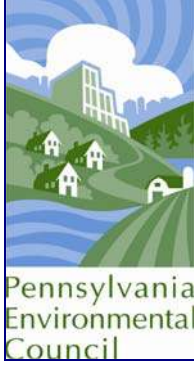




Stormwater Management Listening Sessions

October 2007

Pennsylvania Environmental Council
123 Chestnut Street, Suite 401
Philadelphia, PA 19106
Phone: (215) 592.7020
Fax: (215) 592.7026
www.pecpa.org



Stormwater Management Listening Sessions Final Paper

Pennsylvania Environmental Council

October 2007

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Most of the Listening Session participants (19) view stormwater as a problem. Characterizations of this problem range from “pain in the neck,” “widespread”, and “major headache” to “roots of all evil,” “untamed monster,” and “destructive.”

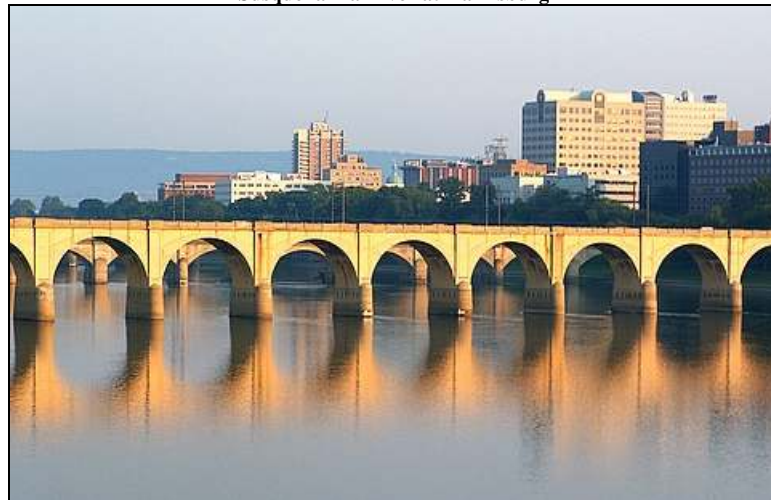
Pennsylvania Environmental Council's Stormwater Management Listening Sessions, 2007

Introduction:

For nearly four decades, the Pennsylvania Environmental Council (Council) has served as a catalyst for collaboration and environmental improvement by working with diverse stakeholders on a variety of issues. For example, across the state our staff and board work with volunteers, watershed associations, local government officials, farmers, and businesses in an effort to implement best management practices that improve water quality. With our offices in Philadelphia, Pittsburgh, Harrisburg, Luzerne, and Meadville, the Council is well positioned to identify those topics that appear to be regional, but are, in fact, statewide concerns. Stormwater management exemplifies this, because it is an issue that challenges leaders in every region and watershed.

Unfortunately, the tools that the Commonwealth provides to address stormwater management are inadequate. Recognizing this, the Council did what it does best – we engaged a diverse group of stakeholders in regional discussions with the intent of identifying policy options that could improve stormwater management across the Commonwealth. This report provides a series of recommendations that, if implemented, will work to improve stormwater management throughout the state.

Susquehanna River at Harrisburg



I - Executive Summary

In 2006, the Council received funding from the William Penn Foundation and the Heinz Endowments to conduct a series of stormwater listening sessions across the Commonwealth. Listening sessions were held in the first quarter of 2007 at four locations in Pennsylvania, including Philadelphia, Erie, Cranberry, and Harrisburg. A wide variety of stakeholders participated, including municipal officials, developers, agency leaders, elected officials, environmental groups, and others. The listening sessions provided an opportunity for participants to express thoughts and communicate their experience

Listening Session participants also view stormwater as either a resource (8) or an opportunity (7). Their responses ranged from “important resource,” “one of our greatest resources” and “waiting to be seen as a resource” to “opportunity to pay more attention to the environment,” “draw attention to environmental issues,” and “basis for some nice spaces.”

Pennsylvania Environmental Council's Stormwater Management Listening Sessions 2007

implementing stormwater management regulations, policies, and practices.

Listening session discussions primarily focused on identifying stormwater management issues, and proposing recommendations to make current and future laws and regulations more effective. Overall, the issues and recommendations identified were highly consistent across the state.

Participants raised the following key issues:

- A lack of coordinated stormwater management strategy for the Commonwealth;
- Inadequate financial and technical resources to manage stormwater;
- Many land use regulations often conflict with stormwater regulations;
- A lack of long-term operation and maintenance practices for stormwater management facilities; and
- A need for more enforcement of stormwater management planning and implementation requirements.

Participants concluded the following recommendations:

- Pennsylvania needs to take a regional/watershed approach to stormwater management;
- Pennsylvania needs to create a vision and strategic plan for stormwater management;
- Pennsylvania needs to define measurable objectives and provide the resources needed to achieve them; and
- Pennsylvania needs to provide leadership/education on what needs to be accomplished to improve Pennsylvania’s water resources.

Schuylkill River in Philadelphia



Why is Stormwater A Problem?

In general, untreated stormwater is unsafe. It can contain toxic metals, organic compounds, bacteria, and viruses. Untreated stormwater is not safe for people to drink and is not recommended for swimming.

*Washington State
Department of Ecology*

II. Recommendations from Stormwater Management Listening Sessions:

Pennsylvania's municipalities need a dedicated source of funding for stormwater – the Council will work towards enabling municipalities to find dedicated sources of funding and technical expertise for stormwater management issues. The Council supports the authorization of stormwater financing options that will function at the multi-municipal or watershed level. A range of funding options includes stormwater authorities or intergovernmental cooperative agreements.

Implement a strategic stormwater plan for the Commonwealth – while planning has occurred at many levels throughout the Commonwealth, there is still uncertainty when it comes to how the Commonwealth will solve the stormwater challenges it faces. The Council believes that an overall stormwater strategic plan is necessary in order to move Pennsylvania forward and towards achieving the goals of the Clean Water Act (CWA). Many state and federal level programs such as National Pollutant Discharge Elimination System (NPDES), Total Maximum Daily Load (TMDL), and Pennsylvania Stormwater Management Act of 1978 (Act 167) are in some way flawed, only partially implemented, and run contradictory to other programs. Other challenges must be dealt with at a state-level, such as operation and maintenance of stormwater facilities, addressing older municipalities that have no stormwater management, and planning at the watershed level while addressing site specific conditions.

