

Introduction

The Town of Harrison is primarily serviced by a combined sewer system, which collects and transports sanitary and stormwater flows in the same conduit. The discharge from the Town's Combined Sewer System (CSS) is regulated under NJPDES General Permit NJ0105023. Information from the NJDEP indicates that combined sewer systems, and stormwater discharges to combined or sanitary sewer systems, are outside the scope of the NJPDES Municipal Stormwater Regulation Program (N.J.A.C. 7:14A-24.2(f)). Accordingly, while the Town may choose to selectively implement components of the MSWMP throughout the municipality, complete implementation of this MSWMP is only required in those areas of the Town serviced by MS4s. Accordingly, areas of the Town serviced by the CSS are excluded from the MSWMP.

This Municipal Stormwater Management Plan (MSWMP) documents the initial strategy for the Town of Harrison (Town) to address stormwater management primarily in new development and redevelopment projects that involve greater than 1 acre of disturbance. The development of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the elements required for completion in 2005 as described in N.J.A.C. 7:8 et seq., Stormwater Management Rules. The plan addresses stormwater quantity, and stormwater quality impacts to projects subject to the requirements of N.J.A.C. 7:8 et seq., by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre 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. The plan, in conjunction with the Stormwater Pollution Prevention Plan (SPPP), will describes long-term operation and maintenance measures for existing and future stormwater facilities.

The need for a “build-out” analysis has been completed. A “build-out” analysis is needed if the total vacant or agricultural lands within a town exceeds one square mile (640 acres). The Town of Harrison covers a land area of approximately 800 acres most of which is developed with limited vacant and no agricultural lands. Accordingly the Town does not meet the criterion that requires the completion of a build-out analysis.

Applicable changes and modifications to the plan will be addressed in subsequent updates, the first of which must be completed and adopted by February 2006. The plan also includes a mitigation strategy for review and approval of the Harrison Planning and Board of Adjustment for implementation when a waiver or exemption of the design and performance standards is required. The 2006 plan update will also address the review and update of existing ordinances, the Town Master Plan, and other planning documents to allow for project designs that include low impact development techniques.

Regulatory Framework

According to the United States Environmental Protection Agency (USEPA) polluted stormwater runoff is a leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies which do not meet water quality standards. Over land or via storm sewer systems, polluted runoff is discharged, often untreated, directly into local water bodies. When left uncontrolled, this water pollution can result in the destruction of fish, wildlife, and aquatic life habitats; a loss in aesthetic value; and threats to public health due to contaminated food, drinking water supplies, and recreational waterways.

Mandated by Congress under the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Stormwater Program is a comprehensive two-phased national program for addressing the non-agricultural sources of stormwater discharges, which adversely affect the quality of our nation's waters. The program uses the NPDES permitting mechanism to require the implementation of controls designed to prevent harmful pollutants from being washed by stormwater runoff into local water bodies.

In response to the requirements of the second phase of the USEPA's national NPDES Phase II regulations published in December 1999, the State of New Jersey developed the Municipal Stormwater Regulation Program. This program addresses pollutants entering our waters from storm drainage systems operated by local, county, state, interstate, and federal government agencies. These systems are referred to as "municipal separate storm sewer systems" or MS4s and are regulated under the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules (N.J.A.C. 7:14A). The NJDEP created four (4) NJPDES Stormwater General Permits for the various types of public separate storm sewer systems. These general permits include the Tier A Municipal Stormwater General Permit, Tier B Municipal Stormwater General Permit, Public Complex Stormwater General Permit, and the Highway Agency Stormwater General Permit.

For each General Permit, NJDEP has mandated Statewide Basic Requirements (herein referred to as SBRs), which include minimum standards, measurable goals, and implementation schedules. The minimum standards are one or more actions that must be taken to comply with the requirement of the permit. The measurable goals are the mechanism for reporting to the NJDEP the progress that the Municipality has made to implement the requirements of the permit and are accomplished primarily through the submittal of an Annual Report and Certification. The implementation schedule sets the deadlines for permit compliance.

