3.4 Post Construction Stormwater Management in New Development and Redevelopment

Post construction stormwater management in new development and redevelopment is a component of the minimum control measures at 40 CFR 122.34. The regulatory standards ensuring that the stormwater measures of such developments are properly designed, constructed and thereafter maintained lie largely in the Stormwater Management rules (N.J.A.C. 7:8), which are incorporated as part of the overall federal municipal stormwater program consistent with 40 CFR 122.34(c). The Post Construction Stormwater Management in New Development and Redevelopment Statewide Basic Requirement (SBR) states that the Tier A Municipality must develop, implement and enforce a program that addresses stormwater runoff from certain new development and redevelopment projects that discharge into the Tier A Municipality's MS4. Below is a summary table of the minimum standards, measurable goals and implementation schedule of this SBR. See Part IV of the Tier A MS4 NJPDES permit for specific requirements.

Post Construction in New Development and Redevelopment SBR			
		Implementation Schedule	
Minimum Standard	**Measurable Goal**	**Existing Permittees**	**New Permittees**
Develop, update, implement and enforce its post construction stormwater management program in new development and redevelopment to ensure compliance with the Stormwater Management rules (N.J.A.C. 7:8).	Certify Annually. Keep records or reference their location in the SPPP.	January 1, 2018	January 1, 2018
For each structural and non-structural stormwater measure (basins), for which an application is made to the municipality after January 1, 2018, the municipality shall complete, update, finalize and maintain a Major Development Stormwater Summary form.	Certify Annually. Keep records or reference their location in the SPPP.	January 1, 2018	January 1, 2018

Note: EDPA means effective date of permit authorization.

Introduction

Land development can have severe adverse stormwater impacts, particularly if the land is converted from woods, meadow, or other natural condition to a highly disturbed area with large percentages of impervious and non-native vegetated covers. Such impacts typically include an increase in stormwater runoff volume, rate, velocity, and pollutants and a corresponding decrease in the quality of runoff and stream flow. Frequently, management of these impacts has focused on collecting and conveying the runoff from the entire site through a structural conveyance system to a centralized facility (e.g., detention basin, wet pond) where it is stored and treated prior to discharge downstream. In effect, such practices first allow the adverse runoff impacts to occur throughout the site and then provide remedial and/or restorative measures immediately prior to releasing the runoff downstream. However, a more effective approach to manage stormwater is to reduce the runoff source and manage the stormwater close to the source generating the runoff. This close-to-the-source approach often requires the implementation of nonstructural strategies, low impact development or green infrastructure on site, at a location close to the impervious surface that generates the runoff, before the stormwater runoff becomes concentrated. This approach of managing and retaining the stormwater from a development site will minimize the flow of stormwater and the pollutant loading into the Tier A Municipality's MS4 and the surface waters within the municipality's watershed.

The municipal post construction stormwater management program created to comply with this SBR is aimed to manage those issues caused by the stormwater runoff from new development and redevelopment. The post construction stormwater management program requires the Tier A Municipalities to manage the issue from an overall planning viewpoint with detailed implementation of effective measures, followed by enforcement to ensure the implementation of the stormwater control ordinances and maintenance of those measures.

Statewide Basic Requirements

Minimum standards for post construction stormwater management in new development and redevelopment are listed in Part IV.B.4 of the Tier A MS4 NJPDES permit. The Tier A municipality must demonstrate compliance with the minimum standards, as discussed below, by meeting the measurable goals found on Page 5. The implementation schedule to be followed is found in the attachment A and A-1 of the Tier A MS4 NJPDES permit and the implementation schedule portion of the Table on Page 1 of this Chapter.

Minimum Standards

Tier A Municipalities must refer to their Tier A MS4 NJPDES permit authorization for the exact language of the minimum standards. Explanations or examples are provided here to enable the Tier A Municipality gain a better understanding of the permit requirements.

Part IV.B.4.a of the Tier A MS4 NJPDES permit requires the Tier A Municipality develop, update, implement and enforce a stormwater management program to address post construction stormwater runoff in new development and redevelopment and to ensure compliance with the Stormwater Management rules at N.J.A.C. 7:8 et seq.

The Stormwater Management rules require developers for major development to minimize the impacts of development on water quality, flooding and groundwater recharge. The water quality, water quantity and groundwater recharge design and performance standards set forth in the Stormwater Management rules are intended to provide water quality treatment for total suspended solids (TSS) and nutrients, prevent increases in flooding and erosion, and prevent the depletion of aquifers and base flow of watercourses, respectively.