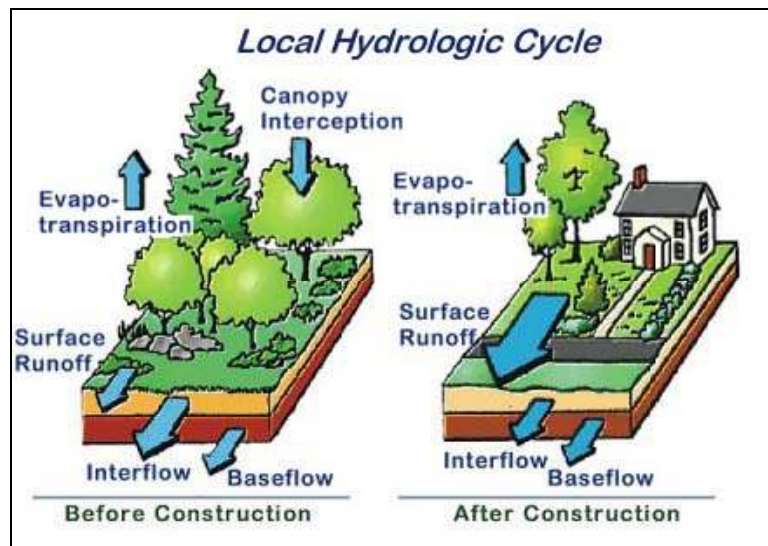
Establish stronger connections between land and water resources – local codes and ordinances often run counter to protecting land and water resources. For example, road width in zoning codes is often larger than it needs to be, therefore increasing the amount of impervious surface cover that is needed. The Council will investigate how the Municipal Planning Code (MPC) could be strengthened in order to help municipalities protect both of these important resources in the Commonwealth. The Council will also review the current permitting structure in the Commonwealth to find ways to improve and modify the system.

Next Steps

The Council will meet with officials from Pennsylvania Department of Environmental Protection (DEP), U.S. Environmental Protection Agency (EPA), townships, boroughs, counties, legislators, 10,000 Friends of Pennsylvania, American Rivers and others to strategize about the findings of the listening sessions and to meet the above objectives.

III. Stormwater: A Brief Overview

During the last century, Pennsylvania has experienced several devastating floods, often as a result of tropical storms, hurricanes, and heavy rainfall. In many watersheds throughout Pennsylvania, flooding from typical rain storms has increased over time due to changes in land use and ineffective stormwater management. This is a result of increased *volume* of water being channeled through our watersheds. The increase in water volume is the result of an increase in impervious (or rain proof) surfaces – such as rooftops and parking lots – coupled with the conversion of woods, meadows, and farm fields to lawns, houses, and stores. As the percentage of paved areas increases, higher volumes of water will run off of these surfaces. Extreme fluctuations in surface water flow from episodic storm events cause localized flooding. These flow fluctuations increase erosion of stream banks and stream beds, increasing downstream deposition soil, resulting in reduction and impairment of aquatic habitat and drinking water sources.



Land development can dramatically alter the hydrologic cycle of an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or it can draw the portion of water that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Conventional development removes this beneficial vegetation and replaces it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. In addition, clearing and grading a site can remove depressions that store rainfall. Construction activities commonly compact the soil and further diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site.

The quality of runoff can vary significantly depending on the type of land use. For example, runoff from residential housing, golf courses, and parks may contain high nutrient levels due to fertilization of grassy areas, pesticides, and

fecal bacteria due to surface malfunctions from on-lot sewage disposal systems. Runoff from paved areas and industrial sites may contain a host of metals, inorganic and organic compounds, as well as petroleum products. Metals, inorganics and pathogens from Pennsylvania's urban communities pose great potential for long-term impacts on aquatic life, human health, and drinking water sources.

Delaware River Water Gap



IV. Listening Session Process

During the first quarter of 2007, the Council conducted a series of high level stormwater listening sessions to engage stormwater professionals in a discussion of stormwater management policy in the Commonwealth. The Council sought to invite individuals from a broad spectrum of stakeholder interest groups, including industry groups, developers, municipalities/local governments, elected officials, environmental advisory councils, engineering/consulting firms, regulatory agencies, governmental commissions, universities and environmental/conservation/watershed groups. The invitation noted that the listening sessions would provide an opportunity for participants to express their thoughts and concerns related to stormwater management and to help shape future policy development in Pennsylvania. The invitees were informed that listening session findings would be summarized in a paper and presented to the Pennsylvania Department of Environmental Protection and the General Assembly. The paper includes recommendations (see page 5) related to water resources in Pennsylvania and how to make current and future laws and regulations more effective in bringing about cleaner water and better public policy.

The listening sessions were held at the following locations: Philadelphia (January 18, 2007), Erie (February 9, 2007), Cranberry (February 22, 2007), and Harrisburg (March 29, 2007). Each listening sessions was held over a four hour period and followed a prescribed agenda. A representative from the Council facilitated the discussion. Two to three other Council representatives recorded written notes of the listening session discussions. These included summary notes that were written on news print paper and displayed during the course of

Ninety-six percent of the water-quality-impaired watersheds in Pennsylvania are polluted because of non-point sources of pollution, such as abandoned mine drainage, urban and agricultural runoff, atmospheric deposition, on-lot sewage systems, groundwater base flow, earthmoving, stream hydro modification, and timber harvesting.

-- PA Department of Environmental Protection

Ten (10) of the Listening Session participants equate stormwater with the water cycle, noting that stormwater is “all the water we get,” “runoff that belongs back in the water table,” “a stage in the cycle of water,” and “a system that began in the beginning of time.”

Pennsylvania Environmental Council's Stormwater Management Listening Sessions, 2007

the sessions, as well as computer-written notes. The sessions commenced with a welcome by the Council, a round of introductions, and opening remarks by the Council. An ice-breaker exercise was then held during which participants were asked to complete a one sentence statement “Stormwater is...” The results of this exercise are summarized in Appendix C.

Each listening session allowed time for municipalities, developers, and regulatory agencies, respectively, to make remarks addressing their experience implementing stormwater management regulations and practices. Each participant group was asked “*What do you need to effectively implement stormwater management?*” Municipalities were given approximately one hour of discussion time. This was followed by approximately one hour of discussion time for developers and builder associations, and approximately one-half hour of discussion time for regulatory agencies. During the discussion, participants from each group made opening remarks. The opening remarks were followed by general discussion and comments from the entire group of participants, which generally focused on issues raised during the opening remarks.