All municipalities within the State of New Jersey have been classified as either Tier A or Tier B communities depending on population density as determined in the 2000 United States Census. The Town of Harrison is regulated under the NJPDES Stormwater Tier A General Permit, NJPDES No. NJ0141852. As part of the permit, several SBRs were mandated and an associated implementation schedule was established (refer to Appendix A of this plan for a copy of the Tier A Permit). To satisfy the permit requirements, each Tier A municipality is required to develop, implement, and enforce a Stormwater Program. The Tier A SBRs are detailed in the Tier A Permit and summarized on the Tier A Matrix also in Appendix A. Each requirement listed in the Tier A permit has a specific

implementation schedule based on the effective date of permit authorization. This implementation schedule is summarized in Table 1.

Table 1	
Tier A Permit Requirement Implementation Schedule for the Town of Harrison	
Implementation Schedule	Permit Requirement
April 1, 2004	Ensure public notice requirements are met when developing and implementing the municipal stormwater program.
April 1, 2004	Ensure major development projects comply with RSIS.
April 1, 2004	Ensure adequate O&M of BMPs on municipal property.
April 1, 2005	Develop & Implement Stormwater Management Plan.
April 1, 2005	Develop & Implement SPPP.
April 1, 2005	Ensure new municipal storm drain inlets meet design standards.
April 1, 2005	Establish Local Public Education Program.
April 1, 2005	Implement Solids and Floatable Controls programs, including street sweeping, storm drain inlet retrofits, stormwater facility maintenance, and roadside erosion control.
April 1, 2005	Implement and comply with Maintenance Yard Operations Plan.
April 1, 2005	Implement Employee Training Program.
April 1, 2005	Implement a municipal storm drain inlet labeling program.
May 2, 2005	Submit first Annual Report and Certification to NJDEP.
Oct. 1, 2005	Initiate and Enforce improper waste disposal ordinances.
Oct. 1, 2005	Initiate and Enforce Illicit Connections Ordinance and Implement Illicit Connection Elimination Program.
Oct. 1, 2005	Initiate and Implement Roadside Erosion Control Program and Outfall Pipe Stream Scouring Detection, Remediation, and Maintenance Program.
April 1, 2006	Ensure adequate O&M of BMPs on private property.
April 1, 2006	Adopt stormwater Control Ordinance.
April 1, 2006	Ensure new storm drain inlets meet design standards for all projects.
April 1, 2007	Label 50% of municipal storm drain inlets.
April 1, 2007	Complete mapping of two sectors of MS4 outfall pipes.
April 1, 2009	Label all municipal storm drain inlets.
April 1, 2009	Complete mapping of all MS4 outfall pipes.
April 1, 2009	Complete NJDEP's Illicit Connection Inspection Report.

General Requirements for Stormwater Management Planning

Subchapter 2 of N.J.A.C. 7:8 includes general requirements for municipal and regional

stormwater management planning. For municipal stormwater management planning the requirements are, at a minimum, applicable to management of stormwater related impacts of major developments, defined in this case as new development or redevelopment projects that ultimately disturb one or more acres of land. Accordingly, this stormwater management plan and the stormwater control ordinance under review by the Town shall be designed in the context of the following goals for major developments:

- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream 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 stormwater basins.
- maintain groundwater recharge; and
- maintain the integrity of stream channels for their biological functions, as well as for drainage.

To achieve these goals for new development and redevelopment projects the model stormwater control ordinance under consideration (Appendix B) outlines specific stormwater design and performance standards for new development; preventative and corrective maintenance strategies to ensure long-term effectiveness of stormwater

management facilities; and safety standards for stormwater infrastructure to be implemented to protect public safety. The model ordinance applies only to non-residential properties within the MS4 portion of the Town. The Town is already enforcing the Residential Site Improvement Standards (RSIS), which carries the same requirements as the model ordinance, but for residential development. Furthermore, the above goals will be considered should additional ordinances, related to stormwater-related water quality and water quantity impacts of existing land uses, be considered by the Town. Issues associated with the stormwater impacts of reconstruction of buildings on existing lots will be evaluated and the need for additional regulation of such considered.

