State of West Virginia
Department of Environmental Protection
Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304-2345

Fact sheet, rationale and information for General WV/NPDES Permit for small Municipal Separate Storm Sewer Systems (MS4s)

WV/NPDES Permit No. WV0116025

General

1. **Name and address of applicant**

   An applicant is an entity that owns or operates a separate storm sewer system with stormwater discharges and agreeing to be regulated under the terms and conditions of this general permit.

2. **General WV/NPDES Permit No.WV0116025**

3. **County**: Any WV county

4. **Receiving stream**: Any WV stream

5. **Public comment period** from December 13, 2008 to January 12, 2009

6. **Background**

   Stormwater is the surface runoff that results from rain and snow melt. Urban development alters natural infiltration capability of the land and generates a host of pollutants that are associated with the activities of urban populations, thus causing an increase in stormwater runoff volumes and pollutant loadings in stormwater discharged to receiving waterbodies. Urban development increases the amount of impervious surface in a watershed as farmland, forests, and meadowlands with natural infiltration characteristics are converted into buildings with rooftops, driveways, sidewalks, roads, and parking lots with virtually no ability to absorb stormwater.

Polluted stormwater runoff is often transported to municipal separate storm sewer systems (MS4s) and ultimately discharged into local rivers and streams without treatment.

The National Pollutant Discharge Elimination System (NPDES) stormwater regulations establish permit requirements for discharges from MS4s. The USEPA's Stormwater Phase II Rule establishes an MS4 stormwater management program that is intended to improve the Nation's waterways by reducing the quantity of pollutants that stormwater picks up and carries into storm sewer systems during storm events.

Common pollutants include oil and grease from roadways, pesticides from lawns, sediment from construction sites, and carelessly discarded trash, such as cigarette butts, paper wrappers, and plastic bottles. When deposited into nearby waterways through MS4 discharges, these pollutants can impair the waterways, thereby discouraging recreational use of the resource, contaminating drinking water supplies, and interfering with the habitat for fish, other aquatic organisms, and wildlife.

In 1999, USEPA promulgated rules establishing requirements for small MS4s. The federal regulations require West Virginia to permit stormwater discharges from small MS4s in the State. A regulated small MS4 is defined as any small MS4 located in an "urbanized area" as defined by the U.S. Bureau of Census, as well as those MS4s located outside of an urbanized area that are designated a regulated small MS4 by the NPDES permitting authority. [40 CFR § 122.32(a)] A regulated small MS4 includes storm drain conveyance systems owned or operated by a state, city or federal entity, a town, or other public entity where stormwater discharges into waters of the United States.

The Federal regulations establish six categories of minimum control measures that must be implemented by permittees. Best Management Practices (BMPs) are put into practice in order to implement the six minimum control measures. Rather than numeric 'end of pipe' limits, these are 'narrative' best management practices that will ultimately reduce the amount of pollutants discharged in stormwater runoff. By implementing and executing the BMPs to the Maximum Extent Practicable (MEP) specified in the permittees stormwater management program, the requirements for antidegradation, up to and including, Tier 2 protection are met.

7. General Permits

The Division of Water and Waste Management is utilizing a general WV/NPDES permit to permit MS4 discharges.

Under 47CSR10-13.6 of the Legislative Rules, a general permit can be used to regulate either separate storm sewers or a category of point sources other than separate storm sewers if the sources all:

a. Involve the same or substantially similar types of operations;
b. Discharge the same types of wastes;

c. Require the same effluent limitations or operating conditions;
d. Require the same or similar monitoring; and
e. In the opinion of the Director, are more appropriately controlled under a general permit than under individual permits.

A general permit is issued for facilities that are similar in nature. This saves the Division time in issuing individual permits for similar discharges.

The Division of Water and Waste Management assumed primacy for the NPDES Program from the USEPA in 1982.

8. **Types of Discharges Covered**

This permit covers stormwater discharges from small MS4s.

SECTION-BY-SECTION RATIONALE

Part I

A. This General Permit covers all areas in the State of West Virginia.

B. According to 40 CFR 122.26(b)(8), "***municipal separate storm sewer*** means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

> (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law)...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States.
>
> (ii) Designed or used for collecting or conveying stormwater;
>
> (iii) Which is not a combined sewer; and
>
> (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

The Stormwater Phase II Final Rule requires nationwide coverage of all operators of small MS4s that are located within the boundaries of a Bureau of the Census-defined "urbanized area" (UA) based on the latest decennial Census. Once a small MS4 is designated into the program based on the UA boundaries, it cannot be waived from the program if in a subsequent UA calculation the small MS4 is no longer within the UA boundaries.

C. Registration under this permit to discharge stormwater is appropriately issued to the municipality or governing body of an MS4. It is the municipality that owns the municipal separate storm sewer system. In most cases in West Virginia, the permittee is the City or the County. This permit is not, nor was ever intended to be issued to a 'sub' department of a municipality. All departments of a municipality fall under the 'governing umbrella' of its City Council. And, this permit covers the entire municipal separate storm sewer *system*, not just select portions.

Public Works and Utility Boards are created, appointed and function on behalf of the City Council, which represent the citizens that live in that municipality. City Councils enact Ordinances that its departments implement and enforce. This permit cannot be adequately implemented without all the appropriate departments of the regulated MS4 working together. Doing so would make would make it impossible to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP), protect water quality, and satisfy the appropriate requirements of the Clean Water Act.

The successful implementation of the MS4 general permit, probably more than any other NPDES permit is hinged upon municipal departments communicating and working together. Especially, those departments that affect stormwater management. Therefore, this permit contains certain terms and conditions that require communication between departments of the MS4.

D. Development and implementation of certain components of the minimum control measures was required under the prior MS4 permit. MS4s are to already have these programs in place, per the requirements of the prior permit.

According to 40 CFR § 122.44(l), to avoid backsliding, the standards and conditions in reissued permits must be at least as stringent as the standards and conditions in the previous permit. All currently regulated MS4s in the State have had more than five years to establish their stormwater programs. The prior permit is very clear in the language stating that; "You must fully implement your program within five years of the effective date of this permit", (Part II.A). MS4s that have not developed and implemented these requirements will be in violation of the new permit once it becomes effective.

The language in this MS4 general permit has been modified to reflect the provision in 40 CFR § 122.44(l)

E. 40 CFR § 122.34(g) states that small regulated MS4's "must evaluate program compliance, the appropriateness of your identified best management practices, and progress towards achieving your identified measurable goals." Therefore, there are several stated evaluation goals in this small MS4 general permit. DWWM believes that the stormwater management program components must be assessed and evaluated to know if measureable goals are being met.

USEPA has several guidance documents available to help the MS4 permittee to understand and meet this requirement. The recently completed "Evaluating the effectiveness of Municipal Stormwater Programs" is available at; http://www.epa.gov/npdes/pubs/region3_factsheet_swmp.pdf USEPA's "MS4 Program Evaluation Guidance" is available at www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf.

Part II

A. An application is required of the small MS4 operator. Applications can be sent to DWWM on the form provided by DWWM, or an appropriate substitute, with all the required information can be used.

B. Requirements of the SWMP

Maximum Extent Practicable (MEP) Discussion

Section 402(p)(3)(B) of the Clean Water Act establishes NPDES permit standards for discharges from municipal separate storm sewer systems, or MS4s. NPDES permits for discharges from MS4s (1) may be issued on a system or jurisdiction-wide basis, (2) must include a requirement to effectively prohibit non-storm water discharges into the storm sewers, and (3) must require controls to reduce pollutant discharges to the maximum extent practicable, including best management practices, and other provisions as the Administrator or the States ***determine*** to be appropriate for the control of such pollutants.

Therefore, this General Permit requires the permittee to develop a stormwater management program that is designed to reduce the discharge of pollutants to the **maximum extent practicable** (MEP). MEP is *not* a *low* standard or doing just enough to get by as some have erroneously thought. West Virginia State law allows municipalities to form stormwater utilities so they may fund their stormwater management programs. Unless there is a steady and reliable funding source to manage stormwater, the permittee is *not* reducing the discharge of pollutants to the MEP.

The MEP standard involves applying best management practices that are effective in reducing the discharge of pollutants in stormwater runoff. This requires that the permittee use all known, available and reasonable methods of prevention, control and treatment of stormwater discharges. Such stormwater BMP controls include management practices, control techniques and systems, design and engineering methods, and such other provisions the Director deems necessary for the control of pollutants in stormwater discharges.

There must be a serious attempt to comply, and although permittees may not have knowledge of *all* stormwater BMPs, ignorance of BMPs is ***not*** a reason for non compliance.

MEP requires that permittees to choose effective BMPs and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive.

And, because MEP is an iterative standard, the BMPs used *and* the MS4 stormwater management program will evolve over time as technology and urban runoff management knowledge increases. As such, the permittees MS4 program must continually be assessed and modified to incorporate improved programs, control measures, BMPs, etc., to attain compliance with water quality standards.

The decision of a permittee to not adopt a stormwater utility is not a reason for an ineffective stormwater management program. In 2003, the West Virginia legislature enabled municipalities to form stormwater utilities in order to pay for and effectively manage stormwater. The 2008 Legislature further strengthened State Law so that municipalities can effectively enforce their stormwater ordinances.

Numerous stormwater BMP's are described in varying degrees of detail on the World Wide Web (internet). It is recommended that the permittee spend time researching BMPs to ascertain if and how they can be implemented in their particular MS4. In most instances, other regulated MS4 entities across the United States may have already implemented certain stormwater BMPs that the permittee is considering. Communities that have implemented stormwater BMPs are usually happy to discuss their successes and failures with other MS4 communities, and therefore, there is no reason to "reinvent the wheel".

