MEDFORD TOWNSHIP

MUNICIPAL STORMWATER MANAGEMENT PLAN

PREPARED FOR:

MEDFORD TOWNSHIP
17 N. Main Street
Medford, New Jersey 08055

NJPES #NJG 0151661
PI ID # 223759
Burlington County

DRAFT: **April 6, 2005**
FINAL: **April 18, 2005**
REVISED: **May 30, 2008**

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1.0 Introduction to Medford Stormwater Management Plan

This Municipal Stormwater Management Plan documents the strategy for Medford Township to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:1 4A-25 Municipal Stormwater Regulations. This plan contains all of the elements required by April 1, 2005 as described in N.J.A.C. 7:8 Section 4.2 of the Stormwater Management Rules. Medford Township contains more than one square mile of open space and agricultural land. As described in schedule for adoption of the stormwater management plan and ordinances N.J.A.C. 7: 8 Section 4.3, the completed elements of N.J.A.C. 7:8-4.2 (c) 8 & 9 will be provided on or before February 10, 2006.

An aerial view of the Township, which illustrates the major waterways, is provided in the Appendix, **Map 1**, **Existing Conditions**. This Municipal Stormwater Management Plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. Note that the definition of major development for the Stormwater Management Plan does not include the increase of impervious area by more than one quarter acre. The implementation of these standards into the Medford Master Plan is intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan stresses best management practices with long-term operation and maintenance measures for existing and future stormwater facilities that perform well in the soil and water table conditions within Medford Township and can be maintained by the Medford Township Public Works Department.

Within Medford, all major residential development is currently required to conform to the stormwater management requirements of N.J.A.C. 7:8 5.4 and 5.5 through conformance to the Residential Site Improvement Standards (RSIS). Medford Township must implement a stormwater management plan that is at least as protective as the requirements of NJAC 7:8 Subchapter 5. The current Medford Municipal Code, Section 509, Drainage, Floodwater Protection and Stormwater Protection, sets forth stormwater management design requirements within Pinelands and non-Pinelands areas of the municipality. The implementation of the stormwater management plan in accordance with NJAC 7:8 Subchapter 5 will have an impact on the design methodology, however the stormwater management facilities will be similar to those previously required under the Medford Township Ordinances.

The final component of this plan is a mitigation strategy for when an exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, stormwater management projects within Medford Township are identified as alternative projects if a development cannot meet the stormwater standards. Exemptions are provided to lessen the impact of redevelopment of existing sites within Medford where the stormwater standards cannot be met to physical limitations. Exemptions are not recommended for development projects on open space, wooded areas, or farm land.

This plan has been prepared in conformance with the Management Plan for the Rancocas Creek Watershed dated March 2003 prepared by the Burlington County Department of Resource Conservation and the Little Creek and Masons Creek Regional Stormwater Management Plan Guidance Document dated January 2005 prepared by the Burlington County Soil Conservation District.

2.0 Goals of Management Plan

The goals of the Medford Municipal Stormwater Management Plan are to:

- Reduce the impact of stormwater runoff for all stormwater events, especially high frequency events. High frequency events are storms the occur frequently with low rainfall amounts (water quality storm);
- Improve baseflow to streams by maintaining groundwater recharge;
- Reduce silting of lakes and ponds by providing total suspended solids reduction and reduction of soil erosion from any development or construction project;
- Improving in-stream water quality and riparian habitat for all watershed residents (humans, wildlife, flora and fauna);
- Reduce flood damage, including damage to life and property;
- Prevent further degradation of existing stream features and structures;
- Prevent to the greatest extent feasible, an increase in nonpoint pollution;
- Minimize pollutants in stormwater runoff from new and existing development 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 best management practices.

To achieve these goals, a variety of management strategies are proposed for implementation. These strategies have been developed from the Management Plan for the Rancocas Creek Watershed and the Little Creek and Masons Creek Watersheds.

3.0 Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration.

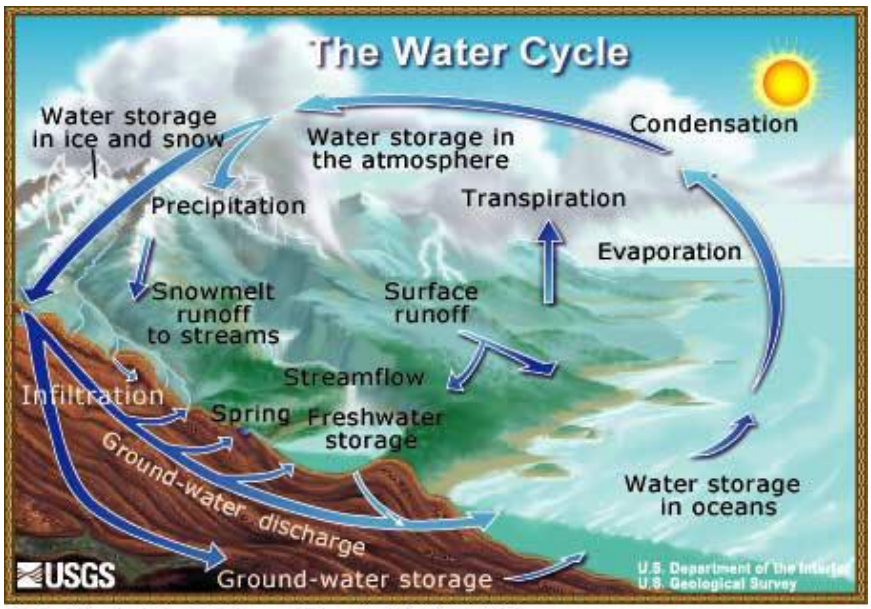

Illustration by John M. Evans, Colorado District, USGS

Figure 1. Hydrologic Cycle

Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new drainage conditions and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Downstream erosion, sediment deposits can be seen in Photograph 1.