For the most part the participants filled the allotted time with comments, back and forth discussions, and recommendations. Council facilitators occasionally posed questions to the entire group to stimulate discussions. Questions asked at some but not all of the listening sessions included:

- “What is the biggest problem with the stormwater management policy/what would you change?”
- “What do you want to see in new stormwater policy?”
- “What should PA Department of Environmental Protection change about stormwater policy?”
- “What is one thing you would change with Act 167 or MS4 program?”
- “How do we pay for all of this?”
- “What are your ideas about using a stormwater authority or utility model?”

Time was allotted at the end of each listening session for concluding remarks.

The following sections of this paper are set-up in the following manner: current municipal and developer requirements; participant issues; participant recommendations.

V. Municipalities and Stormwater Management

(a) Current municipal requirements

The Pennsylvania Department of Environmental Protection (DEP) is responsible for administering the state’s stormwater management program. Historically, municipalities have been responsible for enacting ordinances to regulate stormwater as they review subdivision and land development plans through the Municipalities Planning Code (MPC). In counties where an Act 167 stormwater plan has been developed, municipalities are required to adopt

ordinances consistent with the plan. Federal stormwater management regulations require 930 municipalities in “urbanized areas” across Pennsylvania to apply for and maintain a NPDES permit to discharge stormwater from their municipality.

The NPDES Phase II program requires MS4s to have the following legal provisions:

- Prohibition of non-stormwater discharges (with certain exceptions);
- Requirement for erosion and sediment controls;
- Requirement to address post-construction runoff from new development and redevelopment, including operations and maintenance of stormwater BMPs; and
- Sanctions to ensure compliance with the above provisions.

Villanova University Stormwater Infiltration Basin



To assist municipalities, the DEP issued a statewide general permit (PAG-13) with uniform conditions pertinent to every MS4 that applies and receives approval for coverage under the permit. *Municipal Separate Storm Sewer System Stormwater Management Program Protocol (Protocol)* (December 2002) is a model stormwater management plan developed by DEP which contains all of the requirements of the new federal regulations, including measurable goals and timetables.

The permit gives MS4s the option of using the *Protocol* for implementing a stormwater management program over the five-year permit term or developing their own program. The *Protocol* encourages implementation of a watershed-based, multi-municipal stormwater plan under the Pennsylvania Stormwater Management Act, 32 P.S. §§ 680.1 et seq. (Act 167). MS4s who implement the protocol in its entirety will not have to develop their own stormwater program.

Seven (7) of the Listening Session participant views fell into the “other” category, with viewpoints ranging from “critical to economic redevelopment,” “foundation of land development process,” and “something no one thinks about until it rains” to “little understood,” “great equalizer,” and “evolving program.”

Pennsylvania Environmental Council's Stormwater Management Listening Sessions, 2007

The *Protocol* contains DEP’s preferred and recommended program for MS4s to address the six required elements contained in the federal regulations (see Appendix A). The general permit (PAG-13) is not available to municipalities that discharge stormwater to “special protection” waters under 25 PA Code Chapter 93. Such MS4s will need to comply with an individual NPDES permit. However, the *Protocol* (and model ordinance) is available for these municipalities.

In August 2003, a model stormwater ordinance was also issued by DEP. The model ordinance was based on the existing Act 167 ordinance, as well as various ordinances used in Pennsylvania and elsewhere. In addition, model ordinances suggested by the Center for Watershed Protection and by the Maryland Department of the Environment were also considered. The essential elements of model ordinance were incorporated into the Act 167 model ordinance for use by municipalities who elect to use the *Protocol*.

Since 2003, DEP has developed the *Pennsylvania Stormwater Best Management Practices Manual* (December 2006) and is finalizing an updated model ordinance. DEP also will be extending the MS4 five-year permits to six-year permits and a new *Protocol* and permit will be reviewed during a public comment period to take place by September 2008.

Allegheny River Sojourn



(b) Issues raised by municipalities

In the first hour of the session, the dialog between participants focused on the following question: *What does a municipality need to effectively implement stormwater management?* Participating municipalities each had the opportunity to make opening remarks, during which they stated their experience with and assessment of stormwater management regulations and practices. Their remarks were followed by a general discussion among the entire group.

<p>Five (5) Listening Session participants equated stormwater with finances, including “financial challenge,” “severe financial costs,” “expensive responsibility,” and “inexpensive to manage upfront, expensive to manage after.”</p> <p><i>Pennsylvania Environmental Council’s Stormwater Management Listening Sessions, 2007</i></p>	<p>Comments during this session pointed to the general lack of a unifying strategic plan for managing stormwater. Stormwater management regulations were portrayed as a hodgepodge of requirements and plans. Municipalities noted that the responsibility for stormwater management does not rest solely with them; that the counties and the DEP should take on a larger role in establishing baseline stormwater management requirements. Act 167 was not seen as having been broadly implemented by the counties. Remarks were made that the NDPES and MS4 regulatory requirements have been designed for larger political units than Pennsylvania communities.</p> <p>Questions and comments were raised regarding the primary causes of stormwater problems, and who is ultimately responsible. For example, what are the stormwater contributions from existing development with little or no stormwater management compared to contributions coming from new development or farmland or open space. Existing development was identified as a significant contributor to stormwater challenges. Upstream communities with no NPDES/MS4 requirements that cause downstream stormwater impacts were also identified as a concern.</p> <p>Conflicts between land use planning requirements and stormwater management also were identified. Examples cited include (1) wider Pennsylvania Department of Transportation road width requirements may conflict with DEP guidance for reducing impervious surfaces, and (2) smaller impervious surfaces (e.g. 5 parking spaces or less) may be exempt from stormwater management.</p> <p>Participants commented on the need for adequate resources to finance stormwater management. Several finance related issues were raised, including where the resources should come from (federal, state, or local), what kinds of funding sources (e.g. via taxes or stormwater authority fees), who will pay for stormwater retrofits on existing development, and whether stormwater authorities are legal under the Pennsylvania Municipal Authorities Act.</p> <p>Concern was raised over the need to control the volume of stormwater runoff along with rate controls. It was stated that current regulations put stormwater on the street to be dealt with later, and that the cumulative effects of many development projects are not addressed. While there was support for DEP BMP infiltration requirements (which would address volume control), there was concern that this approach should address site variability. For example, infiltration doesn’t work well in all areas, so local conditions such as soil types need to be considered.</p>
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Monitoring flood waters



Participants recognized the challenge of enforcing stormwater regulations, including the lack of technical review of NPDES construction permits (most are general permits).

Finally, concerns were raised regarding lack of sufficient public knowledge and support of stormwater management, which translates to the lack of political support.