By implementing and executing the BMPs to the Maximum Extent Practicable (MEP) specified in the permittees stormwater management program, the requirements for antidegradation, up to and including, Tier 2 protection are met.

Public Education and Outreach

The permittee must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and steps the public can take to reduce pollutants in stormwater runoff.

Since there is greater support for the stormwater management program as the public gains a better understanding of the reasons why the SWMP is necessary and important, an informed and knowledgeable community is crucial to the success of a SWMP. Public support is particularly beneficial when operators of small MS4s attempt to institute new funding initiatives for the program or seek volunteers to help implement aspects of the program. Education can lead to greater compliance with the local programs, as the public becomes aware of the personal responsibilities expected of them and others in the community, including individual actions they can take to protect or improve the quality of local waters.

West Virginia's small MS4 permit specifies audiences to target with a message to reduce or eliminate practices and behaviors that contribute to polluted stormwater runoff.

Public Involvement and Participation

The small MS4 general permit contains three minimum performance measures for public participation and involvement. By making sure that the public will have opportunities to get involved in the stormwater program, there is greater chance of success of the SWMP. The public can provide valuable input and assistance in the development of a successful SWMP. The public must be given opportunities to play an active role in both the development and the implementation of the SWMP. Broad public support is critical to the success of a SWMP because citizens who participate in the development and decision making process may be less likely to raise legal challenges to the SWMP and are more likely to take an active role in its implementation. In addition, the community is a valuable intellectual resource that can provide a broader base of expertise and economic benefit. Citizens involved in the SWMP development process provide important networking avenues and relationships with other community and government programs that can be particularly valuable when trying to implement a SWMP on a watershed basis.

There are many ways to provide opportunities for the public to participate in the SWMP, a few of which are listed here;

- Conduct annual forums or open house to obtain input from the public.
- Create and maintain a telephone hot line for citizen suggestions and complaints.
- Sponsor or co-sponsor community cleanup activities or workshops
- Conduct storm drain stenciling with scouts or students from a local school.
- Provide a booth at a festival or other family event where citizens can interact with municipal stormwater officials.
- Give prizes or credits to innovation stormwater BMP's or slogan creation.

The general permit requires that the SWMP and annual report be posted on the permittees website. This is to ensure reasonable public access to information and documents relevant to the stormwater program.

Illicit Discharge Detection and Elimination

Dry weather discharges into the MS4 system can contribute significant pollutants to receiving water bodies. Detecting and eliminating these illicit discharge involves complex detective work, which makes it hard to establish a specific prescription to "hunt down" and correct all illicit connections. Frequently, there is no single approach to take, but rather a variety of ways to get from detection to elimination. This process is ongoing and the effectiveness of a program should improve with time.

This minimum measure requires the permittee to detect and eliminate illicit discharges from their storm sewer system. An illicit discharge is any discharge to a MS4 that is not composed entirely of stormwater. There are some exceptions to this definition, such as fire fighting activities and discharges already authorized by another NPDES permit.

Discharges into MS4s often include wastes and wastewater from non-stormwater sources. Illicit discharges enter the system through either direct connections (e.g., wastewater either mistakenly or deliberately connected to storm sewers) or indirect connections (e.g., infiltration into the MS4 from leaking sanitary sewer systems, spills collected by inlets, or paints/oils dumped directly into a drain). Examples of other sources include, but are not limited to: sanitary waste water effluent from septic tanks; car wash waste water; radiator flushing disposal; laundry waste water; and improper disposal of auto and household hazardous waste. The result can be untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, and bacteria to receiving water bodies.

The regulations at 40 CFR § 122.34(b)(3) contain four required components to this control measure. The MS4 operator must:

- Develop a map of the MS4 that shows the location of all outfalls and names of receiving waters;
- Effectively prohibit discharges of non-stormwater to the MS4 through the use of an ordinance or other regulatory mechanism, and provide for enforcement procedures and actions;
- Develop and implement a plan to detect and address non-stormwater discharges; and
- Inform public employees, businesses, and the general public of the hazards associated with illegal discharges and improper disposal of waste.

For comprehensive guidance on building an IDDE program, see "Illicit Discharge Detection and Elimination; A Guidance Manual for Program Development and Technical Assessments". Published in 2004 by the U.S. Environmental Protection Agency, this manual provides excellent guidance to MS4 communities for their IDDE program.
This manual is available free of charge from the USEPA at:
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=3 It is also available on WVDEPs stormwater webpage:
http://www2.wvdep.org/dwwm/stormwater/MS4_BMP.htm

Controlling Runoff from Construction Sites

Polluted stormwater runoff from construction sites often flows to MS4s and ultimately is discharged into receiving water bodies. Sediment is usually the main pollutant of concern. According to the 2000 National Water Quality Inventory, States report that sedimentation is one of the most widespread pollutants affecting assessed rivers and streams. Sediment runoff rates from construction sites are typically much higher than runoff from forested lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants form construction sites, can cause physical, chemical, and biological harm to receiving waters. Excess sediment can quickly fill rivers and lakes, requiring dredging and destroying aquatic habitats.

This control measure requires permittees to develop, implement and enforce a program to reduce pollutants in stormwater runoff from construction activities that result in a land disturbance of one acre or greater. The program must include control of runoff from construction activity disturbing less than one acre if the construction is part of a larger common plan of development that would disturb one acre or more.

Although discharges from construction sites disturbing one or more acres in West Virginia are subject to the NPDES General Permit for Stormwater Discharges from Construction Activity, #WV0115924, this control measure is necessary to enable local MS4 operators to effectively and directly control construction site discharges into their MS4s.

The regulations at 40 CFR § 122.34(b)(4) contain four required program components. All regulated permittees must incorporate the following elements into their local programs:

- An ordinance or other regulatory mechanism requiring proper sediment and erosion control, and proper waste management controls, at construction sites;
- Procedures for site plan review that considers potential water quality impacts;
- Procedures for site inspection and enforcement; and
- Procedures for the receipt and consideration of information submitted by the public.

More information about this minimum control measure can be found on USEPAs website: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4

Controlling Runoff from New and Redevelopment

The way we develop and use land has great impact on the quality of our State's water bodies. It is revealing that West Virginia's most pristine waters are found in undisturbed areas where there is limited or no development. Yet, nearly 100% of West Virginia's water bodies located in Urban Areas are impaired.

An urbanized area is a land area comprising one or more places and the adjacent densely settled surrounding area that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile. It is a calculation used by the U.S. Bureau of Census to determine the geographic boundaries of the most heavily developed and dense urban areas.

For more information about how Urban Areas are defined by the U.S. Census Bureau see: http://www.census.gov/geo/www/ua/uafedreg031502.pdf

Land development directly affects watershed functions, and water quality in receiving waters. When development occurs in previously undeveloped areas, the resulting alterations to the land can dramatically change how water is transported and stored. Development created impervious surfaces and compacted soils increase surface runoff and decreases ground water infiltration. These changes can increase the volume and velocity of runoff, the frequency and severity of flooding, peak storm flows as well as the type, concentration, and quantity of pollutants in

discharges. The effects of this process include stream bank scouring and downstream flooding, which often lead to a loss of aquatic life and damage to property.

This control measure applies in areas undergoing new development or redevelopment and that disturb one acre or more of land, including projects that are less than one acre that are part of a larger common plan of development that disturbs one or more acres.

The best way to mitigate stormwater impacts from new developments is to use practices to treat, store, and infiltrate runoff *on-site* before it can affect water bodies downstream. Innovative site designs that reduce imperviousness and smaller-scale low impact development practices dispersed throughout a site are excellent ways to achieve the goals of reducing flows and improving water quality.

In contrast with the traditional approaches, the guiding principle behind capturing the first one inch of rainfall is to control stormwater at the source. It is much easier and cost efficient to prevent polluted stormwater from entering water than trying to remove pollution once it's in the waterbody. Capturing stormwater and managing it onsite by runoff reduction techniques seek to maximize the area available for infiltration so that runoff volume and pollutant concentrations are reduced. This is achieved through a variety of site design and engineered infiltration techniques. In addition to the environmental benefits, many community value benefits are realized including increased aesthetics and land value.

Section by section rationale for Controlling Runoff from New Development and Redevelopment minimum control measure

Long-term Stormwater Controls

Phase II MS4 regulations found at 40 CFR 122.23(b)(5) state that a Phase II MS4 must "Develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale that discharge into [the] small MS4. [The] program must ensure that controls are in place that would *prevent or minimize water quality impacts*." To that end, the regulations require that a MS4 develop and implement a program to address post-construction runoff from newly developed and redeveloped areas, and ensure the long-term operation and maintenance of these management practices.

Because the creation of impervious surfaces and the generation of runoff pollutants are created by activities and decisions at the site scale, neighborhood scale, and watershed or regional scale, this permit sets up a framework to consider pivotal activities at multiple scales. A program to implement site level controls for new and redevelopment are an evolution of activities required under the prior MS4 permit, and implementation of the necessary components of this programs are achievable within the time frame of this five year permit term. Implementation of some pivotal controls for activities at the watershed or regional scale may be, in some cases, longer-term propositions. Therefore, this permit sets up the framework for initial steps, with the understanding that some institutional controls may not be fully implemented until the next permit

term. However, even though all of these activities may be on different schedules, the permittee should consider all of them in the context of an integrated stormwater management program to ensure that they complement each other.