Photograph 1. Downstream Erosion and Sediment Deposits

Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients. Groundwater recharge and well head protection areas are shown in the Appendix, on **Map 2, Groundwater Recharge and Wellhead Protection Areas** (WPAs). It should be noted that there are no wellhead protection areas in Medford but there is one close to the township boundary in Shamong Township. Soil types, which correspond to the recharge areas, are shown in the Appendix, on **Map 3, Soil Types.**

Land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting the stream biology. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

4.0 Plan Consistency

4.1 Rancocas Creek Watershed Management Plan

The Rancocas Creek Watershed Management Plan was funded through a grant from the New Jersey Department of Environmental Protection with Burlington County. The Rancocas Creek Watershed Management Plan was finalized in March of 2003 by the Burlington County Department of Resource Conservation. The plan is the result of an effort from 1998 to 2003 by the New Jersey Department of Environmental Protection, the Public Advisory Committee (PAC), Omni Environmental, Burlington County Office of Land Use and six public subcommittees.

The Rancocas Creek Watershed Management Plan is a 29 page written summary report with a computer CD containing the Appendices. The Characterization and Assessment Report of the watershed is a Microsoft Power Point presentation contained on the CD. The assessment report is based on a water quality approach from a chemical standpoint. The assessment reviews the NJDEP data and status of water quality for oxygen, phosphorous, nitrogen, fecal coliform, total dissolved solids and pH.

The Rancocas Creek Watershed Management Plan recommends that municipal ordinances should be enacted for commercial and industrial sites to require stormwater inserts to remove floatables, oils and other pollutants as well as long term maintenance insured by escrow accounts. The plan recommends strengthening buffer protection ordinances. The report contains a ranking of open space parcels within Burlington County. A separate report by the Burlington County Soil Conservation compiling a prioritized list of "Action Now" projects for bank restoration and repair is referenced.

4.2 Little Creek and Masons Creek - Regional Stormwater Management Plan Guidance Document

The Burlington County Soil Conservation District with the New Jersey Department of Agriculture, State Soil Conservation Committee and the Camden, Cape-Atlantic and Gloucester Soil Conservation Districts have developed this study of the Little Creek and Masons Creek Watersheds. It was funded by an appropriation from the Stormwater Management and Combined Sewer Overflow Abatement Bond Act via the New Jersey Department of Environmental Protection.

The overall objective of this Regional Stormwater Management Plan Guidance Document is to provide the stakeholders of these watersheds the information to finalize and adopt a regional stormwater management plan. The report includes a detailed assessment, an evaluation of the needs of the watersheds, a discussion of available management strategies and information on the administrative process necessary to implement this plan.

The Masons Creek watershed encompasses 7.5 square miles in portions of Hainesport, Lumberton, Medford and Mount Laurel. The upper reaches of this watershed are located in the northwestern portion of the Township. The creek and its tributaries were found to be in overall good condition and not significantly impacted by stormwater at this time. The plan stresses that management strategies must be implemented to assure that they remain in their existing condition. The management strategies proposed include stormwater recharge, stormwater basin retrofit to improve filtering and infiltration, low impact development standards, pre-development site analysis, wildlife feeding prohibition, and adoption of the DelMarVa peak rate factor. The goals of these strategies include:

- Maintain baseflow in all river segments,
- Prevent stream and streambank erosion and degradation,
- Prevent the silting of streams and receiving waterways,
- Maintain or improve the overall water quality of the streams,
- Manage the potential impacts of waterfowl and beavers

These goals are consistent with this MSWMP and its goals listed in Section 2.

4.3 Medford-Evesham Sub-Regional Resource Protection Plan

The Pinelands Commission through a grant from the William Penn Foundation prepared the Medford-Evesham Sub-Regional Resource Protection Plan – Preliminary Report dated March 2006 in association with Medford Township, Evesham Township and the NJDEP. The need for this sub-regional plan was identified through ongoing natural resource work by the Pinelands Commission and the NJDEP that much more of the ecological resources within the southern portion of these two municipalities were identified than was the case when their zoning plans were initially adopted and implemented. These efforts show that a re-evaluation of the zoning and development policies for this sub-region were warranted to better protect natural resources and avoid development conflicts.

The primary objectives of the plan center around resource protection strategies that consist of land preservation/conservation, reduce non-conformities between existing developed areas and zoning regulations, accommodate growth in appropriate areas and protection of natural resources including water quality. While these objectives center around land use policy changes to preserve natural resources in the entire planning area they are consistent with the goals of Medford's MSWMP and in particular the specific guidance on stream corridor water quality protection.

5.0 Medford Township

5.1 Population and Land Use

The Township of Medford encompasses a 39.86 square mile area of Burlington County, New Jersey. In recent years the Township has been under significant development pressure, as indicated by the number of new construction permits issued since 1991 (see Table 1). The population of the Township has increased from 17,622 in 1980 to 20,526 in 1990 to 22,253 in 2000. The resulting development has likely increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure C-2 illustrates the waterways in the Township. Figure C-3 depicts the Township's boundaries on the USGS quadrangle maps.

Table 1 - New Residential Building Permits

Year	Units
1991	53
1992	128
1993	213
1994	182
1995	73
1996	63
1997	69
1998	92
1999	84
2000	152
2001	106

The existing land uses within Medford as of 2002 NJDEP GIS data can be seen in the Appendix **Map 4, Land Use – Existing Conditions.**

5.2 Description of Watershed

The Township of Medford drains to two separate watersheds, the Rancocas Creek and the Mullica River. The Southwest Branch of the Rancocas Creek Watershed runs through the northern portion of Medford and has five sub-watersheds within Medford Township. The Rancocas Creek is located within Watershed Management Area 19. A smaller area in the southern section of Medford Township drains into the Alquatka Branch of the Mullica River, which is at the headwaters of the Mullica River Watershed. The Mullica River watershed is Watershed Management Area 14. Watershed Management Areas 14 and 19 are two of the twenty major watersheds in the State of New Jersey shown in the Appendix on **Map 5, New Jersey's Watershed, Watershed Management Areas and Water Regions**.