The Stormwater Management rules also set forth the required components of Municipal Stormwater Management Plans (MSWMP), regional stormwater management plans and stormwater control ordinances. Furthermore, the Stormwater Management rules provide information and procedures for the adoption and implementation of stormwater management plans and ordinances. As an integral part of a municipality's master plan, the MSWMP details the municipality's strategy, measures and process to manage post construction stormwater runoff from new development and redevelopment to ensure compliance with N.J.A.C. 7:8. The MSWMP is a significant component of the Stormwater Pollution Prevention Plan (SPPP), which is a requirement under the Tier A MS4 NJPDES permit and is consistent with the written stormwater management program document required by 40 CFR 122.34(b).

As required by Part IV.B.4.b of the Tier A MS4 NJPDES permit, major development projects subject to the post construction program are new development and redevelopment projects that disturb one acre or more, including projects that disturb less than one acre and are part of a larger common plan of development or sale (e.g., phased residential development) that ultimately disturbs more than one acre. Types of developments subject to the post-construction program include residential and nonresidential developments. Additionally, municipal developments, such as municipal complexes and municipal roadways that meet the definition of major development, are subject to the requirements of the post construction program.

Part IV.B.4.b of the Tier A MS4 NJPDES permit sets forth minimum requirements for the types and size of developments that are considered major development and thus are subject to the post construction program. However, the Tier A Municipality may adopt a stormwater control ordinance(s) that require(s) more projects to comply with the municipal post construction program; for example, a Tier A municipality may reduce the disturbance threshold from one acre to one-half acre or add a requirement that projects resulting in an increase in impervious surface more than one quarter-acre, regardless the size of disturbance, would be subject to the post construction program.

To comply with the minimum standards, each Tier A municipality must develop and adopt a municipal stormwater management plan (MSWMP) and a municipal stormwater control ordinance (SCO) in accordance with Part IV.B.4.c, e, f, and g of the Tier A MS4 NJPDES permit. For non-residential developments, at a minimum, the SCO must require compliance with design, performance, safety, and maintenance standards set forth at N.J.A.C. 7:8. For residential development, the SCO must also ensure that any residential development and redevelopment projects that are subject to the Residential Site Improvement Standards (RSIS) for stormwater management (N.J.A.C. 5:21-7) comply with those standards, including any exception, waiver, or special area standard that was approved under N.J.A.C. 5:21.

As stated in Part IV.B.4.l of the Tier A MS4 NJPDES permit, the Stormwater Management rules (N.J.A.C. 7:8) and the Residential Site Improvement Standards for stormwater management (N.J.A.C. 5:21-7), independently and as implemented in the permit, apply to all areas of the Tier A Municipality. Therefore,

the SCO must apply to all areas of the municipality. For example, a major development in an area of the municipality with no storm sewer system or with a combined storm sewer system still must comply with the stormwater control ordinance.

The stormwater control ordinance was originally required in the 2004 Tier A MS4 NJPDES permit, so it is likely that existing Tier A Municipalities have completed this requirement. In order to ensure that a municipality keeps its ordinances up-to-date (with this permit or with any legislative or regulatory changes that occur outside of this permit), this MS4 permit includes a requirement at Part IV.A.3.e requiring the permittee to modify its stormwater program within one year of any notification by the Department that such a change is necessary, which is consistent with the requirements at N.J.A.C. 7:8-4.3(c) and 4.5. Any such notification from the Department would be under separate cover from this permit. Also, the Tier A Municipality must review and adopt necessary changes to the MSWMP when the municipal master plan is under reexamination. Failure to reexamine and, if necessary, to update and readopt the MSWMP and SCO are violations of the permit conditions.

Required by Part IV.B.4.d of the Tier A MS4 NJPDES permit, the Tier A municipality must review and analyze development applications for compliance with the SCO even if a separate permit is required by the Department for the same or similar activity (e.g. a Land Use permit). A Tier A Municipality may not waive or skip any post construction program reviews, but may consult with the Department for consistency and efficiency purposes. To aid in these reviews, the Department developed the New Jersey Stormwater Best Management Practices (BMP) Manual, which is available at http://www.nj.gov/dep/stormwater/bmp_manual2.htm and online training programs, which are available at http://www.nj.gov/dep/stormwater/training.htm. There are mandatory training requirements for individuals that review stormwater management and governing body board members (see the stormwater training section of *Chapter 3.5: Pollution Prevention/Good Housekeeping For Municipal Operators*). Municipal planning board members, municipal engineers, and individuals reviewing stormwater management should also review the other available courses, New Jersey Stormwater BMP Manual, and the respective SCO to have a full understanding of the design, performance, safety and maintenance standards.