Watershed Protection provisions require that the permittee incorporate six (6) watershed protection elements into the subdivision ordinance or equivalent document within the permit term. Within seven years the permittee must incorporate watershed protection elements into other applicable local policy documents. The extended time period for the remaining documents is done in recognition that these documents periodically come up for review, but that schedule may not coincide with the effective period of this permit. Additional documents include comprehensive or master plans, general land use plan, zoning code, transportation master plan, specific area plans, and unified development ordinance. Inclusion of the elements into these legal authority and planning documents will act as the impetus to direct appropriate land use decisions to support the watershed elements.

This permit does not stipulate specific baselines or standards for these elements in order that permittees may develop criteria that meet the characteristics of their watershed(s). However, consideration for environmental outcomes is of critical importance in implementation of this provision.

The permittees legal authority and planning documents shall address the following watershed elements:

(1) ***Minimize the amount of impervious surfaces (roads, parking lots, roofs) within each watershed, by minimizing the creation, extension and widening of roads and associated development.***

Stormwater research shows a high correlation between the level of imperviousness in a watershed and the degree of overall degradation of water quality and habitat[1]. In order to minimize this type of degradation, the permittee should incorporate a number of planning principles to manage the creation of impervious surfaces at the watershed level, such as reducing the footprint of streets and parking lots. These principles apply to urban and suburban development.[2] [3]

(2) ***Preserve, protect, create and restore ecologically sensitive areas that provide water quality benefits and serve critical watershed functions. These areas may include, but are not limited to; riparian corridors, headwaters, floodplains and wetlands.***

Certain ecologically sensitive lands and undeveloped areas naturally provide extraordinary protection of water quality. For example, wetlands act as natural filters of pollutants, and as sponges to maintain existing hydrology. Intact riparian corridors provide the shading

[1] See the Center for Watershed Protection for more information. www.cwp.org and www.stormwatercenter.net
[2] See Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks, Randalll Arendt, Island Press, 1996.
[3] See NEMO publications at http://nemo.uconn.edu/tools/publications.htm#technical

necessary to minimize water temperature, the organic matter to feed aquatic organisms, slow the velocity of flood waters and allow the flood waters to be absorbed into the ground of the floodplain instead of causing damage downstream. Vegetated buffer zones provide a filter to remove sediment and other particles in stormwater as well as the pollutants which adhere to the particulates. In addition to being critical for stormwater management functions, headwaters, floodplains and wetlands all serve a wide variety of ecological functions such as flood control, nursery habitat, and production of food to maintain fisheries.

Protection of ecologically sensitive areas should be based on an inventory and prioritization of such areas through a process such as watershed planning. Restoration of these areas *after* they are already degraded will be more difficult because of the significant expense involved. Therefore, it is important to protect high quality areas with important ecological functions before development occurs.

(3) ***Implement management practices that prevent or reduce thermal impacts to streams, including requiring vegetated buffers along waterways, and disconnecting discharges to surface waters from impervious surfaces such as parking lots.***

Temperature changes result from increased flows, removal of vegetative cover, and increases in impervious surfaces as well. Impervious surfaces, such as pavement or asphalt, increase storm water runoff temperature by absorbing heat from the sun and transferring that heat to the stormwater runoff. Water sitting in stormwater basins is also subject to solar radiation, and contributes to increased temperature of stormwater discharges. Increased temperature in runoff subject aquatic organisms in the receiving waters to thermal stress, and can drive out fish and other organisms that require cool water. Removal of shade trees along water bodies can also affect in-stream temperatures.

(4) ***Seek to avoid or prevent hydromodification of streams and other water bodies caused by development, including roads, highways, and bridges.***

Disturbance (e.g. piping and moving streams, installing bridges) of natural water bodies and drainage systems reduces the ability of the systems to convey flood waters and natural sediment loads as well as impacts the overall health of the riparian and aquatic ecosystems through scouring of stream banks and sediment overloading. The careful selection and design of stream crossings, highways, and development projects in order to minimize this type of hydrologic disturbance will prevent sediment pollution and protect existing systems.

(5) ***Implement standards to protect trees, and other vegetation with important evapotranspirative qualities.***

Trees, even in relatively unnatural settings such as street trees in tree boxes, still have a remarkable capacity to take up water and return it to the atmosphere. One tree can reduce stormwater runoff by 13,000 gallons per year.[4] Coupled with their cooling ability, aesthetic

[4] Riverkeeper Report: "Sustainable Raindrops, Cleaning New York Harbor by Greening the Urban Landscape", Mike Plumb, http://riverkeeper.org/special/Sustainable_Raindrops_FINAL_2008-01-08.pdf

qualities and carbon sequestering capacity this can make trees a very important component of a watershed protection program.

(6) ***Implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils***

Native soils, especially topsoil, contain important organic materials generally not present in underlying soil layers. In areas with thin soil layers, like many parts of West Virginia, those soil layers are especially critical. Unfortunately topsoil layers are often stripped off prior to or during construction operations. Also, heavy traffic both during and after construction can compact soils so that they lose most of their ability to infiltrate stormwater, and become effectively impervious. An effective stormwater program will incorporate measures to protect the integrity of soils.

Measurable goals must be developed for each of the six watershed protection elements, including quantifiable objectives and time frames achieving those objectives. It is appropriate to establish both long-term and short-term objectives for each of these watershed elements, as some may take longer than five years to fully implement. The status of implementation of the watershed elements should be summarized in each annual report.

Site and Neighborhood Design provisions require the permittee to adopt and implement stormwater performance standards for new and redevelopment projects, and a program to implement those standards.

A variety of water quality standards continue to be exceeded in most urban and urbanizing streams, and stormwater discharges are commonly identified as the causes. There are thousands of waters nation-wide with impairment attributed to stormwater. [5] Clearly, we need a better approach.

As urbanization occurs, a corresponding increase in impervious surface area also occurs. These changes to the landscape cause the volumes, rates and duration of runoff-related discharges to increase, along with a corresponding increase in pollutant loadings. In addition, stream channels are destabilized due to the increase energy of the runoff that results in bank cutting, stream channel widening, channel incision and detrimental sediment transport and deposition. Because of these changes in runoff volumes and rates, the stream systems and water bodies within and downstream of urban areas are commonly impaired due to sediment and nutrient loads, increased total suspended solids, poor biotic communities, and increased stream temperatures.

Stormwater management standards are most commonly written with provisions that promote or require extended detention controls, such as extended detention wet ponds, dry detention basins or constructed wetlands. There are multiple problems with the extended detention approach.

[5] Riverkeeper Report: "Sustainable Raindrops, Cleaning New York Harbor by Greening the Urban Landscape", Mike Plumb, http://riverkeeper.org/special/Sustainable_Raindrops_FINAL_2008-01-08.pdf

The primary reason is - that receiving stream dynamics are based on balances of more than just discharge rates.[6]

Extended detention practices are first and foremost designed to prevent downstream flooding and not to protect downstream channel stability and water quality. For decades, water quality protection has been a secondary goal, or one omitted entirely during the design of these facilities. Over time it has become apparent through research and monitoring that these practices do not effectively protect the physical, chemical or biological integrity of our receiving waters[7].

Furthermore, operation and maintenance of these systems to ensure they perform as designed requires a level of managerial and financial commitment that is often not provided. A number of researchers have documented that detention ponds fail to meet their design goals in terms of maintaining water quality, downstream habitat and biotic integrity of the receiving waters.[8,9,10,11] There is now a large body of research demonstrating that practices that mimic the natural water cycle – processes that result in the infiltration, evapotranspiration and capture and use of stormwater (runoff reduction techniques) – are simultaneously advantageous for protecting the physical, chemical and biological characteristics of receiving waters. Why? Because these practices are designed to mimic the way natural vegetated landscapes respond to precipitation events. When it rains or when snow melts, vegetated areas such as forests, prairies and grasslands, gardens and trees, intercept, evaporate and absorb much of the rainfall. Some of the precipitation is also absorbed or infiltrated into the soil. Ideally, site designs and plans should make use of these natural systems and processes as much as possible to mimic or preserve the site hydrology, i.e., the balance of plant uptake of water, infiltration of runoff into the soil and groundwater table, and the natural runoff patterns into natural drainage ways and streams.

Most bioinfiltration measures are designed to not discharge at all during small storm events, which means that pollutants do not reach the receiving water. There are good performance data for practices that infiltrate and/or evapotranspire stormwater. Research studies on bioretention practices and permeable pavements can be found at the following links:

Dr. Allen Davis, University of Maryland
http://www.ence.umd.edu/~apdavis/LID-Publications.htm

Dr. William Hunt, North Caroline State University
http://www.bae.ncsu.edu/topic/bioretention/publications.html,

[6] A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption. Low Impact Development Center, December 2007.
[7] U.S. EPA, *Protecting Water Quality from Urban Runoff*, Nonpoint Source Control Branch, EPA-841-F-03-003, February 2003.
[8] MaCrae, C.R. Experience from Morphological Research on Canadian Streams: Is Control of the Two Year Frequency Runoff Event the Best Basis for Stream Channel Protection? Kingston, Ontario, Canada.
[9] May, C, Livingston, E. Blaha, D, Scoggins, M. & Tims, J. Structural and Nonstructural BMPs for Protecting Streams. Watershed Management Institute, Crawfordville, Florida.
[10] Booth, D.B. & Jackson, C.R. 1997. Urbanization of Aquatic Systems – Degradation Thresholds, Stormwater Detention and the Limits of Mitigation. Journal of the American Water Resources Association 22(5).
[11] Fundamentals of Urban Runoff Management, Chapter 10, North American Lake Management Society. http://www.nalms/org/Resources/PDF/Fundamentals/Fundamentals_Chapter_10.pdf

Dr. Michael E. Dietz, Utah State University
"Low Impact Development Practices: A Review of Current Research and Recommendations for Future Directions"
http://www.springerlink.com/content/nq44j610685n4112/

Dr. Jack Clausen, University of Connecticut
http://www.bae.ncsu.edu/programs/extension/wqg/319/319index_files/Ct-98.1.pdf

Under natural conditions approximately 10% of the volume of precipitation falling to earth runs off to surface waters via surface/overland flow.[12] Nearly all of the remaining amount of stormwater infiltrates, or is intercepted or taken up by plants. Nature's elegant system can be successfully adapted in developed and developing watersheds to protect receiving waters from both pollutants and altered hydrology.

