How Does STEPP Address Interests of Different Stormwater Stakeholder Groups?

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Introduction

The Stormwater Testing and Evaluation for Products and Practices (STEPP) program provides a predictable, analytically robust mechanism to evaluate and verify the efficacy of stormwater management treatment technologies. Different stakeholders involved in stormwater management may have different interests that STEPP can address or affect. This paper summarizes the technology verification interests of four key stakeholder groups involved in stormwater management:

- Stormwater Manufacturers Treatment Device (MTD) and Sellers
- Stormwater Equipment Purchasers (most of whom hold stormwater discharge permits from state or federal NPDES permitting agencies)
- Stormwater Permitting Agencies
- Other stakeholders, including non-governmental organizations (NGOs), researchers, consultants, technical assistance providers, and other organizations with interests in assessing and assuring the effectiveness of stormwater management strategies

The paper summarizes the key interests of these groups by identifying the types of risks they face associated with the effectiveness of stormwater treatment technologies and discussing ways that STEPP (and potentially other technology evaluation and verification programs[1]) in addressing those risks. This information will assist in developing and educating prospective users of the STEPP program to help ensure the program effectively meets the needs of different interested stakeholders. It should be noted that this paper focuses only on proprietary products even though the scope of this program includes both proprietary products as well as public domain practices.

Stormwater Equipment Manufacturers and Sellers

Producers, distributers, and sellers/resellers of stormwater Manufactured Treatment Devices (MTDs) market these technologies based on claims about their efficacy in removing specific pollutants from stormwater discharges. While many manufacturers conduct extensive testing

[1] Other States that maintain stormwater technology testing and/or certification programs include Washington (Technology Assessment Protocol-Ecology or TAPE program), New Jersey (New Jersey Corporation for Advanced Technology or NJCAT program), Georgia (Post-Construction Stormwater Technology Assessment Protocol (PCSTAP), and California (Certification of Trash Full Capture Systems).

to support these claims, their testing may be hamstrung by the absence of standardized, accepted testing methods and/or viewed as biased by potential customers and others interested in MTDs. Absent standardized methods and objective processes for testing and validating the efficacy of MTDs, manufacturers and sellers often must establish the effectiveness of their products on a case-by-case basis at the state, local, or individual purchaser level. The need to continually reestablish the efficacy of MTDs is expensive and time consuming and likely adversely impacts sales and profitability of stormwater MTDs. Furthermore, the absence of generally accepted testing methods makes it difficult to develop MTDs to be sold at the national or international levels since different regulators and buyers may have different technical standards and expectations.

STEPP and similar testing and verification processes offer the opportunity to address these barriers to market entry by establishing standardized testing methods and thresholds to be carried out by an unbiased testing organization for different types of MTDs and for different pollutants of concern. When manufacturers and sellers offer their MTDs for testing and verification through the STEPP program and, they can reliably claim that their MTDs meet certain performance levels and are capable of being implemented to address specific water quality requirements established at the user, local, state, or federal levels. This information supports acceptance of specific MTDs by purchasers, regulators, and other interest holders. Moreover, knowing in advance the performance thresholds needing to be met and the specific methods by which performance will be tested assists manufacturers in developing and improving MTDs by removing guesswork regarding how MTD performance will be measured.

Stormwater MTDs can work effectively only if they are properly maintained. Many communities have seen performance of MTDs decline over time due to deferred or ineffective maintenance. In many cases, recommendations for necessary MTD operations and maintenance have not been based on rigorous testing over time. Currently, the STEPP program is limited to evaluating initial practice effectiveness, but it is envisioned that the platform provided by this program will enable reliable evaluations of long-term performance as well as operations and maintenance practices that are necessary to maintain performance characteristics over time.

Stormwater professionals are increasingly recognizing that stormwater discharge patterns and control needs are changing in response to climate change-related stressors that are changing the frequency, magnitude, and characteristics of stormwater discharges and their impacts. As with long-term performance, the STEPP program is constructed with the flexibility to incorporate objective evaluation of potential future discharge scenarios and the capacity of MTDs to effectively perform under these changing conditions.

