

## Element 9 *Stormwater Management Plan*

### 9.1 Introduction

This Stormwater Management Plan (MSWMP) documents the strategy for the Borough of West Wildwood to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations as promulgated by the New Jersey Department of Environmental Regulations. The elements of this plan are specified by N.J.A.C. 7:8-4 Municipal Stormwater Management Planning. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new 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. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities

These regulations on a statewide basis also intend to minimize the adverse impact of development on the recharge of groundwater that provides base flow in receiving water bodies. The surface aquifer of the island on which the Borough is constructed is isolated and fragmented and does not provide for base flow to the surrounding water body.

A build-out analysis has been included in this plan based upon existing zoning. The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other documents to allow for project designs that include development consistent with this plan. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan; specific stormwater management measures are identified to lessen the impact of existing development.

### 9.2 Goals

The goals required by N.J.A.C. 7:8-2.2 requires the stormwater management plan goals as follows:

- a. Reduce flood damage, including damage to life and property;
- b. Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- c. Reduce soil erosion from any development or construction project;

- d. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- e. Maintain groundwater recharge;
- f. Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- g. Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- h. Minimize pollutants in stormwater runoff from new and existing development in order to restore, enhance and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water; and
- i. Protect public safety through the proper design and operation of stormwater management basins.

This plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for storm water infrastructure to be implemented to protect public safety.

Development can result in the accumulation of pollutants on the land surface that runoff can mobilize and transport to the receiving waters. New impervious surfaces and disturbed areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can also adversely affect water habitat by altering the water temperature and/or alter the natural food chain.

### **9.3 Stormwater Discussion**

Alteration of ground surface elevations and changes to the surface materials can dramatically alter the hydrologic cycle of a site and, ultimately, an entire watershed. In uplands areas with continuous unconsolidated surfaces rainfall and snow melt seep into the soil. The ground water recharge descends through the spaces between soil particles in the unsaturated zone to the water table at the start of the saturated zone. The elevation of the water table surface is sloped downhill and eventually emerges at the ground surface as a lake, stream or other surface body. Soils that conduct water and extend to the surface are called unconfined aquifers. The water level in the lake or stream is controlled by the elevation of the groundwater within the

adjacent ground surface, which holds much more water than the surface of the watercourse. Surface runoff adds to the stream flow for short periods of time.

The fine soils of the salt marsh have such small distances between soil particles that water does not flow. Salt marsh is called a confining layer. At the coastline, the salt marsh covers the edges of the soils containing fresh water aquifer and provides a confining layer that limits the intrusion of salt water into the aquifer. Over-pumping of wells and/or the loss of recharge draw saltwater into and damage the fresh water aquifer.

Surface aquifers located on islands are largely controlled by the elevation of the Ocean. A rain event does not change sea level. The volume of water in the small thin surface aquifer is dwarfed by the volume of water in the Ocean. The daily tide maintains the groundwater at the shoreline at the elevation of the average high tide. Any precipitation that or irrigation on the island then mounds the water table. The groundwater flows towards the closest intersection of the ground surface and the water table. The placement of permeable soils over the existing soils of low permeability raises the elevation of the water table. Where development has raised the land surface with permeable soils the raised water table intersects the surface at the edge of the development. This generally causes flooding of existing lower properties unless the elevation of the groundwater surface is controlled by the installation of a perimeter drainage system as required by Ordinance 452. Where fill has been placed without mitigation of the impact on groundwater problems have developed.

It should also be recognized that Grassy Sound, Wildwood Canal, Post Creek Basin and the connecting water ways are an integral part of the stormwater system. These bodies of water which are beyond the normal limits of a municipal planning board are an integral part of the community.

#### **9.4 Background**

The Borough of West Wildwood encompasses 0.34 square miles (230 acres) in Cape May County, New Jersey. This includes 20 acres of open water and 26 acres of land zoned as conservation. The 175 acres of the remaining 62 acres are public rights of way. The net developed and developable land area within the bough is 121 acres.

The municipality occupies portions of a costal island and a Back Bay island. The entire municipality is located within a Tidal Flood Hazard Area and is contained within a single HUC-14 drainage area within the Great Egg Harbor watershed identified by the United State Geological Service as Watershed No. 02040302. There are no class one surface waters in or adjacent to the Borough.