Masons Creek is part of the Rancocas Creek watershed and is located in the northeast corner of the Township. The importance of Mason's Creek is that it is classified as a Category 1waters requiring the special stream corridor protective buffer. The portion of the Creek within Medford is protected because it is located within the Medford Wildlife Management Area.

The United States Geologic Survey (USGS) uses a 14 digit Hydrologic Unit Code (HUC 14) to delineate and name each sub-watershed with each major watershed area. There are thirteen separate sub-watershed drainage delineations within the Township of Medford as shown in the Appendix on **Map 6, HUC-14 Delineation on USGS Quadrangle Map.** The sub watersheds are:

Rancocas Creek Watershed

- HUC 02040202070030, South Branch Rancocas Creek below Route 38
- HUC 02040202070020, South Branch Rancocas Creek Route 38 to Bobbys Run
- HUC 02040202060090, Little Creek below Bear Swamp River
- HUC 02040202060100, SW. Branch of Rancocas Branch below McEcord Bridge
- HUC 02040202060080, SW. Branch of Rancocas Branch above McEcord Bridge
- HUC 02040202060050, Barton Run below Kettle Run Road
- HUC 02040202060030, Haynes Creek below Fairview Road
- HUC 02040202060070, Little Creek above Bear Swamp River
- HUC 02040202060020, Taunton Lake/Centennial Lake and Tribs
- HUC 02040202060010, Kettle Run above Centennial Lake Mullica River

Mullica River

- HUC 02040301160010, Alquatka Branch
- HUC 02040301160020, Mullica River above Jackson Road
- HUC 02040301150030, Indian Mills Brook/Muskingum Brook

5.3 Stream Conditions

The NJDEP has established and maintains an Ambient Biomonitoring Network (AMNET) of monitoring sites to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macro invertebrates by NJDEP on a five-year cycle. Benthic macro invertebrates include aquatic insects, worms, snails, crayfish and clams. Every five years, streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of bioethics related to benthic macroinvertebrate community dynamics. The AMNET sampling serves as an indicator of the stream health, but does not provide any information on the cause of the impairment. The AMNET sites and their impairment classification within Medford Township are listed below and shown in the Appendix on **Map 7, Amnet and Stream Quality Monitoring Stations.**

- AN0158, Little Creek at Route 70, Non-Impaired
- AN0159, Bear Swamp River at Route 70, Moderately Impaired
- AN0166, Barton Run at Tuckerton Rd & Christopher Mill Rd, Non-Impaired
- AN0168, Haynes Creek at Himmelein Rd, Moderately Impaired
- AN0169, Southwest Br Rancocas Creek at Route 70, Moderately Impaired
- AN0170, Sharps Run at Route 541, Moderately Impaired

The New Jersey Integrated Water Quality Monitoring and Assessment Report, 305(b) and 303(d) are required by the Federal Clean Water Act. The report identifies waters that are impaired by watershed area. There are six monitoring sites within Medford Township. Station AN0166 on Bartons Run at Tuckerton Road is severely impaired. Four of the station, AN0560, AN0168, AN0170 and AN0169 are moderately impaired. Station AN0158 on the Township border with Southampton is not impaired. Sublist 5 of the Integrated List constitutes the list of waters

impaired or threatened by pollutants and is in priority order. The list for Watershed 18 and 19 is included in Attachment 3 of the Appendix. The following table summarizes the specific impairment for the stream segments in Medford Township:

Stream Segment	**Impairment**
Bear Swamp River at Route 70	Pinelands Biological Community
Haynes Creek at Himmelein Road	Pinelands Biological Community
Sharps Run at Route 541	Benthic Macroinvertebrates
Southwest Br Rancocas Creek at Route 70	Pinelands Biological Community

The total maximum daily load, abbreviated TMDL, is the amount of a pollutant that can be accepted by a water body without exceeding water quality standards or interfering with the ability to use a water body for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other best management practices or BMPs.

There is a TMDL for fecal coliform proposed for a segment of Little Creek at Chairville Road that borders Medford. This is one of 25 Fecal Coliform TMDLs NJDEP is proposing throughout the state tentatively scheduled for establishment in May of 2006. There is also a TMDL for fecal coliform along Sharps Run Creek downstream of the confluence with the South Branch Rancocas Creek entitled Total Maximum Daily Load for Fecal Coliform to Address 27 Streams in the Lower Delaware Region dated April 21, 2005. This TMDL has been adopted and much of this MSWMP and the adopted Medford Stormwater Pollution Prevention Plan will meet the strategies recommended for reduction of fecal coliform. Specifically in Medford's situation the stormwater outfall mapping, illicit connection elimination program and the passage of the pet waste ordinance and wildlife feeding ordinance will meet the strategies identified in the TMDL.

The 2002 Integrated Water Quality Monitoring and Assessment Report listed that a TMDL for total phosphorous is to be developed for the Rancocas Creek. Specifically the report cited the stations at the South Branch Rancocas Creek at Vincentown and Sharps Run at Route 541 were in non-attainment for total phosphorus. If numerical allocations are set in the future, this MSMP will be amended to address the impairment and ordinances will be revised to implement the recommendations. This MSWMP will be updated as necessary in the future to incorporate any additional TMDL's that may be adopted not identified for waterways within Medford Township.

As included in the Management Plan for the Rancocas Creek Watershed Plan, the NJDEP formulated an approach to deal with contaminants in the non-tidal reaches of the Rancocas creek and its tributaries. The document, Technical Approaches to Restore Impaired Waterbodies in the Non-Tidal Rancocas Creek Watershed, NJDEP, 2002, recommends steps to develop TMDLs or determine that no TMDL is needed. The technical approach paper was reviewed and approved by the Water Management Area 19 Technical Advisory Committee.

