NEPONSET RIVER WATERSHED ASSOCIATION

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March 30, 2010

Ms. Thelma Murphy
U.S. EPA Region 1
Murphy.Thelma@epa.gov

RE: Proposed General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts North Coastal Watersheds

Dear Ms. Murphy:

The Neponset River Watershed Association (NepRWA) would like to submit the following comments on the above-referenced matter for your consideration. A section-by-section analysis of certain proposed provisions is presented below.

Introductory Comments

Although NepRWA has identified some provisions in the proposed General Permit that we believe should be strengthened, overall it is a vast improvement over the 2003 Permit. We believe that the clear requirements and precise deadlines contained in the proposed General Permit will lead to much better compliance than we've seen with the 2003 Permit. In fact, we believe that this proposal is the most important water pollution initiative in Massachusetts in decades.

Fourteen municipalities lie at least partially in our watershed and all but one (Boston) are covered by the MS4 General Permit. NepRWA has followed the progress of these communities in controlling stormwater since the current Permit was issued in 2003. Progress since then has been moderate at best. NepRWA does the water quality monitoring of our watershed for MassDEP, and we have not seen *any* significant improvement in water quality after rain events, even though the entire watershed is covered by a TMDL for E coli bacteria and most of it is on the 303(d) list for a number of other pollutants. There has been improvement in our dry weather bacteria sampling at certain locations, and some of this is clearly linked to the elimination of illicit discharges that we have worked hard to help municipalities identify and remove .

The detection and elimination of illegal discharges of sewage and other dangerous pollutants to sewers designed for rainwater is probably the most significant measure that can be taken to reduce stormwater pollution in our watershed. Yet illicit discharge detection and elimination (IDDE) by some Neponset communities has been practically nonexistent. The Town of Norwood has known since 1994 that high levels of bacteria are entering Meadow Brook from Town sewers that are leaking into a stormwater under-drain. Despite the requirements of the 2003 MS4 General Permit, none of these discharges were eliminated until the fall of 2009 when a small section of sanitary sewer was lined. Even now, we don't know how successful that lining has been. We applaud EPA for proposing much stricter requirements for IDDE.

On a statewide basis, EPA Region 1 has data on its website documenting the lack of adequate effort made to date by many Massachusetts municipalities. Barely over half have even complied with the few hard mandates in the 2003 Permit: that they enact bylaws or ordinances dealing with IDDE, construction site runoff and post-development runoff. Far fewer than half have implemented outfall inspections or monitoring, or taken all the steps required to prevent runoff from new development and redevelopment. I have attached as ***Appendix A*** a full page of statistics taken from your website showing a poor average level of effort statewide since 2003.

NepRWA believes that progress has been so slow in large part because the 2003 General Permit established requirements that are far too general and set few specific deadlines for compliance. This has made some municipal agencies feel that they don't need to do much, while others who want to do the right thing have not been able to secure adequate funding from town government. With all the other demands on the municipal budgets, it is very difficult to obtain municipal funding for items that the federal and state governments appear to have treated as virtually discretionary. We believe that the clear requirements and precise deadlines contained in the proposed 2008 MS4 General Permit will lead to a stronger municipal commitment to stormwater management in most communities.

NepRWA recognizes that municipalities face difficult financial circumstances at the present time and that the proposed General Permit will result in additional costs to them. However, there are many ways that municipalities can either reduce costs or increase revenues when implementing the new requirements, and we would be happy to work the ones in our watershed that wish to implement one or more of them.

