STORMWATER MANAGEMENT PLAN ELEMENT

(Adopted July 25, 2005)

INTRODUCTION

Harding Township is located in the designated *Highlands* region, an *Environmentally Sensitive Planning Area* (PA-5), and in the Great Swamp Watershed. In each case, Harding is an area of special State concern because of the water resources of exceptional sensitivity and importance. Their protection is a central goal of this Master Plan.

The purpose of this element is to document the strategy for mitigating the impact of development on these resources in accordance with N.J.A.C. 7:14A-25 Municipal Stormwater Regulations and 7:8 Stormwater Management Rules. It addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major developments, defined as projects that disturb one or more acres of land. These standards are 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. This element also describes the measures for long-term operation and maintenance of existing and future stormwater facilities.

The review and updating of existing ordinances, other elements of the Master Plan, and other planning documents is also addressed to promote project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for use when a variance or exemption from the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

GOALS AND OBJECTIVES

The overall goal of this plan element is to preserve the exceptional quality of surface and groundwater resources in Harding Township. In order to achieve this, the following objectives must be implemented:

- Minimize, to the extent practical, any increase in stormwater runoff from any new development.
- Reduce soil erosion from development or construction projects.
- Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures.
- Maintain groundwater recharge and, to the extent practical, restore groundwater recharge to pre-colonial rates.
- Prevent, to the greatest extent feasible, an increase oint 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 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.
- Reduce flood damage, including damage to life and property.

To achieve these objectives, specific stormwater design and performance standards for new development are outlined. Additionally, stormwater management controls to address impacts from existing development are proposed. Preventative and corrective maintenance strategies are included to ensure long-term effectiveness of stormwater management facilities. Safety standards for stormwater infrastructure to be implemented to protect public safety are also outlined.

BACKGROUND

Harding Township serves as the headwaters for major tributaries of the Passaic River. Figure 8 illustrates the various waterways and watersheds of the township. Out of Harding's total of 13,100 acres, 12,793 acres lie within the drainage basin of the Passaic River. This can be broken down into five sub-basins, defined by waters flowing into the five largest waterways in the township: Loantaka Brook, Great Brook, Primrose Brook, Black Brook and the Passaic River. Over 97 percent of the township's land area drains into the Great Swamp. A small area, comprised of about 300 acres in the northwesterly corner of the township, lies within the headwaters of the Whippany River drainage basin and is not directly tributary to either the Great Swamp or the Passaic River. All but 300 acres are located within the Great Swamp basin and approximately 36 percent of the basin itself is comprised of lands within Harding.

A detailed discussion of each watershed and stream is provided in the Environmental Resources Inventory of this Master Plan. Water quality classifications assigned by the NJDEP to the township's waterways are as follows:

- Silver Brook: Freshwater-2, Non-trout
- Great Brook: Freshwater-2, Non-trout
- Mill Brook: Freshwater-2, Non-trout
- Primrose Brook (above Lee's Hill Road): Freshwater-2, Trout Production, Category 1
- Primrose Brook (below Lee's Hill Road): Freshwater-2, Non-trout
- Passaic River (above Osborn Pond): Freshwater-2, Trout Production, Category 1
- Passaic River (Osborn Pond and below): Freshwater-2, Non-trout

It should be noted that all township waterways are designated Category 1 waters as soon as they enter the Great Swamp National Wildlife Refuge.

Water quality studies conducted on the Great Swamp's tributary streams point to the detrimental impact of land development without good stormwater management policies. These studies have raised concern among various groups and at all levels of government that unless development policies in the watershed, and especially those concerning stormwater management, are modified