Stormwater Permittees/Equipment Purchasers

Municipal, industrial, and construction entities subject to NPDES, state, and/or local stormwater permitting requirements need to identify and implement reliable stormwater control MTDs capable of meeting the performance requirements of associated permits. Permits often express discharge limitations in narrative terms that require implementation of stormwater quality controls sufficient to meet numeric pollutant targets (e.g. maximum pollutant thresholds or percent pollution reductions required), numeric performance targets (e.g. stormwater flow capture thresholds), or narrative MTD implementation requirements (e.g., "reduce pollutants to the maximum extent practicable" or "control pollutants as necessary to meet applicable water quality standards"). Narrative targets often require permittees to be capable of documenting the efficacy of implemented controls to demonstrate compliance with these different forms of discharge limitations. However, since different manufacturers provide MTD effectiveness information based on different metrics and different permitting agencies use different methods for setting discharge limitations in permits, permittees are often placed in the difficult position of not being able to establish in advance that selected MTDs are reasonably likely to be effective in addressing the pollutants of concern. Inconsistent information about MTD efficacy also makes it more difficult to design with confidence MTD systems to be implemented across a municipality, industrial site, or construction site that together will be sufficiently effective to meet regulatory requirements.

Some states, counties, and municipalities have developed stormwater BMP handbooks or guidance documents that specify design characteristics of approved stormwater treatment technologies. In those jurisdictions, permittees are often expected to implement MTDs consistent with applicable BMP handbooks or guides and can expect to be considered in compliance with permit requirements when they do so. While these BMP handbooks/guides are helpful, they are often updated infrequently and/or include BMP guidance based on less rigorous testing of MTD efficacy or capacity to treat particular pollutants or stormwater discharges. These handbooks also often offer generic BMP design guidance are cannot be directly used to identify whether specific MTDs marketed by manufacturers are consistent with such guidance. These handbooks rarely provide specific guidance as to the acceptability of specific proprietary MTD products and designs. For these reasons, these handbooks cannot be fully relied upon to support the selection of MTDs in a field where stormwater MTDs are being improved and updated over time.

The STEPP program offers the opportunity to identify and apply MTD testing and verification best practices and procedures, thereby yielding robust, replicable results that can enable buyers to purchase MTDs with confidence about their prospective efficacy. Establishing MTD efficacy through STEPP testing helps purchasers avoid the need to conduct costly and time-consuming

independent evaluation of MTD performance and communicate effectively with senior managers and other stakeholders about the reliability of MTD purchases. Use of MTDs that have gone through the STEPP evaluation process also assists permittees in working with permitting authorities to establish that individual MTDs and MTD systems planned by the permittee are sufficient to meet the numeric or narrative permit limitations in NPDES and other permits.

Permittees may be concerned that recognition of or reliance upon the STEPP program could undercut prior approvals of MTDs as compliant with permit requirements through other MTD testing methods or which were previously identified in BMP handbooks. Permittees have large investments in existing MTD systems and may rightfully be concerned about the potential that previously "approved" MTDs could be found insufficiently effective through rigorous testing methods like STEPP. However, permitting authorities can structure their recognition of MTD testing and verification methods in ways that avoid this potential problem. For example, a State might indicate that MTDs verified through any one of several testing protocols, including but not limited to STEPP, are "acceptable" to establish compliant practices. A State could also "grandfather" previously implemented MTDs and recognize their adequacy to implement permit requirements either permanently or for a set period of time.

These strategies can help ensure that new information about MTD effectiveness does not immediately or necessarily establish that these MTDs are non-compliant. However, it may be in the permittees' and permitting authorities' interest to support STEPP in part because knowledge that MTDs previously believed to be adequate to meet water quality protection needs are actually not sufficiently effective can inform future permitting and MTD planning and investment decision-making. For example, if a previously approved MTD is found insufficiently effective, permittees can avoid continuing to purchase it in the future and make plans to switch to MTDs that have been more rigorously vetted. In some cases, it may be possible to retrofit or adjust existing technologies to address newly-identified performance deficiencies. Incorporating a rigorous MTD testing capability into permitting and individual permittee stormwater management programs provides a more reliable mechanism to support adaptive management and iterative improvement of stormwater controls—a strategy that is central to the regulatory strategy underlying many state stormwater permitting programs.

Similarly, state, county, and local BMP handbook efforts can be paired with STEPP to provide a mechanism for recognizing the efficacy of new, or newly tested stormwater MTDs without having to continually update printed handbooks to account for changes in available practices and methods.

