

# Guide For Municipal Stormwater Plans



2003



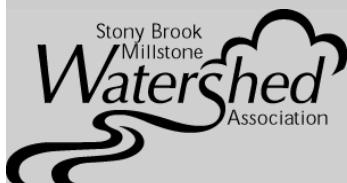
## General Principles for Stormwater Pollution Prevention (NJAC 7:8) specify to:

Develop strategies to prevent or minimize the impacts of stormwater runoff from land developments.

Replace the end-of-the pipe treatment of stormwater by a *prevent-minimize-mitigate* strategy.

Encourage environmental designs that minimize site disturbances and maintains existing drainage conditions.

Implement Best Management Practices (BMPs) to reduce runoff volume and reduce potential runoff pollutants.



31 Titus Mill Road  
Pennington NJ 08534  
Phone: 609-737-3735  
Fax: 609-737-3075  
[www.thewatershed.org](http://www.thewatershed.org)

Municipalities can help reduce flooding and erosion damage, reduce runoff pollution to streams, and improve water quality locally and for neighboring communities, by developing and implementing a Stormwater Management Plan. This guide describes how to develop a stormwater plan unique to your community. Developing this plan is only one of the State Basic Requirements (SBRs) outlined in the stormwater rules proposed by the New Jersey Department of Environmental Protection (NJDEP).

## Goals of Stormwater Management Planning (NJAC 7:8-2.2)

The NJDEP stormwater regulations provides authority for municipalities to develop stormwater management plans and stormwater ordinances, and the following planning goals should be incorporated into those local efforts:

1. Reduce flood damage, including damage to life and property;
2. Minimize any increase in stormwater runoff from new development;
3. Reduce soil erosion from developments or construction projects;
4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
5. Maintain groundwater recharge;
6. Prevent an increase in nonpoint pollution, such as fertilizers, pesticides, motor oils, and metals;
7. Maintain the integrity of stream channels for their biological functions and drainage;
8. Minimize pollutants in stormwater runoff from new and existing development in order to restore and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water;
9. Protect public safety through the proper design and operation of stormwater management basins.

## Develop a Stormwater Task Force

Stormwater management affects everyone, either on a personal level with a flooded basement, or publicly with localized flooding or polluted streams. To create a comprehensive plan, local officials *may consider* creating a diverse team to identify, collect and organize the appropriate data needs. This task force could involve public officials, members of town committees and boards, planners, engineers, neighborhood representatives, businesses, and the local watershed association.

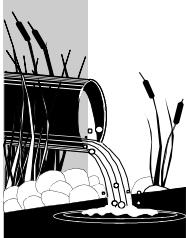
The stormwater plan is required to be adopted into the Master Plan, and reexamined every six years. Within one year after adopting the plan, a stormwater control ordinance should be adopted. The County is required to review and approve both the plan and the ordinance, before they are effective.

This guide provides an overview of state stormwater regulations and policies but is not comprehensive. For more detailed information please refer to the regulations, listed resources and websites on the back cover.

## Municipal Stormwater Management Plan and Elements

A Municipal Stormwater Management Plan shall incorporate the elements outlined below which are taken from the proposed stormwater rule section NJAC 7:8-4.2.

1. Describe how the municipal plan will achieve the *goals* of stormwater management planning (NJAC 7:8-2.2);
2. Include maps showing water bodies;
3. Map groundwater recharge areas and well head protection areas based on maps prepared by NJDEP (NJSA 58:11A-13) or a municipal ordinance;
4. Describe how the municipal plan incorporates design and performance standards (NJAC 7:8-5) or alternative standards adopted as a part of a *regional* stormwater management plan or Water Quality Management Plan;
5. Describe how long-term operation and maintenance (including replacement) of the selected stormwater measures will be ensured;
6. Describe how the plan will ensure compliance with Safety Standards for Stormwater Management Basins (NJAC 7:8-6).
7. Describe how the municipal plan is coordinated with stormwater ordinances and the appropriate Soil Conservation District, any other stormwater management plans, including any adopted *regional* stormwater management plan, prepared by any planning agency related to the same river basins or drainage areas.
8. Evaluate the extent to which the municipality's entire master plan (including the land use plan element), official map and development regulations (including the zoning ordinance) implement the non-structural stormwater management strategies (NJAC 7:8-5.3(b)). This evaluation shall also be included during the six year reexamination process of master plans.
9. Include a map of the municipality showing:
  1. Projected land uses assuming full development under existing zoning (build-out analysis);
  2. Estimate for each drainage area, defined as a hydrologic unit code 14 (HUC14) by the United States Geological Survey, a) the total acreage in the municipality of impervious surface and b) the associated future nonpoint source pollutant load assuming full build out of the projected land uses.
10. The municipality may elect to document that it has a combined total of less than one square mile of vacant or agricultural lands rather than provide the information required in 8 and 9 above. Agricultural lands may be excluded if the development rights to these lands have been permanently purchased or restricted by covenant, easement or deed. Vacant or agricultural lands in environmentally constrained areas may be excluded if the documentation also includes an overlay map of these areas. Document existing land use map of each parcel within the municipality, including: residential, commercial, industrial, agricultural, parkland, other public uses, semipublic uses, and vacant land.
11. When granting a variance or exemption from the stormwater design and performance standards (NJAC 7: 8-5), the municipal plan shall include a *Mitigation Plan* that identifies what measures are necessary to offset the potential problems. The stormwater *Mitigation* shall be completed within the drainage area, for the performance standard for which the variance or exemption was granted.
12. Include a copy of the proposed Municipal ***Stormwater Control Ordinance(s)*** that requires stormwater management measures and authorizes /implements the stormwater plan.