Part IV.B.4.h of the Tier A MS4 NJPDES permit and the Stormwater Management rules at N.J.A.C. 7:8-4.6 allow municipalities to grant a variance or exemption from the design and performance standards for stormwater management measures only if the municipality has a mitigation plan included in an approved MSWMP and SCO. The mitigation plan must ensure that mitigation is completed within the drainage area and for the performance standard for which the variance or exemption was granted. For this reason, it would be helpful for the Tier A municipality to have, in advance, an index of, or otherwise identified, mitigation projects for each drainage area within the municipality so that projects receiving exemptions or variances may take advantage of such mitigation projects to offset the deficits created by the granting of the variance or exemption, provided the projects are within the same drainage area. In the event that a variance or exemption is granted, the municipality is required to submit a written report to the county review agency, and the Department, describing the variance or exemption, as well as the required mitigation, within 30 days after the grant of a variance or exemption. Guidance for the development of municipal mitigation plans is available at http://www.nj.gov/dep/stormwater/pdf/munimitipplan030706.pdf.

In accordance with Part IV.B.4.k of the Tier A MS4 NJPDES permit, the Tier A municipality must complete, update, finalize and maintain a Major Development Stormwater Summary form for each of the major

development projects reviewed by the municipality The person completing Major Development Stormwater Summary form may include any individuals that review stormwater management designs for development and redevelopment projects on behalf of the municipality; this task is typically performed by a municipal engineer. The Major Development Stormwater Summary form is posted on the Department's website at www.nj.gov/dep/dwq/tier_a_forms.htm, as well as in the Attachment D of the permit.

Part IV.B.4.j of the Tier A MS4 NJPDES permit requires a Tier A Municipality to ensure adequate long-term cleaning, operation and maintenance of stormwater management measures owned or operated by the Tier A Municipality, as well as those not owned or operated by the Tier A Municipality. Proper operation and maintenance of stormwater facilities is inexorably tied to post construction stormwater management, as failure to maintain stormwater facilities will reduce their long-term benefits and undermine the goals of the post construction requirements. For example, stormwater detention basins that are not properly maintained as designed could exacerbate flooding, resulting in decreased water quality treatment and damage that can be difficult and costly to repair and clean up. To help promote long-term maintenance of BMPs, the Tier A MS4 NJPDES permit specifies and clarifies maintenance requirements related to municipally owned and operated stormwater facilities, as well as stormwater facilities not owned or operated by the municipality. These changes require the Tier A Municipality to maintain a log sufficient to demonstrate compliance with the Minimum Standards for Stormwater Facility Maintenance. For stormwater management facilities owned or operated by the Tier A Municipality, more specific standards are set forth in Part IV.C.1.a of the Tier A MS4 NJPDES permit, under which the Tier A Municipality is required to perform the maintenance and ensure proper function and operation of the stormwater facilities. For stormwater management facilities not owned or operated by the Tier A Municipality, (e.g. by private homeowner associations), the Tier A Municipality must develop, update, implement and enforce a program to ensure the adequate long-term cleaning, operation and maintenance of stormwater facilities is performed by those private entities, as required in Part IV.C.1.b of the Tier A MS4 NJPDES permit. Guidance on meeting the maintenance requirements of the Tier A MS4 NJPDES permit is available in *Chapter 4.1: Stormwater Facilities Maintenance* and at http://www.nj.gov/dep/stormwater/maintenance_guidance.htm.

Part IV.B.4.i of the Tier A MS4 NJPDES permit requires Tier A Municipalities to enforce the Design Standards for Storm Drain Inlets in Attachment C of the permit to control passage of solid and floatable materials through storm drain inlets publicly or privately installed. Guidance for Solids and Floatable Control is contained in Chapter 3.5 of this guidance document.

Part IV.B.4.m and Part IV.B.4.n of the Tier A MS4 NJPDES permit direct existing permittees and new permittees to implement the minimum standards in accordance with the schedules listed in Attachment A and Attachment A-1 of the permit, respectively, which may be found online with the Tier A Municipal General Permit at http://www.nj.gov/dep/dwq/tier_a.htm.

Measurable Goals

Tier A Municipality must certify in each annual report that it has developed and is implementing and enforcing a program to address stormwater runoff from new development and redevelopment projects. Additionally, the Tier A permittee must certify in each annual report that Major Development Stormwater Summary forms (Attachment D in the Tier A MS4 NJPDES permit) have been completed and records have been maintained by the Tier A municipality. Records demonstrating compliance with Part IV.B.4 of the Tier A MS4 NJPDES permit must be kept, or their location referenced, in the SPPP.