(c) Recommendations made by municipalities

During the course of the municipalities' discussion period, municipalities and other participants made recommendations for how to address stormwater management issues. These recommendations were organized into the following strategy approach for managing stormwater:

Develop and implement an overall stormwater management strategy:

- Establish vision, goals, objectives, and general strategy, then develop regulatory framework.
- Integrate requirements of current regulations (e.g. Act 167, NPDES/MS4, TMDL, etc).
- Create baseline requirements for all development; consistency between municipalities/regulations; level playing field between municipalities.
- Address shortcomings of Act 167 (e.g. lack of counties completing Act 167 plans, lack of ordinance implementation).
- Plan for managing stormwater at the watershed level (versus political boundaries).
- Balance role of individual municipalities with more regional approach (e.g. at county or Council of Government level). For example, PA Department of Environmental Protection (DEP) should create

Listening Session participants also view stormwater as something that needs to be managed (9), or as something that defines their own job (9).

The management view of stormwater ranged from “management is good to do and required to do,” and “rules and regulations need to be followed” to “manage to minimize impacts while sustain the environment” and “be addressed in land development.”

Pennsylvania Environmental Council's Stormwater Management Listening Sessions, 2007

baseline stormwater management plan, but allow municipalities to pass amendments that address local conditions.

- Address cumulative impacts (manage stormwater volumes, water quality, impacts from upstream sources).
- Develop and implement stronger inspection and enforcement requirements.
- Confirm who is responsible for long term operation and maintenance (O&M), and put in place O&M funding and implementation mechanisms.

Strategy should address both existing and new development:

- Address existing development with no (or limited) stormwater management (e.g. requiring stormwater management retrofits).
- Focus on large areas of impervious surface (e.g. parking lots).

Strategy should be flexible and innovative:

- Establish uniformity, but allow for flexibility.
- Consistency between land use (e.g. zoning laws and comprehensive plans) and stormwater management. For example, reduce impervious surface requirements for streets and parking spaces, and allow for cluster development.
- Allow for offsets (e.g. infiltration at an upstream site when development site is small, doesn't infiltrate well, or is otherwise not the best stormwater management location).
- Reduce liability associated with innovation.
- Reduce farmland and open space conversion; use open space to manage stormwater (e.g. restored floodplains).
- Utilize incentives:
 - Market-based incentives;
 - Cost savings (e.g. naturalization reduces mowing costs);
 - Emphasize other amenities (recreation, energy savings); and
 - Set water run-off reduction requirements, provide incentives for over-reductions.

Strategy should include education:

- Public needs to understand the benefits of stormwater, its management, and the associated costs.
- Municipal official education to understand regulations, know how to read plans, and build stormwater management expertise.
- Build political support to address stormwater issues/needs.
- Peer to peer communication (e.g. public officials and engineers).
- Large scale social marketing plan.

Sample Cluster Development Plan



Strategy should provide needed financial and technical resources:

- Source of resources (federal, state, county, and/or local jurisdictions, ratepayers?).
- Collaboration between above-stated entities.
- Creation of stormwater authority or utility (fees versus taxes).
- Technical expertise (stormwater coordinators, stormwater authorities, local or county level).
- Funding for stormwater management at both existing and new development.
- Base fee on impervious surface coverage rather than water use.
- Provide credits for Best Management Practice (BMP) implementation.
- Use fees for enforcement and O&M.

VI. Developers and Stormwater Management

(a) Current developer requirements

Developers are required to follow federal, state, and local earth disturbance and stormwater regulations. These regulations are requirements of Title 25,

Career-related views ranged from “a big job,” “what we do on a daily basis,” and “my life” to “a big part of what we do” and “all time and effort,” to “manage after.”

Pennsylvania Environmental Council's Stormwater Management Listening Sessions, 2007

Chapter 102 of Pennsylvania Code. Municipalities enact and implement drainage control regulations requiring developers to control their excess stormwater runoff from their sites. In watersheds having a completed Act 167 plan, developers following local ordinances would be following the standards and criteria of the approved watershed plans. Depending on the size and scope of the project, the requirements developers will need to follow will range from implementing and maintaining BMPs, to having an erosion and sediment control (E&S) plan, to requiring a NPDES permit associated with the development activities. In Pennsylvania, the county conservation districts are responsible for E&S implementation and enforcement.

Pre-construction: Pennsylvania regulates stormwater impacts occurring during construction under the Erosion and Sediment Pollution Control Program.

- All earth disturbances of 5,000 square feet or greater require the development and implementation of an erosion and sediment control plan under 25 PA Code Chapter 102. For High Quality and Exceptional Value watersheds, there are more protective BMP requirements.
- For earth disturbances of five acres or greater, the Clean Water Act (CWA) requires a NPDES permit. Under DEP’s regulations, any earth disturbance five acres or greater (including earth disturbances of less than five acres that occur as a part of a larger common plan of development) requires a permit prior to commencement of the earth disturbance. An individual permit is required for projects located in High Quality and Exceptional Value watersheds.
- In 1999, EPA promulgated Phase II stormwater regulations establishing NPDES permit requirements for construction activities between one and five acres (including earth disturbances of less than 5 acres that occur as a part of a larger common plan of development), with a point source discharge of stormwater to surface waters of the Commonwealth. For activities that do not have a point source discharge, E&S control plans are the substantive environmental control. An individual permit is required for projects located in High Quality and Exceptional Value watersheds.

Post-construction: Since 1990, the NPDES program has required that post construction BMPs be identified in the developers permit application or Notice of Intent for General Permit users. DEP amended this regulation and further required BMPs be listed within a site specific post construction stormwater plan. As previously mentioned, DEP issued the *Pennsylvania Stormwater Best Management Practices Manual* (December 2006) to help developers with implementing BMPs at their project sites.

In Philadelphia, the Philadelphia Water Department’s Office of Watersheds developed its own *Stormwater Management Guidance Manual* (February 2007) to achieve the three elements in the City’s existing stormwater legislation – water

quality, channel protection, and flood control.

Delaware River at the Commodore Barry Bridge



(b) Issues raised by developers during the listening sessions

The high costs associated with urban stormwater result from the destruction of... natural stormwater treatment systems—trees, meadows, wetlands, and other forms of soil and vegetation.

Of course, natural stormwater retention and filtration is provided by Mother Nature for free.

- *Rooftops to Rivers*,
Natural Resources
Defense Council

In the second part of the session, a dialog between participants focused on the following question: *What does a developer need to effectively implement stormwater management?* Participating developers and builders associations each had the opportunity to make opening remarks, during which they stated their experiences with and assessments of stormwater management regulations and practices. Their remarks were followed by a general discussion among the entire group.