## Evaluating Relevant Stormwater Data

### Understand Land Use Changes and Their Impacts

Land use changes, such as the conversion of agricultural land or forests to urban development, can significantly influence stormwater runoff. One housing development can add acres of impervious surface area and greatly increase both the volume and velocity of runoff flowing into community streams. When impervious cover such as roofs, roads and parking lots exceeds 10% of an area, then water quality can become impaired by stormwater runoff. When impervious cover exceeds 30%, studies have documented impairments to water quality, aquatic diversity and habitat function. Thus it is important to identify trends in land use changes, which can be readily accomplished using GIS databases. Planners can also predict future land use changes by performing build-out analysis and identifying future stormwater concerns. Review the NJDEP Stormwater Best Management Practices (BMP) Manual to learn more about these impacts and innovative strategies, such as Low Impact Developments, to address these concerns. [www.state.nj.us/dep/watershedmgt/bmpmanual2003.htm](http://www.state.nj.us/dep/watershedmgt/bmpmanual2003.htm)



### Assess Local Stormwater Infrastructure

Communities differ significantly in the conveyance and management of stormwater runoff. Areas developed prior to 1980, before stormwater was regulated, typically rely only on street sewers for conveyance. Detention basins were constructed in recent developments and are designed to slow or detain runoff and the discharge to sewers and streams. However, continued downstream flooding and stream scouring are evidence that these measures are not sufficient. Municipal leaders can better understand where the systems are functioning well, and where improvements are needed by recording and mapping existing stormwater infrastructure.

- Identify the location of storm drains, sewers, outfalls, grassed swales, basins, and runoff ponds, and conveyance measures along municipal roads. Also identify discharge points into streams, rivers, wetlands, lakes, or the canal.
- Develop a table that outlines ownership and parties responsible for maintenance of these conveyance, storage and discharge facilities (it may not be the same party).
- Identify problem areas, such as neighborhoods or streets where flooding routinely occurs, and infrastructure that requires further assessment. Identify the storm events that caused these problems, e.g. 10 year storm or 100 year storm.
- Look for areas to implement non-structural stormwater controls, such as grassing roadside swales or disconnecting impervious surfaces to promote infiltration.

### Provide Public Education

*Public education is key to achieving the goal of reducing nonpoint pollution*, identified as stormwater goal #6. National and state studies indicate that more than *50% of pollution in our streams is dependent upon land uses and peoples actions*, such as: over fertilizing, extensive pesticide use, improper disposal of pet and animal waste, wildlife, car emissions, motor oils, and tire wear, etc. Therefore, to reduce these pollutants, the public needs to be better informed, and municipalities are required to assist in this effort. Public education of nonpoint pollution can be promoted through media campaigns on TV, radio, newspaper articles and advertisements, websites, flyers, brochures, community events, etc. The US EPA website provides several ideas to successfully promote nonpoint pollution concerns, and provides a variety of flyers, bookmarks, placemats, etc that can be replicated and distributed in your community. Visit the US EPA—NPS Solution Toolbox website: [www.epa.gov/owow/nps/facts/](http://www.epa.gov/owow/nps/facts/)



## Evaluate Local Drainage Patterns and Impacts to Streams

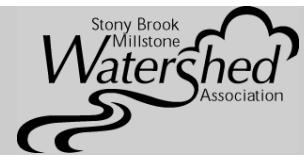
*A stormwater management planning agency shall consider the physical characteristics and the ecological resources of the planning area (NJAC 7:8-2.4).*

Each town is comprised of a unique combination of topographic features, soils, streams, lakes and various land uses, and each town must decide what data is most important to assess their drainage and stormwater issues. This section explains where to find useful data, and interpret it to prioritize stormwater concerns in your community.