Implementation Schedule

Refer to the table listing the Measurable Goals and Implementation Schedule found on Page 1 of this Chapter.

Additional Information

Municipal Stormwater Management Plan (MSWMP)

As previously mentioned, the Tier A Municipality should already have developed and adopted a MSWMP in accordance with N.J.A.C. 7:8-4. The MSWMP must address groundwater recharge, stormwater quantity and stormwater quality impacts by incorporating stormwater design and performance standards for new major developments. While N.J.A.C. 7:8 has defined major development as projects that disturb one or more acre of land, any municipality that has lowered the threshold for major development must acknowledge that in their MSWMP. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity, as well as the loss of groundwater recharge that provides baseflow for receiving water bodies. The MSWMP describes long-term operation and maintenance measures for existing and future stormwater facilities. A "build-out" analysis based upon existing zoning and land available for developments must be part of the MSWMP. The MSWMP must also address the review and update of existing ordinances, the Township Master Plan and other planning documents to allow for project designs that include low impact development techniques. The final component of this MSWMP is a mitigation strategy (as discussed above) for those instances in which a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures and locations are identified to lessen the impact of existing development.

Goals

The goals of an MSWMP are to:

- Reduce flood damage, including damage to life and property;
- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges and other instream structures;
- Maintain groundwater recharge;
- Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- Minimize pollutants in stormwater runoff from new and existing development in order to restore, enhance 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; and
- Protect public safety through the proper design and operation of stormwater management basins.

To achieve these goals, an MSWMP must specify stormwater design and performance standards for new development and redevelopment. Additionally, a MSWMP must include stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies must be included in the MSWMP to ensure long-term effectiveness of stormwater management facilities. The MSWMP also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

Required Elements

According to the requirements in N.J.A.C. 7:8- 4.2, an MSWMP must do the following, at a minimum:

- Describe how the MSWMP will achieve the goals of stormwater management planning set forth at N.J.A.C. 7:8-2.3;
- Include maps showing water bodies based on Soil Surveys published by the U.S. Department of Agriculture; the U.S. Geological Survey Topographic Map, 7.5 minute quadrangle series or other sources of information depicting water bodies in similar or greater detail;
- Map groundwater recharge areas and well head protection areas based on maps prepared by the Department under N.J.S.A. 58:11A-13 or a municipal ordinance;
- Describe how the MSWMP incorporates design and performance standards in N.J.A.C. 7:8-5 or alternative design and performance standards adopted as a part of a regional stormwater management plan or water quality management plan;
- Describe how adequate long-term operation as well as preventative and corrective maintenance (including replacement) of the selected stormwater management measures will be ensured;
- Describe how the MSWMP will ensure compliance with Safety Standards for Stormwater Management Basins at N.J.A.C. 7:8-6;
- Describe how the MSWMP is coordinated with the appropriate Soil Conservation District and any other stormwater management plans, including any adopted regional stormwater management plan, prepared by any stormwater management planning agency related to the river basins or drainage areas to which the plans and/or ordinances apply;
- 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 principles expressed in N.J.A.C. 7:8-5.3(b). This evaluation must also be included (with updating as appropriate) in the reexamination report adopted under N.J.S.A. 40:55D-89;
- Include a map of the municipality showing:
    - □ Projected land uses assuming full development under existing zoning; and
    - □ The hydrologic unit code 14 (HUC 14) drainage areas as defined by the United States Geological Survey and an estimate, for each HUC 14 drainage area, of the total acreage in the municipality of impervious surface and associated future nonpoint source pollutant load assuming full build out of the projected land uses;

- At the option of the municipality, document that it has a combined total of less than one square mile of vacant or agricultural lands rather than provide the evaluation of the master plan and the map described in the two bullets 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 at the same scale as the map described below.
    - □ Documentation must include an existing land use map at an appropriate scale to display the land uses of each parcel within the municipality. Such a map must display the following land uses: residential (which may be divided into single family, two-to-four family and other multi-family), commercial, industrial, agricultural, parkland, other public uses, semipublic uses and vacant land.
- In order to grant a variance or exemption from the design and performance standards in N.J.A.C. 7:8-5 et seq., include a mitigation plan that identifies what measures are necessary to offset the deficit created by granting the variance or exemption. The mitigation plan must ensure that mitigation is completed within the drainage area and for the performance standard for which the variance or exemption was granted;
- Include a copy of the recommended implementing stormwater control ordinance(s) requiring stormwater management measures; and
- The MSWMP may also include a stream corridor protection plan to address protection of areas adjacent to waterbodies.