Developers expressed a number of critiques about the regulatory process. Concern was expressed about the multitude of regulatory requirements and the lack of consistency between regulatory programs. In particular, concern was raised that regulatory requirements varied from municipality to municipality.

Developers also expressed concern about the length of time (too long) required to obtain permits, and in particular, permit variances. This comment regarding variances included the charge that local officials may reject low impact development innovations such as narrower road widths or cluster developments, or that waivers for such innovations are hard to obtain. Developers are thus forced to use conventional design standards. Developers also expressed the concern that the local commissioners or officials making permit and variance decisions often lack the experience to do so objectively.

Developers were concerned about regulatory consistency but also raised the issue that site-specific conditions should be considered. For example, concern was expressed that state-wide BMPs to infiltrate stormwater should not be required at sites where infiltration is impractical based on site conditions. Such

projects don't function well and become "window dressing."

Developers were concerned about the stormwater management financial obligations. They noted that DEP requires stormwater management planning, but does not fund implementation. This can translate to a breakdown at the local level, with insufficient financial and technical resources to implement stormwater plans and process development permits.

Developers also raised the issue of who is ultimately responsible for stormwater management. Developers believe that homeowners or homeowner associations are responsible for operating and maintaining stormwater structures but that these owners frequently are not qualified to do so (e.g. they fill the detention basins with grass clippings). In the case of existing developments with little or no stormwater structures, developers viewed landowners as being liable for stormwater management.

(c) Recommendations made by developers

During the course of the developers' discussion period, developers, builders associations, and other participants made recommendations for how to address stormwater management issues. These recommendations were organized into the following strategy approach for managing stormwater. There is a high degree of consistency between recommendations made during the municipality and developer sessions.

Naturalized Stormwater Basin, Philadelphia



Establish more uniform regulatory requirements:

- Create baseline requirements, consistency between regulations, and a level playing field between municipalities.
- Municipalities should coordinate permitting process with planning, zoning, and watershed managers.

<p>What is Pennsylvania spending on watershed management?</p> <p>\$61 million (from 1990-2005) in federal Section 319 grants to treat non-point source pollution problems, develop educational programs and begin comprehensive watershed initiatives.</p> <p>\$172 million in Growing Greener watershed grants (1999-2005)</p> <p>\$337.5 million from local partners from their own resources</p> <p>--PA DEP 2006 <i>Integrated Water Quality and Assessment Report</i></p> <p>\$729.5 million paid to Pennsylvania communities since 1978 through the National Flood Insurance Program.</p> <p>-- <i>National Flood Insurance Program Loss Statistics</i></p>	<ul style="list-style-type: none"> ▪ Initiate stormwater management earlier in development process. ▪ Plan at watershed level, implement at local level. ▪ Focus as much on existing development as new development. <p><u>Strategy must be flexible and innovative:</u></p> <ul style="list-style-type: none"> ▪ Establish uniformity but allow for flexibility (e.g. have baseline requirements along with ability to modify on case-by-case basis). ▪ Municipalities should be open to and handle more expeditiously innovative stormwater management proposals (e.g. it is hard to get waivers or variances, so developers are pushed to propose conventional practices). ▪ Address liability associated with adapting new design practices. ▪ On-site BMPs often don't work effectively (e.g. infiltration not always practical on-site, project becomes window-dressing). ▪ DEP stormwater manual should have more guidance on how to account for local conditions. Allow for offsets (e.g. upstream of project). ▪ Improve consistency between land use (e.g. zoning laws and comprehensive plans) and stormwater management. ▪ Update local ordinances to allow for smart land use/low impact development practices (e.g. many just allow for detention basins or require wider than necessary roads). <p><u>Strategy must provide needed financial and technical resources:</u></p> <ul style="list-style-type: none"> ▪ Regulators/Conservation District's don't have enough resources (e.g. to process permits, conduct inspections, to implement Act 167 plans). ▪ Establish responsible party for operation/maintenance of stormwater structures (e.g. third party with expertise rather than homeowners/homeowner associations). This funding/technical expertise could be derived from a stormwater authority. ▪ Spread stormwater costs fairly. Spread costs to include new development, existing development (e.g. perhaps through property transfer tax), impact fees for lot/existing impervious surface. ▪ Consider establishment of stormwater financing options, including stormwater authorities, although may be in competition with water/sewer authorities. ▪ Establish incentives (e.g. trading systems, earn stormwater management credits to reduce fees). <p><u>Strategy must include education:</u></p> <ul style="list-style-type: none"> ▪ Approval of waivers/variances for design innovation can be subjective. Reviewers/commissioners should have more land use experience and background to make informed decisions. Implement a training and certification program. ▪ Training for implementing model ordinance, subject to watershed and soil conditions. ▪ Educate and deputize people (on developer side) to monitor/inspect
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"It is vital for communities to put in place sound stormwater management practices that will protect our natural resources and set standards for development."

- Governor Edward G. Rendell

BMP structures.

- Public education will lead to support of municipal ordinance updates.

VII. Regulatory Agencies and Stormwater Management: Issues and Recommendations

Regulatory agencies had about one-half hour of time to raise their own issues or to respond to issues raised in the previous sessions. Their remarks were followed by a general discussion among the entire group.

Issues raised in the previous sessions were taken up during the regulatory session. Issues discussed included regulatory strategies, financial and technical support, and education.

Combined Sewer Overflow in Tookany-Tacony/Frankford Watershed, Philadelphia



Regulatory

Regulatory agencies (in particular those present at the Philadelphia session) recognized that the current stormwater regulatory process is fragmented, can be confusing, and often is not being implemented (e.g. Act 167). They recognized the need for more inter-municipal and inter-governmental coordination and a more regional approach (e.g. at county or watershed level). It was suggested that Act 167 could be amended to create a more coordinated regulatory approach, and to serve as the mandate and source of funding for stormwater management. Existing development was recognized as a major cause of adverse stormwater impacts. Concerns were raised that the Act 167 should address rate control, volume control, and water quality, although a DEP representative noted that newer developments are required to address each of these issues.

Participants voiced the need for more uniformity among municipal ordinances, but with adequate flexibility to address site specific conditions. Ordinances

[There were more than] 25,000 closing and health advisory days at ocean, bay and Great Lakes beaches in 2006. The number of no-swim days caused by stormwater more than doubled from the year before.