1. Set very strict pre- and post-construction stormwater bylaws and regulations for new development and redevelopment, emphasizing low impact development (LID) techniques, in order to minimize the quantity and maximize the quality of stormwater they discharge to MS4s.
2. Set a broad definition of what constitutes *redevelopment* so that the MassDEP redevelopment stormwater standards will apply when companies do things like repaving parking lots, replacing roofs, etc.
3. Establish a stormwater utility that charges fees for new and increased runoff.
4. Require *existing* developments with large amounts of impervious surfaces (e.g., 2 acres) to reduce the quantity and/or improve the quality of the stormwater runoff they send to MS4s or else pay a fee to the municipality.
5. Work with local watershed associations, many of which have considerable expertise in water quality monitoring, illegal discharge detection and elimination, public education and public outreach.
6. Work together with other municipalities to develop educational materials and other strategies to comply with MS4 rules.
7. Establish a *strong public education effort*, which is *critical to gaining the political support necessary to obtain increased municipal stormwater management funding from taxpayers.* Polls have repeatedly found that more than 80% of Americans from every

walk of life and every political persuasion say that clean water is extremely important to them.

8. Ask local watershed associations to help explain the dangers of stormwater runoff at Town Meetings and other municipal gatherings.

SECTION BY SECTION COMMENTS

Section 1.10 SWMPs. EPA should provide municipalities with an electronic SWMP template to fill out. The SWMPs should then be posted on the EPA website, accessible to other towns, agencies and the public.

Section 2.2 Discharges to Impaired Waters

Section 2.2.1.c., **etc**. Section 2.2.1.c. states: "where an approved TMDL establishes a WLA that applies to its MS4 discharges, the permittee shall implement the specific BMPs and other permit requirements identified in Appendix G to achieve consistency with the WLA." The approved Pathogen TMDL in our watershed establishes such a WLA. However, there is nothing we could find in Appendix G for any of the effected watersheds that identifies any such BMPs.

We would propose that municipalities with TMDLs listed in Appendix G be made to adopt stormwater bylaws under Section 2.4.6. that require applicants to implement such BMPs as will cumulatively provide maximum removal of the pollutant of concern and that, at a minimum, these BMPs be selected from those listed in the *MA Stormwater Management Handbook* as having some degree of effectiveness at removing those pollutants. Similarly, municipalities themselves should be required to use these BMPs in carrying out their responsibilities pursuant to:

> Section 2.3.1.2, Increased Discharges to Impaired Waters with an Approved TMDL;
> Section 2.3.2.2, New Discharges to Impaired Waters with an Approved TMDL;
> Section 2.4.6.9, Directly Connected Impervious Areas (retrofitting requirements);
> Section 2.4.7 Good House Keeping and Pollution Prevention for Permittee Owned Operations.

We are attaching as ***Appendix B*** to these comments a summary of these BMPs from the *MA Stormwater Handbook* and a few other sources.

MassDEP takes a similar approach regarding projects under Wetlands Protection Act jurisdiction with stormwater discharges to wetlands and waterways subject to TMDLs. The MA Stormwater Handbook, Vol. 1, Chapter 2, pp. 12 – 13 states: "*If a proponent is proposing a project that is in the watershed of a water body with a TMDL, and if the*

project is subject to wetlands jurisdiction, the proponent must select structural BMPs that are consistent with the TMDL." See ***Appendix C*** for more detail.

Section 2.3 Increased Discharges, New Dischargers, and Antidegradation. See comments under Section 2.2.1.c., above.

2.3.1 Increased discharges. MS4 operators should be required to meet conditions comparable to those applying to new discharges to impaired waters with an approved TMDL; i.e., to submit documentation before the date of the authorization for the discharge documenting that conditions a. – c. of 2.3.1.1 and 2.3.1.2 have been met. They should also be required to submit this documentation in electronic form so that it can be posted on EPA's website, and notice of the submission should be sent to any person who commented the municipality's NOI, SWMP or other MS4 submission or who requests such notice.

2.3.2.2 New Discharger to Impaired Waters with an Approved TMDL. MS4 operators should be required to file their submissions under this subsection electronically so that they can be posted on EPA's website. Notice of the submission should be sent to any person who commented on the municipality's NOI, SWMP or other MS4 submission or who requests such notice.

Section 2.4 Requirements to Reduce Pollutants to the MEP

Section 2.4.b. It should be clarified what is meant by, "MEP is not instantaneous but an iterative process."