Long Term Goals of the MSWMP

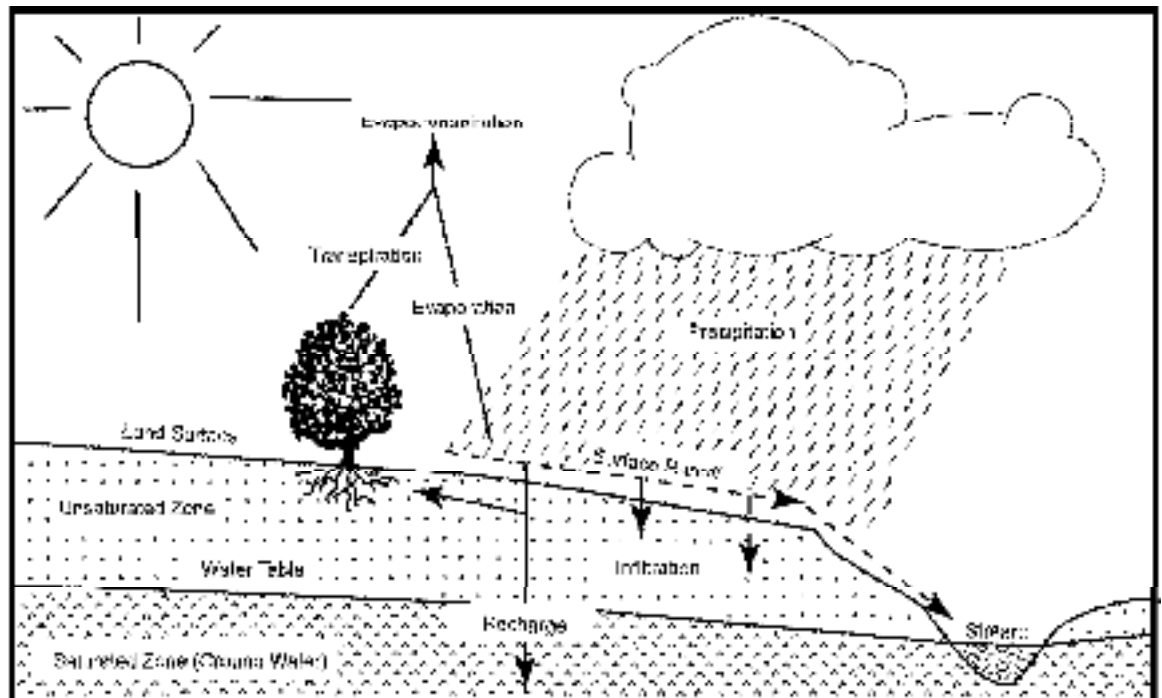
As discussed in the Regulatory Framework Section of this document the municipal stormwater permitting program was founded in response requirements in the Federal Clean Water Act (CWA). For surface waters of the state, the CWA goals are in part expressed in policy and standards included in N.J.A.C. 7:9B Surface Water Quality Standards. The standards include requirements for maintenance and protection of the designated uses of surface waters of the state and where economically feasible, are attained wherever these uses are not precluded by natural conditions. Where the instream water quality parameters exceed the applicable state water quality criteria, the water is considered impaired, and the NJDEP may be required to develop a Total Maximum Daily Load (TMDL) for those pollutants for that waterway. When the non-point source pollution component of the TMDL is considered to be contributing to exceedance of water quality parameters action may be necessary by the Town regarding addressing stormwater related impacts of existing land uses.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody 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 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 in general include: improved stormwater treatment; adoption of ordinances; retrofitting stormwater systems, and other BMPs.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report (<http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/integratedlist.htm>) presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. The need for action in the Town regarding TMDLs for the Passaic River is currently being developed by the NJDEP.

Stormwater Discussion



Source: New Jersey Geological Survey Report GSR-32.

Figure 1 – Schematic of Hydrologic Cycle

The NJDEP has developed a wealth of stormwater management information, both as background for development of the stormwater rules (N.J.A.C. 7:8 et seq.), and as support for implementation of the municipal stormwater permitting program. This information has been made readily available on the NJDEP stormwater website at www.njstormwater.org. The full text of the NJ Stormwater BMP manual can be found on that website. Of particular relevance to this section of the MSWMP is Chapter 1 of the manual entitled “Impacts of Development on Runoff”, from which the following information was excerpted.

Land development can dramatically alter the hydrologic cycle 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. 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 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. 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. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

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.