The detailed requirements for a Municipality to prepare, adopt and effectuate a Stormwater Management Plan are found at N.J.A.C. 7:8-4.3 and 4.4. The Department also has prepared a sample MSWMP as Appendix C of the BMP Manual available at http://www.nj.gov/dep/stormwater/bmp_manual2.htm.

Municipal Stormwater Control Ordinance(s)

Municipal Stormwater Control Ordinances provide the legal foundation for implementing the MSWMP, including design standards, development review procedures, inspections, maintenance and enforcement. The Tier A Municipality is required to adopt a Municipal Stormwater Control Ordinance(s). As local regulation(s), the ordinance(s) must have political support, and this often involves garnering public support through education and outreach efforts.

The minimum requirements for major developments to be regulated under the Municipal Stormwater Control Ordinance(s) include:

- New development and redevelopment projects that disturb one acre or more and are not operated by the municipality (e.g., retail stores, residential complexes);
- New development and redevelopment projects that disturb one acre or more and are operated by the municipality itself (e.g., a town complex); and

- All new development and redevelopment projects that are less than one acre that are part of a larger common plan of development or sale.

Please note that municipalities can adopt definitions of major developments that include more projects than the minimums listed above.

For nonresidential developments, the Tier A Municipality must adopt a Municipal Stormwater Control Ordinance(s) incorporating the requirements set forth in N.J.A.C. 7:8 as a minimum. The Tier A Municipality is encouraged to adopt more stringent Municipal Stormwater Control Ordinance(s), such as incorporating 0.25 acre of new impervious surface into the definition of major development, or increasing the design and performance standards to address local conditions, such as a TMDL.

For residential developments, the Tier A Municipality must review the proposed development in accordance with the stormwater management subchapter of the Residential Site Improvement Standards at N.J.A.C. 5:21-7. However, the Residential Site Improvement Standards refer to N.J.A.C. 7:8-5 and 6 for the design and performance standards (water quality, water quantity and groundwater recharge) as well as the maintenance requirements. Therefore, projects subject to the Residential Site Improvement Standards should be reviewed for compliance with N.J.A.C. 7:8-5 and 6.

The Department has prepared a model Municipal Stormwater Control Ordinance as Appendix D of the New Jersey Stormwater BMP Manual available at http://www.nj.gov/dep/stormwater/bmp_manual/NJ_SWBMP_D.pdf. In addition, the Department also prepared a Municipal Regulations Checklist to assist municipalities in incorporating nonstructural stormwater management measures into the master plan, land use and zoning ordinances. The checklist is available at http://www.nj.gov/dep/stormwater/bmp_manual/NJ_SWBMP_B.pdf.

Review and Analyze Stormwater Management of a Development Application

The Tier A Municipality must review and analyze development applications for compliance with its SCO for nonresidential major developments and the Residential Site Improvement Standards (N.J.A.C. 5:21) for residential major developments. The Tier A Municipality must be cautious in granting exemptions and variances in its reviews. According to N.J.A.C. 7:8 et seq. only a few exemptions and variances can be granted under strict, limited conditions without a mitigation plan. Here is a list of the exemptions and variances:

- The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity and stormwater runoff quality requirements per N.J.A.C. 7:8-5.4 and 5.5:
    - The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;
    - The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and
    - The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.

- The following discharge is exempt from the TSS removal requirement:

  - □ The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement.
  - □ This exemption does not apply to the discharge of stormwater into a combined sewer system where the overflow in wet weather conditions will cause discharge of untreated stormwater runoff into the waterbodies.
  - □ Therefore, a major development, new or redeveloped, that discharges stormwater runoff into the sewer system is still required to treat the stormwater runoff discharge to 80% TSS removal rate before discharging into the sewer.

- The exemption from the groundwater recharge requirement in Urban Redevelopment Area can be granted only to *previously developed* portions of the areas within:

  - □ delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
  - □ CAFRA Centers, Cores or Nodes; or
  - □ Urban Enterprise Zones and, or Urban Coordinating Council Empowerment Neighborhoods.

  Furthermore, if a development site has developed portions (such as building, gravel pavement, constantly mowed lawn) and undeveloped portions (such as wooded area or overgrown vegetated area), *only the developed portion qualifies* for the exemption. The undeveloped portion still must comply with the groundwater recharge standard if the proposed development or redevelopment will change the undeveloped portion to a different land cover.