Section 2.4.1. Control Measures.

a. We strongly support EPA's proposal "not to extend compliance deadlines set forth in the 2003 MS4 General Permit." As noted above, this GP has been in place now for more than 6 years. Any permittee making a good faith effort will have met the requirements of the 2003 GP by now.
b. Since a permittee is required to meet minimum control measures described in Parts 2.4.2. – 2.4.7, why is it that if a permittee shares implementation with another entity, that other entity is allowed implement different measures so long as they are "at least as stringent as the corresponding permit condition?" Can the permittee itself do this? If so, what provision of the proposed GP allows this? If not, why is the other entity given more flexibility than the permittee?

Section 2.4.2 Public Education and Outreach.

Section 2.4.2.1. It is an excellent decision to require permittees to identify responsible parties for program implementation and to otherwise strengthen public education and outreach requirements from those in the 2003 MA GP. However, it is not enough to merely require permittees to "identify steps and/or

activities that the public can take" to reduce pollutants in runoff. There are some things that only governmental entities, and not individuals, can do to manage stormwater (e.g., retrofitting old or ineffective town stormwater management features, properly maintaining storm drains, and establishing stormwater utilities). These things will obviously cost towns money, and unless the public is educated about the need for such municipal spending, it will is not likely to be forthcoming. Permitees should not forfeit the opportunity to educate the public on such matters.

Subsection 2.4.2.1.b. It is an excellent idea to mandate a minimum number of messages be conveyed to a variety of audiences. However, these messages must have a reasonable likelihood of being read or heard by their intended audiences . We are particularly skeptical of allowing permitees to only put materials on their web site or to post them at Town Halls. At least one direct contact with all members of audience, e.g., through direct mail, should be required.

Subsection 2.4.2.1.c.i. Residents in the Neponset towns should also receive educational material explaining why feeding geese and other animals in parks causes bacterial pollution of waterways.

Subsection c. ii. & iv. In the Neponset Watershed with it's bacteria TMDL, audiences covered in these subsections should receive education on the importance of reducing bacterial runoff by regularly sweeping their parking lots and cleaning their catch basins.

2.4.2.2. Although it is an excellent idea to require towns to show that educational efforts have achieved a desired goal, it may be useful for EPA to provide guidance on how this might be done.

Section 2.4.3 Public Involvement and Participation. These provisions are too vague. As stated above regarding 2.4.2.1.b., there should be requirements that the public be notified at least annually by direct mail or an article in a local newspaper.

Section 2.4.4 IDDE Program

Section 2.4.4.5. We strongly support this provision to eliminate SSOs. There has been little accountability of MS4 owners to properly report and remediate SSO's. Reports are simply filled out by MS4 owners on a paper form and sent to MassDEP. In many of these reports the permittee has not filled in key information such as volume of flow or action to remediate. We feel that SSO's are underreported by a wide margin.

Section 2.4.4.6. Section 2.3.3.f. states that new or increased discharges to Outstanding Resource Waters are not authorized under the General Permit. For

this reason, it is critical that outfalls near ORWs be specifically identified during system mapping. We also believe that all system mapping should be done electronically, compatible with GIS.

Section 2.4.4.6.a.i.&ii. These mapping requirements are extremely important and should apply, at a minimum, in any community subject to a TMDL, not just the Charles.

Section 2.4.4.7. We support the provision requiring that outfalls are labeled with a unique identifier. This is very important to watershed associations in order to identify illicit connections.

Section 2.4.4.7.a. Without a lot of work, permittees should be able to inventory all their outfalls in 2 or 3 years, so that they can get on to the critical step of prioritization.

Section 2.4.4.7.c. We suggest that this section require only measurements of bacteria, surfactants, ammonia, conductivity and temperature and that pH, potassium and chlorine be deleted from the list. We strongly recommend that the permit provide guidance on recommended methods to complete the required monitoring work.

Section 2.4.4.8.We strongly support the requirements of this section on Illicit Discharge Detection and Elimination Programs. The language provides adequate detail and clear guidance on benchmarks and methodology to complete this work.