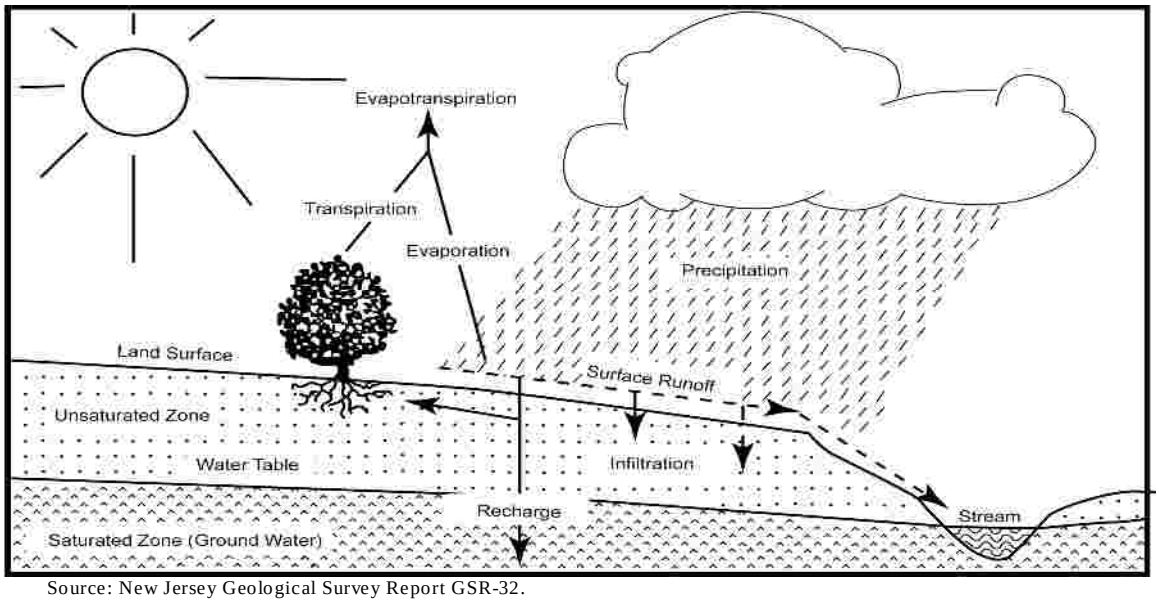
there will be further degradation of the waters flowing into the National Wildlife Refuge. The major concern is that urban development in the watershed is having the effect of increasing the volume, rate, and pollution of stormwater flowing into the Refuge.

EFFECT OF DEVELOPMENT ON WATER RESOURCES

Land development can dramatically alter the hydrologic cycle of a site and, ultimately, an entire watershed as shown in the illustration below. 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. Deve ove 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.

Additional impacts from development are created when impervious areas are connected to each other through gutters, channels, and storm sewers. These features transport stormwater runoff to downstream waterways more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing stream f in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream.

Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base stream flows and increased peak stream 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. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

In addition to increases in stormwater runoff peak flows, stormwater 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.

Land development can also 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 dow fecting cold water fish species such as trout. 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.

DESIGN AND PERFORMANCE STANDARDS

Effective stormwater and water resource management are vital in order to maintain high water quality and supply for a major portion of northern New Jersey (Buried Valley Sole Source Aquifer system). This aquifer system is shown on Figure 4 and groundwater recharge to this aquifer is shown on Figure 2. The township has a special responsibility in this regard in connection with the Great Swamp National Wildlife Refuge because nearly the entire township is in the Great Swamp Watershed.

The township's current design and performance standards for stormwater management can be traced back in time to 1993. It was at that time that the NJ Department of Environmental Protection (NJDEP) adopted a goal of *no net increase* in the volume, rate, and pollution from stormwater runoff for the Great Swamp Watershed. Subsequently, in 1995, the ten municipalities within the watershed of the Great Swamp formally organized the Ten Towns Great Swamp Watershed Management Committee "to establish a common and comprehensive set of regulations and operating practices within their sphere of authority in order to prevent and/or minimize adverse impact upon water quality, wildlife and human well-being within the watershed."

The township worked with the Ten Towns Committee and developed a stormwater ordinance that established design and performance standards necessary to achieve the goal of *no net increase* in the volume, rate, and pollution from stormwater runoff in the Great Swamp Watershed. This ordinance was adopted by Harding Township in 1999. However, because of the Residential Site Improvement Standards adopted by the NJ Department of Community Affairs in 1997, the township's stormwater ordinance was only applicable to nonresidential

development. The township subsequently applied to the Site Improvement Advisory Board for *Special Area* designation of the Great Swamp Watershed. This designation allowed the township to establish *Special Area Standards* for stormwater management in the Great Swamp Watershed. The township's *Special Area Standards* for Stormwater was approved by the NJ Site Improvement Advisory Board in 2002. This standard is substantially the same as the township's stormwater management ordinance adopted in 1999 and is also intended to achieve the *no net increase* goal established for the Great Swamp Watershed by the NJDEP in 1993.