This permit proposes a simple performance standard to approximate 10% discharge, with most of the remainder handled on-site. Analysis of precipitation data for West Virginia indicates that 90% of the 24 hour (or less) rainfall events are one inch or less. Therefore stormwater systems designed to manage one inch of rain will reasonably mimic the natural hydrologic process. All new and redevelopment projects must design, implement and maintain a system of controls that will infiltrate, evapotranspire and/or capture and use the first inch of rain from a 24-hour storm preceded by 48 hours of no measurable precipitation. These controls that infiltrate, evapotranspirate and capture/reuse stormwater are known as runoff reduction practices.

Because implementing this performance standard will require changes to local codes and ordinances, as well as development of a municipal review and approval process, the permit allows four years from the date of SWMP approval to begin implementation of this standard. This performance standard must be implemented and enforced via an ordinance and/or other enforceable mechanism(s).

The permit also includes several additional water quality requirements, as applicable, that the permittee should implement via enforceable requirements within their jurisdiction. For activities/operations with demonstrable potential for pollutant loadings (stormwater hot spots), water quality treatment for pollutants of concern must be provided if infiltration measures are to be used. Activities such as automobile service stations, lawn care operations/greenhouses/nurseries that handle fertilizers and pesticides and operations that handle chemicals are all activities with demonstrable potential for pollutant loading.

If an activity/operation cannot implement adequate preventive or treatment measures to ensure compliance with groundwater and/or surface water quality standards, then stormwater must be properly treated via an NPDES-permitted facility or licensed waste hauler.

There are cases where stormwater infiltration practices are regulated as Class V wells under the Underground Injection Control (UIC) program, and some stormwater managers report that some

[12] Federal Interagency Stream Restoration Working Group (FISRWG). 1998. Stream Corridor Restoration: Principles, Processes and Practices. PB98-158348LUW.

developers are hesitant to incorporate stormwater infiltration practices because they fear regulatory approvals will slow the process and increase costs. The DWWM encourages the use of infiltration and notes that most of these practices do not meet the Class V definition and can be installed without requiring UIC permits.

To provide clarification on which stormwater infiltration techniques meet UIC Class V well definitions, USEPA's Office of Water has developed a "Class V Well Identification Guide." MS4 permittees are requested to refer to this guide when considering stormwater infiltration practices. The guide can be found at this website:
http://www.wvdep.org/dwwm/stormwater/MS4_docs.htm

When considered at the watershed scale, certain types of development can either reduce existing impervious surfaces, or at least create less associated imperviousness. At this scale, development strategies can be used as one approach to improving water resources.

Recognizing that certain development strategies can be part of the process of reducing stormwater runoff and improving water quality, five specific development types can receive a reduction of 20% of the volume of relevant runoff reduction (infiltration/evapotranspire/reuse) standard described in section C.5.a.ii.A(1). Reductions are additive such that a maximum reduction of 75% of the standard in section C.5.a.ii.A(1) is possible for a project that meets all five criteria.

Incentive standards may be applied to these types of projects. A reduction of 20% of the volume of the relevant runoff reduction (infiltration/evapotranspiration/reuse) standard described in section C.5.a.ii.A(1) may be applied to any of the following types of development.

Reductions are additive such that a maximum reduction of 75% of the standard in section C.5.a.ii.A(1) is possible for a project that meets four or more criteria. And, it is certainly acceptable for the permittee to limit the amount of the reduction, if they desire to have less stormwater runoff flowing off site into the MS4. But, in no case should the reduction exceed 75%.

i Redevelopment
ii Brownfield redevelopment
iii High density (>7 units per acre)
iv Vertical Density, (Floor to Area Ratio (FAR) of 2 or >18 units per acre)
v Mixed use and Transit Oriented Development (within ½ mile of transit)

1. REDEVELOPMENT

Definition
Redevelopment is defined as the act of improving by renewing or restoring any developed property that results in the land disturbance of one acre or greater, and that has one of the following characteristics:

- Land that currently has an existing structure, such as buildings or houses, or

- Land that is currently covered with an impervious surface, such as a parking lot or roof, or
- Land that is currently degraded and is covered with sand, gravel, stones, or other non-vegetative covering.

Redevelopment activities shall not apply to development that occurs on farmland, whether active or fallow fields, or on land that is covered with vegetation.

To receive the credit:

- A developer will receive a 20% reduction to the amount of stormwater required to be managed for only the part of the development could be considered redevelopment. For example, if 100% of the project site is redevelopment, the 20% credit is applied to the whole site. If 50% of the project site is redevelopment, the 20% reduction is applied only to the land mass that is redevelopment.

Rationale

Redeveloping already degraded sites can reduce regional land consumption and minimize new land disturbance. Minimizing land disturbance and impervious cover is critical to maintaining watershed health. The amount of land that is converted, or "disturbed," from undeveloped uses, such as forests and meadows, to developed uses, such as lawns, buildings, parking lots, and playing fields, significantly affects watershed health. Research clearly indicates that the volume of runoff from highly compacted lawns is almost as high as that from paved surfaces.[13,14] This research indicates that lawns and other residential landscape features do not function, with regard to water, in the same way as non-degraded natural areas. In part, the difference arises because developing land in undeveloped 'green' areas involves wholesale grading of the site and removal of topsoil, which can lead to severe erosion during construction and soil compaction by heavy equipment.

Typically, there is little or no increase in net runoff when redeveloping underused properties such as vacant properties, brownfield sites, or greyfield sites, since new impervious cover replaces existing impervious cover. For example, an abandoned shopping center (a greyfield property) is often almost completely impervious cover and is already producing high volumes of runoff.[15] If this property were redeveloped, the net runoff increase would likely be zero since the property was already predominately impervious cover. In many cases, redevelopment of these properties breaks up or removes some portion of the impervious cover, converting it to pervious cover and allowing for some stormwater infiltration. In this instance, redevelopment of these properties can produce a net improvement in regional water quality by decreasing total impervious area and its associated runoff. Redevelopment activities can also reduce regional land consumption. By building on underused, already degraded land, the pressure to convert

[13] Schueler, Tom. 1995. "The Peculiarities of Perviousness." *Watershed Protection Techniques*. 2.1.
[14] Schueler, Tom. 2000. "The Compaction of Urban Soil." *Techniques for Watershed Protection*. Ellicottt City, MD: Center for Watershed Protection.
[15] Sobel, Lee and Steven Bozdin. 2002. Greyfields into Goldfields: Dead Malls Become Living Neighborhoods. San Fransico, CA: Congress for New Urbanism.

previously undeveloped land is reduced. Numerous studies support the environmental benefits of redevelopment:

- A 1982 study of three urban areas found that vacant land within developed areas could accommodate from two-thirds to 100 percent of the projected 10-year housing need.[16]

- A 1996 study found that brownfields in Detroit, Chicago, Milwaukee, and Cleveland could absorb one to five years of residential development, ten to 20 years of industrial development, or 200-400 years of office space.[17]

- A George Washington University study found that for every brownfield acre that is redeveloped, 4.5 acres of open space are preserved.[18]

- An analysis by King County, Washington, demonstrated that property that is vacant and eligible for redevelopment in the county's growth areas can accommodate 263,000 new houses—enough for 500,000 people.[19,20]

2. BROWNFIELDS

Definition

A 'brownfield site' is "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." [21]

The Government Accounting Office estimates that the United States has approximately 450,000 brownfield sites.[22]

To receive the stormwater credit, the project shall remediate all site contamination.

Rationale

[16] Real Estate Research Corporation. 1982. Infill Development Strategies. Washington, D.C.: the Urban Land Institute and American Planning Association.
[17] Simons, Robert. 1996. Brownfields Supply and Demand Analysis for Selected Great Lakes States. Cleveland State University: Planning and Development.
[18] Deason, Jonathan, et al. 2001. Public Policies and Private Decisions Affecting the Redevelopment of Brownfields: An Analysis of Critical Factors, Relative Weights and Area Differentials. Prepared for U.S. EPA, Office of Solid Waste and Emergency Response. Washington, D.C.: The George Washington University.
[19] Pryne, Eric. 2002. "20 Years' Worth of County Land?" Seattle Times. May 20.
[20] Real Estate Research Corporation. 1982. Infill Development Strategies. Washington, D.C.: the Urban Land Institute and American Planning Association.
[21] The Brownfields Site definition is found in Public Law 107-118 (H.R. 2869) - "Small Business Liability Relief and Brownfields Revitalization Act" signed into law January 11, 2002.
U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. 1996. Brownfields Initiative. Quick Reference Fact Sheet.
[22] U.S. General Accounting Office. 1995. Community Development: Reuse of Urban Industrial Sites. GAO/RCED-95-172.

A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment.