Section 2.4.4.8.d.i.-v. Appendix G, Table G-3 says that municipalities subject to the Neponset Watershed Pathogen TMDL must comply with the requirements of Section 2.4.4.8(d)i.-v. However there is nothing in that section that does not apply to municipalities in watersheds without TMDLs. The final GP should clarify what municipalities listed in Tables G-1 to G-3 must do beyond that required of other municipalities. (Or was the reference to this section in Table G-3 a typographical error?)

Section 2.4.5. Construction Site Stormwater Runoff Control.

2.4.5.3.b. Written procedures for site inspection and enforcement and identification of responsible person(s) is a welcome and necessary addition to what was required under the 2003 MA GP. However, it is essential that the permittee or another entity within the same executive body have the legal authority to impose sanctions to ensure compliance (and not just "to the extent authorized by law)". Lacking this authority, the permittee should be given no more than 2 years to obtain it.

2.4.5.3.c. Local program BMPs should be bound by the design standards in the MA Stormwater Handbook, unless the permittee has met the requirements of a qualifying local program (QLP). The Handbook was recently updated after a consensus was reached by experts representing a broad range of interests on the best BMP designs and the conditions under which they are effective. Furthermore, the "examples" of appropriate control measures listed in subsections i. – viii. should be mandatory unless a permittee has a QLP.

Section 2.4.6. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management). In our experience, even towns with good stormwater bylaws do not always identify the boards and departments responsible for implementation. Sometimes the task falls to more than one board, yet there is little or no communication among them. The 2008 GP should require identification of responsible parties and procedures for interactions of all boards and departments whose authority covers or impacts stormwater. This usually includes, at a minimum, the Planning Board, Zoning Board, Conservation Commission, and DPW or Building Department. In our experience, designating a single individual as the Town stormwater manager, with responsibility for interacting with all these boards, is the best approach.

See also comments under Section 2.2.1(c), above

2.4.6.4.a.&b. We strongly support the proposed provision to require permittees to update their stormwater bylaws to mandate that new development and redevelopment meet MA Stormwater Management Standards 3-7, regardless of the proximity of the development to wetlands. The General Permit should make specific note of the fact that MA Standards 3-6 all require compliance with specified provisions of the MA Stormwater Handbook. We also recommend that the new development and redevelopment be subject to MA Stormwater Management Standards 1 and 2. While Standard 1 pertains to direct discharges into wetlands and waterways, upland discharges often result in channels that lead directly to or cause erosion in wetlands. In fact, the MA Wetlands Protection Act, provides jurisdiction over such discharges, although only "after the fact" if the upland discharge can be shown to have had such an impact. EPA should require in the GP that town bylaws include provisions for assessing during the permitting phase whether upland discharges are likely to have this undesirable result. The stormwater management bylaw and regulations of the Town of Dedham, MA, do exactly that. Standard 2 requires that post-development peak discharge rates not exceed pre-development. This requirement is equally important for uplands as it is for wetlands.

2.4.6.4.a.i. (Std. 3, Loss of annual recharge). The proposed GP provision "encourages" permittees to require capture of at least the 1 inch (90^{th} percentile) storm event. Because so many individual discharges flow through municipal outfalls, the 1" rule should be a mandatory requirement,

just as it is for large parking lots under MassDEP Stormwater Standard 5. At a minimum, this should be required for watersheds subject to TMDLs.

2.4.6.4.a.ii. (Std. 4, Pollutant removal requirements). The GP, in this section or in another section dealing with TMDLs, should require that in watersheds subject to TMDLs, pollutant(s) of concern be reduced to the maximum extent practicable. The MA Stormwater Handbook essentially requires this for projects subject to the Wetlands Protection Act. Chapter 2, pp. 12 – 13 of the Handbook states: "If a proponent is proposing a project in the watershed … with a TMDL … the proponent must select structural BMPs that are consistent with the TMDL." See ***Appendices B and C***, below.

2.4.6.4.a.iii. (Std 5 Land Uses with Higher Potential Pollutant Loads, and Std 6 Zone IIs, IWPAs and critical areas). The language in the GP would be greatly clarified if permittees were simply directed to implement the measures listed in the appropriate Tables in the Stormwater Handbook (Table LUHPP and Tables CA1 – CA4).