6.0 Design and Performance Standards

Under SubSection 509, Drainage, Floodwater Protection and Stormwater Management (copy attached), Medford Township has adopted in one ordinance the design and performance standards for residential and non-residential development to conform to the Residential Site Improvement Standards and Pinelands Regulation N.J.A.C. 7:50-6.84 for those lands within the Pinelands Area. By modifying the model pineland ordinance so that it is applicable to the entire Township with some requirement exemptions for those areas outside of the Pinelands Area it enables the RSIS standards, the design and performance standards for stormwater management under N.J.A.C. 7:8-5 and Pinelands Rule N.J.A.C. 7:50-6.84 to be applied to both residential and non-residential development.

Medford Township accepts responsibility for stormwater management basins created for residential subdivisions. Long term operation, preventative maintenance and corrective repairs will be performed by the Medford Township Public Works Department. The Planning and Zoning Board review development plans to meet the stormwater regulations of SubSection 509 of the Land Development ordinance, N.J.A.C 7:8 including the safety standards for stormwater management basins under NJAC 7:8-6 and Pinelands Regulation N.J.A.C. 7:50-6.84.

Storm Inlet in Conformance with Stormwater Ordinance

7.0 Plan Coordination

Medford Township Stormwater Management Plan has been coordinated with the Management Plan for the Rancocas Creek Watershed dated march 2003 prepared by Burlington County Department of Resource Conservation. This MSWMP has also been developed in conformance with the Pinelands Comprehensive Management Plan and (CMP) received the Commission's approval as an indication of its compliance with the CMP. This Plan will be updated with any future amendments to the CMP as necessary.

In addition all projects are also required to be designed in conformance with the Standards for Soil Erosion and Sediment Control in New Jersey even though a Soil Erosion and Sediment Control Plan Certification is only required for projects that disturb over 5,000 square feet. As part of any approval that may be granted by the Board it is standard procedure to include a condition for all outside agency approvals or permits to be obtained prior to the start of construction. Township inspectors observe construction of all projects to ensure that they are constructed in accordance with the approved plans and any permits that may have been issued. This includes ensuring that stormwater management facilities are constructed properly and that soil erosion control measures are being maintained. Any deficiencies noted in the field by the Township's inspector that can not be resolved with the contractor are reported to the appropriate agency, typically the NJDEP Bureau of Enforcement or the Burlington County Soil Conservation District for enforcement.

8.0 Evaluation of Development Regulations & Master Plan

Element 8 of N.J.A.C. 7:8-4.2. requires the evaluation of the Township's entire master plan (including the land use element), official map and development regulations (including the zoning ordinance). An illustration of the Township's restricted or limited development potential lands is provided in the Appendix on **Map 8, Land Uses –Wetland Designations** and **Map 9, Flood Prone Areas** to help guide any revisions to land use and zoning code amendments. The review of the original Comprehensive Master Plan adopted in 1966 and various elements that were subsequently adopted including the last re-examination in 2002 found that they are consistent with this plan and do not require any specific revision. They discuss in general terms stormwater management and more specifically the goals and objectives of preserving the natural environmental features unique to Medford and the issues related to being located within the Pinelands Preserve. These items are further addressed in this MSWMP. The 2002 Master Plan Reexamination Report in section VI Review of Remaining Developable Land was used as the basis to complete Section 8 Land Use/Build-Out Analysis portion of this MSWMP.

Land Development Regulations Section 500 General Provisions and Design Standards, Subsection 509 Drainage, Floodwater Protection and Stormwater Management will need to be replaced in its entirety to properly incorporate the new stormwater ordinance necessitated by the DEP and Pinelands Commission. The balance of Section 500 was reviewed for incorporation of nonstructural stormwater management strategies. No specific subsections prohibit the use of these strategies. It is not proposed at this time to amend Section 500 to specifically incorporate strategies other than what is proposed in the new Subsection 509.

9.0 Land Use/Build-Out Analysis

The Land Use/Build-Out Analysis is element 9 of NJAC 7:8-4.2. This analysis illustrates the potential pollutant loads to the streams, lakes and waterways in the municipality under maximum development permitted in the zoning code. The 2002 Master Plan Reexamination Report included a review of remaining developable land. This information provided the base data for this analysis. The Township Zoning is provided on **Map 10**. Using this map **Table C-1** below was prepared to present the pollutant loading coefficients by land cover as published in the NJDEP's Stormwater BMP Manual. An additional column was added to the State's table to correlate the State's land cover designations to the Medford Township zoning district designations.

Table C-1 Pollutant Loads by Land Cover

NJDEP Land Cover Categories	Medford Corresponding Zoning Districts	Total Phosphorus Load (lbs/acre/year)	Total Nitrogen Load (lbs/acre/year)	Total Suspended Solids Load (lbs/acre/year)
High, Medium Density Residential	GD, GMN, GMN-AR, GMS, HVR, RGD-1, RGD-2, RHO, VRD	1.4	15	140
Low Density, Rural Residential	APA, FD, PD, RS-1, RS-2, SAPA	0.6	5	100
Commercial	CC, HC-1, HC-2, HM, HVC, RC, RHC	2.1	22	200
Industrial	PI	1.5	16	200
Urban, Mixed Urban, Other Urban	PPE	1.0	10	120
Agricultural	AR	1.3	10	300
Forest, Water, Wetlands	N/A	0.1	3	40
Barren land/Transitional Area	N/A	0.5	5	60

Source: NJDEP Stormwater BMP Manual 2004.