In 2004, the NJDEP adopted N.J.A.C. 7:8-5 (Stormwater Management). This regulation established stringent requirements for stormwater management and recharge as dictated by the Phase II Stormwater Discharge Permitting requirements of the Clean Water Act. The township has carefully reviewed these new regulations and concluded that its stormwater management ordinance (for nonresidential development) and its *Special Area Standards* for Stormwater (for residential development) meet or exceed the design, performance, and safety requirements of N.J.A.C. 7:8-5 and 7:8-6. The township has already submitted the *Special Area Standards* to the NJDEP for its review and is currently working with personnel from the NJDEP to identify and resolve any minor discrepancies between the township and State requirements.

PLAN CONSISTENCY

Harding Township is not within a regional stormwater management planning area and no total maximum daily loads (TMDLs) have been established for any contaminants for any waters within the township; therefore this plan does not need to be consistent with any regional stormwater management plan or any TMDLs. If any regional stormwater management plan or TMDLs are developed in the future, this element will be updated.

This Stormwater Management Plan Element is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21 and the *Special Area Standards* established for Harding Township. The township will utilize the most current update of the RSIS *Special Area Standard* in the stormwater management review of residential developments. This element will be updated to be consistent with any future updates to the RSIS and the *Special Area Standards*.

The township's Stormwater Management Ordinance and RSIS *Special Area Standards* both require the preparation of maintenance plans for stormwater management facilities. Furthermore, all applicants for final subdivision or site plan approval are required to enter into an agreement with the township to ensure the long term perpetual operation, maintenance, repair, and safety of the stormwater management facility.

The township's Stormwater Management Ordinance and RSIS *Special Area Standards* require all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. Because Harding Township is an exempt municipality, as defined by the New Jersey Soil Erosion and Sediment Control Act of 1975, the township is responsible for reviewing, certifying, and enforcing soil erosion control measures. During construction, township inspectors will observe soil erosion and sediment control measures and require compliance with the standards.

NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

Harding Township's Stormwater Management Ordinance and RSIS *Special Area Standards* already incorporate extensive nonstructural stormwater management strategies. These strategies include the preservation of wooded buffers along water of impervious surfaces, and the restoration of meadow environments. Additionally, several zoning changes intended to reduce stormwater impacts from new development have recently been adopted. These include reduced building coverage limitations, impervious coverage limitations, larger lot size requirements, and a lot size-averaging subdivision option. The township will continue to identify and evaluate potential changes to the Master Plan and land use and development ordinances that will encourage reductions in stormwater impacts from development.

LAND USE/BUILD-OUT ANALYSIS

The Stormwater Management Rules [N.J.A.C. 4.3(a)] require the preparation of a build-out analysis for the township. In accordance with the schedule set forth in the rules, this build-out analysis must be completed by February 2, 2006. When completed, this plan element will be updated to include the build-out analysis.

MITIGATION PLAN

State rules provide for variances or exceptions from design and performance standards affecting stormwater management. They should be reviewed with great care and only granted in compelling circumstances because of the importance and sensitivity of the township's water resources. The township's Stormwater Management Ordinance requires that applicants who are unable to meet the "no net increase" provisions of the ordinance must demonstrate that adjacent waterways will not be impacted by:

1) Deterioration or damage of existing culverts, bridges, dams, and other structures.
2) Deterioration of the waterways' biological functions, drainage, floodwater conveyance, and other purposes.
3) Streambank or streambed erosion or siltation.
4) Increased flooding endangering public health, life, and property.

If compelling circumstances can be demonstrated and an applicant is granted a waiver from the strict requirements of the Stormwater Management Ordinance, the applicant should be required to provide mitigation, as necessary, to ensure that impacts outlined above will not be created.

Waivers from compliance with the township's RSIS *Special Area Standards* are governed by the requirements established at N.J.A.C. 5:21-3.2. In accordance with the requirements of the Stormwater Management Rules (N.J.A.C. 7:8), applicants will be required to submit Mitigation Plans if they are granted a waiver from the stormwater management design and performance standards. The following is a hierarchy of options for mitigation plans.

1. The mitigation project must be implemented in the same HUC-14 drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards contained in the township's *Special Area Standards* or Stormwater Management Ordinance. The developer must ensure the long-term maintenance of the project, including the maintenance requirements as contained in the township's *Special Area Standards*.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1 above, the project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 90 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment.

The township should also consider allowing a developer to provide funding or partial funding to an environmental enhancement project that has been identified by the Tens Towns Great Swamp Watershed Management Committee or contribute toward the implementation of a regional stormwater management plan. The funding should be equal to or greater than the cost to implement a mitigation plan as outlined above, including the costs associated with purchasing property or an easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

5 Stormwater Management Plan 7-25-05 Repaginated.doc