2.4.6.4.c. We assume this provision refers to the "exempt" projects listed in 310 CMR 10.05(6)(l). If so, the GP provision should provide this citation or include the listed exemptions.

2.4.6.5. The requirement that permittees' stormwater rules require projects to "prevent or minimize impacts to water quality" is much too vague. Merely listing procedures that "may" be included is not helpful. Instead, the GP should identify measures which achieve these results and require that permittees' stormwater rules make applicants implement them to the maximum extent feasible.

2.4.6.6. (re/ O&M procedures). This provision should require permittees to have the authority to enforce required O&M procedures, and to recover costs from the responsible party if it is necessary for the municipality do any of the required work.

2.4.6.8. (assessing local rules re/ green roofs, infiltration and water harvesting). It is very common for municipalities to have bylaws, rules and regulations which prevent or discourage developers from implementing *other* LID techniques not listed in this section. Also, such rules are generally not included in Stormwater Bylaws, but rather in planning, zoning, fire, and other regulations. Towns should be required to review all their bylaws, rules and regulations pertaining to development to identify and, where appropriate, revise those that prevent or discourage Low Impact Development. A useful guide for such a review is provided in the *Massachusetts Low Impact Development Toolkit* factsheet entitled *Low Impact Development: Do Your Codes Allow It? A checklist for regulatory*

review (see http://www.mapc.org/resources/low-impact-dev-toolkit/local-codes-lid).

2.4.6.9 (Directly Connected Impervious Area (DCIA). We strongly support efforts to minimize DCIA tributary to MS4s, especially where disconnection of IAs will improve groundwater recharge and treatment of pollutants. Although this subsection requires that DCIAs be inventoried and retrofits be prioritized and reported on, the wording of this subsection does not appear to require that any retrofits actually occur. Some minimal requirements are needed, whether they relate to the number of retrofits; reductions in volumes, intensity or pollutant loadings resulting from retrofits; or level of effort. See also comments under Section 2.2.1.c., above.

Subsection a. EPA should clarify what is meant by "sub-basin." As DEP identifies them, the Mystic, Neponset, and Weir watersheds are all sub-basins of the Boston Harbor watershed.

2.4.7 Good House Keeping and Pollution Prevention (P2) for Permittee Owned Operations. See comments under Section 2.2.1.c., above.

2.4.7.1 Operations and Maintenance (O&M) Programs.

a. - c. Subsection b. on buildings and facilities appears to be the only one that requires employee training. This should be required under a. and c., as well.

d. Infrastructure Operation and Maintenance (O&M). Subsections iii., iv., vii establishes strong but reasonable standards for cleaning of catch basins, streets and parking lots, as well as for the management of salt and sand and for the inspection of permitee-owned stormwater structures. Substantive requirements are lacking, however, for subsections i., ii. and v. Under subsection i., EPA needs to specify what it considers to be "a timely manner" for repair and rehabilitate MS4 infrastructure. Under ii., it needs to offer some guidance as to how permittees can maintain roads "in such a manner as to minimize discharge of pollutants from the MS4." Under v., EPA should specify what it considers to be "proper disposal" of catch basin cleanings and street sweepings.

2.4.7.2 Stormwater Pollution Prevention Plan (SWPP) for maintenance garages, public works facilities, transfer stations and other waste handling facilities. This section sets strong and essential requirements. We are particularly pleased that the SWPPs will have to be developed and implemented within one year, and that "best available control measures" will be required to minimize or eliminate stormwater discharges from these permittee-owned facilities.

Section 3.0 Outfall Monitoring. We suggest that MS4 operators be required to submit the required information electronically and that it be posted on the EPA website at a publically accessible location.

Section 3.1 Monitoring Frequency and Location. We strongly support these provisions, with the exception of 3.1.4.5 which allows in-stream monitoring "which is representative of one or more discharges to the same water body." At a minimum, guidance is needed as to how representativeness is to be determined.