GD - Growth District
GMN - Growth Management Area North
GMN-AR Growth Management Area North - Agricultural Retention
GMS - Growth Management Area South
HVR - Historic Village Residential
RGD-1 - Reserve Growth District 1
RGD-2 - Reserve Growth District 2
RHO - Residential Home Occupation
VRD - Village Residential Development
APA - Agricultural Production Area
FD - Forest District
PD - Preservation District
RS-1 - Rural Suburban 1
RS-2 - Rural Suburban 2
SAPA - Special Agricultural Production Area

CC - Community Commercial
HC-1 - Highway Commercial 1
HC-2 - Highway Commercial 2
HM - Highway Management
HVC - Historic Village Commercial
RC - Restricted Commercial
RHC - Restricted Highway Commercial
PI - Planned Industrial
PPE - Park / Public / Education
AR - Agricultural Retention

Map 11, Developable Lands is a composite drawing utilizing the information from **Maps 4, 6, 8 and 9** that identifies all of the constrained land within the Township by HUC14 boundary. The remaining 7,190 acres of developable area is broken down per land use and the results are shown in **Table C-2** on the following pages. The developable area remaining in this table was calculated by subtracting the out the constrained land area from the total area in each zoning district within the HUC14.

The increase in annual pollutant loads at full build-out is presented in **Table C-3** for the developable acres remaining in the Township by multiplying the developable acres per land use category in **Table C-2** by the pollutant load per acre in **Table C-1**. **Table C-3** quantifies the importance of controlling the impacts from development.

Table C-4 below summarizes the remaining developable land by land use in descending order. This table illustrates that the largest remaining developable land area is zoned as residential (high, medium density plus low density and rural residential) with at total of 4,737 acres out of 7,190 acres of developable land or 66% of the total available land for development. This represents the single largest remaining land use category remaining to be developed and where the Township will need to focus its efforts to control non-point source pollution through low impact developments measures to achieve the greatest benefit.

Table C-4

Developable Area Remaining by Land Use

Land Use	Remaining Acres	Percentage
High, Med Density Res.	**3870**	**53.8%**
Commercial	**1091**	**15.2%**
Low Density, Rural Res.	**867**	**12.1%**
Agricultural	**789**	**11.0%**
Urban, Mixed, Other	**499**	**6.9%**
Industrial	**64**	**0.9%**
Forest, Water, Wetlands	**9**	**0.1%**
Barren land/Transitional	**0**	**0.0%**
Watershed Total	**7190**	**100.0%**

Table C-2 HUC14 Build-Out Calculations

HUC14 and Zone	Acres	Constrained Lands Acres	Developable Area Acres
HUC14 ID	**Subwatershed Name**		
2040202060010	**Kettle Run (above Centennial Lake)**		
High, Med Density Res.	964.1	818.2	145.9
Low Density, Rural Res.	440.1	431.8	8.3
Commercial	0.0	0.0	0.0
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	55.2	53.9	1.3
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	1.9	1.9	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**1461.4**	**1305.8**	**155.5**
HUC14 ID	**Subwatershed Name**		
2040202060020	**Lake Pine / Centennial Lake & tribs**		
High, Med Density Res.	2629.8	1914.0	715.8
Low Density, Rural Res.	14.5	14.5	0.0
Commercial	4.0	1.1	2.9
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	167.6	163.0	4.6
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	0.3	0.3	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**2816.2**	**2093.0**	**723.2**
HUC14 ID	**Subwatershed Name**		
2040202060030	**Haynes Creek (below Lake Pine)**		
High, Med Density Res.	4177.8	2685.1	1492.7
Low Density, Rural Res.	9.4	5.3	4.1
Commercial	313.1	126.6	186.5
Industrial	13.6	1.1	12.5
Urban, Mixed, Other	717.2	346.9	370.3
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	12.5	11.1	1.4
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**5243.6**	**3176.2**	**2067.5**
HUC14 ID	**Subwatershed Name**		
02040202060050	**Barton Run (below Kettle Run Road)**		
High, Med Density Res.	291.8	230.7	61.0
Low Density, Rural Res.	570.1	423.8	146.3
Commercial	49.6	24.2	25.4
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	0.0	0.0	0.0
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**911.5**	**678.7**	**232.8**

Table C-2 HUC14 Build-Out Calculations (Continued)

HUC14 and Zone	Acres	Constrained Lands Acres	Developable Area Acres
HUC14 ID	**Subwatershed Name**		
02040202060070	**Little Creek (above Bear Swamp River)**		
High, Med Density Res.	676.4	443.6	232.7
Low Density, Rural Res.	1435.2	1130.1	305.1
Commercial	15.6	7.1	8.5
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	70.5	70.5	0.0
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	26.8	18.8	8.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**2224.4**	**1670.1**	**554.3**
HUC14 ID	**Subwatershed Name**		
02040202060080	**Rancocas Ck SW Branch (above Medford br)**		
High, Med Density Res.	342.3	338.5	3.7
Low Density, Rural Res.	261.4	158.0	103.4
Commercial	312.2	152.0	160.2
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	207.6	184.0	23.7
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**1123.5**	**832.5**	**291.0**
HUC14 ID	**Subwatershed Name**		
02040202060090	**Little Creek (below Bear Swamp River)**		
High, Med Density Res.	330.1	256.2	73.9
Low Density, Rural Res.	619.5	543.3	76.1
Commercial	163.8	77.4	86.3
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	75.3	0.0	75.3
Agricultural	538.4	351.7	186.7
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**1727.1**	**1228.6**	**498.5**
HUC14 ID	**Subwatershed Name**		
02040202060100	**Rancocas Ck SW Branch (below Medford br)**		
High, Med Density Res.	1743.5	966.7	776.9
Low Density, Rural Res.	15.4	1.4	14.0
Commercial	1131.8	510.6	621.2
Industrial	70.7	18.9	51.8
Urban, Mixed, Other	389.9	370.1	19.8
Agricultural	1188.7	841.3	347.4
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**4540.0**	**2708.9**	**1831.1**
HUC14 ID	**Subwatershed Name**		
02040202070020	**Rancocas Creek SB (Rt 38 to Bobbys Run)**		
High, Med Density Res.	39.7	7.7	32.0
Low Density, Rural Res.	0.0	0.0	0.0
Commercial	0.5	0.0	0.5
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	145.3	143.9	1.4
Agricultural	266.4	173.3	93.2
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**451.9**	**324.8**	**127.1**