- *Natural Resources Defense Council, "Testing the Waters: A Guide to Water Quality at Vacation Beaches"*

should recognized low impact development, smart growth practices, and other opportunities for innovation. Regulations should identify the parties responsible for the long-term operation and maintenance of stormwater features. Where Conservation Districts have and can take on stormwater management responsibilities, the issues of their authority, expertise, and liability should be clarified. One regulatory official called for the requirement of riparian buffers to address stormwater impacts.

A general call for more consistent, stronger enforcement of stormwater regulations was also sounded by participants. This included enforcement of Act 167 plan implementation (against counties and municipalities), and more oversight during the construction, operation, and maintenance of stormwater structures.

Lehigh River near Easton



VIII. Additional Comments

Participants called for the adequate financial and technical resources to address stormwater management issues. Stormwater authorities were identified as a potential source of financial and technical resources. Authorities can provide funding (via stormwater fees), expertise, a management structure, and increased efficiency. It was recognized that authority fee structures could be structured in a variety of ways (e.g. for new development, old development, all uses, by acreage, by impervious surface), with the sentiment towards a sharing of cost among new and old developments.

Several participants called for a stormwater management fee based on impervious surface cover rather than water usage, with incentives provided for best management practices that infiltrate stormwater.

Several participants called for state level funding for stormwater management that is passed on to municipalities (e.g. based on need, require match). Others

called for more DEP personnel to implement Act 167 plans, or for the involvement of the Conservation Districts to do plan reviews.

Participants also recognized using market incentives to finance projects, such as allowing credits sales from offsite stormwater mitigation projects.

Education

Participants called for more education for both the public and for regulatory officials. Education was seen as necessary to build support for stormwater management efforts, to change public behaviors that increase stormwater impacts, and to educate officials on plan development and application.

In southeast Pennsylvania, more than thirty percent of the stream segments are impaired by urban stormwater runoff.

- 1996 National Water Quality Inventory

Darby Creek Water Quality Monitoring, Delaware County



International Coastal Clean Up Day, Cobbs Creek, Philadelphia



Appendix A: Stormwater Policy in the Commonwealth

There are many current laws and regulations in Pennsylvania that are in place to protect the Commonwealth's waters.

Pennsylvania Clean Stream Law of 1937

The Pennsylvania Clean Streams Law (CSL) seeks to protect and restore Pennsylvania's surface waters. Under the CSL, any discharge into the waters of the Commonwealth that causes, contributes to, or creates a danger of pollution is against public policy and constitutes a public nuisance. Of particular importance, the CSL incorporates the federal requirement for point sources to have a NPDES permit for discharging to surface waters.

Under the CSL there are two types of permits: individual permits and general permits. A general permit may be issued instead of an individual permit for a clearly and specifically described category of point sources.

Pennsylvania Stormwater Management Act of 1978

The Pennsylvania Stormwater Management Act of 1978 (Act 167) requires counties to create stormwater management plans for each of the watersheds within its boundaries. Once the plans are created at the county level, they must be approved by DEP. An approved plan has two effects. First, all projects that receive any funding from the Commonwealth must comply with the approved plan. Second, municipalities located within the watershed must “implement such ordinances and regulations, including zoning, subdivision and development, building code, and erosion and sedimentation ordinances, as are necessary to regulate development within the municipality in a manner consistent with the applicable watershed stormwater plan and the provisions of this act.” In other words, although the state provides the impetus of stormwater management through the enforcement of Act 167, and the county conducts the planning, local municipalities undertake a large burden of stormwater management.

Federal Regulations of Stormwater

Regulation of the sources from which pollutants enter surface waters is divided into point source discharges and non-point source discharges. A point source discharge is commonly understood as anything that comes out of the end of a pipe. A non-point discharge is commonly understood as anything that is not a point source discharge, and generally includes water runoff from land development, agricultural, and silvicultural sites. This bifurcation of discharge sources is a fundamental concept for understanding the federal government's approach to controlling water pollution. Under the Clean Water Act (CWA) and EPA's regulatory framework, point sources that discharge to water bodies are required to have a NPDES permit. These permits include limits on the amount of certain pollutants that can be discharged by the permittee, and have generally been successful in limiting the amount of pollutants reaching surface waters from point sources.

Non-point sources have not been regulated effectively at the federal level. Section 319 of the CWA requires states to prepare reports on non-point sources that are degrading water quality and to

Appendix A: Stormwater Policy in the Commonwealth

describe Best Management Practices (BMPs) that will address non-point source discharges. However, this section of the CWA does not provide an enforcement mechanism if states fail to provide proper reports, lowering its effectiveness. In 1987, Congress amended the CWA to require permits for some stormwater discharges. Pursuant to this change to the CWA, EPA created a two-phase permitting system for point source stormwater discharges.

Phase I of EPA's plan, which took effect in 1990, required medium and large Municipal Separate Storm Sewer Systems (MS4s),¹ certain categories of industrial activities, and construction activity that disturbs five or more acres of land to obtain NPDES permits. MS4s are municipally owned systems that collect and transport stormwater, but that are not connected to treatment plants.

Phase II, promulgated in 1999, requires certain small MS4s and construction activities disturbing between one and five acres of land to obtain NPDES permits.

Small regulated MS4s are required to design programs that reduce pollutant discharges to the Maximum Extent Practicable ("MEP") while protecting water quality and otherwise complying with the water quality requirements of the Clean Water Act. Small MS4s meet the MEP standard by implementing BMPs that satisfy each of six standards known as the Minimum Control Standards.

The Six Minimum Control Standards are:

- **Public Education and Outreach** - includes informing the public of the effects of stormwater on water quality;
- **Public Participation/Involvement** - includes involving citizens in the process of developing and implementing stormwater management programs;
- **Illicit Discharge Detection and Elimination** - developing a plan to detect and prevent illegal dumping into the MS4 infrastructure;
- **Construction Site Runoff Control** - developing, implementing, and enforcing programs to prevent sedimentation and erosion stemming from construction activities that disturb one or more acres of land;
- **Post-Construction Runoff Control** - developing, implementing, and enforcing programs to manage stormwater at new development and redevelopment projects following construction; and
- **Pollution Prevention/Good Housekeeping** - developing and implementing a program to limit municipal contributions to polluted stormwater runoff.

¹ Generally, medium MS4s are sewer systems located in areas with populations of between 100,000 and 249,999, and large MS4s are sewer systems located in areas with populations of 250,000 or more. However, MS4s serving populations of below 100,000 can sometimes be designated as medium or large; therefore, a small MS4 is any MS4 not designated as large or medium.