Section 3.2.1. Municipalities should be able to complete outfall screening within 2 or 3 years so that they can move on to the critical work of prioritization.

Section 3.2.2. As we suggested regarding IDDE, we don't believe it is necessary to require measurements of chlorine, turbidity, potassium or pH.

Section 3.4. As stated above, we believe that important information such as this should be filed electronically and posted on EPA's website.

Thank you again for the opportunity to comment on the proposed MS4 General Permit for North Coastal Massachusetts.

Sincerely yours,

Steven Pearlman
Advocacy Director

APPENDIX A

COMPLIANCE WITH 2003 MA MS4 GENERAL PERMIT THROUGH 2009

Based on data from EPA Region 1 Website *

The following figures cover the 6 year period from 2003 to 2009.

1. Illicit Discharge Detection & Elimination. Although IDDE is the most effective thing most MA towns can do to reduce stormwater pollution, six years after the issuance of the 2003 MA MS4 General Permit most of them had done very little:

- Although the General Permit mandates that *every* town have a regulatory mechanisms for IDDE, over 40% of the towns had not complied.
- More than 75% had failed to implement outfall inspections or monitoring.
- More than 80% had not trained staff in IDDE, nor had they established septic system inspection or illegal dumping programs.

2. Construction Site Runoff Control

- Although the General Permit mandates that *every* town have a bylaw or ordinance regulating construction site runoff, after 6 years 44% of the towns under the MS4 permit had not complied.
- Only 50% do inspections.
- Less than 40% have a plan review process.
- Only 20% have enforcement mechanisms.
- Less than 5% have trained their inspectors.

3. Post-Development Runoff Controls

- Although the General Permit mandates that *every* town have a bylaw or ordinance regulating post construction runoff, 46% had not complied as of 2009.
- Less than 30% of the towns did inspections.
- Less than 20% had a plan review process or enforcement procedures.
- Less than 10% had established design standards.

4. Pollution Prevention and Good Housekeeping (for town-owned roads and facilities)

- Only 50% sweep streets in commercial areas or on arterials as frequently as twice a year (as would be required under the proposed 2008 MS4 General Permit).
- Only 30% do so in residential areas (as would be required under the proposed 2008 MS4 General Permit).
- Less than 30% have deicing procedures, grounds care or integrated pest management programs, or BMP maintenance (other than catch basin cleaning).
- Fewer than 15% have vehicle washing rules.

* *"NPDES Phase II Small MS4 Permit Program SWMP MCM Summaries and Select Metrics, Permit Year 6; http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/MA-SWMP-Summaries-Metrics-Yr-6.pdf*

APPENDIX B

BACTERIA AND NUTRIENT REMOVAL EFFICIENCIES OF *STRUCTURAL* BMPs
(according to Vol. 2, Ch. 2, pp. 1 - 132 of MA Stormwater Handbook)

NOTE: *NON-STRUCTURAL BMPs SUCH AS ENVIRONMENTALLY SENSITIVE SITE DESIGN and SOURCE REDUCTION ARE EQUALLY OR MORE EFFECTIVE AS STRUCTURAL BMPs!*