A contaminated site often impacts surface water, ground water, drinking water, sediments, soil and air. Brownfields typically possess the following contaminants: Petroleum/Petroleum Products, Controlled Substances, Asbestos, PCBs, VOCs, lead, PAHs. Moreover, over 800 redeveloped brownfield properties have removed or ameliorated groundwater contamination. Atlantic Station in Atlanta, Georgia is a good example. Formerly a 139-acre brownfield site, the redevelopment of this property included installing a "cap" just under the top soil that prevents the underlying soil contamination from entering groundwater resources.[23]

Given the importance of removing these harmful contaminants from the wide range of water supplies, a project that remediate a brownfield is eligible for one stormwater incentive worth twenty percent reduction of the standard in section C.b.5.a.ii.A(1).

3. HIGH DENSITY AND VERTICAL DENSITY DEVELOPMENT

Definition

High density is defined as seven or more housing units per *gross* developable acre.[24]

- To receive this credit, the developer shall build any residential components of the project at an average density of seven or more dwelling units per acre of buildable land available for residential uses.

Vertical density is defined as development that has:

(1) a floor to area ratio (FAR) of at least 2.0; and/or
(2) 18 or more housing units per gross acre.

- To receive this credit, the developer shall build any residential components of the project at an average density of 18 or more dwelling units per acre of buildable land available for residential uses or build any non-residential components of the project at an average density of 2.0 FAR or greater per acre of buildable land available for non-residential uses.

- In some cases, the developer may wish to combine residential units and commercial space. Often referred to as a mixed use, the density of a mixed use building is calculated by:

[23] There are several EPA documents that detail site conditions and remediation strategies. For general information on the Atlantic Steel redevelop, see http://www.epa.gov/projectxl/atlantic/page1.htm and for specific technical information on site conditions, see http://www.epa.gov/ProjectXL/atlantic/fonsi.pdf.

[24] As this section discusses, there is considerable research confirming that higher density development can reduce overall stormater runoff and is better for watershed water quality. The determination that the developer could receive an incentive for higher density at seven units or more an acre is based on the U.S. Green Building Council's Leadership in Energy and Environmental Design- Neighborhood Development criteria. For more information on LEED-ND, see http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148.

a. Determining the total square footage of all residential and non-residential uses;
b. Calculating the percentages of the total square footage that the residential and non-residential components each represent;
c. Applying those percentages to the building parcel to determine the proportionate share of land area for each component; and
d. Calculating residential density as the number of dwelling units per acre using the residential share of the building parcel, and calculating non-residential density as FAR using the non-residential share of the land area divided by total non-residential square footage.

- A housing unit can include a single-family detached home, town home, condominium, apartment, accessory dwelling unit, mobile home, or any other housing type that allows year-round occupancy.

- The Floor Area Ratio (FAR) is the ratio of the total floor area of buildings on a certain location to the size of the land of that location.

  For example, a FAR of 2.0 indicates the total floor area of a building is two times the gross area of the plot on which it is constructed. By raising the Floor Area Ratio, the permittee can reduce overall impervious cover across the MS4 jurisdiction. A builder can plan for either a single-story building consuming the entire allowable area in one floor, or a multi-story building that rises higher above the plane of the land, but which must consequently result in a smaller footprint than would a single-story building of the same total floor area. By combining the horizontal and vertical limits into a single figure, some flexibility is permitted in building design, while achieving a hard limit on at least one measure of overall size.

To receive the credit:

- The specified density must be achieved by the point in the project's construction at which 50% of dwelling units are built, or within five years of the date that the first building is occupied, whichever is longer.

Rationale

The effect of low-density urbanization on watersheds and the hydrologic cycle is substantial. Several studies have found that covering just ten percent of the watershed's land area with impervious surface can impair hydrological function and water quality within the watershed. The USEPA, the Center for Watershed Protection, and other environmental agencies and organizations have conducted research that indicates that higher density projects may provide more water quality benefits than low-density development. In particular:

1. Higher density does not necessarily mean more impervious surface overall. In fact, multiple units in a compact arrangement may reduce the building footprint and result in less impervious coverage on a per unit or per capita basis than stand alone units dispersed across the landscape. In addition, more compact development requires fewer miles of roads and parking lots than low-density development, thereby reducing

a substantial contributor to total impervious cover.

2. Not all pervious surfaces are equal. Many disturbed surfaces that appear pervious, such as lawns, golf courses, or other maintained lands, may be compacted, which greatly reduces their ability to infiltrate runoff. Therefore developing less total land, including for lawns or other developed "green space," and maintaining more land in its natural, undisturbed condition, is better for water quality.

High-density development, including vertical density, slows land consumption rates and accommodates more land uses on a smaller footprint. Numerous studies support these conclusions:

- A 2006 USEPA study[25] found that higher density development can be more protective of regional water quality than lower density scenarios because less stormwater and associated pollutants are produced on a per unit basis. Many communities assume that low-density development automatically protects water resources. The USEPA study demonstrated that this assumption is flawed and that pursuit of low-density development can be counterproductive, contributing to high rates of land conversion and stormwater runoff, and missing opportunities to preserve valuable undeveloped land within watersheds.
- Queensland University of Technology, Gold Coast City Council, and the Department of Public Works in Brisbane, Australia, examined the relationship between water quality and six different land uses to offer practical guidance in planning future developments. When comparing monitored runoff and associated pollutants from six areas, they found the most protective strategy for water quality was high-density residential development.[26]

- The Belle Hall study, by the South Carolina Coastal Conservation League, examined the water quality impacts of two development alternatives for a 583-acre site in Mount Pleasant, South Carolina. The town planners used modeling to examine the potential water quality impacts of each site design. In the "Sprawl Scenario," the property was analyzed as if it developed along a conventional suburban pattern. The "Town Scenario" incorporated traditional neighborhood patterns. In each scenario, the overall density and intensity (the number of homes and the square feet of commercial and retail space) were held constant. The results found that the "Sprawl Scenario" consumed eight times more open space and generated 43 percent more runoff, four times more sediment, almost four times more nitrogen, and three times more phosphorous than the "Town Scenario" development.[27]

[25] U.S. EPA. 2006. Protecting Water Resources with Higher-Density Development. EPA 231-R-06-001.
[26] Goonetilleke, A., E. Thomas., S. Ginn, D. Gilbert. 2005. "Understanding the Role of Land Use in Urban Stormwater Quality Management." Journal of Environmental Management, 74: 31-42.
[27] South Carolina Coastal Conservation League, Environmental Protection Agency, National Oceanic and Atmospheric Administration, South Carolina Department of Health and Environment; Town of Mount Pleasant. 1995. The Belle Hall Study: Sprawl vs. Traditional Town: Environmental Implications. South Miami, FL: Dover, Kohl, and Partners.

- New Jersey's State Plan calls for increasing densities in the state by directing development to existing communities and existing infrastructure. Researchers at Rutgers University analyzed the water quality impacts from current proposed compact development. The study found that compact development would generate significantly less water pollution for all categories of pollutants than current development patterns, which are mostly characterized by low-density development.[28] The reductions ranged from over 40 percent for phosphorus and nitrogen to 30 percent for runoff. These conclusions supported a similar statewide study completed in 1992 that concluded that compact development would result in 30 percent less runoff and 40 percent less water pollution than would a lower-density scenario.[29]

- Studies in the United States, United Kingdom, and Canada agree that vehicle miles traveled (VMT) are reduced 20-30% every time density doubles.[30,31,32] By increasing density, VMT and associated auto-related water and air pollution can be effectively reduced.

4. MIXED-USE DEVELOPMENT AND TRANSIT ORIENTED DEVELOPMENT

Definition
A mixed-use development has complementary functions that are located close together in an integrated fashion, e.g., apartments and condos above stores and businesses. It has three or more revenue producing uses and has significant functional and physical integration of uses. The multiple uses are either inside a single structure or placed within a neighborhood, where a variety of different living activities (live, work, shop, and play) are in close proximity, and accessible via safe walking routes.

A **Transit Oriented Development** (TOD) is a mixed-use development that is walkable by distance and design, to a transit stop. The development mixes residential, retail, office, open space, and public uses in a way that makes it convenient to travel on foot or by public transportation instead of by car. Successful transit-oriented developments reduce driving if they are both close to transit and well designed. Characteristics include:

[28] Rutgers University. 2000. The Costs and Benefits of Alternative Growth Patterns: The Impact Assessment of the New Jersey State Plan. New Brunswick, NJ: Center for Urban Policy and Research.
[29] Burchell, R.W. and D. Listokin. 1995. "Land, Infrastructure, Housing Costs and Fiscal Impacts Associated with Growth: The Literature on the Impacts of Sprawl Versus Managed Growth." New Brunswick, NJ: Rutgers University, Center for Urban Policy Research. As summarized in The Technological Reshaping of Metropolitan America, Office of Technology Assessment, OTA-ETI-643, Washington, DC.
[30] Holtzclaw, John. "Explaining Urban Density and Transit Impacts on Auto Use." Presented to State of California Energy Resources Conservation and Development Commission, January, 1991. As cited in The Growth Management Institute paper, "The Influence of Regional Land Use and Transportation Patterns on Air Quality: A Framework for Discussion" by Douglas R. Porter, May 23,2001 http://www.gmionline.org/InfluenceRegionalLandUse.htm
[31] Newman, P.; Kenworthy. J. *Cities and Automobile Dependence: An International Sourcebook*, Gower Publishing: Aldershot, England, 1989.
[32] University of Toronto/York University. *The Transportation Tomorrow Survey: Travel Survey Summary for the Greater Toronto Area*, June 1989.