Background

General

The Town of Harrison is an older urban community located in Hudson County, which comprises a land area of approximately 1.25 square miles (800 acres). It is bounded by the Passaic River along the western and southern borders, the Borough of East Newark, on the east, and the Town of Kearny on the north and west. In accordance with Sub-list 5 of the New Jersey Integrated Water Quality Monitoring and Assessment Report (2004), the Passaic River between Route 280 and the confluence of the Pompton River is listed as having high priority ranking for mercury impairment. The NJDEP 2004 Assessment Report identifies the need for TMDL's relating to mercury and Fish-Dioxin to be implemented by 2006 for the Passaic River Estuary and surrounding tributaries, which are adjacent to and downstream of Harrison. Figure 2 illustrates the municipal boundary and water bodies in and around the Town. Currently the need for action regarding the impairment of the Passaic River is under review and development by the NJDEP.

The population of the Town has increased from 13,425 in 1990, to 14,424 in 2000 resulting in a 2000 population density of 11,811 persons per square mile. The 2000

Census indicates that the Town has 5,254 housing units most of which were constructed prior to 1940.

A review of the NJ State GIS indicates that there are no wellhead protection areas located within the Town boundary. As illustrated in Figure 3, there are no identified public community water supply wells located within the Town of Harrison. Additionally groundwater recharge areas have not been delineated within the Town's highly urbanized boundaries. As noted by the New Jersey Geological Survey groundwater recharge for Hudson County has not been calculated due to the lack of current soil surveys and soils coverage for this county"

As previously indicated, the Town of Harrison is served almost entirely by a combined sewer system which conveys both sanitary and storm flows through the same conduit. Therefore a majority of stormwater runoff within the Town is conveyed through the combined system. The Town currently has two (2) areas that are served by a separate stormwater collection system. The two separate storm sewer areas are located along the perimeter of the Town and discharge into the Passaic River. Figure 4 illustrates the municipal separate storm sewer areas within the Town. Mapping of the combined sewer and separate storm sewer systems, as well as the major streets within the Town, is included in the rear of the plan. As previously noted, areas of the Town serviced by the combined sewer system are regulated under their own NJPDES Permit and accordingly are exempt from the strict compliance with the MSWMP.

Land Use

The Town of Harrison is an urban community, which is primarily residential with a large industrial area south of Route 280. Approximately fifty (50) percent of the land in Harrison had been industrial, with railroad property dispersed throughout. The largest industrial areas are located along the Passaic River and the area south of Route 280, while commercial areas are primarily restricted to two main roads, Harrison Avenue and Frank E. Rogers Boulevard. Industry has been on the decline for years and many of the areas

that were previously used for industrial activities are currently zoned for waterfront redevelopment. A copy of the Town zoning map is located in Appendix D of this report.

Topography

The Town of Harrison is relatively flat with elevations ranging from near mean sea level to 30 feet above sea level. Ground elevations are relatively flat and increase gradually towards the center of town with the highest elevations located near Central Avenue and Frank E. Rogers Boulevard. Elevations along the Passaic River are generally at or below 10 feet above sea level and are therefore susceptible to flooding during period of intense rainfall and tidal influence. Figure 5 depicts the Town boundary on the U.S. Geological Survey Topographic map.

Soils and Underling Geology

Harrison is located in the Piedmont or Triassic lowlands physiographic region of New Jersey. The Piedmont contains lowlands and broad valleys and is composed mostly of shales, sandstones, and some igneous intrusions/extrusions of basalt or diabase. The main geological formation that underlies Harrison is the Brunswick Formation of Triassic age. The Brunswick formation consists primarily of shale, sandstones and some conglomerate. Overlying the rocks of the Brunswick Formation are a heterogeneous mixture of clays, silt, sand, gravel and boulders, or stratified drift, deposited by the Wisconsin glacier during the Pleistocene. As the glacier retreated, thick layers of clay, deposited meltwater, and sand carried down the post-glacial Passaic were deposited on the surface. The altitude of the bedrock beneath the area is as much as 280 feet below sea level and the overlying glacial material is as much as 300 feet thick.