	Pathogens (Bacteria)	**Total Nitrogen**	**Total Phosphorus**
	[Effectiveness of BMPs may vary significantly depending on location]		
Pretreatment BMPs (pp. 1-21)			
Deep Sump Catch Basins	**Insuff. Data**[1]	Insuff. Data	Insuff. Data
Oil/Grit Separators	**Insuff. Data**[2]	Insuff. Data	Insuff. Data
Proprietary Separators	Insuff. Data	Insuff. Data	Insuff. Data
Sediment Forebays	Insuff. Data	Insuff. Data	Insuff. Data
Vegetated Filter Strips	Insuff. Data	Insuff. Data	Insuff. Data
Treatment BMPs (pp. 22-67)			
Filtering Bioretention Areas (including rain gardens)	**Insuff. Data**[3]	**30 - 50%**	**30 - 90%**
Constructed Stormwater Wetlands	**Up to 75%**	**20 - 55%**	**40 - 60%**
Water Quality Swales	> 10%	**10 - 90%**	**20 - 90%**
Extended Dry Detention Basins	< 10%	**15 - 50%**	**10 - 30%**
Gravel Wetlands	**Up to 75%**	**30 - 50%**	**40 - 60%**
Proprietary Media Filters	Varies	Varies	Varies
Proprietary media filters may be used for terminal treatment only if verified for such use by the TARP or STEP process (see Volume 2 of Handbook).			
Sand/Organic Filters	Insuff. Data	**20 - 40%**	**10 - 50%**
Wet Basins	**40 - 90%**	**10 - 50%**	**30 - 70%**
Conveyance BMPs (pp. 60-82)			
Water Quality Swales	Insuff. Data	**10 - 90%**	**20 - 90%**
Infiltration BMPs (pp. 83-106)			
Exfiltrating Bioretention Areas including rain gardens	**Insuff. Data**[4]	**30 - 50%**	**30 - 90%**
Infiltration Basins	**90%**	**50 - 60%**	**60 - 70%**
Infiltration Trenches	**Up to 90%**	**40 - 70%**	**40 - 70%**
Leaching Catch Basins	Insuff. Data	Insuff. Data	Insuff Data
Subsurface Structures	Insuff. Data	Insuff. Data	Insuff Data
Other BMPs (pp. 107-132)			
Dry Detention Basins	< 10%	**5 - 50%**	**10 - 30%**

[1] Some studies have found sumped catch basins to be incapable of removing the pathogens that were examined.
[2] Kirk, 2002 (USGS Southeast Expressway study) found that oil/grit separators were most likely ineffective at bacteria removal.
[3] The **MA Stormwater Handbook** also **states**: **"**If properly designed and installed, **bioretention areas remove** phosphorus, nitrogen and **bacteria** to varying degrees.**"** (See Handbook Vol. 2, Ch. 2, p. 25)
[4] See footnote 3.

APPENDIX C

Massachusetts Stormwater Handbook (Vol. 1, Chapter 2, pp. 12 – 13)

Legal Framework for Stormwater Management

…

Stormwater Discharges and Total Maximum Daily Loads

A total maximum daily load (TMDL) is the greatest amount of a pollutant that a water body can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. A TMDL specifies how much of a specific pollutant can come from various sources, including stormwater discharges, and identifies strategies for reducing the pollutant discharges from these sources. ***MassDEP has prepared TMDLs that indicate that in many watersheds action is needed to reduce the concentrations of bacteria, phosphorus, and nitrogen in stormwater discharges, including, without limitation, implementation of specific stormwater BMPs***.

Proper selection of non-structural and structural stormwater management practices is an essential component of any plan to reduce these pollutants. These non-structural BMPs begin with environmentally sensitive site design, pollution prevention and source control. By reducing impervious surfaces and allowing stormwater to infiltrate into the ground and by selecting a landscape design that minimizes the need for fertilizers and pesticides, developers can substantially reduce the concentration of pollutants in stormwater runoff from development and redevelopment projects. Once a project is complete, ongoing action is needed to prevent additional pollutants from entering the stormwater management system. Raw materials and wastes should be stored inside or under cover with adequate containment. Snow, sand, deicing chemicals, fertilizers, pesticides, and solid waste should be properly managed. An effective street-sweeping program should be implemented. ***Structural BMPs that can remove the pollutants of concern must be designed, constructed, operated and maintained. Infiltration BMPs, bioretention areas, constructed stormwater wetlands, and filter systems may be effective tools for reducing the concentration of nutrients and bacteria in stormwater discharges***.

If a proponent is proposing a project that is in the watershed of a water body with a TMDL, and if the project is subject to wetlands jurisdiction, the proponent must select structural BMPs that are consistent with the TMDL. Because pollution prevention is an interest identified in the Wetlands Protection Act, conservation commissions and MassDEP may require use of such BMPs when reviewing projects subject to jurisdiction under the Act. The TMDL may contain information on appropriate BMPs. See http://mass.gov/dep/water/resources/tmdls.htm.