- Higher density development, appropriate to the regional context (urban core, suburban center, neighborhood center).
- Well designed, pedestrian friendly street networks allowing for safe and attractive walking routes.
- Street design that follows a Context Sensitive Design approach with more narrow streets, smaller block sizes, wide-sidewalks, and well defined pedestrian cross walks.[33]
- Parcels adjacent to transit containing a mix of land use activities and a range of housing types.
- Walking distance to transit is generally ½ mile for rail/ferry, and ¼ mile for bus.

The following table describes categories of TOD and the minimum densities that support effective transit.

Typology of Transit-Oriented Development, Reconnecting America

TOD Type	Land Use Mix	Minimum Housing Density	Regional Connectivity	Frequencies
Urban Downtown	Office Center Urban Entertainment Multifamily Housing Retail	>60 units/acre	High Hub of Radial System	<10 minutes
Urban Neighborhood	Residential Retail Class B Commercial	>20 units/acre	Medium Access to Downtown Subregional Circulation	10 minutes peak 20 minutes off-peak
Suburban Center	Primary Office Center Urban Entertainment Multifamily Housing Retail	>50 units/acre	High Access to Downtown Subregional Hub	10 minutes peak 10-15 minutes off-peak
Suburban Neighborhood	Residential Neighborhood Retail Local Office	>12 units/acre	Medium Access to Suburban Center and Access to Downtown	20 minutes peak 30 minutes off-peak
Commuter Town Center	Retail Center Residential	>12 units/acre	Low Access to Downtown	Peak Service Demand Responsive

To receive this credit, the project site shall include a minimum of three land uses, excluding open space and parking, and shall meet all the characteristics of TOD:

- Higher density development, appropriate to the regional context (urban core, suburban center, neighborhood center).

[33] For Design Guidelines See – *Context Sensitive Solutions for in Designing Major Urban Thoroughfares for Walkable Communities*, Institute of Transportation Engineers, Draft Recommended Practice. http://www.ite.org/css/

- Well designed, pedestrian friendly street networks allowing for safe and attractive walking routes.
- Street design that follows a Context Sensitive Design approach with more narrow streets, smaller block sizes, wide-sidewalks, and well defined pedestrian cross walks.[34]
- Parcels adjacent to transit containing a mix of land use activities and a range of housing types.
- Walking distance to transit is generally ½ mile for rail/ferry, and ¼ mile for bus.

Rationale

Mixing uses supports a range of transportation options and facilitates shared parking, thereby reducing the amount of surface needed for roads and parking lots. By bringing a mix of jobs, housing, and commercial activities closer together, total requirements for land, roads, and parking decrease.

Mixing land uses can have direct effects on reducing runoff since mixed-use developments have the potential to use surface parking lots and transportation infrastructure more efficiently, requiring less pavement. When office buildings also contain retail shops and restaurants, the infrastructure that supports the building, such as roads and parking lots, is in use for more of the day. Office traffic uses parking lots mainly during weekday days; so the same parking space can be used for restaurant and theater traffic on evenings and weekends. This shared set-up eliminates the need for two sets of roads and parking lots, one serving office buildings and the other serving retail and entertainment areas.

By encouraging people to walk, bike, and use transit rather than drive, mixed-use development patterns reduce vehicle miles traveled (VMT). Reductions in VMT lead to decreases in automobile emissions, which translate into less automobile pollution in runoff and less air pollution being deposited into water - thereby improving water quality.

Research supports these conclusions. Researchers at Purdue University examined two possible project sites in the Chicago area.[35] The first site was in the city; the second was on the urban fringe. The study found that placing a hypothetical low-density development on the urban fringe would produce ***ten*** times more runoff than a mixed-use development in the urban core.

A study by the Center for Watershed Protection[36] measured the percent of impervious cover in developed areas that was devoted to building footprints (people habitat) versus to streets, driveways, and parking lots (car habitat). The study found that car habitat accounted for 55-75% of the total impervious surface area among the sites measured. Compact, mixed- use designs that ***reduce*** the need for vehicle travel and parking space therefore have great potential to reduce impervious cover and associated water impacts in developed areas.

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[34] For Design Guidelines See – *Context Sensitive Solutions for in Designing Major Urban Thoroughfares for Walkable Communities*, Institute of Transportation Engineers, Draft Recommended Practice. http://www.ite.org/css/

[35] Harbor, J., B. Engel, et al. 2000. A Comparison of the Long-Term Hydrological Impacts of Urban Renewal Versus Urban Sprawl. West Lafayette, IN: Purdue University.

[36] Cappiella, Karen, and Brown, Kenneth. 2001. "Impervious Cover and Land Use in the Chesapeake Bay Watershed." Center for Watershed Protection. January. http://www.cwp.org/Downloads/elc_imperv.pdf

Moreover, transit oriented development produces water quality benefits by reducing: (1) land consumption due to smaller site footprints; (2) parking spaces and the impervious cover associated with them; and (3) average vehicle miles traveled, which, in turn, reduces deposition of air pollution into water bodies.

Land Consumption. TOD can spur neighborhood revitalization, increase ridership on a region's existing public transportation system, and help protect natural resources.[37] As higher density development is clustered around transit stops, the need for developing land elsewhere in a region is minimized. A number of studies have evaluated TOD projects relative to comparable development on suburban sites. Not only are most of these projects built on previously developed land, but they accommodate the same amount of residential and commercial space on one-half to one-tenth of the land area.[38]

Reduced Parking Needs. Parking management strategies for TOD also lead to less impervious surface on the site, therefore, creating ***less*** stormwater runoff. The reduced parking is a result of the greater share of trips made by transit or on foot, lower auto ownership rates, and shared parking arrangements. These three outcomes are a direct result of well-designed TOD projects that place residents and office workers in close proximity to daily activities such as shops, offices, grocery stores, playgrounds, and dry cleaning. This convenience makes it easy for residents to accomplish tasks from their homes or offices by transit, biking, or walking, instead of by car, thus reducing the amount of parking required. Recognizing this effect, several communities across the United States have reduced parking requirements for businesses located in TOD districts. For example:

- Seattle, Washington's existing parking code allows commercial uses a 20 percent reduction in parking based on frequency of adjacent transit service.
- Portland, Oregon has no minimum parking requirements for sites well served by transit.
- Oakland, California reduces their Parking requirements to 0.5 parking spaces per housing unit within a TOD zone.
- Arlington, Virginia regularly decreases required parking in their TOD areas.

Reduced Air Deposition. The range and quality of transportation choices available to people not only have a direct impact on where and what type of development is likely to occur, they also have an indirect effect on water quality. Air emissions from vehicles, through air-to-water deposition of pollutants, are a major contributor to poor water quality and can undermine other efforts to improve regional water quality. For example, in the Washington, D.C. region, mobile sources (e.g., cars, buses, trucks) are a primary cause of not only air quality problems, but also of water pollution through deposition or stormwater runoff.[39] Specifically, the USEPA estimates that 35 percent of the nitrogen entering the Chesapeake Bay originates from mobile sources.[40]

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[37] Building a Regional Framework: TOD, NIPC

[38] Ewing et al 2007, *Growing Cooler*, Ch. 3.5, Urban Land Institute, Washington D.C.

[39] Metropolitan Washington Council of Governments, Metropolitan Washington Air Quality Committee. August 13, 2003. *Plan to Improve Air Quality in the Washington, DC-MD-VA Region.* <www.mwcog.org/environment/air>.

[40] Alliance for the Chesapeake Bay. 1997. "Air Pollution in the Chesapeake Bay." Baltimore, MD.

Therefore, reducing vehicle travel through transit oriented development can produce significant benefits to water quality.

Over a dozen studies have been conducted that compare the travel and emissions of transit oriented infill development projects to conventional suburban development. These site level analyses conducted by regional transportation planning agencies have demonstrated that TOD produces 30 to 70% less vehicle miles traveled (VMT) due to increased transit use, increased walking, and shorter car trips.[41] This can translate into reduced pollutants from cars entering sewer systems and water bodies.

Off-site mitigation and payment in-lieu. With the wide array of runoff reduction practices that can infiltrate, evapotranspire, and capture and use stormwater there should be very few situations where management of one inch of stormwater using combinations of those mechanisms is not possible. However, it is certainly reasonable to expect that a series of physical constraints may exist, particularly in redevelopment situations, making it infeasible to manage an entire inch of stormwater. Therefore this permit provides the permittee the option of creating off-site mitigation and/or payment in lieu programs.

If the permittee chooses to implement one or both of these options, several requirements must be met:

1. The permittee must establish clear and stringent criteria for the conditions under which these options are available that must be related to real physical constraints such as a combination of thin soils limiting infiltration opportunities, space or light limited situations restricting the amount of vegetation that can be used, and a land use that is not conducive to capture and use of stormwater. While one or two of these characteristics should not be adequate to qualify for the alternative, the combination of multiple constraints could;

2. A minimal requirement for at least 0.4 inch of stormwater managed on-site;

3. A 1:1.5 ratio of the amount of requisite stormwater not managed on site to the amount of stormwater required to be mitigated at another site, or for which in-lieu payments must be made;

4. If demonstrated to the permittee that it is completely infeasible to manage the remainder 0.4 inches, then the ratio for this unmanaged portion is 1:2.

5. The necessary tracking systems for both types of programs, including the necessary inventory of public and retrofit projects for off-site mitigation; and,

[41] Eliot A. and F. K. Benfield, "Environmental Characteristics of Smart Growth Neighborhoods, Phase II: Two Nashville Neighborhoods," Natural Resources Defense Council, February 2003. "Environmental Benefits of Brownfield Redevelopment: Empirical Results of Previous Studies," Environmental Mgmt Support Inc, working paper for US EPA, July 2006. Hagler Bailly Inc. and Criterion Planners/Engineers, The Transportation and Environmental Impacts of Infill versus Greenfield Development: A Comparative Case Study Analysis, EPA 231-R-99-005, U.S. Environmental Protection Agency, Washington, D.C., October 1999.