- The exemption from the groundwater recharge requirement for areas of high pollutant loading or industrial stormwater exposed to "source material" is as follows:

  This exemption applies only to the portion of a development that will have stormwater runoff that is exposed to high pollutant loadings, including areas where groundwater recharge would be inconsistent with a remedial action or stormwater runoff would be exposed to industrial source material. This exemption applies only to the runoff from those areas; stormwater generated from other portions of the development are still be subject to groundwater recharge requirements.

- The exemption from the water quantity requirement is limited as follows:

  In tidal flood hazard areas, stormwater runoff quantity analyses are only required if the increased volume of stormwater runoff could increase flood damages below the point of discharge. This exemption applies only when the discharge of the stormwater runoff from the development is directly affected by the tidal effect. This exemption does not apply to the situation where the stormwater discharges into an upstream tributary or a sewer system in a tidal flood hazard area.

- The exemption from the safety standards is limited as follows:

  A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

- Variances or exemptions from the design and performance standards in N.J.A.C. 7:8-5 may only be granted if all of the following requirements are met:

  - □ In order to grant variances or exemptions from its Municipal Stormwater Control Ordinance(s), other than those abovementioned exemptions by rules, the Tier A municipality must have adopted a mitigation plan that identifies what measures are necessary to offset the deficit created by granting the variance or exemption as part of its Municipal Stormwater Management Plan;
  - □ The Tier A municipality must require mitigation, in accordance with the mitigation plan, to offset the deficit created by granting the variance or exemption;
  - □ The Tier A municipality must ensure that mitigation is completed within the drainage area and for the performance standard for which the variance or exemption was granted; and
  - □ The municipality must submit a written report to the county review agency and the Department describing the variance or exemption and the required mitigation within 30 days of granting of a variance or exemption.

Effective Review Process

The Tier A Municipality must incorporate the Municipal Stormwater Control Ordinance(s) and MSWMP into the review of proposed new development and redevelopment projects seeking approval through process authorized by Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq. In order to conduct an effective review of the proposed stormwater management system at a development site, the municipal officials who participate in the approval process, including the planning board members and the municipal engineers, must familiarize themselves with the Municipal Stormwater Management Plan, Municipal Stormwater Control Ordinance(s), the Residential Site Improvement Standards, and the Stormwater Management rules.

A review of the stormwater management design involves the following steps at a minimum:

1. Examination of the existing and proposed site conditions to verify whether the development is subject to the Stormwater Control Ordinance(s).

2. Examination of the hydraulic, hydrologic, and geographic conditions of the development site, such as land use cover, topography, flooding history, and discharge point(s).

3. Examination of proposed stormwater management measures:

   - A determination is made as to whether the proposed stormwater management measures first incorporate nonstructural strategies to meet the design and performance standards to the maximum extent practicable. The nine nonstructural strategies must be adopted in the municipality's Stormwater Control Ordinance(s). They can be also found in N.J.A.C. 7:8-5.3. The Department has prepared a Low Impact Development Checklist that provides information to assist reviewers and designers in demonstrating that nonstructural stormwater management

measures have been implemented in a project. The checklist is available online from the Department at http://www.nj.gov/dep/stormwater/bmp_manual/NJ_SWBMP_A.pdf; and

- After incorporating the nonstructural strategies, a determination is made to ascertain whether the proposed development still requires structural measures in order to meet the design and performance standards for water quality, quantity and groundwater recharge.

4. Examination of whether the proposed structural measures follow the design and performance standards as well as the best management practices required in the Municipal Stormwater Control Ordinance(s), the Residential Site Improvement Standards and the Stormwater Management rules. The Department provides the New Jersey Stormwater BMP manual to guide the detailed designs of stormwater management measures. The municipality's review engineers must be familiar with the design guidelines in order to perform an effective review. The New Jersey Stormwater BMP Manual is available at http://www.nj.gov/dep/stormwater/bmp_manual2.htm.

5. Examination of whether a maintenance plan is proposed and meets the requirements in the Municipal Stormwater Control Ordinance(s). There are specific requirements to prepare a maintenance plan, provide the information of the party responsible for the maintenance and the legal step to record the maintenance plan on the deed.

Enforcement of the Municipal Stormwater Control Ordinance(s)

Enforcement of the Municipal Stormwater Control Ordinance(s) is critical to a successful post-construction program. The Municipal Stormwater Control Ordinance(s) should provide compliance and enforcement tools for different violation circumstances. Enforcement should be involved in all stages of the Post-construction Stormwater Management Program.