Table C-2 HUC14 Build-Out Calculations (Continued)

HUC14 and Zone	Acres	Constrained Lands Acres	Developable Area Acres
HUC14 ID	**Subwatershed Name**		
02040202070030	**Rancocas Creek SB (below Rt 38)**		
High, Med Density Res.	57.5	4.3	53.2
Low Density, Rural Res.	0.0	0.0	0.0
Commercial	0.0	0.0	0.0
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	157.2	154.6	2.7
Agricultural	379.1	217.5	161.6
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**593.8**	**376.3**	**217.5**
HUC14 ID	**Subwatershed Name**		
02040301150030	**Indian Mills Brook / Muskingum Brook**		
High, Med Density Res.	260.0	71.1	188.9
Low Density, Rural Res.	0.2	0.0	0.2
Commercial	0.0	0.0	0.0
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	4.6	4.6	0.0
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**264.8**	**75.7**	**189.1**
HUC14 ID	**Subwatershed Name**		
02040301160010	**Alquatka Branch**		
High, Med Density Res.	123.5	30.6	92.8
Low Density, Rural Res.	3381.8	3186.5	195.3
Commercial	0.0	0.0	0.0
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	29.4	29.4	0.0
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	28.7	28.7	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**3563.3**	**3275.2**	**288.1**
HUC14 ID	**Subwatershed Name**		
02040301160020	**Mullica River (above Jackson Road)**		
High, Med Density Res.	0.0	0.0	0.0
Low Density, Rural Res.	289.7	275.4	14.3
Commercial	0.0	0.0	0.0
Industrial	0.0	0.0	0.0
Urban, Mixed, Other	0.0	0.0	0.0
Agricultural	0.0	0.0	0.0
Forest, Water, Wetlands	0.0	0.0	0.0
Barrenland/Transitional	0.0	0.0	0.0
Watershed Total	**289.7**	**275.4**	**14.3**

Table C-3 Nonpoint Source Loads at Build-Out

HUC14 and Zone	Developable Area Acres	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
HUC14 ID	**Subwatershed Name**						
02040202060010	**Kettle Run (above Centennial Lake)**						
High, Med Density Res.	145.9	1.4	204.3	15	2188.7	140	20427.7
Low Density, Rural Res.	8.3	0.6	5.0	5	41.6	100	832.3
Commercial	0.0	2.1	0.0	22	0.0	200	0.0
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	1.3	1.0	1.3	10	13.0	120	155.6
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**155.5**		**211**		**2,243**		**21,416**
HUC14 ID	**Subwatershed Name**						
02040202060020	**Lake Pine / Centennial Lake & tribs**						
High, Med Density Res.	715.8	1.4	1002.1	15	10736.3	140	100205.1
Low Density, Rural Res.	0.0	0.6	0.0	5	0.0	100	0.0
Commercial	2.9	2.1	6.0	22	63.2	200	574.6
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	4.6	1.0	4.6	10	45.9	120	550.5
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**723.2**		**1,013**		**10,845**		**101,330**
HUC14 ID	**Subwatershed Name**						
02040202060030	**Haynes Creek (below Lake Pine)**						
High, Med Density Res.	1492.7	1.4	2089.8	15	22390.3	140	208976.1
Low Density, Rural Res.	4.1	0.6	2.5	5	20.5	100	410.0
Commercial	186.5	2.1	391.7	22	4103.5	200	37304.8
Industrial	12.5	1.5	18.7	16	200.0	200	2499.6
Urban, Mixed, Other	370.3	1.0	370.3	10	3702.9	120	44435.1
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	1.4	0.1	0.1	3	4.1	40	54.2
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**2067.5**		**2,873**		**30,421**		**293,680**
HUC14 ID	**Subwatershed Name**						
02040202060050	**Barton Run (below Kettle Run Road)**						
High, Med Density Res.	61.0	1.4	85.5	15	915.7	140	8546.5
Low Density, Rural Res.	146.3	0.6	87.8	5	731.6	100	14632.0
Commercial	25.4	2.1	53.3	22	558.6	200	5077.8
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	0.0	1.0	0.0	10	0.0	120	0.0
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**232.8**		**227**		**2,206**		**28,256**

Table C-3 Nonpoint Source Loads at Build-Out (Continued)