The Brunswick Formation provides a significant groundwater in the joints and fractures in consolidated rocks and in the voids of the unconsolidated till material. The most productive water bearing zones are found at depths of 300 – 400 feet. It is reported that heavy pumping in the Newark area has lowered the sub-surface groundwater levels to more than 100 feet below sea level (Nichols, 1968). This has interfered with the natural

groundwater gradient and induced saltwater intrusion. Groundwater contamination is also a common problem in the area, especially in the immediate vicinity of the industrialized and urban areas that overly the aquifer. As a result of saltwater intrusion and pollution, groundwater is used only for industrial purposes. The main source of potable water is from surface water purchased through the Passaic Valley Water Commission (PVWC). The PVWC obtains its water from the Passaic River at Little Falls and from the Wanaque Reservoir.

The depth to groundwater varies with existing grade, the tidal stage and proximity to the surrounding surface waters. Generally, a shallow water table is encountered in the areas immediately adjacent to the River, where groundwater levels are near the elevation of mean sea level.

A detailed soil survey is not currently available for Hudson County. The Hudson-Essex-Passaic Soil Conservation District published a draft soils map for Essex and Hudson Counties in 1992. Sulfaquent-Odorhents-Psamments (NJ036) is the soil unit mapped throughout Harrison on the draft soils maps. This soil is described as nearly level, very poorly drained, very deep mineral and organic soil on tide flooded flats and similar areas overlain by fill material. The sulfaquents component of this mapping unit is hydric.

Design and Performance Standards

The Town of Harrison must adopt a Stormwater Control Ordinance as part of the MSWMP and is currently evaluating the NJDEP model ordinance for implementation (see Appendix B). As part of the adoption process, the Town will also adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity in receiving water bodies. The applicability of the Stormwater Control Ordinance is limited to non-residential developments that ultimately involve one or more acre of disturbance as defined by N.J.A.C. 7:8 et seq. The design and performance standards in the ordinance include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with

N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinance will be submitted to the county for review and approval on or before April 1, 2006. During construction, Town staff will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The Town is not currently within an adopted Regional Stormwater Management Planning Area (RSWMP). If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated, as appropriate, to be consistent with those programs. The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential applications. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Town's Stormwater Management Ordinance will require applicable new development and redevelopment plans in MS4 areas to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Town staff or the Town Consulting Engineer will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Town has reviewed its Redevelopment Plan, Official Map and Ordinances, and has provided a list of the sections of the Town land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance revisions are completed, they will be submitted to the County review agency for review and approval within 24 months of

the effective date of the Stormwater Management Rules. A copy will be sent to the Department of Environmental Protection simultaneously.

Article V of the revised general ordinances entitled “Land Development Ordinance”, was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes are being proposed to this ordinance to incorporate these strategies.

Section 17-90.1: General is a section of ordinance that relates to the Subdivision and Site Plan Design Guidelines which lists broad objectives for development within the Town. Additional language will be added to specify that applicants shall utilize Low Impact Development Techniques and Non-structural Stormwater Management Strategies to the greatest extent possible in the design of site plans and subdivisions.

Section 17-90.2: Public or Common Private Open Space Design is a section of the ordinance that generally describes the intent of open space design. Additionally language will be added to encourage the use of pervious paving materials for walkways and to encourage the use of larger lawn areas.

Section 17-90.3: Buffers requires buffer areas to prevent adverse impacts or nuisances from a given project along property lines or adjacent parking areas, garbage collection areas and unloading areas. Language will be proposed to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from impervious surfaces.

Section 17-91C: Off-Street Parking and Loading specifies, “A minimum of ten (10) percent of any surface parking facility shall be landscaped and shall include one (1) shade tree for every twenty (20) parking spaces.” Additional language is being considered that increases the required area of landscaping and requires that landscape islands be utilized at specific intervals based upon the size of the project in order to break up expansive

parking lots. The goal of this revision is to disconnect large impervious areas and to provide landscape areas for stormwater treatment and recharge.

Section 17-91.1 (5): Sidewalks and Curbing discusses the requirement for pedestrian walkways within parking areas. This section is being considered for revision to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas.

Section 17-96 (B.1): IMPROVEMENTS Stormwater will address stormwater runoff which will be updated to include all requirements outlined in N.J.A.C. 7:8-5.