The health of streams is a good indicator of whether stormwater runoff is being managed well or not. Mapping and assessing the health of streams is an effective way to both determine the recent impacts of stormwater runoff and identify specific areas that may require special attention when making future planning decisions.

A good place to start collecting data is the Conservation Element of the municipal Master Plan. Available data on topography, soils, floodplains, water quality, and infrastructure such as storm sewers, drainage basins, and outfalls, may be summarized here. The use of Geographic Information Systems (GIS) database information will greatly contribute to mapping this relevant information. The NJDEP website provides various statewide data layers, including an easily accessible GIS database for the general public at [www.nj.gov/dep/qis/imapnj/imapnj.htm](http://www.nj.gov/dep/qis/imapnj/imapnj.htm). For example:

- I identify all lakes, rivers, streams and tributaries as well as critical habitats, riparian areas, 100 yr flood plains, flood hazard areas and wetlands, and land uses near these water bodies, and stream corridors.
- I identify major physiographic features such as steep slopes, ridges, hills, or valleys, and soils that erode easily, or areas of ground water recharge, because topography, geology and soils affect drainage, runoff and erosion.
- During site visits record potential sources of impairments such as erosion, sewer outfalls, waste from pets or wildlife, algal blooms, or encroachments to riparian areas.
- Determine whether streams or lakes in your community are monitored by the NJDEP and whether they are impaired. This data is available in the *Integrated Report* published by NJDEP ([www.state.nj.us/dep/wmm/sqwqt/wat/integratedlist/integratedlist.htm](http://www.state.nj.us/dep/wmm/sqwqt/wat/integratedlist/integratedlist.htm)), and it may be summarized in specific reports for watershed areas, such as the reports for the Raritan Basin or Central Delaware Tributaries. Visit the NJDEP Watershed Management website to learn about your area [www.nj.gov/dep/watershed](http://www.nj.gov/dep/watershed). Local watershed association groups may also have independent data.
- I identify current and historic stream flow conditions (height) to evaluate flooding concerns. [http://water.usgs.gov/cgi-bin/daily\\_flow?nj](http://water.usgs.gov/cgi-bin/daily_flow?nj)
- Identify and rank stormwater issues based on how they affect public health and safety, water quality, and environmental conditions and habitats. This systematic data review will also lead to effective problem solving.



### Stormwater Planning Resources

Stony Brook-Millstone Watershed Association  
[www.thewatershed.org](http://www.thewatershed.org)

Association of NJ Environmental Commissions  
[www.ANJEC.org](http://www.ANJEC.org)

Central Delaware Tributaries  
[www.planningpartners.org/projects/past/wma11.html](http://www.planningpartners.org/projects/past/wma11.html)

Delaware Riverkeeper Network  
[www.delawareriverkeeper.org](http://www.delawareriverkeeper.org)

NJDEP Freshwater and Biological Monitoring  
[www.state.nj.us/dep/watershedmgt/bfbm/](http://www.state.nj.us/dep/watershedmgt/bfbm/)

NJDEP Stormwater  
[www.njstormwater.org](http://www.njstormwater.org)

NJDEP Stormwater BMP Manual  
[www.state.nj.us/dep/watershedmgt/bmpmanual2003.htm](http://www.state.nj.us/dep/watershedmgt/bmpmanual2003.htm)

NJDEP Watershed Management  
[www.state.nj.us/dep/watershedmgt/wma\\_index.htm](http://www.state.nj.us/dep/watershedmgt/wma_index.htm)

Natural Resources Conservation Service (NRCS)  
[www.nrcs.usda.gov/programs/](http://www.nrcs.usda.gov/programs/)

Raritan Basin Watershed Management Project  
[www.raritanbasin.org/](http://www.raritanbasin.org/)

Rutgers Cooperative Extension  
[www.rce.rutgers.edu](http://www.rce.rutgers.edu)

Soil Conservation Districts of NJ  
[www.state.nj.us/agriculture/rural/natrsrc.htm](http://www.state.nj.us/agriculture/rural/natrsrc.htm)

Ten Towns Great Swamp Watershed Management Committee  
[www.tentowns.org](http://www.tentowns.org)

The GIS Center  
[www.giscenter.org](http://www.giscenter.org)

The Stormwater Center  
[www.stormwatercenter.net/](http://www.stormwatercenter.net/)

US EPA –NPS Solution Toolbox  
[www.epa.gov/owow/nps/facts/](http://www.epa.gov/owow/nps/facts/)