Appendix A: Stormwater Policy in the Commonwealth

Combined Sewer Systems



In older communities throughout Pennsylvania, such as Philadelphia, Pittsburgh, Harrisburg, and many small boroughs, stormwater from wet weather events is collected in the same system that carries wastewater from residential, commercial and industrial sites to a wastewater treatment plant. These systems are called Combined Sewer Systems (CSS). Because a CSS collects stormwater, there is added flow in the system following wet weather events. The added flow creates two potential problems. First, there is the risk of the system backing up and releasing a mix of untreated sewage and stormwater any place there is an entrance point into the system. Second, wet weather can lead to untreated sewage entering surface waters in the following way. Treatment plants utilize microbes in the process of removing pollutants from water. Because these microbes have biological limitations on how quickly they can work, they limit the amount of water that can be processed at a plant. To prevent increased flows from disrupting or destroying these microbes, Combined Sewer Overflows (CSOs) allow excess water to be released directly to a waterbody (e.g. river, stream) prior to reaching the treatment plant. These releases are a mixture of wastewater and stormwater. Theoretically, the system is designed to limit the amount of wastewater (i.e. untreated sewage) that enters rivers and streams. During a storm event, the initial surge of stormwater should push the wastewater that is already in the system through to the treatment plant. After that, the system is intended to allow excessive flow to exit into surface waters. However, this does not always work, and untreated sewage may enter surface waters following wet weather.

In August 1989, EPA issued the National Combined Sewer Overflow (CSO) Control Strategy, which requires that all CSOs be identified and categorized according to their status of compliance with technology based and water quality-based requirements. State-wide permitting strategies were developed by the state's or EPA's regional offices to ensure implementation and consistency with this CSO strategy. The CSO permitting strategy was designed to complement the control programs for sanitary sewers and separate storm sewers. This strategy established a uniform, nationally-consistent approach to developing and issuing NPDES permits for CSOs.

CSO discharge points are required to have NPDES permits. CSO permits were issued in two phases. Phase I CSO permits included Nine Minimum Controls that did not require major engineering costs to be incurred but were designed to limit the impact of CSOs until Phase II requirements were in place. Implementation of the Nine Minimum Controls was required by January 1, 1997. Under Phase II CSO permits, permittees are required to develop and implement Long-Term Control Plans (LTCP) that will ultimately lead to compliance with the CWA.

The Nine Minimum Controls are:

- Proper operation and regular maintenance programs for the sewer systems and CSO outfalls;
- Maximum use of the collection system for storage;
- Review and modification of pretreatment requirements to ensure that CSO impacts are minimized;
- Maximization of flow to the publicly operated treatment works (POTW) for treatment;

Appendix A: Stormwater Policy in the Commonwealth

- Elimination of CSOs during dry weather;
- Control of solid and floatable materials in CSOs;
- Pollution prevention programs to reduced containments in CSOs
- Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and
- Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

Pennsylvania's Comprehensive Stormwater Management Policy

In September 2002, DEP published the *Comprehensive Stormwater Management Policy* to integrate more fully post construction stormwater planning requirements, emphasizing the use of groundwater infiltration and volume and rate control into the existing NPDES permitting program and Act 167 program. In particular, the policy promotes and integrates the following into the DEP's existing stormwater programs:

- A clarification of the application of existing antidegradation provisions in 25 PA Code Section 93.4a to the BMP-based stormwater programs to protect and maintain existing uses and maintain water quality necessary to support those uses in all streams and maintain water quality in special protection streams.
- A uniform approach to post construction stormwater management that emphasizes ground water recharge through infiltration, water quality treatment, discharge volume, and rate control with a goal of replicating infiltration and water runoff characteristics of the site prior to development.
- The promotion of a comprehensive watershed approach to stormwater management through the Act 167 stormwater management planning program.

Appendix B: Listening Session Participant Lists

Philadelphia Listening Session: January 18, 2007

Name	Organization/Agency	Municipality
Jim Blanch	Whitpain Township	Blue Bell
Jan Bowers	Chester County Water Authority	West Chester
Steve Brown	Whitemarsh Township	LaFayette Hill
Dan DeMaria	PA Dept. of Transportation	King of Prussia
Joanne Denworth	Governor's Office of Policy	Harrisburg
Robert Eppley	PA Dept. of Transportation	King of Prussia
Jane Fava	Brandywine Valley Association	West Chester
Dave Forrest	Lansdowne Borough	Lansdowne
Lisa Grayson	Environmental Finance Center University of Maryland	College Park
Steve Hann	Pennsylvania Municipal Authorities Assoc.	Wormleysburg
William Heasom	Dept. of Civil and Environmental Engineering/ Villanova University	Radnor
Michael Leff	Philadelphia Horticultural Society	Philadelphia
Paul Leonard	Upper Dublin Township	Fort Washington
Joe Litvin	WolfBlock	Philadelphia
Kimberly Long	PA Department of Environmental Protection	Norristown
Paul Lonie	Westrum Development	Ft. Washington
Khiet Luong	Pennsylvania Environmental Council	Philadelphia
Richard Lutz	Horsham Township	Horsham
Christine Marjoram	Philadelphia Water Department	Philadelphia
Allison Mathern	Westrum Development	Philadelphia
Evelyn McKnight	U.S. EPA, Region III	Philadelphia
Mark Mitman	Bucks/MontCo Homebuilders	Horsham
Jim Moulton	Moulton Builders	Lansdale
Howard Neukrug	Philadelphia Water Department	Philadelphia
Jim Newbold	PA Department of Environmental Protection	Norristown
Fred Stine	Delaware Riverkeeper Network	Washington Crossing
Evan Stone	Northampton Environmental Advisory Council & Pickering Corts & Summerson, Inc.	Newtown

Erie Listening Session: February 9, 2007

Name	Organization/Agency	Municipality
Lori Boughton	PA Department of Environmental Protection	Meadville
Tim Bruno	PA Department of Environmental Protection	Meadville
Joseph Chriest	City of Meadville	Meadville
Chanel Cook	U.S. Congressman Phil English's Office	Erie
Debra Frawley	Venango County Regional Planning Commission	Franklin
Edward Kissel	SONS of Lake Erie	Erie
Teresa Koon	Rep. John Evans' Office - PA House 5 th District	Edinboro
Pat Lupo, OSB	Lake Erie-Allegheny Earth Force	Erie
Don Luttman	PA Department of Environmental Protection	Meadville
Rick Morris	Millcreek Township	Millcreek Twp.
Patricia Norcott	Sen. Jane Earl's Office - PA Senate District 49	Erie
Eric Obert	PA Sea Grant	Erie
Sean Rafferty	PA Sea Grant	Erie