HUC14 and Zone	Developable Area Acres	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
HUC14 ID 02040202060070	**Subwatershed Name: Little Creek (above Bear Swamp River)**						
High, Med Density Res.	232.7	1.4	325.8	15	3491.0	140	32582.4
Low Density, Rural Res.	305.1	0.6	183.1	5	1525.6	100	30512.1
Commercial	8.5	2.1	17.9	22	187.5	200	1704.6
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	0.0	1.0	0.0	10	0.0	120	0.0
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	8.0	0.1	0.8	3	23.9	40	318.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**554.3**		**528**		**5,228**		**65,117**
HUC14 ID 02040202060080	**Subwatershed Name: Rancocas Ck SW Branch (above Medford br)**						
High, Med Density Res.	3.7	1.4	5.2	15	55.9	140	521.4
Low Density, Rural Res.	103.4	0.6	62.1	5	517.2	100	10344.4
Commercial	160.2	2.1	336.3	22	3523.5	200	32031.4
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	23.7	1.0	23.7	10	236.5	120	2838.2
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**291.0**		**427**		**4,333**		**45,736**
HUC14 ID 02040202060090	**Subwatershed Name: Little Creek (below Bear Swamp River)**						
High, Med Density Res.	73.9	1.4	103.5	15	1108.7	140	10347.4
Low Density, Rural Res.	76.1	0.6	45.7	5	380.7	100	7614.1
Commercial	86.3	2.1	181.3	22	1899.4	200	17267.0
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	75.3	1.0	75.3	10	753.5	120	9041.5
Agricultural	186.7	1.3	242.8	10	1867.5	300	56025.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**498.5**		**649**		**6,010**		**100,295**
HUC14 ID 02040202060100	**Subwatershed Name: Rancocas Ck SW Branch (below Medford br)**						
High, Med Density Res.	776.9	1.4	1087.6	15	11653.0	140	108761.5
Low Density, Rural Res.	14.0	0.6	8.4	5	69.9	100	1397.6
Commercial	621.2	2.1	1304.5	22	13666.2	200	124238.6
Industrial	51.8	1.5	77.8	16	829.3	200	10366.8
Urban, Mixed, Other	19.8	1.0	19.8	10	198.4	120	2380.3
Agricultural	347.4	1.3	451.6	10	3474.0	300	104220.4
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**1831.1**		**2,950**		**29,891**		**351,365**
HUC14 ID 02040202070020	**Subwatershed Name: Rancocas Creek SB (Rt 38 to Bobbys Run)**						
High, Med Density Res.	32.0	1.4	44.8	15	480.0	140	4480.2
Low Density, Rural Res.	0.0	0.6	0.0	5	0.0	100	0.0
Commercial	0.5	2.1	1.0	22	10.3	200	93.5
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	1.4	1.0	1.4	10	14.3	120	172.1
Agricultural	93.2	1.3	121.1	10	931.9	300	27955.6
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**127.1**		**168**		**1,436**		**32,701**

Table C-3 Nonpoint Source Loads at Build-Out (Continued)

HUC14 and Zone	Developable Area Acres	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
HUC14 ID	**Subwatershed Name**						
02040202070030	**Rancocas Creek SB (below Rt 38)**						
High, Med Density Res.	53.2	1.4	74.5	15	798.2	140	7449.9
Low Density, Rural Res.	0.0	0.6	0.0	5	0.0	100	0.0
Commercial	0.0	2.1	0.0	22	0.1	200	1.0
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	2.7	1.0	2.7	10	26.6	120	318.6
Agricultural	161.6	1.3	210.1	10	1615.9	300	48478.3
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**217.5**		**287**		**2,441**		**56,248**
HUC14 ID	**Subwatershed Name**						
02040301150030	**Indian Mills Brook / Muskingum Brook**						
High, Med Density Res.	188.9	1.4	264.4	15	2833.3	140	26443.7
Low Density, Rural Res.	0.2	0.6	0.1	5	1.0	100	19.1
Commercial	0.0	2.1	0.0	22	0.0	200	0.0
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	0.0	1.0	0.0	10	0.0	120	0.2
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**189.1**		**265**		**2,834**		**26,463**
HUC14 ID	**Subwatershed Name**						
02040301160010	**Alquatka Branch**						
High, Med Density Res.	92.8	1.4	129.9	15	1392.3	140	12994.4
Low Density, Rural Res.	195.3	0.6	117.2	5	976.4	100	19527.8
Commercial	0.0	2.1	0.0	22	0.0	200	0.0
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	0.0	1.0	0.0	10	0.0	120	0.0
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0
Barrenland/Transitional	0.0	0.5	0.0	5	0.0	60	0.0
Watershed Total	**288.1**		**247**		**2,369**		**32,522**
HUC14 ID	**Subwatershed Name**						
02040301160020	**Mullica River (above Jackson Road)**						
High, Med Density Res.	0.0	1.4	0.0	15	0.0	140	0.0
Low Density, Rural Res.	14.3	0.6	8.6	5	71.5	100	1430.5
Commercial	0.0	2.1	0.0	22	0.0	200	0.0
Industrial	0.0	1.5	0.0	16	0.0	200	0.0
Urban, Mixed, Other	0.0	1.0	0.0	10	0.0	120	0.0
Agricultural	0.0	1.3	0.0	10	0.0	300	0.0
Forest, Water, Wetlands	0.0	0.1	0.0	3	0.0	40	0.0

10.0 Mitigation Plans

Exemptions are provided to lessen the impact of redevelopment of existing sites within Medford where the current stormwater standards cannot be imposed due to physical limitations. Exemptions are not recommended for major development projects on previously undeveloped parcels. Exemptions are to be granted only upon the condition that the applicant provides a mitigation project of equal value within the same sub-watershed as delineated by the HUC 14 do not negatively impact sensitive receptors. For those exemptions granted in the Pinelands Area, in addition to be located within the same sub-watershed the mitigation project must also be located in the Pinelands. The Township at its sole discretion based on recommendation from the Township Engineer may accept monetary contributions in lieu of performing the off-site mitigation. The amount of any such in lieu contribution shall be equivalent to the total cost (including design, permitting, land acquisition or easement, and construction) of implementing and maintaining the stormwater management measure for which an exception is granted. The Township must expend any contributions collected within 5 years of their receipt.

Sensitive receptors in Medford include:

- Property within Pinelands Preserve identified in the Medford-Evesham Sub-Regional Resource Protection Plan
- Little Creek for Fecal Coliform
- Masons Creek – Category 1 Waters
- Sharps Run for Fecal Coliform
- South Branch Rancocas Creek – for Phosphorous
- All Lakes for nutrient and sediment loading

All mitigation projects are to be under the review and approval of the Medford Township Engineer. Mitigation Plan project submissions shall include for review:

1. A table to show the required values and the values provided in the project are equivalent
2. An alternatives analysis demonstrating that on-site compliance was maximized.
3. Narrative and supporting information regarding the need for the waiver.