Stormwater Permitting Agencies

As discussed in the preceding section, NPDES and other stormwater discharge permits establish MTD implementation requirements in several ways, including imposition of narrative and, sometimes, numeric limitations. These limitations are designed to meet goals to reduce or prevent discharges of specific pollutants of concern and/or to limit stormwater discharge flows. Permits often require the permittee to show that their stormwater implementation plans (which include many types of stormwater controls, technologies, and practices, have "reasonable assurance" of meeting individual permit limitations. Currently, there are no national and few state-based systems to independently evaluate and verify the ability of specific MTDs to meet required performance requirements (i.e., to establish reasonable assurance of their effectiveness). This has resulted in a varied and confusing patchwork of approaches to associating permit requirements with practice and technology implementation. As a result, permit issuance often involves review of extensive MTD performance data and protracted negotiation with permittees concerning stormwater pollution prevention plans (SWPPPs) and associated MTD plans.

In states that recognize the STEPP program as a rigorous mechanism for testing and validating the performance of stormwater management technologies, permitting agencies benefit by being able to incorporate narrative NPDES permit limitations based on use of MTDs with recognized performance characteristics. For example, a MS4 permit might need to incorporate provisions to address a waterbody impaired by excessive levels of copper. Based on an analysis of receiving water conditions through evaluation of available receiving water data in comparison with applicable copper water quality standards, or application of an approved TMDL wasteload allocation for the MS4, the permitting authority can incorporate either numeric water quality-based limitations (WQBELs) or narrative WQBELs to address the copper impairment. Permitting authorities have discretion as to whether to incorporate numeric WQBELs or narrative WQBELs to address impaired waters. However, incorporating only narrative WQBELs could raise questions about whether the narrative limitations are actually sufficient to meet applicable water quality standards or wasteload allocations. In situations where the State recognizes results from STEPP verification, the State can specify in writing narrative WQBELs that a permittee will be considered in compliance if it implements controls whose performance has been verified through STEPP to be sufficient to reduce copper loadings to levels in compliance with applicable standards or wasteload allocations. In cases where states do not use or recognize evaluation and verification programs like STEPP, uncertainty is likely to arise as to whether there will be "reasonable assurance" that the controls will meet applicable water quality standards or TMDLs.

Such testing-based assurances are particularly important in light of the holding in the recent Supreme Court decision in *City and County of San Francisco v. EPA* decision. The Court found that outcome-based permit limitations are impermissible as they do not adequately specify what a permittee must implement to be considered in compliance with the permit limit. While the Court's decision focused specifically on the use of receiving water limitations, its logic could also apply to situations where narrative permit limitations are included that do not adequately specify what permittees must do in order to be considered in compliance. This potential vulnerability would be addressed through recognition of verification programs like STEPP to establish in advance the expected efficacy of controls to be implemented to comply with a narrative limitation.

It may be possible for permitting authorities or permittees to use other approaches to establishing the expected effectiveness of controls to be implemented to meet narrative limitations. For example, some municipalities, counties, and states, have established BMP handbooks or guidance that identify specific controls that are acceptable to meet different pollution control requirements. However, it is worth considering whether such BMP manuals and handbooks are backed by rigorous and objective testing-based verification of BMP effectiveness. If not, their use to establish the adequacy of a particular stormwater control strategy could be vulnerable to challenge by permitting authorities or third parties. Use of STEPP or other objective performance verification mechanisms enables permitting authorities and permittee to build confidence in their reliance on BMP handbooks or guidance documents.

Some states, such as Washington and New Jersey, maintain their own comprehensive stormwater technology verification programs that include testing protocols to ensure consistent testing methods and procedures. Many other states, as well as jurisdictions, defer to one of these two state programs with little or no consideration of differences in precipitation patterns, pollution profiles, or other physiographic factors that affect performance of stormwater infrastructure. Some states and jurisdictions, with California being a notable example, host evaluation programs that are not based on testing at all, but rather, are more qualitative in nature. The dearth of technology verification programs in the stormwater reflects the challenge in establishing and sustaining these programs. Maintenance of these programs is time and resource intensive, and resource constrained permitting programs may find benefit in enrolling in STEPP as a more cost-effective approach to providing verification services.

The section above addressing the interests of MTD manufacturers discusses the capacity of STEPP to provide needed evaluation and verification to more rigorously predict MTD operation and maintenance needs over time. Both permittees and permitting agencies should be interested in supporting this type of verification capacity to help address the need to build and maintain rigorous O&M standards and protocols. Similarly, the manufacturer section discusses

the capacity of STEPP to enable evaluation of MTD performance capabilities under future climate change-affected discharge scenarios. Permittees and permitting agencies should share an interest in supporting use of solid mechanisms to anticipate climate-change related stressors that affect the capacity of MTDs to deliver as advertised.