Appendix B: Listening Session Participant Lists

Erie Listening Session: February 9, 2007 (Continued)

Name	Organization/Agency	Municipality
Robert Robbins	Pennsylvania Senate District 50	Greenville
Jason Sayers	City of Erie Sewer Department	Erie
David Skellie	PA Sea Grant	Erie
Curtis G. Sonney	Pennsylvania House 21 st District	Erie
John Tushak	City of Erie Sewer Department	Erie
Burt Waite	Cochranon Borough	Cochranon Borough

Cranberry Listening Session: February 22, 2007

Name	Organization/Agency	Municipality
Doniele Andrus	Planning Commission, Butler County	Butler
Rob Bassett	Lennon, Smith & Souleret	Pittsburgh
Robert Bednar	The Meritage Group	Pittsburgh
Jeff Bergman	Nine Mile Run Watershed Assoc.	Pittsburgh
Brad Davis	L. Robert Kimball & Assoc.	Coraopolis
Mike Dowling	K V Resources	Duquesne
Jim Dykes	Office of Senator Jane Orie	Cranberry Twp.
James Eichenlaub	Builders Association of Metropolitan Pittsburgh	Pittsburgh
Janie French	Three Rivers Wet Weather	Pittsburgh
Christine Goswick	Allegheny County - Department of Economic Development	Pittsburgh
Ken Howard	Bankson Engineering	Indianola
Paul King	Duquesne University	Pittsburgh
Roy Kraynyk	Allegheny Land Trust	Moon Twp
David Lucci	Victor, Wetzel Associates	Sewickley
Jerry Maragos	Robert Kimball & Assoc.	Ebensburg
Tim McClelland	Lennon, Smith & Souleret	Coraopolis
Lorin Meeder	Cranberry Township	Cranberry Twp
Bill Moul	North Area Environmental Council	Marshall Twp.
Jim Pillsbury	Westmoreland County Conservation District	Greensburg
Dan Przybylek	Buffalo Township	Sarver
AJ Schwartz	Environmental Planning and Design	Pittsburgh
Megan Sweringen Fahinger	McCarty & Gray, Inc.	Monroeville
Jason Tigano	Congressman Mike Doyle's Office	Pittsburgh
Jack Ubinger	Jones, Day, Reavis & Pogue	Pittsburgh
Mike Wetzel	Victor Wetzel Associates	Sewickley

Harrisburg Listening Session: March, 29, 2007

Name	Organization/Agency	Municipality
Keith Ashley	Metro Harrisburg Builders Assoc.	Harrisburg
Thomas Au	Sierra Club	Harrisburg
Lou Biacci	PA Builders Association	Harrisburg
Al Brulo	HRG Engineering	Harrisburg
Bob Christoff	Dauphin County Conservation District	Harrisburg
Eric Conrad	E.R. Conrad and Associates	Harrisburg

Appendix B: Listening Session Participant Lists

Harrisburg Listening Session: March, 29, 2007 (Continued)

Name	Organization/Agency	Municipality
Stan Custer	Custer Homes	Harrisburg
Pat Devlin	Alliance for the Chesapeake Bay	Camp Hill
Bob Edwards	Rettew and Associates	Lancaster
Andrew Gavin	Susquehanna River Basin Commission	Harrisburg
Marlou Gregory	AMEC	Plymouth Meeting
Mark Gutshall	LandStudies, Inc.	Lititz
John Hines	PA Department of Environmental Protection	Harrisburg
Mike Hubler	Dauphin County Conservation District	Harrisburg
Judy Jordan	PA Organization of Watersheds & Rivers	Harrisburg
Larry Martick	Adams County Conservation District	Gettysburg
Gerald McClune	Rettew and Associates	Lancaster
Don McNutt	Lancaster County Conservation District	Lancaster
Matt Miller	Lower Paxton Township	Lower Paxton
Ken Murin	PA Department of Environmental Protection	Harrisburg
Meg Murphy	PA Department of Environmental Protection	Harrisburg
Janine Park	Tri-County Regional Planning Commission	Harrisburg
Gary Peacock	York County Conservation District	York
Ben Pratt	Susquehanna River Basin Commission	Harrisburg
Brenda Shambaugh	PA Association of Conservation Districts	Harrisburg
Rep. David Steil	PA House of Representatives	Bucks Co.
Paul Swartz	Susquehanna River Basin Commission	Harrisburg

Appendix C: “Stormwater is...” Participant Responses

“Stormwater is...”

An ice-breaker exercise was conducted at the beginning of each listening session during which participants were asked to define in one sentence what “Stormwater is...” The exercise provides a snapshot of participant perception regarding stormwater.

Of the 83 tabulated results, the biggest block of participants (19) view stormwater as a problem. Characterizations of this problem range from “pain in the neck,” “widespread problem,” and “major headache” to “roots of all evil,” “untamed monster,” and “destructive.” Nine (9) participants view stormwater as a challenge, with characterizations ranging from “big challenge for the state” and “nationally number 1 water quality issue” to “last big water issue not yet resolved” and “regulatory challenge.”

Participants also view stormwater as something that needs to be managed (9), or as something that defines their own job (9). The management view of stormwater ranged from “management is good to do and required to do,” and “rules and regulations need to be followed” to “manage to minimize impacts while sustain the environment” and “be addressed in land development,” Job related views ranged from “a big job,” “what we do on a daily basis,” and “my life” to “a big part of what we do” and “all time and effort.”

Ten (10) of the participants equate stormwater with the water cycle, noting that stormwater is “all the water we get,” “runoff that belongs back in the water table,” “a stage in the cycle of water,” and “a system that began in the beginning of time.”

Participants also view stormwater as either a resource (8) or an opportunity (7). Their responses ranged from “important resource,” “one of our greatest resources” and “waiting to be seen as a resource” to “opportunity to pay more attention to the environment,” “draw attention to environmental issues, and “basis for some nice spaces.”

Five (5) participants equated stormwater with finances, including “financial challenge,” “severe financial costs,” “expensive responsibility,” and “inexpensive to manage upfront, expensive to manage after.”

Seven (7) of the participant views fell into the “other” category, with viewpoints ranging from “critical to economic redevelopment,” “foundation of land development process,” and “something no one thinks about until it rains” to “little understood,” “great equalizer,” and “evolving program.”