There are no wellhead protection areas in or adjacent to the Borough. The surface aquifer discharges to saltwater and has an estimated volume of 2 million cubic feet which is less than 9 percent of the 23 million cubic feet of annual rainfall.

The ground surface elevation of the developed portions of the island range from 2.9 feet to 8 feet NGVD 1929. The elevation of the new moon high tide typically reaches an elevation of 3.7 feet NGVD 1929. The groundwater table for much of the year is therefore at or near the ground surface. This results in runoff approaching 100% of the precipitation.

The definitions contained within the Storm Water Regulations NJAC 7:8 include the following:

“Stormwater” means water resulting from precipitation (including rain and snow) that runs off the land’s surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities or conveyed by snow removal equipment.

“Tidal Flood Hazard Area” means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but is primarily caused by the Atlantic Ocean.

The major flood events in the recent history of the Borough have not been accompanied by heavy rains. The floods have been caused by extreme tides associated with high winds. The storm drainage system is therefore designed for the tidal flood event which is the equivalent of 56 inches of rainfall in a 6-hour period which exceeds the 100-year rain event, by a factor of 9.

## **9.5 Design and Performance Standards**

The Borough will adopt revised design and performance standards for stormwater and tidal flood management that are consistent with the goals of NJAC 7:8-4 as they apply within the tidal flood plan. Peak capacity of new stormwater structures must provide for the removal of the tidal flood event. The recharge and runoff quantity standards will be consistent with NJAC 7:8-5.4(a)3iv. The Stormwater quality standards will be in accordance with NJAC 7:8-5.5. The design standards will include language for the maintenance of stormwater management measures consistent with the stormwater management rules at NJAC 7:8-5.8. Maintenance requirements and language for safety standards consistent with NJAC 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the county for review within 24 months of the effective date of the Stormwater management rules.

## **9.6 Plan Consistency**

The Borough is not located within a Regional Stormwater Management Planning (RSWMP) Area and no Total Maximum Daily Load (TMDL) requirements have been developed for waters within the Borough. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be reviewed for consistency.

The Municipal Stormwater Management Plan will be updated to be consistent with future updates of the Residential Site Improvement Standards (RSIS) as applicable to achieve the goals of the program.

## **9.7 Developmental Ordinance Revisions**

A review of the Land Development Ordinance of the Borough of West Wildwood has identified several areas that may be revised to provide consistency between the Storm Water Regulations and the Residential Site Improvement Standards (RSIS). The topics are as follows:

- The applicability of the RSIS rules to development will be further defined in the Ordinance,
- The use of permeable parking lot surfaces for overflow parking will be reviewed and revised if deemed appropriate,
- The rules regarding stormwater runoff calculations will be reviewed by the Municipal Engineer for consistency with other regulations and the Borough Flood Mitigation Strategy.
- The development ordinance does not yet include reference to stormwater quality standards,
- The development ordinance does not yet include provisions for stormwater mitigation in lieu of struck compliance.

## **9.8 Land Use/Build-Out Analysis**

The Borough is located within a single HUC-14 and has a total area of 220 Acres (0.34 square miles). The existing land uses were documented in 2000 for the Wildwood Urban Enterprise Zone Application. The Re-Development Build-Out of the Borough in accordance with the current zoning regulations would result in a maximum impervious surface area of 122 Areas (0.19 sq miles). The overall impervious surface of the Borough at total build-out would then be 55% impervious coverage.

## 9.9 Mitigation Projects

**The Borough of West Wildwood has identified several projects directly related to stormwater quantity and quality that could be undertaken as mitigation projects. These projects include:**

- The construction of the missing components of the Arion Avenue Drainage System. This system has been designed however only those portions for which funding were available have been completed.
- The extension of the Lake Road Drainage System from Maple to Pine Avenue.
- The completion of the Avenue E Drainage system. This system has been designed however several elements have not yet been constructed pending availability of funds.
- The installation of an oil skimmer on the South Neptune Avenue Drainage system adjacent to the Borough Public Works Facility.
- The construction of a roofed street sweeping drying area at the Borough Yard.
- The video inspection of municipal sanitary sewer mains. Infiltration into the sanitary system has direct impact upon ground water.
- The video inspection of the municipal and county storm sewer system within the Borough, to document its current condition and to verify the absence of illegal connections.