Land Use/Build-Out Analysis

As previously noted, a build-out analysis is required where the municipality has more than 1 square mile (640 acres) of undeveloped land. The Town of Harrison is a highly urbanized municipality with a total land size of approximately 800 acres. Accordingly, the Town of Harrison does not meet the criterion established by the NJDEP and accordingly does not have to complete a build-out analysis.

Mitigation Plan

In situations where a proposed development cannot meet the design and performance standards for stormwater runoff quality, stormwater runoff quantity, and groundwater recharge, as established by the Municipal Stormwater Management Plan, the Town of Harrison (the Town) may grant a waiver from the performance standards. For each waiver, a mitigation project must be performed which offers an option that clearly offsets the effect of groundwater recharge, stormwater quantity control, and/or stormwater quality control that was created by granting the waiver (to be granted by the Planning Board). The existence of a mitigation plans does not preclude the requirements that an applicant meet the design and performance standards for stormwater runoff quality, stormwater runoff quantity, and groundwater recharge on the project site. Instead, it allows the Town, in limited circumstances, to waive the strict compliance with one or

more of the performance standards, where full compliance cannot be reasonably accommodated on-site, including through a reduction in the size or scale of the development. A waiver cannot be granted if the project requesting a waiver would result in a localized adverse impact or create a compliance deficit that cannot be compensated for by off-site mitigation. Under no circumstances will the Township grant a waiver for the Special Water Resource Protection Area requirements established under the Stormwater Management Rules at N.J.A.C. 7:8-4.

The Town may grant a waiver for any or all of the design and performance standards for projects reviewed under the Municipal Land Use Law (MLUL), or for projects undertaken by the Town that are not subject to the MLUL. Any waiver granted by the Town for its own projects must include a report for the project addressing the requirements for mitigation projects. A summary of each waiver granted must be included in the Annual Report prepared by the Town as part of the compliance with the Town's NJPDES General Permit. Waivers for linear development projects must be evaluated using the requirements under N.J.A.C. 8:8-5.2(e), which includes the requirements to address mitigation for the performance standard which compliance was not obtained. The issuance of a permit by the NJDEP, that includes a stormwater management review and an associated waiver under the provisions of the specific permit, does not automatically waive the requirements for mitigation to be performed under the Town's review. The Town may choose to require mitigation for projects receiving a waiver from the Department.

The mitigation 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 outlined in the Municipal Stormwater Management Plan. The applicant must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual. If a suitable mitigation site cannot be located in the same drainage area as the proposed development, the

mitigation project may provide mitigation that is not equivalent to the impacts for which the waiver or exemption is sought, but that addresses the same issue. For example, if a waiver is given because the 80 percent total suspended solids (TSS) removal requirement (50 percent for redevelopment areas) is not met; the selected project may address water quality impacts due to a fecal impairment.

Specific Mitigation Projects

The different performance standards require different ways to look at mitigation projects for each performance standard identified. Stormwater quality is intended to prevent an increase in pollutants from entering the waterbodies. Stormwater quantity focuses on the impacts of increased runoff on flooding, and groundwater recharge maintains the water that feeds baseflow in streams and aquifers. Mitigation projects can be retrofits of an existing system, such as preexisting development where stormwater management was not sufficiently addressed based on the new performance standards. They may also be new projects designed to provide control of stormwater runoff where none previously existed.

Sensitive receptors are areas with specific sensitivity to impacts of stormwater, whether through changes to stormwater runoff quality, stormwater runoff quantity, and groundwater recharge. Examples of sensitive receptors are trout associated waters, threatened and endangered species, impaired waterways, inadequate culverts, property subject to flooding, Category One waters, and aquifers. The sensitive receptor that is affected by the performance standard for which a waiver is sought should be identified and considered when selecting the mitigation project.

Mitigation Projects for Stormwater Quality

Stormwater quality is regulated for the purpose of minimizing/preventing non-point pollution from reaching a waterway. Mitigation for stormwater quality can be achieved by directing the runoff from the water quality design storm into a natural area where it can be filtered and/or infiltrated into the ground; by constructing a new

BMP to intercept previously untreated runoff; or by retrofitting existing stormwater systems that previously did not provide sufficiently for water quality.