Other Interested Stakeholders

A variety of other groups have keen interests in ensuring that stormwater control practices are backed by rigorous evaluation and verification and are therefore truly capable of performing at levels adequate to address pollutants and discharge conditions of concern. These groups may have compelling reasons to support the use of STEPP or other MTD verification programs. As the interests in stormwater management among these other stakeholder groups may vary, their prospective interests in STEPP are discussed separately.

Citizen and Environmental Groups

Many national, state-level, and local NGOs focus on helping to ensure that local stormwater management efforts are sufficient to ensure that stormwater discharges do not cause or contribute to water quality standards violations or otherwise cause adverse impacts (e.g., excessive flooding). Many NGOs have focused attention on questioning the effectiveness of state permitting strategies that rely upon narrative effluent limitations and iterative improvement of stormwater controls over time. It is in the interests of the NGOs to ensure that state permitting agencies and individual stormwater permittees have a solid analytical basis to support assertions that the MTD systems they employ are adequate to implement permit limitations and protect water quality. NGOs might advocate for state support of STEPP and incorporation of STEPP-based MTD verification and with state or jurisdiction approval or certification as part of the permitting program strategy to help provide this rigorous analytical basis.

In cases where states and/or individual permittees have not yet taken advantage of the MTD assurances reliance upon STEPP or other verification programs can provide, NGOs may be interested in urging permitting authorities to require or encourage their use to provide a stronger analytical basis for permit provisions and associated claims permit limitations are sufficient to result in attainment of water quality standards and TMDLs.

Some NGOs regularly bring legal actions under CWA Section 502 to directly enforce against alleged permit violations, often for violations of receiving water-based permit limits. This practice may become more difficult if, in the future, permits no longer contain “outcome-based” limitations pursuant to the SCOTUS *San Francisco* decision discussed above. If NGOs are left to seeking enforcement of narrative limitations, they may need to rely more on assessment of the effectiveness of MTDs implemented by permittees rather than focusing as much on water

quality outcomes that may or may not be attributable to individual permitted discharges. It may be in the NGO's interest in such cases to have available reliable information (of the types provided by STEPP) concerning the expected efficacy of specific MTDs or MTD systems to address specific pollutants or types of water quality impairments.

Consultants

Many permittees rely upon expert consultants to advise them in the selection of MTDs to address specific stormwater management and water quality protection requirements. Third party technical assistance providers like As discussed previously, reliable information about MTD efficacy is not always available from manufacturers or other reviewers of MTD performance. It may be in the consultants' interest to have states and permittees agree on the use of STEPP or other performance testing protocols to assist consultants in making MTD design recommendations with confidence that selected practices will perform as advertised. Reliance on STEPP can also reduce consultants' legal liability in making such recommendations if implemented MTD systems do not actually perform as advertised and result in permit non-compliance.

Technical Assistance Providers

EPA and States are increasingly hiring and relying upon third party technical assistance providers to help permittees plan stormwater management systems and procure specific stormwater MTDs to address local water quality and other stormwater management challenges. Organizations including Rural Water Association, Rural Community Assistance Partnership, and Regional Environmental Finance Centers provide engineering and planning assistance to communities to aid in planning stormwater management systems and investments. Similar to consultants, technical assistance providers need objective, reliable information about MTD performance, and it would be in their interest to support the use of STEPP and other performance assessment methods to help bolster the analytical basis for their technology recommendations and remain abreast of new developments in stormwater MTD options.

Researchers

A host of university and other researchers regularly conduct research on stormwater management challenges and control technologies. Since stormwater management technologies are based on a wide variety of locally adapted, often proprietary approaches, it can be very difficult to efficiently obtain information about MTD efficacy and performance challenges. Supporting the STEPP program would help to create more widely accepted standard testing and verification methods, make the process of collecting effectiveness information more efficient, and improve the stormwater MTD research process.

Conclusion

STEPP and other stormwater verification programs can provide rigorous information that addresses the varying needs of equipment manufacturers, permittees who purchase stormwater equipment, permitting agencies, and a range of other stakeholders with interests in ensuring stormwater MTDs work effectively in protecting water quality. As the STEPP program evolves to build its capacity to evaluate stormwater MTDs' capacity to control different pollutants, stormwater interest holders should carefully consider how support for STEPP can help address their practical, technical, legal, and management challenges and vulnerabilities.