1. Enforcement of Stormwater Control Ordinances – Design and Approval Stage

   Enforcement of the Municipal Stormwater Control Ordinance(s) can start as early as the beginning of the approval process of the proposed development. It is solely the responsibility of the municipal officials and employees to know the municipality's Stormwater Control Ordinances and strictly follow the ordinances. The municipality should use the New Jersey Stormwater BMP manual to guide their review. In order to ensure municipal review of proposed development is in compliance with the Municipal Stormwater Control Ordinances, the Department has begun conducting compliance assistance audits of municipalities' stormwater programs.

2. Enforcement of Stormwater Control Ordinances – Operation and Maintenance Stage

   The ordinance should be clear about who is responsible for conducting inspections—the responsible party, such as a local government department—and the type and frequency of reporting that must be submitted by the applicant.

   Inspection language should establish authority for local program staff to access sites and carry out any enforcement actions. More sophisticated programs might provide for a system of private certified inspectors that receive training and certification from the municipality's stormwater program and inspect sites on behalf of responsible parties.

Various options to seek compliance should be established in the Municipal Stormwater Control Ordinances to allow flexibility for different circumstances. The Tier A Municipalities should have

ordinances that allow the municipality to put a stop to construction work if corrective actions are necessary and also allow the municipality to back charge the maintenance cost that the municipality has performed for the responsible parties that are delinquent of maintenance of their stormwater management measures.

Recommendations

Maintenance Guidance

The Department has developed maintenance guidance, available on line at http://www.nj.gov/dep/stormwater/maintenance_guidance.htm, which is intended to assist design engineers and responsible parties in complying with the maintenance requirements for stormwater management measures. The maintenance guidance includes a template of a maintenance plan, 14 templates of field manuals and checklists for various BMPs, and a template of an inspection and maintenance log. The inspection and maintenance logs are a tool for collection of the maintenance records. Moreover, the maintenance guidance may also be used in any of the following ways:

- Municipal officials reviewing the developer's maintenance plan may also use the available maintenance guide as a tool during their review;
- Municipal officials inspecting the operation and maintenance of the stormwater management measures may also use the maintenance guidance as a tool during inspection;
- The maintenance plan template can be utilized by the municipal officials as a reference to check whether the maintenance plan submitted by the developer meets the requirements;
- Municipal officials may also direct the design engineer of the stormwater management measures to use the maintenance template for easy compliance of the requirements; and
- The field manual and checklist may be used by the municipal inspector for field inspection as well as by the responsible party as a self-inspection tool.

Review Checklist

The Checklist found on the following pages provides municipal officials or persons reviewing stormwater management measures a checklist to conduct a systematic and organized review. The checklist is not meant to be all inclusive but is open to be edited to meet specific requirements set forth in the Stormwater Control Ordinances and the MSWMP.

Checklist for Conducting Stormwater Management Reviews	
Information	**Check/ Comments**
1. Existing Site Conditions	
a. Identify existing drainage areas with the flow paths and specific hydrologic features, such as depression areas or ponds that detain stormwater runoff.	
b. Identify existing discharge point(s) of the site.	
c. Identify existing land cover with the lowest runoff potential in the past five years.	
d. Use Soil Survey information to identify the Hydrologic Soil Groups of the soils on site (or on-site soil testing, if available).	
e. Identify impaired waters and TMDLs, and identify the parameters for which those waters are impaired or for which the TMDL was adopted.	
2. Proposed site conditions	
a. Identify proposed disturbance and impervious surfaces.	
b. Identify proposed drainage area, flow paths, grading, sewers and slopes.	
c. Determine if the proposed drainage areas converge on-site or are diverted to different discharge points.	
d. Identify water quantity requirements and the compliance method the design engineer chose.	
e. Identify water quality requirements: any increase of impervious surface, redeveloped impervious surface, lost water quality treatment or features.	

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Checklist for Conducting Stormwater Management Reviews (*cont'd.*)	
Information	**Check/ Comments**
3. Review of Soil Testing Report	
a. Determine if the soil test was performed and reported in accordance with Appendix E, Soil Testing Criteria, of the New Jersey Stormwater BMP Manual.	
b. Identify if the seasonal high water table was determined by direct observation during the months of January through April or by mottling during any time of year.	
c. Determine if the soil borings and profile pits were conducted at the location of infiltration BMPs.	
d. Determine if the depth of the soil boring and permeability rate was conducted at the greater of 8 feet from the lowest point in the basin, or twice the maximum water depth in the basin.	
e. Determine if the method to determine permeability rate is permitted in the Appendix E Soil Testing Criteria.	
f. Verify whether the soil designation from the Soil Survey is consistent with the soil testing result. If not, the adjust the HSG soil designation used in calculation of the quantity of the runoff.	
4. Review of Calculation of Runoff Volume and Peak Flow	
a. Review the applicability of the selected modelling method.	
b. Review the modelling parameters for pre- and post-constructions, such as the runoff coefficient, curve number, time of concentration, and HSG soil designation.	
c. Identify if the runoff from impervious and pervious surfaces are calculated separately and not with a weighted average of the CN numbers for impervious surface and pervious surface.	
d. Determine if the curve number selection makes sense.	