6. The establishment of a credible valuation structure for payment in lieu, i.e., what is the actual cost for the permittee to provide retrofits for the necessary amount of stormwater, not just a token payment. The purpose of these provisions is to disincentivize the use of alternatives unless really needed, but also to provide a financial foundation for implementation of public stormwater management projects, including retrofits where those needs have been identified.

Road and parking lot repairs, modifications and reconstruction. Although most roads and parking lots are not repaired, modified or reconstructed with great frequency, most municipalities engage in these types of activities on a fairly regular basis. Since roads and parking lots are often a significant percentage of urban impervious areas these are land uses with significant opportunity for implementation of better stormwater controls. Because road and parking lot work is a major investment of resources, it makes sense to incorporate controls when work is ongoing for another purpose.

This permit term provides the permittee with an opportunity to experiment with different management practices and designs, in conjunction with the assessment in section C.5.b. There are numerous stormwater management practices for streets, street rights-of-way, and parking lots including Portland, OR style Green Streets planters and bump-outs[42], porous pavements[43], Seattle, WA style **Street Edge Alternatives** (SEA) bioretention cells[44], parking lot bioretention islands[45], and a variety of other stormwater management practices[46].

Plan Review, Approval and Enforcement provisions require that the permittee incorporate the standards outlined in section C.5.a.ii.B into site plan review, approval and enforcement procedures to ensure accountability for their implementation. Plan review procedures include pre-application procedures, site plan review and approval procedures, submittal of as-built certification within 90 days of project completion, post-construction verification procedures, and an education program for municipal staff and those subject to these requirements.

Maintenance Agreements provisions require that the permittee obligate the owner of long-term management practices to properly operate and maintain them for their accepted life span. This obligation can take the form of a maintenance agreement between the land owner and/or the developer, which would be transferred to subsequent owners, between the permittee and a homeowner's association, covenants and restrictions on the property deed itself, or other type of contract requiring all owners of the property to properly maintain and operate management practices. The maintenance agreement shall allow the permittee or its designee to perform

[42] http://www.portlandonline.com/bes/index.cfm?c=44407& and http://www.portlandonline.com/bes/index.cfm?c=44213&

[43] http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=71

[44] http://www.ci.seattle.wa.us/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

[45] http://www.lid-stormwater.net/biocomind_home.htm and http://www.civil.umd.edu/~apdavis/Bioinstallations.htm

[46] http://cfpub.epa.gov/npdes/home.cfm?program_id=298

maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from that owner/operator.

Inventory and Tracking of Management Practices provisions require the permittee to create a tracking system for stormwater management practices implemented on development and redevelopment projects. The information contained in the inventory database will allow the permittee to locate facilities for inspection, track necessary maintenance, and accurately report the level of implementation in each annual report. [47]

Stormwater Management Practices Inspections provisions require that the permittee perform regular inspections of post-construction management practices in order to ensure that they are operating correctly and that the owners are maintaining them for maximum performance.[48] It is recommended that the permittee develop an inspection schedule for stormwater management BMPs so that all BMPs are inspected at least once during the term of this permit.

With this inspection frequency, the permittee could manage to inspect most management practices in its jurisdiction in this five year permit term. The inspections are to be followed by any necessary compliance or enforcement action, and follow up inspections are to be conducted to ensure corrective maintenance has occurred. The DWWM anticipates that eventually, perhaps as soon as the next permit term, it may not be feasible to inspect all management practices on a five year cycle. At that time it may be reasonable to implement a 3rd party inspection program paid for by land-owners, or a municipal inspection program that identifies high priority management practices for inspection. The DWWM welcomes suggestions on workable frameworks for future permit terms.

Reporting provisions require that the permittee submit information in each annual report detailing the level of implementation of the long-term stormwater management program during the previous year, including summaries of numbers of site plan reviews and approvals, types of management practices approved, number of maintenance agreements approved, and number of management practices inspections conducted and follow-up actions. In addition, the permittee must provide a summary of any evaluation data collected, and must also provide a comparison of new development trends using implementation data from the current and past years during the permit term.

The goal of the trend analysis is to apply the iterative management process to identify strengths and weaknesses, new development program areas, management practices, and activities that may need to be modified in order to meet the goals of this permit.

Assessments provisions require the permittee to conduct assessments to provide a foundation for program improvements to be implemented during the next permit term.

[47] For more information on management practices tracking systems go to www.stormwatercenter.net [Program Resources, STP Maintenance Resources].
[48] For example checklists go to http://www.epa.gov/npdes/pubs/sw_maintenance_inspection_checklists.pdf

Street/Parking Design Assessment provisions require the permittee to assess current street design guidelines and parking requirements that affect the creation of impervious cover. This assessment shall be conducted within two years of the effective date of this permit.

Pollution Prevention & Good Housekeeping for Municipal Operations

This control measure requires permittees to implement an operation and maintenance program to prevent or reduce polluted runoff from ***activities conducted by the municipality***. The permittee must examine and subsequently alter their own actions to reduce the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, storage and vehicle maintenance areas, that may be discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems.

Activities associated with maintenance of parks and open spaces, as well as fleet and building maintenance, must also be considered for possible water quality impacts.

While this measure is meant primarily to improve or protect receiving water quality by altering municipal or facility operations, it also can result in a cost savings for the permittee, since proper and timely maintenance of storm sewer systems can help avoid repair costs from damage caused by age and neglect.

The regulations at 40 CFR § 122.34(b)(4) require the permittee to:

- Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;

- Include employee training on methods to incorporate pollution prevention and good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

The permittee can use training materials that are available from the USEPA, WVDEP or any other organization with suitable training material that will meet the needs of the MS4.

In September 2008, the Center for Watershed Protection released a guidance manual for Municipal Pollution Prevention & Good Housekeeping. It is available on WVDEPs website: http://www2.wvdep.org/dwwm/stormwater/MS4_BMP.htm

The West Virginia small MS4 general permit also requires that monitoring be conducted at municipal sites that discharge "industrial" stormwater. This includes, but is not limited to maintenance yards, vehicle fueling, storage and maintenance areas, salt storage areas, parks and recreation maintenance areas, public works buildings and storage, and sewage treatment facilities.

Samples are to be collected once every six months, during spring and fall seasons.

PART III

Special Conditions

A. Sharing Responsibility.

The DWWM supports and encourages permittees partnering with other MS4s to meet the requirements of the small MS4 permit. Especially, if two or more permittees are in close or adjacent proximity to each other. Sharing resources can be more cost effective, save time and gain knowledge from a greater intellectual pool of people. It just makes sense to pool resources and knowledge to implement a stormwater management program.

Many Phase I municipalities across the United States have already developed and implemented stormwater management programs. Duplication of efforts is unnecessary. Most of these municipalities are usually very open to sharing their stormwater program successes and failures.

B. Discharge compliance with Water Quality Standards

Full compliance with all the terms and conditions of this permit is considered an acceptable effort to reduce stormwater pollutants from the small MS4 to the maximum extent practicable.

The Clean Water Act 301(b)(1)(C) provides that all NPDES permittees achieve water quality standards. If a discharge has the reasonable potential to cause or contribute to violations of water quality standards the receiving water, additional controls are required.

In 1987 Congress added the following provision in § 402(p)(3)(B) requiring State permitting authorities to require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and ***such other provisions*** as the Administrator or State determines appropriate for the control of such pollutants.

The Phase II Final Rule, published in the Federal Register on December 8, 1999, 64 F.R. 68722, required NPDES permit coverage for stormwater discharges from both small MS4s and smaller construction sites. The promulgation of those Phase II requirements also includes language in which EPA officially clarified the relationship between sections 301(b)(1)(C) and 402(p) of the Act for all municipal dischargers (small, medium and large):

> Today's rule specifies that the 'compliance target' for the design and implementation of municipal storm water control programs is 'to reduce pollutants to the maximum extent practicable (MEP), *to protect water quality, and to satisfy the appropriate water quality requirements of the CWA.*' The first component, reductions to the MEP, would be realized

> through implementation of the six minimum measures. The second component, to protect water quality, reflects the overall design objective for municipal programs based on CWA section 402(p)(6). The third component, to implement other applicable water quality requirements of the CWA, recognizes *the Agency's specific determination under CWA section 402(p)(3)(B)(iii) of the need to achieve reasonable further progress toward attainment of water quality standards according to the iterative [Best Management Practices] process,* as well as the determination that State or EPA officials who establish TMDLs could allocate waste loads to MS4s, as they would to other point sources.

As a result, it is clear that USEPA intends all municipal dischargers to achieve both technology-based and water quality-based limits.

Also, see the discussion on MEP on page five of this fact sheet.

C. Individual Permit

There may be special instances where DWWM will require an individual permit. The DWWM will notify the permittee in writing and include a statement of the reasons.

D. Discharge to impaired waters

Impaired waters are those that do not meet applicable water quality standards. Impaired waters are identified on the West Virginia Section 303(d) list until a Total Maximum Daily Load (TMDL) is developed and subsequently approved by the USEPA.

A MS4 that discharges into a receiving waterbody that has been listed on the WV Section 303(d) list must provide details in their stormwater management program how the selected BMPs will control the discharge of the pollutants of concern.

