfamiliar with NPDES permitting have found themselves pulled into the regulatory arena. These include small villages, airports, universities, military bases, school districts, and others. We describe some unique new requirements facing non-traditional regulated entities in this newsletter.

Another issue that may not have been foreseen when Congress implemented the 1987 amendments was the intersection of stormwater regulations with other provisions of the Clean Water Act. For example, the last 15 years have seen a tremendous growth in activity related to the Total Maximum Daily Load (TMDL) provisions

of the Act. Today, EPA, States, and the regulated community are struggling with how to integrate stormwater controls into TMDLs, and how to manage stormwater discharges to help meet TMDLs. There seem to more questions than answers, and the issue bears careful watching.

As stormwater management evolves, more and more emphasis is being placed on results: identifying measurable goals, demonstrating benefits of best management practices, and improving monitoring and data analysis methods for stormwater. Program audits are increasing, and Federal enforcement actions are being taken against communities that fail to demonstrate compliance with their MS4 permits.

A positive development for municipal stormwater managers is the growing recognition of the benefits of urban watershed restoration as a tool for stormwater management. Restoration of urban waterways has direct benefits such as improving water quality and natural habitat, and it can also provide innovative opportunities for enhancing stormwater management programs, meeting TMDL goals, and improving the quality of life for residents.

We hope that you will find the topics discussed in this newsletter interesting and informative. Please contact us with any questions or comments you may have about the articles.

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