Some examples of areas or features sensitive to water quality changes include:

- *Trout associated waters* - chemical pollutants and temperature effects can diminish viability of trout populations;
- *Lakes, ponds or other impoundments* - these waterways are sensitive to the addition of nutrients;
- *Threatened and endangered species or their habitats* - sensitive to both water quality and quantity changes;
- *Drinking water supplies* - adverse affects on quality can increase the cost of treatment or threaten the use of drinking water supplies;
- *Category One waters* - an issue for those streams where quality was basis of the designation; and
- *Waterways with water quality or use impairment* – non-point pollution. may result in further deterioration of water quality.

Mitigation Projects for Stormwater Quantity

Increased stormwater runoff volume from new development can cause damage to property and habitat due to increased flood elevations and/or flood velocities. Mitigation project areas can include locations that will provide for additional storage and slower release of excess stormwater. Mitigation of stormwater quantity can be accomplished by increasing existing ponding areas along a waterway, creating new BMPs to control previously uncontrolled runoff, or by retrofitting existing stormwater structures to decrease the volume and peak of stormwater runoff.

In areas adjacent to a stream, a hydrologic and hydraulic analysis can be performed to determine if increasing storage capacity would offset the additional volume of runoff from sites upstream of the storage area. Areas that may provide storage are lakes, ponds, parkland, or other land upstream of constrictions such as inadequately sized bridges or culverts. Increases in the storage capacity of an existing structure, such as upstream of a bridge or culvert, can also be considered provided that it is demonstrated that such as increase does not exacerbate flooding at other areas.

Some examples of areas or features sensitive to changes with regard to flooding include:

- *Culverts and bridges* - these features may constrict flow and cause flooding or may provide storage that, if lost, would cause downstream flooding problems;
- *Property subject to flooding* - areas of concern include those where there is historical evidence of recurrent problems, particularly if exacerbated over time because of increasing impervious surface in the contributing watershed;
- *Eroding/widening stream banks or channels* - particularly if due to changes in hydrology due to the effects of development;
- *Category One waters* - flooding affects could alter habitat that was the basis for the designation; and
- *Wetlands* - changes in hydrology can affect viability of wetlands, either by increasing or decreasing volumes and velocities of water discharging to the wetlands.

Mitigation Projects for Groundwater Recharge

Groundwater recharge is regulated to maintain the groundwater hydrology of the project area. Recharge *is* the portion of the infiltrated stormwater runoff that makes it below the root mass and becomes groundwater. There are two (2) options to demonstrate compliance with the groundwater recharge standards. The first *is* that 100 percent of the site's average annual pre-developed groundwater recharge volume be maintained after development, and the second is that 100 percent of the difference between the sites pre-and post-development 2-year runoff volumes be infiltrated. To mitigate for groundwater recharge, either computational method can be utilized to determine the deficit that needs to be provided by the mitigation project.

Some examples of areas or features sensitive to groundwater recharge changes include:

- *Springs, seeps, wetlands, white cedar swamps* – these features are sensitive to changes in ground water level/hydrology;
- *Threatened and endangered species or their habitats* - some are sensitive to changes in ambient groundwater levels;
- *Streams with low base flow or passing flow requirements* – these features may be particularly sensitive to changes in hydrology;
- *Aquifer recharge zones* - loss of recharge in these areas can adversely affect

- groundwater supply; and
- *Category One waters* - loss of base flow may affect the basis for the designation.

Selection of Mitigation Projects

Mitigation projects shall be proposed by the applicant. The applicant shall locate an appropriate project and site for the mitigation of the performance standard for which they are requesting a waiver. The applicant shall look at existing problems related to stormwater runoff quality, stormwater runoff quantity, and groundwater recharge to assist in the identification of appropriate projects. The process of selecting mitigation projects must incorporate the following requirements:

1. The mitigation project must be within the same drainage area that would contribute to the sensitive 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 Town, preferably at a location that would provide the most benefit relative to an existing stormwater problem in the same category (i.e. quality, quantity, or recharge).
2. Legal authorization 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. For example, if the project for which a waiver is obtained discharges to a tributary, but the closest location of the application project discharges to the main branch, it may be more beneficial to identify a location for mitigation which discharges to the same tributary.