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Checklist for Conducting Stormwater Management Reviews (*cont'd.*)	
Information	**Check/ Comments**
4. Review of Calculation of Runoff Volume and Peak Flow (continued)	
e. Determine if the method to determine permeability rate is permitted in the Appendix E Soil Testing Criteria.	
f. Verify whether the soil designation from the Soil Survey is consistent with the soil testing result. If not, the adjust the HSG soil designation used in calculation of the quantity of the runoff.	
5. Review of Water Quality Requirement	
a. Determine if drainage areas having separate discharge points (identified in Step 2 above) are all proposed to be treated to 80% TSS removal.	
b. Determine if the untreated, clean, roof runoff is mixed with roadway/parking area runoff before flow into a BMP. If so, the volume of clean, roof runoff must be also considered with the volume of roadway/parking area runoff.	
c. Identify if any BMPs in series are in order of ascending TSS removal.	
d. If a BMP with extended detention is used, determine if the detention time is calculated properly.	
e. Identify the nonstructural strategies and BMPs that can reduce the nutrient load to the maximum extent feasible. Typical phosphorous and nitrogen removal rates for BMPs are available in Table 4.2 of Chapter 4 of the BMP Manual.	
6. Review of Water Quality Requirement	
a. Identify the extent of the site that has been previously developed, if the applicant claims the Urban Redevelopment Area exemption of groundwater recharge. The definition of "previously developed area is available at DEP's Stormwater Management Rule FAQs.	

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Checklist for Conducting Stormwater Management Reviews (*cont'd.*)	
Information	**Check/ Comments**
6. Review of Water Quality Requirement (continued)	
b. Determine if the stormwater runoff is from the area of high pollutant loading or if the stormwater is exposed to industrial source material that must not be recharged.	
c. Apply the presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition unless the applicant can demonstrate other hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application.	
d. Determine if the design engineer has assessed the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts.	
7. Review of the BMP design	
a. Review the BMPs chosen with their respective chapters in the New Jersey Stormwater BMP Manual to ensure they match the design.	
b. Determine if the BMPs have adequate separation from the seasonal high water table and are proposed in areas with sufficient infiltration rates.	
c. Review the details of the proposed BMPs to ensure they match the submitted model, they match the design in the New Jersey Stormwater BMP Manual, and the safety requirements in the SCO, RSIS, and/or Stormwater Management rule.	
d. If infiltration BMPs are used, determine if a groundwater mounding analysis is provided. If not, it must be requested. This analysis must show that the BMP will drain in less than 72 hours and will not adversely affect any nearby structures.	
8. Maintenance Plan	
a. Identify if the maintenance plan includes the contact information of the responsible party including name, address and telephone number.	

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Checklist for Conducting Stormwater Management Reviews (*cont'd.*)	
Information	**Check/ Comments**
8. Maintenance Plan (continued)	
b. Identify if the responsible party is an individual homeowner in a multiple-lot development. Assigning maintenance responsibilities to an individual homeowner shall not be permitted.	
c. Identify if the maintenance plan has the required specific preventive and corrective maintenance tasks and schedules, including: □ repairs or replacement to the structure; □ removal of sediment, debris or trash; □ restoration of eroded areas; □ snow and ice removal; □ fence repair or replacement; □ restoration of vegetation and repair or replacement of non-vegetated linings; and □ cost estimates, including estimated cost of sediment, debris, or trash removal.	
d. Determine if the developer has recorded the maintenance plan with the county clerk's office. If this is required as a condition of approval, follow-up is necessary.	
9. Complete Permit Attachment D – Major Development Stormwater Summary	
a. Document all structural and non-structural stormwater measures on the Major Development Stormwater Summary form (as posted on the Department's website www.nj.gov/dep/dwq/tier_a_forms.htm). b. Each form has space for up to four stormwater measures/BMPs. Please complete additional forms as needed to document all stormwater measures included in each major development project. c. Update this form during installation and finalize once the certificate of occupancy is issued. d. Maintain the completed form(s) and make available to the Department upon request.	