TMDL Development Schedule:

From 1997 until 2003, USEPA Region III developed West Virginia TMDLs under the settlement of a 1995 lawsuit, Ohio Valley Environmental Coalition, Inc., West Virginia Highlands Conservancy, et. al. v. Browner, et. al. The lawsuit resulted in a consent decree between the plaintiffs and the USEPA that specifies TMDL development requirements and compliance dates.

While the USEPA was working on developing TMDLs, the WVDEP concentrated on building its own TMDL program. With the help of the TMDL stakeholder committee, the agency secured funding from the state legislature and created the TMDL section within the Division of Water and Waste Management.

The TMDL section is committed to implementing a TMDL process that reflects the requirements of TMDL regulations, provides for the achievement of water quality

standards, and ensures that ample stakeholder participation is achieved in the development and implementation of TMDLs. The DWWM's approach to TMDL development allows 48 months to develop a TMDL from start to finish. This approach enables the agency to carry out an extensive data generation and gathering effort to produce scientifically defensible TMDLs, and allows ample time for modeling, report drafting and frequent public participation opportunities.

Barring unforeseen circumstances, all WVDEP TMDLs will be developed according to the Watershed Management Framework cycle. The framework divides the state into 32 major watersheds and operates on a five year, five-step process. The watersheds are divided into five hydrologic groups (A - E). Each group of watersheds is assessed once every five years.

The TMDL process begins in the first year of the cycle with pre-TMDL sampling and public meetings in the affected watersheds. The data is compiled and TMDL development begins in year two of the cycle. In the third year, TMDL development continues and the TMDL is drafted.

The TMDL is finalized in the fourth year. In the fifth year of the cycle, TMDL implementation is initiated through the NPDES permitting process and efforts toward limiting nonpoint source loading. Throughout the TMDL development process, there are numerous opportunities for public participation and input.

A schedule of TMDL implementation can be found in several of the documents on WVDEP's TMDL webpage: http://www.wvdep.org/item.cfm?ssid=11&ss1id=720

It is strongly advised that the permittee become familiar with the schedule of TMDL development and implementation. If a TMDL is scheduled to be developed during the permit term, any specific practices or changes that need to take place in the SWMP in order to meet the wasteload allocations can be planned and anticipated. If your MS4 discharges into waters in which a TMDL has been developed, the SWMP must be modified within six months. The MS4 operator must modify the SWMP to include BMPs that are appropriate and specifically targeted to achieve wasteload allocations prescribed by the TMDL. The MEP standard does not apply to water bodies with approved TMDL. The NPDES permitted entity must meet their wasteload allocations.

The SWMP must be modified within six months. The MS4 operator must modify the SWMP to include BMPs that are appropriate and specifically targeted to achieve wasteload allocations prescribed by the TMDL.

The MS4 General Permit requires that a description of the BMPs that the permittee implemented be included in the annual report.

Part IV

Monitoring, Recordkeeping, Reporting and Program Review

A. Evaluating the SWMP

Permittees shall evaluate the effectiveness of their stormwater management programs and chosen BMPs. The process of developing a stormwater management program, implementing the program, and evaluating the program is a dynamic, iterative process that helps move MS4 communities toward achievement of their stormwater goals.

There are several reasons to evaluate the effectiveness of the SWMP;

1. 40 CFR 122.26(d)(2)(v) and 122.34(g) requires MS4 operators to assess BMPs and the effectiveness of their SWMP.
2. Evaluation of SWMP effectiveness is essential to document progress toward meeting water quality goals.
3. Knowledge of program effectiveness can help to justify SWMP expenditures to decision makers and the public, and will help to improve cost effective implementation and management of the SWMP.
4. Stormwater management is an iterative process and knowledge of program effectiveness is essential for mid-course corrections to improve the program.
5. If a receiving water body is impaired, it is very helpful to assess the effectiveness of the SWMP in reducing the pollutants of concern.

The three approaches to evaluating effectiveness are:

- Assessing program operations;
- Evaluating social indicators; and
- Monitoring water quality.

Stormwater program evaluation must be more than an exercise in collecting and tabulating data. Evaluation data must be analyzed, interpreted, and reported so that results can be used to modify and/or strengthen the SWMP when necessary.

Water quality monitoring is the most direct, and usually the best, approach to evaluating the effectiveness of a SWMP. Program evaluation through water quality monitoring can apply to several of the SWMP components, including illicit discharge detection, construction site runoff control and post-construction runoff control. However, if the permittee discharges to a waterbody with an approved TMDL, the collection of water quality data (along with BMP performance data) is very important. (For more information about the TMDL program, visit **www.epa.gov/owow/tmdl**). Detailed guidance on design and operation of monitoring is available elsewhere, e.g., *USDA-NRCS National Handbook of Water Quality Monitoring* **(ftp://ftp.wcc.nrcs.usda.gov/downloads/wqam/wqm1.pdf)** and *EPA Monitoring*

Guidance for Determining the Effectiveness of Nonpoint Source Controls (Sept. 1997, EPA 841-B-96-004).

Water quality monitoring approaches range from qualitative observations to highly quantitative measurements, covering areas as small as individual BMPs to large receiving waters such as lakes or estuaries. A good monitoring program for evaluation of SWMP effectiveness will probably contain several elements at various levels of detail and scale. Before embarking on new monitoring, however, it is important to collect and evaluate historic and current data from existing monitoring activities. Data from state 305(b) assessments, 303(d) lists, and published TMDLs, ongoing state and federal agency monitoring programs, water supply intake testing, and watershed volunteer groups, for example, can be useful both in designing a monitoring program and in supplementing program results.

For more information see the USEPA/State guidance titled: *Evaluating the effectiveness of municipal stormwater programs* and *Understanding Impaired Waters and Total Maximum Daily Load (TMDL) Requirements for Municipal Stormwater Programs.* Both of these guidance documents can be found on WVDEP's website: http://www2.wvdep.org/dwwm/stormwater/MS4_docs.htm

B. Stormwater Monitoring

There are no numerical effluent limits established in this general permit. Effluent limits are established in the small MS4 general permit in the form of stormwater BMPs, which, when implemented, are designed to prevent the discharge of polluted stormwater runoff to surface waters of the state.

Part IV of this general permit requires two stormwater samples per year to ascertain certain pollutants found in stormwater runoff, and to measure the effectiveness of the stormwater management program.

When a representative outfall for stormwater sampling is chosen, that sample location must remain the same throughout the permit period. A representative outfall is one located in the most densely populated area. The latitude and longitude of the outfall must be determined also.

Upon approval of the SWMP a Discharge Monitoring Report will be issued to the permittee.

C. Recordkeeping & Public Availability of SWMP and Annual Report

Records are documentation of the activities and policies that are implemented under the small MS4 general permit. Records must be maintained for at least three years after the termination of this permit.

It is strongly advised that the permittee record and maintain documentation of all components of the stormwater management program, including all six minimum control measures and any monitoring activities. Records do not need to be submitted to the DWWM unless requested.

The SWMP and the annual report shall be made available to the public during regular business hours. This permit requires that the SWMP and subsequent annual reports be made available on the permittees website. However, if the permittee does not maintain or operate a website, the SWMP and annual report can be submitted to the DWWM in either Microsoft Word or Adobe PDF format for distribution to the public.

D. Annual Report

To aid in assessing achievement of improved water quality from the development and implementation of stormwater BMPs, the permittee is required to submit an annual report to the DWWM. Annual reports may be used to assess the effectiveness of the permittees stormwater management program.

E. Program Review

In order to assess the effectiveness of the permittees stormwater management program, periodic program evaluations should be conducted by the permittee. DWWM also intends to conduct program evaluations during this permit cycle.

USEPA has published a guidance document on conducting program evaluations. This guidance can be found on USEPA's website at this link: http://cfpub.epa.gov/npdes/docs.cfm?document_type_id=1&view=Policy%20and%20Guidance%20Documents&program_id=6&sort=name

Appendix D

Management Conditions

This section is boilerplate language essentially extracted from Title 47, Series 10 of the West Virginia Legislative Rules. These rules establish that every NPDES permit contains certain standard conditions. A reference to Title 47, Series 11, Section 9 of the West Virginia Legislative Rules was included that requires that outlet markers be posted.

The State of West Virginia, Department of Environmental Protection, Division of Water and Waste Management, has made a tentative decision for a state NPDES permit as listed on this fact sheet. In order to provide public participation on the proposed issuance of the required permit, the following information is being supplied in accordance with Title 47, Series10, Section 11.3.e.2 and 3, of the West Virginia Legislative Rules.

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing. A request for a public hearing shall be made in writing and addressed to:

Director, Division of Water and Waste Management, DEP
601 57th Street SE
Charleston, WV 25304-2345
Attention: William Timmermeyer
E-mail: William.F.Timmermeyer@wv.gov

The request shall state the nature of the issues proposed to be raised in the hearing and must be received within the comment period. The Director shall hold a public hearing whenever he or she finds, on the basis of requests, a significant degree of public interest on issues relevant to the draft permit. Any person may submit oral or written statements and data concerning the draft permit; however, reasonable limits may be set upon the time allowed for oral statements, and the submission of statements in writing may be required. A tape recording or written transcript of the hearing shall be made available to the public upon request.

If information received during the public comment period appears to raise substantial new questions, the Director may reopen the public comment period.

All applicable information concerning any permit application and the tentative decisions is on file and may be inspected by appointment, or copies obtained at a nominal cost, at the offices of the Division of Water and Waste Management, 601 57th Street SE, Charleston, West Virginia 25304, Monday through Friday (except State holidays) between 8:00 a.m. to 4:00 p.m.

Requests for additional information should be directed to William Timmermeyer at (304) 926-0499, Extension 1336.