4. Identify the sensitive receptor and demonstrate that the mitigation project contributes to the same sensitive receptor.
5. Design details to include but not be limited to drawings, calculations, and other information needed to evaluate the mitigation project.
6. List the party or parties responsible for the construction and the future operation and maintenance of the mitigation project. Submit ownership documentation or easements as applicable.
7. Maintenance Plan meeting the requirements of Section 12 of the Township's drainage ordinance.
8. Construction schedule of the mitigation project and development project.

All mitigation projects are to be reviewed and approved by the Township Engineer subject to all of the requirements of the Stormwater Ordinance. Proposed mitigation projects will be evaluated based on:

1. Project must be within the same area that would contribute to the receptor impacted by the project. If there is no specific sensitive receptor impacted, then the location of the mitigation project can be located anywhere within the Township, preferably at a location that would provide the most benefit.
2. Legal authorization from the property owner must be obtained to construct the project at the location selected. This includes the maintenance and any access needs for the project in the future.
3. The project should be close to the location of the original project, and if possible, be located upstream at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but on a similar hydraulic distance to the sensitive receptor.
4. Preference is given to one location that addresses any and all of the performance standards waived, rather than separate locations for each performance standard.
5. The project location must demonstrate no adverse impacts to other properties.

There are no specific mitigation projects within Medford Township established at this time. In general mitigation projects can generally categorized as:

WATER QUALITY MITIGATION PROJECTS

1. Stormwater Basin Retrofit

   Provide Water Quality measures at existing stormwater basins within the same HUC14 under the guidance of the Medford Township Engineer and Engineering Department. The retrofit of existing basins may be accomplished through a variety and/or combination of options to meet the mitigation costs required. Review of each existing basin condition and surrounding condition should be reviewed with the Township before selecting one or more of the following options:

   a. Outlet structure modifications to accommodate water quality design storm

   b. Regrading and Planting

   c. Elimination of Low Flow Channels

   d. Installation of in-line or end-of-pipe Best Management Practice (BMP) as approved by the NJDEP to pretreat stormwater draining into an existing stormwater management basin

2. Stream and Stream Bank Stabilization

   Mitigation projects other than those listed meeting the following criteria may be presented for review and approval by the Medford Township Engineer and Engineering Department. Stabilization projects will be reviewed for the following benefits:

   a. Stabilization of eroded stream banks where public or private property or structures are threatened. Bioremediation of eroded stream banks is recommended.

   b. Reduced sediment deposition in lakes, ponds and other low velocity areas.

   c. Improved water quality

3. Stormwater Outfall Restoration

   Mitigation of Existing Stormwater Outfalls within the same HUC14 under the guidance of the Medford Township Engineer and Engineering Department. The retrofit of existing

outfalls may be accomplished through a variety and/or combination of options to meet the mitigation costs required. Review of each existing outfall condition should be reviewed with the Township before selecting one or more of the following options:

a. Replacement of failed outfall structure with outlet protection

b. Replacement with installation of drop manhole to set outfall structure at invert of stream channel with outlet protection

c. Installation of in-line or end-of-pipe Best Management Practice (BMP) as approved by the NJDEP to pretreat stormwater before the outfall structure

d. Disconnect outfall from receiving waterway to eliminate erosion condition. Permitted only with detailed hydrologic analysis and stability analysis of the receiving area.

4. Lake and Pond Management

Provide a comprehensive management plan and maintenance schedule for a publicly held lakes and ponds within Medford Township with Birchwood Lakes and Oakwood Lakes being the first priority.

5. Inlet Retrofit

Retrofit existing inlets with the following:

a. Metal bar insert to retrofit

b. Replacement of cast curb piece

c. Replacement of flat grate with a bicycle safe grate

d. Sediment Traps

All retrofits of inlets will be approved by the Medford Township Engineer to meet NJDEP Attachment "C" of the MS4 Permit requirements. The inserts improve water quality by reducing floatables and materials that reach the bottom of the inlet to decay and that ultimately reach the stream. The priority of inlets to be retrofit as a mitigation within Township right-of-ways shall be determined by the Medford Township Engineer. However, the Birchwood Lakes drainage shed will be the first priority. In other areas, Medford Township will retrofit inlets when street are repaved. By including additional inlets as a mitigation option, the Township of

Medford will be improving water quality on public right-of-ways that will not be repaved or resurfaced for the greatest number of years.

RECHARGE MITIGATION PROJECTS

1. Stormwater Basin Retrofit

   Provide groundwater recharge at existing stormwater basins within the same HUC14 under the guidance of the Medford Township Engineer and Engineering Department. The retrofit of existing basins may be accomplished through a variety and/or combination of options to meet the mitigation costs required. Review of each existing basin condition, soils and surrounding area should be reviewed with the Township before selecting one.

QUANTITY MITIGATION PROJECTS

1. Stormwater Basin Retrofit

   Provide stormwater quantity reduction at existing stormwater basins within the same HUC14 that do not meet the current standards for the 2, 10 and 100 year storms of 50%, 75% and 80% respectively. Under the Guidance of the Medford Township Engineer and Engineering Department review each existing basin condition, downstream area and contributory drainage areas before selecting a basin.

11.0 Summary

The Stormwater Management Plan has been revised to incorporate both Burlington County and Pineland Commission comments and is presented for adoption to the Township of Medford Planning Board is required for the Township of Medford to meet the requirements of the Medford Township NJPDES MS4 permit. If adopted the stormwater management plan will become an element of the Medford Township Master Plan.

The revised ordinance included as Attachment 1 has been reviewed and will be adopted by the Township of Medford Council upon approval of both Burlington County Planning and Pinelands Commission.

The Township of Medford Stormwater Management Plan represents the beginning of a new process in which municipalities participate in improving water quality conditions from non-point source pollution. The Township of Medford's Stormwater Management Plan will improve the non-point source pollution conditions to the Delaware River, the Rancocas River Watershed and the Mullica River Watershed.

Appendices

Maps