4. It is preferable to have one location that addresses any and all performance standards waived rather than one location for each performance standard.
5. The project location must demonstrate no adverse impacts to other properties.
6. Mitigation projects that address stormwater runoff quantity can choose to provide storage for proposed increases in runoff volume, as opposed to a direct peak flow reduction.
7. Mitigation projects that address stormwater runoff quality can choose to address another pollutant, other than TSS, which has been demonstrated to be of particular concern such as streams listed as an impaired waterbody on the Integrated List. Care should be taken to ensure that waivers from the TSS requirement do not result in impairment of an existing unimpaired area.

Requirements for Mitigation Projects

The following requirements for mitigation projects must be included in the project submission:

- 1. Impact from noncompliance:** Provide a table to show the required values, and the values provided in the applicant's project, the corresponding deficit(s) from the performance standard(s), and include an alternatives analysis demonstrating that on-site compliance was maximized.
- 2. Narrative and supporting information regarding the need for the waiver:**
 - The waiver cannot be due to a condition created by the applicant. If the applicant can provide compliance with the Stormwater Management Rules through a reduction in the scope of the project, the applicant has created the condition and a waiver cannot be issued.
 - A discussion and supporting information of the site conditions that would not allow the construction of a stormwater management facility to provide

compliance with the performance standards, and/or if the denial of the application would impose an extraordinary hardship on the applicant brought about by circumstances particular to the subject property. Site conditions to be considered are soil type, the presence of karst geology, acid soils, a high groundwater table, unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare and safety.

- Demonstrate that the grant of the requested waiver will not result in an adverse impact that will not be compensated for by off-site mitigation.

3. **Sensitive Receptor:** Identify the sensitive receptor to the performance standard from which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive receptor.
4. **Design of Mitigation Project:** Provide the design of the mitigation project. This includes, but is not limited to, drawings, calculations, and other information needed to evaluate the mitigation project.
5. **Responsible Party:** List the party or parties responsible for the construction and the maintenance of the mitigation project. Documentation must be provided to demonstrate that the responsible party is aware of, has authority to perform, and accepts the responsibility for the construction and maintenance of the mitigation project. Under no circumstances shall the responsible party be an individual single-family homeowner.
6. **Maintenance:** Include a maintenance plan that addresses the maintenance criteria at N.J.A.C. 7:8-5.8 as part of the mitigation plan. In addition, if the maintenance responsibility is being transferred to the Town (if such an arrangement is approved by the Town), or other entity, the entity responsible for the cost of the maintenance must be identified. The Town may provide the option for the applicant to convey the mitigation project to the Town (if such an arrangement is approved by the Town, if the

applicant provides the cost of maintenance in perpetuity.

7. **Permits:** Obtain any and all local, State or other applicable permits for the mitigation measure or project. These must be obtained prior to the Town approval of the project for which mitigation is being provided.

8. **Construction:** Demonstrate that the construction of the mitigation project coincides with the construction of the proposed application project. A certificate of occupancy or final approval by the Town for the application project cannot be issued until the mitigation project or measure receives final approval by the Town and/or other agencies requiring approval. Any mitigation project proposed by the Town to offset the stormwater impacts of the Town's own projects must be completed within 6 months of the completion of the Town project, in order to remain in compliance the NJPDES General Permit.

Funding Municipal Projects

The Town may allow an applicant to fund analyses to identify potential mitigation projects that could be used to address deficits in complying with each of the performance standards. However, this funding option shall only be allowed where the project requesting the waiver will have no measurable impact with respect to flooding, erosion, water quality degradation, etc. and will have no immediate impact to a sensitive receptor. The funding option may also be used in situations where the size of an individual project requesting a waiver is small, or the degree of deficit in complying with the design and performance standard(s) is small. Also, if the project requiring mitigation is for one individual single family home, a financial contribution may be a preferred option. In these situations, it may not be practical to implement a commensurate mitigation, project and may be preferable to accumulate funds to implement an analysis and construction of a larger mitigation project. In such cases, the receipt of the financial contribution shall satisfy the mitigation obligation for the applicant. This funding option will only be used in limited circumstances after all

other mitigation options have been considered. The Town becomes responsible to ensure that the mitigation occurs in a timely fashion and must provide a detailed discussion of the status of the mitigation fund and funded projects in the annual report required under the NJPDES municipal stormwater permit.

March 22, 2005

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